

# Chapter- One

## Introduction

### 1.1 Background of the Study :

Nepal is a landlocked country with agro-based economy. The country is divided into mountains, hills and Terai region with its geographical nature. Economic status of our country is growing very slowly and Nepal is known as a very poor country all over the world. Development of different institutions is essential for the rapid economic development of the country. Although, being an agriculture dependent country, the non-agricultural sectors should be given priority. This will help not only to solve the problems of employment but also in the economic development of the nation. Only the establishment of industry is not sufficient but successful operation is also necessary. For successful operation, every industry and organization depends on the crucial decisions made by the top management relating to the management of fund. Capital structure decision is one of the most crucial complex areas of financial decision making area relating to the management of fund, due to its interrelationship with other financial decision variables.

Each and every managerial decision is based on financial analysis. It covers the acquisition, utilization, control and administration of funds. "Managerial finance is an exciting and dynamic area study, and its importance to the long run success of today's business is unquestioned"<sup>1</sup>. Virtually all individuals and organizations earn or raise money and invest money. Finance is concerned with the process of institution markets and instrument involved in the transfer of money among and between individual business organization and governments. The field of finance is broad and dynamic. Financial management leads to the decision making most skillfully. Finance has become an important branch of any economy,

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<sup>1</sup> Lawrence J. Gittman. "Principles of management finance" 4<sup>th</sup> ed., Harper and Raw Inc., New York(1985)

of which share market is a leading sector. In short period, the field of finance has developed considerably. Issue of securities to raise funds from the capital market certainly helps to expand the national economy.

There are various factors that are inhibiting the economic development of the country. The per capita income is very low, which remains about US\$ 242 and recorded as the least developed country of the world. The open border with India and the trade policy of India affect Nepalese economy in one or other way. Though tourism industry seemed good as a foreign currency earner, recent political instability at home and in the international stage have direct impact upon this industry. In the last few years, basically after the restoration of democracy (1990) in the country, the government's move towards liberalization and privatization have paved the way for economic growth and the resultant effect has been positive. The continuing thrust to the private sector in the process of national development has helped in establishing many banks, financial institutions and industries under joint venture arrangements.

Capital formation is one of the most important and basic factors for overall economic development. In fact, capital accumulation may be regarded as the core process by which all other aspects of development are possible. The level of capital formation depends upon the level of saving and its mobilization. The trend in recent days in declining interest rates, high inflation and slow growth in per capita income have so far depressed the private saving rate in Nepal. At the same time, public sector saving has also not been improved. The vicious circle of low income, low savings and low investment, which is the key responsible factor for low growth rate of the country, enhances the need for vigorous efforts to increase the level of saving. Saving mobilization and effective credit management system is a must for economic development especially for a country like Nepal where the growth rate is very low. However, the banking and financial system can

play a vital role in accelerating the pace of economic development of the country through the mobilization of scattered savings and channeling it in the real sector of the economy. In this regards, the role of capital market would be to give more focus on the efficient and effective savings mobilization and capital formation so as to contribute substantially in the economic development of the country.

Bank is a financial institution, which plays a vital role in the economic development of a country. Bank deals in receiving, collecting, transferring, paying, lending, investing and exchanging money both domestically and internationally. It provides a service to various segments of the society as well as it facilities growth of trade, commerce, industry and agriculture of the country. In the absence and insufficiency of banking and financial facilities, the growth of the economic development becomes slow.

The history of modern banking now started after the establishment of Nepal Bank Ltd., the first-ever bank in the country in 1973 A.D. Only the Nepal Bank Ltd. was not able to provide required services all over the country. With the political freedom in 1951, a planned development process has been started in the country that leads to the formulation of first development plan in money supply and help banking development in the country. As such, Nepal Rastra Bank, the central bank of the country was established in 1956 under the Nepal Rastra Bank Act. 1955.

The role of financial institutions has been instrumental in the overall economic development of the country. Financial systems help pool and utilize resources, reduce costs and risks, expand and diversify opportunities, increase the allocate efficiency of resources, and promote the productivity and economic growth. Larger accumulation of financial resources and efficiency in financial intermediation are essential for promoting investment, productivity and economic growth. Nepal's rising

development requirements also call for greater proportions of financial resources being available at the required size, price, modality and place which is served by financial system.

As a precondition to economic liberalization, the industrial Enterprise Act was enacted in 1982 and Foreign Investment and Technology Transfer Act came into effect since 1983. Since 1985 Nepal has been following liberal economic policy. In its first stage of implementation, banking and financial sector was liberalized. A policy to invite foreigners to invest jointly with the domestic investors in the banking and financial sector was introduced. Finance Companies Act, 1986 was also enacted with a view to provide non-banking services to the people in order to promote their economic benefit in general through institutionalized investment. Accordingly, many banks and finance companies were incorporated in the private sector and listed in the securities exchange center. Nepal Rastra Bank liberalized the regulation of interest rate and endeavored to reform and strengthens the financial sector by implementing various prudential financial norms like income recognition, loan classification, and maintenance of adequate loan loss provisions, reserves and capital adequacy ration and liquidity portion of the banks and finance companies. The industrial policy of 1988 introduced various reforms in order to encourage the establishment of corporate enterprises and guaranteed the non-nationalization of private sector industrial organizations As a result, the establishment owned bank in operation till 1984. The recent boom in the established government owned commercial bank the opening of the stock exchange, reserve requirements branch expansion and many others are the manifestation of the adoption of new and more marker oriented policies by the government.

The financial system of Nepal comprises of the central bank, viz. Nepal Rastra Bank, 19 commercial banks, 4 specialized Development banks, 5 Rural development banks, 45 finance companies, 2 contractual saving institutions, Viz. employees provident fund and citizen investment trust,

deposit Insurance and credit guarantee corporation, credit information bureau {CIB}, Nepal Stock Exchange {NEPSE}, Stock Exchange Board, 12 Insurance Companies, 29 Cooperatives, 30 NGO's and postal Savings Banks. This stand denoted to risk and return analysis of some of these enterprises.

### **Primary Market**

Before the establishment of the Securities Exchange Centre (SEC) there was no any institutional arrangement to undertake new issue and manage the sales of the shares and debentures of the corporate bodies. A public limited company could make public offering according to the provisions of the Companies Act. 1964. When the SEC came into existence, it started managing new issues of shares and debentures according to the guidelines for new issues and sales management 2043 (1986).

### **Secondary Market**

The corporate bodies were required to list their shares and debenture in the SEC in order to qualify for the trading. However, the government bonds issued under the National Debt Act were exempted from such compulsory-listing obligation.

Securities Exchange Act 1983 made it obligatory to trade the securities through the recognized Centre or through their licensed brokers. Therefore, the securities Exchange Center opened its floor for secondary trading of corporate shares in November 1984. Before this, the SEC was restricted to the trading of Government Bonds.

Along with the formation of Security Exchange Board, His Majesty's Government converted the Securities Exchange Centre Ltd. into Nepal Stock Exchange Ltd. (NEPSE) in 1993 with a view to reform the capital market. It is a non-profit making organization operation under Securities Exchange Act 1983. Brokers and market makers operate on the trading

floor as per the Securities Exchange Act rules bylaws of NEPSE. Nepal Stock Exchange started its trading operation on 13 January 1994 through its licensed members.

The Securities Board was constituted in 1993 under Sec. 1 of the Securities Exchange Act. 1983. Its main objective is to provide essential policy direction for the systematic and regular exchange of securities and develop competitive stock exchange market by protecting and promoting the interest of the investors. Nepal Stock Exchange is a trading (operational) Institution, whereas Securities Exchange Centre carried on both the functions. Though any corporate body desirous to carry out the transaction of securities can submit application to the Board for obtaining the license, till now Nepal Stock Exchange Ltd. alone is representing the securities market in the country.

### **A brief looking-back of stock Market with reference to commercial banks**

The first six months of 1994 (Mid. January to Mid-June) witnessed an upward trend in the stock market of Nepal. Strong public sentiment towards the corporate shares caused the prices of equity share of most of the companies, especially shares of companies in the banking and finance sector to go up abruptly without any proportionate strong financial backing. Following the declaration of attractive dividend rate by joint venture banks, investors exhibited a grave concern over the income gain irrespective of the other information like nature and financial strength of the company. The NEPSE Index tremendously went up to 265, the monthly share market turnover reached a record level of Re. 963.9 million and the market capitalization of the listed shares reached Rs. 16407 million. But this period onwards, the bearish tendency in the history of stock market in Nepal began gradually. Most of the investors were not aware of the risks associated with the corporate investment. They were neither familiar with

the corporate information nor there were and financial information disseminated.

By the end of 2001/2002, the 115 companies listed on the Stock Exchange were capitalized at 46.3 billion and turn over for the year was 2.3 billion. The capitalization of the Nepalese Stock Market as a percentage of GDP was a little over 4% in 1996. By mid-July 2001, market capitalization has reached 11.8% of GDP.

Out of total market capitalization, banking industry has been contributing major pie. In 1996 July, Market capitalization of commercial Bank was 10,395 million, which has been soared up to 27630.31 million in 2001 July. Contribution of commercial banks in terms of market capitalization under the review period has been in increasing trend except in 2001 July.

When going through this chapter, risk and return analysis, the profit and increment in the wealth, can be let as the return. The return is not made itself but there should be a lot of positive attempts to create it. Risk is an assumption of that case when the business can not create profit or it gives variable and fluctuated figure of return. So, risk and return are the interrelated fact; they have always-inverse relationship between them. So, where is the return there must be risk and vice-versa.

"An investment is a commitment of money that is expected to generate additional money. Every investment entails some degree of risk; it requires a present sacrifice for future uncertain benefits."<sup>2</sup>.

"Risk can be thought of as the possibility that the actual return from holding a security will deviate from the expected return. The greater magnitude of deviation and the greater the probability of its occurrence, the greater is said to be the risk of security."<sup>3</sup>

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<sup>2</sup> Francis. 1992, P-1

<sup>3</sup> Van Horne, 200, P-89

Another statement about financial risk "Risk may be defined as the likelihood that actual from an investment will be less than forecasted return stated differently, it is variability of return from an investment."<sup>4</sup>

"Risk is defined as variability of the returns of a period. One period return is basic random variable used in investment risk. The greater the variability of the returns the riskier the project.

As investors may have to face different sort of risk. The total magnitude of risk can be measured by adding systematic and unsystematic risk. Systematic risk that are beyond control of the management and unsystematic risk can be taken into control by management. Systematic risks are risk brought by economic inflation, business recession and economic depression. The unsystematic risks are avoidable or non-market risk e.g. labour strike, disorganized management policies, consumer preferences etc.

The risk of common stock investors is measured by the fluctuation on regular earning recurred per share i.e. calculated and denoted by standard deviation ( $\Omega$ ) of the return."<sup>5</sup> ( )

Simplify the return can be let as the fruit from planting tree. Or we can say that return is a benefit from the investment. This study refers to risk and return on the common stock investment of different listed Joint Venture Banks. So for study, rate of return for the single period will be calculated. Single period rate of return is very important to measure the speed of the investors wealth increment or decrement.

The rate of return for the single period can mathematically be represent as shown below :

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<sup>4</sup> Hampton, P-396

<sup>5</sup> *ibid.* P-396, 397



$$\text{Rate of return} = \frac{(\text{Changing in Price}) + \text{Cash Flow}}{\text{Price of the stock at the beginning of the period}}$$

**Symbolically it can be presented as :**

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

Development and expansion of financial markets are essential for the economic growth of the country. Financial market helps economic development by mobilizing long term as well as short term capital needed for the productive sectors. For the development of the financial market, the investors play the important role. When investors invest their wealth in any business sector they expect some return or they want to increment in wealth and regular cash flow with minimum risk. They expect more with minimum risk.

So, it is most necessary to evaluate the securities in terms of risk and on investment.

## **1.2 Statement of the problem**

In the context of Nepal, there are no any separate institutions, which may provide information required to make rational decision that can accelerate the stock investment and market efficiency. Government policy is less encouraging in promotion common stock investment. Most of the Nepalese investors invest their fund in single security rather than investing in portfolio of security through diversification of risk. Not only general public but also even most of educate people related on such subject cannot prominently analyze the risk and return in stock market investment.

Due to lack of information and poor knowledge, individual investor is manipulated or exploited by the financial institutions or other market intermediaries to such an extent that investing in common stock is

intolerably hazardous. There is another problem for financial sector to earn goodwill among the public because some financial companies have collapsed due to improper use of public funds. Investors are responsible to make rational investment decision rather than switching blame to others. Previous research by Bhatta Shows that in Nepal, most of the investors invest their funds in single security rather they can be benefited by investing in portfolio of securities through diversification of the risk. Most of the rational investors hold portfolio of stock and they are more concerned with the risk of portfolio than with the risk of the individual securities. (Weston and Brigham, P-215).

At the same time there are no any separate institutions, which provide information required to rational decision that can accelerate the stock investment and market efficiency. Government policy is less encouraging in promoting common stock investment. The Nepalese stock market is characterized by a low trading volume, absence of professional brokers, early stage of growth, limited movement of share prices, limited information available to investors, unexciting political environment and internal conflict. The number of investors in stock market is still very few who are not confident to get appropriate returns from the listed joint venture banks. About the common stock investment Gewal viewed; it is not only a wholly rational or logical process, which can be understood in terms of conventional region and logic. Since it involves the use of institution, imagination, guesswork, conscious judgment based on little understood statistical probability. The writer further add, most investors use linear logic to formulate their investment strategies and to make investment decisions, where as linear logic is based on the assumption that the further will reuse the past in a predictable fashion.

Among the various empirical contradictions, the cross sectional relationship between stock returns and other related variables have been found extensively studied in the USA and Japan. In general these studies show

positive relationship has been revealed between equity returns and earning yield, cash flow yield, book to market ratio and negative relationship between equity returns and size. Especially voluminous and the studies that documented the size and the earning yield effects and studies that have tried to disentangle the two effects as for example the studies by Basu, Banz, Reingnum, Cook and Rozeff, Lakonishok and Shapiro, Banz and Breen.

The asset pricing model of Sharpe, Linter, and Black, have found that the returns are positively related to risk, but the study by the Fama and French doesn't support this relation. The study indicates that the size and book to market equity has captured the cross sectional variation in average returns for the period of 1963-1990. Davis found that book to market ratio, earnings yield and cash flow yield have significant explanatory power with respect to the cross section of realize stock returns during the period of July 1940 to June 1963.

The study by Banz documented that the stocks with larger market equity have lower returns. The size effect becomes weaker when beta and expected returns were allowed to vary over time. Ball found earning price (E/P) was likely to be higher for stock with higher risks and expected returns. Similarly Verma found positive relationship between profitability and dividends. Thus, these empirical results suggest that the number of variables influences the stock returns and they are related to each other's. Although these are the studies in the context have big and developed capital market but their applicability is yet to be seen in the context of smaller and under developed capital market like Nepal.

As the economic status and awareness towards economic activities are very poor development and growth of capital market in Nepal is still in its infancy. Investors use their own guess and hunches to invest their wealth because they do not have any knowledge about financial assets and they also do not know to take decision to construct an ideal portfolio and to

reach a profitable decision. Investors of Nepal invest their wealth on the basis of looking the past trends of stock price, so some time they have to face heavy loses.

It is, therefore necessary to import required knowledge to investors and make them able to analyses risk and return of individual stock as well as portfolio so they can minimize their risk.

Investors feel more risk in stock investment than its real risk. To build their confidence, unbiased analysis and information about it is a must unavailability of a simple and clear ways or technique, risk and return of individual stock and portfolio is there fore being a major requirement to increase stock investment and stock market efficiency as well. Brokers, issue manager, stock broker and all the related person in those fields must become necessary to set the policies, evaluate relative risk ness of their decision and impression to general investor “ securities market t and other institutional set up are yet to work toward providing knowledge and skill to Investors:”

Beating above all in the mind following research issues is identified.

- i. How should investors decide to invest based on risk and return?
- ii. What is the comparative risk and return position of selected manufacturing companies?
- iii. Does the risk and return vary significantly?
- iv. To what extent there is systematic risk in relation to total risk.
- v. Would portfolio construction within these sectors be profitable?
- vi. What sort of relationship exists between returns and various financial variables for these sectors? Etc.

### **1.3 Objectives of the study**

The major objective of the study is to determine whether the shares of commercial banks are correctly priced or not by analyzing the required

rates of return using the Capital Assets pricing Model. The specific objectives are as follows:

The major objectives of this study is to evaluate the risk and return associated with common stock investment of some listed commercial Banks. The specific objectives of this study are as follows :

- a) To evaluate common stock in terms of risk and return of Commercial banks.
- b) To examine whether the common stock are over price, under price or equilibristic price.
- c) To examine the relation among returns of various Commercial. Banks.
- d) To provide suggestions & recommendation based on finding.

#### **1.4 Significance of the study**

In the context of Nepal,, the capital market is growing very slowly. The market is not efficient, there are very few magazines or articles related to capital market and very few studies are made on the topics. "Risk and Return". Because of all things some investors are investing on the capital market without any proper knowledge and information.

This study will give information about Nepalese Capital Market by analyzing risk and return and will definitely contribute to increase the analytical power of the investor in capital market. The study will be beneficial for all the persons who are directly or indirectly related to the Nepalese Capital Market.

Investor's feeling towards risk and return is on the surface level only. They feel more risk than that exist. As a result, there are fair of laps of investment in common stock. So, the study will be more significant for exploring and increasing stock investment. It will also provide little contribution to Nepalese stock market development.

This study is not only to fulfill M.B.S. level course of T.U, but also to provide some knowledge about the Nepalese stock market developments along with providing ideas to minimize the risk on stock investment.

The analysis of risk and return is a significant managerial decision from the viewpoint of investors. It influences the shareholders risk and return. Consequently the risk and return analysis influences the market price of the stock, by making it at an appropriate level. Apart from this, study will be a matter of interest for academicians, students, researchers, teachers or persons practicing in the field of finance.

## **1.5 Limitations of the study**

Disclosure of financial information is very limited, and accessibility is equally poor as well. Some of the listed companies have not followed disclosure of financial and other information as per requirement. Furthermore, information regarding dividend in particular for the research purpose is not sufficient. As the researcher has aimed to analyze the risk and return on base of monthly data, though it is substantially important, it is felt to find out data about the date of share split, stock dividend and other information regarding dividend is virtually impossible. It is that is why, the researcher, has gathered data and analyzed on quarterly basis with out adjustment of stock dividend and stock dividend. One of which is there is no such a trend in price change in the share price as theoretically conceived following the stock split and stock dividend distribution. The other reason is the assumption that all available information is impounded in an efficient market. All sampled banks distribute cash dividend in annual basis. The researcher has segregated the annual dividend in quarters as the observed data is on quarterly basis. The same kind of observation regarding cash dividend has been made in the past years in international arena. As the stock price movement correlates other macro variable factors, data and/ or information on those factors is equally important. In this light, study covers

up to f/y 2007. The study covers five fiscal years from 2003 to 2007. This study is confined to the study of only 4 commercial banks enlisted in NEPSE particularly in relation with risk and return.

In this fast changing world it is difficult to manage with the speed of changing, due to the arrival of unexpected difficulties. As no study can be free from its own limitations, this study has also some limitations, which are mentioned below.

### **Lack of up to date data**

The study is based on the secondary data source such as annual reports of concerned banks, annual reports of Nepal Rastra Bank, Nepal stock exchange, subject related books, magazines, journal and other related materials etc. It is difficult to get the up to date and complete data, due to the lack of data system with concerned authority. Variations in the data itself are also found when comparing with different sources. So the trustworthiness of analysis and conclusion of the study depends upon the accuracy of secondary data.

### **The Effect of Inflation**

Inflation is one of most vital factor for the country's economic and financial activities. The effect of inflation has not been taken into consideration for the purposes of study.

### **Limited scope of the study**

This study is simply presented to fulfill a partial requirement of M.B.S. program. It is neither a Ph.D. thesis, nor any master piece of work.

### **Coverage of time period**

The study covers the time period of last 5 years from fiscal year.

2002/03

2003/04

2004/05

2005/06

2006/07

### **Resource & Time constraints**

The study is fully based on the students financial resources and it is to be conducted and submitted with in a time constraint. Further, the study is not a final study on the subject.

### **Sample size**

There are about 25 commercial banks in Nepal. Due to time & resource constraints, only five commercial joint venture banks; namely SCBLT, NIBL, HBL, NSBIBL and NABL have been selected as samples in the study.

## **1.6 Organization of the study**

This study has been organized in five chapters, each devoted to some aspects of analysis of risk & return on investment in commercial banks. The titles of each of these chapters are summarized and the contents of each of these chapters of this study are briefly mentioned here.

### **Chapter I : Introduction**

This first chapter will be made of the following topics.

- a) Background of the banks.
- b) Statement of the problem.
- c) Objectives
- d) Limitation of the study
- f) Organization of the study

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

The second chapter concerns with literature review that includes a discussion on the conceptual framework on risk & return and review of major studies relating with its decision.

### **Chapter III : Research Methodology**

This third chapter describes the research methodology adopted in carrying out the present research. It deals with research design,, sources of data,, data processing procedures, population and sample, period of the study, method of analysis and financial and statistical tools.



#### **Chapter IV : Analytical Framework**

This fourth chapter is concerned with analytical framework. It includes the analysis of financial indicators; analysis of mean, standard deviation,, coefficient of variation, correlation coefficient analysis.

#### **Chapter V : Conclusions**

This fifth and final chapter is concerned with suggestive framework that consists with the overall findings, conclusions and recommendations of the study.

The bibliography and appendices will be incorporated at the end of the study.

# **Chapter-Two**

## **Review of Literature**

Review of Literature is the chapter where a researcher reviews the books, Journals, Magazine or any other type of studies, which are related to his field of study. "Review of Literature is basically a " Stock taking " of available literature is one's field of research " (**Wolf and pant p 30**) . So research is a continuous process which never ends. The procedures and findings may change but research continues. So, for analysis the data and to find something new researcher must to review and know if there are any studies ahead or not.

The concern of the study primarily is to focus on the risk and return. Theoretical aspect of the topic on risk and return on sock investment is explored in this chapter in more detail and descriptive manner. In this chapter, some basic academic course books, journals and other related studies are reviewed. Since there are very limited study materials related to this topic has published in Nepal. This study has to refer almost all books related with this topic published in the foreign countries. On the other hand, our market is also in emerging state. Some master degree thesis are available in Tribhuvan University which are related to some extent with this topic "risk and return" has been reviewed. In addition independent studies carried out by well-known Nepalese financial experts and others are also taken into consideration.

