

# **CHAPTER – I**

## **INTRODUCTION**

### **1.1 General Background**

Nepal is one of 49 least developed countries of the world (UN, 2003:3-4). It is surrounded by the two regional superpowers of Asia. Indian in east, south and west and China in north. In Nepal, a large number of populations still live below the poverty line. Nepal's agro-demeaned economy is further worsened by the complex geographical situation and poorly developed rural infrastructures, various factors such as land locked situation, poor resource mobilization, lack of institutional commitment; volatile government policies, political instability etc. are responsible for the slow pace of development in Nepal. Development of business enterprises is vital for the economic growth and overall development of the country.

"Nepal is a mountainous country. It is located on the southern flank of the Himalayan range. Nepal covers an area of 147181 sq. km. It extends about 885 kilometers along east west; the north south extension varies from 145 kilometer to 241 kilometers. Agriculture is the largest sector and the backbone of the Nepalese economy. Nepal is one of the poorest countries of the world." (Shrestha; 1999:1-2)

Even in the least develop country like Nepal; stock market has become one of the important parts of the national economy. Stock market is the important part of the finance that encourages the development of the country's financial sector. It is assumed that the capitalistic economy expansion of stock market represents the development of the country's financial sector and it speeds up the nation's growth. In today's world, where each and every managerial decision making is based on financial analysis, stock market as important part of finance will encourage the development of the country's financial sector. In a capitalistic economy, expansion of stock market represents the developments of

a country's financial sector and speed of the nation's economic growth Banks are one of major players in the economic growth of the country and hence it needs proper attention to run successfully. Banks should be established and conducted after analyzing the various factors.

Normally Banks play at public money that is why people pay their attention whether their money is properly utilized or not and whether the Bank is running at profit or loss. The existence of profit to any business firm is the basic factor. If there is no profit a business firm will become unable to provide its facilities in the long run. Financial market refers both to money market and capital market. Money market may be defined as short-term financial assets market, which facilities liquidity and marketability of securities. It includes the market for short term debt instrument having maturity of less than one year. The functions of money market interest rates are reflecting the demand and supply of funds in the competitive market. The instruments used in money market are treasury bills, negotiable, certificate of deposit, municipal bonds, Banker acceptor etc. In Nepalese context, some financial institutions have been involved in capital market. They are: Nepal Rastra Bank, commercial Banks, agriculture development Bank, Nepal industrial development corporation, employees provident fund, citizen investment trust, cooperative agencies, non-government organizations (NGOs), some hotels, manufacturing and trading agencies etc.

These institutions play a vital role on the development of capital market. Nepalese capital markets are classified into two sector organized sectors and unorganized sectors. Government agencies and other institutions are categorized as organized sectors, they provide long term fund for the development of the agriculture, industrial and commercial sectors by investing in stock, debenture and government bonds, individual investor, merchants and private sectors also helps for the development of capital markets. Rural areas are still dominated by unorganized sectors. It implies that mass poverty and exploitation from higher classes are still found in these areas.

Common stock is easier to describe but hard to analysis. Common stock represents equity or ownership position in a corporation. Hence common stock is known as risk security. It is regarded as most expensive form of long term financing. This is because dividends are not tax deductible and it is risky security. Investing is a process of making decision today whose result will not be known until tomorrow. The motivation for investment in stock market is desired to increase the wealth.

Generally, investment is risk, the assets having great returns with the least amount of risk. Investor must be able to identify the securities having low risk but high return. One way in which investor can reduce the risk is by spreading their capital across a range of investment. This is the principle of diversification or not putting the eggs in one basket. Diversification involves constructing the investor's portfolio in such a manner that risk is minimized.

Securities raise funds in the capital market that certainly helps to expand that national economy. There are different types of securities such as treasury bill, long-term government bonds, long term corporate bonds, common stock etc. Among these, this study concerns only with common stock. Common stock holders of the company are its ultimate owners. Collectively they own the company and ultimate risk is associated with their ownership. So the common stock is known as risky security.

An investment involves sacrifice of current rupees for future rupees. The sacrifice takes place in the present and is certain while the reward comes late and it is uncertain. Investment is always associated with return and risk. People invest with an aim of earning some profits in addition to the initial amount. Investment generally involves real asset or financial assets. Financial assets are piece of paper representing an indirect claim to real assets held by someone else. Real assets are generally less liquid than financial assets. Investment is an exchange of financial claims such as stocks and bonds etc.

There are various types of alternatives for investments. Out of the, this study deals with the common stock investment. Common stock has one important investment characteristics and one important speculative characteristics. As the common stock is riskier it will yield higher return. Common stock is an ownership security. 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.

Higher the risk of security, higher the rate of return demanded by the investor. Since ordinary share is more risky, investor will require highest rate of return on their investment in common stock performance share is more risky than debt. Therefore risk return relationship for various securities is different.

"Risk plays a central role in the analysis of investments. Investors often ask about the total risk they will be assuming in an investment and like to know whether the risk premium provided to them is enough or not. But they are also concerned about many other issues. First of all, it is necessary to see the total risk associated with a single asset is relevant for them. Second, they need to know the actual contribution of an assets risk to portfolio risk". (Pradhan; 2001:334)

Return is the reward for uncertainty of risk. This is the main attraction for investors, which encouraged them to invest in risky securities as stock accepting a varying degree of risk tolerance. Return is the total gain or loss experienced on an investment over a given period of time.

"A portfolio is a combination of investment assets. The portfolio is the holding of securities and investment in financial assets i.e. bond, stock. Portfolio management is related to the efficient portfolio investment in financial assets. The primary objective of portfolio is to maximize return and to minimize risk.

Risk presents in virtually every decision. Assessing risks and incorporating the same in the final decision is an integral part of financial analysis. The

objectives in decision making is not to eliminate or avoid risk often it may be neither feasible nor necessary to do so but to properly assess it and determine whether it is worth bearing". (Chandra; 1999:67)

"The concept of risk and return are the determinant for the valuation of securities. However, risk means that we do not know what is going to happen even though we occasionally have a good idea of the range of possibilities that we face. In the most basic sense, risk can be defined as the chance of loss. Assets having greater chances of loss are viewed as more risky than those with lesser chances of loss. More formally, the term risk is used interchangeably with uncertainty to refer to the variability of returns associated with a given asset". (Gitman; 2001:237)

Risk cannot be avoided if investor is seeking higher rate of return. Investor will require different rate of return on various securities. Since they have risk difference, higher the rate of return demanded by the investor. Since ordinary share is more risky, investor will require highest rate of return on their investment in common stock: preference share is more risky than debt therefore risk-return relationship for various securities is difference.

"Investor generally does not invest their money in only one risky asset instead; they hold a portfolio of many in the hope of diversifying the investment risk. The relevant risk of an asset is defined as the portion of its total risk that changes proportionately with the market risk. In the context of portfolio, the contribution of each asset to the portfolio risk is the portion of relevant risk of the asset. Therefore, an investor is concerned with the portfolio risk, which is the sum of the relevant risk of individual assets included in portfolio" (Pradhan; 2001:114)

The market risk depends on the degree of variability in the market return. The relevant risk of an asset depends on how sensitive the asset return is to the changes in the market returns. The relevant risk of individual assets is measured in term of the sensitivity of its returns to changes in the market

return. It is known as systematic or beta risk. The term beta is used to measure the sensitivity of asset returns to the changes in the market returns. The total risk of an investment project is the absolute risk and it is measured in various or standard deviation. The variability of returns is one and only the cause of risk.

The homogenous stock risk of individual stocks can be eliminated if they are included in a well-diversified portfolio. When individual stocks with imperfect correlations are combined in to a portfolio the lower the return on a stock caused by the factors specific to a company or groups of homogenous stocks is usually offset by the higher return on the stocks. Thus, this part of the risk is eliminated and the portfolio risk is reduced.

"Banking plays a significant role to the development of national economy. Bank is a financial institution, which primarily deals in borrowing and lending. Modern Bank performs many other varieties of functions. The word "Bank" is derived from Italian word "BANCA" which means a counter tables or bench used by medieval money exchange. Oxford dictionary defines Bank as "an establishment for the custody of money". The Bank operates in the modern and competitive business environment. A Bank is one who is the ordinary course of his business, receives money which he repays by honoring cheque of persons from whom or on whose account he receive it". (Bradford; 1995:453-454)

Although, there are various types of Banks, only commercial Banks are considered here, for the purpose of present study. They are the hearts of the modern financial system.

In Nepal, organized Banking system is a relatively recent phenomenon. The process was started after the establishment of Nepal Bank Limited in 1994 B.S., which is the first financial institution in Nepal. Then, Nepal Rastra Bank as the central Bank of Nepal was established in 2013 B.S. Rastriya Banijya Bank founded as the second commercial Bank of Nepal in 2022 B.S.

After 2040 B.S. HMG of Nepal allowed to established joint venture Banks in Nepal. In 2041 B.S. the first joint venture Bank under the name of Nepal Arab Bank Limited was incorporated. In 2043 B.S., the second joint venture Bank Nepal Indosuez Bank Limited was established. In the same year, Nepal Grindlays Banks Limited (now standard chartered Bank limited) as their joint venture Bank was also established. But more joint venture Banks came in to existence after he initiation of governments policy of economic liberalization and privatization in 2049 B.S. They are Himalayan Bank Limited, Nepal SBI Bank Limited, Nepal Bangladesh Bank Limited, Everest Bank Limited, Bank of Kathmandu, Kumari Bank Limited, Laxmi Bank Limited and Siddhartha Bank Limited (Source: [www.nepalstock.com](http://www.nepalstock.com)).

## **1.2 Focus of the Study**

Financial analysis is the important part of the economy so that every management is making their managerial decision on the basis of financial analysis. Finance is composed of three main functions: investment, financing and dividend. All investors invest their fund with hopes of getting good profit but for the lack of necessary knowledge the investor gets result in loss. In the context of Nepal, people are ignorant about the investment opportunity and risk associated with it. Investor must consider all related factors before considering making an investment. This study is focused on analyzing risk and return associated with the shares of some commercial Banks.

## **1.3 Statement of the Problem**

The capital market has grown rapidly within very short period after the establishment of stock exchange but the attitudes, thoughts and knowledge of investor has not changed yet. They do not have idea of risk and return. There are no separate institutions, which provide information required making national decision by the investors and on the other hand lack of good policy had discouraged the investors.

Investors need to have more knowledge about investment opportunities. They must be able to analyze the associated risk and returns of individual stock. This will increase the market efficiency. An investor must be able to design his investment and financing activities in a manner to maximize the market value of shares. There are no sources to get exact or perfect information about the future regarding risk and return on investment in Nepal. Investing funds in different securities diversifies the risks, which needs to be understood by Nepalese investors.

In Nepal, major weakness on the increment of stock market efficiency is due to lack of skills, knowledge, resources and technology. Most of the investors are not seem to be aware of financial position of the companies in term of their financial indicators in which they are going to invest their funds. Through secondary market NEPSE, the market price of common stock seems to be in accordance with the financial indicators. Instead, in determination of market price of share, there has been major influence of rumors rather than strengths of the companies.

At the same time there are no any institutions, which provide information required to make rational decision that can accelerate stock investment and market efficiency. Government policy is found less encouraging in promoting common stock investment. On the other had, usually there is positive trade off between risk and return. It is true that riskier assets will play higher average rate of return to make the riskier investment.

There are very few practices of analyzing this aspect in Nepalese context. Most of the investors seem to be investing their funds haphazardly without considering risk involved in their investment. In Nepal the investors have no much more alternatives for investment, so every one is making investment on security market. Only few companies are listed in NEPSE, which still limits the opportunities of investment. This trend has made the market unbalanced and unfair. If any Bank or financial institution issues shares there becomes huge



demand rather than supply, but if any manufacturing and processing issues shares, very little investors make investment.

The study seeks to analyze the following problems:

- ) How do they know about the magnitude of risks?
- ) How can one make higher return through lower risk?
- ) What are the factors that determine the return out of the risk of a company?
- ) What is the proportion of systematic and unsystematic risk to the total risk?

#### **1.4 Objective of the Study**

The basic objectives of this study are to assess the risks associated with return on the common stock investment on the basis of selective tools.

The other specific objectives of this study are as follows:

- ) To examine risk and return of common stock of listed commercial Banks.
- ) To analyze risk and return of selected portfolios.
- ) To analyze risk and return relationship of individual stock with that of market.
- ) To study systematic risks and unsystematic risk associated with security.
- ) To provide suggestions and recombination for the betterment of the selected Banks.

#### **1.5 Importance of the Study**

Investors are investing their saving funds in common stocks of public companies with the hope of good expectation of higher capital gain in future but there seems very least consciousness about the real financial conditions of the companies and degree of risk involved in their investment.

In Nepalese context, the capital market is growing very slowly. The market is not sufficient, there are very few magazines or articles related to capital market and very few studies are made on the topic 'Risk and return analysis'. Because of this reasons most the investors are investing on the capital market without any proper knowledge and information. So investment on capital market is just like 'shooting in dark'. The study will give more information about Nepalese capital market, by analyzing risk and return. It will definitely contribute to increase the analytical power of the investors in capital market.

This research has attempted to analyze the risk and associated returns of samples companies with references to their financial indicators, which would provide real pictures of sampled companies to both current and potential investors in order to take proper investment decision. Similarly this piece of task may work as guide for future researches and concerned persons.

## **1.6 Limitation of the Study**

The following are some limitations of the studies.

- ) It covers only relevant data of last five years from 2059/60 to 2063/64.
- ) Only few commercial Banks are taken into consideration.
- ) This study focuses only on analysis of risk and return leaving other components.
- ) Most of the data are secondary in nature.
- ) The main focus is given to the quantitative aspects.

## **1.7 Organization of the Study**

This study has been broadly divided in to five chapters, which are as follows:

### **Chapter I: Introduction**

It covers general introduction, statement of problem, objectives, significance of study, limitation of study etc.

## **Chapter II: Review of Literature**

It consists of the conceptual/theoretical review and review of related studies.

## **Chapter III: Research Methodology**

It focuses on research design, population and sample sources of data, data analysis tools and limitation of the research methodology.

## **Chapter IV: Data Presentation and Analysis**

This chapter attempts to analyze and evaluate the data with the help of analytical tools and interpret the result.

## **Chapter V: Summary, Conclusion and Recommendations**

This chapter attempts the results obtained through analysis and recommends some suggestions.

Bibliography and Appendices is incorporated at the end of the study.

## **CHAPTER – II**

### **REVIEW OF LITERATURE**

This chapter is divided into two parts. One is conceptual review and another is review of previous related studies. In this regard, basic academic course books on finance recently published books of finance and related to the topics, journals, and other related studies/research reports were reviewed.

#### **2.1 Conceptual Review**

Central focus of the finance is trade off between risk and return. This study has focused on the risk and return analysis in the investment on common stock. This section of the chapter reviews the meaning and definitions of different concepts and terms used in this study.

##### **2.1.1 Common Stock**

Literally common stock is an ownership security. It is a source of long term financing. The common stock certificates are legal documents that give an evidence of ownership in a company that is organized as a corporation. Common stocks are marketable financial instruments. Sole proprietorships and partnerships are other forms of business organization, but only corporations can issue common stock.

Common stock is the recipient of the residual income of the corporation. Through the right to vote, holders of common stock have legal control of the corporation. An element of risk is also involved in equality ownership due to its low priority of claims at liquidation. In case, if the firm is Bankrupted, common stock holders will be, in the principal entitled to any value remaining after all other climates have been satisfied. Thus risk is highest with common stock and so must be in its expected return. Common equality provides a cushion for creditors if losses occur on dissolutions. Common stocks are generally "fully paid and non assessable", meaning that common stock holder may lose their

initial investment. If the corporation fails to meet its obligation, the stockholders cannot be forced to give the corporation the funds that are needed to pay off the obligations.

"Of all the forms of securities common stock appears to be the most romantic while fixed income investment revenue may be more important to most of the investor. Common stock seems to capture their interest the most. The potential reward and penalties associated with common stock make them an interesting even exciting proposition, no wonder, and common stock investment is a favorite's topic for conversation in parties and gets together". (Chandra; 1999:67)

"Common stockholders of a corporation are its residual owners, their claim to income and assets comes after creditors and preferred stock holders have been paid full. As a result, stockholders return on investment is less certain than the return to lender or to a preferred stockholder. On the other hand, the share of a common stock can be authorized either with or without par value. The par value of a stock is merely a stated figure in the corporate charter and is of little economic significance". (Van Horne; 1997:560)

A corporation exists only when it has been granted a charter, or certificate of incorporation by a state/government. This document specifies a right and obligation of stockholders. It may be amended with the approval of the stockholders, perhaps by a majority or a two-third vote, where each share of stock generally entitles its owner to one vote. Both the initial term of charter and term of any amendment must also be approved by the state/government in which the corporation is chartered. The main characteristics of common stock are as follows.

#### Ñ **Priority to Assets and Earning**

Common stockholders have a residual claim on the earnings and assets of their corporation.

## Ñ **Authorized, Issued and Outstanding Share**

The corporate of a company specifies the number of authorized shares of common stock that the company can issues maximum without amending its charter.

## Ñ **Voting Rights**

The common shareholder's right to vote in the affairs of the company. In most of the common stock each shareholders costs one vote in one share. A proxy is a temporary transfer of the right to vote.

There are two types of voting system, which are as follows:

- 1. Majority Voting System:** A voting system in which each stockholder may cast one vote for each director for each share held. This system is to the advantage of the majority shareholders. It is also known as non-cumulative voting or straight voting system.
- 2. Cumulative Voting System:** A voting system in each share of stock entitles the holder to cast as many votes as there are directors to be elected. This system gives minority shareholders an opportunity to elect some directors. The nature of cumulative system is given below. By the following formulas.

$$\text{req.} = \frac{\text{des}(n)}{\#+1} + 1$$

Where,

req. = Number of shares required to elect desired number of directors

des = Desired number of directors

n = Total number of shares outstanding

# = Total number of directors to be elected

$$\text{des} = \frac{(\text{req} - 1) (\# + 1)}{n}$$

(Gautam and Thapa, 2060 B.S.).

