

# CHAPTER - I

## INTRODUCTION

### 1.1 BACKGROUND OF THE STUDY

Nepal has agriculture dominated economics where most of the populations are engaged in farming. So it is obvious that contribution of this sector in national economy is huge. But in recent years non agriculture sector is significantly contributing in national economy. Due to political insurgency manufacturing sector is not growing as expected but service sector is growing rapidly within service sector banking industry is growing in high rate than it was anticipated. Banking sector is the most dynamic part of economy, which collects unused funds and mobilizes it in needed areas. It is the heart trade commerce industry. In Nepalese context commercial banks have comparatively good performance among the public limited companies? The nature of bank fund and its payment depends upon day-to-day operation. Therefore its operation of fund raising and investments of funds are of short-term nature. As long term investments are associated with higher risk. Banks are confined to make short-term investments only. R W Goldsmith suggests that significance of commercial banks is greater in countries of comparatively lower level of economic development. The shares of commercial banks in the net issues of all financial institution are much higher in such countries in the ones with higher stage of economic development. There are different types of securities as treasury bills, long term government bonds long-term corporate bonds, common stocks etc. among these securities this study concerns with common stocks. Common stocks represent a commitment on the part of a corporation to pay periodically whatever its board of directors deems appropriate as a cash dividend.

Common stockholders of a company are its ultimate owners. Collectively they own the company and it is assumed that ultimate risk is associated with ownership. So the

common stock is risky security. Investor invests in common stock for higher return. But their expected return may or may not change in realities. This uncertainty is major risk to investors in stock market investment. The return is income received on investments, which is expressed as dividend plus any change in market price of share and usually expressed in percent. Both market price of share and dividend are uncertain figures. So the actual figure of return on investment in common stock may differ substantially from the expected return. The greater variability the riskier the security is said to be. The market price of share of a company is driven both by fundamental business values and stock market sentiment. For a given business it is always.

Worth attempting to identify which of those is driving its share price. So far as the stock market is concerned it is an important constituent of capital market. It has wide term embracing the buyers and sellers of securities and resale of corporate securities. Stock market is a financial market, which probably has the greatest glamour, and perhaps the least understood. Some observers consider it as a legalized heaven for gambling and many investors consider stock market investing as a game in which the sole purpose is picking winners. Having said these stock market investments can be both rewarding and fun so long as sufficient time is given to appreciate its many facet and characteristics.

In recent years field of finance has truly undergone a revolution and it is one of the leading sector stock market has become a global phenomenon. Even in the least developed country like Nepal stock market is one of the important part of the national economy justification for encouragement of the stock market is taken not only on the ideological background but also on the assumption that stock market expansion is partly a natural progression of the development of a country financial sector as long term economic growth progress.

## 1.2 History of Banking Development

History tells us that it was the merchant who first evolved the system of banking by trading in commodities than money. Reviewing the history we can find that present day banker has three ancestors of particular note. One the merchant and two other were lender and the goldsmith. Lending and borrowing are almost as old as money itself. But modern banking sowed its se in medieval Italy. The bank of Venice, founded in 1157 A.D. was the first public banking institution. Subsequently bank of Barcelona 1401 and bank of Genoa 1407 were established. The Lombard migrated to England and other parts of Europe from Italy are regarded for the development and expansion of the modern banking. Ancestors Geoffrey couter says that the merchant goldsmith and money lenders are the ancestors of modern banking.

Though bank of England was established in 1694 as a joint stock bank and later on it became the first bank in the world in 1844, the growth of bank accelerated only after the introduction of banking act 1833 in united kingdom as it allows to open joint stock commercial banking system development in the lending countries of the world.

Though the modern banking system is a very recent origin in Nepal to compare to other developing nations, some operations alike to banking were known and have been practiced even in ancient times.

Prior to the establishment of the Nepal bank limited there was no organized financial institution in Neola. During the prime ministers ship of Ranoddip Singh around 1877 AD a number of economic and financial reforms were introduced. The establishment of the "Tejarath adda" fully subscribed by the government in the Katmandu valley was one of them. In the overall development of the banking system in Nepal the "Tejarath adda" may be regarded as the father of modern banking institution and for quite a long time it tended a good service to government servants as well as to the general public. However the installation of "Kausi tosha khana" as a banking agency during the regime

of King Prithivi Narayan Shah could also claim to be regarded as the first step towards initiating banking development in Nepal.

The inception of Nepal Bank Limited in 1937 AD was a landmark in the field of banking and financial sector in Nepal. It was established under the Special Banking Act 1936 AD having elementary functions of a commercial bank as a semi-government organization, without the existence of a central bank in the country. After the founding of Nepal Bank Limited, the organized expansion of banking was apprehended. Nepal Rastra Bank, the central bank, was established on 26<sup>th</sup> April 1956 with an authorized capital of Rs. 10 million subscribed by the HMG/N under the Nepal Rastra Bank Act of 1955. The main purpose is to help the government in formulating monetary policies with objectives of supervising, protecting and directing the functions of commercial banking activities. It has acted as a government's agent and has contributed to the financial growth of the country's economy. In order to facilitate the people all over the country, the government established the second commercial bank named Rastriya Banijya Bank in 2022 (B.S.) which is fully owned and controlled by the Nepalese government. With a view to promote the development and modernization of the agriculture sector, the Agriculture Development Bank was established in 2024 B.S. under the Agriculture Development Bank Act 2024. And the Security Exchange Centre was also set up to enhance the capital market. The successful establishment of Nabil Bank Limited as the first joint venture bank and the liberal economic policy adopted by the successive government, more commercial banks came into existence. Till now 25 commercial banks are in Nepal, out of which Sunrise Bank Limited is the last one operating in the Nepalese market. Out of 25 banks, 6 are joint stock banks.

During the mid 80s, the government adopted the policy of liberalization which attracted foreign banks to come to Nepal. In 1984 (2041 B.S.) NABIL Bank Ltd. was established as the first joint venture bank. After the restoration of democracy in 1990, Nepal adopted a democratic constitution that was lauded as the best social-legal document in the world. Further, the economy was liberalized with a view of enhancing private sector participation.

in various spheres. As consequences as in the most to the countries, Nepalese financial sector is largely dominated by the banking sector. Under the commercial banking sphere, majority occupied by large number of joint venture banks.

NABIL bank, Nepal Indosuez bank Ltd (Nepal investment bank) Nepal Grindlays bank Ltd (now standard chartered bank Ltd.) Himalayan bank Ltd. Nepal SBI bank Ltd. Nepal Bangladesh bank Ltd. Everest bank Ltd. Bank of Ceylon (now Nepal credit and commerce bank Ltd.) was established as a joint venture bank. Out of which Nepal Indosuez bank was take over by Nepalese investors like wise bank of Ceylon. Now only NABIL, SCBL, NBBL, SBI, EBL and HBL are in existence as joint venture bank.

Quantitative operative commercial banks although are giving some choosing right of banking service but overall competitive environment have not been created yet. NRB and NBL have lost their faith to public. Which are now in reconstruction process through privatization (management contract). In urban areas standard chartered bank, Himalayan bank Ltd, NABIL bank Ltd, Nepal investment bank Ltd., has been dominating the segment of commercial banking. On the other hand there are some banks from other country whose domestic banking system is not properly supervised by their home country Central banks. In regard of other Nepalese private commercial bank some of them are not far from the critics. But it is not the time to evaluate the performance of some recent originated young commercial banking financial activities. (Business law journal 2003:15-18).

### **Commercial bank**

A commercial bank is one, which exchange money, deposits money, accepts deposits, grants loans and performs. Commercial banking function which is not a bank meant for cooperatives, agriculture, industries or for such specific purpose. (Commercial bank act (2013B.S.). Bank provides funds to needed person and accepts funds from savers. It accepts various types of deposits, lends money in productive sector, provides facility of

guarantee, exchange foreign currency, remittance discounting of bills, L.C. etc. to its customers. It involves in the agency services like remitting and collecting cash on behalf of its clients opening bank draft and L.C. facilities underwriting shares of newly established companies etc. with the advancement of technology it provides facilities like credit card visa card ATM tale banking and mobile banking and so on. In short bank helps people in every sector of economy e.g. trade, industry, agriculture etc. till date there are 23 commercial banks operating in Nepalese market.

### **Joint Venture Bank:**

In global perspectives, joint venture are a mode of trading through partnership among nations and also a form of negotiation between various group of industries and trader to achieve mutual exchange of goods and services for sharing comparative advantages.

A joint venture bank is defined as the joining of forces between two or more enterprises for the purpose of carrying out a specific operation i.e. industrial, commercial investment or trade. Simply we can define as any agreement between two or more than two parties for specific purpose is called joint venture.

In the fiscal year 2039/40, new banking policy was introduced for the establishment of new banks by the joint investment of foreign nations. Its objectives were to create healthy, competitive banking system to provide cheap banking facilities to the people and to meet the shortage of finds needed for investment in the development work. After the introduction of new policy Nepal Arab Bank limited (NABIL) was established in 1984 A.D (2041 B.S.) Thereafter, Nepal Indosuez Bank limited in 1985, Nepal Grind lays Bank (now Standard Chartered Bank limited) in 1986 under the collaboration between Nepal and

Grindlays bank of London. After democracy in 1990, the then government took economic liberalization then there was a massive entrance of foreign bank as a joint venture with Nepalese investors. The establishment of Himalayan bank Limited in 1992 as a joint venture with Habib bank Ltd, Pakistan. Nepal Bangladesh bank Limited in 1992 as a joint venture with Bangladesh bank, Bangladesh. Everest bank Limited in 1992 joins hand with Punjab national bank, India. Bank of Ceylon (now Nepal credit and commerce bank) as a joint venture with Sri-lanks bank, Srilanka. Nepal SBI bank Limited in 1993 A.D. associate with state bank of India- India's premier bank, India. This shows an expansion of Joint Venture Bank in Nepal.

In global prospective, JVs are the model of credit through partnership among and also from of negotiation between various groups of traders and industrious to achieve mutual exchange of goods and services for sharing competitive advantages. From the above definition, it is clear that JV is single business deal that is jointly undertaken by two or more persons or parties with the view of making and sharing profit.

### **Portfolio**

Investment in two or more 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 bond, stock etc. Portfolio means the risk of holding in securities owned by an investor or institution. (Oxford dictionary of financial and banking new edition 1997) a portfolio simply represents the practice among the investors of having their funds in more than one asset. The combination of investment assets is called portfolio. Portfolio theory deals with the selection of optimum portfolios; that is portfolio that provides the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return.(Weston and Copeland,1992)

According to Weston & Brigham, "A portfolio simply represents the practice among the investors of having their funds in more than one asset. The combination of investment assets is called a portfolio." (Weston & Brigham, 1982:245). According to Raymond Brockington, "The term 'portfolio' simply means collection of investments. For an investor through the stock exchange the portfolio will be a collection of shareholding in different companies. For a property, investor has portfolio will be a collection of buildings. To a financial manager within an industrial company has portfolio will be a collection of a real capital projects. It will be apparent that the actual of the components of a portfolio depends on the population of opportunities from which the selection has been made." (Relly and Brown; 2004:148)

It has following two types of objectives.

**1. Primary objectives:**

1) To minimize risk 2) to maximize return

**2. Secondary objectives:**

1) Regular returns 2) Stable income 3) Safety of investment 4) Tax benefit

5) Appreciation of capital

### **1.3 Statement of the Problem**

Due to the lack of the information and poor knowledge individual investors are manipulated or exploited by the financial institution or the market intermediaries to such an extent that investing in common stock is intolerable hazardous. But investors are responsible to make rational investment decision rather than switching blame to others. For this purpose knowledge is essential. Investor's attitude and perceptions also play a vital role in rational decision. Previous research 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 risk. Not only general public but also even most of the university graduates and postgraduates in commerce or business administration cannot perfectly analyze the risk and return in stock market investment. There are no any separate institutions which give such valuable information that accelerates the stock investment and market efficiency.

Government policy is less encouraging proper investment situations. Some plans and policies are not implemented. There are no strong commitment towards increasing public investment in policy makers and government. Investors are the bases for any company they are the sources of revenue as a customer for the stock brokers and financial institutions and ultimately they are the backbone of economic development of the nation. But any above body has no any effective program to develop investor's knowledge.

People feel more risk in stock investment than its real risk which may due to lack of proper knowledge about the stocks he/she is trading in due to the false presentation of stock prices in the secondary market. To build their confidence unbiased analysis and information about it is a must. Unavailability of a simple and clear way or technique to analyze risk and return of individual stock and portfolio is therefore being a major weakness to increase stock investment and stock market efficiency as well.

This study will be helpful to investors regarding the risk return statistics association with investment. Analysis of comparative study among various banks will be benefited for them to know about the position of financial performance. Risk return analysis and portfolio theory will create awareness to utilize their scarce resources with optimization. The customers financing agencies and stock traders are interested in the performance of the banks and they can identify as to which bank they should invest. This study will be helpful to know about the portfolio management taken by Nepalese investors and financial institution. Considering the above in mind, following problems are identified which are to be researched.

- 1) Does the risk and return of commercial banks vary significantly?
- 2) What are the comparative risk positions of commercial banks?
- 3) Would portfolio construction within the commercial banks be profitable?
- 4) How can investors diversify the risk within commercial banks?

## **1.4 Objective of the Study**

The main and basic objectives of this study are to find out the condition of portfolio investment, and to estimate an optimal portfolio among the common stock investment of five selected commercial Banks. The basic objective of the study is to estimate the portfolio on common stock investment of commercial banks in Nepal.

The specific objectives of the study are as follows:

- To evaluate the common stocks of selected commercial Banks in terms of risk and return.
- To study risk and return associated with common stock investment of selected commercial bank.
- To examine systematic and unsystematic risk associated with stock.
- To determine whether the share of selected commercial banks in Nepal are over-priced, under priced or correctly priced.

## **1.5 Significance of the Study**

Investment decision depends upon two factors i.e. risk and return. The return is defined as the reward for bearing the risk. Return is the most important outcome from an investment. Return from stock can be of holding period return, return from speculation or from short sell, capital gain and dividend gain etc. But return to investor is ever followed by risk, which is known as the occurrence of unfavorable outcomes and is ever harmful for the business. Many times, investor blindly invest their money with the hope of getting good return in their investment able funds but due to the many reasons they lose their hard earning while investment made without analyzing the risk

and return involved in the stocks. Other hand the increasing number of the bank and financial institution has created a competitive environment in financial sectors. Those, to get the maximum return from a minimum level of risk, the investor should diversify its investment by the means of portfolio with analysis the risk and return. So, our main focus of the study is to measure and analysis the financial performance of Joint Venture Banks, their risk & return, and portfolio patterns etc. to make sound investment decision.

As discussed above main target of the study is that potential investor who wants to invest in security but repel by imaginary or unreal risk. So the study will be more significant for exploring and increasing stock investment. Study not only used a partial fulfillment of TU course of MBS but it also will provide little contribution to Nepalese stock market development.

During the period of last decade due to political conflict investors were skeptical to invest. After the political change in 2063 BS people participation in security investment and stock trading is increasing. This situation indicates that there is a high potentially in stock investment. These potentialities can change into fruitful investment by increasing transparency, increasing information flow and developing analytical power of public sector investors which ultimately increase national economic health. This study will give information about Nepalese capital market by analyzing risk and return and their portfolio will definitely contribute to increase the analytical power if the investors in capital market.

## **1.6 Limitation of the Study**

This study is simply a partial study for the fulfillment of MBS degree. Hence this study is not far from several limitations of its own kind which weaken the heart of the study. It has certain limitations. This study has employed secondary data published by and

collected from selected banks. So the consistency of findings and conclusions are dependent upon the reliability of secondary data and information.

- Among the various commercial banks only five commercial banks are taken under study. The study covers a period of six fiscal years which will be tabulated and processed for drawing conclusion.
- The study concentrates only on those factors which are related with common stock and available in the form required for analyzing the different issues.
- The accuracy of the research work will be dependent on data provided by concerned bank differential coverage of data limits the study.

## **1.7 Organization of the Study**

This research has been organized in five chapters as below:

### **Chapter I: Introduction:**

The first chapter deals with introduction. This includes background, statement of problem, objectives of the study, significance of the study, limitation of the study.

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

Second chapter presents review of available literature. It includes review from book, reports, article journal, previous thesis etc.

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

Third chapter incorporates the research methodology used in the study, which includes research design, sources of data population and samples, methods of data collection and analysis etc.

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

The fourth chapter deals with data collected from different sources. Based on the data analysis of analysis of investors' preferences will be made using statistical and non-statistical tools. This chapter also includes major findings.

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

The fifth chapter includes summary, conclusion and offers suggestions for further improvement.

## CHAPTER- II

### REVIEW OF LITERATURE

This chapter deals with the study of past research studies and relevant materials. It is an advancement of existing knowledge and in-depth study of subject matters. It starts with a search of a suitable topic and continuous throughout the volumes of similar or related subjects. This chapter with about review of literature; deals with the review of the financial system and investment opportunity. The more details are in descriptive manner, for this study, various books, journal and articles as well as the past thesis review were taken into consideration. During the review of this research, in depth study and theoretical investigation regarding portfolio's aspects and their present application and potentialities also are made.

The simplest meaning of the investment is sacrificing the present worth to generate more value of worth in certain future. It is concern with the sacrifice of the current rupee for the expectation of future money. It maximizes the wealth position. Investment, in its broadest sense, means the sacrifice of the 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 magnitude is generally uncertain." (Francis; 1998:38)

#### **2.1 Conceptual Framework**

Portfolio management is the process of selecting a bundle of securities that provides the investing the organization a maximum yield for a given level of risk or alternatively ensuring minimum level of risk for given level of return. It can be also taken as risk and return management. Its aims to determine an appropriate asset mix which attains optimal level of risk and return. Various

books which are either dependent or independent deals with theoretical aspects of risk, return and portfolio are taken into consideration in this chapter. Major focus is on the investment of common stock and its impact on individual risk, return and portfolio.

### **2.1.1 Common Stock**

"Common stock is an ownership share in a corporation. Therefore the common stockholders are true owners of a corporation. Each share of common stock represents a fractional ownership interest in the firm. For example, One share of common stock in a corporation that has 100 shares outstanding would represent 1/1,000 ownership interest. The return on common investment comes from either of two sources-the periodic receipt of dividend and capital gains. Common stock holders enjoy a No. of rights such as is dividend right. Assets right, preemptive right, voting right etc. Common stock is the recipient of the residual income of the corporation. Common stock holders are an uncertain position about dividend, Capital gain and residual claim. Therefore, common stock holder must bear greatest risk. Common stock is suitable for the investor who wants to take high risk and return for a long period too. Common stocks are traded in stock exchanges and over the counter market (OTC)."(Thapa, Bhattarai and Basnet; 2006: 9)

"Common stocks are easier to describe than fixed-income securities such as bonds, but they are harder to analyze. Fix-income almost always has a limited life and an upper dollar limit on cash payments to investors. Common stocks have neither. Although the basic principles of valuation apply to both, the role of uncertainty is larger for common stocks. So much so that often dominates all other elements in their valuation.

The great advantage of the corporate form of organization is the Limited Liability of its owners. Common stocks are generally "fully paid and no assessable", meaning that

common stockholders may lose their initial investment but no more. That is, if the corporation fails to meet its obligations, the stockholders cannot be forced to give the corporation the funds that are needed to pay off the obligations. However, as a result of such as a failure, it is possible that the value of a corporation's shares will be negligible. This outcome will result in the stockholders' having lost an amount equal to the price to buy the shares." (Sharpe and Alexander; 2003: 457)

"Common stock represents ownership of a firm. Owners of the common stock of a firm share in the company's profits, the investor receives high rates of return and can become wealthy. In contrast, the investor can lose money if the firm does not do well or even goes bankrupt, as the once formidable **K-Mart**, **Enron**, **W.T. Grant**, and **Interstate Department Stores** all did. In these instances, the firm is forced to liquidate its assets and pay off all its creditors. Notably, the firm's preferred stockholders and common stocks all the advantages and disadvantages of ownership and is a relatively risky investment compared with fixed-income securities." (Rely and Brown; 2004: 83)

"Common stock has one important investment characteristic and one important speculative market policy. Stock prices tend to increase irregularly but persistently over the decades as their net worth builds through the reinvestment of undistributed earnings. However, most of the time common stocks are subject to irrational and excessive price fluctuations in both directions, as consequences of the ingrained tendency of most people to speculate or gamble, i.e. to give way to hope, fear, and greed." (Western and Bringham; 1999)

"Common stockholders of a corporation are its residual owners, their claim to income and assets comes after creditors and preferred stockholders have been paid in full. As a result, a stockholder's return on investment is less certain than the return to lenders or to a preferred stockholder. On the other hand, the shares of a common stock can be authorized either with or without par value. The par value of a stock is merely a stated

figure in the corporate charter and is of little economic significance. A company shouldn't issue stock at price less than par value because stock holders who bought stocks for less than par value would be liable to creditors for the difference between the below par price they paid and the par value." (Van Horne and James; 1997: 560)

### **2.1.2 Investment**

The common definition of investment is, "the sacrifice of certain present value for future value." (Sharp and Alexander, 1999; 217). Investment is not a gamble rather it is the systematic and scientific way of using the excess fund to get the maximum return at minimum level of risk. Investment made to obtain some expected profit. Investment forgives the present return for future return. Present investment is contribution to the future return. Investment is not gambling rather than it is systematic and scientific way of using excess fund from income to gain expected return with lower level of risk. While investing future return one should not forget that the amount s/he investing i.e. capital, a collective form of surplus. The surplus is that part of money deducting all the expenses from income. A person spends his/her years in capital formation process. That is why each one should be rational while investing. Since most of investors are risk averters, they require additional unit of return for bearing one more level of risk. People always try to reduce the risk factor. Common definition say us that contribution of present value for future return is investment or it's a search of certainty within the uncertainty. An investment is a commitment of money that expects to generate additional money. Every investment entitles some degree of risk; it required a present sacrifice for a future uncertain benefit. The motivating factor of investment is collective form of saving, expectation of future return and wealth position maximization.