### **2.1 Conceptual framework:**

#### **2.1.1 Investment, Common stock, Risk and Return**

Analysis, Risk and Return are the financial term, which are heavily associated with each other. Investment simply means sacrificing current fund for future cash inflows. Here the future cash flows are the "returns" and future is uncertain uncertainty obviously points out risk.

"Investment in its broadest sense means the sacrifice of current dollars for future dollars. Two different attributes are generally 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". (Willam, Gordon & Jeffery, P-1)

Investment can be made on real assets or on financial assets. Investment on real assets (like land, building, factory etc.) is known as financial investment.

"Real investment generally involves some kind of tangible assets such as land, machinery or factories. Financial investment involves contracts written on pieces of paper such as common stock and bonds. In primitive economics most investment is of the real variety, where as in a modern economy much investment is of the financial variety." (**ibid, P-2**)

### **2.1.1 Common stock:**

“The study is focused on the common stock investment that’s why light is thrown on it. Common stock represents ownership position in a corporation. it has a residual Claim, in the sense that creditors and preference shareholders can receive payment only after the payment of all other claims. In bankruptcy, Common stockholders are in principal, entitled to assets remaining after all prior claimants have been satisfied. The risk is highest with common stock investment .when investors buy common stock they receive certificate of ownership as a proof of there being part of the company. The certificate states the number of shares purchased and their par value.<sup>6</sup>

Common stocks have one important investment characteristic and are important speculative characteristics. Their investment value and average

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<sup>6</sup> V.K. Bhalla, “Investment Management”. 2000. pg 196

market price tend to increase regularly but persistently over the decided as their net worth builds through the reinvestment of undistributed earning. However, most of the time common stocks are subject to irrational and excessive price fluctuation in both directions as most people tend to speculate or gamble i.e. to give way to hope fear and greed.<sup>7</sup>

“Common stock holders of a corporation are its residual owners, their claim to income and asset comes after creditors and preference share holders have been paid in full. As a result, a stockholders return on investment is less certain than the return to lender or to a preferred stock holder’s. On the other hand, the share of the common stock can be authorized either with or without par value. The par value of the stock is merely a stated figure in the incorporated charter and is of little economic significance. A company should not issue stock at a price less than par value because stock holders who bought stock for less than par value would be liable to creditors for the difference between the below par price they paid and the par value.<sup>8</sup> But in Nepal, as per the provision of Nepal Company Act 2057, no common stock is allowed to issue without par value. its par value must be either Rs.10 or Rs.100.

The term risk and return is closely associated with investment. Investment simply means sacrificing current funds for future returns bearing certain risk. Here as a student of finance we have focused the term investment as sacrificing current funds on financial assets like shares, debentures, warrants, convertibles etc. for the long term return.

Investors invest their fund on the securities of certain companies for the long run future returns. The return is defined as the reward for bearing risk. Return is the most important outcome from an investment. It measures the investor's rate of wealth accumulation i.e. increase or decrease per

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<sup>7</sup> Ibid. pg-98

<sup>8</sup> Van Horne, James C., “Financial Management and Policy”. Prentice Hall, India (1997).

period return. Return from speculation of from short shell capital gain dividend gain. Yield on investment, yield to maturity etc. These all types of returns are the reward to the investor's for bearing the risk. Risk is defined to the occurrence of unfavorable outcome, which is ever harmful for the business.

Return to investors is ever follows by risk. Risk ever creates an uncertainty. Some of the factors that (relates investment uncertainties are internal rate risk, purchasing power risk, bull – bear market risk, management risk and so on. Risk can be diversifiable or invertible. The level of the risk depends on the condition of the market. If market is efficient there is low risk, but if it is inefficient, definitely there will be higher risk. An efficient market is that market, where the security price reflects all available information about the economy, about the financial market and about specific company involved. In efficient market the price of stock reflects its value.

### **2.1.2 The Return on common Stock:**

Return is the income received on investment pus any charge in market piece, usually expressed as a percent of beginning price of the investment. The overall rate of return can be decomposed into two parts as capital appreciation and dividend. Capital appreciation is the difference between ending value and beginning value of an investment. Returns are defined as the dividend yield plus the capital gain or loss. The relationship between different levels of return on their relative frequencies is called a probability distribution .we could formulate a probability distribution for the relative frequency of a firm's annual return by analyzing its historical return over the previous period. But we know that history never repeats itself exactly. Hence after analyzing relative frequencies of historical return for the individual company, we can form a probability distribution based on the historical data plus the analysis for the out look for the economy and the

outlook for the industry, the outlook for the firm in its industry and other factors.

For investors, return is considered as the main attraction to invest in a risky security as a stock (equity share) accepting a varying degree of risk tolerance. "The return from holding an investment over some period says a year is simply any cash payments received due to ownership plus the change in market price divided by the beginning price. Thus the return comes from two sources, income and price appreciation.

For common stock we can define, one period (single period) return as:

Where,

$R$  = Actual (expected) Return

$t$  = particular time period in the past (future)

$D_t$  = cash dividend at the end of time period  $t$

$P_t$  = Stock's price at the time period  $t$

$P_{t-1}$  = Stock's price at the time period  $t-1$

Above formula can be used to determine both actual one period return (when based on historical figure) as well as expected one period return (when based on expected dividends and prices). The term in the parenthesis in the numerator of the above equation represents the capital gain or loss during the period.<sup>9</sup>

Holding period return measures mentioned above is useful with an investment horizon of one year or less. For longer period, it is better to calculate rate of return as an investment yield. The yield calculated is present value based and this considers the time value of money.

Annualized rate of return over several periods can be calculated in two ways. The first one is simply to take the arithmetic average of the annual

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<sup>9</sup> Van Horne, James C & Wachowicz, "Fundamental of financial Management". 9<sup>th</sup> Ed., Prentice Hall Inc. U.S.A

holding period returns over a given period and the second one, which also takes account the compounding effects of cash receipts over different time intervals, is the geometric mean rate of return.

➤ The simple arithmetic mean:

$$\overline{HPR} = \sum_{t=1}^n \frac{HPR_t}{n}$$

➤ The geometric mean,

$$\overline{HPR}_g =$$

When  $HPR_g$  is the individual period return,  $n$  is the number of period and represents  $\Pi$  the product (or the result of multiplying)<sup>10</sup>

### 2.1.3 The risk on common stock:

Uncertainties and risks are the facts of life so to the common stock holders. Different people interpret uncertainties and risk in different ways. For some uncertainty is simply a lack of definite outcome, it is any thing that could happen any unknown event, which may be favorable or unfavorable. To other, it is a risk, many people consider, risk as a chance of happening some unfavorable event or danger of losing some value.

Risks and uncertainty are treated separately in financial analysis. The practice is to translate the uncertainty into a mathematical value, which represents the best estimate of all uncertain values. In other words uncertainty is taken care of by calculating the expected value of all possible uncertain outcomes. But risk is treated differently.

Risk is a complicated subject and needs to be properly analyzed. The relationship between risk and return is described by investor's perceptions about risk and their demand for compensation. No, investor will like to invest in risky assets unless he is assured of adequate compensation for the assumption of risk. Therefore, it is the investor required risk premium that establishes a link between risk and return. In a market dominated by

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<sup>10</sup> Cheney, John M. and Edward A Moses "Fundamental of Investment" West publishing company

rational investors higher risk will command by rational premium and the trade off between the two assumes a linear relationship between risk and risk premium.

“Risk, defined most generally, is the probability of the occurrence of unfavorable outcomes. But risk has different meanings in different context. In our context two measures developed from the probability distribution have been used as initial measures of return and risk. There are the mean and the standard division of the probability distribution.<sup>11</sup> Instead of measuring risk the probability of a number of different possible outcomes, the measures of risk should some how estimates the extent to which the actual outcome is likely to diverge form the expected outcome. Standard deviation is a measure that does this since it is an estimate of the likely divergence of actual from an expected return.<sup>12</sup>

Risk is the unlooked for the unwanted event in the future; some one has said that risk was the sugar and salt of life. “Risk is defined in Webster’s Dictionary as a hazard, a peril, exposure to the loss or injury, thus for most, risk refer to the chance that some unfavorable event will occur. If you invest in speculative stocks (or really, any stock), you are taking a risk in the hope of making an appreciable return.<sup>13</sup>

#### **2.1.4 The range:**

“The range (maximum return minimum return) is known as one of the traditional way of measuring risk. It simply shows the difference between the best possible return and the worst possible return but does not provide information about the distribution of the rates of return between the extremes.<sup>14</sup>

i.e. The Range = Best possible rate of return worst possible rate of return.

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<sup>11</sup> Op. cit. Weston and Brigham. P. -93

<sup>12</sup> Sharp Willam F., Alexander Gordon J., and Bailey J.V. “Investment” 5<sup>th</sup> ed. prentice hall. USA. (1995)

<sup>13</sup> Op. cit. Weston, Besley & Brigham, P. 182-183

<sup>14</sup> John M. Cheney & Edward A. Moses, “Fundamental of Investment”



### 2.1.5 Standard deviation:

The standard deviation provides more information about the risk of asset. It's advantage is that the uncertainties of the return can be summarized into a single, easily calculated number. The major disadvantage is that the standard deviation considers possible return above the expected value to be as risky as returns below the expected value. Standard deviation measures the dispersion or deviation or variation. In other word, the conventional measure of the dispersion is the standard deviation. (s.d) the greater the s.d. the greater the risk of the investment.

Standard deviation measures the magnitude of the difference between best possible return and the worst possible return. Hence it measures the degree of risk of common stock. Because we have defined risk as the variability of returns, we can measure risky by examining the tightness of the probability distribution, associated with the possible outcome. Normally, the width of the probability distribution of the expected returns, the less its variability thus the small risk associated with the investment. Standard deviation is denoted by the symbol 'σ' (sigma). It can be expressed mathematically as:

$$\sigma = \sqrt{\sum_{i=1}^n (R_i - \bar{R}_j)^2 \cdot P_i}$$

Where,

$R_i$  = Expected rate of return

$P_i$  = Probability

$\sigma$  = Standard deviation

$R_i$  = Return for 1<sup>st</sup> possibility

Operationally we generally first calculate distribution variance or the weighted average of square deviations of possible occurrence from the mean value of the distribution, with the weights being the probability of occurrence. The square root of the figure will provide the standard deviation.

S.D. (Standard deviation) is the weighted average deviation from the expected value, and it gives an idea of how far above or below expected value and the actual value likely to be. It is the statistical tool for measuring risk. It measures the total risk of a security consisting both systematic and unsystematic risk. Standard deviation with lower value is acceptable.

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

$$\text{Coefficient of variation (C.V.)} = \frac{\dagger}{R}$$

Thus the coefficient of variation is a measure of relative dispersion (risk) a measure of risk per unit of expected return. The larger the C.V. the larger the relative risk of the investment.<sup>15</sup>

C.V. is the ratio of the standard deviation of a distribution to the mean of that distribution which is the measure of the relative risk.

## 2.1.6 Portfolio

Investment in two or more than two assets is normally called portfolio. A portfolio is the combination of investment assets. Portfolio is the holding of securities and investment in financial assets like bonk, stock etc. Portfolio management is related to the efficient portfolio investment in financial assets. Investors rarely place their entire wealth into a single asset or investment rather they construct a portfolio or group of investments. Therefore it is needed to extend analysis of risk and return to include portfolio a combination of two or more securities or assets is portfolio. It has following two types of objectives.

➤ Primary objectives:

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<sup>15</sup> Op. cit Van Horne and Wachowicz, p-94

- To minimize risk
- To maximize return.
- Secondary objectives
  - Regular return
  - Stable income
  - Safety of investment
  - Tax benefit
  - Appreciation of capital

The expected return on the portfolio is simply a weighted average of the expected returns of the individual securities that they are included in the portfolio. The weights are equal securities (the weight must sum to 100% or 1). The general formula for expected return of a portfolio  $\overline{R_p}$  is as follows:

$$\overline{R_p} = \sum_{j=1}^n W_j \cdot \overline{R_j}$$

Where,

$W_j$  = Proportion of total funds invested in security j.

$\overline{R_j}$  = Expected return for security j

n = Total no. of different securities in the portfolio

While the portfolio expected return is a straight forward weighted average of returns on the individual security, where as portfolio standard deviation is not the weighted average of the individual security standard deviation. To take a weighted average of individual security standard deviations would be to ignore the relationship or correlation between the returns of two securities.

The standard deviation of probability distribution of possible portfolio return  $\sigma_p$  is

$$\sigma_p = \sqrt{\sum_{i=1}^n \sum_{k=1}^n W_j W_k COV_{J.K}}$$

Where,

$n$  = Total no of different securities in the portfolio

$W_j$  = Proportion of total funds invested in security j

$W_k$  = Proportion of total funds invested in security k

$COV_{j,k}$  = Covariance between the possible return of securities j and k

The covariance of the possible returns of two securities is a measure of the extent to which they are expected to vary together rather than independently of each other. The covariance term in the above formula can be written as,

$$COV_{j,k} = \rho_{jk} \sigma_j \sigma_k$$

Where,

$\rho_{jk}$  = the correlation coefficient between possible return for security j and k

$\sigma_j$  = S.D. of the security j.

$\sigma_k$  = S.D. of the security k

When,  $j = k$ , the correlation coefficient is 1 as variable movements correlate perfectly with itself.

“The correlation coefficient which is significant in portfolio construction is standardized statistical measure of the linear relationship between two variables. Its range from  $-1$  (perfect negative correlation) to  $+1$  (perfect positive correlation).

Lesser the correlation higher the reduction in portfolio risks.<sup>16</sup> The positive correlation coefficient shows that the returns from two securities generally moves in the same direction, while negative correlation coefficient shows that they move in opposite direction and zero correlation coefficient shows that the returns from two securities are un correlated. They show to tendency to vary together in either a positive or negative in linear function.

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<sup>16</sup> Ibid p-97

### 2.1.7 Systematic risk and Unsystematic risk:

Systematic and unsystematic risks are the terms frequently used in the portfolio context. Combining securities that are not perfectly positively correlated helps to reduce the risk of a portfolio to some extent.

Systematic risk has its source factors that affect all the marketable assets and thus cannot be diversified away. Systematic risk is due to the risk factor that affects the overall market such as changes in national economy, tax reform by the government or changes in the world energy situation. The sources of systematic risk are market pervasive. The measure of systematic risk permits an investor to evaluate an asset's required rate of return relative to the systematic risk of the stock. Unsystematic risk is risk unique to a particular company or industry. It is independent of economic, political and other factors that affect all securities in a systematic manner. A wild card risk may affect only one company; a new competitor may begin to produce essentially the same product.

“For most stocks, unsystematic risk accounts for between 60 to 70 percent of stocks total risk or standard deviation.<sup>17</sup> The kind of risk can be reduced by diversification and even eliminated if diversification is efficient. Hence not all the risk involved in holding a stock is relevant since part of this risk can be diversified away. The relationship among systematic, unsystematic and total risk are shown below.

Total risk( $\sigma_j$ ) = systematic risk + unsystematic risk

Where, systematic risk =  $\sigma_j \rho_{jm}$  and unsystematic risk =  $\sigma_j \sqrt{1 - \rho_{jm}^2}$  Here  $\rho_{jm}$  is the correlation coefficient between the return of given stock (j) and the return on market portfolio.

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<sup>17</sup> Van Horn and Wachowicz pg 91 “Fundamental of Financial Management” 9<sup>th</sup> Ed.

### 2.1.8 Capital Asset pricing model (CAPM):

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

“CAMP is the Model that describes the relationship between risk and expected return. In this model, a security’s expected (required) return is the risk free rate plus a premium base don the systematic risk of the security.

**This model is expressed as:**

$$K_j = R_f + [E(r_m) - R_f] \beta_j$$

Where,  $K_m$  = Required rate of return for stock j

$R_f$  = Risk free rate

$E(R_m)$  = Expected return for market portfolio

$\beta_j$  = An index of systematic risk of stock j (Beta coefficient)

“Beta measures the sensitivity of a stock’s return to change in the returns on the market portfolio. The beta of a portfolio is simply a weighted average of the individual stock betas in the portfolio.<sup>18</sup>

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<sup>18</sup> Op. cit. Van Horne, P-100

If beta is one then the required return is simply the average return for all situation, that is the return on market portfolio, other wise, the higher the beta, higher the risk premium and the total required return. However, a relatively high beta does not guarantee a relatively high return. The actual return depends partly on the behavior of the market, which acts as a proxy for general economic factor.

“The major implication of the CAPM is that the expected return of an asset will be related to a measure of risk for that asset known as beta. The exact manner in which expected return and beta are related is specified by the CAPM. The model which provides the intellectual basis for a number of the current practices in the investment industry.<sup>19</sup>

The capital assets pricing model states that the expected risk premium on each investment is proportional to its beta. This means that each investment should lie on the sloping security market line connecting treasury bills and market portfolio. In mid 1960's three economist's willam Sharpe, John Linter and Jack Treynor created the CAPM, a theory which began a quest to identify the tendency portfolio. CAPM is the predominant model used for estimating equity risk and return. It is useful tool for the investment portfolio and for estimating expected rate of return. Comparison between the expected rate of return and required rate of return indicates whether the stock is under priced or overpriced. And when these two returns are equal then it is said to be market equilibrium i.e. all the stocks lie on the Security Market Line (SML).

SML is the graphical representation of the CAPM. Which shows the relationship between risk and required rate of return? The SML clearly shows that returns are the increasing function, in fact a linearly increasing function of risk. Further it is only market risk that affects return. The investor receives no added return for bearing the diversifiable risk. If

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<sup>19</sup> op.cit Sharpe, Willam F...P.261-262

stocks are under priced it lie above the SML and if they are over priced the below the SML. The following diagram shows the SML with over priced and the under priced stocks.

“Above figure clarifies that stock x is under priced relative to the security market line while stock – y is over priced. As a result stock x is expected to provide a rate of return greater than that required, based on its systematic risk. In contrast, stock y is expected to provide a lower return than that required to compensate for its systematic risk. Investors seeing the opportunity for the superior return by investing in stock x, will rush to buy. This action would drive the price up and the expected return comes down. How long would this continue? It would continue until the market price was seen that the expected return would now lie on the SML. In the case of stock y, investors holding this stock will start to sell it, recognizing that they could obtain a higher return for same amount of systematic risk with others stocks. This selling pressure would drive y’s market price down and its expected return goes up until the expected return matches on the SML.



When the expected return for these two stocks returns to SML, market equilibrium will again prevail.<sup>20</sup>

“The CAPM is some times used to estimate the required rate of return for any firm with publicly traded stock. The CAPM is based on the promise that the only important risk of a firm is systematic risk, or the risk that returns from exposure to general stock market movements. The CAPM is not concerned with so called unsystematic risk, which is specific to an individual firm, because investors can avoid that type of risk by holding diversified portfolios.<sup>21</sup>

Investors appear to be concerned principally with the risk that why cannot eliminate by diversification. If this is not so, we find that stock prices increases whenever two companies merge to spread their risk, and we should find that investment companies which invest in the share of other firm are more highly valued than the shares they hold. But we do not observe either phenomenon. Mergers under taken just to spread risk done increase stock prices and investment companies are no more highly valued than the stocks held. The CAPM model captures these ideas in simple way. That’s why many financial managers find it is the most convenient for coming to decision with the slippery motion of risk. And it is why economists often use the CAPM to demonstrate important ideas in finance even when there are other ways to prove these ideas.

## **2.2 Review from related studies:**

So far focus is given in basic well known books, which are academically accepted in most of the world. In this section reviewing procedure will slightly twist as we review the journals, Master’s degree these and other independent studies related to the topic.

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<sup>20</sup> Op. Cit. vin Horne & Wachowiz

<sup>21</sup> Jeff Mdura, “Financial market & institutions”. South wester college publishing. 5<sup>th</sup> Ed. 2001

### **2.2.1 Review in foreign context**

In recent years we have seen that an explosion of research into the opportunities and risks of investing in emerging equity markets, stimulated in part by the growing exposure of U.S. and European investors to these markets, but also following the rapid rise and fall of returns on the assets class. Here we consider two more books in this growing portfolio. Both analyze the structural characteristics of the markets and issues related to asset allocation but they have different emphases. Here were two books emerging markets portfolios: Diversification and Hedging Strategies. Edited by Michael Papaioannou and George Tsetsekos, Chicago: Irwin professional publishing 1997 and emerging markets: Research, strategies and Benchmarks by Michael Kepler and Martin Lencher, Chicago: Irwin professional publishing, 1997 which were received simultaneously by kent Hergis, (Goldman, Sacha and Co.) In the journal of finance, February 1999.

In emerging markets: Research, Strategies and Benchmarks, Kepler and Lencher focus on the examination of the performance of specific investment strategies. In Emerging Markets portfolios: Diversification and Hedging strategies, Papaioannou and Tsetsekos focus more on regulatory issues and derivatives instruments in emerging markets, following a number of chapters on the risk characteristics and potential diversification opportunities. Their book will be of greater interest to policymakers or a more academically inclined people.

Kepler and Lencher's book is divided into four parts: opportunities and risk of investing in emerging markets, investment strategies, assets allocation and investment vehicles, and a summary of market characteristics in twenty five emerging markets investing by Park and Van Agtmael (1993), Stanley (1995), price (1994), and George (1994), which examine the case for investing in emerging market, They provide a good description of recent trends and structural of recent trends and structural

characteristics, though they do not distinguish themselves from the rest of the literature. Park and Agtmael (1993), although not as current, stocks provide a more detail examination of structural characteristics of the markets. Posner (1998) is stronger in resenting investment vehicles such as American Depositary Receipts (ADR), mutual funds, and bonds, Berry, Peavey, and Rodriguez (1997) examine in depth the risk and diversification benefirts. Malkiel and Mei (1998) are targeted more towards retail investors and is the most accessible book for introducing movies investors to emerging markets.

The second edition of the book on investment strategies is the most interesting and useful, Kepler and Lechner systematically explore a large number of investment strategies. Second, the presentation format, comparing emerging market investment strategies with previously published work by the authors (e.g. Keppler and Traub (1993) in the developed markets is effective. For example, analysis of the small country effect in emerging market sin presented following discussion of the small country effect in developed markets. Third the authors examine a wide range of measure of the portfolio risk in addition to standard deviations, which have not been analyzed in other work; such measures include the probability and expectation of monthly loss, average loss, number of losing months, and lowest monthly return. The Kepler ratio is introduced as an alternative to the Sharpe ratio, replacing the standard deviation by the expectation of monthly loss. In many cases, the standard risk measures such as standard deviation are shows to be missing leading when compare to these other measures. Even though it is well known that emerging market returns are not normally distributed (Bekaert et al. (1998), the comparison of various risk measures helps the practitioner to understand more effectively how this impacts portfolio allocation decisions. These measures complement extensive analysis of country risk measures, such as

institutional Investor Credit Ratings, reviewed in Erb, Harvegy and Viskanata (1997).