### Ñ **Maturity**

The capital obtained from this source is called as fixed capital. This cannot be redeemed in the mid life of the organization.

### Ñ **Capital in Excess of Par Value**

Capital in excess of par value often called capital surplus or additional paid in capital usually refers to the amounts directly contributed to equity capital in excess of the par value.

### Ñ **Retained Earning**

Retained earnings are the believe sheet account that indicates the total amount of earnings that is retained in the business. These earnings have been reinvested in the firm.

### Ñ **The Book Value Per Share**

The book value of each common stock is equal to the net worth or common equity, consisting of sum of common stock, retained earnings and paid in capital, divided by the number of shares of common stock outstanding.

### Ñ **Stock Certificate**

Stock certificate is usually registered with the name address and holding of the investor included on the corporation books, which represented the ownership of a firm's stock.

## Ñ **Ownership Right**

Common stockholders are owners of the firm they often have voting right that permits them to select the firm's director and to vote on special issue.

## Ñ **Tax Treatment**

Interest payments to the debt holders are treated as tax-deductible expenses on the firm's income statement, whereas dividend payment to the common stockholders are non-tax deductible. The tax-deductibility of interest primarily accounts for the fact that the explicit cost of debt is generally less than the explicit cost of equity.

Thus stockholders are the last to receive any distribution of assets during Bankruptcy proceedings.

"An equity share is one, which is not a preference share. These are normally risk-bearing shares. In lean years equity shareholders do not receive any dividends. During liquidation of a company they are paid out but are usually entitled to all the surplus assets after the payment of creditors and preference shareholders. The value of these shares in the market fluctuates with the fortunes of the company. A wise investor in equality share does not receive regular dividend but is also assured of capital appreciations. "Deferred shares" are also known as founders' shares or management shares. These are usually allotted to promoters and their friends at the time of formation of the company. These shares usually carry disproportionate voting rights and right to substantial dividends from the profits left after paying off preference and equality dividend. Public limited companies, subsidiaries of such companies and private companies cannot issue such shares after the commencement of the companies Act." (Gupta and Radhaswamy; 1997:49)

### **2.1.1.1 General Right of the Common Stockholder**

There are two types of rights of common stockholders.



1. Collective rights: Certain collective rights are usually given to the common stockholders. They are as follows:
  - a) Right to formulate and amend the memorandum and the articles of association.
  - b) Right to elect directors.
  - c) Right to authorize the sales of fixed assets.
  - d) Right to authorize the merges.
  - e) Right to issue preferred stock, debentures, bonds, and other securities.
  - f) Right to change the amount of authorized common stock.
2. Specific rights: Common stockholders also have specific rights as individual owners. They are as follows:
  - a) Right to income.
  - b) Right to inspect the corporate books.
  - c) Right to vote.
  - d) Right to sell their stock certificates.
  - e) Preemptive right.

### **2.1.2 Investment**

An investment involves the sacrifice of current rupees for future rupees. The sacrifice takes place in the present and certain. The reward comes later and is uncertain. Investment generally involves real assets or financial assets. Real assets are tangible, material things such as buildings, automobiles, machinery, factories and textbooks.

Financial assets are pieces of paper representing an indirect claim to real assets held by some one else. Real assets are generally less liquid than financial assets. Returns on real assets are frequently more difficult to measure accurately. But our principal concern is with financial assets. Investment is an exchange of financial claim stocks and bonds etc. Investment is the employment of funds with the aim of achieving additional income or growth in

value. It involves the commitment of resources that have been saved or put away from current consumption in the hope that some benefits will accrue in future. Investment involves long-term commitment and waiting for a reward.

Investment may be defined as the purchase by an individual or institutional investor of a financial or real asset that produces a return proportional to the risk assumed over some future investment period. It is an investment is a commitment of funds made in the expectation of some positive rate of return. If the investment is properly undertaken, the return will be commensurate with the risk the investor assumes.

“Investing or speculating in the stock market has all the characteristics of a game. The purpose of the stock market game is to win” (Grewal; 1995:56). Sharpe et. al. 1995: 354 define the investment in the broadest sense as he sacrifice of current rupees for future rupees in which two different attributes are involved: Time and risk. The sacrifice takes place in present and is certain. The reward comes later if at all and the magnitude is generally uncertain.

### **2.1.3 Risk**

Risk is defined as the variability of the returns of a period. The one-period rate of return is the basic random variable used in measuring and investment's risk. The greater the variability of the return's the riskier the project for example, a government bond that guarantees its holders NRs 30 interest after 30 days has no risk, since there is no variability associated with the return. An equivalent investment in a firm's common stock the may earn over the same period anywhere from NRs 00 to NRs 300 is very risky due to the high variability of return. The more certain the return from an asset's the less variability and therefore the less risk.

"Risk and return are the determinant for the valuation of securities. When the firm should recognize that the forecast return may or may not be achieved. The taught part of decision-making under uncertainty is deciding how much extra

return should be required to accept a measurable risk. Therefore, risk may be defined as the likelihood that the actual return from an investment will be less than the forecast return. Stated differently, it is the variability of return from an investment." (Hampton; 1996:340-345)

In the financial term, risk can be defined as the probability of the occurrence of unfavorable outcomes. In our context two measures developed from the probability distribution have been used as initial measures of return and risk. They are the mean and standard deviation of the probability distribution.

The Webster's dictionary defined risk as a hazard: a peril; exposure to loss or injury". Thus, risk refers to the chance that some unfavorable event will occur. In real sense, if someone wishes to invest in speculative stocks, he/she is taking a risk in the hope of making an appreciable return. Risk in a simple language is an uncertainty. "Risk is typically defined as uncertainty. It arises from imperfect knowledge or from incomplete data".

#### **2.1.3.1 Sources of Investment Risk** (*Kiran Thapa 2002:9-10*)

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

##### **Ñ Interest Rate Risk**

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

##### **Ñ Purchasing 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, stock and bonds) may lose their ability to command the same amount of real goods and services they did in the past. To put this way, the real rate of return on financial assets may not adequately compensate the holder of financial assets for inflation.

#### Ñ **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 bull market. The bull market ends when the market index reaches a peak and starts a downward trend. The period during which the market declines to the next trough is called bear market.

#### Ñ **Default Risk**

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

#### Ñ **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. Illiquid assets are not readily marketable either price discounts must be given or sales commissions must be paid, or both of these costs must be increased by the seller.

#### Ñ **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 security's total variability of return that derives from the possibility that the issue may be called is the callability risk.

## Ñ **Convertibility Risk**

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

## Ñ **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.

## Ñ **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.

### **2.1.3.2 An Approach to Risk Management**

Firms often use the following for managing risks.

- ) Identify the risks faced by the firm: The risk manager identifies the potential risks faced by his/her firm.
- ) Measure the potential impact of each risk: some risks are so small as to be immaterial, whereas others have the potential for dominating 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 situations risk exposure can be reduced through one of the following techniques.
  1. Transfer the risk to an insurance company

It is often advantageous to insure against risk. However, insurability does not necessarily mean that a risk should be covered by insurance. In many instances,

it might be better for the company to self insure, which means bearing the risk directly rather than paying another party to bear it.

2. Transfer the fraction than produces the risk to a third party

For example, suppose a furniture manufacturer is concerned about potential liabilities arising from its ownership of a fleet of trucks used to transfer products from, its manufacturing plant to various points across the country. One way to eliminate this risk would be to contract with a transportation company to do the shipping.

3. Purchase derivative contracts to reduce risk

Firms use derivatives to hedge risk. 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 and exchange rates.

4. Reduce the probability of occurrence of an adverse event

The expected loss arising from any risk is a function of both the probability of occurrence and the dollar loss if the adverse event occurs. In some instance, it is possible to reduce the probability that an adverse event will occur.

5. Totally avoid the activity that gives rise to risk

For example, a company might discontinue a product or service because the risks outweigh the rewards.

#### **2.1.4 Return**

Return is the reward for uncertainty of risk. The concept of return has different meaning to different investor. Return is the main attraction for investors to invest in risky securities as stock accepting a varying degree of risk tolerance. Return is the total gain or loss experienced on an investment over a given period of time.

Some investors seek near term cash inflows and give less value to more distant return such an investor might purchase the stock of other firm that pays large cash dividends. Other investors are concerned primarily with growth. They would seek projects that offer the promise of long term, higher than average growth of sales, earning and capital appreciation.

"The return is the total gain or loss experienced on an investment over a given period of time. It is commonly measured as the change in value plus any cash distributions during the period, expressed as a percentage of the beginning of period investment value." (Gitman; 2001:237). The return better known as reward for investments includes both current income and capital gains or losses that arise by the increase or decrease of the security prices.

The expected rate of return for any asset is the weighted average rate of return, using probability of each rate of return as the weight. The expected rate of return is calculated by summing the products of the rates of the return and their respective probabilities.

$$\begin{aligned} \text{Expected value/return } E(r) &= \sum_{t=1}^T r_t P_t \\ &= P_1 r_1 + P_2 r_2 + \dots = \sum_{t=1}^T P_t r_t \end{aligned}$$

Where as,

$r_t$  = the  $t^{\text{th}}$  rate of return from a probability distribution

$P_t$  = the probability that the  $t^{\text{th}}$  rate of return will take place

$T$  = Possible rates of return

When historical return are used, the following formula is used to calculate on average return.

$$\text{Expected value/return } E(r) = \frac{\sum_{t=1}^T r_t}{T}$$

Where  $E(r)$  is the average or mean return and  $T$  is the number of observed returns.

#### **2.1.4.1 Single-Period Rate of Return** (*Van Horne and Wachouiez; 1995:90*)

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

- ) Income from price appreciation (or losses from price depreciation). Sometimes called capital gains (or losses). This quantity is denoted  $P_t - P_{t-1}$ .
- ) Cash flow income from cash dividend or coupon interest payments, represented by the convention  $ct$ .

Sum of these two sources of income (or loss) equals the total return and can express in percentage of follows:

$$\begin{aligned} \text{Single period rate of return, } r_t &= \frac{(\text{Price change}) + \text{cash dividend}}{\text{Purchase price at start of the period}} \\ &= \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}} \end{aligned}$$

Where,

- $P_{t-1}$  = Starting stock price
- $P_t$  = Ending stock price
- $D_t$  = Cash dividend for time  $t$ .

This formula can be used to determine both actual one period returns (when based on historical figures) as well as expected one-period returns (when based on expected dividends and prices). Also note that the term in parenthesis in the



number of the above equation represents the capital gain or loss during the period.

### **2.1.5 Portfolio Analysis**

Portfolios of assets usually offer the advantage of reducing risk through diversification. A portfolio is a combination of investment assets. The portfolio is the holding of securities and investment in financial assets i.e. bond, stock. Portfolio management is related to the efficient portfolio investment in financial assets.

A portfolio is defined as a combination of assets. Portfolio theory deals with the selection of optimal portfolio that is a portfolio that provides the highest possible return for any specified degree of risk on the lowest possible risk for any specified rate of return. Since portfolio theory has been developed most thoroughly for financial assets-stocks and bonds. However, extensions of financial asset portfolio theory to physical assets are readily made, and certainly the concepts are relevant in capital budgeting.

"The rate of return on a portfolio is always a weighted average of the returns of the individual securities in the portfolio. A fundamental aspect of portfolio theory is the idea that the riskiness inherent in any single asset held in a portfolio is different from the riskiness of that asset held in isolation. The portfolio analysis is performed to develop a portfolio that has the maximum return at whatever level of risk and investor thinks appropriate. If portfolio is being constructed they can reduce unsystematic risk without losing considerable return. Therefore, we need to extend our analysis of risk and return to portfolio context. Portfolio theory shows an investor can reach his optimal portfolio position. Portfolio theory, originally proposed by Harry M. Markowitz is based on the assumption that the utility of the investor is a function of two factors: mean return and variance or its square root, the standard deviation of return. Hence it is also referred as the mean variance portfolio theory or two-parameter portfolio theory." (Chandra; 1994: 71)

Three influences reduce portfolio risk in relation to the standard deviation of individual securities in isolation:

- ) Extend to which the correlation between the returns from the individual securities is less than one.
- ) Number of the securities in the portfolio and
- ) Proportion or weights of the individual securities in the portfolio in relation to their correlation among one another.

## **2.2 Review from Related Studies**

### **2.2.1 Review of Publication in the Area**

Views expressed by different persons in their articles regarding risk and return of common stock of commercial Banks are presented or reviewed here in the topic.

**Radhe Shyam Pradhan** (1993) expressed his view in relation with subject to certain extent with the topic, "*Stock Market Behavior on a Small Capital Market: a Case in Nepal*". Pradhan has summarized the following findings.

- ) Dividend per share and market price per share was positively correlated.
- ) There are positive relationship between dividend payout and liquidity.
- ) Higher the earning on the stocks, larger the ratio of dividends per share to market price per share.
- ) There are positive relationship between dividend payout and liquidity.

**Manohar Krishna Shrestha** (2049) expressed his view in relation with subject to certain extant with the topic, "*Shareholders Democracy and Annual General Metting Feed Back, Portfolio analysis*", Shrestha's findings are as follows:

- ) In many cases the existing authoritarian mentality of management seems to have not considered the shareholders in the managerial plans and polices.

- ) To-level decision often by pass the interest of shareholders.
- ) The annual general meeting has become a plat form for shareholders to express their opinions and grievance in front of the management and board of directors.
- ) Many general meetings feedback reveal no serious response to the feelings of shareholders. Thus it reflects unwillingness of the management and board of directors to change their traditionally held activities to wards shareholders.

### **2.2.2 Review from Journals and Articles**

In this section of the chapter, articles published in the journals were reviewed. Information from the internet was also collected and reviewed for this purpose.

Willam N Goetzmann (1999), in his article title "*An Introduction to Investment Theory*" Finance from the investor's perspective is explained as; investor's whether they are individuals or institutions such as pension funds, mutual funds hold portfolios that are they hold a collection of different securities. Much of the innovation in investment research over the past 40 years has been the development of a theory of portfolio management, and this module is principally on introduction to these new methods. It will answer the basic question what rate of return will inventors demands to bold a risky security in their portfolio? To answer this question we first must consider what investors what how we define return, and what mean by risk.

Edward J Elton Journal of (1999), "*Excepted Return, Realized Returns and Assets Pricing Test*" all of the testing involved using realized returns as a proxy for excepted returns. The use of a average realized return is a proxy for expected return relies on a belief that information surprises tend to out over the period of a study and realized returns are therefore an unbiased estimate of expected returns. However, the author believed that there was ample evidence that this belief was misplaced. There are periods longer than 10 years during which stock market realized returns are on average less than the risk free rate

(1973 to 1984). There are periods longer than 50 years to which risky long-term bonds on average under perform the risk free rate (1927 to 1981). Having a risky asset with expected return above the risk-less rate is an extremely weak condition for realized returns to be an appropriate proxy for expected return, and 11 and 50 years is an awfully long time for such a weak condition not to be satisfied. In the recent past, the United States has had stock market returns of higher than 30 percent per year while Asian markets have had negative returns.

Among such studies, a study carried out by Shrestha (1992, Cited by Satyal, 2002: 27-29) is noteworthy to mention here. Professor Shrestha critically analyzed the situation of common stock investors and argued the need of separate acts regarding the protection of shareholders right.

Company Act and other related Act s relating to financial and industrial sector have provisioned rights of the shareholders as:

- ) Participation in general meeting.
- ) Right of getting information.
- ) Electing as a board of director.
- ) Participation in the profit and loss of the company.
- ) Transferring shares.
- ) Proxy representations.

The collective rights of the shareholders are:

- ) Amend the internal by laws.
- ) Authorize the sales of assets.
- ) Enter to merger.
- ) Change amount of authorized capital.

The author noted that there were several companies, which conduct the annual general meetings (AGM) just to fulfill their desires and do not consider the

voice of the majority of the shareholders. Similarly management involvement and government intervention in the board election have brought a greater set back in the noting rights of the shareholders.

Nava Raj Pokharel (1999), "*Stock Market Doing Pretty Well*", wrote that the investment on the sharers of manufacturing and processing was more attractive than that of the Banks. He found that the shares of individual companies showed very good performance from October 1998 to 1999. NEPSE index showed upward trend for all the shares in this period. The author gave following reasons behind the appreciation of share price.

- ) Companies have rewarded shareholders.
- ) Reduction of interest rate of money market.
- ) Healthy speculation and loan has made the market interesting by providing loan to the stock investors their share as collateral.
- ) Investors are appearing more rational in their investment decision.
- ) Continuity maintained in the government policy is an added advantage to the market.

Finally the author concluded that the capital market needs more infrastructure investment than institution investment once the required infrastructure can facilitate the market, the size of the market could be made even bigger by introducing new instruments such as government.

Ashok Ghimire (2001), "*Nepal Share Market and Investor's Prospective*" pointed out some important trends to our capital market. He concluded that the Nepalese share price is decreasing because of many unbalanced factors. The major reason behind the movement in the index is the domination of the Banking sector in the Nepalese stock market transactions. Mismanagement practices cannot help the growth of share market. The general public has invested recklessly. They just believe what one broker or the investor says about the business. One of the prime motives for the investment is to earn

return on it. Finally the author concluded that the general investors should be alert and aware of the situations. They must receive the financial information before they make investment rationally."

It is important to understand how personal circumstances affect investment decision (If these factors make no difference we could simply publish one suggested portfolio for everyone to follow). Investment profile is the beginning of the asset allocation process, which consists of dividing portfolio among the major asset categories of stocks, bonds and cash. The asset categories of stocks, bonds and cash. The asset allocation decision will have a far more effect on portfolio return.

The technical term for this is not putting all your eggs in one basket. In this way if you trip, you won't break all the eggs. The creation of a portfolio by combining two assets that behave exactly the same way cannot reduce the portfolios overall risk below the risk of the least risky assets.

### **2.2.3 Review from Thesis**

In financial analysis and management, the concept of risk and return is not a new however limited studies have been carried out in this subject in Nepal due to mainly to slow growing capital market some of selective findings of those studies are presented as below.