### 2.1.3. Return

Return is the main motivating force of the investment or return is the reward of investment. In return there have two factors one is capital gain and another is regular gain or ordinary gain. Capital gain means difference between the ending and beginning price. Regular gain means annually cash receipt.

Total return = Capital gain + regular gain (ordinary gain)

Capital gain = ending price - beginning price

Regular gain = dividend or interest.

#### 2.1.3.1 Single Period Rate of Return

The rate of return is the speed at which the investor's wealth increases or decreases. This rate of return depends upon the future cash flows that include cash receipt (dividend) and capital gains. And the investors make investment for high rate of return at minimum risk. Thus, the investor's single period rate of return can be defined as the total return that the investor receives during the holding period of the shares as a percentage of the purchase price at the beginning of the holding period. The rate of return over the holding period is called holding period rate of return (HPR) which can be calculated as:

$$\text{HPR \%} = [(\text{ending price} - \text{beginning price} + \text{cash receipt}) / \text{beginning price}] * 100$$

HPR in Rs. = Capital gain + Cash Receipt

#### 2.1.3.2 Required Rate of return

When setting the required rate of return on an investment an investor must consider the real rate of return, expected inflation and risk. Because consumption is foregone today, investor is entitled to a rate of return that compensate for differ consumption in future. Required rate of return is the rate of return demanded by an investor forgoing the present utility and satisfaction. If investors postponed his satisfaction for uncertain future, investment should compensate his satisfaction. The compensation,

e demand on behalf of future uncertainty over the risk free risk, is required rate of return. The capital market determines required rate. The required rate of return is the minimum rate of return that an investor expects from his investment. It is function of real rate of return and risk.

### **2.1.3.3 Expected Rate of Return**

Expected rate of return is the return one expects by his/her investment. Suppose one invested Rs 100 in security of Nepal Ban Limited and he/she thinks that it will generate year-end dividend of Rs 5 with ending price of Rs 110 then its total return will be Rs 15 and expected return will be 15%. The expected rate of return should be higher than required rate of return. Expected return is the hypothetical rate of return. The expected rate of return based upon the expected cash receipt over the holding period and expected year-end selling price of the securities. Of course, an investor has expected return must be reasonable. Most expectation based on history. Reasonable conclusions about future returns could be reached by looking at the past, tempered with the understanding that these returns. Even if your expectations are reasonable, however, there are the possibilities that your investment's actual return will be different from the expectation. This is risk, we must take as an investor and it includes the possibility of losing original investment. Risk is greater when the variation is greater in return.

### **2.1.3.4 Expected Rate of Return Based on Historical Data**

During this research, it is assumed that history repeats itself. The future cash flows will base on the historical cash flow. The expected rate of return will be the average of historical rate of returns. In term of holding period return, the expected rate of return for any specific securities is the expected rate of return taken from its historical return. However the simple arithmetic averaging ignores the compounding effects that result if the first period returns reinvested. In addition, the result of the arithmetic average, return distorted if there are large differences in the rate of return across period. Large difference in the periodic rates of return over longer

investment horizons will; because the arithmetic rate of return to be misleading. The geometric rate of return does not suffer from this defect. The geometric mean rate of return HPR defined as the rate of return that would make the initial investment equal to the ending investment value.

#### **2.1.4. Risk**

Risk is the potential variability in future cash flows. So it is defined as variability of returns in a period. The wider the range of possible events that can occur, the greater the risk, that means higher the variability higher the risk and vice versa.

Risk and uncertainty are the integral part of investment. Risk is a situation where the possible consequences of the decision are known. But uncertainty is a situation where the probabilities can not be eliminated. However, risk and uncertainty are used interchangeably.

"Risk is defined in Webster's dictionary as a 'hazard: a peril: exposure to loss or journey', thus for most, risk refers to the chance that some unfavorable event will occur. If you invest in speculative stock (or, really, any stock), you are taking a risk in the hope of making an appreciable return."(Weston, Basely and Brigham; 1995: 182-183)

"Although there is difference in the specific definitions of risk and uncertainty, for our purposes and in most financial literature the two terms are used interchangeably. In fact, one way to define risk is the uncertainty of future outcomes. And alternative definitions might be the probability of an adverse outcome. Subsequently, in our discussion of portfolio theory, we will consider several measures of risk that are used when developing the theory." (Relly and Brown; 2004: 210-211)

### **2.1.5 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." (Cheney and Moses; 1992: 41) The range is one of the traditional methods of measuring risk, which simply communicates the difference between the best possible returns and the worst possible return; it does not provide information about distribution of the rates of return between the extremes.

The Range = Best possible Rates of return-worst possible rate of return.

The degree of risk of an underlying security is reflected in the magnitude of the differences. The smaller the difference the lower will be degree of risk." (Pokharel; 2004:11)

"Another measure risk is the range of returns. It is assumed that a larger range of expected returns, from the lowest to the highest return, means greater uncertainty and risk regarding future expected returns." (Relly and Brown; 2004: 211)

### **2.1.6 Standard Deviation (SD)**

Standard deviation measures the risk as variability of return. "Standard deviation is a statistical measure of the variability of a set of observations. It is the measure of total risk. Smaller the variance, lower the risky of the stock and vice- versa. The risk or standard deviation is denoted by the symbol sigma ( $\sigma$ ). The square root of the variance of the rate of return is called the standard deviation ( $\sigma$ ) of the rate of return." (Thapa, Bhattarai and Basnet, 2006; 121-122).

### **2.1.7 Coefficient of Variation (CV)**

Standard deviation is obsolete measure of return where as coefficient of variation is relative measure of return. Risk is measured by standard deviation. And risk per unit of expected return is measured by coefficient of variation is denoted by CV. Greater the CV the greater relative risk of the investment. Coefficient of variation is calculated to compare the variability in returns of two alternative investments. Hence, it is useful to compare the investments having different expected return and different level of risk. (Van Horne and Wachowicz; 2001:94)

### **2.1.8. Portfolio Analysis and Diversification**

#### **2.1.8.1 Portfolio Analysis**

Investors undertake investment with the target of making some expected rate of return. For making more return, they diversify their investment across different securities rather than invest in one stock. Risk diversification creates an efficient investment thereby reducing the variability of return around the expected return. The reduction in risk will occur only if the stock returns within the portfolio do not move precisely together over time- that is, if they are not perfectly correlated.

A portfolio is collection of investment securities. Portfolio theory deals with the selection of optimal portfolio; that is, portfolios that provides the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return.(Western and Copeland, 1992:302)."A portfolio simply represents the practice among the investors of having their funds in more than one asset. The combination of investment assets is called a portfolio."(Western and Brigham, 1982; 245).

In simple words, portfolio means the list of holdings in securities owned by an investor or institution, which provides maximum return at minimum risk. So an investor should always have good knowledge of portfolio analysis as it considers the future return and risk and helps to develop a portfolio that provides the maximum return at given level of risk.

Portfolio theory deals with the selection of optimum portfolio. Only the optimum portfolio provides the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return in order to develop the optimum portfolio, which is the main objective of portfolio announcements, the investor should have good knowledge of portfolio management. It is concerned with efficient management of investment in financial assets including equity shares, preference share and debentures of the companies. It is the process involves a logical set of steps common to any decisions. It is just an attempt made by the investor to gain maximum return at lower risk and largely depends on the correct decision of them, which can not be always ensured. The objectives of portfolio management are:

#### **Primary Objective**

- ) To maximize return
- ) To minimize risk.

#### **Secondary objectives**

- ) Regular return.
- ) Safety or security of an investment.
- ) Appreciation of capital.
- ) Liquidity.
- ) Marketability.
- ) Tax planning - capital gain tax, income tax and wealth tax.

The main objective of portfolio construction is to diversify the risk by combining securities of low risk with securities of high risk so as to obtain the highest expected return for a given level of risk. This is supported by one of the well said proverb "never keep all the eggs in a same basket". So diversification plays an important role in designing efficient portfolios (that is portfolios whose return is maximize for a given

level of risk or, equivalently, portfolios whose risk is minimized for a given level of return.).

Diversification simply means spreading the risk among the various companies, industries and asset class. It reduces the portfolio risk thereby eliminating the unsystematic risk, which is not rewarded. There are two types of risk attached with investment; systematic and unsystematic risk. The investors are only rewarded for systematic risk that is market risk which is unavoidable. It is important to investors as it protect them from business risk, financial risk and the volatility. There are different types of diversification risk management techniques that help in reducing portfolio risk. They are simple

#### **Types of Diversification:**

##### **i) Simple diversification**

In simple diversification is the random selection of securities to add to a portfolio. It would reduce unsystematic risk or diversifiable risk. According to this approach, it is found that 10- 15 securities in portfolio brings adequate returns with average risk and each selected securities in this portfolio is provided equal weight in its portfolio. This is better way of reducing the risk.

##### **ii) Superfluous diversification across quality rating categories**

It is investing in only same qualified and same rated securities such as NEPSE has rated security in various grades, A, B, C and so on and in this portfolio investor will make in same category security.

##### **iii) Markowitz's Diversification**

It may be defined that combining assets, which are less than perfectly positively correlated in order to reduce portfolio risk without sacrificing portfolio return. It can sometimes reduce the risk below the un-diversifiable level. There is a natural trade off between risk and return in the market but at any given level of expected return,

Markowitz diversification can reduce risk more than simple diversification. Applying diversification to a collection of potential investment assets with a compute is Markowitz portfolio analysis. It is a scientific way to manage a portfolio and its result is quite interesting.

### 2.1.8.2 Expected Portfolio return

Since each security's future may be considered as a random variable, the return of a portfolio also can be thought as a random variable depended on expected returns of the individual securities that make up the portfolios. The expected return of portfolio is a weighted sum of the expected returns of the individual securities weight being the proportion of funds invested in individual securities. The portfolio weights are % of the total dollar amount available to be invested in the portfolio and sum to the expected portfolio return can be calculated as:

$$E(r_p) = \sum_{i=1} W_i E(r_i) \dots \dots \dots (5.1)$$

$$= W_1 E(r_1) + W_2 E(r_2) + \dots \dots \dots + W_n E(r_n) \dots \dots \dots (5.1a)$$

**Where,**

$E(r_p)$  = Expected rate of return of portfolio

$W_i$  = The fraction of the total value of the portfolio invested in the  $i$ th asset or stock

$E(r_i)$  = The expected return from the  $i$ th assets or stock"

(Thapa, Bhattarai and Basnet; 2006: 149)

### 2.1.8.3 Portfolio Risk:

Portfolio risk is a function of the proportional invested in the components. The risk ness of the components is correlation of returns on the component securities. It is measured by standard deviation. The risk of a portfolio is not a simple weighted average of the standard deviation of the individual securities. It depends on the



investment weight on individual security. Risk on individual security and correlation between given securities.

"Portfolio risk is measured by statistical tool standard deviation and variance. It is a function of the proportions invested in the components. The riskiness of the components and the correlation of returns on the components securities are computed by using the following equations:

$$\text{Var}(r_p) \text{ or } \sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n W_i W_j \text{cov}_{ij} \text{ or } = \sum_{i=1}^n \sum_{j=1}^n W_i W_j \text{cov}_{ij} W_i W_j P_{ij} \sigma_i \sigma_j.$$

Where,

$\sigma_p$  = Standard deviation of portfolio's return

$W_i$  = Proportion of investment in asset i

$W_j$  = Proportion of investment in asset j

$\text{Cov}_{ij}$  = covariance of the return between asset i and asset j

$P_{ij}$  = Correlation co-efficient between asset I and asset j

(Thapa, Bhattarai and Basnet; 2006: 150)

### 2.1.9 Correlation Coefficient and Portfolio Risk:

"The risk of the portfolio can be measured by using covariance of the returns of assets in the portfolio. The covariance's simply means the degree to which the returns of the two assets vary together. In other words its measures how two variables co-vary. A positive covariance indicates that the returns of two assets move in the same direction where as a negative covariance indicates that the return of two assets moves in opposite direction. If the covariance is zero, it means the rate of return on assets is independent. The correlation coefficient is the covariance divided by the product of the standard deviation for the investments.

$$\text{Correlation coefficient } (\rho_{ij}) = \frac{\text{cov}(r_i, r_j)}{\sigma_i \sigma_j}$$

Where,

$\rho_{ij}$  = Correlation coefficient between assets i and j

$\sigma_i$  = Standard deviations of return for asset i

$\sigma_j$  = Standard deviation of return for asset j

The correlation coefficient between -1 and +1, if the value of correlation is 1, it is perfectly positively correlated. It indicates that the return on two assets move together exactly the same way. In addition, the value of correlation -1 means perfectly negatively correlated which indicates that the return on two assets move together perfectly opposite way. If the value of correlation 0 means that, there is no relationship between two assets return."(Thapa; 2005: 38-39)

### **2.1.10 Systematic Risk and Unsystematic Risk:**

"Systematic risk is market related risk. It is also called market risk or un-diversifiable risk. For example; inflation, interest rates war etc. Unsystematic risk is non-market related risk. It is also called non-market risk or company unique risk or company specific risk or diversifiable risk. For example, winning a new contract, an industrial dispute, and the discovery of a new technology, Labor strikes etc. The systematic risk is rewarded in the form of risk premium. The unsystematic risk is not rewarded because it can be reduced to zero." (Thapa, Bhattarai and Basnet; 2006: 183)

"Systematic risk has its source factors that affect all the marketable assets and thus can't be diversified away. The sources of systematic risk are market- pervasive. The measure of systematic risk permits an investor to evaluate an asset required rate of return relative to systematic risk of the stock. Unsystematic (company specific/unique) risk can be reduced through diversification. The relationship among total risk, systematic risk and unsystematic risk are shown below:

Total risk = Systematic Risk + Unsystematic Risk

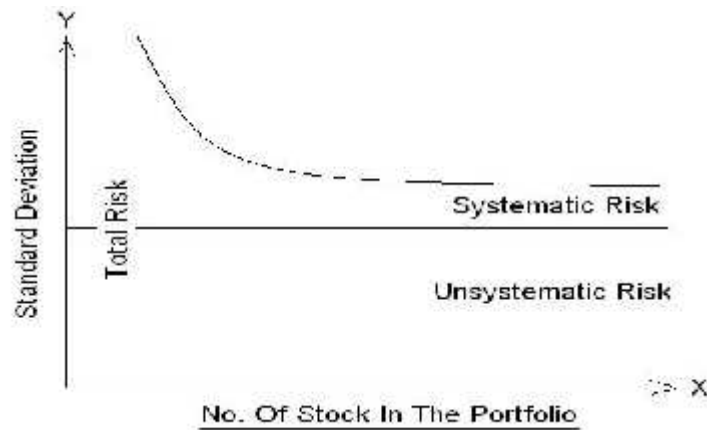
While Systematic Risk =  $(\sigma_j) (\rho_{jm})$  and unsystematic Risk =  $(\sigma_j) (1-\rho_{jm})$

In this equation  $\rho_{jm}$  is the correlation between the return of given stock (i) and the return on market portfolio." (Upadhyaya; 2001: 11)

The relationship between systematic risk and unsystematic risk are shown in given figure

**Figure: 2.1**

**Relation between Systematic risk and Unsystematic risk**



(Source: Thapa, Bhattarai and Basnet; 2006: 183)

### **2.1.11 Capital Assets Pricing Model (CAPM):**

"Capital assets pricing model (CAPM) is a model that indicates what should be the expected or required rate of return on risky assets. This transition is important because it helps you to evaluate an asset by providing an appropriate discount rate to use in any valuation model. Alternatively, if you have already estimated the rate of return that you think you will earn on an investment, you can compare this estimated rate of return to the required implied by the CAPM and determine whether the assets is undervalued, overvalue, or properly valued.

To accomplish the foregoing, we demonstrate the creation of security market line (SML) that visually represents the relationship between risks and expected or the required rate of return on an asset. The equation of this SML, together with estimates for the return on risk-free asset and so on the market portfolio, can generate expected or required rate of return to any asset based on its systematic risk. You compare this required rate of return to the rate of return that you estimate that you will earn on investment to determine if the investment is undervalued or overvalued. After demonstrating this procedure, we finish the section with demonstration of how to calculate the systematic risk variable for a risky asset."(Reilly and Brown; 2004: 247)

The capital assets pricing model states that 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." (Brealey and Myers; 2003: 200)

"The capital assets pricing model (CAPM) specifies the relationship between risk and required rates of return on assets when they are held in well diversified.

#### **Basic Assumptions of the CAPM**

- 1) All investors focus on a single holding, and they seek to maximize the expected utility of their wealth by choosing among alternative portfolios on the basis of each portfolio's expected return and standard deviation.
- 2) All investors can borrow and lend an unlimited amount at a given risk free rate of interest  $K_{RF}$ , and there are no restrictions on short sales of any assets.
- 3) All investors have identical estimates of the expected returns, variances, and covariance among all assets; that is, investors have homogeneous expectations.
- 4) All assets are perfectly divisible and perfectly liquid.

- 5) There are no transaction costs.
- 6) There are no taxes
- 7) All investors are price takers (that is, all investors assume that their own buying and selling activity will not affect stock prices)
- 8) The quantities of all assets are given and fixed."

(Thapa, Bhattarai and Basnet; 2006: 177)

"CAPM is a model that describes the relationship between risk and expected return. In this model, a security's expected return is the risk free rate plus a premium based on the systematic risk of the security. The SML equation as suggested for the computation of expected rate of return on common stock.

This model is as under:

$$R_j = R_f + [E(R_m) - R_f] \beta_j$$

Where,

$R_j$  = required rate of return or equilibrium rate of return for stock j

$E(R_m)$  = expected return for the market portfolio

$\beta_j$  = an index of systematic risk of stock j.

It means the sensitivity of a stock's return. It changes in returns on the market portfolio. The beta of portfolio is simply a weighted average of the individual stock beta in the portfolio." (Van Horne; 1997: 100)

"The major implication of the CAPM is that expected return of assets will be related at a measure of risk for that asset known as beta ( $\beta$ ). The exact manner in which expected return and beta are related is specified by the CAPM. The model provides the intellectual basis for a number of the current practices in the investment industry." (Sharpe, William, and Alexander; 2002: 261-262)

"CAPM is a model that describes the relationship between risk and return. In this model, a security expected return is the risk free rate plus a premium based on the systematic risk of the security. The model is given below.

$$R_j = R_f + (R_m - R_f) \beta_j$$

Where,

$R_j$  = required rate of return on stock  $j$ .

$R_f$  = The nominal risk free rate of return (the real risk free rate of return plus risk premium for inflation).

$(R_m)$  = The expected rate of return on the market portfolio.

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

Hence, beta is the index of systematic risk. It means the sensitivity of a stock return to change in returns on the market portfolio. The beta of a portfolio is simply weighted average of the individual stock betas in the portfolio." (*Van Horne and Wachowicz; 1995: 100*)

"Beta measures un-diversifiable risk. Beta shows how the price of a security responds to market forces. In effect, the more responsive the price of a security is to changes in the market, the higher will be its beta. Beta is calculated by relating the returns on a security with the returns for the market. Market return is measured by the average return of a large sample of stocks, such as the S & P 500 stock index.