Kepler and Traub (1993) argue that the case of active management in emerging markets is strengthened by features of those markets, which make indexing more expensive, such as frequent changes in the composition of the market indices and liquidity of many companies in the indices. They investigate the performance of various weighting strategies equal, market capitalization, liquidity, HDP, and manager composite and find that equally weighting markets results in higher returns and lower risk in both the developed and emerging markets. As a result that it is driven in part by the small country effect present in both developed and emerging markets. For example, an equally weighted portfolio of small countries outperforms and equally Bekaert et al. (1997) for a longer historical period, Brkaert et al. Find that this strategy has been less effective since 1991.

Following Kepler's previous research, Kepler and Lechner shows that returns on values strategies, based in part on looking at dividends yield and price to cash flows of different markets, are even greater than those based on the small country effect. Although risk is higher according to standard deviations, other risk measures show that these portfolios can also be less risky. The analysis is then extended to forming regional portfolios. Strategies based on industry selection and company selection is less promising. A strategy based on equally weighting individual companies within a market gives small excess returns.

The other three section of the book provide a useful introduction an I reference to the markets and are similar in content to other such Park and Van Agtmael (1993) and Posner (1998). The first section (Chapter 1 & 2) begins by discussing board trends in market capitalization, trading volume, and new issues. After reviewing the historical growth experience across

regions, the authors give an in depth discussion into why emerging markets have grown faster than developed markets in the past, and they offer projections for the future. Among the factors analyzed are liberalization of capital markets, reduced debt servicing burden, expanding global trade, and improving education and infrastructure. Although higher growth rates have been achieved, the risks of investing in these markets are also greater. Keppler and Lechner explore risks caused by political instability and corruption, high levels of foreign debt commodity prices, and short term speculators. The causes of higher cash flows and greater risk are then analyzed in the context of the risk and return characteristics of the markets, followed by a discussion of the different emerging markets benchmarks.

The third diction (chapter 4 and 5) looks at assets allocation and at the different way of investing in emerging markets. The section on asset allocation shows the standard result that adding emerging markets to a U.S. or global portfolio reduces risk. However, a detailed analysis of different asset allocations for investors with different risk and a large number of risk measures are also presented. Vehicles for accessing these markets, such as direct share purchase, American Depositary Receipts, open – end and closed end mutual funds, options and multinationals are analyzed, with a focus on closed end mutual funds. Given the movement by investors away from close end funds into open end mutual funds and American Depositary receipts, a more detailed examination of these latter investment vehicles would have been helpful.

The longest and final section (according for about half of the book) is a summary of twenty five emerging markets around the world accessible to foreign investors. The economic structure, recent economic and stock market developments and foreign investment regulation for each market are reviewed. Though the information is similar to that in other books, this chapter provides a useful introduction and reference for investors. The

presentation style of the country summary tables is improved by the reformulation of many of the IFC valuation indicators. Returns on equity, earning, book value and dividend growth along with relative price earning, price book value and dividend yields are added to the standard indicators such as market price/earning ratios.

The volume of papers assembled by Papaioannou and Tsetkos in *Emerging Markets portfolios: Diversification and Hedging Strategies* will be of interest to both policymakers and portfolio managers concerned with quantifying and managing risk in emerging markets. Although the stated objective of the book is to “develop a framework for portfolio management” in emerging markets, many chapters focus on topics of direct concern to policymakers- topics that have received less attention on the literature, such as market based measures to manage commodity price risk and the preconditions for the development of derivatives markets in emerging economics. The book analyses four broad themes: investment risk and opportunities in emerging markets: structural features and the role of government in the market development ; the impact of return, correlation and the development and use of derivatives markets in emergine economies by government and investors . Although the chapters are separated in to seven different parts, they do not fit very well into their groupings

Chapters 2 through 4 survey the risk and opportunities faced by U.S investors in emerging markets. The case for investing in emerging markets is argues to have become more important in asset allocation as a correlation among provides a useful analysis of how the portfolio allocation to emerging markets should vary under different assumption for expected returns, correlation and investors risk tolerance. Among with investment opportunities, additional risks such as volatility, currency and political risk, lack of liquidity and information, market access and repatriation restrictions server as a deterrent to investing in these markets. The chapter

also discusses the role of policymakers in encouraging market development and concludes that the role of government is to provide a legal structure and promote policies that allow market forces to work. Recent institutional reforms and liberalization efforts should help to promote their development.

Chapter 6 to 9 present a number of empirical studies analyzing the ability of emerging markets to reduce risk for investors based in developed markets. Potential portfolio diversification benefits are assessed by examining linkages in returns and volatility, co integration among markets and factor models. Although the chapters are informative, they often simply correlate the results of earlier studies, with a notable lack of data from recent years. These factors limit the value added of the chapters. The empirical studies support the view that diversification benefits of investing in emerging markets are present but have been reduced in recent years as a result of growing foreign institutional investors' involvement and are less effective during periods of large market movements. Mr. Ratner finds that the U.S. has little contemporaneous or casual influence on Latin American countries with U.S. Mexico relationship being the most significant. Mr. Agrawal and Mr. Leal demonstrate that daily correlation between U.S. markets and emerging market are low but increase during large market movements when longer time intervals are examine and they recently have increased. Though emerging market volatility can be explained to some extent by U.S. and world index returns, Asian markets are more linked with the U.S. and within the region than with Latin America. These finding are consistent with others such as Bekaert and Harvey (1997) that foreign volatility only explains a small portion of emerging market volatility.

Tsetsekos does not find co integration among any of the regions, indicating that correlation and corresponding diversification benefits are independent of time horizon. Mr. Buckberg finds that a two factor model, which includes return on a developing country market portfolio on addition to the

world market portfolio, dominates a one- factor model for more markets the recent periods. This indicates that growing institutional investor's involvement has increased the sensitivity of these markets as one asset class.

Chapters 5 through 14 analyze derivative market developments and potential uses by investors on emerging markets. The chapter by Claessens and Varangis presents the case successful for government that widely used approaches such as price stabilization schemes and reserve management. They analyze different mechanism for risk management and the benefits of using these techniques. They argue that the preconditions for establishment of commodities futures exchanges are not met in emerging markets but recommend the development of regulated forward markets. The lack of development of derivatives markets in emerging is claimed to be caused by exchange controls and government regulation through price stabilization and insurance. Duck discusses the benefits of future contracts for lowering transaction costs and improving price transparency. But he stresses the difficulties of using these contracts in emerging Asian markets because of high transaction costs, lack of liquidity and the difficulty of shorting equities. The last chapter shows how the introduction and use of derivatives in emerging markets can alter monetary policy. It is argued that the use of derivatives implies an increased loss of control of monetary policy, hindering the policymakers' ability to achieve broader economic goals.

These two books provide a useful compliment to the existing literature. They provide investors with valuable tools for investment strategies in emerging markets, and they provide policymakers with a framework for analyzing the benefits and costs of developing derivatives markets and using market based techniques for managing risk in emerging markets.<sup>22</sup>

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<sup>22</sup> Hargis, KENT, "Book Review "The journal of finance", Vol. LIV(1), 1998, P. 421-426



### **2.2.2 Review from thesis:**

There are only few researches performed in this specific topic. However, some studies related to the topic had been conducted as a thesis for the partial fulfillment of Master's degree in T.U. In this context, three different thesis are reviewed here. The study performed by Mr. Gopal Prasad Bhatta in 1995 entitled "A study on Security investment in Nepal", by Mr. Jeet Bahadur Sapkota in 2000, entitled "Risk and Return Analysis in common stock Investment" and By Mrs. Pramina Pandey in 2000, entitled "Risk and Return Analysis of common stock investment, with special reference to investment portfolio of insurance companies" are reviewed here.

The study conducted by Gopal Prasad Bhatta in the title of "Assesmentof the performance of listed companies 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 from 1990 to 1995. One of the major objective that concern with this research topic is "to analyze the performance of listed companies in terms of risk and return i.e. excepted 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 finding in risk return behavior from the analysis of different stock.

"A highly significant positive co relationship has been addressed between risk and return character of the company. Investors expect higher returns from 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 of the stocks nor does the member of stock exchange try to represent reality. However, the analysis based in the available information shows high priced stocks such as BBC, NIB, NIC, has higher

beta than others. These companies require higher returns to satisfy the investor for their risk premium.

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

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

Lastly Bhatta recommended the following points to improve the market efficiency:

- Develop institutions to consult investors for risk minimization.
- Establish an information channel in Nepal stock exchange, and
- Make proper amendment of Trading Rules.

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 results. Indeed, study did not focus the viewpoint of investor rather it concentrates the companies and stock market. However, this study also explores some dimension for further research in this subject.

The study performed by Buddhi Raj Tamang in the year (2003) entitled "Risk and Return Analysis of commercial Banks in Nepal" is also reviewed

her. Among different objective of his tudy, oneis to analyze whether the common stock of commercial banks are correctly priced or not by analyzing the required rate of return using CAPM and it also aims to measure systematic and unsystematic risk of the commercial banks. From his findings Nepal Bangladesh Bank is placed as the highest return earner and Arab as the lowest return earner where as unsystematic risk of Arab Bank is highest and that of Bank of Kathmandu is lowest. Correlation coefficient of Arab bank shows that the return on Bank goes down when the market return goes up. Though lthe share of banking sectors are heavily traded shares in Nepal none of hte companies shares are correctly price. From his study, the shares of the commercial banks in Nepal are heavily traded in NEPSE. one of the share prices is correctly priced.

Lila Nath Pandey (2003) in his thesis entitled "A study on risk and return analysis of common stock investment" has concluded that without proper analysis of individual security, industry and overall market, it is almost impossible to beat the stock market. The main objective of the study is to analyze risk and return of common stock investment with special reference to six finance companies in Nepal. He says that the investors attitude perception and risk diversification lowers the risk of portfolio. He further says that the stock market is risky in short run hence role it is necessary to prepare the investor for it. According to CV finance and insurance sector is best for investment where as form the expected return point of view banking sector is best for investment. Among the selected finance companies Kathmandu finance company is best for investment due to high return and low CV and HISEF is most risky.

A research study on the topic "Risk and Return Analysis of common stock (with special reference to insurance companies) carried out in the year (2002) by Richa Raj Karnikar is reviewed here. The main objective of her study is to describe the important variables used while making investment decision and also to solve problem faced by investors as well as

companies. The main problem on which she has focused is ingonaranace of investors about the fact that risk is associated with the investment. She concludes that for most stock market is black art about which they know very little. Her study will enable investors to accept the returns according to the risk associated . She has also emphasized on portfolio investment. She has carried out her study with six insurance companies is less risky. Expected return of NLGI is highest and that of HGIC is lowest".

"Risk and Return Analysis of listed companies" a research carried out by **Mohan Purna Satyal** (2002) is also relevant to out study. The objective of his study is to analyze risk and return other relevant variable along with the examination of movement of market price of share. The problem on which he has focused is unequal and unfair contribution of different sectors. He has included 2 companies from banking sectors, 2 from finance, 2 from insurance and 1 from trading sector in his study. According to him among the selected companies share price of NIB, HBL NFC, NEFINCSO, UIC & NLL are moving in positive direction but share price of NIC and BBC is in decreasing trend. In his study he has found out that Nepal level limited is most risk a well as it provides more return where as Himalayan Bank is best for risk averters as it has leapt CV.

His study has further revealed that trading sectors has highest return and insurance sector has highest risk. Shares of all the companies except BBC are under priced.

Another study conducted by Mr. Jeet Bahadur Sapkota is very closely related to this study. He has performed an analysis of risk and return on common stock investment with special reference to banking industry and included eight commercials banks. "The main objectives of the study are to analyze the risk and return of the common stocks in Nepalese stock market, the study is focused on the common stock of commercials banks. In his findings "Banking industry is the biggest one in terms of market

capitalization and turnover. Expected return on the common stock of Nepal Bank Ltd. is maximum (i.e. 66.99%) and CS of Nepal SBI Bank Ltd. is found minimum. In this regard CS of NBL is most risky and CS of NSB is least risky. In the context of industries, expected return of finance and insurance industry is found highest. Expected return of banking industry is 60.83%. At the end of study Mr. Sapkota has concluded that CS of NBB is the best of for investment. “On the other hand, portfolio between the CS of NGB and BBC is 0.2666, but portfolio standard deviation is only 0.1497, which is less than each individual stock’s standard deviation. Hence, the portfolio approach of investment is better way to win stock market investment.

**Mr. Sapkota has recommended followings points:**

- Private investors should try and work out their attitude towards the risk of various investments.
- To reduce the risk, investors should diversify their fund. Proper construction of portfolio never creates any considerable loss.
- HMG needs to manage the trading of government securities in NEPSE, instead of NRB.
- Government frequently needs to amend of the rules and regulation regarding stock market.

Another study conducted by Mrs. Pramina Pandey, entitled “Risk and Return Analysis of common stock investment, with special reference to investment portfolio of insurance companies is related to our study to some extent. In the study, she has considered six insurance companies in account and has given following conclusion.

“ On the basis of market capitalization, size of NIC is the biggest one, expected return on the common stock of NLGI is maximum i.e. 65.39% This high rate of expected return is due to unrealistic annual return in 2050/51 and then declines in the preceding years.

About risk, she had concluded, “NLGI is regarded as the most risky security. As we know higher the risk higher must be the return. NLGI expected return is highest as indicated by the highest the standard deviation and EIC’s risk and expected return in lowest one. Standard deviation is not only a single measure of risk. Coefficient of variation (C.V.) is best for investment in single security. NIC can be taken as the best investment as per minimum C.V. and its return is also quite high, more than 50%.

Stocks that drop dramatically when the market falls are those with high betas. The good news is that these same high beta stocks recover more quickly when the market changes from bear to bull. She has provided the following recommendations:

- Administration should be made further efficient to check the performance of individual companies. Flow of information should be more regular.
- Stock market investment is a risky job. The stock market is undoubtedly risky in the short term and investors need to be prepared for it.

As the entire these reviewed above the thesis of Gopal Prasad Bhatta has focused his study mainly on analysis of the performance of listed companies. Similarly, the thesis of Jeet Bahadur Sapkota is focused on risk and return of joint venture commercial banks and the last one thesis of Mrs. Pramina Pandey is focused on the analysis of risk and return of insurance companies listed in NEPSE index.

### **2.2.3 Review from Journals:**

This part of study is mainly focused to present the theories and thought of several scholars and finding of their research work undertaken on "Risk and Return" and their relationship.

This part of study is objected to presented and state how the relationship between risk and return is measured by several researchers. There are very few journals available in Nepal relevant to the topic. Hence, have tried to

find some articles that are published in the magazines, which seemed relevant to our study.

Like books, it is very difficult to get advanced and research based journals in the field of finance in Nepal. There are very limited numbers of journals available in the subject of management and it is also hard to find any article in the subject matter of finance. almost no articles about the risk and return analysis on common stock investment are found. Hence some foreign well known recently published journals of finance has been reviewed here. However, it helps to build the sound conceptual framework on this topic.

The journal of finance, published bimonthly by American finance Association for many decades is taken into account. In its recent volume of August 1999, an article “Local Return Factors and Turnover in Emerging Stock Markets” by K.Greet Rou Wenhorst has been reviewed here. “There is growing empirical evidence that multiple factors are cross sectionally correlated with average returns in the United States. Measured over long time period, small stocks earn higher average returns than large stocks (Bang. 1981) Farma French (1992, 1996) and Lakonishock, Shlefier, and Vishmy (1994) shows that value / stocks with high book to market (B/M), earning to price (E/P), on cash flow to price (C/P) out form stocks with poor prior performance (Jagadeesh and Titma (1993). The evidence that beta is also compensated for average returns is weaker (Fama and French 1992), Kothari, Shakken and Stoan (1995). The interpretation of the evidence is strongly debated. Some believe that the premiums are a compensation for pervasive risk factors; others attribute them to firm characteristics or inefficiency in the way market incorporate information into prices. Yet others average that the premiums may be biased by survivorship or data snooping.

This paper examine the sources of return variation in emerging stock markets. From the perspective of collecting independent samples, emerging

market countries are particularly interesting because of their relative isolation from the capital markets of other countries. Compared to developed markets, the correlation between most emerging markets and other stock markets has historically been low (Harvey (1995), and until recently many emerging countries restricted investment by foreign investors. Interestingly, Beakert and Harvey (1995) found that despite the recent trend toward abolition of these restrictions and the substantial inflows of foreign capital, some emerging equity markets have actually become more segmented from world capital markets. A large portion of the equity capital of emerging economies is held by local investors who are likely evaluate their portfolios in the light of local economy and market condition. (Bekaert and Harvey (1997)

On the above background Rouwenhorst attempts to answer two set of questions. The first set of three questions concern the existence of expected return premiums (1) Do the factors that explain expected return differences in developed equity markets also describe the cross section of expected returns of emerging market firms? (2) Are the returns factors in emerging markets primarily local or they having global components as well? (3) How does the emerging market evidence contribute to the international evidence from developed markets that similar return factors are present in markets around the world? The second sets of questions of the paper include (4) is there a cross sectional relation between liquidity and average returns in emerging markets? (5) Are the return factors in emerging markets cross sectionally correlated with liquidity? About the data Rouwenhorst stated that: as of April 1997 the emerging market Data base (EMDB) of the IFC contains data on more than 2200 firms from 31 emerging markets but not all are included in the sample.

Eleven countries are excluded because of insufficient return histories, which leave 1705 firms in the 20 countries that the IFC tracks for at least seven years. For some firm's monthly closing prices and dividends are



available dating back to 1975. Starting at various points during 1980s the IFC expanded its reporting to include monthly time series for price to book ratios, price earning ratios, market capitalization, Trading volume, and the number of days per month that a stock is traded.

Total returns are calculated as the sum of the dividend return and price appreciation, using prices scaled by a capital adjustment factor, which the IFC computes to correct for price effects associated with stock splits, stock dividends, and right issues. Most emerging markets have firms with multiple share classes are treated as a single value weighted portfolio of the outstanding equity securities.

In this paper Rouwenhorst has been made detail analysis of the data and he interprets the result in each section. Lastly, he has concluded his finding as “The first conclusion is that the return factors in emerging markets are qualitatively similar to those in developed markets: small stock outperforms growth stocks and emerging markets stocks exhibit momentum. This is no evidence that local market betas are associated with average returns. The low correlation between the country return factors suggests that the premiums have a strong local character. Furthermore, global exposure cannot explain the average factor returns of emerging markets. There is little evidence that the correlation between the local factor portfolios have increase, Which suggests that the factors responsible for the increase of emerging market country correlation are separated from those that drive the difference between expected return within these markets. A Bayesian analysis of premiums in developed and emerging markets shows that unless one has strong prior beliefs to the contrary, the empirical evidence favors the hypotheses that size, momentum, and value strategies are compensated for in expected returns around the world. Finally, the paper documents the relationship between expected returns and share turnover, and examines the turnover characteristics of the local returns factor portfolios. There is no evidence of a relation between

expected returns and turnover, in emerging markets. However, beta size momentum, and value are positively cross sectionally correlated with turnover in emerging markets. This suggests that the return premiums do not simply reflect a compensation for liquidity.

This study by Rouwenhorst does not consider the analysis of single security. It has been analyzed the return factors in worldwide stock markets. However, it concentrates in the various emerging stock markets. Hence the article contributes in the area of risk and return analysis in common stock investment.

#### **2.2.4 Review of other independent studies in Nepal:**

Very few independent studies can be found in the topics of finance. Specifically, it is rare in the case of this research topic, risk and return analysis. However, the available independent studies which are related to the Nepalese stock market and about shareholders democracy are reviewed here.

Radhe Shyam Pradhan carried out a study in the topic of “Stock Market Behavior on a small capital market: a case in Nepal” in 1993. The study was based on the data collected for seventeen enterprises from 1986 through 1990.

One of the major objectives which is related to this study was “To assess the stock Market behavior in Nepal.”

**Mr. Pradhan has summarized the findings as follows:**

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

Another study was carried out by Professor Dr. Manohar Krishna Shrestha in the title of “Shareholder’s Democracy and Annual General Meeting feedback. Dr. Shrestha prefers to consider this book as an assemblage of opinions which he had express in different occasions of various annual general meeting. Where he has critically analyzed the situation of common stock investors and the situation that is not improving till date.

The contents of the book have been divided into two parts. The first part includes views on the rights of the shareholders regarding how they can exercise them in democratic perspective. Where as the second part consists of feedbacks and the issues raised by shareholders at different annual general meeting of the public limited companies and financial institutions.

Writer has found the overall shareholders democracy in terms of the protection of their interest, is basically focused on the payment of satisfactory dividend and the maximization of shareholders wealth by appreciating the value of share they hold.

“In many cases the existing authorization mentality of management seems to have not considered the shareholders in deciding the managerial plans and policies. Top level decision often by pass the interest of shareholders. As the management lacks serious concern about the protection of shareholders rights and expectations. The annual general meeting has become a plate- 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 towards shareholders.

Dr. Shrestha has expressed his deep concern to the government for not taking my initiative in formulating the separate act. Which protects the shareholders right despite the increase in population of shareholders in

Nepal and questioned the need of separate act regarding the protection of shareholders right?

He has further quoted as writing company and other relating acts relating to financial and industrial sector have provisioned rights of the shareholders as:

1. Voting rights
2. Participation in general meeting
3. Right of getting information
4. Electing as a board of director
5. Participation in the profit and loss of the company]
6. Transferring shares.
7. Proxy representation

**The collective rights of the shareholders are:**

1. Amend the internal by laws.
2. Authorize the sales of assets
3. Enter into mergers.
4. Change amount of authorized capital

As reviewed above, Nepalese stock being in emerging state, study conducted previously in Nepal in relation with the subject was not in specific issues but in broad manner.

Similarly, Narayan Prasad Poudel also carried out another study in a topic of “Investing in shares of Return and Risk elements”, in 2001. The study was based on the data collected for eight banks from mid July 2001. The main objectives of the study was to determine whether the shares of commercial banks in Nepal are over or under priced by analyzing risk and return characteristics of the individual shares.