#### **Bhatta's study**

The study performed by Gopal Prasad Bhatta (1996), "*A Study on security investment in Nepal*" is related to this study to some extent. bhatta's study in performance of listed companies is based on 10 listed companies' data form 1990 to 1995.

Major objective that concern with this research topic is to:

1. Analyze the performance of listed companies in terms of risk and return.

2. To analyze expected rate of return and company specific risk, required rate of return and internal rate of return, systematic risk and diversification of risk through portfolio context.

Bhatta addressed the following findings in risk return behavior form the analysis of different stock.

"A highly significant positive co-relationship has been addressed between risk and return character of the company. Investor expects higher returns form those stocks, which associates higher risk Nepalese capital market is not efficient one. So the stock price does not contain all the information relating to market and company itself. Neither investor analyzes the overall relevant information shows high priced stocks such as BBC, NIB, NIC has higher beta them others. These companies required higher returns to satisfy the investors for their risk premiums.

Investors in Nepal have not yet practice to invest in portfolio of securities portfolio shows that risk can be totally minimized if the correlation if perfectly negative. In this situation, the risk can totally be diversified but when there is perfectly positive correlation between the return the two securities, the risk is UN diversifiable. The analysis shows some has negative correlation and some has positive. Negative correlation and some has positive. Negative correlation between security returns is preferred for diversification of risk.

On the basic of findings Bhatta concluded. "An analysis of risk and return shows that many companies have higher unsystematic or specific risk. There is a need of expert institution, which will provide consultancy series to the investors to maximize their wealth through rational investment decision.

Lastly Bhatta findings the following points to improve the market efficiency.

- ) Develop institution to consult investors for risk minimization.
- ) Establish an information channel in NEPSE.

) Make proper amendment of trading roles.

To some extent Bhatta focused in the analysis of risk and return in common stock investment. But due to so many other aspects of analysis investor cannot easily assess the result. Indeed, study did not focus the viewpoint of investor rather in concentrates the companies and stock market. However, this study also explores. Some dimension for further research in this subject.

### **Pramila Tuladhar's Study**

The study performs by Pramila Tuladhar (2002), "A study on risk and return analysis of common stock".

Objective of the study

The basis objective of the present study is to describe risk return analysis of common stock.

Following are the specific objective

- ) To describe the risk return and other relevant variable those are very importation in making decision on stock investment.
- ) Identify the problems faced by the individual investors in stock market.
- ) To analyze the risk and return of common stock and their portfolio.
- ) To access the past and present states of investment of common stock.
- ) The study will provide some of the strong recommendation based on the analysis of the data.

Finding of Pramila Tuladhar

- 1) There is a positive correlation between risk and return character of the company.



- 2) Nepalese capital market being inefficient, the price index itself sufficient to give the information about prevailing market.
- 3) Investors do not have any idea about the procedures of the securities issuance.
- 4) Investors should get regular information about the systematic risk (Beta), return on equity (ROE) and P/E ratio of various listed companies.
- 5) An analysis of risk and return shows that many companies have higher unsystematic or specific risk.

### **Mishra's study**

Shanker Kumar Mishra (2002) analyzed "*Risk and Return on Common Stock Investment of Commercial Banks in Nepal*" with special reference to five listed commercial Banks.

The major objective of this study

1. To promote and protect the interest of the investor by regulating the issuance sales and distribution of securities and purchase, sale or exchange of securities.
2. To supervise and monitor the activities of the stock exchange of other related firms carrying on securities business.
3. To render contribution to the development of capital market by making securities transactions fair health, efficient and responsible.

Following are the findings of this study

It was noticed that there is a positive correlation between risk and return character of the company. Nepalese capital market being inefficient, the price index itself is not sufficient to give the information about the prevailing market.

Situation and the company proper regulation should be introduced so that there is more transparency in issuance, sales and distribution of the securities. Investors do not have any idea about the procedures of the securities issuance. Neither company nor the stock brokers transmit any information to the investors about the current market situation and hence it becomes different for common investors to investor in the securities. Both government authorities and the stock exchange regulator body should try to promote healthy practices so that the stock brokers don not give false information to the investors for their personal benefit which is a common practice in Nepal. Investors should get regular information about the systematic risk (Beta), return on equity and P/E ratio of various listed in Nepal stock exchange. Security exchange board of Nepal should make this mandates that it is easier for the investors to calculate risk and risk return of portfolio and transparent is increased.

### **Manandhar's Study**

Another study was conducted by Manilata Manandhar (2003), "*Analysis of Risk and Return Analysis on Common Stock Investment of Commercial Banks in Nepal*" with special reference to five listed commercial Banks.

The main objective of the study

- 1) To examine risk and return of common stocks in Nepalese stock market.
- 2) To focus on the common stock of commercial Banks.

In her findings "Banking industry is the biggest one in F/Y 057/058 in terms of market capitalizing and turnover expected return of the common stock of BOKL is maximum (i.e. 1.1267) due to effete of unrealistic annual return and CS of NIBL is found minimum. In the context of industries, expected return on Banking sector (i.e. 67.39) is highest and other sectors is the least (.65%). Except NIBL, other Banks common stocks are more volatile (aggressive with market stocks of all Banks in the study are said to be under priced. CS of BOKL is most risky and CS of NIBL is least risky.

Mrs. Manandhar has findings following points.

- ) Stocks have greater volatility risk than other investment, which takes a random and unpredictable path. Stock market is risky in the short term and it is necessary to prepare the investors for it.
- ) One of the most important things to consider when choosing investment strength is the balance between risk and return that you are comfortable.
- ) Investors should diversify their fund to reduce risk with the help of optimal portfolio concept.
- ) It is better to buy something that is going up and sell something that is going down.
- ) Investor's attitude, perception and risk handling capacity also play essential role in rational investment decision.

### **Khadka's Study**

Another study conducted by Ram Hari Khadka (2004), "*Analysis of Risk and Return on Selected Nepalese Commercial Banks*" is also relevant to this study.

The main objective of the study

1. To analyze the risk, return and other relevant variables that help in making decision about investment on securities of the listed commercial Banks.
2. To determine whether the share of commercial Banks are correctly priced or not by analyzing the required rate of returns using the CAPM.

Khadka addressed the following finding in risk return behavior from the analysis of different stock.

The shares of Bangladesh Bank offered highest realized rate of return. Amongst them NABIL Bank is the lowest having 5.23% which is less than

required rate or return. NBL, which is hard hit by the events (Return= -0.8809), the ranking of the Bank is placed as the highest return earner. The study showed that the realized rate of returns of the samples banks do not have the some features being with in the range of 5.23% to 16.12%. Return on the average stock is 5.51% over the period. All the shares under review generated higher rate of return them the market portfolio except NABIL Bank Ltd. the prices rate of return them the market portfolio except NABIL Bank ltd. the higher rate of return them the marker portfolio except NABIL Bank ltd. the price of shares of bans under review except NABIL Bank ltd. are under priced the marker forces will causes the price of NABIL Bank to slightly fall. The unsystematic risk of NBL is the highest one amongst the shares under review which is 95.59% and SCB of Nepal has the lowest one being 45.14%. The negative correlation coefficient of NBL (-.21) revenue that the return on the Bank goes down if the market return goes up. The rest of the shares moved in the direction the market moves. By observing the individual shares moved in the direct the market moves. By observing the individual shares beta coefficient, most of the shares appear to be defensive as beta coefficient are less them one. However, beta of the stocks of NB Bank SCB is grater than one indicating that the shares are more risky than the market.

On the basis of findings, Khadka concluded that in Nepalese capital market, the contribution of real sector is negligible. Thought the shares of commercial Banks in Nepal are heavily traded in NEPSE, none of the share price is correctly priced. Therefore, the price of all the shares except shares of NABIL Bank will have a positive price trend toward the equilibrium.

He outlined following recommendations

- ) Adoption of comprehensive and Advance regulatory framework.
- ) Awareness campaign for the investor.
- ) Regular publication of financial information.
- ) Improvement in the infrastructure facilities

- ) Effective use of banking system.
- ) Deregulation of foreign exchange.

### **Manandher's Studies**

The study performed by Surandra Manandher (2006), "*A Study on Risk and Return Analysis on Common Stock of Listed Commercial Bank in Nepal*". The main objective of the study is to analyze the risk return and other relevant variables that help in making decisions about investment on securities of the listed commercial banks. The other specific objectives of this study are as follows:

1. To evaluate common stock of listed commercial bank in terms of risk and return and to perform sector wise comparison on the basis of market capitalization.
2. To identify whether the share of commercial banks are overpriced, under priced or at equilibrium price.
3. To identify the correlation between returns of commercial banks.
4. To construct optimum portfolio from listed common stock.
5. To make relevant suggestion and practical idea and materialize recommendations based on findings.

#### Finding of the study

1. Among all the securities common stock is known to be most risky security.
2. Higher the risk higher will be the return.
3. Most of investors attached to common stock securities because of its higher expected returns.
4. As for the investors it is important to analyze each investment, company to pentagonal returns with the risk and average the potential returns form an investment should compensate for the level of risk undertaken.

## **CHAPTER – III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

Research methodology describes the method and process applied in the entire aspect of the study focus of data, data gathering instruments and procedure, data tabulating and processing and methods of analysis. It is away to systematically solve the research problem. It refers to the various sequential steps that to be adopted by a researcher during the course of studying a problem with certain objectives. It also refers t o the approach of the research process from theoretical foundation to the collection and analysis of the data. As most of the data are quantitative study is based on scientific models.

#### **3.2 Research Design**

The study aims at analyzing the risks and returns of the selected four commercial Banks. The research design used in this study is basically a combination of descriptive and analytical one. It is composed of both parts of technical aspects and logical aspects. It is based on financial statements and others information covers five fiscal years of commercial Banks.

#### **3.3 Population and Sample**

The population of the study is the commercial Banks of Nepal, which have been listed in the Nepal stock exchange company (NEPSE). These are:

1. NABIL Bank Limited
2. Nepal Investment Bank Limited
3. Standard Chartered Bank Nepal Ltd.
4. Himalayan Bank Limited
5. Nepal SBI Bank Limited
6. Nepal Bangladesh Bank Limited
7. Everest Bank Limited

8. Bank of Kathmandu Limited
9. Nepal Credit and Commerce Bank
10. Lumbini Bank Limited
11. Nepal Industrial and Commercial Bank
12. Machhapurchhre Bank Limited
13. Kumari Bank Limited
14. Laxmi Bank Limited
15. Siddhartha Bank Limited
16. Development Credit Bank Ltd.
17. NMB Bank Ltd.

*Sources:* [www.nrb.gov.np](http://www.nrb.gov.np)

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.

### **3.4 Source of Data**

The study will review the available secondary information of past consecutive five year's period, which are listed as follows.

- i. Annual report of Banks approved by a AGM.
- ii. Magazine, newspaper, books and documents.
- iii. Published books, journals related to commercial Banks.
- iv. Government reports, bulletin and other published statement of related field.
- v. Previous studies made in this field.

### **3.5 Data Analysis**

Both financial and statistical tools will be used for analyzing the collected data.

## Financial Tools

### Ñ Single period rate of return of common stock

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

1. Income from price appreciation (or losses from price depreciation). Sometimes called capital gains (or losses). This quality denoted  $P_t - P_{t-1}$ .
2. Cash how income from cash dividend or coupon interest payments, represented by the convention it.

Sum of these two sources of income (or loss) equals the total return and can be express in percentage as follows:

Single period rate of return,  $r_t$

$$\begin{aligned} r_t &= \frac{(\text{Price Change}) + \text{Cash Dividend}}{\text{Purchase price at start of the period}} \\ &= \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}} \end{aligned}$$

Where,

$P_t$  = Ending stock price

$D_t$  = Cash dividend received at time t.

$P_{t-1}$  = Starting stock price

### Ñ Expected rate of return of common stock

This rate is obtained by arithmetic mean of the past year's return. This study also aims to find out the expected return on the investment in common stock. Symbolically, expected rate of return of common stock can be expressed as follows:



$$\begin{aligned} \text{Expected value } E(r) &= \sum_{t=1}^T r_t P_t \\ &= P_1 r_1 + P_2 r_2 + \dots + P_T r_T \end{aligned}$$

Whereas,

$R_t$  = the  $t^{\text{th}}$  rate of return from a probability distribution

$P_t$  = the probability that the  $t^{\text{th}}$  rate of return will take place

$T$  = Possible rates of return

### Ñ **Beta Coefficient (b)**

The beta coefficient is an idea of systematic risk. It may be used for ranking the systematic risk of different assets. It is an index of the degree of movement of an assets return in response to a change in the market return. An asset's historical returns are used in finding the asset's beta coefficient.

Market sensitivity of stock is explained in terms of beta coefficient. Higher the beta greater the sensitivity and reaction to the market movement market bet serves as a benchmark or a measuring scale for the evaluation of risk of individual stocks. For an individual stock, the beta could be less than 1, equal to 1 or more than 1 depending up on the volatility of that stocks return relative to market returns. Beta coefficient can be expressed as follows.

$$\text{Beta coefficient } (b_i) = \frac{\text{cov}(r_i r_m)}{\exists m^2}$$

Where,

$\text{cov}(r_i r_m)$  = Covariance of the return on assets  $i$ , and market portfolio.

$\exists m^2$  = Variance of the return on the market portfolio.

$R_m$  = Required rate of return on the market portfolio of securities.

## Ñ Portfolio Risk ( $\sigma_P$ )

Expected risk on a portfolio is a function of the proportions invested in the components, the riskiness of the components and correlation of returns on the component securities. It is measured by standard deviation and calculated by using this formula.

Portfolio Risk ( $\sigma_P$ )

$$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 W_A W_B r_{AB} \sigma_A \sigma_B}$$

Where,

$\sigma_P$  = Portfolio Risk

$W_A$  = The proportion of the portfolio devoted by security 'A'.

$W_B$  = The proportion of the portfolio devoted by security 'B'.

$\sigma_A$  = Standard deviation of security 'A'

$\sigma_B$  = Standard deviation of security 'B'

$r_{AB}$  = Correlation between the securities A and B.

## Ñ Portfolio Return $E(r_P)$

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

$$\text{Portfolio return } E(r_P) = \sum_{j=1}^n W_j R_j$$

In a two security portfolio, the portfolio return will be :

$$E(r_P) = W_j \times R_j + W_i \times R_i$$

Where as,

$E(r_P)$  = Expected return on portfolio

$W_i$  = The fraction of the total value of the portfolio invested in the  $i^{\text{th}}$  assets.

$W_j$  = The fraction of the total value of the portfolio invested in the  $j^{\text{th}}$  asset.

$R_i$  = The expected rate of return from the  $i^{\text{th}}$  assets.

$R_j$  = The expected rate of return from the  $j^{\text{th}}$  assets.

(The sum of the  $W_i$  and  $W_j$  should be 1 or 100%)

## Statistical Tools

### J Average Rate of Return (ARR)

Average rate of return can be easily calculated using total sum of return divided by no. of year. Symbolically, average rate of return can be expressed as follows:

Average rate of return,  $(\bar{R}_A)$

$$(\bar{R}_A) = \frac{\sum R_A}{n}$$

Where,

$\Sigma$  = Sign of summation

$n$  = No. of years that the return is taken

$R_A$  = Return of stock

### Ñ Standard Deviation

It is a statistical concept and is widely used to measure risk from holding single assets. It is a statistical measure of the variability of a distribution of return around its mean. This is a measure of the dispersion of forecast returns when such returns approximate a normal probability distribution.

The standard deviation is derived so that a high standard deviation represents a large dispersion of return and is a high risk. It provides more information about the risk of the assets; it is major of the total risk of the asset. It is the square root of the variance and measures the systematic risk of stock investment. Symbolically, ( $\Xi$ ) can be expressed as follows:

Standard deviation ( $\Xi$ )

$$\Xi_j = \sqrt{\frac{\phi[R_j Z(\bar{R}_j)]^2}{N}}$$

Where,

$\Xi_j$  = Standard deviation of return on stock j.

$R_j$  = Rate of return of stock j.

$\bar{R}_j$  = Average rate of return of stock j.

$N$  = Time period

Variance = Var ( $r_j$ ) =  $\Xi_j^2$

#### $\bar{N}$ **Coefficient of Variations (C.V)**

The risk per unit of expected return can be measured by the coefficient of variation. The CV is a measure of relative dispersion that is useful in comparing the risk of assets with differing expected return. The higher the coefficient of variation the greater the risk, which is expressed as follows:

Coefficient of variation (C.V.)

$$CV_j = \frac{\Xi_j}{\bar{R}_j} \times 100\%$$

Where,

$CV_j$  = Coefficient of variation of stock j.

$\Xi_j$  = Standard deviation of return on stock j.

$\bar{R}_j$  = Average rate of return of stock j.

## Ñ Correlation Coefficient

Correlation is defined as the "relationship" (or association) between one dependent variable (or factor) and one (or more than one) independent variable (s) or factor(s). In other words, correlation is the relationship between (or among) two or more variables (i.e. only one variable dependent and one or more variable independent).

If the two (or more) variables are so related that the change in the value of one (or more) independent variable results the change in the value of dependent variable then they are said to have "correlation". The most important of method of measuring the correlation between the two variables is 'Karl Pearson's coefficient of correlation'; this is the mathematical method of measuring the degree of association between the two variables say X and Y. Which can be expressed as follows (Shrestha and Silwal; 2001:313-316).

Correlation coefficient

$$r_{XY} = \frac{\text{COV}(r_X, r_Y)}{\exists_X \exists_Y}$$

Where,

Cov (r<sub>X</sub>, r<sub>Y</sub>) = Covariance of X and Y

$$= \frac{\phi(X - \bar{X})(\psi - \bar{\psi})}{N}$$

$\exists_X$  = Standard deviation of X

$$= \sqrt{\frac{\phi(\epsilon - \bar{\epsilon})^2}{N}}$$

$\exists_Y$  = Standard deviation of Y

$$= \sqrt{\frac{\phi(\psi - \bar{\psi})^2}{N}}$$

The value of correlation of coefficient 'r' lies between -1 to +1.

If  $r = +1$ , there is a perfect positive relationship.

If  $r = -1$ , there is a perfect negative relationship.

If  $r = 0$ , there is no correlation at all.