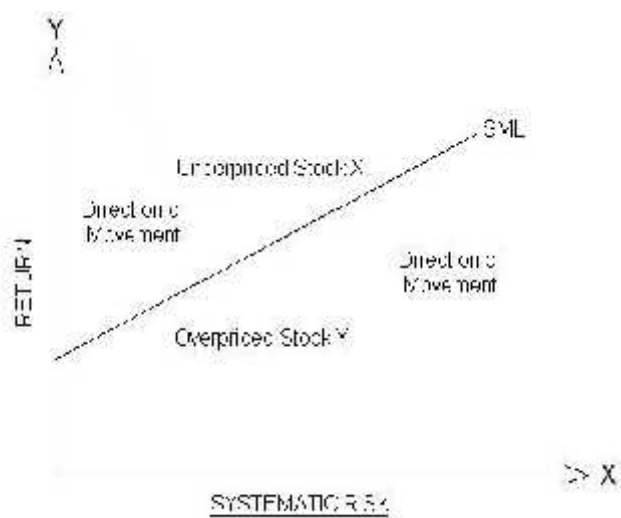
The beta for the overall market is equal to 1.00 and other betas are viewed in relation to this value." Betas can be positive or negative. However, nearly all betas are positive.

Most betas lie between 4 and 1.9. "The CAPM provides a means by which one can estimate the required rate of return of a security. On the basis of price and dividend data, expected return can be calculated. By comparing two or more than two returns, investors can analyze whether the stocks are over-priced or under-priced. "The capital asset pricing model allows us to draw certain implications about the expected return of a specific security. The key assumptions in the model are that the perfect capital markets exist and that investors have homogeneous expectations." (Van Horne; 1997: 85)

"... In market equilibrium, the required rate of return on stock equals its expected return. That is all stocks will lie on the security market line, what happens when this is not so? Suppose that in the given diagram the security market line is drawn on the basis of what investors as a whole know to be the approximate relationship between the required rate of return and systematic or unavoidable risk. For some reason, two stocks call them X and Y is improperly priced. Stock X is under-priced relative to the security market line, while stock Y is over-priced.

**Figure: 2.2**

**Movement of stock**



(Source: Thapa, Bhattarai and Basnet; 2006: 218)

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 compensating for its systematic risk. Investors seeing the opportunity for superior returns by investing in stock X should rush to buy it. This action would drive the price up and the expected return down. How long would this continue? It would continue until the market price was seen. The expected return would now lie on the security market line. In the case of stock Y, investors holding this stock would sell it, recognizing that they could obtain a higher return for the same amount of systematic risk with other stocks. This selling pressure would drive Y's market price down and its expected return up until the expected return was on the SML. When the expected returns for those two stocks return to SML market equilibrium will again prevail." (*Van Horne and Wachowicz, 1995; 107-108*).

### **2.1.12 Arbitrage Pricing Theory (APT)**

Arbitrage is the process of earning risk less profits by taking advantage of differential pricing for the same physical asset or security. As a widely applied investment tactic, arbitrage typically entails the sale of security at a relatively high price and the simultaneous purchase of the same security (or its functional equivalent) at a relatively low price.

Arbitrage activity is a critical element of modern, efficient security markets. Because arbitrage profits are by definition risk less, all investors have an incentive to greater resources and inclination to engage in arbitrage than others. However, it takes few of these active investors to exploit arbitrage situations and, by their buying and selling actions eliminate these profits opportunities." (*Reilly and Brown; 2004: 284*)

"The basis foundation of Arbitrage pricing theory is 'Law of one price' Law of one price states that two identical goods cannot be sold at different prices there will be the presence of arbitrage opportunity. Arbitrage opportunity means zero additional



investment, zero additional risk but presence of additional return." If two identical goods sold at differing prices anyone could engage in arbitrage by simultaneously buying at low price and selling high price and make risk less profit. Arbitrage also applies to financial assets. If two financial assets have the same risk they should have the same expected return. If they don't have the same expected return, a risk less profit could be on by simultaneously issuing at low return and buying the high return assets. Arbitrage causes prices to be revised as suggested by the law of one price." Arbitrage pricing process can be shown as below: - (Thapa, Bhattarai and Basnet; 2006: 220)

$$E(r_j) = \lambda_0 + \lambda_1 b_{j1} + \dots + \lambda_n b_{jn} \dots \dots \dots (5.35)$$

Where,

$E(r_i)$  = required rate of return on asset  $i$  or equilibrium rate of return.

$\lambda_0$  = risk free rate of return.

$\lambda_1$  = constant variable

$b$  = systematic risk factor or independent variable"

"Arbitrage is the process of earning risk less profits by taking advantage of differential pricing for the same physical asset or security. As a widely applied investment tactic, arbitrage typically entails the sale of security at a relatively high price and the simultaneous purchase of the same security (or its functional equivalent) at a relatively low price.

Arbitrage activity is a critical element of modern, efficient security markets. Because arbitrage profits are by definition risk less, all investors have an incentive to take advantage of the whenever they are discovered. Granted, some investors have greater resources and inclination to engage in arbitrage than others. However, it takes relatively few of these active investors to exploit arbitrage situation and, by their buying and selling actions, eliminate these profit opportunities." (Sharpe, Alexander and Bailey; 2003: 284.)

### 2.1.13 Beta Coefficient

It is defined as a comparative measure of the sensitivity of an assets return to changes in the return on the market portfolio. It tells is how much systematic risk a particular asset has relatively to an average assets. The tendency of a stock to move up and down with the market reflected in its beta coefficient,  $\beta$ . Therefore, beta is a key element of the CAPM; mathematically the beta coefficient of a stock is the stock's co-variance with the market portfolio divided by the variance of the market portfolio. (Kothari, Shakkun and Stoaan; 1995:117)

### 2.1.14 Portfolio Performance Evaluation

Risk and return should be considered by giving important priority when considering a portfolio performance. Due to absence of either risk or return we can not measure their performance of portfolio effectively. There are various methods applied to measure the portfolio performance. Among them, one of the important techniques that is Sharpe's Portfolio Performance Measure is considering here in this study:

#### 2.1.14.1 Sharpe's Performance Measure:

It was developed by William Sharpe. Sharpe's measure divides average portfolio excess return over the sample period by the standard deviation of return over that period.

The Sharpe's measure of portfolio performance (designated  $S_i$ ) is stated as

$$S_i = \frac{r_i - R_f}{\sigma_i}$$

Where,

$S_i$  = Sharpe's index of portfolio performance.

$r_i$  = average return on portfolio 'i' during a specified time period.

—

$R_f$  = average risk free rate during the same period.

$\Sigma_i$  = standard deviation of portfolio 'i'

*(Thapa, Bhattarai and Basnet; 2006: 421-424)*

#### **2.1.14.2 Treynor's portfolio Performance Measure**

Another index of portfolio performance i.e. similar to the Sharpe index is the Treynor's performance index. The Treynor's index however is concerned with systematic risk, while the Sharpe index is concerned with total risk as measured by portfolio standard deviation of return. The Treynor's index is defined as follow:

$T_p = (\text{risk premium} / \text{systematic risk index})$

#### **2.1.14.3 Jensen performance measures**

Michel Jensen has also developed a method for evaluating a portfolio or assets performance. Jensen's measures are the average return of the portfolio over and above that predicted the CAPM, given the portfolio's beta and the average market return. Jensen's measure is the portfolio alpha value. The Jensen's measures are computed with regression equation.

$A_p = a_p = r_p - r_f + (E(r_m) - r_f) B_p$

Where,

$A_p$  = Jensen's alpha of portfolio or Jensen's performance measures.

$r_p$  = average realized return from portfolio.

$r_f$  = risk free rate of return.

$E(r_m)$  = expected market return.

$B_p$  = beta portfolio.

## 2.2 Review of Related Studies

### 2.2.1 Review of Journals and articles

Very limited numbers of journals are available in management and it is further hard to find any journals in the subject matter of finance in context of Nepal. In the Nepalese context, there are very limited numbers of articles can be found relating to management of commercial banks of Nepal. Specially, it is rare in the case of this research topic. However, there are available some independent-studies which are related to the Nepalese Stock Market, Portfolio management and Shareholders democracy are summarized below in detail

**Radhe Shyam Pradhan (1993)**, carried out a study on the topic of "*Stock Market Behavior in a small capital market: a case in Nepal*" in 1993, the study was based on the data collected for 17 enterprises from 1983 through 1990. One of the major objectives, which are related to this study, was "To access the stock market behavior in Nepal."

Pradhan has summarized the following findings:

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

**Sunil Chopra (2046 B.S.)**, in his article "*The Role of Foreign Bank in Nepal*" conclude that the joint venture banks are already playing a dynamic and vital role in the economic development of the country and this will undoubtedly increase with time.

**Shiva Raj Shrestha (2055 B.S.)** has given a short foretaste on the "*Portfolio Management in Commercial Bank, Theory and Practice*". Shrestha has highlighted the following issues in his article.

The portfolio management becomes very important for both individuals as well as institutional investors. Investors would like to select a best mix of investment assets subject to the following aspects:

- ) Higher return which is comparable with alternative opportunities available according to the risk class of investors.
- ) Good liquidity with adequate safety of investment.
- ) Certain capital gain.
- ) Maximum tax concession.
- ) Flexible investment.
- ) Economic, efficient and effective investment mix.

In view of above aspects, following strategies are adopted:

- ) Do not hold any single security i.e. try to have a portfolio of different securities.
- ) Do not put all the eggs in one basket i.e. to have a diversified investment (making investment in different sectors).
- ) Choose such a portfolio of securities, which ensures maximum return with minimum risk or lower of return but added objectives of wealth maximization.

However, Shrestha also presented the following approaches to be adopted for designing a good portfolio and its investment:

- ) To find out the invisible assets (generally securities) having scope for better returns depending upon individual characteristics like age, health, need, disposition, liquidity, tax liability etc.
- ) To find out the risk of securities depending upon the attitude of investor toward risk.
- ) To develop alternative investment strategies for selecting a better portfolio this will ensure a trade off between risk and return to attach the primary objective of wealth maximization at lowest risk.
- ) To identify securities for investment to reduce volatility of return and risk.

In this study, Shrestha has presented two types of investment analysis techniques i.e. fundamental analysis and technical analysis to consider any securities such as equity, debentures bond and other money and capital market instruments. He has further suggested that the banks having been international net work can also offer access to global financial market. He has also point out the required skilled work force research and analysis and proper management information system in any type of commercial banks to get success in portfolio management and customer's confidence. (Shrestha; 2055: 13)

**Dr. Manohar Krishna Shrestha (Ph.D.),** (2000 AD), in his article "*Commercial Banks Comparative Performance Evaluation*" concluded that the Joint Venture Banks are new operationally more efficient, having superior performance while comparing with local banks that are operating in Nepal. Better performance of joint venture banks is due to their sophisticated technology, modern banking method and skill. Their better performance is also due to the government's branching policy in rural areas. Local banks are efficient and expertise in rural

sectors but having number of deficiencies. Thus, local banks are facing growing constraints of socio-economic, political system on one hand spectrum and that of the issues and challenge of joint venture banks commanding significant banking business on other spectrum.

## **2.2.2 Review of Dissertations**

Upadhyaya, (2001), has undertaken a study entitled "*Risk and Return on Common Stock Investment of Commercial Banks in Nepal*". The main objective of the study was to assess the risk associated with returns on common stock investment of the listed commercial banks on the basis of selective financial tools. Others objectives of his research were to evaluate common stocks in terms of risk and return, to assess the risk compensating returns, and to analyze the volatility of common stocks and other relevant variables as an affecting factor in portfolio construction of common stocks.

In order to achieve the objectives, he has analyzed risk and return of individual bank, systematic risk and unsystematic risk and portfolio among the sample banks.

The major findings of his study are:

In general, most people see stock market investment as a black art that they know little about. Many people have unrealistically optimistic or pessimistic expectations about stock market investment or perhaps a fear of the unknown. Due to the lack of information and poor knowledge, Nepalese individual investors can not analyze the securities as well as market properly.

He further stated, "Expected return on the common stock of Nepal Grindlays Bank now renamed, as SCBNL is maximum (i.e. 127.84%) which is

very high rate of return. In reality this rate exists only due to the effect of unrealistic annual return because of the issue of bonus share and increase in share price at the same. Similarly expected return of the CS of Nepal SBI Bank Ltd. is found minimum. In the context of industries (or sector), expected return of "Others" sector is highest (i.e. 15.5 %). Manufacturing and production sector is the least performer."

He also revealed, "Common stock of Nepal Grind lays Bank Limited now renamed as Standard Chartered Bank Nepal Ltd is most risky and of SBI is least risky. This proves the proverb 'high risk - high return'. Regarding the market volatility, EBL's common stock is more volatile which has beta value of 3.941 and NIBL's common stock is least volatile, which has beta value of 0.875. Others are also volatile. All the stocks of commercial banks are over-priced. NGBL stock has maximum difference of expected rate of return and required rate of return."

Upadhyaya further summarized, "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 make any analysis of portfolio before selecting. They invest their fund in different securities on the basis of expectation and assumption of individual security rather than analysis of the effect of portfolio."

According to him, "The correlation of returns between most of the banks is nearer to +1. It is not favorable to construct a portfolio. Only the correlation between NIBL's CS return and NBBL and EBL CS return is found negative. Investor can reduce risks through holding the CS of NIBL and NBBL or EBL. Portfolio between the CS of NGBL



and BBC is very advantageous as far as risk reduction is concerned. Here, portfolio standard deviation is less than individual standard deviation. Hence the portfolio approach of investment is better way to get the maximum return".

**Basnet**, (2002 AD), Thesis entitled "*Portfolio Management of Joint Venture Banks in Nepal*" is based on study of four joint venture banks. They are: Nepal Bangladesh Bank Ltd., Standard Chartered Bank Ltd., Himalayan Bank Ltd. and Everest Bank Ltd. The general objective of this study is to identify the situation of portfolio management of joint venture banks in Nepal.

The major findings of this study are given below:

- ) Among the selected bank on ratios of Everest Bank Ltd. Are more consistent among the four joint venture banks.
- ) SCBNL is not investing its fund on NRB bond after 1997 and no government securities after 1998.
- ) HBL is not investing its fund in NRB bond after 1997 and investing very high amount of fund on government securities.
- ) NBBL is investing very high amount of its fund in government securities. EBL is not investing its fund on NRB bond after 1997 but is investing high amount of fund on government securities.
- ) SCBNL is providing very high amount of its loans & advances to the private sector. It has also given the second priority to foreign bills purchase and discount.
- ) HBL is providing very high amount of its loans & advances to the private sector in increasing trends. It has also given the second priority to foreign bills purchase and discount.
- ) NBBL is providing very high amount of its loans & advances to the private sector. It has also given the second priority to government securities by providing very low amount of loans to the foreign bills purchase and discount.

- ) EBL is providing very high amount of its loans & advances to the private sector and has given the second priority to the foreign bills purchase and discount. It is not providing amount of loans & advances to government enterprises.

**Khaniya (2003AD)**, in her thesis entitled "*Investment Portfolio Analysis of Joint Venture Banks*" has been done in 2003. The study based on five joint venture banks and they are: NABIL, SCBNL, HBL, NBBL and EBL. The general study of the present study is to identify the current situation of investment portfolio of joint venture banks in Nepal.

The major findings of her study are below:

- ) SCBNL and HBL have better position. NBBL and NABIL have a low position in the industry. But Everest Bank has a very low position in the industry because of having lowest mean return on shareholders' fund resulting from the negative returns in the fiscal years 1995/96 and 1996/97.
- ) SCBNL has the highest mean return and EBL has the lowest return. Except EBL, all other four banks i.e.; NABIL, SCBNL, HBL and NBBL have good performance.
- ) Among other joint venture banks, SCBNL has the highest return and EBL has mean return than industry average. SCBNL and EBL mobilizes the funds in investment title is higher than the standard ratio.
- ) NABIL, SCBNL & HBL are investing low amount of deposits on loans and advances which is lower than industry average and NBBL & EBL have invested a high amount of deposits to loans and advances title which is higher than industry average.
- ) SCBNL has the highest EPS and EBL has the lowest EPS. Similarly, HBL also has above mean EPS than industry average and that of NBBL is lower than industry average.
- ) Himalayan Bank has the lowest beta coefficient among the five joint venture banks which means that the systematic risk of Himalayan bank is the lowest

among the JVBs. The portfolio return of NBBL is 94%. This return is the average capital gain yield and dividend yield.

- ) The coefficient of correlation between loans and advances in private sector and portfolio return of joint venture banks come out to  $r_{xy} = -0.6$ . Therefore, it indicates that there is negative correlation between loans and advances in private sector and portfolio return of five JVBs in Nepal.

**Joshi, (2004)**, has conducted a study entitled "*Risk and Return Analysis of common stock of five listed Commercial Banks.*" The major objectives of the study are to calculate and analyze the risk and return of banking sector, to evaluate common stock of listed commercial banks and to analyze whether the common stock of commercial banks are correctly priced or not etc.

The major findings of his study are summarized below:

- ) Regarding the market capitalization of selected companies, SCBL has the maximum market capitalization and NBBL has the minimum market capitalization.
- ) Regarding the market capitalization of the inter industry, Banking sector has 65%, Insurance & Finance has 14%, Manufacturing & Processing sector has 13%, Hotel sector has 7%, Trading sector has 1% and Other sector has negotiable proportion of share in over all market capitalization.

Joshi further concludes that the considering return, the return of SCBL is maximum (i.e.73.30%) but its risk also maximum but if risk is taken into account for consideration, NIBL has the minimum risk of 43.82%. In industry wise analysis, the expected return of finance and insurance has a maximum expected return (i.e. 27.70%), while other sector has a minimum expected return (i.e.16.61%). If the risk is assessed in term of C.V., Banking sector has minimum C.V. like 1.66, which indicates that it is better to invest on the shares of banking sector.

Theme of Joshi's study is summarized as below:

- ) As analyzing the Coefficient of variation, he suggests that the banking industry is the best one for investment. Similarly, while analyzing individual securities, SCBL is the best for investment due to highest return and lowest C.V.
- ) Based on the findings and conclusion of the study, it is recommended to the investor that if they wish to generate higher return, then they should bear higher risk and invest in the shares of SCBL. But if they are risk averters and they want to invest in single assets, then they can invest in the share of NIBL or HBL because these two stocks have lower risk than that of portfolio risk.
- ) Portfolio analysis shows that the portfolio investment can reduce risk significantly. Thus, portfolio investment is recommended to receive high return at minimum risk.

**Pokharel, (2005)**, has under taken a study entitled "*Risk & Return on Common Stock Investment of commercial banks, with reference to six commercial banks.*" Among various objectives of his study, some majors basic objectives of his research are to analyze, whether the common stock of commercial banks are correctly priced or not, by analyzing the required rate of return and to study systematic and unsystematic risk associated with securities of the commercials banks.

Majors finding of his study are given below:

- ) Among the six commercials banks, NABIL bank has highest expected rate of return on common stock (i.e.14.03%) and NIB bank has negative expected rate of return o common stock (i.e.-3.9698%). Similarly, The common stock of BOKL is most risky asset, which has highest standard deviation (i.e.52.15%) and HBL's stock is less risky due to lowest standard deviation (i.e.19.49%).
- ) Regarding the market capitalization of six selected companies, SCBNL has the maximum market capitalization (i.e.31.36%) and the market capitalization of BOKL is low by 7.11%.
- ) Considering the different investment sectors, the expected return of other sector is maximum by 34.53% and the processing sector has very low expected

return (-12.076%). Similarly, considering coefficient of variation of different sectors, the trading sector has maximum by 18.49 units, which indicate that to earn 1 unit of return, the investor has to bear 10.49 units of risk. The coefficient of variation on manufacturing & processing is -3.1349 and -3.28 (negative) respectively.

- ) On the basis of required rate of return and expected rate of return, the study shows that RRR of NIBL, NABIL, SCBNL, HBL, EBL & BOKL is 0.0175, -0.0677, -0.0174, -0.0099, -0.0526, and -0.0903 respectively. The ERR of NIBL, NABIL, SCBNL, HBL, and BOKL is -0.0396, 0.1403, 0.2264, 0.1158, 0.1312 and 0.0021 respectively. As his study shows that the common stock of NIBL is overpriced and rest of all's common stocks are under priced.

At the end of study, Mr. Pokharel recommended that before making investment decision, the investor should visit and discussion with investment Companies, with export and researchers because sharing experience, idea and view of export will provide grater help. He also advises that the investors need to diversify their investment to reduce risk. Proper construction of portfolio never takes any considerable loss.

**Mainali**, (2005), has performed another study entitled "*Risk and Return Analysis on common stock investment*". In his study, he has performed an analysis of risk and return on common stock investment with special reference to banking industry. In this study, his writs, the main objective of the study is to determine whether the shares of selected commercial banks are over-priced, under-priced or correctly valued by analyzing the risk and return. His others objectives are evaluate the common stock, to analyze the risk and return and to provide relevant suggestion to concerned authority based on analysis of data. His major findings on his study are given below in details:

- ) Among the selected commercials banks, he writs that the SCBNL has highest (i.e.32%) market capitalization which indicates that the size of the stock market of SCBNL is grater one.