**Mr. Poudel summarized the following findings:**

- Most of the individual share’s appeared to be defensive as beta coefficient were less than one. Low beta shares were less volatile than the market as a whole. Only the return of shares of bank of Kathmandu has beta coefficient

of greater than one, indicating that the share was more risky than the market.

- Nepal Arab Bank Limited, Nepal Indosuez Bank Ltd. Himalayan Bank Ltd. had higher expected equilibrium return than expected rate of return. And Standard Charter Bank Ltd., Nepal SBI Bank Ltd., Bank of Kathmandu had lower equilibrium return than expected rate of return.
- From this study we get Nepal Arab Bank Ltd., Nepal Indosuez Bank Ltd. and Himalayan Bank Ltd. were over priced and others were under priced.

### **2.2.5 Research Gap**

In my research to find out the condition of 'Risk and Return' done 5 banks among the 13 commercial Banks listed in Nepal /stock Exchange, I got an opportunity to study a few thesis on same topic on several commercial banks, companies and hotels by ex-researchers. In my study, I found a poor analysis of portfolio despite a better analysis of 'Risk and Return' of the investment in security. They've prioritized the theoretical aspect rather than its practical aspect. Their research have been limited to the definition of portfolio and they've suggested to invest the 'Security-investment' in two sectors rather than in one sector. But they have not applied all the possibilities of portfolio by mean of 'Data Analysis Tools'. Hence, in my study, I've tried to make a comparative study of 'Risk and Return' in investment for all alternatives.

Likewise, the ex-researchers have not dealt with the relation between the two sectors of investment and I have tried to analysis them in my study. The researchers have promoted investment regarding the result of 'Data Analysis Tools'. But several other external factors influence the investment so, in my thesis, I have provided with some suggestions.

# **Chapter-Three**

## **Research Methodology**

The research methodology is the systematic way of solving research problems. Research methodology refers to the overall research processes, which a researcher conducts during his/her study. It includes all the procedures from theoretical foundation to the collection and analysis of data. As most of the data are quantitative the research is based on the scientific models. It is composed of both parts of technical aspect and logical aspect, on the basis of historical data. Research is systematic and organizational effort to investigate a specific problem that needs a solution. This process of investigation involves a series of well thought out activities of gathering, recording and analyzing and interpreting the data with the purpose of finding answer to the problem. Hence, the entire process by which we attempt to solve the problem is called research.

Research can be conducted on the basis of primary and secondary data. In this study, all the data are secondary and those data are analyzed using appropriate financial as well as statistical tools. Outcomes are presented in simple way. In this study, the research design, data collection procedure and analysis are described serially.

### **3.1 Research Design:**

The research is based on the recent historical data, so simply it is a historical research. It covers the data from the fiscal year 2002/03 to 2006/2007. It deals with the common stocks of commercial banks on the basis of available information. For the portfolio analysis, other companies' common stocks are also taken into account. As the title of the study suggest, it is more analytical and empirical and less descriptive.

### **3.2 Population and sample:**

The population of the study is all the listed companies in NEPSE index.. Till new total number of listed companies are 110. Hence, the total population is 110. This study is concentrated in listed commercial banks only. The numbers of listed commercial banks are then. For our study, total number of samples taken is six. Common stocks of six listed commercial banks are the sample for our study.

### **3.3 Data collection procedure:**

Most of the data necessary for the research is collected form the secondary sources. Data related to the market prices of stocks, market capitalization, movement of NEPSE index etc. is taken from the trading Report published by NEPSE. Financial statements of commercial banks and their annual reports are also collected.

**The collection procedure is summarized below:**

- Financial documents provided by the companies.
- Trading Report published by Nepal Stock Exchange Limited.
- Related websites.
- Materials published in papers and magazines.
- Telephone inquiries.
- Other related books and booklets.

### **3.4 Data Analysis Tools:**

For the analysis of data all the tools taken are as appropriate as possible. The related tools and terms are described below.

#### **3.4.1 Market price of stock (P):**

On the major data of this study is market price of stock. As we follow the market price of shares of companies we can get three types of prices high, low and closing.

Among high, low and closing price, each year closing price has been taken as the market price of the stock which have specific time of span of one year and the study has focused in annual basis. To get the real average, volume and price of each transaction in the stock and duration of time of each transaction in the whole year are essential. Which is tedious and impossible too, considering the data availability and maintenance? Hence, the closing price is used as the market price of stock, which has a specific time span of one year and the study has focused in annual basis.

### **3.4.2 Dividend (D):**

Dividend is relevant during the computation of rate of return, which is a reward to the shareholders for their investment. If a company declares only the cash dividend, there are no problems to take the dividend amount. But if the company declares stock dividend (Bonus share), it is difficult to obtain the amount that really shareholders has gained. In this case, they get extra numbers of shares as dividend and simultaneously price of the stock declines as a result of increased number of stocks. To get a real amount of dividend there are no any model (formula). So the model have been developed considering practical as well as theoretical aspect.

**The mode is:**

In case of stock dividend,

Total dividend amount = cash dividend + stock dividend% x next year's MPS.

Where, MPS = Market Price Per share.

### **3.4.3 Return of Common stock Investment (R):**

Return is the income received in an investment plus any change in market price, usually expressed as a percent of the beginning market price of the investment.

Symbolically,

$$R = \frac{D_1 + (P_1 - P_{1-1})}{P_{1-1}}$$



Where,

$R$  = Actual Rate of Return on Common stock at time  $t$ .

$D_t$  = Cash dividend received at time  $t$ .

$P_t$  = Price of stock at time  $t$ .

$P_{t-1}$  = Price of stock at time  $(t-1)$

### 3.4.4 Expected rate of return of common stock ( $\bar{R}_j$ ) :

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

$$\text{Symbolically, } \bar{R}_j = E(R_j) = \frac{\sum R_j}{n}$$

Where,

$\bar{R}_j = E(R_j)$  = Expected rate of return of stock  $j$ .

$n$  = Number of years that the return is taken.

$\sum$  = Sign of summation

$(R_j)$  = Return of stock  $j$ .

### 3.4.5 Standard Deviation (S.D.) :

It is a statistical measure of the variability of a distribution of return around its mean. It is the square root of the variances of the returns. S.D. is the measures of the total risk of the asset i.e. it means the dispersion of returns around the mean return. S.D. can be calculated using following formula,

When time series data is given,

$$\dagger_j = \sqrt{\frac{\sum (R_j - \bar{R}_j)^2}{n}}$$

Where,

$\dagger_j$  = S.D. of returns on stock  $j$  during the time period  $n$ .

When the probability distribution is given,

$$\text{S.D. } (\dagger_j = \sqrt{\sum_{j=1}^n p_j (R_j - \bar{R}_j)^2})$$

Where,

$$\begin{aligned} P_j &= \text{Probability distribution of the observation (returns).} \\ R_j &= \text{Holding period returns on stock j.} \\ \overline{R_j} &= \text{Expected return on stock j.} \end{aligned}$$

### 3.4.6 Coefficient of Variation (C.V.) :

It is applicable to calculate the risk per unit of the expected return. It is the ratio of standard deviation of returns to the mean of the distribution. It is the measure of relative risk. The formula to calculate coefficient of variation is,

$$C.V._j = \frac{\sigma_j}{\overline{R_j}}$$

Where, C.V.<sub>j</sub> = Coefficient of variation of stock j.

C.V. is the unitary risk measure. It gives the result regarding the unit of risk to bear for earning 1 unit of return.

### 3.4.7 Beta coefficient ( $\beta$ ) :

Market sensitivity of stock is explained in terms of beta coefficient. Higher the beta greater the sensitivity and reaction to the market movement. Logically, the systematic risk is the covariance between the returns of an individual asset or portfolio and the returns of the market portfolio. The measure of systematic risk is represented by beta.

It is an index of systematic risk, which cannot be eliminated through the means of diversification. Beta measures the sensitivity of a stock's return on market portfolio. The formula for the calculation of beta is given by,

$$\beta_j = \frac{COV(R_j, R_m)}{\sigma_m^2}$$

Where,  $\beta_j$  = Beta coefficient of stock j.

$COV(R_j, R_m)$  = Covariance between returns on stock j.i.e. ( $R_j$ ) and return of market i.e. ( $R_m$ ) and it is calculated as,

$$COV(R_j, R_m) = \sqrt{\sum_{j=1}^n (R_j - \bar{R}_j)(R_m - \bar{R}_m)}$$

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

Market beta 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, equal to or more than 1 depending upon the volatility of that stocks return relative to market returns.

An assets or a portfolio with a beta greater than 1 is considered to be aggressive (more risky than the market). An asset or portfolio with a beta less than 1 is considered to be defensive (less risky than the market). Beta coefficient of market is always equal to 1.

### 3.4.8 Correlation coefficient ( $\rho_{ij}$ ):

The correlation is also a measure of the relationship between two assets. The correlation coefficient can be taken on a value from  $-1$  to  $+1$ . Correlation coefficient and covariance are related by the following equation,

$$\rho_{ij} = \frac{COV_{ij}}{\sigma_i \sigma_j}$$

Where,

$\sigma_i$  and  $\sigma_j$  are the standard deviations of returns for asset i and j. There are various cases of correlation and risk condition which are presented below:

#### 1. Perfectly positive correlation ( $\rho_{ij} = +1$ )

Returns on two perfectly positive correlated stocks would move up and down together and portfolio consisting of two such stocks would be exactly as risky as the individual stocks. Thus diversification cannot reduce risk if the portfolio consists of perfectly positive correlated stock.

#### 2. Perfectly negative correlation ( $\rho_{ij} = -1$ )

Returns on two perfectly negative correlated stocks would move perfectly together but in exactly opposite in directions. In this

condition, risk can be completely eliminated. Perfect negative correlation almost never found in the real world.

**3. No relation between returns ( $\rho_{ij}=0$ )**

When the correlation between two stocks is exactly zero there is no relationship between the returns they are independent of each other. In this condition, some risk can be reduced.

**4. Intermediate risk ( $\rho_{ij} = +0.5$ )**

Most of the stocks are positively correlated but not perfectly. On average the returns on two stocks would lie on the range of +0.4 and +0.75 under this condition combining stocks into portfolios reduces risk but not eliminate it completely.

**3.4.9 Portfolio risk and return:**

A portfolio is a collection of investment securities. Portfolio theory deals with the selection of optimal portfolios, i.e. portfolios that provide the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return. Calculating and analyzing portfolio risk is not straight forward as calculating portfolios expected returns. We have to follow the long process for its calculation and analysis. Portfolio expected returns. We have to follow the long process for its calculation and analysis.

**3.4.9.1 Portfolio risk:**

It is the measure of combined standard deviation of stocks held in the portfolio, with reference to individual stocks corresponding correlation contribution. The formula for the calculation of portfolio risk for two assets case is given by:

$$\sigma_p = \sqrt{\sigma_A^2 W_A^2 + \sigma_B^2 W_B^2 + 2W_A W_B \rho_{AB}}$$

Where,

$\sigma_p$  = Standard deviation of portfolio A and B.

$\sigma$  = Variance of asset A, i.e. risk of asset A.

$\sigma$  = Variance of asset B, i.e. risk of asset B

$W_A$  = Weight of asset A

$W_B$  = Weight of asset B.

$COV(AB)$  = Covariance between the returns of assets A and B

**The formula for n- asset case is given by,**

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n W_i W_j \rho_{ij}$$

### 3.4.9.2 Portfolio Return:

“While the portfolio expected return is straight forward weighted average of returns on the individual securities, the portfolio standard deviation is not the weighted average of individual securities standard deviation. To take a weighted average of individual security standard deviations would be to ignore the relationship or correlation between the returns of the two securities. This correlation however has no effect on the portfolios expected returns. Correlation between securities return complicates our calculation of portfolio standard deviation by forcing us to calculate the covariance between returns for every possible pair wise combination of securities in the portfolio.

But this dark cloud of mathematical complications contain a silver lining correlation between securities provides for the possibilities of eliminating some risk without reducing potential returns.

Portfolio is the combination of two or more securities or asset and portfolio return is simply a weighted average of individual stock returns. The return on the portfolio, in case of only two assets portfolio is given by:

$$\overline{R_p} = W_A \overline{R_A} + W_B \overline{R_B}$$

Where,

$\overline{R_p}$  = Expected return on portfolio of stocks A and B

$W_A$  = Weight of investment on stock A

$W_B$  = Weight of investment on stock B

$W_A + W_B = 1$  (or 100%) Always

### 3.4.9.2.1 Risk Minimizing Portfolio:

It is the proportion of stock that minimizes the possible (unsystematic) risk,  
Symbolically,

$$W_A = \frac{\sigma_B^2 - COV(R_A R_B)}{\sigma_A^2 + \sigma_B^2 - 2COV(R_A R_B)}$$

Where,

$W$  = Weight of stock a that minimize the portfolio risk of stock A  
and stock B

$\sigma_A$  = Standard deviation of Stock A

$\sigma_B$  = Standard deviation of Stock B

$COV(R_A R_B)$  = Covariance of returns between stocks A & B

### 3.4.10 Market Return ( $R_m$ ):

Market return is the return in overall market portfolio, which can be obtained by taking difference between the market indexes (i.e. NEPSE index). Here market dividend is ignored.

$$R_m = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$$

Method of analysis and presentation:

All the method of analysis and presentation are applied as simple as possible. Proper financial and statistical tools are used and results are presented in tables and also shown in diagram. Interpretation is made in very simple way. Details of calculation, which cannot be shown in the main body part, are presented in Appendix, at the end. Summary, conclusion and recommendations are presented finally.

## **Chapter-Four**

### **Data Presentation and Analysis**

This chapter includes analysis of data collected and their presentation. In this chapter, the effort has been made to analyze “risk and return on common stock investment of commercial banks”. Detail data of MPS and dividend of each bank and NEPSE index of each sector and market is presented and their interpretation and analysis is done. With reference to the various readings and literature review in the preceding chapter, effort is made to analyze and diagnose the recent Nepalese stock market movement, with a special reference to the listed commercial banks. The analysis of data consists of organizing, tabulating and assessing financial and statistical result. Different tables and diagrams are drawn to make the result more simple and understandable.

#### **4.1 Analyze of Individual Commercial Banks:**

As the study has taken a special reference to listed commercial banks, common stock of listed commercial bank is analyzed here separately. Among of the listed banks the study has focused on the six commercial banks. Although data coverage for some of banks is less than five years, each bank is introduced and their common stock’s risk and return are analyzed here.

##### **4.1.1 Nepal Arab Bank Ltd. (NABIL)**

###### **Introduction**

Nepal Arab Bank Ltd. is the first joint venture commercial bank established in 1984 A.D. (2041 B.S.) in Nepal and listed in NEPSE in year 1986 A.D (08/09/2042 B.S ). Initially, Dubai Bank Ltd. (DBL) invested 50% of equity share of NABIL. The share owned by DBL were transferred to Emirates Bank International Ltd. (EBIL), Dubai. Later on EBIL sold its entire 50% equity holding to National Bank Ltd., Bangladesh (NBLB). NBLB is managing the bank in accordance with the technical services

agreement signed between both banks on June 1995. Seventeen branches of the bank are in operation around the country. Authorized capital, issued capital and paid up capital of the bank are Rs.500, 000,000, Rs.491, 654,400 and Rs.491, 654,000 respectively, with per value per share Rs.100 and total numbers of shareholders are 5076.

## Data

Market price and dividend record of common stock of NABIL are shown in Table No. 4.1. Year end price movement is shown in the diagram 4.1.

**Table 4.1: MPS and Dividend Data of NABIL**

In Rs.

F/Y	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
2001/02	762	404	700	50	-	50
2002/03	1495	700	1400	55	-	55
2003/04	2301	1310	1500	40	-	40
2004/05	1005	705	1000	50	-	50
2005/06	1515	1000	1505	65	-	65
2006/07	2300	1500	2240	70	-	70

**Data Source: NEPSE**

The above table shows that the high MPS low MPS, closing, MPS, DPS, dividend and total dividend of NABIL stock from the F.Y. 2001/02 to 2006/07. The closing MPS of NABIL is increasing from the F.Y. 2001/02 to 2003/04. But in the F.Y.2004/05. It has decreased slightly and again it has Increased from the F.Y. 2005/06 to 2006/07. The dividend per share of the stock is Rs. 50, Rs. 55, Rs. 40, Rs. 50, Rs. 65 and Rs. 70 in the F.Y. 2001/02, 2002/03, 2003/04, 2004/05, 2005/06 and 2006/07 respectively. Dividend per share shows the increasing trend of common stock of NABIL except in the F.Y. 2003/04 and 2004/05, NABIL has not issued the bonus share from the F.Y. 2002/03 to 2006/07 so the amount of total dividend has not changed.



**Diagram 4:1**  
**Year end Price movement of NABIL**

The above diagram shows the closing MPS of common stock of NABIL .It is the highest in F/Y 2005/2006 (2062/063) and is the lowest in the F/Y 2000/01 (2057/058). The highest MPS is Rs.2240 and lowest is Rs.700. It shows that the MPS of NABIL is generally increasing from the F/Y 2000/01 to 2005/06 except in the F.Y. 2003/04.

**Realized returns (R), Standard deviation and Expected return (  $\bar{R}$  ):**  
Year end price and dividend amounts are used to calculate realized rate of return fro each year. Table 4.2 shows the calculation of yearly realized return, expected return and standard deviation of return.

**Table 4.2: Realized rate of returns, expected returns and  
S.D. of the C.S. of NABIL.**

Year	Year end Price (P) (Rs.)	Total dividend (D) ( In Rs.)	$R = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	$(R - \bar{R})$	$(R - \bar{R})^2$
2001/02	700	50	-	-	-
2002/03	1400	55	0.9214	0.5561	0.3092
2003/04	1500	40	0.1	-0.2653	0.0704
2004/05	1000	50	-0.3	0.6653	0.4426
2005/06	1505	65	0.57	0.1947	0.0379
2006/07	2240	70	0.5349	0.1696	0.0288
<b>Total</b>			1.8263		0.8889

We have,

$$\text{Expected Return } (\bar{R}) = \frac{\sum R}{n} = \frac{1.8263}{5} = 0.3653$$

Standard Deviation ( $\sigma$ ) =

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{\bar{R}} = \frac{0.4714}{0.3653} = 1.2904$$

The above table shows the expected return, standard deviation, coefficient of variation and realized rate of returns of common stock of NABIL. The expected return and standard deviation of NABIL are 36.53% and 47.14% respectively. Which indicates that both return and risk of NABIL is medium, where as realized rate of return of NABIL is 1.8263. The CV of NABIL is 1.2904 which means that for earning one extra unit of return from the common stock of NABIL, investors have to bear 1.2904 unit of risk. It would prove to be the investment having moderate return with moderate risk.

**Diagram 4.2: Annual Realized rate of returns of the C.S. of NABIL.**

The annual realized return of common stock of NABIL is positive from the Fiscal Year 2002/03 to 2006/07 except in the fiscal year 2004/05. The realized return of NABIL is highest at 0.9214 in the fiscal year 2002/03 and is the lowest at -0.3 in the Fiscal year 2004/05

**Diagram 4.3: Year end Price of C.S. of Nabil**

The annual realized return of common stock of NABIL is positive from the F. Y. 2001/02 to 2006/07 except in the F. Y. 2004/05 . The realized return of NABIL is highest at 0.9214 in the F. Y. 2002/03. and is the lowest in the F. Y. 2004/05.

## 4.1.2 Nepal Investment Bank Ltd. (NIBL)

### Introduction

Nepal investment Bank Ltd. (Previous Nepal Indosuez Bank Ltd.) was established on 21 January 1986 as a third joint- venture bank under the company Act- 1964. The bank is managed by Banque Indosuez, Paris in accordance with joint venture and technical services agreement signed between it an Nepalese promoters. Now this bank is operating under the full ownerships of Nepalese Promoters and shareholders. Authorized capital of this bank is Rs.16,99, 84,500. Par value per share is rs. 100 and the numbers of shareholders are 2780. Bank was listed in the NEPSE at B.S. 05-08-2044.The central office of this origination is in kings way, Kathmandu.

### Data

Market price and dividend records of common stock of NIBL are shown in Table 4.3 MPS of NIBL is very high at year 2003/04. Year end price movement is shown in the diagram 4.2. Annual dividend amount gained by shareholders of NIBL are calculated in the same table 4.3.

**Table 4.3: MPS and Dividend data of NIBL**

Year	High MPS	Low MPS	Closing MPS	DPS	In Rs.	
					Stock Dividend	Total Dividend
2001/02	980	551	822	30	-	30
2002/03	1415	822	1401	25	-	25
2003/04	2730	1080	1150	-	-	-
2004/05	942	745	940	15	-	15
2005/06	1430	760	800	12.5	-	12.5
2006/07	1265	762	1260	20	-	20

***Data Source: NEPSE***

The above table shows that the high, low and closing MPS, DPS, stock dividend and total dividend of the NIBL. The closing MPS of NIBL has increasing from the F/Y 2001/02 to 2002/03. But the closing MP of bank has decreased from the F/Y 2003/04 to 2005/06 and again it has increased in the F/Y 2006/07. The dividend per share of the stock is zero in the F/Y 2003/04. The dividend per share of the NIBL from the F/Y 2001/02 to 2006/07 is Rs 30, Rs. 25, Rs. 0, Rs. 15, Rs. 12.5 and Rs. 20 respectively. DPS of the bank share the decreasing trend of common stock of NIBL except in the last year. Bank has not issued bonus share from the F/Y 2001/02 to 2006/07. So the total dividend of NIBL Bank has not changed.

**Diagram 4.4: Year end price movement of the C.S. OF NIBL.**

The above diagram shows the closing MPS of common stock of NIBL. It is maximum in F.Y 2002/ 2003 and is minimum in F.Y. 2005/06. The highest MPS Rs. 1401 and lowest MPS is Rs. 800 closing MPS of the NIBL has increased from the F/Y 2001/02 to 2002/03. But it is decreasing from the F/Y 2003/04 to 2006/07 except the last year.

**Realized Return (R), Standard Deviation (†) and Expected Return ( $\bar{R}$ ).**

Year end price and dividend amounts are used to calculate realized rate of return for each year. Table 4.4. Shows the calculation of yearly realized return, expected return and standard deviation of returns.