## Ñ **Tools of Testing Hypothesis**

One of the important applications, of statistical inference is test of hypothesis. In testing of hypothesis, an assumption is made about the population parameter. To test whether the assumption or hypothesis is right or not, a sample is selected from the population, sample statistics is obtained, observe the difference between the sample mean and the population hypothesized value, and test whether the difference is significant or in significant. Smaller the difference, the sample mean is close to the hypothesized value and larger the difference the hypothesized value has low chance to be correct.

## Ñ **T-test**

The sampling distribution of sample mean when the sample size is large (most commonly  $n > 30$ ) is normally distributed with mean  $\hat{\mu}$  and standard deviation  $\hat{\sigma}$ . But what about the situation when sample size is less than 30.

The student's t-distribution states that if the sample size is less than 30 (i.e.  $n < 30$ ), the sampling distribution of the sample mean follows student's t-distribution. In order to test the significance of an observed samples return and beta the following procedure is applied.

Null Hypothesis :  $H_0 : R_m = R_j$  that is, there is no significance of difference between market portfolio and average return of common stock of listed commercial Banks.

It is applied for hypothesis testing 1<sup>st</sup> to test whether there is any significant difference between average mean of commercial Bank with market or not. If the test is 'test of significance for a single mean' the test statistic is given by:

$$t = \frac{\bar{\varepsilon} - \mu}{\frac{s}{\sqrt{n}}}$$

Where,

$$\bar{\varepsilon} = \frac{\sum X}{n}$$

Where,

t = Student's test statistics

$\bar{\varepsilon}$  = Arithmetic mean of sample statistics

$\mu$  = Arithmetic mean of population parameter

s = Estimated standard deviation of population parameter with is given as

$$S = \sqrt{\frac{\sum (\varepsilon - \bar{\varepsilon})^2}{n - 1}}$$

n = Sample size

## 11 Analysis of Variance (ANOVA)

When we have to test the significance of the differences between two sample means, t-test is suitable. But when we need to test the significance of the differences between more than two sample means, f-distribution is suitable technique, called the "Analysis of variance". Using ANOVA technique we will be able to make inferences about whether our samples are drawn from populations having the same mean.

The assumptions made in ANOVA are:

- a. The population for each sample must be normally distributed with same mean and variances (in large sample this assumption is not necessary).
- b. All the sample must be randomly selected and independent.

## Ñ One-Way Analysis of Variance

The basic concept of ANOVA is to test whether the samples have same mean. One-way analysis of variance is the one if we study the effect of only one factor at as time and the hypothesis is to test the difference in average value due to the factor is insignificant.

The whole analysis of ANOVA is finally presented in the ANOVA table.

**One-Way ANOVA Table**

Source of variation	d.f	Sum of squares (ss)	Mean sum of squares (MSS = ss/d.f.)	F-ratio
Between samples	$K - 1$	SSB	$MSB = \frac{SSB}{K - 1}$	$\frac{MSB}{MSW} = F_{cal}$
With in sample	$N - K$	SSW	$MSW = \frac{SSW}{N - K}$	
Total	$N - 1$	SST		

To make decision if the computed value of F is less than its calculated value  $H_0$  accepted otherwise  $H_0$  is rejected.

### 3.6 Data Analysis Techniques

Method of analysis is applied as possible. Results are presented in tabular form and clear interpretation is made simultaneously. To make report simply and easily understandable, tables and diagrams have been used.



## **CHAPTER – IV**

### **DATA PRESENTATION AND ANALYSIS**

The chapter is the main part of the study, which includes analysis of data collected and their interpretations. Detail data of market price per share (MPS) and dividend of each bank and NEPSE index of each industry is presented and their interpretation and analysis is done. With reference to various readings and literature review in the proceeding chapters, effort is made to analyze and diagnose the recent Nepalese stock market changes with special reference to commercial banks. Different tables and diagrams are drawn to make the result easier clear and understandable.

#### **4.1 Analysis**

The study was focused on analyzing the common stocks of listed commercial banks separately as the scope of the study concentrated only on listed commercial banks of Nepal. There are currently 17 commercial banks listed in NEPSE. Out of these 17 banks, four commercial banks were taken as a sample for the study. They are Nepal Arab Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Himalayan Bank Limited (HBL) and Everest Bank Limited (EBL). Common stock of each listed commercial banks: their risk and return analyses were included in this study.

##### **4.1.1 Nepal Arab Bank Limited (NABIL)**

The bank was established in 2041 B.S. (1984 A.D.). The bank has authorized capital, issued capital and paid up capital NRs. 500,000,000, NRs. 491,650,000 and NRS. 491,650,000 respectively. The total numbers of shareholders are 5076 and per value per share is NRs. 100. The bank was listed in the stock exchange in 2042/08/09 (1986).

**Table 4.1**

**Market Price Per Share (MPS) and Dividend of NABIL Bank Limited**

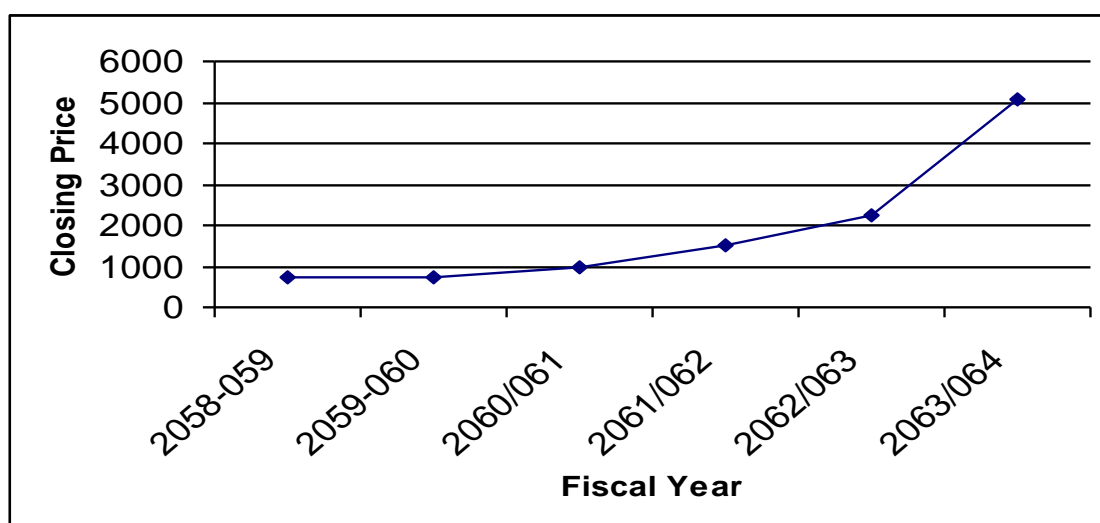
Fiscal year	Closing MPS	Cash dividend	Stock dividend	Total dividend <sup>1</sup>
2058-059	735	20	-	20
2059/060	735	50	-	50
2060/061	1000	65	-	65
2061/062	1505	70	-	70
2062/063	2240	85	-	85
2063/064	5050	85	-	85

*Source:* SEBO, Annual Trading Report (2063/2064)

Closing market price, cash dividend, stock dividend and total dividend of common stock of NABIL have been shown in Table 4.1. From the above table, the market value of the share (closing MPS) of the NABIL was the highest in the fiscal year of 2063/64 with a closing value of 5050, while it was at the minimum in the fiscal year of 2059/60 with a closing value of 735. Year end price movement of NABIL has been shown in the diagram 4.1.

**Diagram 4.1**

**Closing MPS of Movement of NABIL**



<sup>1</sup> Total dividend amount = Cash dividend + % stock dividend × Next Year's MPS.

**Table 4.2**

**Average Rate of Return, SD and CV of NABIL Bank Limited**

Fiscal year	Closing MPS	Total dividend	$R_N \times \frac{(P_t Z P_{t-1}) \Gamma D_t}{P_{t-1}}$	$R_N Z \bar{R}_N$	$(R_N Z \bar{R}_N)^2$
2058-059	735	20	-	-	-
2059/060	735	50	0.0680	-0.5179	0.2682
2060/061	1000	65	0.4490	-0.1369	0.0187
2061/062	1505	70	0.575	-0.0109	0.0001
2062/063	2240	85	0.5449	-0.041	0.0017
2063/064	5050	85	1.2924	0.7065	0.4991
Total			$\phi R_N = 2.9293$		0.7878

**Source:** Table No. 4.1.

Where,

$P_t$  = This year closing price

$P_{t-1}$  = Previous year closing MPS

$D_t$  = This year dividend

$R$  = Return

$$\begin{aligned} \text{Average Return of NABIL } (\bar{R}_N) &= \frac{R_N}{N} = \frac{2.9293}{5} \\ &= 0.5859 \end{aligned}$$

$$\begin{aligned} \text{Standard Deviation of NABIL } (\Xi_N) &= \sqrt{\frac{[R_N Z \bar{R}_N]^2}{N}} \\ &= \sqrt{\frac{0.7878}{5}} \\ &= \sqrt{0.15759} \\ &= \sqrt{0.1576} \\ &= 0.3970 \end{aligned}$$

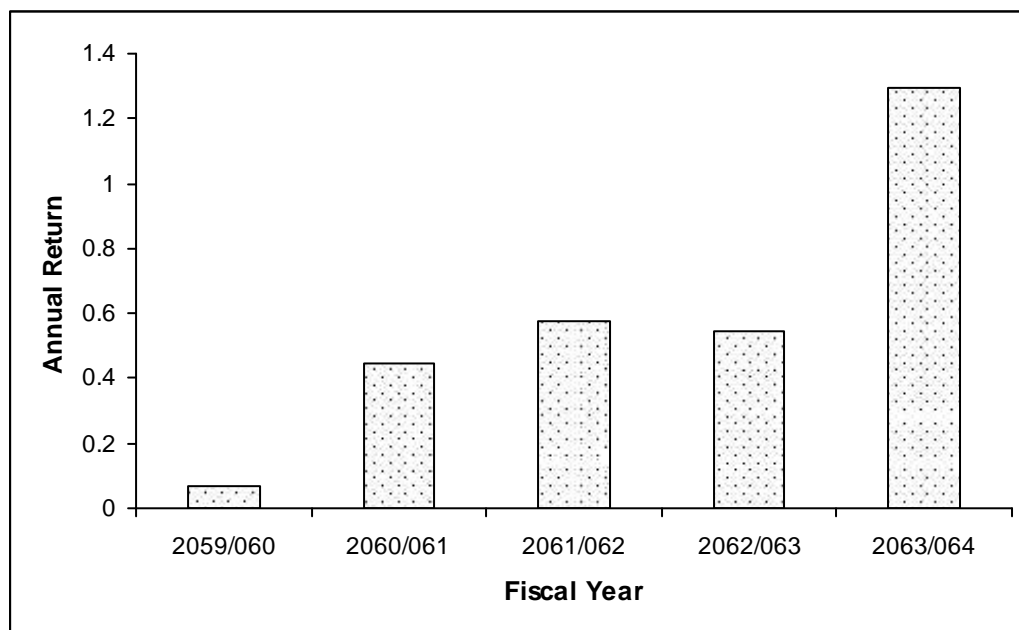
$$\text{Variance (Var)} = \Xi_N^2 = (0.3970)^2 = 0.1576$$

$$\begin{aligned}
\text{Coefficient of Variation (CV}_N) &= \frac{\sigma_N}{R_N} | 100\% \\
&= \frac{0.3970}{0.5859} | 100\% \\
&= 67.76\%
\end{aligned}$$

From the above table, the holding period rate of return of the NABIL was the highest in the fiscal year 2063/064 with a rate of 1.2924, while it was at the minimum in the fiscal year 2059/060 with a rate of 0.0680.

Average rate of return, standard deviation, variance and coefficient of variation of NABIL are 0.5859, 0.3970, 0.1576 and 0.6776 percent respectively.

**Diagram 4.2**  
**Annual Rate of Return of Common Stock of NABIL**



The rate of return of share of NABIL is maximum in the fiscal year of 2063/064, while the minimum return in fiscal year 2059/060.

#### **4.1.2 Standard Chartered Bank Ltd. (SCBL)**

The bank was established in 2042 B.S. (1985 A.D.). The bank has an authorized capital, issued capital and paid up capital NRs. 1,000,000,000, NRs. 500,000,000 and NRs. 374,640,000 respectively. The par value of a share was

Rs. 100 and the numbers of shareholders are 5037. The bank was listed on stock exchange in B.S. 2045/03/21 (1988 A.D.).

**Table 4.3**  
**Market Price and Dividend of SCBL**

Fiscal year	Closing MPS	Cash dividend	Stock dividend	Total dividend
2058-059	1550	100	-	100
2059/060	1640	110	10	284.5
2060/061	1745	110	-	110
2061/062	2345	120	-	120
2062/063	3775	130	10	720
2063/064	5900	130	10	-

*Source:* SEBO, Annual Trading Report (2063/2064)

Closing market price, cash dividend, stock dividend and total dividend of common stock of SCBL have been shown in Table 4.3. It is evident from the above table that the closing MPS of the SCBL was the maximum in the fiscal year 2063/64 with a closing MPS of 5900 and the minimum in the fiscal year of 2059/060 with a closing MPS of Rs. 1640. Year end price movement of SCBL have been shown in the diagram 4.3.

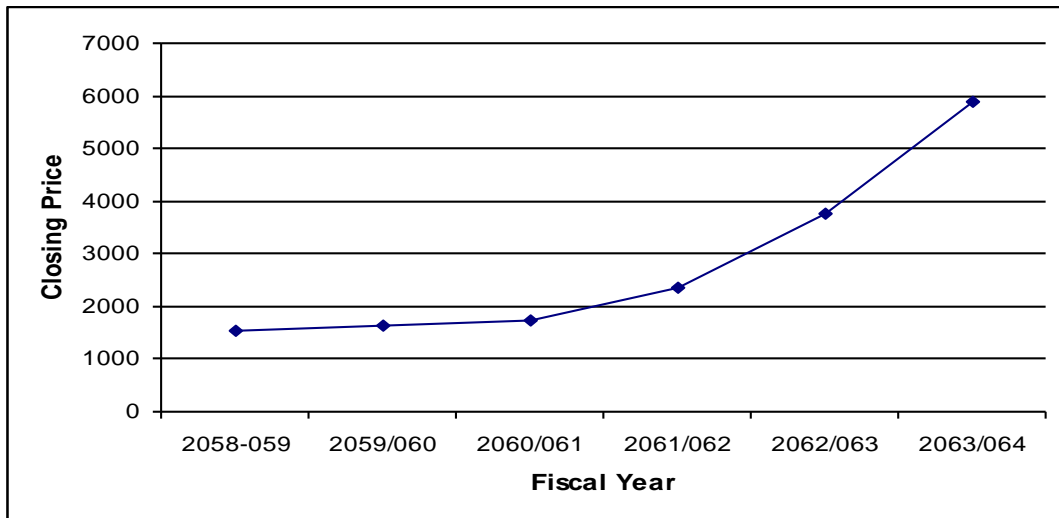
Total dividend can be calculated as follows.

$$\text{Total dividend} = \text{Cash dividend} + \text{Percent stock dividend} \times \text{next year MPS.}$$

For calculating the total dividends of fiscal year 2063-064, we need closing MPS of fiscal year 2064-065, which was not available in the concerned banks and/or stock records.

**Diagram 4.3**

**Closing MPS of Movement of SCBL**



**Table 4.4**

**Average Rate of Return, SD and CV of SCBL Bank Limited**

Fiscal year	Closing MPS	Total dividend	$R_s \times \frac{(P_t Z P_{tZ}) \Gamma Dt}{P_{tZ}}$	$R_s Z \bar{R}_s$	$(R_s Z \bar{R}_s)^2$
2058-059	1550	100	-	-	-
2059/060	1640	284.5	0.2416	-0.2114	0.0447
2060/061	1745	110	0.1311	-0.3219	0.1036
2061/062	2345	120	0.4126	-0.0404	0.0016
2062/063	3775	720	0.9168	0.4638	0.2151
2063/064	5900	-	0.5629	0.1099	0.0121
Total			$\phi R_s = 2.265$		0.3771

**Source:** Table No. 4.3.

$$\text{Average Return of SCBL } (\bar{R}_s) = \frac{\phi R_s}{N} = \frac{2.265}{5} = 0.453$$

$$\begin{aligned} \text{Standard Deviation of SCBL } (\Xi_s) &= \sqrt{\frac{(R_s Z \bar{R}_s)^2}{N}} \\ &= \sqrt{\frac{0.3771}{5}} \end{aligned}$$

$$= \sqrt{0.0754}$$

$$= 0.2746$$

$$\text{Variance (Var)} = (\Xi_s)^2 = (0.2746)^2 = 0.0754$$

$$\text{Coefficient of Variation (CV}_s) = \frac{\Xi_s}{R_s} | 100\%$$

$$= \frac{0.2746}{0.453} | 100\%$$

$$= 0.6062 | 100\%$$

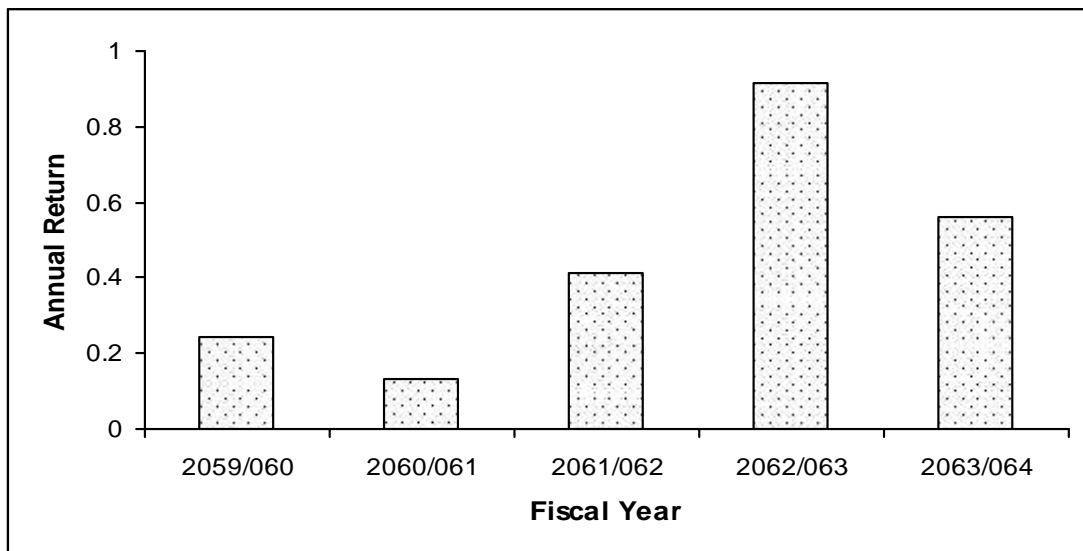
$$= 60.62\%$$

From the above table, the rate of return of the SCBL was the highest in the fiscal year 2062/63 with a rate of 0.9168 and the minimum in the fiscal year 2060/61 with a rate of 0.1311.