- ) Regarding the expected rate of return among the selected commercial banks, the highest expected rate of return of SBI is 19.9% and lowest expected return on common stock of NBBL is -27.99%. So, it indicates that the investment in SBI will earn best return.
- ) Among the selected banks, the highest C.V. on common stock of NABIL is 12.23 and lowest C.V. common stock of SCBNL is 3.0191. It indicates NABIL stock is more risky and SCBNL stock is less risky than other. Similarly, bet coefficient of SBI is highest (i.e.3.30) and the NIBL has lowest beta coefficient (i.e.0.5831). So, it means C.S. of SBI is most aggressive stock and C.S. of NIBL is most defensive stock than other.
- ) At the last, he writes at major finding of his study that the correlation between NIBL and SBI is in negative. It indicates making portfolio investment in these two stocks will minimize risk without losing considerable return.

### **2.3 Research Gap:**

Risk, return and portfolio are the most important part of finance because they can strong impact on investment. Thus, it is not totally new concept. Many researchers have done research on this aspect. As long as researcher knows, no specific research has yet been able to go in-depth of the topic and has successfully accomplished the specified objectives of the research work. All of the previous research on this topic has been based on only showing the risk and return analysis of the stocks of commercial banks. Hence, this research will fulfill the prevailing research gap by calculating the portfolio risk, return and market price of different companies and estimating the optimal portfolio among the common stock on the basis of all relevant data and information of the latest ten fiscal year of six Nepalese joint venture banks, which are the major concern of public share holders and others stakeholders. Furthermore, the portfolio performance has also been evaluated with using Sharpe index of portfolio performance measure, which has not been calculated on other studies.

## CHAPTER - III

### RESEARCH METHODOLOGY

This chapter presents all the necessary steps to be followed throughout this research work in order to achieve and accomplish the objective of the study. Research methodology discussed in this chapter helps to guide the research study providing different issues and aspects. It systematically solves the various sequential steps to adopt by a researcher in studying problem with the objectives in view. This chapter is to outline the nature and sources of data, sample selection & classification of variables, techniques and steps adopted in interpreting and analyzing the data. It also focuses on how to collect required data, what is the population and sample, and what techniques to be adopted to analyze and interpret etc.

#### **3.1 Research Design:**

Research design is the conceptual structure within which research is performed. Research design is an overall framework or plan, which specifies the sources and types of information relevant to the research problem. In this study, the research is based on recent historical data, which are collected from various secondary sources. The research study covers the data of six fiscal years up to 2006/07. It relates with the study of risk, return and portfolio analysis of commercial banks on the basis of available information.

This study is more analytical, empirical and less descriptive. Analytical in the sense that all the available data are analyzed by using various statistical tools and techniques, such as, standard deviation, coefficient of variation and regression model etc. All the data used in this study have been taken from

related sources. The study is purely empirical due to purely historical data. The Risk, return and portfolio are main subjects of the study that follow the numerical data. For explanation of result description has been also followed.

### **3.2 Population and Sample:**

At the present, there are twenty five Commercial Banks operated in the market out of which 19 banks shares are traded in the stock market, it is not possible to study all of them regarding the study topic. So, out of them five banks are taken under study. This study is based on the portfolio analysis on common stock investment of five selected commercial banks in NEPAL. That's why it implies the study of 20% population out of total number of the commercial Banks in Nepal i.e. NABIL, HBL, EBL, NBBL, SCBNL

### **3.3 Nature and Source of Data:**

This research study is mainly based on secondary data. Published annual report of the concern banks are taken as the basic source of data. Similarly, related books, magazine, journals, articles, reports and data from Nepal Stock Exchange, Nepal Rastra Bank banking directive and financial statistics and related website etc. Previous related studies to the subject are also counted as the source of information.

### **3.4 Data Collection Techniques:**

Almost the data, which are necessary for the research is, collected from secondary sources. However, during the study period, informal opening survey has also been taken with the individual investor, related bank officials, SEBO/N (Security Board of Nepal) and NEPSE (Nepal Stock Exchange) staffs. The information has also been collected by financial documents provided by commercial banks, NRB (Nepal Rastra Bank), trading manual published by NEPSE, NEPSE periodical articles, related Websites and previous research reports.



## **3.5 Data Analysis Tools:**

### **3.5.1 Market Price of Stock (P)**

Among the various major data of this study, market price of stock is the most important tools because without market price, we cannot further calculation. There are three types of prices of the share, i.e. High price, low price & closing price of each year, which are summarized and published by Nepal Stock Exchange. For the analysis, single one is needed. Therefore, two approach either average price (i.e. average of high and low price) or closing price can be used. It is denoted by symbol of "P".

It may be very closer result if it is used average price that represents the price of whole year but it is very difficult to obtain the real average. To get the real average, volume and price of each transition of the stock and the duration of the time of each transaction in the whole year are necessary. But, it is very hard and difficult to include all the information. In this regard, it is very difficult to use average price as a market price of stock. Thus, the closing price of each year is used as the market price of the stock (MPS).

### **3.5.2 Dividend (D)**

Dividend is a portion of net earning which are paid out to the shareholders as a reward for their investment. Normally there are two types of dividend i.e. cash dividend and stock dividend. If a company declares only the cash dividend, it is easy to calculate dividend amount. But, if company declares the stock dividend (Bonus Share), it is difficult to obtain the amount that really shareholders have gained. In such condition, they get extra numbers of shares as a dividend and simultaneously the price of stock declines due to increased numbers of outstanding stocks. So to get the real amount of dividend, there is no model or formula developed yet. But in this study, model is used

which has been developed by considering practical and theoretical aspect after several discussing with NEPSE staffs & investors.

In case of stock dividend;

Total dividend = cash dividend + stock dividend % × next year's MPS

Where,

MPS = Market Price per Share

It is denoted by symbol as "D"

### 3.5.3 Return on Common Stock Investment (R<sub>j</sub>):

Return is the income received in an investment plus any change in market price, usually expressed as a % of the beginning market price of the investment. It is denoted by "R<sub>j</sub>"

Symbolically,

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

Where,

R = Return on common stock investment.

D<sub>t</sub> = Cash dividend received at 't' period.

P<sub>t</sub> = Price of stock at 't' period.

P<sub>t-1</sub> = Price of stock at 't-1' period.

### 3.5.4 Expected Return on Common Stock: E (R<sub>j</sub>)

One of the main objectives of the study is to determine the expected return on common stock investment. Thus, Expected return is one of the main tools to measure the performance of the company.

Expected rate of return is the average rate of return on common stock, which is calculated by the arithmetic mean of historical returns.

Symbolically

$$E(R_j) = \bar{R}_j \quad \text{X} \quad \frac{R_j}{n}$$

Where,

$\bar{R}_j$  = Expected rate of return on stock 'j'.

n = Number of years that the return is taken.

$\phi$  = Sign of summation.

### 3.5.5 Standard Deviation ( $\dagger$ )

Standard deviation is the statistical measurement of the variability of a distribution of return around its mean .it is the square root of the variance and measures the total risk on stock investment. It is denoted by sigma sign ( $\dagger$ ).

Symbolically,

$$\dagger_j \quad \text{X} \quad \sqrt{\frac{(R_j - \bar{R}_j)^2}{n}}$$

Where,

$\dagger_j$  = Standard deviation of returns on stock 'j' during the time period n.

### 3.5.6 Co-efficient of Variation (CV)

The Co-efficient of Variation is defined as the standard deviation divided by the mean of expected return. It is used to standardize the risk per unit of return. In other word, it is the ratio of standard deviation of returns to the mean of that distribution. It gives the result regarding the unit of risk to bear for earning 1 unit of return.

Symbolically,

$$C.V. = \frac{\dagger_j}{\bar{R}_j}$$

### 3.5.7 Beta (S)

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 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. It measures the sensitivity of a stock's return on the market portfolio.

Symbolically,

$$S_j = \frac{\text{Cov}(R_j, R_m)}{\sigma_m^2}$$

Where,

$S_j$  = Beta co-efficient for stock 'j'.

$\text{COV}(R_j, R_m)$  = Covariance between returns on stock j return of market.

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

$$\text{Cov}(R_j, R_m) = \frac{\sum (R_j - \bar{R}_j)(R_m - \bar{R}_m)}{n - 1}$$

An asset 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.

### 3.5.8 Correlation Co-efficient ( $r_{ij}$ )

The correlation is also a measure of the relationship between two assets. It can be taken on a value ranging from -1 to +1. Correlation and co-variance are related by the following equation.

Symbolically,

$$\rho_{ij} = \frac{\text{Cov}_{ij}}{\sigma_i \sigma_j}$$

Where,

$\sigma_i$  and  $\sigma_j$  are standard deviations of returns for assets I and j.

$\rho_{ij}$  = Correlation co-efficient of assets i and j.

There are various cases of correlation and risk conditions, which are presented as follows:

• **Perfectly positive correlation ( $\rho_{ij} = +1$ ):**

Return on two perfectly positive correlated stocks would move up and down together and a portfolio of two such stocks would be exactly as risky as the individual stocks. Thus, the diversifications cannot reduce risk if the portfolio consists of perfectly positive correlated stocks.

• **Perfect negative correlation ( $\rho_{ij} = -1$ ):**

Returns on two perfectly negative correlated stocks would move perfectly together but in exactly opposite direction. In this condition, risk can be completely eliminated. Perfect negative correlation almost never found in the real world.

• **No relationship between return ( $\rho_{ij} = 0$ ):**

When the correlation between two stocks is exactly 0, there is no relationship between the returns of the two stocks. In such case, some risk can be reduced.

• **Intermediate risk ( $\rho_{ij} = +0.5$ ):**

Most 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 in portfolios reduces risk but does not eliminate it completely.

### 3.5.9 Portfolio Risk & Return

A portfolio is a combination of investment assets. 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. Portfolio management is related to the efficient portfolio investment in financial assets.

#### 3.5.9.1 Portfolio Return ( $R_p$ )

The expected return on portfolio,  $\bar{R}_p$ , is simply the weighted average of the expected returns on the individual assets in the portfolio with the weights being the fraction of the total portfolio invested in each asset.

$$\bar{R}_p = \sum_{i=1}^n W_i \bar{R}_i$$

• *In case of two assets case:*

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

#### 3.5.9.2 Portfolio Risk ( $\sigma_p$ )

Portfolio risk is measured by a statistical tool standard deviation. It is a function of the proportions invested in the components, the riskiness of the components and correlation of return on the component securities. The portfolio risk is computed by using the following equations:

• *In case of two assets:*

$$\sigma_p = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \text{Cov}(R_A, R_B)}$$

### 3.5.10 Risk minimizing Portfolio

It is the ratio of two assets, which minimize risk ( $\Xi_p$ ):

Formula:

$$W_A = \frac{\sigma_B^2 \text{Cov}(R_A, R_B)}{\sigma_A^2 \Gamma + \sigma_B^2 \text{Cov}(R_A, R_B)}$$

Where,

$W_A$  = weighted of stock A that minimize the portfolio risk of stock A&B.

$\sigma_A$  = Standard deviation of stock A.

$\sigma_B$  = Standard deviation of stock B.

### 3.5.11 Systematic Risk

Systematic risk refers to that portion of total variability in return caused by factors affecting the prices of all securities. Systematic risk is market related risk or non-diversifiable risk which is due to economy wide factors. Systematic risk is external to an industry and, of business and is attributed to board forces out of the business. Unlike systematic risk it is the risk that can be diversify away. Due to this character of this risk it is said to be relevant risk to be concerned.

We can sort out systematic risk out of total risk by using this tool mentioned below:

Total risk = Systematic risk + Unsystematic.

$$\sigma_j^2 = \beta_j^2 \sigma_m^2 + \sigma_e^2 \dots \dots \dots (i)$$

$$\text{Portion of systematic risk} = \frac{\text{SystematicRisk}}{\text{TotalRisk}}$$

$$\beta_j^2 = \frac{\sigma_j^2 - \sigma_e^2}{\sigma_m^2}$$

Where,

$\sigma_j^2$  = Variance of stock J.

$\sigma_m^2$  = Variance of market.

$\beta_j^2$  = Square of beta of stock J.

## Unsystematic Risk

Unsystematic risk which is also called diversifiable risk is that component of total risk that is unique to the firm and may be eliminated by diversification. The unsystematic risk can be removed by holding a wide range of well diversified portfolio where the returns on such well diversified portfolio will vary due to the effects of market-wide or economy wide factors.

Portion of unsystematic risk will simply be (1- portion of systematic risk).

### 3.5.13 Sharpe's Portfolio Performance Measure ( $S_p$ )

It was developed to evaluate a portfolio's performance, considering both return and risk simultaneously which measures the reward to total volatility trade off. Sharpe's Performance Measure can be defined by this equation:

$$S_p = \frac{\bar{R}_j - R_{fj}}{\sigma_j}$$

Where,

$S_p$  = Sharpe's Portfolio Performance Measure for portfolio 'J'

$\bar{R}_j$  = Average/ Expected return from portfolio 'j'

$\sigma_j$  = Standard deviation of returns for portfolio 'J'

$R_{fj}$  = Risk free rate of return.



## CHAPTER - IV

### DATA PRESENTATION AND ANALYSIS

The presentation of data is the basic organization and classification of the data for analysis. After data collection is completed, the data will be in the raw form. It has to be arranged so that it makes some sense. Different types of data require different methods to present. There are a number of methods, which can be used to simplify the data. The easiest way to understand data is by examining it in charts, graphs and tables. The first and foremost part of presentation is to re arrange the data. Almost all possible data are collected from NEPSE and SEBON. However, some of the data are also collected from concerned sources. The data were in unorganized form, which was one of the gray areas of present study. However, they are simplified for the analysis purpose. First they are summarized and presented in tabulated form and thereafter they are analyzed in terms of risk, return, and coefficient of variation, beta calculation, correlation and covariance. Finally, the minimum risk portfolio weight is calculated by various correlated assets and tried to find out the optimum solution of the study as to constructing portfolio that will result in maximum return at its same level of risk or minimum risk at its same level of return. This chapter is sub-divided in to nine parts and each part gives the clear presentation and analysis figure and facts of the calculation.

#### 4.1 Individual Assets Analysis

As the study has been taken special reference to five listed Banks, the common stock of each bank's which are listed in NEPSE are analyzed here individually. It is already known that there are 23 commercial banks operated in Nepal till date. The names of Banks that are included under study are as follows:

## 4.1.1 Nabil Bank Limited (NABIL)

### 4.1.1.1. Calculation of market per share (MPS) and dividend per share (DPS) of NABIL

Table: 4.1

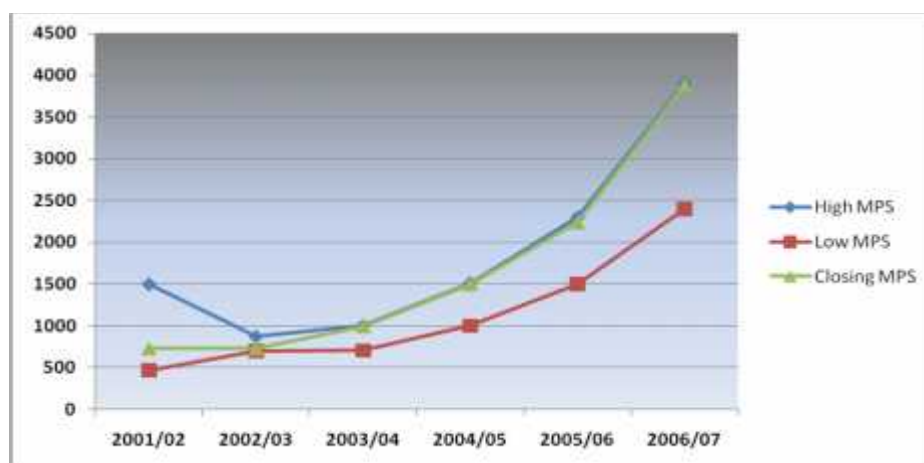
MPS and DPS of NABIL bank limited.

Fiscal Year	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend(%)	Total Dividend
2001/02	1500	465	735	30	25	55
2002/03	875	700	735	50	-	50
2003/04	1005	705	1000	60	-	60
2004/05	1515	1000	1505	70	-	70
2005/06	2300	1500	2240	85	-	85
2006/07	3900	2400	3875	100	40	100

Source: NEPSE; website <http://www.nepalstock.com>

Figure 4.1

Year-end price movement of NABIL



From the above Diagram, it can be concluded that the movement of MPS of common stock of NABIL, is increasing throughout the study period but remain constant in 2002/03. By the year 2002/03, the closing Market price per share of NABIL bank is in increasing trend continuously. It indicates that the growth of Nabil Bank is in increasing trend. From the above table we can also see that the NABIL bank has increasing trend of dividend .

**4.1.1.2 Calculation of expected rate of return, standard deviation and coefficient of variance of NABIL bank.**

Expected rate of return (R), Standard deviation (σ), expected return ( $\bar{R}$ ) and coefficient variation are the main required term that are calculated in Table no.4.2. Year-end price and dividend amounts are used to calculate to realize rate of return for each year

**Table 4.2**

**Realized return(R), Standard Deviation (σ) and expected return ( $\bar{R}$ )**

Fiscal Year	Closing MPS	Dividend	$R_n \times \frac{D_t + P_{t+1}}{P_{t1}}$	$R_n - \bar{R}_n$	$(R_n - \bar{R}_n)^2$
2001/02	735	30	-	-	-
2002/03	735	50	0.4285	-0.1321	0.0174
2003/04	1000	60	0.5650	-0.0004	0.0001
2004/05	1505	70	0.5348	-0.0258	0.0016
2005/06	2240	85	0.7299	0.1693	0.0286
2006/07	3875	100	0.5448	-0.0158	0.0012
<b>Total</b>			Rn X2.803	$(R_n - \bar{R}_n)^2$ X0.4879	

# expected rate of Return  $(\bar{R}_n) \times \frac{R_n}{n} \times \frac{2.803}{5} \times 0.5606 = 56.06\%$

# Standard Deviation  $(\sigma_n) \times \sqrt{\frac{(R_n - \bar{R}_n)^2}{n}} \times \sqrt{\frac{0.4879}{5}} \times 0.1219 = 12.19\%$

$$\# \text{ Co-efficient of Variation (CV}_n) = \frac{\dagger_n}{R_n} \times \frac{0.1219}{0.5606} \times 0.2174$$

$$\# \text{ Variance } (\dagger_n)^2 \times (0.1219)^2 \times 0.014$$

Above table shows that the expected rate of return of NABIL are 56.06, which is the sum of single rate of return divided by no. of observations where standard deviation of NABIL is 12.19% which is due to the variation in single period rate of return. Where coefficient of variation of NABIL bank is 0.2174 which means for earning 1 unit of return the investors has to bear 0.2174 unit of risk where variance is 0.014.

#### 4.1.1.3 Calculation of Co-variance, Correlation and Beta of NABIL Bank

**Table 4.3**

Fiscal Year	$(R_n - \bar{R}_n)$	$(R_m - \bar{R}_m)$	$(R_n - \bar{R}_n)(R_m - \bar{R}_m)$
2002/03	-0.1321	-0.4025	0.05317
2003/04	-0.0004	-0.1552	0.00062
2004/05	-0.0258	0.1284	0.00573
2005/06	0.1693	0.3356	0.13945
2006/07	-0.0158	0.2939	0.04653
<b>Total</b>			$\Sigma(R_n - \bar{R}_n)(R_m - \bar{R}_m) = 0.24551$

$$\# \text{ Cov}(R_n, R_m) = \frac{\Sigma(R_n - \bar{R}_n)(R_m - \bar{R}_m)}{n - 1} = \frac{0.24551}{5-1} = 0.061$$

$$\# \text{ Cor}(R_n, R_m) = \frac{\text{Cov}(R_n, R_m)}{\dagger_n \dagger_m} = \frac{0.061}{0.1219 * 0.2867} = 1.745$$

$$\# S_n = \frac{\text{Cov}(R_n, R_m)}{\dagger_m^2} = \frac{0.061}{(0.2867)^2} \times 0.7421$$

From above calculation beta coefficient of NABIL is 0.7421 which is less than 1. Here; Beta is less than 1 means that the stock of NABIL is less volatile than the market i.e.

Stock seems to be a defensive. Covariance and correlation coefficient of NABIL are 0.0610 and 1.745 respectively which shows that it is positive correlated variables.