**Table 4.4: Realized rate of return, expected returns and S.D. of C.S. of NIBL**

Year	Year end Price (P) (In Rs)	Dividend (D) (In Rs)	$R = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	$(R - \bar{R})$	$(R - \bar{R})^2$
2001/02	822	30	-	-	-
2002/03	1401	25	0.7348	0.3516	0.1236
2003/04	1150	-	-0.1792	-0.5624	0.3163
2004/05	940	15	-0.1696	-0.3397	0.1154
2005/06	800	12.5	-0.1353	-0.3054	0.0933
2006/07	1260	20	0.6000	0.4299	0.1848
<b>Total</b>			0.8507		0.8334

*Data Source: NEPSE*

We have,

$$\text{Expected Return } (\bar{R}) = \frac{\sum R}{n} = \frac{0.8507}{5} = 0.1701$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum (R - \bar{R})^2}{n - 1}} = \sqrt{\frac{0.8334}{4}} = 0.4565$$

$$\text{Coefficient of Variation (C.V.)} = \frac{\dagger}{\bar{R}} = \frac{0.4565}{0.1701} = 2.6834$$

The above table shows the expected return, realized rate of return, standard deviation and coefficient of variation of common stock of NIBL. The expected return, and S.D of NIBL are 17.01% and 45.65% which indicates the less return with the more risk. The total annual realized return of NIBL is 0.8507. The C.V. of NIBL is 2.6834 which means that to earn every extra one unit of return from the common stock of NIBL, investors must

bear 2.6834 unit of risk. It would prove to be the investment having less return with high risk.

**Diagram 4.5: Annual Realized Rate of Return of C.S. of NIBL**

The above diagram shows the annual realized rate of return of NIBL. The annual realized rate of return of NIBL shows both positive and negative value. It is positive in the F/Y 2002/03 and 2006/07. But it is negative in the F.Y. 2003/2004, 2004/05 and 2005/06. The highest realized return is 0.7348 in F.Y. 2002/2003 and lowest realized return is –0.1353 in the F.Y. 2005 /06.

**4.1.3 Standard Chartered Bank Nepal Ltd. (SCBNL).**

SCBNL was established in 1985 as a second joint venture bank under the company Act 1964. Standard chartered Bank, England is managing the bank under joint venture and technical services agreement signed between bank and Nepalese promoters. The authorized capital of this bank is Rs.339548800, issued capital is Rs.339548800 and paid up capital is Rs.339548800. Par value per share is Rs.100 and total numbers of shareholders are 5037. This bank was listed in the NEPSE in B.S. 03/21/045 i.e. 1988. It's central office is at New Baneshwor, Kathmandu.

**Data:**

Market price and dividend records of common stock of SCBNL are shown in diagram 4.5 Annual dividend paid to shareholders of SCBNL are calculated in the table 4.5

**Table 4.5: MPS and dividend data of SCBNL**

<b>In Rs.</b>						
Year	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
2001/02	1338	775	1162	80	1:1	2065
2002/03	2050	1181	1985	100	-	100
2003/04	3113	1860	2144	100	-	100
2004/05	1800	1520	1745	110	-	110
2005/06	2350	1553	2345	120	-	120
2006/07	3775	2200	3775	120	-	120

**Data Source: NEPSE**

The above table shows that the high lows closing MPS, low MPS, closing MPS, DPS, stock dividend and total dividend of SCBNL. The closing MPS of SCBNL show the increasing trend except in the F.Y. 2004/05. The closing MPS has increased from Rs.1162 in the F/Y 2001/02 to Rs. 3775 in F.Y. 2006/07. The dividend per share is Rs. 80 in the F/Y 2001/02. The DPS of the bank is Rs. 100 in the F/Y 2002/03 and 2003/04. The DPS of bank is Rs. 110 in the F/Y 2004/05 and the DPS of Bank is Rs. 120 in the F/Y 2005/06 and F/Y 2006/07. The DPS of the Bank also shows the increasing trend of common stock. The Bank has distributed the Bonus share 1:1 in the F/Y 2001/02. The total dividend of the SCBNL are Rs. 2065, Rs. 100, Rs. 100 Rs. 110, Rs. 120 and Rs. 120 from the F/Y 2001/02 to 2006/07.

**Diagram 4.6: Year-end price movement of the C.S. of SCBNL**



The above diagram shows the closing MPS of common stock of SCBNL. The closing MPS is highest in the F.Y. 2006/07 and is the lowest in the F.Y. 2001/02. The highest MPS is Rs. 3775 and the lowest MPS is Rs. 1162. The closing MPS shows increasing trend from the F/Y 2001/02 to 2006/07 except in the F/Y 2004/05. It has decreased slightly in the F/Y 2004/05 .

**Realizing Return(R), Standard deviation (†) and Expected Return ( $\bar{R}$ )**

Year end price and dividend amounts are used to calculate realized rate of return for each year. Table 4.6 shows the calculation of yearly-realized return, expected return and standard deviation of returns.

**Table 4.6: Realized rate of return, expected return and S.D. of the C.S. of SCBNL**

Year	Year end Price (P) (Rs)	Dividend (D) (Rs)	$R = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	$(R - \bar{R})$	$(R - \bar{R})^2$
2001/02	1162	2065	-	-	-
2002/03	1985	100	0.7943	0.4225	0.1785
2003/04	2144	100	0.1305	-0.2413	0.0582
2004/05	1745	110	-0.1395	0.5113	0.2614
2005/06	2345	120	0.4126	0.0408	0.0017
2006/07	3775	120	0.66098	0.2892	0.0836
<b>Total</b>			1.85888		0.5834

*Data Source: NEPSE*

We have,

$$\text{Expected Return } (\bar{R}) = \frac{\sum R}{n} = \frac{1.85888}{5} = 0.3718$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum (R - \bar{R})^2}{n - 1}} = \sqrt{\frac{0.5834}{4}} = \sqrt{0.14585} = 0.3819$$

$$\text{Coefficient of variation (C.V.)} = \frac{\dagger}{\bar{R}} = \frac{0.3819}{0.3718} = 1.0272$$

The above table shows that the expected return standard deviation and CV of common stock of common stock of SCBNL. From the expected return

and SD it reveals that the risk and return SCBNL are medium. The total realized rate of return of SCBNL is 1.8589. Similarly the expected return and SD of SCBNL are 37.18% and 38.19% respectively. Where as its CV is 1.0272 which means that for earning one extra unit of return from the share of SCBNL investor has to been 1.0272 unit of risk. It would prove to be the investments have moderate return with moderate risk.

**Diagram 4.7: Annual Realized Rate of Return of C.S. of SCBNL**

The annual realized returned of common stock of SCBNL is positive from the year 2001/02 to 2002/03. The annual realized return of SCBNL is the highest at 0.7943 in the F.Y. 2002/2003 and lowest at -0.1395 in the F.Y. 2004/2005.

#### **4.1.4 Himalayan Bank Ltd. (HBL)**

##### **Introduction**

Himalayan Bank Ltd. was established in 1992 under the company Act 1964 joint venture partner of this bank is Habib Bank Ltd. of Pakistan. HBL is the first joint venture bank managed by Nepalese chief executive. The operation of this bank started from 1993, February. The bank was listed in NEPSE in B.S. 2050/01/03. The central office of this organization is in Sanchayakosh building, Thamel. Its authorized capital, issued capital and

paid up capital are Rs.240, 000,000, Rs.240, 000,000 and Rs. Rs.240, 000,000 respectively. Par value per share is Rs.100 and number of shareholders are 7210.

**Data:**

Market price and dividend records of common stock of HBL are shown in table no. 4.7. Year end price movement is shown in the diagrams 4.7. Annual dividend amounts gained by shareholders of HBL are calculated in the same table 4.7. No stock dividend has been distributed by the HBL during study period.

**Table 4.7: MPS and Dividend data of HBL.**

**(In Rs)**

Year	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
2001/02	1200	700	1000	50	-	50
2002/03	1780	1000	1700	50	-	50
2003/04	2726	1325	1500	27.5	-	27.5
2004/05	1010	600	840	-	-	-
2005/06	1181	855	920	11.58	-	11.58
2006/07	1200	900	1100	30	-	30

**Data Source: NEPSE.**

The above table shows that the high, low and closing MPS and low MPS, closing MPS, DPS, and the total dividend of HBL from the F.Y. 2001/02 to 2006/07. The closing MPS of HBL has increased from the F/Y 2001/02 to 2002/03. But it has decreased from the F/Y 2003/04 to 2004/05 and again it increased slightly in the F/Y 2005/06 to 2006/07. The highest closing MPS is Rs. 1700 in the F/Y 2002/03 and the lowest closing MPS is Rs. 840 in the F/Y 2004/05. The dividend per share of the HBL is Rs. 50 in the F/Y 2001/02 and 2002/03. DPS of HBL is Rs. 27.5 in the F/Y 2003/04. The dividend per share of the stock is zero in the F/Y 2004/05 and the DPS of HBL is Rs. 11.58 and Rs. 30 in the F/Y 2005/06 and 2006/07. dividend per share of HBL shows the decreasing trend of common stock except in the last year. HBL has not issued the bonus share so, the amount of total dividend has not changed from the F.Y. 2001/02 to 2006/07.

**Diagram 4.8: Year-end price movement of the C.S. of HBL**

**Data Source: NEPSE**

The above diagram shows the closing MPS of HBL from the F/Y 2001/02 to 2006/07. The highest MPS is Rs. 1700 in F.Y. 2002/2003 and lowest MPS is Rs. 840 in F.Y. 2004/05. Closing MPS of HBL does not show the increasing or decreasing trend.

**Realized return (R), Standard Deviation (†) and Expected Return ( $\bar{R}$ ).**

The table presented below shows the calculation of yearly realized return, expected return and standard deviation of return.

**Table 4.8.: Realized rate of return, expected return and S.D of the C.S of HBL**

Year	Year end Price (P) (In Rs)	Dividend (D) (In Rs.)	$R = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	$(R - \bar{R})$	$(R - \bar{R})^2$
2001/02	1000	50	-	-	-
2002/03	1700	50	0.7500	0.6408	0.4106
2003/04	1500	27.5	-0.1015	-0.2107	0.0444
2004/05	840	-	-0.44	-0.5492	0.3016
2005/06	920	11.58	0.1090	0.0002	0
2006/07	1100	30	0.2282	0.119	0.0142
<b>Total</b>			0.5457		0.7708

We have,

$$\text{Expected Return } (\bar{R}) = \frac{\sum R}{n} = \frac{0.5457}{5} = 0.1092$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum (R - \bar{R})^2}{n - 1}} = \sqrt{\frac{0.7708}{4}} = 0.4389$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{\bar{R}} = \frac{0.4389}{0.1092} = 4.0192$$

The above table shows the expected return, realized return, S.D. and CV of common stock of HBL. The expected return and S.D. of HBL are 10.92% and 43.89% respectively. The expected return of HBL is minimum which shows that there is the high risk to get the minimum return. The CV of HBL is 4.0192, which means that to get one extra unit of return from the common stock of HBL investors should bear 4.0192 unit of risk. It would prove to be the investment having less return with high risk.

**Diagram 4.9: Annual Realized Rate of Return of C.S. of HBL.**

The above diagram shows the annual realized rate of return of HBL is positive except for the F.Y. 2003/04 and 2004/05 where annual realized rate of return is negative. The realized return of HBL is the highest at 0.75 in the F.Y. 2002/03 and lowest at -0.44 in the F.Y. 2004/05

## 4.1.5 Nepal SBI Bank Ltd. (SBI)

### Introduction:

Nepal SBI bank Ltd. is another joint venture bank established under the company Act of Nepal. The bank was incorporated in 1993 A.D. It is managed by the rate of Bank of India under joint venture and technical services agreement signed between it a Nepalese promoters. State Bank of India is holding its 50% of equity shares. This bank was listed in NEPSE in 1994 ( 2051/03/10 B.S) It's authorized capital is Rs. 1000000000, issued capital is Rs.144000000 and paid up capital is Rs.143935200. Par value per share is Rs.100 and numbers of share holders are 20589. The central office of this organization is in Durbarmarg, Kathmandu. As mentioned in NEPSE annual report, the main objective of bank is to carry out modern banking business in the country under commercial Bank act 1974. The Bank is one of the largest shareholders based company.

### Data

Market price and dividend records of C.S. of SBI are shown in table no. 4.9 Year end price movement is shown in the diagram 4.9. Annual dividend amounts gained by shareholders of SBI are calculated in same table 4.9

**Table 4.9 : MPS and Dividend data of SBI Bank.**

**In Rs.**

F/Y	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend	Total Dividend
2001/02	670	435	562	10	-	10
2002/03	1221	525	1165	15.01	-	15.01
2003/04	2699	1150	1500	0	-	0
2004/05	307	231	307	0	-	0
2005/06	480	315	335	0	-	0
2006/07	689	335	612	5	-	0

Data Source: NEPSE

The above table shows the high MPS, low MPS closing MPS, DPS, stock dividend. Total dividend of SBI book from the F/Y 2001/02 to 2006/07 The closing MPS of SBI is increasing from the F/Y 2001/02 to 2003/04. But it has decreased in the F/Y 2004/04. And again it has slightly increased

in the F/Y 2005/06 and 2006/07. The DPS of HBL are Rs.10 and Rs.15.01 in the F/Y 2003/04, 2004/05 and 2005/06 and DPS in the F/Y 2006/07 is Rs.5. It had not issued the bonus share. In the amount of total divided has not changed from the F/Y 2001/02 to 2006/07.

**Diagram 4.10: Year end price movement of the C.S. of SBI closing MPS**

The above diagram shows the closing MPS of SBI Bank from the F/Y 2000/01 to 2006/07. The highest closing MPS is Rs.1500 in the F/Y 2003/04. And lowest closing MPS is Rs.307 in the F/Y 2004/05. The closing MPS of SBI Bank has increased from the F/Y 2001/02 to 2003/04. But it has decreased in 2004/05 and 2005/06 and again in the F/Y 2006/07 it has increased slightly .

**realized return (R), Standard Deviation (  $\sigma$  ) and Expected Return (  $\bar{R}$  )**

The table presented below shows the calculation of yearly realized return, expected return and S.D. of returns.

**Table 4.10: Realized rate of return, expected return and S.D. of the C.S. of SBI.**

Fiscal Year	Year end Price (P) (In Rs.)	Total dividend (D) (In. Rs)	$R = \frac{D_t + (P_t - P_{t-1})}{P_{t-1}}$	$(R - \bar{R})$	$(R - \bar{R})^2$
2001/02	562	10	-	-	-
2002/03	1165	15.01	1.0997	0.7947	0.6316
2003/04	1500	0	0.2876	-0.0145	0.0003
2004/05	307	0	-0.7953	1.10028	1.21061
2005/06	335	0	0.0912	-0.2138	0.0457
2006/07	612	5	0.8418	0.5368	0.2882
<b>Total</b>			1.5249		2.1764

We have,

$$\text{Expected Return } (\bar{R}) = \frac{\sum R}{n} = \frac{1.8249}{5} = 0.3049$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum (R - \bar{R})^2}{n - 1}} = \sqrt{\frac{2.1764}{4}} = 0.7376$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{\bar{R}} = \frac{0.7376}{0.30498} = 2.4186$$

The above table shows that the expected return, annual realized rate of return, S.D. and CV of the SBI Bank. The expected return, and S.D of Bank are 30.49% and 73.76% respectively which indicates that risk is higher than return. The realized rate of return of SBI Bank is 1.5249. The C.V of SBI is 2.4186 which means that to earn every extra 1 unit of return from the common stock of SBI bank, investor must bear 2.4186 unit or risk. It would prove to be the investment having moderate return with aggressive risk.



**Diagram : 4.11 Annual Realized rate of return of the C.S. of SBI.**

## **4.2 Inter Bank Comparison:**

According to the result from the section 4.1, a comparative analysis of return and risk is performed here. Expected return, Standard deviation of returns, Coefficient of variation of each bank for the year 2001/02 to 2006/07 are given in table 4.11

**Table 4.11: Expected Returns, S.D. and Coefficient of Variation of each bank.**

<b>Banks</b>	<b>Expected Rate of Return (%)</b>	<b>Std Deviation(%)</b>	<b>Coefficient Variation</b>	<b>Remarks</b>
NIBL	0.1701	0.4565	2.6834	-
NABIL	0.3653	0.4714	1.2904	-
SCBNL	0.3718	0.3819	1.0272	Highest Return Lowest c. v.
HBL	0.1092	0.4389	4.0192	Lowest S.D.
SBI	0.3049	0.7376	2.4186	-

The above table shows the expected return, standard deviation and coefficient of variation of each J. V. Banks. Investors can get the highest return from investment in the C.S of SCBNL and lowest return from investment in C.S. of HBL. SCBNL stands at the top since it has the lowest C. V. and HBL at the since it has the highest C. V. SBI has the highest

standard deviation and SCBNL has the lowest standard deviation on the basis of risk per unit reduce. SCBNL is the best bank among all Banks on the basis of C.V. to make the comparison easily understandable, diagram 4.13 is present below.

**Diagram 4.12: Expected Return, S.D. and C.V.  
of each commercial bank.**

The diagram confirms that the total risk has measured by S.D. is observed maximum in the common stock of SBI Bank and minimum in the common stock of SCBNL Bank i.e 73.76% and 38.19% respectively. This means that stock of SBI is more risky than that of SCBNL. Since return of SCBNL is maximum at 37.18%. HBL has least expected return i.e. 10.92%, whereas SCBNL has least CV at 1.0272 and HBL has highest CV at 4.0192 .

On the basis of the Market Capitalization at the end of 2005/06, size of each bank is presented in table no. 4.11. Market Capitalization is the total market value at specific time period of the company, industry and market as a whole. Standard Chartered Bank Nepal Ltd. has highest Market Capitalization among listed bank at July 16, 2006 to July 15, 2007.

**Table 4.12 Market Capitalization of Listed J. V. banks  
at July 15, 2005 – July 15, 2006.**

<b>Banks</b>	<b>Market Capitalization ( In .Rs)</b>	<b>Percentage</b>
NIBL	2,362,344,000	10
NABIL	7,389,475,000	30
SCBNL	878,5317,000	35
HBL	4,830,000,000	19
Nepal SBI	144,6042,000	6

*ource: NEPSE Index*

**Diagram 4.13 Market Capitalization of listed banks at  
July 15, 2005 – July 15, 2006.**

The above table and pie-diagram show the market capitalization of the selected J. V. banks at the end of 2005/2006 and coverage market of the banks. On the basis of market capitalization, we can easily conclude that SCBNL is the biggest and SBI is the smallest Bank. It can also be confirmed the fact that SCBNL covers 35% where as SBI only covers 6% of total market we conclude that other Banks i.e. NABIL, HBL, NIBL and NBBL has 30%, 19%, 10% and market share respectively.

Similarly a comparison is made on the movement of market capitalization. Here only five banks are taken into consideration as their data covers the entire study period.

**Table 4.13: Year – wise comparative movement of Market Capitalization.**

<b>Year</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>Banks</b>						
NABIL	2749.60	5499.14	5891.94	4909.95	7389.47	8494.20
NIBL	1112.58	1896.26	1945.66	2775.75	2362.34	3964.56
SCBNL	3945.57	6740.04	7279.93	6537.47	8785.32	1432.65
HBL	1920	4080.00	4500	4410.00	4830.00	5212.62
SBI	674.12	1395.90	2156	1325.18	1446.04	3940.44

To take an investment decision on single common stock (security) coefficient of variation (C.V.) is the more appropriate basis. Since it measures risk per unit return of a stock. So standard deviation and return are included in it. On the basis of C.V. SCBNL's common stock is the best security for investment because of its minimum coefficient of variation as mentioned table 4.13.

**Diagram 4.14 Year wise comparative movement of Market Capitalization**

### 4.3 Inter Industry Comparison:

To compare the size of industries, table no 4.13 and the diagram 4.13 is presented below. We can observe that the banking industry has Majority value of total market share i.e. 70% as compared to other sectors.

**Table 4.14: Market Capitalization of each industry at July 17, 2006**

<b>Industry</b>	<b>Market Capitalization (in million)</b>	<b>Percentage</b>
Banking	41435.35	68
Manufacturing & processing	5024.83	8
Hotel	2308.38	4
Trading	635.88	1
Finance & Insurance	7631.07	12
Others	4594.62	7
<b>Total</b>	<b>61630.13</b>	<b>100</b>

**Diagram 4.15: Market capitalization of each industry at July 15, 2006**

To compare the size of industries Table – 4.13 and the diagram – 4.13 is presented below. We can observe that the banking industry has majority value of total market share that 67.23% as compare to other sector. With the help of above table as well as from the above presented pie-diagram, we can easily deduce the banking sector is the biggest and others sector is the smallest according to market capitalization. Banking sector alone

covers more than 65% of market i.e. it covers 67.23% whereas others sector only cover 32.77 of market. The increasing order of different sector according to market capitalization is others, Trading Hotels, Finance and Insurance, Manufacturing and Processing and finally Banking. The focus of our study, Banking sectors cover 67.23% of market is the biggest sector of the market.

**Table 4.15: Industry wise NEPSE Index in NRs at closing date of F/Y**

**In Rs.**

Industry Year	Banking	Mfg. &Proc.	Hotel	Trading	Fin. & Ins	Others	Market
2001/02	397.17	340.59	123.74	305.98	346.15	308.46	360.70
2002/03	379.33	349.31	291.34	155.55	318.67	190.90	348.43
2003/04	482.29	216.51	216.51	102.20	577.51	77.34	227.54
2004/05	446.82	250.13	196.68	94.56	448.57	48.56	204.41
2005/06	422.9	255.58	184.98	95.01	433.71	142.65	222.65
2006/07	548.37	276.50	178.00	123.20	548.49	347.65	287.90

*Data Source: NEPSE Index*

**Table 4.16 : Expected Return, Standard Deviation and C.V. of different sectors.**

Industry	Expected Return (%)	S.D. (%)	C.V.	Remarks
Banking	0.0791	0.2152	2.7206	-
Man& pro	-0.01898	0.6643	-35	-
Hotel	0.1816	0.6872	3.7841	-
Trading	-0.1217	0.4534	-3.7265	-
Fin & Ins	0.1482	0.3822	2.5789	Best as per C.V.
Others	0.4053	1.0436	2.5749	-

The main focus of our study is risk and return, Industry wise comparison of risk and return, is made here on the basis of year end NEPSE index. Year end industry wise NEPSE index is given in table no. 4.14. Similarly, table 4.15 shows the expected return, S. D. and C.V. of each industry. Detail calculation of each variables of each industry is presented in Appendices table no A<sub>1</sub> to A<sub>6</sub>. From the above table 4.15, we found that C.V. of

banking sectors is 2.7206, which is minimum as compared to other sectors. Similarly, expected return of Hotel industries is the highest i.e. 18.16% whereas Trading, manufacturing and processing lowest expected return. Where as total risk is concerned Hotel at highest risk at 68.72% and Banking Sector at minimum risk at 21.52% From the view point of C.V., banking sector is better because it has least C.V. and Financial and Insurance has highest C. V.