Average return, standard deviation, variance and coefficient of variance of SCBL are 0.453, 0.2746, 0.0754 and 0.6062 percent respectively. Annual rate of return of common stock of SCBL have been shown in the diagram 4.4.

**Diagram 4.4**

**Annual Rate of Return of Common Stock of SCBL**



The rate of return of share of SCBL is maximum in the fiscal year of 2062-063 and minimum in fiscal year of 2060/061.

### 4.1.3 Himalayan Bank Limited (HBL)

Himalayan Bank Ltd. was established in B.S. 2048 (1992 A.D.) with a n authorized capital, issued capital and paid up capital of NRs. 1,000,000,000, NRs. 772,200,000 and NRs. 772,200,000 respectively. The per value per share was NRs. 100 and the numbers of shareholders were 7210. The bank listed with the NEPSE in 2050/03/21 (1993 A.D.).

**Table 4.5**  
**Market Price and Dividend of HBL**

Fiscal year	Closing MPS	Cash dividend	Stock dividend	Total dividend
2058/059	1000	25	10	108.6
2059/060	836	1.32	25	211.3
2060/061	840	-	20	184
2061/062	920	11.58	20	231.6
2062/063	1100	30	5	118
2063/064	1760	30	5	-

*Source:* SEBO, Annual Trading Report (2063/2064)

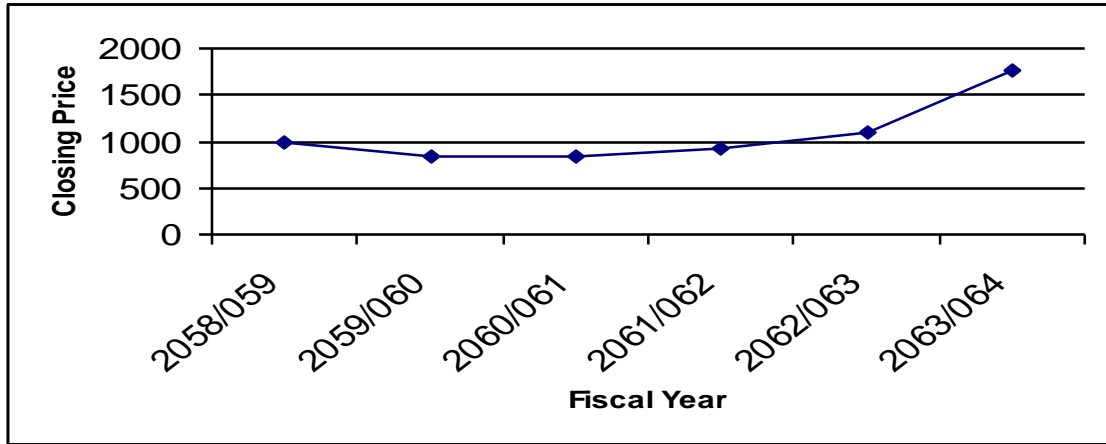
Closing market price, cash dividend, stock dividend and total dividend of common stock of HBL have been shown in Table 4.5. From the above table, the closing MPS of the HBL was the highest in the fiscal year 2063/64 with a closing MPS of 1760 and minimum in the fiscal year 2059/60 with a closing MPS of 836. Year-end closing MPS movement have been shown in the diagram 4.5.

For calculating the total dividends of fiscal year 2063-064, we need closing MPS of fiscal year 2064-065, which was not available in the concerned banks and/or stock records.



**Diagram 4.5**

**Closing MPS of Movement of HBL**



**Table 4.6**

**Average Rate of Return, SD and CV of HBL**

Fiscal year	Closing MPS	Total dividend	$R_H \times \frac{(P_t Z P_{tZ}) \Gamma Dt}{P_{tZ}}$	$R_H Z \bar{R}_H$	$(R_H Z \bar{R}_H)^2$
2058-059	1000	108.6	-	-	-
2059/060	836	211.3	0.0473	-0.2661	0.0708
2060/061	840	184	0.2249	-0.0885	0.0078
2061/062	920	231.6	0.3709	0.0575	0.0033
2062/063	1100	118	0.3239	0.0105	0.0001
2063/064	1760	-	0.6000	0.2866	0.0821
Total			1.567		0.1641

**Source:** Table No. 4.5.

$$\begin{aligned} \text{Average return } (\bar{R}_H) &= \frac{\phi R_H}{N} = \frac{1.567}{5} \\ &= 0.3134 \end{aligned}$$

$$\begin{aligned} \text{Standard Deviation of HBL } (\Xi_H) &= \sqrt{\frac{(R_H Z \bar{R}_H)^2}{N}} \\ &= \sqrt{\frac{0.1641}{5}} \end{aligned}$$

$$= \sqrt{0.03282}$$

$$= 0.1812$$

$$\text{Variance (Var)} = (\Xi_H)^2 = (0.1812)^2 = 0.0328$$

$$\text{Coefficient of Variation (CV}_H) = \frac{\Xi_H}{R_H} | 100\%$$

$$= \frac{0.1812}{0.3134} | 100\%$$

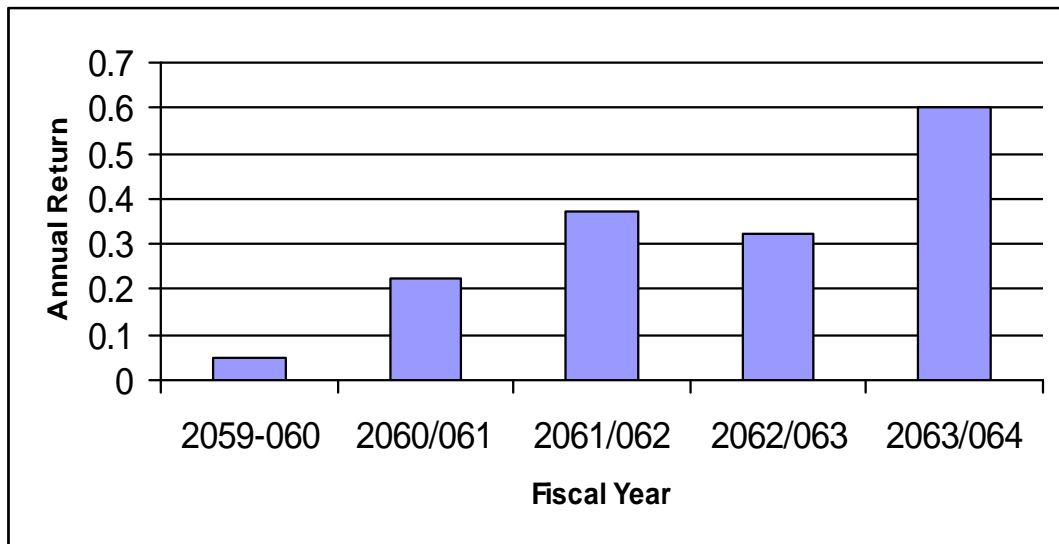
$$= 57.82\%$$

It is evident from the above table that the rate of return of the HBL was the maximum in the fiscal year of 2063/064 with a rate of 0.6 and minimum in the fiscal year 2059/060 with a rate of 0.0473.

Average rate of return, standard deviation, variance and coefficient of variation of HBL are 0.3134, 0.1812, 0.0328, 0.5782 percent respectively. Annual rate of return of common stock of HBL have been shown in the diagram 4.6.

**Diagram 4.6**

**Annual Rate of Return of Common Stock of HBL**



The annual rate of return of the share of HBL is maximum in the fiscal year of 2063/064 and minimum in fiscal year of 2059/060.

#### 4.1.4 Everest Bank Limited (EBL )

Everest Bank Ltd. was established in 2049 B.S. (1993 A.D.) with an authorized capital, issued capital and paid-up capital of NRs. 600,000,000, NRs. 529,800,000 and NRs. 518,000,000 respectively. Per value per share was NRs. 100 and numbers of shareholders were 24,222. The share of the EBL were listed on the stock exchange in 2052/12/25 (1995 A.D.).

**Table 4.7**  
**MPS and Dividend of EBL**

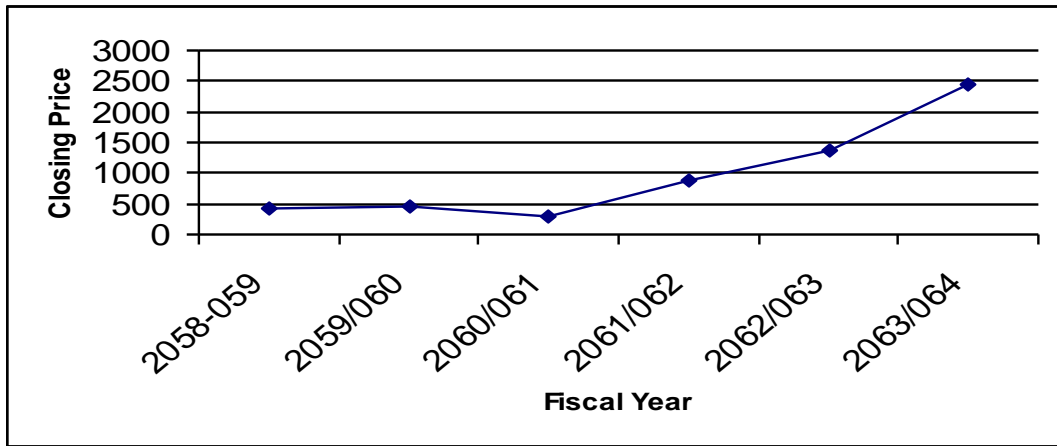
Fiscal year	Closing MPS	Cash dividend	Stock dividend	Total dividend
2058-059	430	-	20	89
2059/060	445	20	-	20
2060/061	295	20	-	20
2061/062	870	-	20	275.8
2062/063	1379	25	-	25
2063/064	2430	25	-	25

**Source:** SEBO, Annual Trading Report (2063/2064)

In the above table, closing market price, cash dividend, stock dividend and total dividend of common stock, of EBL have been shown. From the above table, the closing MPS of EBL was the maximum in the fiscal year 2063/64 with a closing MPS of 2430 and minimum in the fiscal year 2060/61 with a closing MPS of 295. Year-end closing MPS movement have been shown in the diagram 4.7.

**Diagram 4.7**

**Closing MPS of Movement of EBL**



The closing MPS is maximum in the fiscal year of 2063/64 and minimum in the fiscal year of 2060/61.

**Table 4.8**

**Average Rate of Return, SD and CV of EBL**

Fiscal year	Closing MPS	Total dividend	$R_E \times \frac{(P_t Z P_{tZ}) \Gamma Dt}{P_{tZ}}$	$R_E Z \bar{R}_E$	$(R_E Z \bar{R}_E)^2$
2058-059	430	89	-	-	-
2059/060	445	20	0.0814	-0.7321	0.5360
2060/061	295	20	-0.2921	-1.1056	1.2224
2061/062	870	275.8	2.8841	2.0706	4.2874
2062/063	1379	25	0.6138	-0.1997	0.0399
2063/064	2430	25	0.7803	-0.0332	0.0011
Total			$\phi R_E = 4.0675$		6.0868

**Source:** Table No. 4.7.

$$\text{Average Return of EBL, } (\bar{R}_E) = \frac{\phi R_E}{N} = \frac{4.0675}{5} = 0.8135$$

$$\text{Standard Deviation of EBL, } (\Xi_E) = \sqrt{\frac{[R_E Z \bar{R}_E]^2}{N}}$$

$$= \sqrt{\frac{6.0868}{5}}$$

$$= \sqrt{1.2174}$$

$$= 1.1034$$

$$\text{Variance (Var)} = (\sigma_E)^2 = (1.1034)^2 = 1.2174$$

$$\text{Coefficient of Variation (CV}_E) = \frac{\sigma_E}{R_E} | 100\%$$

$$= \frac{1.1034}{0.8135} | 100\%$$

$$= 1.3564 | 100\%$$

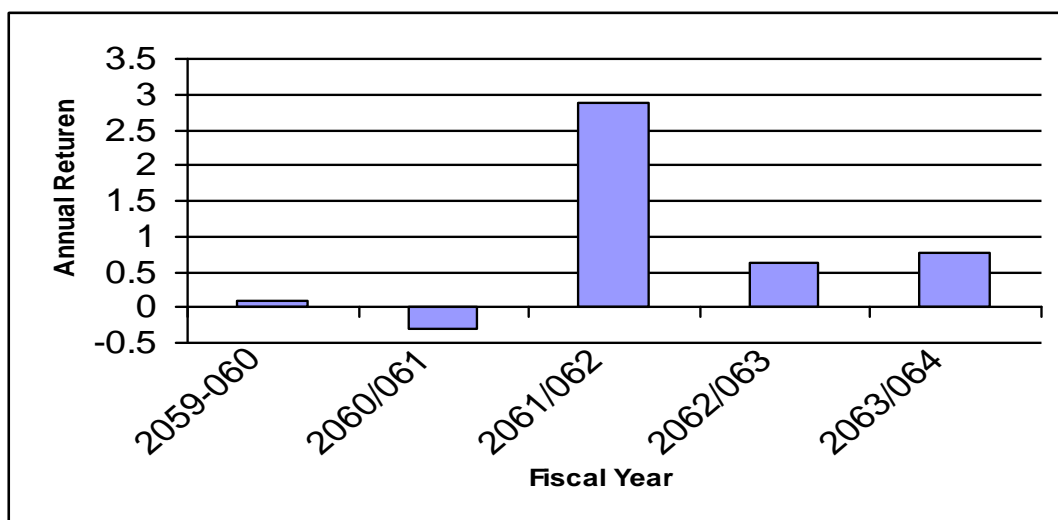
$$= 135.64\%$$

From the above table, the rate of return of the EBL was the maximum in the fiscal year of 2061/62 with a rate of 2.8841 and minimum in the fiscal year 2060/061 with a negative rate of -0.2921.

Average rate of return, standard deviation, variance and coefficient of variation of EBL are 0.8135, 1.1034, 1.2174 and 1.3564 percent respectively. Annual rate of return of common stock of EBL have been shown in the diagram 4.8.

**Diagram 4.8**

**Annual Rate of Return of Common Stock of EBL**



The rate of return of the share of EBL is maximum in the fiscal year of 2061/062 and minimum in the fiscal year of 2060/061.

## 4.2 Inter-Banking Comparison

According to the result obtained from the analyses done above, a comparative analysis of return, total risk and risk per unit is performed here. Average returns, standard deviation of the return (risk) and coefficient of variation of each bank for the year 2059/060 to 2063/064 are given in the Table No. 4.9.

**Table 4.9**

### Average Return, SD and CV of Selected Commercial Banks

S.N.	Banks	Average Return	Standard deviation (†)	Coefficient of variation (C.V.)	Remarks		
					Return	Risk	C.V.
1.	NABIL	58.59%	39.70%	67.76%			
2.	SCBL	45.30%	27.46%	60.62%			
3.	HBL	31.34%	18.12%	57.82%	Lowest	Lowest	Lowest
4.	EBL	81.35%	110.34%	135.64%	Highest	Highest	Highest

*Source:* Table No. 4.2, 4.4, 4.6, 4.8.

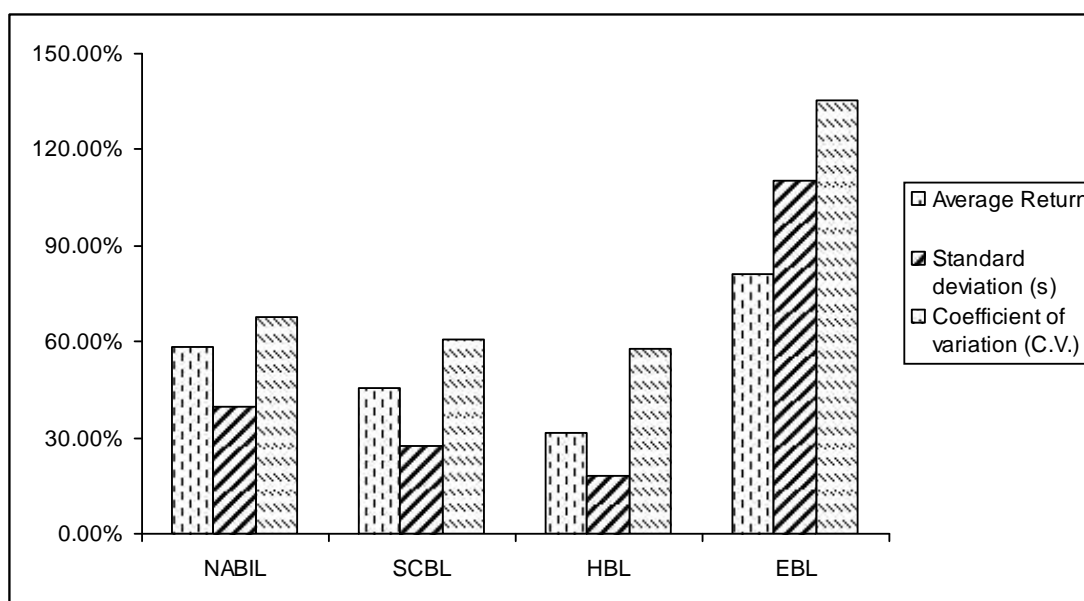
The Table No. 4.9 shows that Average Return, Standard Deviation, Coefficient of Variation of NABIL is 58.59%, 39.70%, and 67.76% respectively. Similarly, Average Return, Standard Deviation, Coefficient of Variation of SCBL is 45.30%, 27.46% and 60.62% respectively. Average Return, Standard Deviation, Coefficient of Variation of HBL is 31.34%, 18.12% and 57.82% respectively. Similarly, Average Return, Standard Deviation, Coefficient of Variation of EBL 81.35%, 110.34% and 135.64% respectively. Investment made in the highest in EBL and lowest returns from the investment made in the HBL. EBL has higher total risk as compare to other banks where as HBL has lowest total risk. Similarly, EBL has the highest degree of risk per unit of share where as HBL has lowest per unit risk, i.e. HBL has lowest coefficient of variation. EBL has higher risk and hence it has higher average return from the

investment. HBL has lower risk and hence it has liner average return from the investment, which is in line with the established financial norms of "Lower return lower risk". But for other banks, this principle doesn't hold good as the returns on the investment were also affected by non-financial factors such as: political instability, conflict etc.