## 4.1.2 Himalayan Bank Limited. (HBL)

### 4.1.2.1 Calculation of market per share (MPS) and dividend per share (DPS) of HBL

Table 4.4

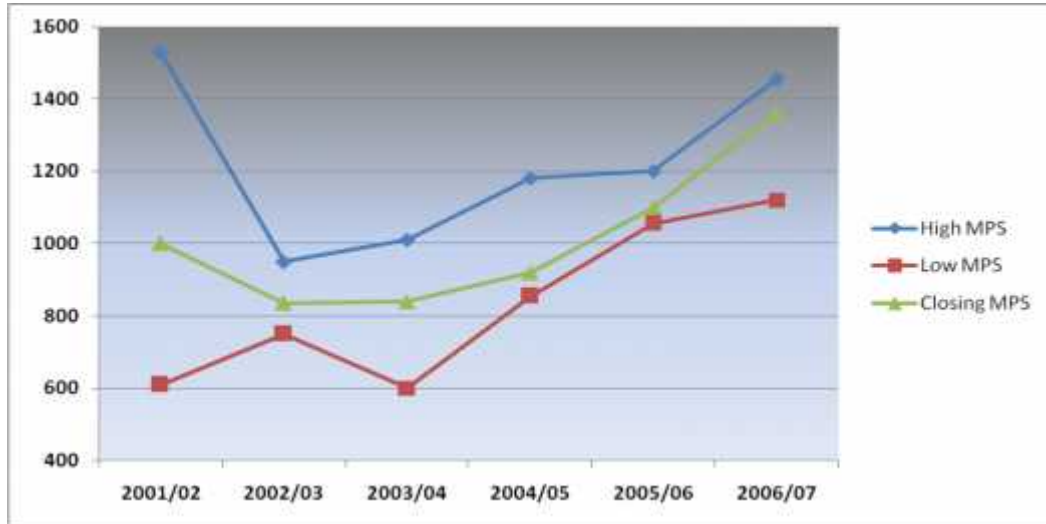
MPS and Dividend data of Himalayan Bank Limited

Fiscal Year	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend (%)	Total Dividend
2001/02	1530	610	1000	25	10	108.6
2002/03	950	750	836	1.32	25	211.3
2003/04	1010	600	840	0	20	184
2004/05	1181	855	920	11.5	20	231.5
2005/06	1200	1055	1100	30	5	118
2006/07	1455	1120	1360	30	10	146

Source: NEPSE; website <http://www.nepalstock.com>, Annual Report of HBL 2006/07

Figure 4.2

Year-end price movement on common stock of HBL



From the above diagram, it can be concluded that the movement of price of share of HBL is in increasing trends from fiscal year 2002/03 and onward. 1530 is the highest MPS of HBL in 2001/02 during the period but in the fiscal year 2002/03 MPS of HBL is decrease than of previous year. However, it is slightly increased from fiscal year 2002/03. The portion of highest stock dividend paid by HBL is 25% in 2002/03 and the lowest during the period is 5% in fiscal year 2005/06. In the conclusion, it can be said that a fluctuating scenario is seen in the closing MPS of HBL.

#### 4.1.2.2 Computation of Required Terms

Table 4.5

Calculation of expected rate of return, standard deviation and coefficient of variance:

Fiscal Year	Closing MPS	Dividend	$R_h \times \frac{D_t \Gamma(P_t Z P_{tZ})}{P_{tZ}}$	$R_h Z \bar{R}_h$	$(R_h Z \bar{R}_h)^2$
2001/02	1000	25	-	-	-

2002/03	836	1.32	0.0063	-0.1732	0.0300
2003/04	840	0	0.0952	-0.0843	0.0071
2004/05	920	11.5	0.2081	0.0837	0.0070
2005/06	1100	30	0.2636	0.0286	0.0508
2006/07	1360	30	0.3239	0.1444	0.0208
Total			$\Sigma R_h = 0.8971$	$(R_h \bar{Z} R_h)^2 \times 0.06578$	

# Expected Rate of Return ( $\bar{R}_h$ )  $\times \frac{R_h}{n} \times \frac{0.8971}{5} \times 0.1795 = 17.95\%$

# Standard Deviation ( $\dagger_h$ )  $\times \sqrt{\frac{(R_h \bar{Z} R_h)^2}{n \bar{Z} 1}} \times \sqrt{\frac{0.06578}{5 \bar{Z} 1}} \times 0.1283$

# Co-efficient of Variation ( $CV_h$ )  $= \frac{\dagger_h}{R_h} \times \frac{0.1283}{0.1795} \times 0.7147$

# Variance ( $\dagger_h$ )<sup>2</sup>  $\times (0.1283)^2 \times 0.0164$

The result shows that the Expected Return on common stock of HBL is normal i.e. 17.95% and deviation on return from mean return are also normal that is 12.83 %. Similarly, the co-efficient of variation is 0.7147 indicates that to earn 1 unit of return, the investors should bear 0.7147 of risk. Thus, it is profitable asset.

**Table 4.6**

**Calculation of Co-variance, Correlation and Beta of HBL**

Fiscal Year	$(R_h \bar{Z} R_h)$	$(R_m \bar{Z} R_m)$	$(R_h \bar{Z} R_h) (R_m \bar{Z} R_m)$
2001/02	-0.1732	-0.4025	0.0697
2002/03	-0.0843	-0.1552	0.0130
2003/04	0.0837	0.1284	0.0017
2004/05	0.0286	0.3356	0.0076
2005/06	0.1444	0.2939	0.0420
Total	$\Sigma (R_h \bar{Z} R_h) (R_m \bar{Z} R_m) = 0.0455$		

$$\# \text{Cov}(R_h, R_m) = \frac{(R_h \bar{Z} \bar{R}_h) (R_m \bar{Z} \bar{R}_m)}{n Z1} = \frac{0.0455}{5 Z1} = 0.01137$$

$$\# \text{Cor}(R_h, R_m) = \frac{\text{Cov}(R_h, R_m)}{\uparrow_h \uparrow_m} = \frac{0.0455}{0.1283 \mid 0.2867} = 1.2369$$

$$\# S_h = \frac{\text{Cov}(R_h, R_m)}{\uparrow_m^2} = \frac{0.01137}{(0.2867)^2} = 0.1384$$

As we know that beta is the index of systematic risks, which normally stimulate by market forces and cannot be diversified. HBL has beta of 0.1384, which indicates that it is a defensive asset, which seem to less volatile than market. Covariance is 0.01137 indicates the lower than perfectly positively correlation of HBL with market and therefore it is a less risky asset. The correlation of HBL is 1.2369 i.e. greater than 1. It indicates that the correlation of HBL is exact and positive also.

### 4.1.3 Everest Bank Limited (EBL)

#### 4.1.3.1 Calculation of market per share (MPS) and dividend per share (DPS) of EBL

Table 4.7

MPS and Dividend data of Everest Bank Limited

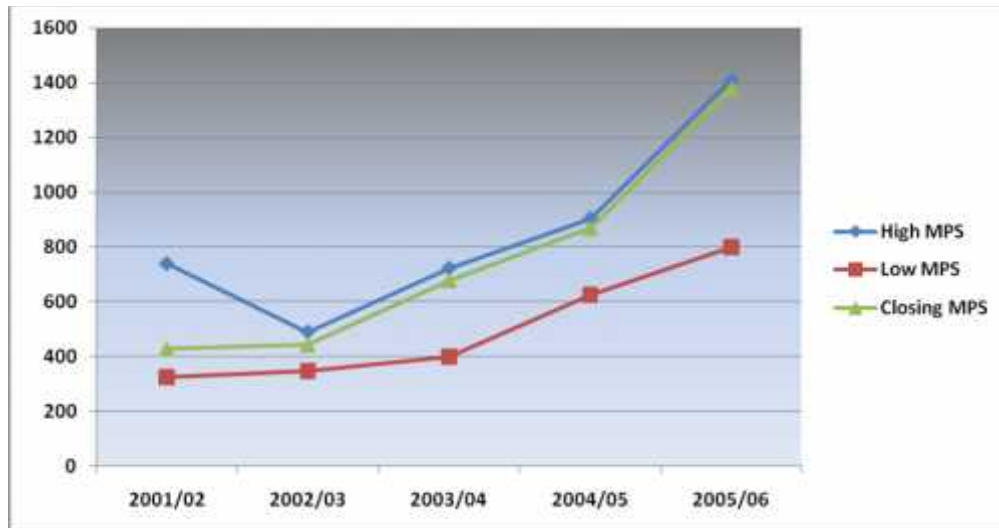
Fiscal Year	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend (%)	Total Dividend
2001/02	740	325	430	0	20	89
2002/03	490	349	445	20	0	20
2003/04	723	400	680	20	0	20
2004/05	905	625	870	0	20	275.8
2005/06	1410	800	1379	25	-	25
2006/07	1950	1270	1725	40	30	458

Source: NEPSE; website <http://www.nepalstock.com>, Annual Report of EBL 2005/06



**Figure 4.3**

**Year-end price movement on common stock of EBL**



From the above diagram, it can be concluded that the movement of closing MPS of EBL is fluctuate in both increasing and decreasing trends during the period. Which has the highest closing MPS in year 2006/07 and the lowest in fiscal year 2001/02 during the period, however it is slightly increasing from fiscal year 2002/03. During the period, the4 lowest closing MPS of EBL is Rs. 430 in the fiscal year 2001/02 and the highest is Rs. 1725 in the fiscal year 2006/07. Over the study period high MPS decrease in year 2002/03 in comparison with 2001/02, after that the Closing MPS of EBL is always in increasing trend.

#### 4.1.3.2 Computation of required terms

**Table 4.8**

**Calculation of expected rate of return, standard deviation and coefficient of variation**

Fiscal Year	Closing MPS	Dividend	$R_e \times \frac{D_t \Gamma(P_t Z P_{tZ1})}{P_{tZ1}}$	$R_e Z \bar{R}_e$	$(R_e Z \bar{R}_e)^2$
2001/02	430	0	-	-	-
2002/03	445	20	0.5730	0.1042	0.01085
2003/04	680	20	0.3970	-0.0718	0.00515
2004/05	870	0	0.5850	0.1162	0.0135
2005/06	1379	25	0.2690	-0.1998	0.03992
2006/07	1725	40	0.5204	0.0516	0.00261
Total			$\Sigma R_e = 2.3444$	<input type="text"/>	

$$\# \text{ Expected Return } (\bar{R}_e) \times \frac{R_e}{n} \times \frac{2.344}{5} \times 0.4688 = 46.88\%$$

$$\# \text{ Standard Deviation } (\dagger_e) \times \sqrt{\frac{(R_e Z \bar{R}_e)^2}{n Z 1}} \times \sqrt{\frac{0.07331}{5 Z 1}} \times 0.1353 = 13.53\%$$

$$\# \text{ Co-efficient of Variation } (CV_e) = \frac{\dagger_e}{R_e} \times \frac{0.1353}{0.4688} \times 0.289$$

$$\# \text{ Variance } (\dagger_e)^2 \times (0.1353)^2 \times 0.01833$$

The above calculation shows that expected rate of return of EBL is 46.88% and variability on mean return is only 13.53%. And deviation on return from mean return are also normal i.e.13.53%. Co-efficient of variance is 0.289 Thus, there is associated 0.289 amount of risk, which indicates that to earn 1 unit of return, and the investors should bear 0.289 unit of risk.

**Table 4.9**

**Calculation of Co-variance, Correlation and Beta of EBL**

Fiscal Year	$(R_e - \bar{R}_e)$	$(R_m - \bar{R}_m)$	$(R_e - \bar{R}_e)(R_m - \bar{R}_m)$
2002/03	0.1042	-0.4025	-0.2560
2003/04	-0.0718	-0.1552	0.3384
2004/05	0.1162	0.0284	0.1069
2005/06	-0.1998	0.2356	-0.0839
2006/07	0.0516	0.2939	0.0837
<b>Total</b>			$\sum (R_e - \bar{R}_e)(R_m - \bar{R}_m) = 0.3256$

$$\# \text{Cov}(R_e, R_m) = \frac{(R_e - \bar{R}_e)(R_m - \bar{R}_m)}{n - 1} = \frac{0.3256}{5} = 0.0814$$

$$\# \text{Cor}(R_e, R_m) = \frac{\text{Cov}(R_e, R_m)}{\sigma_e \sigma_m} = \frac{0.0814}{0.1353 \times 0.2867} = 2.0984$$

$$\# S_e = \frac{\text{Cov}(R_e, R_m)}{\sigma_m^2} = \frac{0.0814}{(0.2867)^2} = 1.00$$

From above calculations it is found that beta coefficient of EBL is 1.00. This indicates that the stock of EBL is moderate. Covariance and correlation coefficient of EBL are 0.0814 and 2.0984 respectively that indicates that the stock of EBL is positively correlated.

## 4.1.4 Nepal Bangladesh Bank Limited (NBBL)

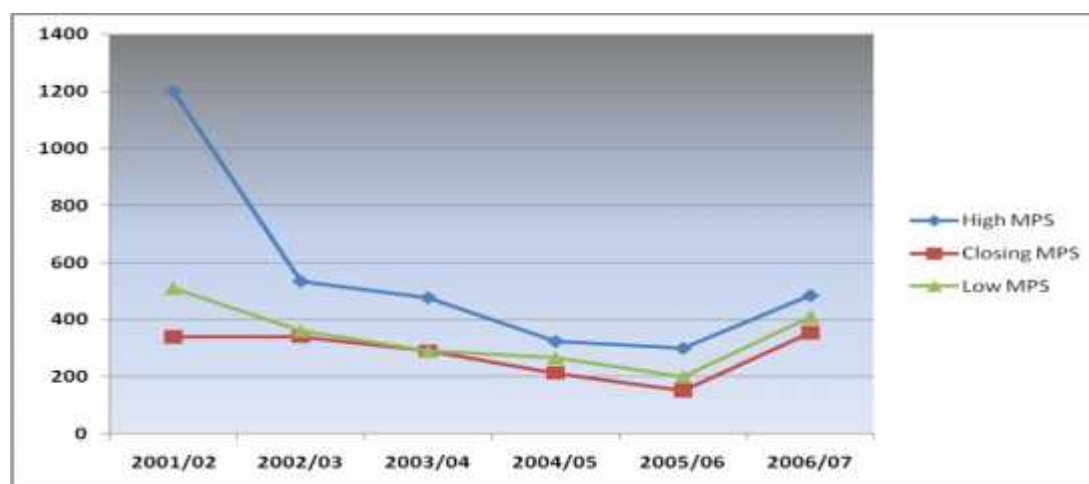
### 4.1.4.1 Calculation of market per share (MPS) and dividend per share (DPS) of NBBL

Table 4.10  
MPS and Dividend data of NBBL

Fiscal Year	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend (%)	Total Dividend
2001/02	1200	340	510	0	-	0
2002/03	535	341	360	0	-	0
2003/04	477	290	290	0	-	0
2004/05	324	214	265	0	-	0
2005/06	300	152	199	0	-	0
2006/07	485	355	410	0	-	0

Source: NEPSE; website <http://www.nepalstock.com>, Annual Report of SEBO/N 2005/06

Figure 4.4  
Year-end price movement on common  
NBBL



As mentioned values of MPS and dividend according to the above Table and diagram, it is seen that there is more fluctuation in market price in every year of NBBL. The maximum high MPS is Rs.1200 in 2001/02 but it was decreased to Rs.199 till 2005/06. The lowest MPS at the end of year is Rs199 in 2005/06 among mentioned five years of period. The movement of market price per share of NBBL has been fluctuating in every year since it has a higher price of Rs.1200 for once. During the study period NBBL has not declared any dividend in any fiscal year. That's why NBBL did not pay any kind of dividend during the research period.

#### 4.1.4.2 Computation of required terms

Calculating required terms like Expected Rate Of return(R), Standard Deviation ( $\sigma$ ) and coefficient of variation that are shown in figure no. 4.4. Year-end price and dividend amounts are used to calculate the realized rate of returns for each year.

**Table 4.11**

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

Fiscal Year	Closing MPS	Dividend	$R_{nb} \times \frac{D_t + P_{tZ}}{P_{tZ}}$	$R_{nb} \times \bar{R}_{nb}$	$(R_{nb} \times \bar{R}_{nb})^2$
2001/02	510	0	-	-	-
2002/03	360	0	-0.1944	-0.5243	0.2748
2003/04	290	0	-0.0943	-0.4242	0.1799
2004/05	265	0	-0.1944	-0.05243	0.0027
2005/06	199	0	1.0600	0.7301	0.5330
2006/07	410	0	1.073	0.7431	0.5521
Total			$\Sigma R_{nb} = 1.6499$	$\Sigma (R_{nb} \times \bar{R}_{nb})^2 = 1.5425$	

$$\# \text{ Expected Rate of Return } (\bar{R}_{nb}) \times \frac{R_{nb}}{n} \times \frac{1.6499}{5} \times 0.3299 = 32.99\%$$

$$\# \text{ Standard Deviation } (\sigma_{nb}) \times \sqrt{\frac{(R_{nb} \times \bar{R}_{nb})^2}{n \times Z1}} \times \sqrt{\frac{1.5425}{5 \times Z1}} \times 0.6205$$

$$\# \text{ Co-efficient of Variation (CV}_{nb}) = \frac{\dagger_{nb}}{R_{nb}} \times \frac{0.6205}{0.3299} \times 1.8808$$

$$\# \text{ Variance } (\dagger_{nb})^2 \times (0.6205)^2 \times 0.3850$$

The calculation that is done above among six year can be interpreted that the mean return of NBBL is 32.99% and the S.D. is 62.05%, which creates the risk portion of i.e. co-efficient of variation. Thus, there is associated 0.6205 amount of risk, which indicates that to earn 1 unit of return, the investors should bear 0.6205 unit of risk.

**Table 4.12**

**Calculation of Co-variance, Correlation and Beta of NBBL**

Fiscal Year	$(R_{nb} - \bar{R}_{nb})$	$(R_m - \bar{R}_m)$	$(R_{nb} - \bar{R}_{nb})(R_m - \bar{R}_m)$
2002/03	-0.5243	-0.4025	0.211031
2003/04	-0.4242	-0.1552	0.065836
2004/05	-0.05243	0.0284	-0.00149
2005/06	0.7301	0.2356	0.172012
2006/07	0.7431	0.2939	0.218397
<b>Total</b>			$\Sigma (R_{nb} - \bar{R}_{nb})(R_m - \bar{R}_m) = 0.6657$

$$\# \text{ Cov}(R_{nb}, R_m) = \frac{(R_{nb} - \bar{R}_{nb})(R_m - \bar{R}_m)}{n - 1} = \frac{0.6657}{5 - 1} = 0.16642$$

$$\# \text{ Cor}(R_{nb}, R_m) = \frac{\text{Cov}(R_{nb}, R_m)}{\dagger_{nb} \dagger_m} = \frac{0.16642}{0.6205 \times 0.2867} = 0.2282$$

$$\# S_{nb} = \frac{\text{Cov}(R_{nb}, R_m)}{\dagger_m^2} = \frac{0.16642}{(0.2867)^2} = 2.00246$$

Above table shows From above calculations it is found beta coefficient of NBBL is 2.00246 which is more than 1. This indicates that it is a offensive type of asset which seem to more volatile than market. Covariance and correlation coefficient of NBBL bank are 0.16642 and 0.2282 respectively.

## 4.1.5 Standard Chartered Bank Nepal Limited. (SCBNL)

### 4.1.5.1 Calculation of market per share (MPS) and dividend per share (DPS) of SCBNL

Table 4.13

#### MPS and Dividend data of SCBNL

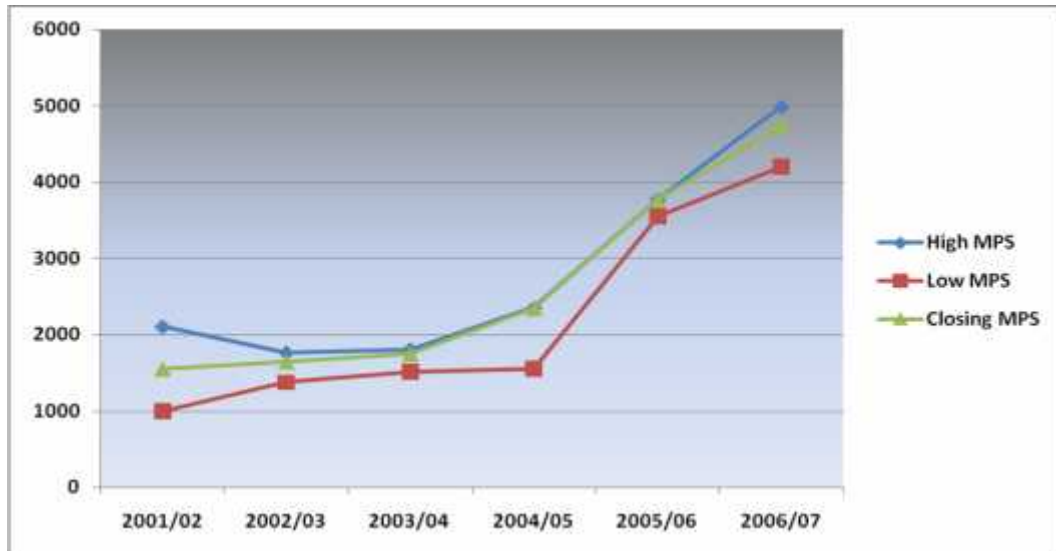
Fiscal Year	High MPS	Low MPS	Closing MPS	DPS	Stock Dividend (%)	Total Dividend
2001/02	2100	1000	1550	100	-	100
2002/03	1760	1380	1640	110	10	284.5
2003/04	1800	1520	1745	110	-	110
2004/05	2350	1553	2345	120	-	120
2005/06	3775	3550	3775	130	10	720
2006/07	4990	4200	4750	100	50	2550

Source: NEPSE; website <http://www.nepalstock.com>, Annual Report of SCBL 2005/06

The higher MPS of SCBL is found very high in 2006/07 i.e. Rs. 4990 whereas the lowest one is Rs. 1760 in 2002/03. The MPS of SCBNL looks increasing trend from fiscal year 2002/03. The SCBNL has been paying cash dividend regularly to his stockholders but varied from year to year. The diagram shows the clear picture of price movement and dividend fluctuations of the SCBNL.