So, from above, we can say that it will be better to invest in banking sector as its risk as compared to return is minimum and it has also moderate C.V.

**Diagram 4.16: Industry wise Expected return for the year**

The above diagram shows that the expected return of different sectors. Other has the highest expected return i.e. 0.4053 and Manufacturing and Processing sector has the negative expected return i.e.  $-0.0189$ . Similarly, trading has the lowest expected return i.e.  $-0.1217$  respectively.

## **4.4 Comparison with Market:**

### **4.4.1 Market Risk and Return**

In Nepal there is only one stock market, NEPSE. Over all market movement is represented by market index (i.e. NEPSE Index). The market return, its S.D. and C.V. is calculated below.

**Table 4.17: Calculation of market returns, S.D. and C.V.**

Year	NEPSE Index (NI) (in Rs)	$R_m = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_m - \overline{R_m})$	$(R_m - \overline{R_m})^2$
2001/02	360.70	-	-	-
2002/03	348.43	-0.0340	-0.1413	0.0199
2003/04	227.54	-0.3469	-0.4542	0.2063
2004/05	204.41	-0.1017	-0.0817	0.0067
2005/06	222.65	0.0892	0.1093	0.119
2006/07	287.90	0.2931	0.3132	0.0981
<b>Total</b>		-0.1003		0.3429

$$\text{Expected Return } (\overline{R}) = \frac{\sum R}{n} = \frac{-0.1003}{5} = -0.0201$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum (R - \overline{R})^2}{n - 1}} = \sqrt{\frac{0.3429}{4}} = \sqrt{0.0857} = 0.2927$$

$$\text{Coefficient of variation (C.V.)} = \frac{\sigma}{\overline{R}} = \frac{0.2927}{-0.0201} = -14.5622$$

The above table shows that total realized market return is -0.1003, whereas expected return and standard deviation of market is 2% and 29.27% respectively. It indicates that return is low and risk is average. The C.V. of market is -14.5622 .

#### 4.4.2 Analysis of market sensitivity.

Market sensitivity is explained by its beta coefficient. Beta is known as systematic risk measure. The beta of market is always equals to 1. So, beta of stock more than 1 is known as more risky or aggressive investment and beta of stock less than 1 is known as less risky or defensive investment.

We have,

$$S_1 = \frac{COV(R_1, R_m)}{\sigma_m^2} = \frac{\sigma_1 \sigma_m \dots m}{\sigma_m^2}$$

$$= \frac{\sigma_{i \dots im}}{\sigma_m}$$



Where,

$\rho_{im}$  = Correlation between market return and stock I return.

Here,

$$S_1 = \frac{COV(R_i R_m)}{\sigma_m^2} = \frac{\rho_{im} \sigma_i \sigma_m}{\sigma_m^2} = \rho_{im} \frac{\sigma_i}{\sigma_m} = 1$$

Hence, beta coefficient of market is always 1.

**Table 4.18: Calculation of beta coefficient of the C.S. of NABIL**

Fiscal Year	$(R_j - \bar{R}_j)$	$(R_m - \bar{R}_m)$	$(R_j - \bar{R}_j) (R_m - \bar{R}_m)$	Remarks
2001/02	-	-	-	$(R_j - \bar{R}_j)$
2002/03	0.5561	-0.1413	-0.0786	taken from
2003/04	-0.2653	-0.4542	0.1205	table 4.2 and
2004/05	0.6653	0.0817	0.0544	$(R_m - \bar{R}_m)$
2005/06	0.1947	0.1093	0.0213	taken from
2006/07	0.1696	0.3132	0.0531	Table no.
<b>Total</b>			<b>0.34640.1707</b>	4.16

Where,  $R_j$  = Realized return of NABIL [Taken from table 4.2]

$\bar{R}_j$  = Expected return of NABIL [Taken from table 4.2]

$R_m$  = Realized return of market. [Taken from table 4.16]

$\bar{R}_m$  = Expected return of market.[Taken from table 4.16]

n = Number of observations = 5

$\sigma_m^2$  = Variance of market return

$\beta_j$  = Beta coefficient of NABIL

We have,

$$COV(R_j R_m) = \frac{\sum (R_j - \bar{R}_j)(R_m - \bar{R}_m)}{n-1} = \frac{0.1707}{5-1} = \frac{0.1707}{4} = 0.0427$$

$$S_j = \frac{COV(R_j R_m)}{\sigma_m^2} = \frac{0.0427}{(0.2927)^2} = 0.4982$$

Since beta coefficient of NABIL is 0.4982 i.e. less than 1, the stock's return is lower than the market return. It is risky than market. It means if return increased by 1%, the return of NABIL increase by 49.82% and vice versa.

**Table 4.19: Showing the beta coefficient of each bank  
(the betas are calculated in  
Appendix from A<sub>7</sub> to A<sub>11</sub> and from Table 4.21**

S.N	Bank	Beta coefficient	Remarks
1	NABIL	0.4982	
2	NIBL	0.8145	
3	SCBNL	0.8938	Most aggressive
4	HBL	0.0931	
5	SBI	0.3757	Least aggressive

The market beta serves as a benchmark for evaluation of risk of individual stock. The above table shows that the beta of selected banks range from 0.0931 to 0.8938 SCBNL has the highest beta which is equal to 0.8938 among the selected banks. Smallest beta for HBL represent advice movement of stock price of the market. Since the SCBNL and NIBL have higher beta coefficient than beta coefficient of market, the stock of these banks are aggressive. Remaining banks have lower beta than market so they are defensive stock. HBL has the lowest beta. So, stock of HBL is highly defensive with market return.

**Required rate of return  $[E(R_1)]$ , Expected rate of return  $(\bar{R})$  and  
price evaluation analysis**

Comparison of required rate of return and expected rate of return gives the result, whether the stock is under priced or over priced. If the required rate of return is less than expected rate of return, the stock is said 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 Treasury 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 days duration is taken as risk free rate, which is approximately 3.2947%

Hence,  $R_f = \text{Risk free rate of return} = 3.2947\% = 0.032947$ .

$\bar{R}_m = \text{Market rate of return} = -2.01\% = -0.0201$

**Table 4.20: Required rate of return, Expected return and Price evaluation**

Banks	Beta	$E(R_1) = R_f + (\bar{R}_m - R_f)S_1$	Expected rate of return	Remarks
NABIL	0.4982	0.0699	0.3653	Under Priced
NIBL	0.8145	0.09351	0.1701	Under Priced
SCBNL	0.8938	0.0994	0.3718	Under Priced
HBL	0.0931	0.03987	0.1092	Under Priced
SBI	0.3757	0.06088	0.3049	Under Priced

All the commercial bank's stock are under priced so all the joint ventures Banks have stocks with good investment opportunity. All the stocks are in demand. Their stock's value will be increased in the near future providing the investors higher return. Since all the stock is under priced, investors can gain from buying those stocks. These stocks are recommended to buy.

#### 4.5 Portfolio Analysis:

Portfolio theory was proposed by Harry M. Markowitz which gives the concept gives the concept of diversification of risk by investing total funds in more than a single asset or single stock. Markowitz diversification helps the investors to attain a higher level of expected utility than with any other risk reduction technique. In a very simple way we can understand it as not keeping all the eggs in a single basket. By diversifying total fund in different securities the risk of individual security can be reduced without losing considerable return. The main objectives of portfolio is reduction of unsystematic risk, from which investors can take more benefit by making efficient portfolio. Therefore, a brief analysis of risk and return is extended in portfolio context. The portfolio expected return is straightforward weighted average of returns on the individual securities. The weights are equal to the

proportions of the total fund invested in each security (the weights must sum to 100%)

#### 4.5.1 Analysis of risk diversification:

The analysis is based on the two assets portfolio and the tools for analysis are presented in the third chapter (research methodology). Here, the portfolio of the common stock of NIBLL ( say stock A ) and SCBNL ( say stock B ) is analyzed Table 4.21 shows the calculation of covariance of the returns of given two stocks  $COV(R_A R_B)$  and the proportion of stock A ( $W_A$ ) that minimizes the risk.

We have,

$$W_A = \frac{\sigma_B^2 COV(R_A R_B)}{\sigma_A^2 + \sigma_B^2 - 2COV(R_A R_B)}$$

Where,

$\sigma_B^2$  = Standard deviation of C.S. of SCBNL

$\sigma_A^2$  = Standard deviation of C.S. of NIBL

$COV(R_A R_B)$  = Covariance of returns between C.S. of NIBL and SCBNL

$W_A$  = Proportion of the C.S. of NIBL

$W_B$  = Proportion of the C.S. of SCBNL

**Table 4.21: Covariance ( $R_A R_B$ ) and  $W_A$  of stock A and  $W_B$  of Stock B.**

Year	$(R_A - \bar{R}_A)$	$(R_B - \bar{R}_B)$	$(R_A - \bar{R}_A)(R_B - \bar{R}_B)$	Remarks
2002/03	0.3516	0.4225	0.1486	$(R_A - \bar{R}_A)$ from table 4.6 and $(R_B - \bar{R}_B)$ from table 4.10
2003/04	-0.5624	-0.2413	0.1357	
2004/05	-0.3397	0.5113	-0.1737	
2005/06	-0.3054	0.0408	-0.0125	
2006/07	0.4299	0.2892	0.1243	
<b>Total</b>			<b>0.2224</b>	

We have,

$$COV(R_A R_B) = \frac{\sum (R_A - \bar{R}_A)(R_B - \bar{R}_B)}{n - 1} = \frac{0.2224}{5 - 1} = \frac{0.2224}{4} = 0.0556$$

Again,

We have,

$$\begin{aligned}
W_A &= \frac{\sigma_B^2 - COV(R_A R_B)}{\sigma_A^2 + \sigma_B^2 - 2COV(R_A R_B)} \\
&= \frac{(0.3819)^2 - 0.0556}{(0.4565)^2 + (0.3819)^2 - 2 \times 0.0556} \\
&= \frac{0.1458 - 0.0556}{0.2084 + 0.1458 - 0.1112} \\
&= \frac{0.0902}{0.3542 - 0.1112} \\
&= 0.3712 \\
\therefore W_B &= 1 - W_A = 1 - 0.3712 = 0.6288
\end{aligned}$$

If the portfolio is constructed with 37.12% of NIBL common stock and 62.88% of SCBNL common stock, constructed portfolio will minimize risk and will be ideal properties.

And portfolio return will be,

$$\begin{aligned}
\overline{R_p} &= W_A \overline{R_A} + W_B \overline{R_B} \\
&= 0.3712 \times 0.1701 + 0.6288 \times 0.3718 \\
&= 0.0631 + 0.2338 \\
&= 0.2969 \times 100 = 29.69\%
\end{aligned}$$

Where, the portfolio risk is given as,

$$\begin{aligned}
\sigma_p &= \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(R_A R_B)} \\
&= \sqrt{(0.3712)^2 (0.4565)^2 + (0.6288)^2 (0.3819)^2 + 2 \times 0.3712 \times 0.6288 \times 0.0556} \\
&= \sqrt{0.1378 \times 0.2084 + 0.3954 \times 0.145 + 0.02595} \\
&= \sqrt{0.0287 + 0.0576 + 0.02595} \\
&= \sqrt{0.1123} \\
&= 0.3351 \\
&= 33.51\%
\end{aligned}$$

Using the diversification, we can reduce the risk. Standard deviation of NIBL and SCBNL was 45.65% and 38.19% respectively before the diversification. But after portfolio construction, which is lower than the risk is 33.51%, which is lower than the risk before diversification.

# **Chapter- Five**

## **Summary, Findings and Recommendations**

### **5.1 Summary**

Risk and Return is getting considerable attention in financial management. Central focus of finance is trade off between risk and return. And its major part, stock market had greatest glamour, not only for the professional or institutional investors but also for the individual or private investors. Development in the field of finance has led to the applications of many new concepts and models to deal with various issues to financial management.

The relationship between risk and return is described by investor's perceptions about risk and their demand for compensation. No investors will like to invest in risky assets unless he/she is assured of adequate compensation for the acceptance of risk. Hence, risk plays a central role in the analysis of investment. Investors often ask about an investment and like to know if the risk will command higher premium and the trade-off between the two assumes a linear relationship between risk and risk premium.

Common stock is the most risky security and lifeblood of stock market. Because of higher expected return, an investment in common stock of a corporate firm neither ensures an annual return nor ensures the return of principal. Therefore, investment in the common stock is very sensitive on the ground of risk. Dividends to common stock holders are paid only if the firm makes an operating profit after tax and preference dividend. Common stock has attracted more investors in Nepal. Rush in the primary Market issue is one of the examples. Private C.S holders are the passive owners of the company. But private investor plays a vital role in economic development of the nation by mobilizing the dispersed capital in different from in the society.

The main objective of the study is to analyze the risk and return in common stock investment of Nepalese stock market. The study is focused on the common stock of listed commercial bank. Hence, listed bank are taken 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. Scientific methods are used I data analysis. Tables, graphs and diagrams are used to presents the data and results more clearly. Both quantitative and qualitative analyses have performed by using statistical tools as well as personal judgment. Secondary data are collected from the NEPSE, NRB, SEBO/N and other related banks. Other subject's types of information are collected through the discussion with private investors, financial executive of companies and official of NRB, SEBO/N an NEPSE. Findings of analysis are summarized and conclusions are drawn as follows.

## **5.2 Findings and Conclusions:**

- Most of the people considered stock market investment as a black art that they have unrealistically optimistic or pessimistic expectation about stock market investment or perhaps a fear of the unknown. This study enables investors to put the returns they can expect and the risks they may take in to better perspective. We know that Nepalese stock market is in emerging stage. Its development is accelerating since the political change in 1990 in effect of openness and liberalization in national economy. But Nepalese individual investors cannot analyze the securities as well as market properly because of the lakh of information and poor knowledge about the analysis of securities for investment.
- The return is the income received on a stock investment which is usually expressed in percentage. Expected return on the common stock of Standard Chartered Bank Nepal Ltd. (SCBNL) is maximum (i.e. 128.60%). Which is very high rate of return? In reality this rate exists only due to the effect or unrealistic annual return because of the issue of bonus shares and

increase in share price. Similarly expected return of C.S of Himalayan Bank Ltd. Is found minimum (28.94%).

- Risk is the variability of return. Which is measured in terms of standard deviation? On this basis of S.D., common stock of NBBL most risky since it has high S.D and C.S. of HBL is least risky because of its lowest S.D on the other hand, we know that coefficient of variation (C.V) is more rational basic of investment decision. Which measures this risk per unit of return? On the basis of C.V., common stock of NABIL is the best among all banks. NABIL has 0.8600 unit of risk per 1 unit of return. But C.S of NABI has the highest risk per 1 unit (i.e.1.2792)
- 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 and measured by data coefficient ( $\beta$ ). Beta coefficient explains the sensitivity or volatility of the stock with market. Higher the beta, greater the volatility. In this context, common stock of SCBNL is most volatile (i.e. $\beta = 2.85$ ) and Common stock of SBI is least volatile (i.e.  $\beta = 0.1662$ ). The banks stock having the beta more than beta coefficient of market i.e. more than 1 is aggressive type of common stock and less than 1 is defensive stock and remaining bank have defensive stocks.
- SCBNL is the highest position (Rs.7279930000) and NIBL is In lowest position (Rs.1945660000) according to their inter bank market capitalization comparison. The inter industry comparison has placed the banking Industry in the top position (R.S 32135.21 million ) and the other's industry in the bottom position (Rs.249.88 million).
- One of the main significance of beta is in Capital Asset pricing Model (CAPM). CAPM is the model that describes the relationship between risk and required rate of return. Where risk free rate plus a premium based on the systematic risk of the security is required rate of return of that stock. Comparison between expected rate of return identify whether the stock is



overpriced or under priced. If required rate of return is lower than expected rate of return, stock is known as under priced and if the required rate of return is greater than the expected rate of return, the stock is over priced. This study shows that all the stocks of commercial banks, which are analyzed, are under priced. This means that their stock value will be increased in near future. All the stocks are in demand. So, investor 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 reduced totally. If the correlation between the returns of two stock is highly positive risk reduction is not so significant. So, portfolio between the C.S. of same industry cannot reduce risk properly. In this study, SCBNL and SBI have negative correlation between their returns, which is favorable with the viewpoint of the diversification. And all other banks have positive correlation among their returns. HBL and NBBL have highly positive correlation between their returns. So, the portfolio construction of the common stocks of these two banks will not reduce any risk, which is not favorable as portfolio construction is concerned.
- Most of the investors invest only keeping the return in the mind but they are found unable to calculate the risk factor of the security. Most of the Nepalese private investors invest in single security. Some of the investors use their fund in two or more securities. But it is found that they don't have make any analysis of portfolio before selecting security. They invest their fund in different securities on the basic of expectation and assumption of individual securities rather than analysis of the effect of portfolio. It seems that they don't have knowledge of the risk diversification by using portfolio of their investment.

### **5.3 Recommendations and Suggestions:**

Mainly this study is focused on individual investors. Other related components of stock market are also taken into account to some extent. The following recommendation and suggestions are prescribed on the basis of data analysis and major findings of this research.

- 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 in share prices. To win the market, sell share when the market is rising and buy share when market is falling and hold share, which will perform better than market.
- Different financial and statistical tools are considered to analyzed that data in this study. Coefficient of variation (C.V.) suggests that the banking industry is the best for investment. Similarly, while analyzing individual security NABIL seems to undoubtedly the best for investment with considering the full time horizon of the study, C.S. of NABIL may be the best investment opportunity for the investors. Whose beta is also lower than the beta coefficient of market (i.e.1) so, it is less risky or defensive type of stock? Hence it is prescribed to select the C.S. of NABIL or the C.S. of banking industry for individual stock investment.
- 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. But portfolio construction is dynamic job. For the portfolio construction, select the stocks that have higher return with not correlated or negatively correlated stock. Similar stock cannot diversify the risk properly. So, the construction of portfolio between the common stock of SCBNL and SBI is recommended.
- Analysis of personal risk attitude, needs and requirements will be helpful before making an investment decision in stock market. Investors should make several discussions with stock broker before reaching at the decision.

Investors should make their decision on the basis of reliable information rather than the imagination and rumors.

- Investment clubs are a good way to exchange and share investment ideas. In Nepal, there are no any such types of club. Mutual fund is worthwhile for people with little interest in investment. So, sharing experience, ideas and taking view of expert will be of greater help.
- NEPSE needs to initiate to develop different programs for private investors such as investor's meetings and seminar in different subjects matters like "Trading Rules and Regulations" etc. On the other hand, NEPSE is following "open cry system" of trading even in the age of digital technology. It should be modernized. It needs to develop efficient and effective information channel and to provide up to date data.
- Government needs to amend the rules and regulations regarding stock market in time to time and to make the policy that protects the individuals investor's right. And also need to follow up the implementation of rules and regulations and to make sure the objectives are achieved. On that regard, HMG needs to monitor and to make active all the components of stock market properly. The government has to implement the rules and regulation strictly other wise it will be meaning less. The political problem of the country is another burning issue, which affects the economy of the nation adversely. At present the industry and share market is in declining trend and it will be completely finish if the present political problem will not solve soon.
- The corporate firms should communicate the real financial statements. Value of assets and liabilities should not be manipulated to report the under or over profitability. Every decision of the corporation should be made to maximize the value of the firm and value per share.

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## APPENDIX

### ANNEX NO. 1

#### Calculation of Return, S.D., Expected return and C.V. of Banking Industry.

Fiscal Year	NEPSE Index (NI)(In Rs.)	$R_b = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_b - \bar{R}_b)$	$(R_b - \bar{R}_b)^2$
2001/02	397.17	-	-	-
2002/03	397.33	-0.045	-0.311	0.097
2003/04	482.29	0.271	0.005	0.000025
2004/05	446.82	-0.0735	0.1526	0.0233
2005/06	422.9	-0.0535	0.1326	0.0176
2006/07	545.37	0.2967	0.2176	0.0473
<b>Total</b>		0.3957		0.1852

Where,

$R_b$  = Realized return of Banking industry.

$\bar{R}_b$  = Expected return of Banking industry.

$\dagger_b$  = Standard deviation of Banking industry.

$C.V._b$  = Co-efficient of variation of Banking industry.

$NI_t$  = Ending NEPSE index of Banking industry.

$NI_{t-1}$  = Starting NEPSE index of Banking industry.

We have,

$$\text{Expected Return } (\bar{R}_b) = \frac{\sum R_b}{n} = \frac{0.3957}{5} = 0.0791$$

$$\text{Standard Deviation } (\dagger_b) = \sqrt{\frac{\sum (R_b - \bar{R}_b)^2}{n-1}} = \sqrt{\frac{0.1852}{4}} = \sqrt{0.463} = 0.2152$$

$$\text{Coefficient of Variation } (C.V._b) = \frac{\dagger_b}{R_b} = \frac{0.2152}{0.0791} = 2.7206$$

## ANNEX NO. 2

### Calculation of Return, S.D., Expected return and C.V. of Mfg. & Proc. Industry

Fiscal Year	NEPSE Index (NI) (Rs.)	$R_{mp} = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_{mp} - \bar{R}_{mp})$	$(R_{mp} - \bar{R}_{mp})^2$
2001/02	340.59	-	-	-
2002/03	349.31	0.026	-0.011	0.00012
2003/04	216.51	-0.380	0.343	0.118
2004/05	250.31	0.1561	0.17508	0.0307
2005/06	255.58	0.0211	0.04008	1.6064
2006/07	276.50	0.0819	0.10088	0.0102
<b>Total</b>		-0.0949		1.7654

Where,

$R_{mp}$  = Realized return of manufacturing and processing industry.

$\bar{R}_{mp}$  = Expected return of manufacturing and processing industry.

$\dagger_{mp}$  = Standard deviation of manufacturing and processing industry.

$C.V._{mp}$  = Co-efficient of variation of manufacturing and processing industry.

$NI_t$  = Ending NEPSE index of manufacturing and processing industry.

$NI_{t-1}$  = Starting NEPSE index of manufacturing and processing industry.