For taking a wise an investment decision on a single common stock (security), coefficient of variation (CV) is the more appropriate indicator than others. To make comparison easily understandable diagram 4.9 is presented below:

**Diagram 4.9**

**Average Return, S.D. and CV of each commercial Banks**



### 4.3 Analysis of Market Risk and Return

In Nepal, there is only one stock market called Nepal stock exchange ltd. (NEPSE). The overall market movement is represented by market index (i.e. NEPSE index). The NEPSE index is adjusted and change continuously with this NEPSE base market portfolio return, it's standard deviation and coefficient of variation is presented below.

**Table 4.10**  
**Calculation of Realized Rate of Return, SD, Average Return and C.V. of**  
**Overall Market**

Fiscal year	NEPSE index	$R_m \times \frac{(\text{NEPSE}_t - \text{NEPSE}_{t-1})}{\text{NEPSE}_{t-1}}$	$(R_m - \bar{R}_m)$	$(R_m - \bar{R}_m)^2$
058-059	227.54	-	-	-
059/060	204.86	-0.0997	-0.3783	0.1431
060/061	222.04	0.0839	-0.1947	0.0379
061/062	286.67	0.2911	0.0125	0.0002
062/063	386.83	0.3494	0.0708	0.0050
063/064	683.95	0.7681	0.4895	0.2396
Total		1.3928		0.4258

*Source:* SEBON, Annual Report (2063/2064)

$$\begin{aligned} \text{Average Return on Market } E(\bar{R}_m) &= \frac{\sum R_m}{n} \\ &= \frac{1.3928}{5} = 0.2786 \end{aligned}$$

$$\begin{aligned} \text{Standard Deviation } (\Xi_m) &= \sqrt{\frac{\sum (R_m - \bar{R}_m)^2}{N}} \\ &= \sqrt{\frac{0.4258}{5}} \\ &= \sqrt{0.0852} \\ &= 0.2918 \end{aligned}$$

$$\begin{aligned} \text{Variance } (\Xi_m)^2 &= (0.2918)^2 \\ &= 0.0852 \end{aligned}$$

$$\text{Coefficient of Variation } (CV_m) = \frac{\Xi_m}{\bar{R}_m} \times 100\%$$

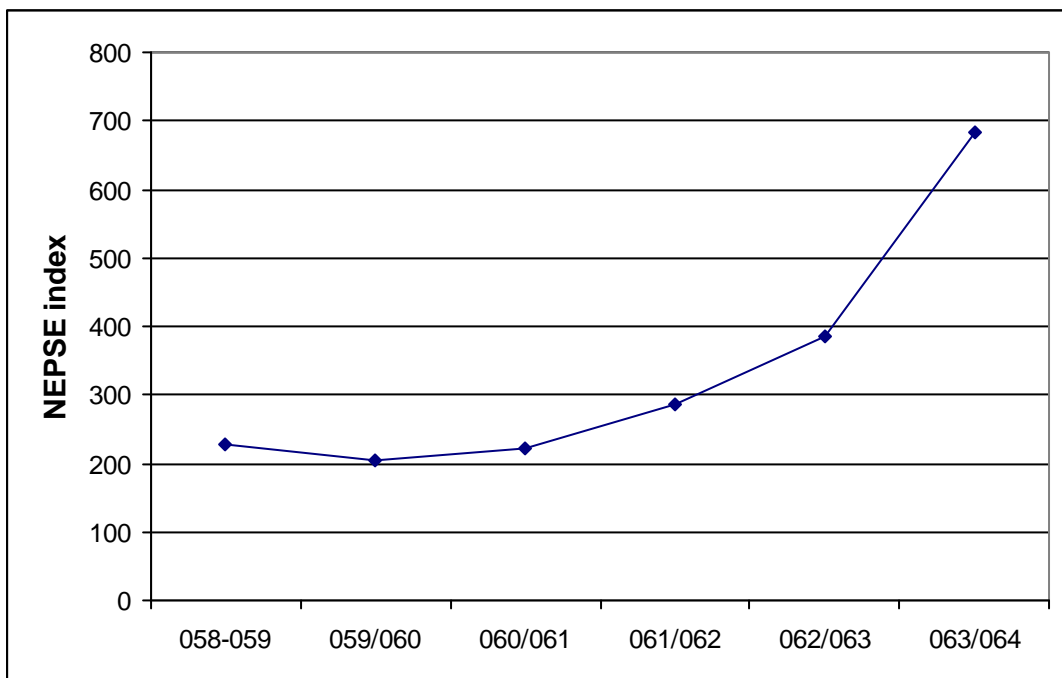


$$\begin{aligned}
 &= \frac{0.2918}{0.2786} | 100\% \\
 &= 1.0474 | 100\% \\
 &= 104.74\%
 \end{aligned}$$

Here, the market return is 27.86%, risk is 29.18% and C.V. is 1.0474.

**Diagram 4.10.1**

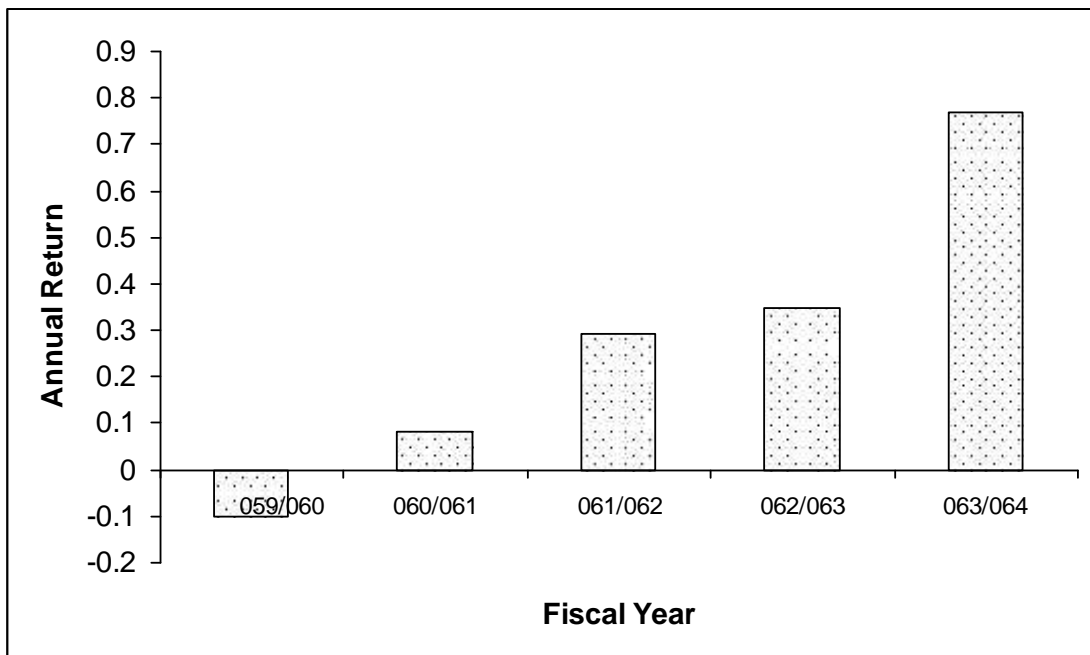
**NEPSE Index Movement**



The above diagram shows that the movement of NEPSE index is decreasing from the fiscal year 2058/059 to 2059/060 and begins to increase in the 2059/060 to 2063/064. The movement of NEPSE index is highly increased during the fiscal year 2062/063 to 2063/064.

**Diagram 4.10.2**

**Market Return Movement**



The above diagram shows that the market returns in negative in the fiscal year 2059/060 and then after it started to increase positively in year 2060/061 to 2063/064. The return is high in fiscal year 2063/064.

**Comparison with Single Stock**

**Table 4.11**

S.N.	Banks & Market	Average Return ( $\bar{R}$ )	Standard Deviation ( $\Xi$ )	Coefficient of Variation (C.V.)
1	NABIL	58.59%	39.70%	67.70%
2	SCBL	45.30%	27.46%	60.62%
3	HBL	31.34%	18.12%	57.82%
4	EBL	81.35%	110.34%	135.64%
5	Market	27.86%	29.18%	104.74%

Comparing with individually with the stock of NABIL's Return is greater than the market return, where as the total risk of the NABIL is also greater than the market risk.

Similarly, comparing with stock of SCBL's Return is also greater than market. Where as total risk is less than the market risk.

Again, comparing with the HBL's Return is greater than market return where as the risk is less than the market risk.

Similarly, comparing with individually with the stock of EBL's Return is greater than the market return where as the risk is also greater than the market risk.

When seeing the risk per unit NABIL, SCBL and HBL are less than the market risk per unit where as the EBL's risk per unit is greater than market risk per unit.

From the above result there is less risk with comparison to return of SCBL and HBL. So it is better for risk per unit is less comprisingly for market risk per unit.

#### **4.4 Market Sensitivity Analysis**

Market sensitivity of stock is explained by terms of beta coefficient. Beta coefficient can be used for an ordinal ranking of the systematic risk of asset. Higher the beta represents greater the sensitivity and higher the reaction to the market movement and vice-versa. Percentage of risk that is correlated with market is said to be systematic portion of risk Beta coefficient is systematic risk, which can not be eliminated through the means of diversification.

**Table 4.12**

**Beta Coefficient of Studied Commercial Banks**

<b>S.N.</b>	<b>Commercial Bank</b>	<b>Beta (S)</b>	<b>Remarks</b>
1.	NABIL	1.3275	Aggressive
2.	SCBL	0.5376	Defensive
3.	HBL	0.6092	Defensive
4.	EBL	1.1455	Aggressive

*Source:* Appendices A1 to A4

For an individual stock, the beta could be less than, equal to or more than depending upon the volatility of that stocks return relative to the market return. The different values of beta are defined as the beta equals to 1 implies, the average market risk and commands the average market risk premium. The beta less than 1 implies that stock's return is less sensitive to market fluctuation and such stock is considered to be the defensive type. The beta greater than 1 implies the opposite case of beta less than 1.

Since, the NABIL and EBL have higher beta coefficient than beta coefficient of market, the stocks of these banks are aggressive. Remaining Banks SCBL and HBL have lower beta than market so they are defensive stock.

**Required Rate of Return (RRR), expected Rate of Return( $\bar{R}$ ) and Price Evaluation Analysis**

Comparison of required rate of return and excepted rate of return gives the result, whether the stock under priced or overpriced. If the required rate of return is less than to be under priced and investors tend to buy this type of stock and vice versa. For this analysis, the risk free rate of return is needed, which is taken from the interest rate of Treasuring bill issued by Nepal Rastra Bank (NRB). NRB issued Treasuring bill 91 days and 364 days duration. As suggested by the Treasury bill section of NRB. The interest rate of T-bill, i.e., of 364 duration is taken as risk free rate, which is approximately 3.50%.

Hence,

$$R_F = \text{Annual risk free rate of return} = 3.50\% = 0.0350$$

$$R_m = \text{Market rate of return} = 27.86\% = 0.2786$$

**Table 4.13**

**ERR, RRR and Price Evaluation**

S.N.	Commercial Banks	$R_F$ (%)	Beta (b)	$R_m$ (%)	Expected Rate of Return	$RRR = R_F + (R_m - R_F)b$		Price evaluation
1.	NABIL	3.50	1.3275	27.86	58.59%	0.3584	35.84%	Under Priced
2.	SCBL	3.50	0.5376	27.86	45.30%	0.1660	16.60%	Under Priced
3.	HBL	3.50	0.6092	27.86	31.34%	0.1834	18.34%	Under Priced
4.	EBL	3.50	1.1455	27.86	81.35%	0.3140	31.40%	Under Priced

From the above table, we get that the expected rate of return is higher than the required rate of return, so all commercial banks stocks are under priced, It shows that all the banks have stock with good investment opportunity and all stock in the demand. Their stock's value will be increased in the near future providing the investors higher return. Since all the stocks are under priced, investors can gain from buying those stocks. These stocks are recommended to buy.

#### 4.5 Portfolio Analysis

The portfolio assets i.e. bond, stock. A portfolio is a combination of investment assets. Portfolio management is related to efficient portfolio investment in financial assets. If portfolio is being constructed they can reduce unsystematic risk without losing considerable return. The portfolio analysis is performed to develop a portfolio that has the maximum return at whatever level of risk an

investor thinks appropriate. Therefore, we need to extend our analysis risk and return to portfolio context.

The average return on a portfolio is simply the weighted average of the average returns on the individual assets in the portfolio with the weight being the fraction of the total portfolio invested in each asset. The weights are equal to the proportion of total funds invested in each security (the sum of weight must be 1 or 100%).

The analysis is based on two assets portfolio and the tools for analysis are presented in the chapter, research methodology.

**Table 4.14**  
**Calculation of Correlation**

Banks	NABIL	SCBL	HBL	EBL
NABIL	1	0.3899	0.9777	0.2249
SCBL	0.3899	1	0.4779	0.2185
HBL	0.9777	0.4779	1	0.4003
EBL	0.2249	0.2185	0.4003	1

*Source:* Appendices from A5 to A10

General portfolio theory suggests that the portfolio should be formulated with the securities, with has negative correlation because portfolio risk is the function of standard deviation of single security, proportion of the investment and correlation. If there is high degree of negative correlation significant size of the risk can be diversified.

But Table No. 4.14 shows that there is no negative correlation at all. Therefore we are taking the correlated securities NABIL, SCBL, HBL and EBL for two assets portfolio. Optimal Portfolio Risk and Portfolio Return is presented in Table No. 4.15.

**Table 4.15**

**Calculation of Optimal Portfolio Return ( $\bar{R}_P$ ) and Portfolio Risk ( $\uparrow_p$ )**

Banks →		NABIL	SCBL	HBL	EBL
NABIL	$\bar{R}_P$	1	0.4825	0.1082	0.5973
	$\exists_P$		0.2610	0.0678	0.3932
SCBL	$\bar{R}_P$	0.4825	1	0.3342	0.4558
	$\exists_P$	0.2610		0.1775	0.2744
HBL	$\bar{R}_P$	0.1082	0.3342	1	0.2918
	$\exists_P$	0.0678	0.1775		0.1755
EBL	$\bar{R}_P$	0.5973	0.4558	0.2918	1
	$\exists_P$	0.3932	0.2744	0.1755	

*Source:* Appendices from A<sub>11</sub> to A<sub>16</sub>

Even though the Portfolio combination gives the reduction in risk it does not give realized magnitude in risk reduction so the portfolio is not preferable as expectation. Using diversification, we can reduce the risk. Standard deviations (S.D.) of NABIL and SCBL, NABIL and HBL, NABIL and EBL, SCBL and HBL, SCBL and EBL, HBL and EBL are 39.70% and 27.46%, 39.70% and 18.12%, 39.70% and 110.34%, 27.46% and 18.12%, 27.46% and 110.34%, 18.12% and 110.34% respectively before diversification. But after Portfolio construction, we get the Portfolio risk is 26.10%, 6.78%, 39.32%, 17.75%, 27.44% and 17.55% respectively, which is lower than risk before diversification. From the above table there is less risk with comparison to its return. From the point of view of Portfolio risk and return the Portfolio construction is better.

## T-test

### Hypothesis - 1

#### Formulation of Hypothesis

Null hypothesis, ( $H_0$ ): Average return of common stock of listed commercial bank is equal to the market return.

Alternative hypothesis, ( $H_1$ ): Average return of common stock of listed commercial bank is not equal to the market return.

$$\text{Computation of test statistics: } t = \frac{\bar{X} - Z \uparrow}{\frac{S}{\sqrt{n}}}$$

Where,

$$\begin{aligned} E(n) &= \text{Average return of listed commercial banks} \\ &\text{i.e. } (0.5859 + 0.4530 + 0.3134 + 0.8135)/4 = 0.5415 \\ \uparrow &= \text{Average rate of return of overall market} \\ &\text{(i.e. } 0.2786) \\ n &= \text{Number of observation} \\ S &= \text{Average standard deviation of selected commercial banks i.e.} \\ &\frac{(0.3970 \Gamma 0.2746 \Gamma 0.1812 \Gamma 1.1034)}{4} \\ &= 0.4891 \end{aligned}$$

Now,

$$\begin{aligned} t &= \frac{0.5415 - 0.2786}{\frac{0.4891}{\sqrt{4}}} \\ &= \frac{0.2629}{0.2446} \\ &= 1.0748 \end{aligned}$$

...Calculated  $t = 1.0748$ .



Tabulated value of t at 5% level of significance for 3(4-1) degree of freedom is 3.182.

Decision: Since the calculated value of t (1.0748) is less than tabulated value of t (3.182), the null hypothesis is accepted, it means that the average return of common stock of listed commercial banks is equal to the market return.

## Hypothesis – 2

### Hypothesis Formulation

#### Step 1<sup>st</sup>

Null hypothesis, ( $H_0$ ):  $\hat{\mu}_1 = \hat{\mu}_2 = \hat{\mu}_3 = \hat{\mu}_4$  i.e. there is no significant different in a average return of common stock of selected commercial banks.