Figure 4.5

Year-end price movement of SCBNL



From the above diagram, it can be seen that the movement of price of common stock of the SCBNL is in increasing trends from fiscal year 2002/03 but it looks slightly decline at fiscal year 2001/02 than of 2002/03. Similarly, after the fiscal year 2002/03, the stock price is in increasing trend up to fiscal year 2006/07, which is the highest MPS during the period.

#### 4.1.5.2 Computation of required terms

Here is computing required terms like Required Rate of ( $R$ ), Standard Deviation ( $\sigma$ ) and expected return ( $\bar{R}$ ) that are shown in Table no. 4.5. Year-end price and dividend amounts are used to calculate the realized rate of returns for each year.



**Table 4.14**

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

Fiscal Year	Closing MPS	Dividend	$R_{sc} \times \frac{D_t \Gamma(P_t Z P_{tZ})}{P_{tZ}}$	$R_{sc} Z \bar{R}_{sc}$	$(R_{sc} Z R_{sc})^2$
2001/02	1550	100	-	-	-
2002/03	1640	110	0.1310	-0.3158	0.09973
2003/04	1745	110	0.4068	-0.04	0.0016
2004/05	2345	120	0.4904	0.0436	0.001901
2005/06	3775	130	0.2927	-0.1541	0.023747
2006/07	4750	100	0.9025	0.4557	0.207662
Total			$\Sigma R_{sc} = 2.2234$	$(R_{sc} Z R_{sc})^2 \times 0.3346$	

$$\# \text{ Expected Return } (\bar{R}_{sc}) \times \frac{R_{sc}}{n} \times \frac{2.2234}{5} \times 0.4468 = 44.68\%$$

$$\# \text{ Standard Deviation } (\dagger_{sc}) \times \sqrt{\frac{(R_{sc} Z \bar{R}_{sc})^2}{n Z 1}} \times \sqrt{\frac{0.3346}{5 Z 1}} \times 0.2892 = 28.92\%$$

$$\# \text{ Co-efficient of Variation } (CV_{sc}) = \frac{\dagger_{sc}}{R_{sc}} \times \frac{0.2892}{0.4468} \times 0.6472$$

$$\# \text{ Variance } (\dagger_{sc})^2 \times (0.2892)^2 \times 0.083663$$

The expected rate of return of SCBNL is 44.68% that is calculated by summing the single period rate of return of different years dividing by number of observations. Standard deviation is 28.92 % means the stock of SCBNL is less risky with higher rate of return. The coefficient of the variation is 0.6472, which means for earning 1 unit of return, the investor has to bear 0.6472 units of risk.

**Table 4.15**

**Calculation of Co-variance, Correlation and Beta of SCBNL:**

Fiscal Year	$(R_{sc} - \bar{R}_{sc})$	$(R_m - \bar{R}_m)$	$(R_{sc} - \bar{R}_{sc})(R_m - \bar{R}_m)$
2002/03	-0.3158	-0.4025	0.12711
2003/04	-0.04	-0.1552	0.006208
2004/05	0.0436	0.0284	0.001238
2005/06	-0.1541	0.2356	-0.03631
2006/07	0.4557	0.2939	0.13393
Total			$\sum (R_{sc} - \bar{R}_{sc})(R_m - \bar{R}_m) = 0.2321$

$$\# \text{Cov}(R_{sc}, R_m) = \frac{\sum (R_{sc} - \bar{R}_{sc})(R_m - \bar{R}_m)}{n - 1} = \frac{0.2321}{4} = 0.0580 = 5.8\%$$

$$\# \text{Cor}(R_{sc}, R_m) = \frac{\text{Cov}(R_{sc}, R_m)}{\sigma_{sc} \sigma_m} = \frac{0.1064}{0.4202 \times 0.2867} = 0.8832$$

$$\# S_{sc} = \frac{\text{Cov}(R_{sc}, R_m)}{\sigma_m^2} = \frac{0.1064}{(0.2867)^2} = 1.2944$$

Here, beta coefficient of SCBNL is found 1.2944 i.e. beta is greater than 1. So this is an offensive asset. Covariance between SCBNL and market is only 10.64%. So it is a more volatile than the market. Beta is an index of systematic risk and that is found to be maximum, so this is offensive type of asset and found to be more risky. Correlation coefficient between market and SCBNL is 0.8832.

## 4.2 Inter Bank Comparison

### 4.2.1 On the basis of Risk and Return

According to the analysis of the return from the section 4.1, a comparative analysis of risk and return is performed in this section. The portion of systematic risk and unsystematic risk also has been included in this section. The Expected return, standard deviation of returns, coefficient of variation of each bank for the fiscal year 2001/02 to 2006/07 is given in Table no. 4.16.

**Table 4.16**

**Expected Return, Standard Deviation, Variance and Coefficient of Variation of individual Bank:**

Name of Bank	Expected Return	S.D.	Var.	C.V.	Remarks
NABIL	0.5606	0.1219	0.0140	0.2174	Lowest S.D and Highest return.
HBL	0.1795	0.1283	0.7147	0.0164	Lowest S.D and lower return
EBL	0.4688	0.1353	0.0183	0.2886	Medium return and lowest S.D.
NBBL	0.3299	0.6205	0.3850	1.8808	Medium return and Highest S.D.
SCBNL	0.4468	0.2892	0.0836	0.6472	Lower S.D and medium return

From above calculation we can observe that the investors will get highest expected return from NABIL Bank Limited i.e. 56.06% with comparison to other banks. The lowest rate of return is from the HBL by return of 17.95%. the others bank provided by SCBNL is 44.68% and EBL is 46.88% which seems nice but of NBBL is 32.99% which is slightly low than two banks.

Risk is underlying factor of the security and associated factor of return. The risk factors of commercial banks are high enough. The range of standard deviation is 0.1219 to 0.6205. The standard deviation of the NABIL, HBL, EBL, NBBL, and SCBNL are 0.1219, 0.1283, 0.1353, 0.6205, and 0.2892. This indicates NABIL as the least risky and NBBL is the most risky assets.

Risk and return are one of the major determinants of investment. Therefore an investor does not invest on the ground of one of them. They compare risk and return taking the degree of return in term of risk which we measure as coefficient of variance (CV). This helps to rank the investment alternatives. The alternative with lower CV is preferable for investment. The calculation shows CV among the commercial banks is from HBL. Investors prefer HBL due to lower level of risk. Hence CV 0.0164 of HBL represents that if there is 1% changes in return of stock will result 0.00164% change in risk factor in both directions. It has been inferred from the table that NBBL is the worst security and HBL is the best security in term of coefficient of variation. But investors must give attention to the standard deviation of assets. Further knows that the expected return and standard deviation from any security is the object of choice for any investor. Ultimately most investor is risk averter and they prefer highest return with low risk. Covariance is the tool that shows how the return of market and individual stock vary. Therefore investor should concentrate about both risk and return but it is difficult to say that which security is best for investment point of view, for that purpose C.V. gives clear design about risk for any security per unit of return. So now investor can clearly know that the HBL with highest covariance has

the strongest relationship with market and NBBL with the lowest covariance has the weakest relationship with the market among all.

#### 4.2.2 On The Basis Of Systematic and Unsystematic Risk

Total risk is measured by the variance of return. Total risk can be partitioned into systematic risk and unsystematic risk. Systematic risk cannot be eliminated through diversification. Beta coefficient is the index of systematic risk. In other words market sensitivity of stock can be defined by term "Beta Coefficient". Beta coefficient of different banks is summarized below:

**Table 4.17**  
**Comparison of risk of Different banks**

Name of Bank	Beta	Variance ( $\sigma^2$ )	Systematic Risk (S.R.)= $\frac{s_j^2   t_m^2}{t_j^2}$	Unsystematic Risk = (1- S.R.)
NABIL	0.7421	0.0140	0.9199	0.0801
HBL	0.1384	0.0164	0.7799	0.2201
EBL	1.0000	0.0183	0.9465	0.0535
NBBL	2.0020	0.3850	0.9116	0.0884
SCBNL	1.2944	0.0836	0.7213	0.2787

(a) Market Variance ( $\sigma_m^2$ ) =  $(0.2867)^2 = 0.0822$

Summary of beta calculation: - Above table shows that the beta of NBBL and SCBNL is greater than one i.e.  $\beta > 1$ , and the beta of the EBL is equal to 1. So above mentioned three assets have aggressive type of asset, which indicates they are more volatile than the market. On the other hand HBL & Nabil have less than one beta i.e.  $\beta < 1$ , which indicates they have a defensive type of assets and these assets are less volatile than the market.

According to above calculation, NBBL and SCBNL faces more risk because of their higher beta i.e. 2.0020 and 1.2944 respectively, lowest is 0.1384 of HBL bank. It means NBBL is more sensitive than remaining others due to its higher beta and HBL is less sensitive.

In case of systematic risk, EBL takes the first position with 0.9465 and SCBNL faces the lowest systematic risk of 0.7213. The above table indicates that the total risk of NBBL is highest and total risk of HBL & SCBNL is lowest among the commercial banks.

Systematic risk is the market risk and that can't eliminate through diversification. Here, NBBL and EBL have highest coefficient of determination, which indicates that the total risk of them has, consist with systematic risk that can't be eliminated. Unsystematic risk of NABIL and SCB can be diversified away. In the other hand NBBL has highest total risk. EBL has lower coefficient of determination, which shows that there is huge part of unsystematic risk on total risk. So risk of NBBL and EBL can be eliminating through diversification.

#### **4.2.3 On the basis of Movement of Market Capitalization**

Market capitalization movement denotes the changed values of the company from year to year. Thus, it is trying to compare market value of each bank by considering their year-end market capitalization amount from the fiscal year 2001/02 to 2006/07.

**Table 4.18**

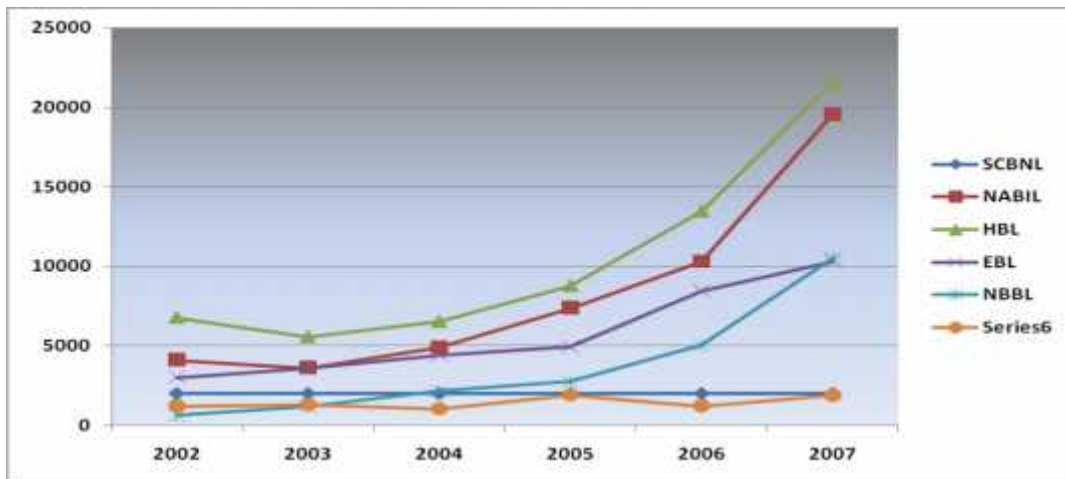
**Year-wise comparative movement of market capitalization (Rs in million)**

Bank	15 <sup>th</sup> July 02	15 <sup>th</sup> July 03	15 <sup>th</sup> July 04	15 <sup>th</sup> July 05	15 <sup>th</sup> July 06	15 <sup>th</sup> July 07
NABIL	4112.57	3608.81	4909.95	7389.47	10310.90	19568.24
SCBNL	6790.98	5568.60	6537.47	8785.32	13487.10	21590.46
HBL	3000.00	3586.44	4410.00	4933.50	8455.59	10290.32
EBL	619.00	1171.29	2142.00	2740.50	5038.74	10532.4
NBBL	1224.00	1296.00	1044.00	1899.06	1223.87	1872.54

) source: NEPSE website <http://www.nepalstock.com>, Annual Report SEBO/N (2006/07)

**Figure 4.6**

**Year-end Movement of Market Capitalization:**



According to above presentation, normally, SCBL has the highest market capitalization in every year than others banks. However, there is seemed more fluctuation in such value between current year and following year in each bank and most of the bank has the highest market capitalization in the fiscal year 2007 but only SCBNL has the highest market capitalization in the fiscal year 2002.

### 4.3 Comparison with Market

There is only one stock market exist in Nepal namely Nepal Stock Exchange Limited (NEPSE). Overall market movement is represented by the market index i.e. NEPSE index. All the trading of stock is traded in Nepal Stock Exchange Limited. In this section risk and return of each industry will compare with market risk and return.

#### 4.3.1 On the basis of Market Risk and Return

Table 4.19

Calculation of Market Returns, Expected Return, S.D. and C.V. of market

Fiscal Year	NEPSE Index	$R_m \times \frac{NI_t \times ZNI_{tZ1}}{NI_{tZ1}}$	$R_m \times Z\bar{R}_m$	$(R_m \times Z\bar{R}_m)^2$
2001/02	227.54	-	-	-
2002/03	204.86	-0.3470	-0.4025	0.1620
2003/04	222.04	-0.0997	-0.1552	0.0241
2004/05	286.67	0.0839	0.0284	0.0008
2005/06	386.83	0.2911	0.2356	0.0555
2006/07	536.32	0.3494	0.2939	0.0864
Total		$\sum R_m = 0.2777$		$\sum (R_m \times Z\bar{R}_m)^2 = 0.3288$

Calculation of expected return, standard deviation and coefficient of variation are as follow:

$$\# \text{ Expected Return } (\bar{R}_m) \times \frac{R_m}{n} \times 0.2777 / 5 \times 0.0555$$

$$\# \text{ Standard Deviation } (\dagger_m) \times \sqrt{\frac{(R_m \times Z\bar{R}_m)^2}{n \times Z1}} = \sqrt{\frac{0.3288}{5 \times Z1}} \times 0.2867$$

$$\# \text{ Co-efficient of Variation (C.V.)} = \frac{\dagger_m}{R_m} = \frac{0.2867}{0.0555} \times 5.1658$$

$$\# \text{ Variance (V)} = 0.0822$$



The year wise market index movement is shown in the

**Figure 4.7.**

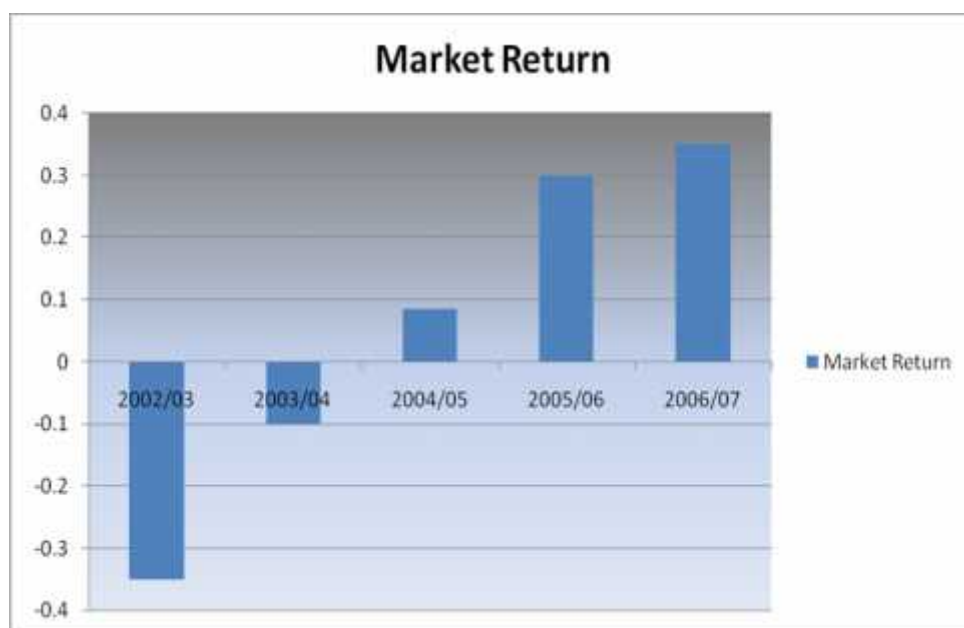
**Market index Movement**



The NEPSE Index is very high in 2006/07 i.e. 536.32 and the lowest is 204.86 in 2002/03 during the period of time in this study. From the fiscal year 2001/02 to 2003/04, NEPSE index looks in decreasing trend. However in forward three years, the NEPSE Index starts to increase its value and reach up to Rs 536.32 at fiscal year 2006.07The year wise realized return of market is shown in Figure 4.8.

**Figure 4.8**

**Market returns Movement**



From the above diagram, we can see that the realized returns of the market is in negative trend up to 2002/03 but after that it is in positive trend up to fiscal year 2006/07 that's why return of such year has become negative in each year. However, in current year the realized return of market increase once again which covers its return as positive value. Comparing with the market the return of NABIL, HBL, EBL and SCBNL is high where return of NBBL is less than the market which indicates NBBL is worst and other are best. According to risk NABIL, HBL and SCBNL is high than the market where EBL and NBBL is less risky as its deviation is less than that of market.

### 4.3.2 Analysis of Market Sensitivity

Market sensitivity is explained by beta co-efficient of selected sample banks. Higher beta is the greater sensitivity and higher beta will be the reaction to the market movement. Beta measure the systematic risk which can not be eliminated through the means of diversification.

**Table 4.20**

**Beta coefficient of different Banks**

<b>Banks</b>	<b>Beta Coefficient</b>	<b>Remarks</b>
NABIL	0.7421	Defensive
HBL	0.1384	Most defensive
EBL	1.0000	Moderate
NBBL	2.0020	Most Aggressive
SCBNL	1.2944	Aggressive

The beta of common stock of HBL is most defensive because the Beta coefficient of HBL is the lowest than other sample banks under this study period i.e.0.1384, which mean that if market return is increased by 1%, then HBL stock return will rise by 0.1384. The Beta coefficient of EBL, NBBL and SCBL are also greater. Thus, their common stocks are also known as aggressive. Similarly, the common stock of HBL is

known as a defensive stock among the sample banks under the study period because the Beta coefficient of HBL is the lowest one i.e. 0.1384 than market beta. The highest beta coefficient is 2.0020 of NBBL Bank that means this bank is most aggressive.

### 4.3.3 On the basis of price Evaluation of Common Stock of each bank

Comparison of required rate of return and expected rate of return gives that result whether the common stock is under priced or over priced. Generally, there are three conditions of price evaluation that are as follows:

- When expected rate of return is greater than required rate of return, in that case, the price of the stock will be under priced.
- When expected rate of return is less than rate of return, in that case, the price of the stock will be over priced.
- When expected rate of return is equal to required rate of return, in that case, the price of stock will be correctly priced.

For the price evaluation, the calculation required rate of return is necessary and it can be calculated by using the following formula.

$$\text{Required rate of return } (\bar{K}_i) = K_{rf} + \beta_i (\bar{R}_m - K_{rf})$$

In the above equation, the risk free rate of return (Krf) is needed to determine required rate of return. The discount rate of Treasury bill (T-bill) issued by Nepal Rastra Bank is taken as risk free rate (Krf) in Nepal. NRB issued two types of T-bill i.e. 91 days and 364 days but According to the suggestion of T-bill section of NRB, it is better to take 364 days weighted average discount rate as risk free rate. T-bill rate will be differs in various issues but in this study I have taken weighted average discount rate of 364 days T-bill of mid July 2006(fiscal year 2005/06). As provided by the T-bill section of NRB, the weighted average T-bill rate for fiscal year 2005/06 is 4.32%

**Table 4.21**

**Equilibrium Return, Expected return and Price evaluation of commercial banks:**

Bank	Beta	Equilibrium Return $(\bar{K}_i) \times K_{rf} \Gamma (\bar{R}_m \ Z K_{rf}) S_i$	Expected return $(\bar{R}_i)$	Price Evaluation
NABIL	0.7421	0.0671	0.2294	Under Priced
SCBL	0.1384	0.0591	0.2943	Under Priced
HBL	1.0000	0.0539	0.1412	Under Priced
EBL	2.0200	0.0607	0.3290	Under Priced
NBBL	1.2944	0.0492	-0.2720	Over Priced

Where,

$K_{rf}$  = Risk free rate of Return = 0.0432 = 4.32%

(Risk free rate of return is based on weighted average Treasury Bills rate of 91 days; source: NRB)

$\bar{R}_m$  X Market rate of return = 0.0555

(Expected market rate of return is for the year 2001/02 to 2006/07)

$\bar{K}_i$  X Equilibrium rate of return of CAPM.