We have,

$$\text{Expected Return } (\bar{R}_{mp}) = \frac{\sum R_{mp}}{n} = \frac{-0.0949}{5} = 0.01898$$

$$\text{Standard Deviation } (\dagger_{mp}) = \sqrt{\frac{\sum (R_{mp} - \bar{R}_{mp})^2}{n-1}} = \sqrt{\frac{1.7654}{4}} = \sqrt{0.4414} = 0.6643$$

$$\text{Coefficient of Variation } (C.V._{mp}) = \frac{\dagger_{mp}}{R_{mp}} = \frac{0.6643}{-0.01898} = -35$$

### ANNEX NO. 3

#### Calculation of Return, S.D., Expected return and C.V. of Hotel Industry

Fiscal Year	NEPSE Index (NI) (Rs.)	$R_h = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_h - \bar{R}_h)$	$(R_h - \bar{R}_h)^2$
2001/02	123.74	-	-	-
2002/03	291.34	-1.354	1.258	1.583
2003/04	216.51	-0.257	0.353	0.125
2004/05	196.68	-0.0916	0.2732	0.0746
2005/06	184.98	0.0595	0.2411	0.0581
2006/07	178.00	-0.0377	0.2193	0.0481
<b>Total</b>		0.9082		1.8888

Where,

$R_h$  = Realized return of Hotel Industry.

$\bar{R}_h$  = Expected return of Hotel Industry.

$\dagger_h$  = Standard deviation of Hotel Industry.

$C.V._h$  = Co-efficient of variation of Hotel Industry.

$NI_t$  = Ending NEPSE index of Hotel Industry.

$NI_{t-1}$  = Starting NEPSE index of Hotel Industry.

We have,

$$\text{Expected Return } (\bar{R}_h) = \frac{\sum R_h}{n} = \frac{0.9082}{5} = 0.1816$$

$$\text{Standard Deviation } (\dagger_h) =$$

$$\sqrt{\frac{\sum (R_h - \bar{R}_h)^2}{n-1}} = \sqrt{\frac{1.8888}{4}} = \sqrt{0.4722} = 0.6872$$

$$\text{Coefficient of Variation } (C.V._h) = \frac{\dagger_h}{R_h} = \frac{0.6872}{0.1816} = 3.7841$$



## ANNEX NO. 4

### Calculation of Return, S.D., Expected return and C.V. of Trading Industry

Fiscal Year	NEPSE Index (NI) (Rs.)	$R_t = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_t - \bar{R}_t)$	$(R_t - \bar{R}_t)^2$
2001/02	305.98	-	-	-
2002/03	155.55	-0.492	-0.61367	0.3766
2003/04	102.20	-0.343	-0.464667	0.21592
2004/05	94.56	-0.0748	-0.19647	0.0386
2005/06	95.01	0.004758	0.126428	0.01598
2006/07	123.20	0.2967	0.41837	0.17503
<b>Total</b>		-0.608342		0.82213

Where,

$R_t$  = Realized return of Trading Industry.

$\bar{R}_t$  = Expected return of Trading Industry.

$\dagger_t$  = Standard deviation of Trading Industry.

$C.V._t$  = Co-efficient of variation of Trading Industry.

$NI_t$  = Ending NEPSE index of Trading Industry.

$NI_{t-1}$  = Starting NEPSE index of Trading Industry.

We have,

$$\text{Expected Return } (\bar{R}_t) = \frac{\sum R_t}{n} = \frac{0.608342}{5} = -0.12167$$

$$\text{Standard Deviation } (\dagger_t) =$$

$$\sqrt{\frac{\sum (R_t - \bar{R}_t)^2}{n-1}} = \sqrt{\frac{0.82213}{4}} = \sqrt{0.2055} = 0.4534$$

$$\text{Coefficient of Variation } (C.V._t) = \frac{\dagger_t}{R_t} = \frac{0.4534}{-0.12167} = 3.7265$$

## ANNEX NO. 5

### Calculation of Return, S.D., Expected return and C.V. of Finance & Insurance

Fiscal Year	NEPSE Index (NI) (Rs.)	$R_{fi} = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_{fi} - \bar{R}_{fi})$	$(R_{fi} - \bar{R}_{fi})^2$
2001/02	346.15	-	-	-
2002/03	318.67	-0.079	-0.406	0.165
2003/04	577.51	0.812	0.485	0.235
2004/05	448.57	-0.2233	0.3715	0.1380
2005/06	433.71	-0.0331	0.1813	0.327
2006/07	548.49	0.2646	0.1164	0.0135
<b>Total</b>		0.7412		0.5842

Where,

$R_{fi}$  = Realized return of finance and Insurance.

$\bar{R}_{fi}$  = Expected return of finance and Insurance

$\dagger_{fi}$  = Standard deviation of finance and Insurance

$C.V._{fi}$  = Co-efficient of variation of finance and Insurance

$NI_t$  = Ending NEPSE index of finance and Insurance

$NI_{t-1}$  = Starting NEPSE index of finance and Insurance

We have,

$$\text{Expected Return } (\bar{R}_{fi}) = \frac{\sum R_{fi}}{n} = \frac{0.7412}{5} = 0.1482$$

$$\text{Standard Deviation } (\dagger_{fi}) =$$

$$\sqrt{\frac{\sum (R_{fi} - \bar{R}_{fi})^2}{n-1}} = \sqrt{\frac{0.5842}{4}} = \sqrt{0.1461} = 0.3822$$

$$\text{Coefficient of Variation } (C.V._{fi}) = \frac{\dagger_{fi}}{\bar{R}_{fi}} = \frac{0.3822}{0.1482} = 2.5789$$

## ANNEX NO. 6

### Calculation of Return, S.D., Expected return and C.V. of another Industry

Fiscal Year	NEPSE Index (NI) (Rs.)	$R_o = \frac{NI_t - NI_{t-1}}{NI_{t-1}}$	$(R_o - \bar{R}_o)$	$(R_o - \bar{R}_o)^2$
2001/02	308.46	-	-	-
2002/03	190.90	-0.381	0.291	0.085
2003/04	77.34	-0.595	-0.505	0.2550
2004/05	48.56	-0.3721	0.7774	0.60435
2005/06	142.65	1.93760	1.5323	2.3479
2006/07	347.65	1.4371	1.0318	1.0646
<b>Total</b>		2.0266		4.3569

Where,

$R_o$  = Realized return of another Industry.

$\bar{R}_o$  = Expected return of another Industry.

$\dagger_o$  = Standard deviation of another Industry.

$C.V._o$  = Co-efficient of variation of another Industry.

$NI_t$  = Ending NEPSE index of another Industry.

$NI_{t-1}$  = Starting NEPSE index of another Industry.

We have,

$$\text{Expected Return } (\bar{R}_o) = \frac{\sum R_o}{n} = \frac{2.0266}{5} = 0.4053$$

$$\text{Standard Deviation } (\dagger_o) =$$

$$\sqrt{\frac{\sum (R_o - \bar{R}_o)^2}{n-1}} = \sqrt{\frac{4.3569}{4}} = \sqrt{1.0892} = 1.0436$$

$$\text{Coefficient of Variation (C.V.}_o) = \frac{\dagger_o}{R_o} = \frac{1.0436}{0.4053} = 2.5749$$

## ANNEX NO. 7

### Calculation of beta coefficient of the C.S. of NIBL

Fiscal Year	$(R_i - \bar{R}_i)$	$(R_m - \bar{R}_m)$	$(R_i - \bar{R}_i)(R_m - \bar{R}_m)$	Remarks
2001/02	-	-	-	$(R_i - \bar{R}_i)$ taken from table 4.4 ( $R_m - \bar{R}_m$ ) taken from table 4.16
2002/03	0.3516	-0.1413	0.0497	
2003/04	-0.5624	-0.4542	0.2554	
2004/05	-0.3397	0.0817	-0.0278	
2005/06	-0.3054	0.1093	-0.0334	
2006/07	0.4299	0.3132	0.1346	
<b>Total</b>			0.2791	

Where,

- n = No. of observations = 5
- $\dagger_m^2$  = Variation of Market Return
- $R_i$  = Return of stock NIBL
- $\beta_i$  = Beta coefficient

We have,

$$COV(R_i R_m) = \frac{\sum (R_i - \bar{R}_i)(R_m - \bar{R}_m)}{n - 1} = \frac{2.2791}{4} = 0.0698$$

$$S_i = \frac{COV(R_i R_m)}{\dagger_m^2} = \frac{0.0698}{(0.2927)^2} = \frac{0.0698}{0.0857} = 0.8145$$

## ANNEX NO. 8

### Calculation of beta coefficient of the C.S. of SCBNL

Year	$(R_i - \bar{R}_i)$	$(R_m - \bar{R}_m)$	$(R_i - \bar{R}_i)(R_m - \bar{R}_m)$	Remarks
2001/02	-	-	-	$(R_i - \bar{R}_i)$ taken from table 4.6 and $(R_m - \bar{R}_m)$ taken from table 4.16
2002/03	-0.4225	-01413	0.0597	
2003/04	-0.2413	-0.4542	0.1096	
2004/05	0.5113	0.0817	0.0418	
2005/06	0.0408	0.1093	0.00446	
2006/07	0.2892	0.3132	0.096	
Total			0.3062	

We have,

$$COV(R_i R_m) = \frac{\sum (R_i - \bar{R}_i)(R_m - \bar{R}_m)}{n - 1} = \frac{0.3062}{4} = 0.0765$$

$$S_i = \frac{COV(R_i R_m)}{\dagger_m^2} = \frac{0.0766}{(0.2927)^2} = \frac{0.0766}{0.0857} = 0.8938$$

Where,

- n = No. of observations = 5
- $\dagger_m^2$  = Variation of Market Return
- $R_i$  = Return of stock SCBNL
- $\beta_i$  = Beta coefficient

## ANNEX NO. 9

### Calculation of beta coefficient of the C.S. of HBL

Fiscal Year	$(R_i - \bar{R}_i)$	$(R_m - \bar{R}_m)$	$(R_i - \bar{R}_i)(R_m - \bar{R}_m)$	Remarks
2001/02	-	-	-	$(R_i - \bar{R}_i)$ taken from table 4.8 and $(R_m - \bar{R}_m)$ taken from table 4.16
2002/03	0.24084	-0.1413	-0.0340	
2003/04	0.11066	-0.4542	-0.0503	
2004/05	0.44916	0.0817	0.0367	
2005/06	0.0998	0.1093	0.0109	
2006/07	0.2104	0.3132	0.0686	
<b>Total</b>			0.0319	

Where,

- n = No. of observations = 5
- $\dagger_m^2$  = Variation of Market Return
- $R_i$  = Return of stock HBL
- $\beta_i$  = Beta coefficient

We have,

$$COV(R_i R_m) = \frac{\sum (R_i - \bar{R}_i)(R_m - \bar{R}_m)}{n-1} = \frac{0.0319}{4} = 0.007975$$

$$S_i = \frac{COV(R_i R_m)}{\dagger_m^2} = \frac{0.007975}{(0.2927)^2} = 0.0931$$

**ANNEX NO. 10**

**Calculation of beta coefficient of the C.S. of SBI**

Fiscal Year	$(R_i - \bar{R}_i)$	$(R_m - \bar{R}_m)$	$(R_i - \bar{R}_i)(R_m - \bar{R}_m)$	Remarks
2001/02	-	-	-	$(R_i - \bar{R}_i)$ taken from table 4.10 and $(R_m - \bar{R}_m)$ taken from annex no. 26
2002/03	0.7947	-0.1413	-0.1123	
2003/04	-0.0145	-0.4542	0.00659	
2004/05	1.10028	0.0817	0.0899	
2005/06	-0.2138	0.1093	-0.0234	
2006/07	0.5336	0.3132	0.1681	
<b>Total</b>			0.1289	

Where,

- n = No. of observations = 5
- $\uparrow_m^2$  = Variation of Market Return
- $R_i$  = Return of stock SBI
- $\beta_i$  = Beta coefficient

We have,

$$COV(R_i R_m) = \frac{\sum (R_i - \bar{R}_i)(R_m - \bar{R}_m)}{n-1} = \frac{0.1289}{4} = 0.0322$$

$$S_i = \frac{COV(R_i R_m)}{\uparrow_m^2} = \frac{0.0322}{(0.2927)^2} = \frac{0.0322}{0.0857} = 0.3757$$

### Annex No. 11

**Calculation of correlation of return ( $P_{AB}$ ), portfolio return  $[\overline{R}_p]$  and portfolio risk  $[\sigma_p]$  between NABIL and SCBNL.**

Fiscal Year	$[R_A - \overline{R}_A]$	$[R_B - \overline{R}_B]$	$[R_A - \overline{R}_A][R_B - \overline{R}_B]$	Remarks
2001/02	0.5561	0.4225	0.23495	$[R_A - \overline{R}_A]$ from
2002/03	- 0.2653	- 0.2413	0.0640	
2003/04	0.6653	0.5113	0.3402	



2004/05	0.1974	0.0408	0.0074	table 4.2 [R <sub>B</sub> - R̄ <sub>B</sub> ] from table 4.6
2005/06	0.1696	0.2892	0.0490	
<b>Total =</b>			$\sum [R_A - \bar{R}_A] [R_B - \bar{R}_B]$ $= 0.5961$	

Where,

$R_A$  = Realized return of common stock of NABIL

$\bar{R}_A$  = Expected return of common stock of NABIL

$R_B$  = Realized return of common stock of SCBNL

$\bar{R}_B$  = Expected return of common stock of SCBNL

$\sigma_A$  = Standard deviation of common stock of NABIL

$$= 0.4714$$

$\sigma_B$  = Standard deviation of common stock of SCBNL

$$= 0.3819$$

$n$  = Number of observations.

$P_{AB}$  = Correlation of returns between NABIL and SCBNL.

CoV [ $R_A, R_B$ ] = Covariance of returns between common stock of NABIL and SCBNL

We, know,

$$\text{CoV } [R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{0.6961}{5-1} = \frac{0.6961}{4} = 0.1740$$

$$\begin{aligned} P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\sigma_A \sigma_B} \\ &= \frac{0.1740}{0.4714 \times 0.3819} \\ &= \frac{0.1740}{0.180003} \end{aligned}$$

$$= 0.9665$$

Again, where,

$W_A$  = proportion of common stock of NABIL

$W_B$  = Proportion of common stock of SCBNL

$\bar{R}_p$  = Portfolio return between NABIL and SCBNL

$\dagger_p$  = portfolio of risk between NABIL and SCBNL

$\bar{R}_A$  = Expected return of NABI common stock.

$\bar{R}_B$  = Expected return of SCBNL common stock.

We know,

$$\begin{aligned} W_A &= \frac{\dagger_B^2 - CoV[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times CoV[R_A, R_B]} \\ &= \frac{(0.4714)^2 - 0.1740}{(0.3819)^2 + (0.4714)^2 - 2 \times 0.1740} \\ &= \frac{0.2222 - 0.1740}{0.1458 + 0.2222 - 0.348} \\ &= \frac{0.0482}{0.02} \\ &= 2.41 \end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - 2.41 = -1.41$$

$$\begin{aligned} \bar{R}_p &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\ &= 2.41 \times 0.3653 + (-1.41) \times 0.3718 \\ &= 0.8804 \times 0.5242 \\ &= 0.3562 \end{aligned}$$

We know,

$$\begin{aligned} \dagger_p &= \sqrt{W_A^2 \cdot \dagger_A^2 + W_B^2 \cdot \dagger_B^2 + 2W_A W_B \cdot CoV[R_A, R_B]} \\ &= \sqrt{(2.41)^2 \times (0.4714)^2 + (-1.41)^2 \times (0.3819)^2 + 2 \times 2.41 \times (-1.41) \times 0.1740} \\ &= \sqrt{5.8081 \times 0.2222 + 1.9881 \times 0.1458 - 1.1825} \\ &= \sqrt{1.2906 + 0.2899 - 1.1825} \\ &= \sqrt{1.5805 - 1.1825} \end{aligned}$$

$$\begin{aligned}
&= \sqrt{0.398} \\
&= 0.6309 \\
&= 0.6309 \times 100 \\
&= 63.09\%
\end{aligned}$$

### Annex No. 12

#### Calculation of correlation of return ( $P_{AB}$ ), portfolio return $[\bar{R}_p]$ and portfolio risk $[\dagger_p]$ between NABIL and HBL.

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A]$ $[R_B - \bar{R}_B]$	Remarks
2001/02	0.5561	0.24084	0.1339	$[R_A - \bar{R}_A]$ from table 4.2 $[R_B - \bar{R}_B]$ from table 4.8
2002/03	- 0.2653	0.11066	- 0.0294	
2003/04	0.6653	0.44916	0.2988	
2004/05	0.1947	0.0998	0.0194	
2005/06	0.1696	0.21904	0.0371	
<b>Total =</b>			$\sum [R_A - \bar{R}_A] [R_B - \bar{R}_B]$ = 0.4598	

Where,

$R_A$  = Realized return of common stock of NABIL

$\bar{R}_A$  = Expected return of common stock of NABIL

$R_B$  = Realized return of common stock of HBL

$\bar{R}_B$  = Expected return of common stock of HBL

$\sigma_A$  = Standard deviation of common stock of NABIL

$\dagger_B$  = Standard deviation of common stock of HBL

$n =$  Number of observations.

$P_{AB} =$  Correlation of returns between NABIL and HBL

$\text{CoV}[R_A, R_B] =$  Covariance of returns between common stock of NABIL and HBL

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{0.4598}{5-1} = \frac{0.9598}{4} = 0.11495$$

$$\begin{aligned} P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\uparrow_{A \times B}} \\ &= \frac{0.11495}{0.4714 \times 0.2872} \\ &= \frac{0.11495}{0.1354} \\ &= 0.84897 \end{aligned}$$

Again, where,

$W_A =$  proportion of common stock of NABIL

$W_B =$  Proportion of common stock of HBL

$\bar{R}_p =$  Portfolio return between NABIL and HBL

$\uparrow_p =$  portfolio of risk between NABIL and HBL

$\bar{R}_A =$  Expected return of NABI common stock.

$\bar{R}_B =$  Expected return of HBL common stock.

We know,

$$\begin{aligned} W_A &= \frac{\uparrow_B^2 - \text{CoV}[R_A, R_B]}{\uparrow_A^2 + \uparrow_B^2 - 2 \times \text{CoV}[R_A, R_B]} \\ &= \frac{(0.2872)^2 - 0.11495}{(0.4714)^2 + (0.2872)^2 - 2 \times 0.11495} \\ &= \frac{-0.03254}{0.0748} \\ &= -0.4338 \end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - (-0.4338) = 1 + 0.4338 = 1.4338$$

$$\begin{aligned} \bar{R}_p &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\ &= (-0.4338) \times 0.3653 + 1.4338 \times 0.00916 \\ &= -0.1585 + 0.0131 \\ &= -0.1454 \\ &= -14.54 \end{aligned}$$

We know,

$$\begin{aligned} \dagger_p &= \sqrt{W_A^2 \cdot \dagger_A^2 + W_B^2 \cdot \dagger_B^2 + 2W_A W_B \cdot CoV[R_A, R_B]} \\ &= \sqrt{(-0.4338)^2 \times (0.4714)^2 + (1.4338)^2 \times (0.2842)^2 + (-0.4338) \times (1.4338) \times 0.11495} \\ &= \sqrt{0.1882 \times 0.2222 + 2.0558 \times 0.0825 - 0.0715} \\ &= \sqrt{0.0418 + 0.1696 - 0.0715} \\ &= \sqrt{0.2114 - 0.0715} \\ &= \sqrt{0.1399} \\ &= 0.3740 \times 100 \\ &= 37.40\% \end{aligned}$$

### Annex No. 13

**Calculation of correlation of return ( $P_{AB}$ ), portfolio return [ $\bar{R}_p$ ] and portfolio risk [ $\dagger_p$ ] between NABIL and SBI.**

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A]$	Remarks

			$[R_B - \bar{R}_B]$	
2001/02	0.5561	0.7947	0.4419	$[R_A - \bar{R}_A]$ from table 4.2 $[R_B - \bar{R}_B]$ from table 4.10
2002/03	- 0.2653	-0.0145	0.0038	
2003/04	0.6653	1.10028	0.3720	
2004/05	0.1947	-0.2138	- 0.0416	
2005/06	0.1696	0.5368	0.0910	
<b>Total =</b>			$\sum [R_A - \bar{R}_A][R_B - \bar{R}_B]$ = 1.2271	

Where,

$R_A$  = Realized return of common stock of NABIL

$\bar{R}_A$  = Expected return of common stock of NABIL

$R_B$  = Realized return of common stock of SBI

$\bar{R}_B$  = Expected return of common stock of SBI

$\sigma_A$  = Standard deviation of common stock of NABIL

$\sigma_B$  = Standard deviation of common stock of SBI

$n$  = Number of observations.

$P_{AB}$  = Correlation of returns between NABIL and SBI

$\text{CoV}[R_A, R_B]$  = Covariance of returns between common stock of NABIL and SBI

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{1.2271}{5-1} = \frac{1.2271}{4} = 0.3068$$

$$P_{AB} = \frac{\text{CoV}[R_A, R_B]}{\sigma_A \sigma_B}$$

$$\begin{aligned}
&= \frac{0.3068}{0.4714 \times 0.7376} \\
&= \frac{0.3038}{0.3477} \\
&= 0.8824
\end{aligned}$$

Again, where,

$W_A$  = proportion of common stock of NABIL

$W_B$  = Proportion of common stock of SBI

$\bar{R}_p$  = Portfolio return between NABIL and SBI

$\dagger_p$  = portfolio of risk between NABIL and SBI

$\bar{R}_A$  = Expected return of NABI common stock.

$\bar{R}_B$  = Expected return of SBI common stock.