#### Step 2<sup>nd</sup>

Alternative hypothesis, ( $H_1$ ):  $\hat{\mu}_1 \neq \hat{\mu}_2 \neq \hat{\mu}_3 \neq \hat{\mu}_4$  i.e. there is a significant different in a average return of common stock of selected commercial banks.

#### Step 3<sup>rd</sup> Calculation of ANOVA

**Table 4.16**  
**ANOVA Table**

Sources of variation	Sum of square	Degree of freedom (d.f.)	Mean sum of square	F-ratio
Between Return	SSB=0.6791	K-1 = 4-1 = 3	$MSB = \frac{SSB}{K - 1}$ $= \frac{0.6791}{3} = 0.2264$	$F = \frac{MSB}{MSW}$ $= \frac{0.2264}{0.4635}$
Win in Return	SSW=7.4158	N-K = 20-4 = 16	$MSW = \frac{SSW}{N - K}$ $= \frac{7.4158}{16} = 0.4635$	= 0.4885

#### **Step 4<sup>th</sup>**

Level of significance, d.f. and critical value

level of significance ( $\alpha$ ) = 5% = 0.05

degree of freedom (d.f.) = (K-1, N-K) = (3, 16)

from table,  $F_{\text{tab}}$ ,  $F_{0.05, (3, 16)} = 3.24$

#### **Step 5<sup>th</sup>**

Since, calculated value of F (0.4885) is less than tabulated value of F (3.24)  $H_0$  is accepted, it means that there is no significance different between the average returns of common stock of listed commercial banks.

### **4.6 Major finding of the study**

The findings of this study are as follows:

- ) Nepalese stock market is in emerging state. Its development is accelerated after the political change of 1990. The successive governments have adopted the policy of openness and liberalization in national economy, which has effected positively in the development of common stock of Nepal. But due to the lack of information and poor knowledge, Nepalese individual investors can not analyze the security as well as market property.
- ) 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 ( $\beta$ ). 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.

- ) The first hypothesis is best on the test of significance of single mean (i.e. Banks returns and market return). over the study period it was found that is the level of significance is 5% null hypothesis is accepted (i.e. average return of commercial Banks is equal to market return).
- ) The second hypothesis is best on the test of significance of different mean (i.e. difference commercial Banks return). Thus over the study period, it was found that the null hypothesis is accepted at 5% of significance which means there is no significance between the average return of common stock of listed commercial Banks.

## **CHAPTER – V**

### **SUMMARY, CONCLUSIONS & RECOMMENDATIONS**

#### **5.1 Summary**

The relationship between risk and return is described by investor's perception about risk and their demand for compensation. No investor will like to invest in risk assets unless he or she is assured of adequate compensation for the acceptance of risk hence risk plays a central role in the analysis of investments. Risk and return are now receiving considerable attention in the field of financial management. Financial ratios have been used for centuries as rule of thumb to aid in understanding trade off between risk and return but they only scratch the surface.

The investors willingly offer more capital at higher rate of return where as users of capital always show their readiness to use more capital at lower rate common stock is the most risk security though it is the lifeblood of the stock market.

An investment in common stock of corporate firm neither ensures an annual return nor ensures the return of principal. Therefore, investment in common stock is very sensitive on the ground of risk. Dividend to common stock holders is paid only if the firm makes an operating profit after tax and preference dividend. The company can return the principal in case of its liquidation only to the extend of the residual assets after satisfying to all its creditors and preferential shareholders.

The main objective of the study is to analyze the risk and return of common stock in Nepalese context that is why the study is focused on the common stock of listed commercial banks of Nepal. The study has taken a sample of listed commercial banks as reference to analyze the risk and return in common stock investment. While analyzing the risk and return, brief review of related studies

has been performed. Tables, graphs, and diagrams are used to present the results of the analysis. Secondary data are collected from NEPSE, thesis, journals, books and internet. Other types of information are collected through personal visit to the official of security Board of Nepal (SEBON) and NEPSE.

In this study, the CVs of NABIL, SCBL, HBL and EBL are 67.76%, 60.62%, 57.82%, 135.64% respectively. The beta coefficient of NABIL, SCBL, HBL and EBL are 1.3275, 0.5376, 0.6092 and 1.1455 respectively.

## **5.2 Conclusions**

The returns of the studied commercial banks are highly fluctuating, which shows highly risk in absolute term. The beta of NABIL and EBL are greater than one and hence their respective stocks are aggressive stock. The beta of SCBL and HBL is less than one and hence it's respective stocks are defensive stock. Correlation coefficients of returns among the studied banks are positive and other side using diversification. Portfolio construction is in comparison before diversification is more than after Portfolio construction which is lower than risk before diversification. There is less risk with comparison to its return. All the studied banks expected return (Average return) is higher than the required rate of return therefore the stock is under priced security. So, an investor makes buying strategy for this type of stock.

## **5.3 Recommendations**

The recommendations of the study may be important information for those who are directly and indirectly concerned with the common stock investment thus the following recommendations are as follows:

) Proper analysis of individual security, industry and overall market is always essential to make Possible to conquer the stock market. General knowledge about economic, political as well as Technological trend will be advantageous which is proved by the present political situation of Nepal. It caused a great deterioration is share priced? To win the market,

sell share when market is rising and buy share when market is falling and hold share, which will perform better than market.

- ) Investors have to focus their mind also on risk and not only on return. Before thinking about higher return they also have to think about risk associated with return. If there is higher return there will be higher risk definitely. So risk averse investor can invest on moderate types of stock having average risk and return.
- ) Different financial and statistical tools are considered to analyse the data in this study while analyzing the CV of studied banks, the C.S. of HBL may best investment opportunity of the investors. Therefore, HBL is the best in managing the risk in efficient way among the studied banks.
- ) Standard deviation is only the measure of unsystematic risk which is not defined by the market. Another major aspect of the risk is systematic risk, which is defined by the market risk and measured by beta coefficient ( $\beta$ ). Beta coefficient explains the sensitivity or volatility of the stock with market. Beta coefficient of NABIL and EBL are greater than one so these are aggressive type of common stock. Therefore such bank's common stock are volatile than markets and hence the investors should think about external factor, risk taking capacity, investment objectives, before investment. SCBL and HBL is less than one so these are defensive type of stocks. Hence, it is prescribed to select the C.S. of SCBL and HBL for individual stock investment.
- ) Correlation coefficient (Homogeneous) between banks and banks is positive, which indicates that there is high degree of positive correlation between them therefore the investors should try to formulate portfolio with other trading and manufacturing firms.
- ) Investors need to diversify their fund to reduce risk, proper construction of portfolio will reduce considerable potential loss which can be defined in terms of risk. By optimal portfolio construction is dynamic job.

Portfolio construction, select the stock that have higher return with not correlated or negatively correlated stock, similar stock can not diversity the risk properly. So the construction of portfolio between the common stock of NABIL and HBL is recommended.

- ) All the studied commercial Banks stocks are under priced therefore it is recommended that the investors need to buy these stocks. In the under price expected return (Average return) is greater than required rate of return so buyer get profit.
- ) One of the most important things to consider when choosing investment strength is the balance between risk and return that you are comfortable.
- ) NEPSE needs to initiate to develop different program for private investor such as investors meeting and seminars in different subject matter like "Trading Rules and Regulation" etc. It needs to develop efficient and effective information channel and to provide up to date data.
- ) The corporate firms should communicate about the rules and regulations regarding stock market time and to make the policy that protects the individual investor's right. On the other hand, government needs to implement such rules properly and to monitor in time to time.
- ) Investors should diversity their fund to reduce risk with the help of optimal portfolio concept. It is said that "beware of one product companies" that means things can change do not put all your eggs in one basket.
- ) Risk and return analysis is completely untouched area in Nepalese context. It is strongly suggested that further studies should be conducted on this topic and research should include maximum number of sample.



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## Appendices 1

### Calculation of Beta for NABIL Bank

Fiscal Year	$(R_N - \bar{R}_N)$	$(R_M - \bar{R}_M)$	$(R_N - \bar{R}_N)(R_M - \bar{R}_M)$
2059/060	-0.5179	-0.3783	0.1959
2060/061	-0.1369	-0.1947	0.0267
2061/062	-0.0109	0.0125	-0.0001
2062/063	-0.041	0.0708	-0.0029
2063/064	0.7065	0.4895	0.3458
<b>Total</b>			0.5654

**Source:** Table No. 4.2, Table No. 4.10

$$\begin{aligned}
 \text{Cov. Of (N, M)} &= \frac{\sum (R_N - \bar{R}_N)(R_M - \bar{R}_M)}{N} \\
 &= \frac{0.5654}{5} \\
 &= 0.1131
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Beta Coeff. of NABIL} &= \frac{\text{Cov. of (N, M)}}{\sigma_m^2} \\
 &= \frac{0.1131}{0.0852} \\
 &= 1.3275
 \end{aligned}$$

## Appendices 2

### Calculation of Beta for SCBL Bank

Fiscal Year	( $R_s - \overline{R_s}$ )	( $R_M - \overline{R_M}$ )	( $R_s - \overline{R_s})(R_M - \overline{R_M})$
2059/060	-0.2114	-0.3783	0.0800
2060/061	-0.3219	-0.1947	0.0627
2061/062	-0.0404	0.0125	-0.0005
2062/063	0.4638	0.0708	0.0328
2063/064	0.1099	0.4895	0.0538
<b>Total</b>			<b>0.2288</b>

**Source:** Table No. 4.4, Table No. 4.10

$$\begin{aligned}
 \text{Cov. Of (S, M)} &= \frac{\sum (R_s - \overline{R_s})(R_M - \overline{R_M})}{N} \\
 &= \frac{0.2288}{5} \\
 &= 0.0458
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Beta Coeff. of SCBL} &= \frac{\text{Cov. of (S, M)}}{\sigma_m^2} \\
 &= \frac{0.0458}{0.0852} \\
 &= 0.5376
 \end{aligned}$$

### Appendices 3

#### Calculation of Beta for HBL Bank

Fiscal Year	$(R_H - \overline{R}_H)$	$(R_M - \overline{R}_M)$	$(R_H - \overline{R}_H)(R_M - \overline{R}_M)$
2059/060	-0.2661	-0.3783	0.1007
2060/061	-0.0885	-0.1947	0.0172
2061/062	0.0575	0.0125	0.0007
2062/063	0.0105	0.0708	0.0007
2063/064	0.2866	0.4895	0.1403
<b>Total</b>			0.2596

*Source:* Table No. 4.6, Table No. 4.10

$$\begin{aligned} \text{Cov. Of (H, M)} &= \frac{\sum (R_H - \overline{R}_H)(R_M - \overline{R}_M)}{N} \\ &= \frac{0.2596}{5} \\ &= 0.0519 \end{aligned}$$

$$\begin{aligned} \dots \text{Beta Coeff. of HBL} &= \frac{\text{Cov. of (H, M)}}{\uparrow m^2} \\ &= \frac{0.0519}{0.0852} \\ &= 0.6092 \end{aligned}$$

## Appendices 4

### Calculation of Beta for EBLBank

Fiscal Year	$(R_E - \overline{R_E})$	$(R_M - \overline{R_M})$	$(R_E - \overline{R_E})(R_M - \overline{R_M})$
2059/060	-0.7321	-0.3783	0.2770
2060/061	-1.1056	-0.1947	0.2153
2061/062	2.0706	0.0125	0.0259
2062/063	-0.1997	0.0708	-0.0141
2063/064	-0.0332	0.4895	-0.0163
<b>Total</b>			0.4878

*Source:* Table No. 4.8, Table No. 4.10

$$\begin{aligned}
 \text{Cov. Of (E, M)} &= \frac{\sum (R_E - \overline{R_E})(R_M - \overline{R_M})}{N} \\
 &= \frac{0.4878}{5} \\
 &= 0.0976
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Beta Coeff. of EBL} &= \frac{\text{Cov. of (E, M)}}{\sigma_m^2} \\
 &= \frac{0.0976}{0.0852} \\
 &= 1.1455
 \end{aligned}$$

## Appendices 5

### Calculation of Cov of NABIL and SCBL Bank

Fiscal Year	( $R_N - \overline{R_N}$ )	( $R_S - \overline{R_S}$ )	( $R_N - \overline{R_N}$ )( $R_S - \overline{R_S}$ )
2059/060	-0.5179	-0.2114	0.1095
2060/061	-0.1369	-0.3219	0.0441
2061/062	-0.0109	-0.0404	0.0004
2062/063	-0.041	0.4638	-0.0190
2063/064	0.7065	0.1098	0.0776
<b>Total</b>			<b>0.2126</b>

**Source:** Table No. 4.2, Table No. 4.4

We have,

$$\text{Cov. } (R_N, R_S) = \frac{\sum (R_N - \overline{R_N})(R_S - \overline{R_S})}{N}$$

$$= \frac{0.2126}{5}$$

$$= 0.0425$$

$$\dots \text{Correlation Coeff. of N and S, } (\rho_{NS}) = \frac{\text{Cov}(R_N, R_S)}{\sigma_N \cdot \sigma_S}$$

$$= \frac{0.0425}{0.3970 \cdot 0.2746}$$

$$= \frac{0.0425}{0.1090}$$

$$= 0.3899$$

## Appendices 6

### Calculation of Cov of NABIL and HBL Bank

Fiscal Year	( $R_N - \overline{R_N}$ )	( $R_H - \overline{R_H}$ )	( $R_N - \overline{R_N}$ )( $R_H - \overline{R_H}$ )
2059/060	-0.5179	-0.2661	0.1378
2060/061	-0.1369	-0.0885	0.0121
2061/062	-0.0109	0.0575	-0.0006
2062/063	-0.041	0.0105	-0.0004
2063/064	0.7065	0.2866	0.2025
<b>Total</b>			0.3514

**Source:** Table No. 4.2, Table No. 4.6

We have,

$$\begin{aligned}
 \text{Cov. } (R_N, R_H) &= \frac{\sum (R_N - \overline{R_N})(R_H - \overline{R_H})}{N} \\
 &= \frac{0.3514}{5} \\
 &= 0.0703
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Correlation Coeff. of N and H, } (\rho_{NH}) &= \frac{\text{Cov}(R_N, R_H)}{\sigma_N \cdot \sigma_H} \\
 &= \frac{0.0703}{0.3970 \cdot 0.1812} \\
 &= \frac{0.0703}{0.0719} \\
 &= 0.9777
 \end{aligned}$$



## Appendices 7

### Calculation of Cov of NABIL and EBL Bank

Fiscal Year	( $R_N - \overline{R_N}$ )	( $R_E - \overline{R_E}$ )	( $R_N - \overline{R_N})(R_E - \overline{R_E})$
2059/060	-0.5179	-0.7321	0.3792
2060/061	-0.1369	-1.1056	0.1514
2061/062	-0.0109	2.0706	-0.0226
2062/063	-0.041	-0.1997	0.0082
2063/064	0.7065	-0.0332	-0.0235
<b>Total</b>			0.4927

**Source:** Table No. 4.2, Table No. 4.8

We have,

$$\begin{aligned}
 \text{Cov. } (R_N, R_E) &= \frac{\sum (R_N - \overline{R_N})(R_E - \overline{R_E})}{N} \\
 &= \frac{0.4927}{5} \\
 &= 0.0985
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Correlation Coeff. of N and E, } (\rho_{NE}) &= \frac{\text{Cov}(R_N, R_E)}{\sigma_N \cdot \sigma_E} \\
 &= \frac{0.0985}{0.3970 \cdot 1.1034} \\
 &= \frac{0.0985}{0.4380} \\
 &= 0.2249
 \end{aligned}$$

## Appendices 8

### Calculation of Cov of SCBL and HBL Bank

Fiscal Year	( $R_S - \overline{R_S}$ )	( $R_H - \overline{R_H}$ )	( $R_S - \overline{R_S})(R_H - \overline{R_H}$ )
2059/060	-0.2114	-0.2661	0.0563
2060/061	-0.3219	-0.0885	0.0285
2061/062	-0.0404	0.0575	-0.0023
2062/063	0.4638	0.0105	0.0049
2063/064	0.1099	0.2866	0.0315
<b>Total</b>			<b>0.1189</b>

**Source:** Table No. 4.4, Table No. 4.6

We have,

$$\begin{aligned}
 \text{Cov. } (R_S, R_H) &= \frac{\sum (R_S - \overline{R_S})(R_H - \overline{R_H})}{N} \\
 &= \frac{0.1189}{5} \\
 &= 0.0238
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Correlation Coeff. of N and S, } (\rho_{SH}) &= \frac{\text{Cov}(R_S, R_H)}{\sigma_S \cdot \sigma_H} \\
 &= \frac{0.0238}{0.2746 \mid 0.1812} \\
 &= \frac{0.0238}{0.0498} \\
 &= 0.4779
 \end{aligned}$$

## Appendices 9

### Calculation of Cov of SCBL and EBL Bank

Fiscal Year	( $R_S - \overline{R}_S$ )	( $R_E - \overline{R}_E$ )	( $R_S - \overline{R}_S$ )( $R_E - \overline{R}_E$ )
2059/060	-0.2114	-0.7321	0.1548
2060/061	-0.3219	-1.1056	0.3559
2061/062	-0.0404	2.0706	-0.0837
2062/063	0.4638	-0.1997	-0.0926
2063/064	0.1099	-0.0332	-0.0036
<b>Total</b>			<b>0.3308</b>

**Source:** Table No. 4.4, Table No. 4.8

We have,

$$\begin{aligned}
 \text{Cov. } (R_S, R_E) &= \frac{\sum (R_S - \overline{R}_S)(R_E - \overline{R}_E)}{N} \\
 &= \frac{0.3308}{5} \\
 &= 0.0662
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Correlation Coeff. of S and E, } (\rho_{SE}) &= \frac{\text{Cov}(R_S, R_E)}{\sigma_S \cdot \sigma_E} \\
 &= \frac{0.0662}{0.2746 \mid 1.1034} \\
 &= \frac{0.0662}{0.3030} \\
 &= 0.2185
 \end{aligned}$$

## Appendices 10

### Calculation of Cov of HBL and EBL Bank

Fiscal Year	( $R_H - \overline{R_H}$ )	( $R_E - \overline{R_E}$ )	( $R_H - \overline{R_H})(R_E - \overline{R_E})$
2059/060	-0.2661	-0.7321	0.1948
2060/061	-0.0885	-1.1056	0.0978
2061/062	0.0575	2.0706	0.1191
2062/063	0.0105	-0.1997	-0.0021
2063/064	0.2866	-0.0332	-0.0095
<b>Total</b>			0.4001

*Source:* Table No. 4.6, Table No. 4.8

We have,

$$\begin{aligned}
 \text{Cov. } (R_H, R_E) &= \frac{\sum (R_H - \overline{R_H})(R_E - \overline{R_E})}{N} \\
 &= \frac{0.4001}{5} \\
 &= 0.08002
 \end{aligned}$$

$$\begin{aligned}
 \dots \text{Correlation Coeff. of H and E, } (\rho_{HE}) &= \frac{\text{Cov}(R_H, R_E)}{\sigma_H \cdot \sigma_E} \\
 &= \frac{0.08002}{0.1812 \cdot 1.1034} \\
 &= \frac{0.08002}{0.1999} \\
 &= 0.4003
 \end{aligned}$$

## Appendices 11

### Portfolio Analysis

$Cov(R_N, R_S) = 0.0425$  (From Appendices 5)

The optimal portfolio weight of stock N and S, which minimized the risk, is given below:

$$W_N = \frac{\sigma_S^2 \text{Cov}(R_N, R_S)}{\sigma_N^2 \sigma_S^2 + 2 \text{Cov}(R_N, R_S)}$$

$$W_S = 1 - W_N$$

Where,

$W_N$  = Optimal weight to invest in stock of NABIL.