From the above table it is observed that the pricing of common stock of all the banks under study are under priced. Thus, under pricing situation of common stock of the banks indicates that all the sample banks stock demands are very good investment opportunity. The investors can gain from buying the under priced stocks. It is recommended to purchase under priced stock but rational and efficient investment decision-maker need to analyze other dimensions as well to invest from the investment point of view.

#### **.4.4 Portfolio Analysis**

From all above calculations and analysis we can see that there are some risk factors in various assets. Risk can be reflected by standard deviation of different assets. Constructing portfolio can diversify some of the risk which is unsystematic. Portfolio is the combination of different investment assets. The portfolio would be able to reduce unsystematic risk or diversifiable risk. Thus investors want to invest in portfolio assets because of diversification of risk. Therefore, the analysis within this study is based on two assets and the tools for analysis are based on two assets that are presented in chapter III.

The main objective of portfolio is reduction of unsystematic risk, from which the investor can get optimum return in certain degree of risk by constructing efficient portfolio. In making portfolio investment, the total available fund is divided into proper amount or proportion for different securities that means, in this study, investment making in common stock of different banks. The total weighted of a portfolio is equal to 100%. In this chapter, co-variance of the returns of the given two stocks and proportion of stock i.e. the optimal weight is calculated to minimize the risk and to find the risk and return of the portfolio assets. Table 4.23 shows the portfolio risk and returns and co-variance between each two banks respectively.

**Table 4.22**

**Portfolio Risk and returns and Co-variance between banks**

S.No:	Portfolio	Weight	Co- variance	$\bar{R}_P$	$\dagger_P$
1.	NABIL & SCBL	$W_n = 0.6523$ $W_{sc} = 0.3477$	0.1468	0.2519	0.4172
2.	NABIL & HBL	$W_n = 2.2629$ $W_h = -1.2629$	0.1149	0.3408	0.6974
3.	NABIL & EBL	$W_n = 2.9250$ $W_e = -1.9250$	0.1910	0.0337	0.5123
4.	NABIL & NBBL	$W_n = 1.4771$ $w_{nb} = -0.4771$	0.0705	0.4686	0.5908
5.	SCBL & HBL	$W_{sc} = 1.2807$ $W_h = -0.2807$	0.0858	0.3373	0.4828
6.	SCBL & EBL	$W_{sc} = 0.4653$ $W_e = 0.5347$	0.1316	0.3128	0.3813
7.	SCBL & NBBL	$W_{sc} = 1.1085$ $W_{nb} = -0.1085$	0.0409	0.3557	0.4555

8.	HBL & EBL	$W_h = -1.2896$ $W_e = 2.2896$	0.1082	0.5711	0.6570
9.	HBL & NBBL	$W_h = 1.9767$ $W_{nb} = -0.9767$	0.0404	0.5448	0.3579
10.	EBL & NBBL	$W_e = 1.4904$ $W_{nb} = -0.4904$	0.0663	0.6237	0.5691

\* Source: Appendix 1 to 10.

Risk can be decreased by using diversification method or forming an optimal portfolio of each bank. For example, before diversification, S.D. of NABIL and EBL was 0.4502 and 0.4202 respectively and average risk was 43.52% but after diversification, their portfolio risk is only 41.72%, which is considerable reduction in risk than previous.

Diversification can only reduce risk but can not increase return. Portfolio return is simply the average of weighted of high return individual's security returns. Hence, average of high return is also high. According to table 4.23, portfolio return between NBBL and EBL is very high i.e. 62.37%. Likewise, the lowest portfolio returns is 3.37% between NABIL and EBL because of lower expected return of NABIL Bank. Risk is minimized till 48.28 between SCBL and HBL by doing portfolio.

In case of weight on the way of doing portfolio there is seem some borrowing portion. Portfolio weight between NABIL and EBL is 2.9250 and -1.9250 respectively. The meaning is that borrowing from EBL and investing in NBBL (192.50%) is found to be of profitable to an investor. Likewise, NBBL borrows 47.71% from NABIL, NBBL borrow 10.85% from SCBL, HBL borrows 128.96% from EBL, NBBL borrows 97.67% from HBL, NBBL borrow 49.04% from EBL, while creating portfolio between mentioned banks.

## 4.5 Correlation between Banks

Correlation between the returns of the two securities plays vital role to risk minimization because some risk can be reduced when stocks will be positively correlated but not perfectly. Correlation between each bank is presented below in Table 4.24. Details of calculation are shown in appendix-11

**Table 4.23**

**Correlation Co-efficient between each Bank**

BANK	NABIL	SCBL	HBL	EBL	NBBL
NABIL	1	0.7760	0.9942	0.9910	0.9344
SCBL	0.7760	1	0.7954	0.7316	0.5839
HBL	0.9942	0.7954	1	0.9846	0.9441
EBL	0.9910	0.7316	0.9846	1	0.9290
NBBL	0.9394	0.5839	0.9441	0.9290	1

\*See appendix 11 for details.

According to table 4.23, NABIL and HBL are highly positively correlated i.e. 0.9942 and the lowest correlation co-efficient is 0.5839 between SCBL and NBBL. However, there is no negative correlation. It neither seems between individual bank and perfect correlation. The meaning is that each bank is positively correlated from 0.5839 to 0.9942 which indicates while making portfolio some risk can be reduced.

## 4.6 Measurement of Portfolio Performance

Risk and return both have to consider when bearing in mind a portfolio performance. There are various methods applied to measure the portfolio performance. For the simplicity of the study, here the Sharpe Portfolio Performance is to be well thought-out.

The Sharpe portfolio performance measure is based on the capital market line (CML) and total risk, which makes it more suitable for evaluating portfolios rather than

individual assets. Ranking of each portfolio using the Sharpe measure has been presented in Table no. 4.24. Results and interpretation is shown below and details of calculation can be seen in appendix- 12 .

**Table 4.24**

**Sharpe's Portfolio Performance Measurements (Sp)**

S. No:	Portfolio	Sharpe's Performance (Sp)	Rank
1.	NABIL & SCBL	0.5002	7
2.	NABIL & HBL	0.4267	8
3.	NABIL & EBL	-0.0185	10
4.	NABIL & NBBL	0.7200	3
5.	SCBL & HBL	0.6091	6
6.	SCBL & EBL	0.7070	4
7.	SCBL & NBBL	0.6860	5
8.	HBL & EBL	0.8035	2
9.	HBL & NBBL	1.4015	1
10.	EBL & NBBL	0.3405	9

Source: Appendix:12

The Sharpe's portfolio performance measures for the market  $S_m \times \frac{\bar{R}_m - R_{Krf}}{\sigma_m} = 0.0426$

Where,

Risk free rate of return ( $R_{Krf}$ ) = 4.32%

Expected Return of market ( $\bar{R}_m$ ) = 5.55%

Standard deviation of market ( $\sigma_m$ ) = 28.87%

From the above calculation, portfolio NABIL&EBL has the lowest risk premium return per unit of total risk and the HBL & NBBL has the highest risk premium return per unit



of total risk. Nevertheless, every portfolio performed better than the aggregate market.

## 4.7 Hypothesis Test

Hypothesis - 1

Formulation of Hypothesis

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

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

$$\text{Computation to test statistics: } t = \frac{\bar{X} - \hat{\mu}}{\frac{S}{n}}$$

where, —

$\bar{X}$  = Average return of listed five commercial banks i.e.

$\hat{\mu}$  = Average rate of return of overall market

$n$  = Number of observation

$S$  = Average standard, deviation of selected commercial banks i.e.

—

$$\bar{X} = \frac{0.5606 + 0.1795 + 0.4688 + 0.3299 + 0.4468}{5}$$

$$= 0.39712$$

$$\hat{\mu} = 0.0555$$

$$S = \frac{0.1219 + 0.1283 + 0.1353 + 0.6205 + 0.2892}{5}$$

$$= 0.25904$$

$$n = 5$$

Now,

$$\frac{0.39712-0.0555}{\frac{0.25904}{5}} = 2.94$$

Tabulated value of at 5% level of signification for 4 (5-1) degree of freedom is 2.13

Decision: Since the calculated value of "t" = 2.94 is grater than tabulated value "t" = 2 the alternative hypothesis is rejected i.e. the average return of the common stock of selected commercial bank is not equal to the market return.

## 4.8 Major Findings of the Study

From the presentation and analysis of data the following points can be listed out as the major finding of the study:

According to above calculation the expected return of EBL is the highest among sample banks that is 32.90% and standard deviation is 42.81% which shows that the risk on investing on common stock of EBL is 42.81% with coefficient of variance of 1.3012. The meaning is that EBL has best performance among mentioned banks and it seems more secure for the investment. HBL Bank shows its expected return only 14.12%, which is the lowest one among five banks. It means there is less opportunity of investment in common stock of HBL Bank. However, NBBL shows the negative return i.e. -27.20% mean has the worst financial performance. On the basis of SD., NABIL has the highest SD that is 45.02% and NBBL has the lowest S.D. that is 16.69% among the sampled banks of Nepal. Thus, it indicates that the common stock of NBBL is less risky but expected return is negative so it is risky for invest and the NABIL is very risky for investment. Similarly, on the basis of CV the EBL has the lowest CV i.e. 1.3012, NABIL has the highest i.e. 1.9625 3 and NBBL has negative C.V. i.e. -0.6136 which indicates that the common stock of NBBL is the best for investment due to less risk but it has negative return i.e., -27.20% which seems risky to invest.

- 1) Considering the beta coefficient of mentioned banks, the beta coefficient of NABIL is the highest one 1.5061, which is greater than 1 as well as EBL and SCBNL ,that indicates that the return of NABIL is more volatile than that of market. That means, every 1% change in market return leads to 1.5061% change in NABIL stock's return. Thus, it is most aggressive stock but the stock of NBBL is most defensive due to the lowest beta coefficient i.e. 0.4939.
- 2) The systematic risk of HBL is the highest one among the mentioned joint venture bank of Nepal i.e. 0.9465 and the lowest is 0.7213 of the NBBL. In the case of unsystematic risk, the NBBL has the highest i.e. 0.2787 and the lowest are 0.0535 of HBL, AS we know that unsystematic risk is diversifiable risk and could be eliminated through diversification.
- 3) Considering the market capitalization of five sample banks, the market capitalization of NABIL, HBL, EBL, NBBL and SCBNL 26.77%,21.95%,13.08%, 03.18%and 35.02% respectively in the fiscal year 2005/06. The SCBNL has capitalized grater amount of money in the market i.e. Rs.13487050000 and the lowest amount that is capitalized by NBBL is Rs. 1223870000.
- 4) Considering the market risk and return, the expected return is 5.55%and S.D. of market is 28.67% where coefficient of variation of the market is 5.1659.
- 5) From the analysis of required rate of return and expected rate of return, it was found that NABIL, SCBL, HBL & EBL's common stocks are under priced and NBBL's & stocks are overpriced.
- 6) While creating the portfolio between the two assets of all the sample banks, the optimal portfolio of NBBL and EBL gives the maximum expected return that is 62.37% where as, the portfolio of NABIL & EBL gives the lowest expected return i.e.3.37%. Considering the portfolio risk, the portfolio of NABIL and HBL has

maximum S.D. i.e.69.74% but the portfolio of HBL & NBBL has the lowest S.D. which is 35.79% which indicates HBL & NBBL is good to invest due to low SD.

7) Correlation between NABIL & HBL is found 0.9942, which is highest between mentioned banks under the study and the correlation of SCBL & NBBL is 0.5839 that is the lowest correlation. However, all the banks are positively correlated but they are neither perfectly correlated nor negatively correlated.

8) Considering the Sharpe's performance measure, the portfolio of HBL & NBBL has the best performance because of the highest risk premium return per unit of total risk that is 1.4015 and the portfolio of NABIL&EBL is worst due to the lowest risk premium return per unit i.e.-0.0185.

## CHAPTER - V

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter consists of three parts summary, conclusion and recommendation. Research has been summarized in summary parts; finding and their interpretation are summarized in conclusion part, necessities remedies are presented in recommendation.

#### 5.1 Summary

Finance is mainly concern with the efficient flow of funds. And investor tries best to provoke highest rate of return bearing lower level of risk. To trade of between risk and return, financial market plays vital role. Stock market one of the parts of capital markets has greatest attraction not only for the professional or institutional investors but also for the individual or private investors. Financial market classified as money market and capital market transit the fund from surplus unit to deficit unit. Although Nepalese financial market is not developed much financial securities are high in demanded compared to its supply.

An investment is an assertion of money that expects to inflame additional money. Investment is a scientific method of using excess income bearing lower level of risk. It requires a present sacrifice for a future uncertain benefit. Saving and increment in the wealth position is the motivating factors of investments. Portfolio theory explores how risk averters construct portfolios in order to optimize expected returns for a specified level of risk. The theory quantifies the benefits of diversification. Each portfolio maximizes possible expected return for a given level of risk on the efficient frontier. Investors should not hold optimal portfolios on the efficient frontier and adjust their total market risk. Portfolio theory provides a broad context for understanding the interactions of systematic risk and reward.

Financial system is a set of institutional array through which surplus transferred to deficit units. Primary market denotes the market mechanism for the original sale of securities by an issuer to public. It is the only market in which the corporate or government issuer is directly involved in the transaction and receives direct benefits from the issue. Secondary market is simply a place where already outstanding securities are traded between investors. It is the markets that creates the price and allow for liquidity. Investment rationalities are the pre considerations are to be taken in selection of investment alternatives. Investor does not invest in the entire investment alternative. Investment rationalities are investment objectives, investment horizon, and risk and return analysis, demand and supply in the market, taxes and investment strategies, bull and bear market and analysis etc.

The objective of portfolio management is to analyze different financial assets and delineate efficient portfolios and safety through precaution, risk minimization, generating income, marketability, liquidity etc. the objectives of this research are to understand portfolio investment, risk and return analysis and to find out optimal portfolio among the security traded in the NEPSE and to suggest remedies for existing problems. This research focuses on the effective use of liquidity in the best portfolio in NEPSE.

This study is to find out some certain clues about the theoretical aspects and their practical implication of portfolio theory developed with some limitations and assumption. Data of selected banks for last six years (2001/02 to 2006/07) were used for this research. This research is based on the secondary data.

Risk and return of sample banks are analyzed with the help of expected rate of return, standard deviation, variance and coefficient of variation. Market sensitivity was analyzed with the help of covariance with market, beta of the stock and correlation with market. Systematic risk and unsystematic risk were differentiated and pricing the

stock at stock market is evaluated. Various portfolio set were developed having negative correlation to each other. Investment alternatives were selected among those all portfolio sets using Markowitz portfolio (two assets portfolio) selection model with the help of minimum variance portfolio selection method. Sharpe's optimum portfolio, Jensen's performance and Treynor's performance model was used to find out to optimum portfolio among the sample securities.

Thus the main focus of the study is portfolio management regarding how an individual investor can get the maximum return at certain level of given risk. How the optimum portfolio is constructed from the securities listed in NEPSE. Five listed commercial banks are chosen as sample. The sampling is made based on personal judgments and data availability so the method used is purposive method of sampling.

The research is totally based on the historical data so it is a historical research. it covers the data from the fiscal year 2001/02 to 2006/07.

In order to achieve the objective of the study, the research has been designed based on secondary data collected from NEPSE, SEBON and concerned banks by using financial tools. Moreover for clear understanding some graphs have been used and are interpreted in simple manner. It is basically empirical, descriptive and analytical study.

## **5.2 Conclusion**

In the Nepalese context, there is seen very fluctuation in the return of common stock investment, which is expected from the investor. Thus, due to such inequality, stock market is known as a gambling. Many people have unrealistically optimistic or pessimistic expectations about the stock market investment that means they are taking fear of unknown. Therefore, the conclusion of this research work may be important information for those who are directly or indirectly concerned with the common stock

investment. From the analysis of various financial indicators and statistical tools of all the sample banks, the following conclusion can be found:

- 1) The return is defined as income received on common stock investment, which is usually expressed in percentage. EBL has the highest rate of return i.e. 32.90% and NBBL has the negative rate of return i.e. -27.20%. NBBL stock is the less risky assets and NABIL stock is the most risky assets. EBL is the best security measuring then in terms of CV, which is 1.3012.
- 2) Beta is systematic risk and market beta is always 1. Beta coefficient of NABIL is the highest i.e. 1.5061 which is greater than 1. Thus, it indicates that the return of NABIL is more volatile that means every 1 % change in market return leads to 1.5061 change in NABIL stock return. Therefore, stock of NABIL is most aggressive and the stock of NBBL is the most defensive stock than other due to the lowest beta coefficient i.e. 0.4939.
- 3) Regarding the market capitalization of five sampled Banks, SCBNL is in the highest position with Rs. 13487050000.00 (35.02%) and NBBL is the lowest position with Rs. 1223870000.00 (03.18%).
- 4) Considering the market risk and return, expected return of overall market is 5.55% which is the lowest than the expected return of NABIL, SCBL, HBL and EBL has the and NBBL has negative return. The risk is also found in minimum portion i.e. 28.67%, which represent the lower sensitivity on investment in the market.
- 5) One of the main significant of beta is Capital Asset Pricing Model (CAPM), which describes the relationship between risk and equilibrium return. In this model, risk free rate plus a premium based on systematic risk of security is equilibrium rate of return of the stock. Comparing the expected rate of return and equilibrium rate of return there is found common stock of NABIL, SCBL, HBL, EBL are under priced



and NBBL over priced. So NABIL, SCBL, HBL, EBL are having stock with a good investment opportunity because there is chance of increasing of stock value in near future except one remaining bank i.e. NBBL. Thus the investor can purchase the common stock of four under priced bank.

- 6) Using the Markowitz simple diversification, risk could be diversified on investing in two or more asset with out loosing considerable return. According to this research work, investing on NABIL & SCBL, unsystematic risk could be reduced to 41.72%. Before diversification, risk of these particular banks was 45.02% and 42.02% respectively. Their expected return of portfolio is 25.19%. Similarly, after creating the portfolio between SCBL & EBL, the risk can be minimized to 38.13% but before diversification, risk of these particular banks was 42.02% and 42.81% respectively. In this way, with doing the diversification, every bank could reduce their risk for the same or more return but after diversification risk can be maximized also instead of minimization. While creating the portfolio between two assets among the sample banks, the portfolio between NBBL & EBL gives the highest expected return, which is 62.37% where as the portfolio between NABIL & EBL gives the lowest expected return i.e. 3.37%. Similarly, considering the portfolio risk, the portfolio of NABIL and HBL has the highest risk i.e. 69.74% and the portfolio of HBL and NBBL has the lowest risk i.e. 35.79%.
- 7) Correlation co-efficient between NABIL & EBL is the highest one that is 0.9942, which is about near of perfectly positively correlation (1) and correlation co-efficient between SCBL & NBBL is the lowest that is only 0.5839, which means common stock of such banks are less correlated.
- 8) Portfolio performance evaluation measures the financial better position of created portfolio between mentioned sample banks by making comparison among them. Three models are used to measure this performance, according to that model mentioned in research methodology. Various results are to be found which is

presented in chapter 4 and showing in major findings parts. Considering the Sharpe's performance measure, the portfolio of HBL and NBBL has the best performance because of the highest risk premium return per unit of total risk that is 1.4015. The portfolio of NABIL & EBL is worst due to the negative risk premium return.

### **5.3 Recommendation**

On the basis of proceeding chapter of this study the following recommendation are made to related person as well as company: The finding of this study may provide significant information for those who are concerned directly or indirectly with the stock market activities. Thus, on the basis of the analysis and findings of this study, the following recommendations are presented separately for investors and institution to overcome the weakness and inefficiently and to improve present stock performance.