We know,

$$\begin{aligned}
W_A &= \frac{\dagger_B^2 - CoV[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times CoV[R_A, R_B]} \\
&= \frac{(0.7376)^2 - 0.3068}{(0.4714)^2 + (0.7376)^2 - 2 \times 0.3068} \\
&= \frac{0.5441 - 0.3068}{0.2222 + 0.5441 - 0.6136} \\
&= \frac{0.2373}{0.1527} \\
&= 1.5540
\end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - 1.5540 = -0.554$$

$$\begin{aligned}
\bar{R}_p &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\
&= 1.5540 \times 0.3653 + (-0.554) \times 0.3049 \\
&= 0.5577 - 0.1681 \\
&= 0.3996 \times 100 \\
&= 39.96\%
\end{aligned}$$

We know,

$$\begin{aligned}
\sigma_p &= \sqrt{W_A^2 \cdot \sigma_A^2 + W_B^2 \cdot \sigma_B^2 + 2W_A W_B \cdot \text{CoV}[R_A, R_B]} \\
&= \sqrt{(1.5540)^2 \times (0.4714)^2 + (-0.554)^2 \times (0.7376)^2 + 2 \times 1.5540 \times (-0.3068)} \\
&= \sqrt{2.4149 \times 0.2222 + 0.3069 \times 0.5441 - 0.5283} \\
&= \sqrt{0.5366 + 0.16698 - 0.5283} \\
&= \sqrt{0.7036 - 0.5283} \\
&= \sqrt{0.1753} \\
&= 0.4187 \times 100 \\
&= 41.87\%
\end{aligned}$$

#### Annex No. 14

**Calculation of correlation of return ( $P_{AB}$ ), portfolio return  $[\bar{R}_p]$  and portfolio risk  $[\sigma_p]$  between NIBL and SCBNL.**

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A][R_B - \bar{R}_B]$	Remarks
2001/02	0.3516	0.4225	0.1486	$[R_A - \bar{R}_A]$ from table 4.4 $[R_B - \bar{R}_B]$ from
2002/03	-	-	0.1357	
2003/04	0.5624	0.2413	-0.1737	
	-	0.5113	-0.1737	
2004/05	0.3397	0.0408	-0.0125	
	-	0.3054	-0.0125	
2005/06	0.4299	0.2892	0.1243	



<b>Total =</b>	$\frac{\sum [R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1}$ $= 0.2224$	table 4.6
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Where,

$R_A$  = Realized return of common stock of NIBL

$\bar{R}_A$  = Expected return of common stock of NIBL

$R_B$  = Realized return of common stock of SCBNL

$\bar{R}_B$  = Expected return of common stock of SCBNL

$\sigma_A$  = Standard deviation of common stock of NIBL

$\sigma_B$  = Standard deviation of common stock of SCBNL

$n$  = Number of observations.

$P_{AB}$  = Correlation of returns between NIBL and SCBNL

$\text{CoV}[R_A, R_B]$  = Covariance of returns between common stock of NIBL and SCBNL

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{0.2224}{5-1} = \frac{0.2224}{4} = 0.0556$$

$$\begin{aligned}
 P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\sigma_A \sigma_B} \\
 &= \frac{0.0556}{0.4565 \times 0.3819} \\
 &= \frac{0.0556}{0.1743} \\
 &= 0.31899
 \end{aligned}$$

Again, where,

$W_A$  = proportion of common stock of NIBL

$W_B$  = Proportion of common stock of SCBNL

$\bar{R}_p$  = Portfolio return between NIBL and SCBNL

$\dagger_p$  = portfolio of risk between NIBL and SCBNL

$\bar{R}_A$  = Expected return of NIBL common stock.

$\bar{R}_B$  = Expected return of SCBNL common stock.

We know,

$$\begin{aligned}W_A &= \frac{\dagger_B^2 - CoV[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times CoV[R_A, R_B]} \\&= \frac{(0.3819)^2 - 0.0556}{(0.4565)^2 + (0.3819)^2 - 2 \times 0.0556} \\&= \frac{0.1458 - 0.0556}{0.2084 + 0.1458 - 0.1112} \\&= \frac{0.0902}{0.243} \\&= 0.3712\end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - 0.3712 = 0.6288$$

$$\begin{aligned}\bar{R}_p &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\&= 0.3712 \times 0.1701 + 0.6288 \times 0.3718 \\&= 0.0613 + 0.2338 \\&= 0.2969 \times 100 \\&= 39.26\%\end{aligned}$$

We know,

$$\begin{aligned}\dagger_p &= \sqrt{W_A^2 \cdot \dagger_A^2 + W_B^2 \cdot \dagger_B^2 + 2W_A W_B \cdot CoV[R_A, R_B]} \\&= \sqrt{(0.3712)^2 \times (0.4565)^2 + (0.6288)^2 \times (0.3819)^2 + 2 \times 0.3712 \times 0.6288 \times 0.0556} \\&= \sqrt{0.1378 \times 0.2084 + 0.3954 \times 0.1458 + 0.02595} \\&= \sqrt{0.0287 + 0.0576 + 0.02595} \\&= \sqrt{0.1123} \\&= 0.3351 \times 100 \\&= 33.51\%\end{aligned}$$

### Annex No. 15

**Calculation of correlation of return ( $P_{AB}$ ), portfolio return  $[\bar{R}_p]$  and portfolio risk  $[\sigma_p]$  between NIBL and HBL**

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A]$ $[R_B - \bar{R}_B]$	Remarks
2001/02	0.3516	0.24084	0.0847	$[R_A - \bar{R}_A]$ from table 4.4 $[R_B - \bar{R}_B]$ from table 4.8
2002/03	- 0.5624	0.11066	- 0.0622	
2003/04	- 0.3397	0.44916	- 0.1526	
2004/05	- 0.3054	0.0998	- 0.0305	
2005/06	0.4299	0.21904	0.0942	
<b>Total =</b>			$\sum [R_A - \bar{R}_A] [R_B - \bar{R}_B]$ = - 0.0664	

Where,

$R_A$  = Realized return of common stock of NIBL

$\bar{R}_A$  = Expected return of common stock of NIBL

$R_B$  = Realized return of common stock of HBL

$\bar{R}_B$  = Expected return of common stock of HBL

$\sigma$  = Standard deviation of common stock of NIBL

$\dagger_B$  = Standard deviation of common stock of HBL

$n$  = Number of observations.

$P_{AB}$  = Correlation of returns between NIBL and HBL

$\text{CoV}[R_A, R_B]$  = Covariance of returns between common stock of NIBL and HBL

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{-0.0664}{5-1} = \frac{-0.0664}{4} = 0.0928$$

$$\begin{aligned} P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\dagger_A \dagger_B} \\ &= \frac{-0.0166}{0.4565 \times 0.2872} \\ &= \frac{-0.0166}{0.1311} \\ &= -0.1266 \end{aligned}$$

Again, where,

$W_A$  = proportion of common stock of NIBL

$W_B$  = Proportion of common stock of HBL

$\bar{R}_p$  = Portfolio return between NIBL and HBL

$\dagger_p$  = portfolio of risk between NIBL and HBL

$\bar{R}_A$  = Expected return of NIBL common stock.

$\bar{R}_B$  = Expected return of HBL common stock.

We know,

$$\begin{aligned} W_A &= \frac{\dagger_B^2 - \text{CoV}[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times \text{CoV}[R_A, R_B]} \\ &= \frac{(0.2872)^2 - (-0.0166)}{(0.4565)^2 + (0.2872)^2 - 2 \times 0.0166} \\ &= \frac{0.0825 + 0.0166}{0.2084 + 0.0825 + 0.0332} \end{aligned}$$

$$= \frac{0.0991}{0.3241}$$

$$= 0.3058$$

$$\therefore W_B = 1 - W_A = 1 - 0.3058 = 0.6942$$

$$\begin{aligned} \bar{R}_P &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\ &= 0.3058 \times 0.1701 + 0.6942 \times 0.00916 \\ &= 0.0520 + 0.0064 \\ &= 0.0584 \times 100 \\ &= 5.84\% \end{aligned}$$

We know,

$$\begin{aligned} \sigma_p &= \sqrt{W_A^2 \cdot \sigma_A^2 + W_B^2 \cdot \sigma_B^2 + 2W_A W_B \cdot \text{CoV}[R_A, R_B]} \\ &= \sqrt{(0.3058)^2 \times (0.4565)^2 + (0.6942)^2 \times (0.2872)^2 + 2 \times 0.3058 \times 0.6942 \times 0.0166} \\ &= \sqrt{0.0935 \times 0.2084 + 0.4819 \times 0.0825 - 0.0070} \\ &= \sqrt{0.0593 - 0.0070} \\ &= \sqrt{0.0523} \\ &= 0.2287 \times 100 \\ &= 22.87\% \end{aligned}$$

## Annex No. 16

**Calculation of correlation of return ( $P_{AB}$ ), portfolio return [ $\bar{R}_p$ ] and portfolio risk [ $\dagger_p$ ] between SCBNL and HBL**

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A] [R_B - \bar{R}_B]$	Remarks
2001/02	0.4225	0.24084	0.1018	$[R_A - \bar{R}_A]$ from table 4.6 $[R_B - \bar{R}_B]$ from table 4.8
2002/03	-	-	-	
2002/03	0.2413	0.11066	0.0267	
2003/04	0.5113	0.44916	0.2297	
2004/05	0.0408	0.0998	0.0041	
2005/06	0.2892	0.21904	0.0633	
<b>Total =</b>			$\sum [R_A - \bar{R}_A] [R_B - \bar{R}_B]$ $= 0.3722$	

Where,

$R_A$  = Realized return of common stock of SCBNL

$\bar{R}_A$  = Expected return of common stock of SCBNL

$R_B$  = Realized return of common stock of HBL

$\bar{R}_B$  = Expected return of common stock of HBL

$\sigma_A$  = Standard deviation of common stock of SCBNL

$\sigma_B$  = Standard deviation of common stock of HBL

$n$  = Number of observations.

$P_{AB}$  = Correlation of returns between SCBNL and HBL

CoV [ $R_A, R_B$ ] = Covariance of returns between common stock of SCBNL and HBL

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{0.3722}{5-1} = \frac{0.3722}{4} = 0.0931$$

$$\begin{aligned} P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\dagger_{A \times} \dagger_B} \\ &= \frac{0.0931}{0.3819 \times 0.2872} \\ &= \frac{0.0931}{0.1097} \\ &= 0.8487 \end{aligned}$$

Again, where,

$W_A$  = proportion of common stock of SCBNL

$W_B$  = Proportion of common stock of HBL

$\bar{R}_p$  = Portfolio return between SCBNL and HBL

$\dagger_p$  = portfolio of risk between SCBNL and HBL

$\bar{R}_A$  = Expected return of SCBNL common stock.

$\bar{R}_B$  = Expected return of HBL common stock.

We know,

$$\begin{aligned} W_A &= \frac{\dagger_B^2 - \text{CoV}[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times \text{CoV}[R_A, R_B]} \\ &= \frac{(0.2872)^2 - 0.0931}{(0.3819)^2 + (0.2872)^2 - 2 \times 0.0931} \\ &= \frac{0.0825 - 0.0913}{0.1458 + 0.0825 - 0.1862} \\ &= \frac{-0.0106}{0.0421} \\ &= -0.2518 \end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - (-0.2518) = 1 + 0.2518 = 1.2518$$

$$\bar{R}_p = W_A \times \bar{R}_A + W_B \times \bar{R}_B$$

$$\begin{aligned}
&= 0.2518 \times 0.3718 + 1.2518 \times 0.00916 \\
&= 0.0936 + 0.0115 \\
&= 0.1051 \times 100 \\
&= 10.51\%
\end{aligned}$$

We know,

$$\begin{aligned}
\sigma_p &= \sqrt{W_A^2 \cdot \sigma_A^2 + W_B^2 \cdot \sigma_B^2 + 2W_A W_B \cdot \text{CoV}[R_A, R_B]} \\
&= \sqrt{(-0.2518)^2 \times (0.3819)^2 + (1.2518)^2 \times (0.2872)^2 + 2 \times (-0.2518) \times (1.2518) \times (0.0913)} \\
&= \sqrt{0.0634 \times 0.1458 + 1.5670 \times 0.0825 - 0.0587} \\
&= \sqrt{0.0798} \\
&= 0.2825 \times 100 \\
&= 28.25\%
\end{aligned}$$



### Annex No. 17

#### Calculation of correlation of return ( $P_{AB}$ ), portfolio return [ $\bar{R}_p$ ] and portfolio risk [ $\dagger_p$ ] between SCBNL and SBI

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A] [R_B - \bar{R}_B]$	Remarks
2001/02	0.4225	0.7947	0.3358	$[R_A - \bar{R}_A]$ from table 4.6 $[R_B - \bar{R}_B]$ from table 4.10
2002/03	- 0.2413	-0.0145	0.0035	
2003/04	0.5113	1.10028	0.5626	
2004/05	0.0408	-0.2138	- 0.0082	
2005/06	0.2892	0.5368	0.1152	
<b>Total =</b>			$\sum [R_A - \bar{R}_A] [R_B - \bar{R}_B]$ = 1.0089	

Where,

$R_A$  = Realized return of common stock of SCBNL

$\bar{R}_A$  = Expected return of common stock of SCBNL

$R_B$  = Realized return of common stock of SBI

$\bar{R}_B$  = Expected return of common stock of SBI

$\sigma_A$  = Standard deviation of common stock of SCBNL

$\dagger_B$  = Standard deviation of common stock of SBI

n = Number of observations.

$P_{AB}$  = Correlation of returns between SCBNL and SBI

CoV [ $R_A, R_B$ ] = Covariance of returns between common stock of SCBNL and SBI

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{1.0089}{5-1} = \frac{1.0089}{4} = 0.2522$$

$$\begin{aligned} P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\dagger_A \dagger_B} \\ &= \frac{0.2522}{0.3819 \times 0.7376} \\ &= \frac{0.2522}{0.2817} \\ &= 0.8953 \end{aligned}$$

Again, where,

$W_A$  = Proportion of common stock of SCBNL

$W_B$  = Proportion of common stock of SBI

$\bar{R}_p$  = Portfolio return between SCBNL and SBI

$\dagger_p$  = Portfolio of risk between SCBNL and SBI

$\bar{R}_A$  = Expected return of SCBNL common stock.

$\bar{R}_B$  = Expected return of SBI common stock.

We know,

$$\begin{aligned} W_A &= \frac{\dagger_B^2 - \text{CoV}[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times \text{CoV}[R_A, R_B]} \\ &= \frac{(0.7376)^2 - 0.2522}{(0.3819)^2 + (0.7376)^2 - 2 \times 0.2522} \\ &= \frac{0.5441 - 0.2522}{0.1458 + 0.5441 - 0.5044} \\ &= \frac{0.2919}{0.6899 - 0.5044} \\ &= \frac{0.2919}{0.1855} \\ &= 1.5736 \end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - 0.1622 = 0.8378$$

$$\begin{aligned}
\bar{R}_P &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\
&= 0.1622 \times 1.2860 + 0.8378 \times 0.3704 \\
&= 0.5189 \times 100 \\
&= 51.89\%
\end{aligned}$$

We know,

$$\begin{aligned}
\sigma_P &= \sqrt{W_A^2 \cdot \sigma_A^2 + W_B^2 \cdot \sigma_B^2 + 2W_A W_B \cdot \text{CoV}[R_A, R_B]} \\
&= \\
&= \sqrt{(1.5736)^2 \times (0.3819)^2 + (-0.5736)^2 \times (0.7376)^2 + 2 \times 1.5736 \times 0.2522} \\
&= \sqrt{2.4762 \times 0.1458 + 0.3290 \times 0.5441 - 0.2892} \\
&= \sqrt{0.3610 + 0.1790 - 0.2892} \\
&= \sqrt{0.2508} \\
&= 0.5008 \times 100 \\
&= 50.08\%
\end{aligned}$$

## Annex No. 18

**Calculation of correlation of return ( $P_{AB}$ ), portfolio return [ $\bar{R}_p$ ] and portfolio risk [ $\dagger_p$ ] between HBL and SBI**

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A][R_B - \bar{R}_B]$	Remarks
2001/02	0.24084	0.7947	0.1914	$[R_A - \bar{R}_A]$ from table 4.8 $[R_B - \bar{R}_B]$ from table 4.10
2002/03	0.1106	- 0.0145	- 0.0016	
2003/04	0.44916	1.1003	0.4942	
2004/05	0.0998	- 0.2138	- 0.0213	
2005/06	0.21904	0.5368	0.1176	
<b>Total =</b>			$\sum [R_A - \bar{R}_A][R_B - \bar{R}_B]$ $= 0.7803$	

Where,

$R_A$  = Realized return of common stock of HBL

$\bar{R}_A$  = Expected return of common stock of HBL

$R_B$  = Realized return of common stock of SBI

$\bar{R}_B$  = Expected return of common stock of SBI

$\sigma_A$  = Standard deviation of common stock of HBL

$\dagger_B$  = Standard deviation of common stock of SBI

$n$  = Number of observations.

$P_{AB}$  = Correlation of returns between HBL and SBI

$CoV [R_A, R_B]$  = Covariance of returns between common stock of HBL and SBI

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{0.7803}{5-1} = \frac{0.7803}{4} = 0.1951$$

$$\begin{aligned} P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\dagger_A \dagger_B} \\ &= \frac{0.1951}{0.2872 \times 0.7376} \\ &= \frac{0.1951}{0.2118} \\ &= 0.9212 \end{aligned}$$

Again, where,

$W_A$  = Proportion of common stock of HBL

$W_B$  = Proportion of common stock of SBI

$\bar{R}_p$  = Portfolio return between HBL and SBI

$\dagger_p$  = Portfolio of risk between HBL and SBI

$\bar{R}_A$  = Expected return of HBL common stock.

$\bar{R}_B$  = Expected return of SBI common stock.

We know,

$$\begin{aligned} W_A &= \frac{\dagger_B^2 - \text{CoV}[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times \text{CoV}[R_A, R_B]} \\ &= \frac{(0.7376)^2 - (0.1951)}{(0.2872)^2 + (0.7376)^2 - 2 \times (0.1951)} \\ &= \frac{0.5441 - 0.1951}{0.0825 + 0.5441 - 0.3902} \\ &= \frac{0.349}{0.6266 - 0.3902} \\ &= \frac{0.349}{0.2364} \\ &= 1.4763 \end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - 1.4763 = -0.4763$$

$$\begin{aligned}\bar{R}_p &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\ &= 1.4763 \times 0.1092 + (-0.4763) \times 0.3049 \\ &= 0.1612 - 0.1452 \\ &= 0.016\end{aligned}$$

We know,

$$\begin{aligned}\sigma_p &= \sqrt{W_A^2 \cdot \sigma_A^2 + W_B^2 \cdot \sigma_B^2 + 2W_A W_B \cdot \text{CoV}[R_A, R_B]} \\ &= \sqrt{(1.4763)^2 \times (0.2872)^2 + (-0.4763)^2 \times (0.7376)^2 + 2 \times 1.4763 \times (-0.4763) \times 0.1951} \\ &= \sqrt{0.1798 + 0.1235 - 0.2744} \\ &= \sqrt{0.0289} \\ &= 0.17 \times 100\end{aligned}$$

$$= 17\%$$

## Annex No. 18

### Calculation of correlation of return ( $P_{AB}$ ), portfolio return [ $\bar{R}_p$ ] and portfolio risk [ $\dagger_p$ ] between NIBL and SBI

Fiscal Year	$[R_A - \bar{R}_A]$	$[R_B - \bar{R}_B]$	$[R_A - \bar{R}_A][R_B - \bar{R}_B]$	Remarks
2001/02	0.3516	0.7947	0.2794	$[R_A - \bar{R}_A]$ from table 4.4 $[R_B - \bar{R}_B]$ from table 4.10
2002/03	- 0.5624	- 0.0145	0.0082	
2003/04	- 0.3397	1.1003	-0.3738	
2004/05	- 0.3054	- 0.2138	0.0653	
2005/06	0.4299	0.5368	0.2308	
<b>Total =</b>			$\sum [R_A - \bar{R}_A][R_B - \bar{R}_B]$ $= 0.2099$	

Where,

$R_A$  = Realized return of common stock of NIBL

$\bar{R}_A$  = Expected return of common stock of NIBL

$R_B$  = Realized return of common stock of SBI

$\bar{R}_B$  = Expected return of common stock of SBI

$\sigma_A$  = Standard deviation of common stock of NIBL

$\dagger_B$  = Standard deviation of common stock of SBI

n = Number of observations.

$P_{AB}$  = Correlation of returns between NIBL and SBI

CoV [ $R_A, R_B$ ] = Covariance of returns between common stock of NIBL and SBI

We, know,

$$\text{CoV}[R_A, R_B] = \frac{[R_A - \bar{R}_A][R_B - \bar{R}_B]}{n-1} = \frac{0.2099}{5-1} = \frac{0.2099}{4} = 0.0525$$

$$\begin{aligned} P_{AB} &= \frac{\text{CoV}[R_A, R_B]}{\dagger_A \dagger_B} \\ &= \frac{0.0525}{0.4565 \times 0.7376} \\ &= \frac{0.0525}{0.3367} \\ &= 0.1559 \end{aligned}$$

Again, where,

$W_A$  = Proportion of common stock of NIBL

$W_B$  = Proportion of common stock of SBI

$\bar{R}_p$  = Portfolio return between NIBL and SBI

$\dagger_p$  = Portfolio of risk between NIBL and SBI

$\bar{R}_A$  = Expected return of NIBL common stock.

$\bar{R}_B$  = Expected return of SBI common stock.

We know,

$$\begin{aligned} W_A &= \frac{\dagger_B^2 - \text{CoV}[R_A, R_B]}{\dagger_A^2 + \dagger_B^2 - 2 \times \text{CoV}[R_A, R_B]} \\ &= \frac{(0.7376)^2 - (0.0525)}{(0.4565)^2 + (0.7376)^2 - 2 \times (0.0525)} \\ &= \frac{0.5441 - 0.0525}{0.2084 + 0.5441 - 0.105} \\ &= \frac{0.4916}{0.7525 - 0.105} \\ &= \frac{0.4916}{0.6475} \\ &= 0.7592 \end{aligned}$$

$$\therefore W_B = 1 - W_A = 1 - 0.7592 = 0.2408$$



$$\begin{aligned}
\bar{R}_p &= W_A \times \bar{R}_A + W_B \times \bar{R}_B \\
&= 0.7592 \times 0.1701 + (0.2408) \times 0.3049 \\
&= 0.1291 + 0.0734 \\
&= 0.2025 \times 100 \\
&= 20.25\%
\end{aligned}$$

We know,

$$\begin{aligned}
\sigma_p &= \sqrt{W_A^2 \cdot \sigma_A^2 + W_B^2 \cdot \sigma_B^2 + 2W_A W_B \cdot \text{CoV}[R_A, R_B]} \\
&= \sqrt{(0.7592)^2 \times (0.4565)^2 + (0.2408)^2 \times (0.7376)^2 + 2 \times 0.7592 \times (0.2408) \times 0.0525} \\
&= \sqrt{0.1201 + 0.0315 + 0.0192} \\
&= \sqrt{0.1708} \\
&= 0.4133 \times 100 \\
&= 41.32\%
\end{aligned}$$