$W_S$  = Optimal weight to invest in stock of SCBL

$\sigma_N^2$  = Variance of NABIL

$\sigma_S^2$  = Variance of SCBL

$$\begin{aligned} W_N &= \frac{0.0754 \times 0.0425}{0.1576 + 0.0754 + 2 \times 0.0425} \\ &= \frac{0.0329}{0.2330 + 0.085} \\ &= \frac{0.0329}{0.148} \\ &= 0.2223 \qquad = 22.23\% \end{aligned}$$

$$\begin{aligned} \dots W_S &= 1 - W_N \\ &= 1 - 0.2223 \\ &= 0.7777 \\ &= 77.77\% \end{aligned}$$

As we know that the proportion of stock 'N' in the Portfolio is constructed with i.e. 22.23% of NABIL and 77.77% of SCBL common stock that will minimize risk and be ideal proportion.

## Portfolio Return

It is a combination of two or more securities or Assets and Portfolio return is simply a weighted average of the Average returns on individual stock returns.

$$\begin{aligned}\overline{R_P} &= \overline{W_N} \cdot \overline{R_N} + \overline{W_S} \cdot \overline{R_S} \\ &= 0.2223 \cdot 0.5859 + 0.7777 \cdot 0.453 \\ &= 0.1302 + 0.3523 \\ &= 0.4825\end{aligned}$$

Where,

$\overline{R_P}$  X Average return on Portfolio of Stock NABIL and SCBL

$\overline{R_N}$  X Average Return of NABIL

$\overline{R_S}$  X Average Return of SCBL

## Portfolio Risk

Portfolio Risk is a function of the proportions invested in the common stocks. It is measured by standard deviation and calculated by using this formula.

$$\begin{aligned}\sigma_P &= \sqrt{W_N^2 \cdot \sigma_N^2 + W_S^2 \cdot \sigma_S^2 + 2 \text{Cov}_{NS} \cdot W_N \cdot W_S} \\ &= \sqrt{(0.2223)^2 \cdot 0.1576 + (0.7777)^2 \cdot 0.0754 + 2 \cdot 0.0425 \cdot 0.2223 \cdot 0.7777} \\ &= \sqrt{0.0494 + 0.1576 \cdot 0.6048 + 0.0754 \cdot 0.0147} \\ &= \sqrt{0.0078 + 0.0456 + 0.0147} \\ &= \sqrt{0.0681} \\ &= 0.2610\end{aligned}$$

## Appendices 12

$Cov(R_N, R_H) = 0.0703$  (From Appendices 6)

The optimal portfolio weight of stock N and H, which minimized the risk, is given below:

$$W_N = \frac{\sigma_H^2 \text{Cov}(R_N, R_H)}{\sigma_N^2 \Gamma \sigma_H^2 + 2 \text{Cov}(R_N, R_H)}$$

$$W_H = 1 - W_N$$

Where,

$W_N$  = Optimal weight to invest in stock of NABIL.

$W_S$  = Optimal weight to invest in stock of HBL

$\sigma_N^2$  = Variance of NABIL

$\sigma_H^2$  = Variance of HBL

$$\begin{aligned} W_N &= \frac{0.0328 \times 0.0703}{0.1576 \Gamma 0.0328 + 2 \times 0.0703} \\ &= \frac{0.0375}{0.1904 + 0.1406} \\ &= \frac{0.0375}{0.0498} \\ &= -0.7530 \qquad = -75.30\% \end{aligned}$$

$$\begin{aligned} \dots W_H &= 1 - W_N \\ &= 1 - (-0.7530) \\ &= 1.7530 \\ &= 175.30\% \end{aligned}$$

As we know that the proportion of stock 'N' in the Portfolio is constructed with -75.30% of NABIL and 175.30% of HBL common stock that will minimize risk and be ideal proportion.

### Portfolio Return

$$\begin{aligned}\overline{R}_P &= W_N \cdot \overline{R}_N + W_H \cdot \overline{R}_H \\ &= -0.7530 \cdot 0.5859 + 1.7530 \cdot 0.3134 \\ &= -0.4412 + 0.5494 \\ &= 0.1082\end{aligned}$$

Where,

$\overline{R}_P$  Average return on Portfolio of N and H

$\overline{R}_N$  Average Return of NABIL

$\overline{R}_H$  Average Return of HBL

### Portfolio Risk

$$\begin{aligned}\sigma_P &= \sqrt{W_N^2 \cdot \sigma_N^2 + W_H^2 \cdot \sigma_H^2 + 2 \cdot \text{Cov}_{NH} \cdot W_N \cdot W_H} \\ &= \sqrt{(0.7530)^2 \cdot 0.1576 + (1.7530)^2 \cdot 0.0328 + 2 \cdot 0.0703 \cdot (0.7530) \cdot 1.7530} \\ &= \sqrt{0.5670 + 0.1576 \cdot 3.0730 + 0.0328 \cdot 2.01856} \\ &= \sqrt{0.0894 + 0.1008 + 0.1856} \\ &= \sqrt{0.1902 + 0.1856} \\ &= \sqrt{0.0046} \\ &= 0.0678\end{aligned}$$



### Appendices 13

$\text{Cov}(R_N, R_E) = 0.0985$  (From Appendices 7)

The optimal portfolio weight of stock N and E, which minimized the risk, is given below:

$$W_N = \frac{\sigma_E^2 \text{Cov}(R_N, R_E)}{\sigma_N^2 \Gamma \sigma_E^2 + 2 \text{Cov}(R_N, R_E)}$$

$$W_E = 1 - W_N$$

Where,

$W_N$  = Optimal weight to invest in stock of NABIL.

$W_E$  = Optimal weight to invest in stock of EBL

$\sigma_N^2$  = Variance of NABIL

$\sigma_E^2$  = Variance of EBL

$$\begin{aligned} W_N &= \frac{1.2174 \times 0.0985}{0.1576 \Gamma 1.2174 + 2 \times 0.0985} \\ &= \frac{1.1189}{1.375 + 0.197} \\ &= \frac{1.1189}{1.178} \\ &= 0.9498 \qquad = 94.98\% \end{aligned}$$

$$\begin{aligned} \dots W_E &= 1 - W_N \\ &= 1 - (0.9498) \\ &= 0.0502 \\ &= 5.02\% \end{aligned}$$

As we know that the proportion of stock 'N' in the Portfolio is constructed with 94.98% of NABIL and stock 'E' is constructed with 5.02% of EBL common stock that will minimize risk and be ideal proportion

### Portfolio Return

$$\begin{aligned} \overline{R}_P &= W_N \cdot \overline{R}_N + W_E \cdot \overline{R}_E \\ &= 0.9498 \cdot 0.5859 + 0.0502 \cdot 0.8135 \\ &= 0.5565 + 0.0408 \\ &= 0.5973 \end{aligned}$$

Where,

$\overline{R}_P$  Average return on Portfolio of N and E

$\overline{R}_N$  Average Return of NABIL

$\overline{R}_E$  Average Return of EBL

### Portfolio Risk

$$\begin{aligned} \sigma_P &= \sqrt{W_N^2 \cdot \sigma_N^2 + W_E^2 \cdot \sigma_E^2 + 2 \cdot W_N \cdot W_E \cdot \text{Cov}_{NE}} \\ &= \sqrt{(0.9498)^2 \cdot 0.1576 + (0.0502)^2 \cdot 1.2174 + 2 \cdot 0.9498 \cdot 0.0502 \cdot 0.0985} \\ &= \sqrt{0.9021 + 0.0025 + 0.0094} \\ &= \sqrt{0.1422 + 0.0030 + 0.0094} \\ &= \sqrt{0.1546} \\ &= 0.3932 \end{aligned}$$

## Appendices 14

$\text{Cov}(R_S, R_H) = 0.0238$  (From Appendices 8)

The optimal portfolio weight of stock S and H, which minimized the risk, is given below:

$$W_S = \frac{\sigma_H^2 \text{Cov}(R_S, R_H)}{\sigma_S^2 \sigma_H^2 + \text{Cov}(R_S, R_H)^2}$$

$$W_H = 1 - W_S$$

Where,

$W_S$  = Optimal weight to invest in stock of SCBL

$W_H$  = Optimal weight to invest in stock of HBL

$\sigma_S^2$  = Variance of SCBL

$\sigma_H^2$  = Variance of HBL

$$\begin{aligned} W_S &= \frac{0.0328 \times 0.0238}{0.0754 \times 0.0328 + 0.0238^2} \\ &= \frac{0.0090}{0.1082 + 0.0476} \\ &= \frac{0.0096}{0.0606} \\ &= 0.1485 \qquad = 14.85\% \end{aligned}$$

$$\begin{aligned} \dots W_H &= 1 - W_S \\ &= 1 - (0.1485) \\ &= 0.8575 \\ &= 85.15\% \end{aligned}$$

As we know that the proportion of stock 'S' in the Portfolio is constructed with i.e., 14.85% and 85.15% of HBL common stock that will minimize risk and be ideal proportion.

### Portfolio Return

$$\begin{aligned}\overline{R}_p &= W_S \overline{R}_S + W_H \overline{R}_H \\ &= 0.4530 + 0.8515 + 0.3134 \\ &= 0.0673 + 0.2669 \\ &= 0.3342\end{aligned}$$

Where,

$\overline{R}_p$  X Average return on Portfolio of stock S and H

$\overline{R}_S$  X Average Return of SCBL

$\overline{R}_H$  X Average Return of HBL

### Portfolio Risk

$$\begin{aligned}\sigma_p &= \sqrt{W_S^2 \sigma_S^2 + W_H^2 \sigma_H^2 + 2W_S W_H \text{Cov}_{SH}} \\ &= \sqrt{(0.4530)^2 (0.0754)^2 + (0.8515)^2 (0.0328)^2 + 2(0.4530)(0.8515)(0.0238)} \\ &= \sqrt{0.0221 + 0.0725 + 0.0060} \\ &= \sqrt{0.0017 + 0.0238 + 0.0060} \\ &= \sqrt{0.0315} \\ &= 0.1775\end{aligned}$$

## Appendices 15

$\text{Cov}(R_S, R_E) = 0.0662$  (From Appendices 9)

The optimal portfolio weight of stock 'S' and 'E', which minimized the risk, is given below:

$$\begin{aligned}
 W_S &= \frac{\sigma_E^2 \text{Cov}(R_S, R_E)}{\sigma_S^2 \sigma_E^2 + \text{Cov}(R_S, R_E)^2} \\
 &= \frac{1.2174 \times 0.0662}{0.0754 + 1.2174^2 \times 0.0662} \\
 &= \frac{1.1512}{1.1604} \\
 &= 0.9921 \qquad \qquad \qquad = 99.21\%
 \end{aligned}$$

$$\begin{aligned}
 W_E &= 1 - W_S \\
 &= 1 - 0.9921 \\
 &= 0.0079 \\
 &= 0.79\%
 \end{aligned}$$

Where,

$W_S$  = Optimal weight to invest in stock of SCBL.

$W_E$  = Optimal weight to invest in stock of EBL

$\sigma_S^2$  = Variance of SCBL

$\sigma_E^2$  = Variance of EBL

As we know that the proportion of stock 'S' in the Portfolio is constructed with 99.21% of SCBL and 0.79% of EBL common stock that will minimize risk and be ideal proportion.

### Portfolio Return

$$\begin{aligned} \overline{R}_P &= W_S \cdot \overline{R}_S + W_E \cdot \overline{R}_E \\ &= 0.9921 \cdot 0.4530 + 0.0079 \cdot 0.8135 \\ &= 0.4494 + 0.0064 \\ &= 0.4558 \end{aligned}$$

Where,

$\overline{R}_P$  X Average return on Portfolio of S and E

$\overline{R}_S$  X Average Return of SCBL

$\overline{R}_E$  X Average Return of EBL

### Portfolio Risk

$$\begin{aligned} \sigma_P &= \sqrt{W_S^2 \cdot \sigma_S^2 + W_E^2 \cdot \sigma_E^2 + 2 \text{Cov}_{SE} \cdot W_S \cdot W_E} \\ &= \sqrt{(0.9921)^2 \cdot 0.0754 + (0.0079)^2 \cdot 1.2174 + 2 \cdot 0.0662 \cdot 0.9921 \cdot 0.0079} \\ &= \sqrt{0.9843 + 0.0001 + 0.0010} \\ &= \sqrt{0.0742 + 0.0001 + 0.0010} \\ &= \sqrt{0.0753} \\ &= 0.2744 \end{aligned}$$

## Appendices 16

$\text{Cov}(R_H, R_E) = 0.08002$  (From Appendices 10)

The optimal portfolio weight of stock H and E, which minimized the risk, is given below:

$$W_H = \frac{\sigma_E^2 \text{Cov}(R_H, R_E)}{\sigma_H^2 \Gamma \sigma_E^2 + 2 \text{Cov}(R_H, R_E)}$$

$$W_E = 1 - W_H$$

Where,

$W_H$  = Optimal weight to invest in stock of HBL.

$W_E$  = Optimal weight to invest in stock of EBL

$\sigma_H^2$  = Variance of HBL

$\sigma_E^2$  = Variance of EBL

$$\begin{aligned} W_H &= \frac{1.2174 \times 0.08002}{0.0328 \Gamma 1.2174 + 2 \times 0.08002} \\ &= \frac{1.1374}{1.2502 + 0.16004} \\ &= \frac{1.1374}{1.0902} \\ &= 1.0433 \qquad = 104.33\% \end{aligned}$$

$$\begin{aligned} \dots W_E &= 1 - W_H \\ &= 1 - 1.0433 \\ &= -0.0433 \\ &= -4.33\% \end{aligned}$$

As we know that the proportion of stock 'H' in the Portfolio is constructed with 104.33% of HBL and -4.33% of EBL common stock that will minimize risk and be ideal proportion.

### Portfolio Return

$$\begin{aligned} \overline{R}_P &= W_H \cdot \overline{R}_H + W_E \cdot \overline{R}_E \\ &= 0.3134 + (-0.0433) \cdot 0.8135 \\ &= 0.3270 - 0.0352 \\ &= 0.2918 \end{aligned}$$

Where,

$\overline{R}_P$  X Average return on Portfolio of H and E

$\overline{R}_H$  X Average Return of HBL

$\overline{R}_E$  X Average Return of EBL

### Portfolio Risk

$$\begin{aligned} \sigma_P &= \sqrt{W_H^2 \cdot \sigma_H^2 + W_E^2 \cdot \sigma_E^2 + 2 \cdot W_H \cdot W_E \cdot \text{Cov}_{HE}} \\ &= \sqrt{(1.0433)^2 + 0.0328 + 2 \cdot 1.2174 \cdot 0.0800 \cdot (-0.0433)} \\ &= \sqrt{1.0885 + 0.0328 - 0.0019} \\ &= \sqrt{1.1194} \\ &= 1.0580 \end{aligned}$$



**Appendices 17**  
**Calculation of ANOVA**

<b>Fiscal Year</b>	<b>NABIL (R)</b>	<b>SCBL (R)</b>	<b>HBL (R)</b>	<b>EBL (R)</b>	<b>Total</b>
2059/060	0.0680	0.2416	0.0473	0.0814	0.4383
2060/061	0.4490	0.1311	0.2249	-0.2921	0.5129
2061/062	0.575	0.4126	0.3709	2.8841	4.2426
2062/063	0.5449	0.9168	0.3239	0.6138	2.3994
2063/064	1.2924	0.5629	0.6000	0.7803	3.2356
<b>Total</b>	2.9293	2.265	1.567	4.0675	10.8288

N = 20

$$\begin{aligned} \text{Correction Factor (C.F)} &= \frac{T^2}{N} = \frac{(10.8288)^2}{20} = \frac{117.2630}{20} \\ &= 5.8632 \end{aligned}$$

$$\begin{aligned} \text{Total Sum of Square (SST)} &= (0.0680)^2 + (0.4490)^2 + \dots + (0.7803)^2 \\ &= 13.9581 - 5.8632 \\ &= 8.0949 \end{aligned}$$

Sum of square between the Bank (SSB)

$$\begin{aligned} &= \frac{(2.9293)^2}{5} + \frac{(2.265)^2}{5} + \frac{(1.567)^2}{5} + \frac{(4.0675)^2}{5} - \text{C.f.} \\ &= 1.7162 + 1.0261 + 0.4911 + 3.3099 - 5.8632 \\ &= 6.5423 - 5.8632 \\ &= 0.6791 \end{aligned}$$

Sum of square with in Banks (SSW)

$$\begin{aligned} &= \text{SST} - \text{SSB} \\ &= 8.0949 - 0.6791 \\ &= 7.4158 \end{aligned}$$