- 1) Risk and return play vital role on common stock investment of banking sector. Therefore, it is suggested to analyze risk and return with sincerely before investing in this sector. According to the analysis of individual common stock of commercial Bank, Investors should invest their money in common stock of EBL due to the lowest C.V. (i.e. 1.3012), higher expected return (i.e. 32.90%) and defensive type of stock.
- 2) Analysis of the market sensitivity of common stock guides in investing on stock market. It is better to invest on such common stock, which has less beta i.e. defensive stock for that investor who does not eager to take high risk but higher return can't obtain in such investment. Thus, investor should buy the under priced stocks when market is rising and sell the over-priced securities when market performance is falling. Similarly, the investors should hold that securities which are performing better than the market. This study recommends to purchase the common stock of all sample banks due to the under priced. So we prefer for under price and sell over priced.

- 3) Investors must concern with the systematic risk that is measured by given stock's beta. The systematic risk is only the risk, which is priced at market. According to the study, the stock of HBL has the higher systematic risk i.e. 94.65% and NBBL has the lowest systematic risk i.e. 72.13%. Although, there is chance of more return than expected and there is also a chance of heavy loss because stock market investment is risky job. Thus, investor must be well aware of this fact and must be able to visualize and analyze about the whole things. To beat the stock market, proper analysis of individual security, industry and overall market is always essential. Similarly, general knowledge about the economic, political and technological trend is advantageous.
- 4) Investors need to diversify their fund to reduce the risk. Proper construction of portfolio will reduce considerable potential loss, which can be defined in term of the risk but portfolio construction is dynamic and difficult job. Thus, investor should be selected the stocks that have higher return and negative correlation or near to zero correlation between different companies and sector. The portfolio revision is also necessary at certain interval time to get best return at lower risk. According to the study, the portfolio between EBL & NBBL is recommended to construction due to lowest risk as well as higher return.
- 5) Government should amend the rules and regulations regarding to the stock market in time to time that ensures the protection of an individual investor's right. Such amendment is essential to make the act effectiveness with the pace of time and also need to follow the implementation and supervision of rules and regulation to make sure the objective is achieved.
- 6) Before making an investment decision in stock, it is recommended to visit and discuss with investment companies, with individual expert and researchers. Investor

should make their investment decision on the basis of reliable information or financial parameters of the related bank rather than imagination.

- 7) The financial institutions and companies should provide the real financial statements. The data provided by NEPSE and the company itself are different in some cases. It creates confusion to potential investors about the actual financial condition of the company. They should publish their annual reports and information timely and accurately, which will help to the investors to take the investment decision on their common stock.
- 8) Portfolio management is a dynamic subject matter which changes at a flash. It is ever challenging. There should be regular research in portfolio management. Corporate body and individual investor strongly recommended make regular research on portfolio managements.

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# APPENDIX

## APPENDIX- 1

Calculation of Portfolio Risk and Return of NABIL & SCBL:

<i>Fiscal Year</i>	$(R_n - \bar{R}_n)$	$(R_{sc} - \bar{R}_{sc})$	$(R_n - \bar{R}_n)(R_{sc} - \bar{R}_{sc})$
2001/02	-0.7194	-0.5247	0.3775
2002/03	-0.1614	-0.0527	0.0085
2003/04	0.2196	-0.1632	-0.0358
2004/05	0.3456	0.1183	0.0409
2005/06	0.3154	0.6225	0.1963
<b>Total</b>			$\sum (R_n - \bar{R}_n)(R_{sc} - \bar{R}_{sc}) = 0.5874$

$$\# \text{Cov. } (R_n, R_{sc}) = \frac{(R_n - \bar{R}_n)(R_{sc} - \bar{R}_{sc})}{n} = \frac{0.5874}{5} = 0.11748$$

$$\# w_n = \frac{\sigma_{sc}^2 \text{Cov.}(R_n, R_{sc})}{\sigma_n^2 \Gamma \sigma_{sc}^2 + 2 \text{Cov.}(R_n, R_{sc})}$$

$$= \frac{0.2027 \times 0.11748}{0.2027 \Gamma 0.1766 + 2 \times 0.11748} = 0.6523$$

$$\# w_{sc} = 1 - w_n = 1 - 0.6523 = 0.3477$$

$$\# \bar{R}_p = w_n \bar{R}_n + w_{sc} \bar{R}_{sc} = 0.6523 \times 0.2294 + 0.3477 \times 0.2943 = 0.2519$$

$$\begin{aligned}
& \# \dagger_p X \sqrt{W_n^2 \dagger_n^2 \Gamma W_{sc}^2 \dagger_{sc}^2 \Gamma 2W_n W_{sc} Cov(R_n, R_{sc})} \\
& = \sqrt{(0.6523)^2 \mid 0.2027 \Gamma (0.3477)^2 \mid 0.1766 \Gamma 2 \mid 0.6523 \mid 0.3477 \mid 0.1468} \\
& = \sqrt{0.0862 \Gamma 0.0213 \Gamma 0.0666} = 0.4172
\end{aligned}$$

## APPENDIX- 2

### Calculation of Portfolio Risk and Return of NABIL & HBL:

<b>Fiscal Year</b>	$(R_n - \bar{R}_n)$	$(R_h - \bar{R}_h)$	$(R_n - \bar{R}_n) (R_h - \bar{R}_h)$
2001/02	-0.7194	-0.4021	0.2893
2002/03	-0.1614	-0.0939	0.0151
2003/04	0.2196	0.0837	0.0184
2004/05	0.3456	0.2296	0.0793
2005/06	0.3151	0.1827	0.0576

<b>Total</b>	$\sum (R_n - \bar{R}_n)(R_h - \bar{R}_h) = 0.4597$
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$$\# \text{Cov.}(R_n, R_h) = \frac{(R_n - \bar{R}_n)(R_h - \bar{R}_h)}{n} = \frac{0.4597}{5} = 0.1149$$

$$\# w_n = \frac{\sigma_n^2 \text{Cov.}(R_n, R_h)}{\sigma_n^2 \sigma_h^2 + \text{Cov.}(R_n, R_h)} = \frac{0.2027 \times 0.1149}{0.2027 \times 0.0659 + 0.1149} = 2.2629$$

$$\# w_h = 1 - w_n = 1 - 2.2629 = -1.2629$$

$$\# \bar{R}_p = w_n \bar{R}_n + w_h \bar{R}_h = 2.2629 \times 0.2294 + (-1.2629) \times 0.1412 = 0.3408$$

$$\begin{aligned} \# \sigma_p &= \sqrt{w_n^2 \sigma_n^2 + w_h^2 \sigma_h^2 + 2w_n w_h \text{Cov.}(R_n, R_h)} \\ &= \sqrt{(2.2629)^2 \times 0.2027 + (-1.2629)^2 \times 0.0659 + 2 \times (2.2629) \times (-1.2629) \times 0.1149} \\ &= \sqrt{1.0380 + 0.1051 - 0.6567} = 0.6974 \end{aligned}$$

### APPENDIX- 3

#### Calculation of Portfolio Risk and Return of NABIL & EBL:

Fiscal Year	( $R_n \ Z \bar{R}_n$ )	( $R_e \ Z \bar{R}_e$ )	( $R_n \ Z \bar{R}_n$ ) ( $R_e \ Z \bar{R}_e$ )
2001/02	-0.7194	-0.6360	0.4575
2002/03	-0.1614	-0.2476	0.0400
2003/04	0.2196	0.2440	0.0536
2004/05	0.3456	0.3560	0.1230
2005/06	0.3154	0.2848	0.0898
<b>Total</b>			$\Sigma (R_n \ Z \bar{R}_n) (R_e \ Z \bar{R}_e) = 0.7639$

$$\# \text{ Cov. } (R_n, R_e) = \frac{(R_n \ Z \bar{R}_n)(R_e \ Z \bar{R}_e)}{n \ Z 1} = \frac{0.7639}{5 \ Z 1} = 0.1910$$

$$\# \ W_n = \frac{\dagger_n^2 \ Z \text{Cov.}(R_n, R_e)}{\dagger_n^2 \ \Gamma \dagger_e^2 \ Z 2 \text{Cov}(R_n, R_e)} = \frac{0.2027 \ Z 0.1910}{0.2027 \ \Gamma 0.1833 \ Z 2 \ | 0.1910} = 2.9250$$

$$\# \ W_e = 1 - w_n = 1 - 2.9250 = -1.9250$$

$$\# \bar{R}_p \times W_n \mid \bar{R}_n \Gamma W_e \mid \bar{R}_e = 2.9250 \mid 0.2294 \Gamma (Z1.9250) \mid 0.3290$$

$$= 0.6710 - 0.6333 = 0.0337$$

$$\# \dagger_p \times \sqrt{W_n^2 \dagger_n^2 \Gamma W_e^2 \dagger_e^2 \Gamma 2W_n W_e \text{Cov}(R_n, R_e)}$$

$$= \sqrt{(2.9250)^2 \mid 0.2027 \Gamma (Z1.9250)^2 \mid 0.1833 \Gamma 2 \mid (2.9250) \mid (Z1.9250) \mid 0.1910}$$

$$= \sqrt{1.7342 \Gamma 0.6792 \Gamma 2.1509}$$

$$= 0.5123$$

## APPENDIX- 4

Calculation of Portfolio Risk and Return of NABIL & NBBL:

<i>Fiscal Year</i>	$(R_n \ Z \bar{R}_n)$	$(R_{nb} \ Z \bar{R}_{nb})$	$(R_n \ Z \bar{R}_n) (R_{nb} \ Z \bar{R}_{nb})$
2001/02	-0.7194	-0.2644	0.1902
2002/03	-0.1614	-0.0221	0.0036
2003/04	0.2196	0.076	0.0170
2004/05	0.3456	0.1858	0.0642

2000/01	0.3154	0.023	0.0072
<b>Total</b>			$\frac{\sum (R_n - \bar{R}_n)(R_{nb} - \bar{R}_{nb})}{2} = 0.282$

$$\# \text{Cov.}(R_n, R_{nb}) = \frac{(R_n - \bar{R}_n)(R_{nb} - \bar{R}_{nb})}{n} = \frac{0.2822}{5} = 0.0705$$

$$\# w_n = \frac{\bar{R}_n \text{Cov.}(R_n, R_{nb})}{\bar{R}_n^2 + \text{Cov.}(R_n, R_{nb})} = \frac{0.2027 \cdot 0.0705}{0.2027 + 0.0705} = 1.4771$$

$$\# w_{nb} = 1 - w_n = 1 - 1.4771 = -0.4771$$

$$\# \bar{R}_p = \bar{R}_n w_n + \bar{R}_{nb} w_{nb} = (1.4771) \cdot 0.2294 + (-0.4771) \cdot 0.2720$$

$$= 0.3388 + 0.1298 = 0.4686$$

$$\# \sigma_p = \sqrt{w_n^2 \sigma_n^2 + w_{nb}^2 \sigma_{nb}^2 + 2w_n w_{nb} \text{Cov.}(R_n, R_{nb})}$$

$$= \sqrt{(1.4771)^2 \cdot 0.2027 + (-0.4771)^2 \cdot 0.0278 + 2(1.4771)(-0.4771) \cdot 0.0705}$$

$$= \sqrt{0.4422 - 0.0063} = 0.5908$$

## APPENDIX- 5

### Calculation of Portfolio Risk and Return of SCBL & HBL:

Fiscal Year	$(R_{sc} - \bar{R}_{sc})$	$(R_h - \bar{R}_h)$	$(R_{sc} - \bar{R}_{sc})(R_h - \bar{R}_h)$
2001/02	-0.5247	-0.4021	0.2110
2002/03	-0.0527	-0.0939	0.0049
2003/04	-0.1632	0.0837	-0.0136
2004/05	0.1183	0.2296	0.0272
2005/06	0.6225	0.1827	0.1137
<i>Total</i>			$\sum (R_{sc} - \bar{R}_{sc})(R_h - \bar{R}_h) = 0.3432$

$$\# \text{Cov. } (R_{sc}, R_h) = \frac{(R_{sc} - \bar{R}_{sc})(R_h - \bar{R}_h)}{n - 1} = \frac{0.3432}{5} = 0.0858$$

$$\# W_{sc} = \frac{\sigma_{sc}^2 \text{Cov}(R_{sc}, R_h)}{\sigma_{sc}^2 \Gamma + \sigma_h^2 \Gamma + 2 \text{Cov}(R_{sc}, R_h)} = \frac{0.1766 \times 0.0858}{0.1766 \times 0.0659 + 0.0858} = 1.2807$$

$$\# W_h = 1 - w_{sc} = 1 - 1.2807 = -0.2807$$

$$\# \bar{R}_p = W_{sc} \bar{R}_{sc} + W_h \bar{R}_h$$

$$= 1.2807 \times 0.2943 + (-0.2807) \times 0.1412 = 0.3373$$

$$\# \sigma_p = \sqrt{W_{sc}^2 \sigma_{sc}^2 + W_h^2 \sigma_h^2 + 2 W_{sc} W_h \text{Cov}(R_{sc}, R_h)}$$

$$= \sqrt{(1.2807)^2 + 0.1766 \Gamma (Z0.2807)^2 + 0.0659 \Gamma^2 + 1.2807 + (Z0.2807) + 0.0858}$$

$$= \sqrt{0.2896 \Gamma 0.0052 Z0.0617} = 0.4828$$

## APPENDIX- 6

### **Calculation of Portfolio Risk and Return of SCBL &EBL:**

Fiscal Year	$(R_{sc} - Z\bar{R}_{sc})$	$(R_e - Z\bar{R}_e)$	$(R_{sc} - Z\bar{R}_{sc}) (R_e - Z\bar{R}_e)$
2001/02	-0.5247	-0.6360	0.3337
2002/03	-0.0527	-0.2476	0.0130
2003/04	-0.1632	0.2440	-0.0398
2004/05	0.1183	0.3560	0.0421
2005/06	0.6225	0.2848	0.1773



<b>Total</b>	$\sum (R_{sc} Z \bar{R}_{sc}) (R_e Z \bar{R}_e) =$ 0.5263
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$$\# \text{Cov. } (R_{sc}, R_e) = \frac{(R_{sc} Z \bar{R}_{sc})(R_e Z \bar{R}_e)}{n Z 1} = \frac{0.5263}{5 Z 1} = 0.1316$$

$$\# W_{sc} = \frac{\dagger_{sc}^2 Z \text{Cov.}(R_{sc}, R_e)}{\dagger_{sc}^2 \Gamma \dagger_e^2 Z 2 \text{Cov}(R_{sc}, R_e)} = \frac{0.1766 Z 0.1316}{0.1766 \Gamma 0.1833 Z 2 | 0.1316} = 0.4653$$

$$\# W_e = 1 - W_{sc} = 1 - 0.4653 = 0.5347$$

$$\# \bar{R}_p X W_{sc} | \bar{R}_{sc} \Gamma W_e | \bar{R}_e$$

$$= 0.4653 | 0.2943 \Gamma 0.5347 | 0.3290 = 0.1369 + 0.1751 = 0.3128$$

$$\# \dagger_p X \sqrt{W_{sc}^2 \dagger_{sc}^2 \Gamma W_e^2 \dagger_e^2 \Gamma 2 W_{sc} W_e \text{Cov}(R_{sc}, R_e)}$$

$$= \sqrt{(0.4653)^2 | 0.1766 \Gamma (0.5347)^2 | 0.1833 \Gamma 2 | 0.4653 | 0.5347 | 0.1316}$$

$$= \sqrt{0.0382 \Gamma 0.0524 \Gamma 0.0548} = 0.3813$$

## APPENDIX- 7

*Calculation of Portfolio Risk and Return of SCBL & NBBL*

Fiscal Year	$(R_{sc} \ Z \bar{R}_{sc})$	$(R_{nb} \ Z \bar{R}_{nb})$	$(R_{sc} \ Z \bar{R}_{sc}) (R_{nb} \ Z \bar{R}_{nb})$
2001/02	-0.5247	-0.2644	0.1387
2002/03	-0.0527	-0.0221	0.0012
2003/04	-0.1632	0.0776	-0.0127
2004/05	0.1183	0.1858	0.0220
2005/06	0.6225	0.0230	0.0143
<i>Total</i>			$\sum (R_{sc} \ Z \bar{R}_{sc}) (R_{nb} \ Z \bar{R}_{nb}) =$ 0.1635

$$\# \text{Cov. } (R_{sc}, R_{nb}) = \frac{(R_{sc} \ Z \bar{R}_{sc})(R_{nb} \ Z \bar{R}_{nb})}{n \ Z1} = \frac{0.1635}{5 \ Z1} = 0.0409$$

$$\# W_{sc} = \frac{\dagger_{sc}^2 \ Z \text{Cov.}(R_{sc}, R_{nb})}{\dagger_{sc}^2 \ \Gamma \dagger_{nb}^2 \ Z2 \text{Cov}(R_{sc}, R_{nb})} = \frac{0.1766 \ Z0.0409}{0.1766 \ \Gamma 0.0278 \ Z2 \ |0.0409} = 1.1085$$

$$\# W_{nb} = 1 - W_{sc} = 1 - 1.1085 = -0.1085$$

$$\# \bar{R}_p \ X W_{sc} \ | \bar{R}_{sc} \ \Gamma W_{nb} \ | \bar{R}_{nb}$$

$$= 1.1085 \ | 0.2943 \ \Gamma (Z0.1085) \ | (Z0.2720)$$

$$= 0.3262 + 0.0295 = 0.3557$$

$$\# \dagger_p \ X \sqrt{W_{sc}^2 \dagger_{sc}^2 \ \Gamma W_{nb}^2 \dagger_{nb}^2 \ \Gamma 2 W_{sc} W_{nb} \text{Cov}(R_{sc}, R_{nb})}$$

$$= \sqrt{(1.1085)^2 + 0.1766 + (0.1085)^2 + 0.0278 + 2(1.1085)(0.1085) + 0.0409}$$

$$= \sqrt{0.2170 + 0.0003 + 0.0098} = \mathbf{0.4555}$$

## APPENDIX- 8

### Calculation of Portfolio Risk and Return of HBL & EBL:

Fiscal Year	$(R_h - \bar{R}_h)$	$(R_e - \bar{R}_e)$	$(R_h - \bar{R}_h)(R_e - \bar{R}_e)$
2001/02	-0.4021	-0.6360	0.2557
2002/03	-0.0939	-0.2476	0.0232
2003/04	0.0837	0.2440	0.0204
2004/05	0.2296	0.3560	0.0817
2005/06	0.1827	0.2848	0.0520
<b>Total</b>			$\sum (R_h - \bar{R}_h)(R_e - \bar{R}_e) = 0.4330$

$$\# \text{ Cov. } (R_h, R_e) = \frac{(R_h - \bar{R}_h)(R_e - \bar{R}_e)}{n \cdot Z1} = \frac{0.4330}{5 \cdot Z1} = 0.1082$$

$$\# W_h = \frac{\sigma_h^2 \text{Cov}(R_h, R_e)}{\sigma_h^2 \Gamma \sigma_e^2 \Gamma \text{Cov}(R_h, R_e)} = \frac{0.0659 \times 0.1082}{0.0659 \times 0.1833 \times 2 \times 0.1082} = -1.2896$$

$$\# W_e = 1 - W_h = 1 - (-1.2896) = 2.2896$$

$$\# \bar{R}_p = W_h \bar{R}_h + W_e \bar{R}_e$$

$$= (1.2896) \times 0.1412 + (2.2896) \times 0.3290 = -0.1821 + 0.7532 = 0.5711$$

$$\# \sigma_p = \sqrt{W_h^2 \sigma_h^2 \Gamma W_e^2 \sigma_e^2 \Gamma 2W_h W_e \text{Cov}(R_h, R_e)}$$

$$= \sqrt{(1.2896)^2 \times 0.0659 + (2.2896)^2 \times 0.1833 + 2 \times (1.2896) \times 2.2896 \times 0.1082}$$

$$= \sqrt{0.1096 + 0.9609 + 0.6389} = 0.6570$$

## APPENDIX- 9

### Calculation of Portfolio Risk and Return of HBL & NBBL:

Fiscal Year	$(R_h - \bar{R}_h)$	$(R_{nb} - \bar{R}_{nb})$	$(R_h - \bar{R}_h)(R_{nb} - \bar{R}_{nb})$
2001/02	-0.4021	-0.2644	0.1063
2002/03	-0.0939	-0.0221	0.0021

2003/04	0.0837	0.0776	0.0065
2004/05	0.2296	0.1858	0.0426
2005/06	0.1827	0.0230	0.0042
<i>Total</i>			$\sum (R_h - \bar{R}_h)(R_{nb} - \bar{R}_{nb}) = 0.1617$

$$\# \text{Cov.}(R_h, R_{nb}) = \frac{(R_h - \bar{R}_h)(R_{nb} - \bar{R}_{nb})}{n} = \frac{0.1617}{5} = 0.0404$$

$$\# W_h = \frac{\sigma_{nb}^2 \text{Cov.}(R_h, R_{nb})}{\sigma_h^2 \sigma_{nb}^2 + \text{Cov.}(R_h, R_{nb})^2} = \frac{0.0278 \times 0.0404}{0.0278 + 0.0404^2} = 1.9767$$

$$\# W_{nb} = 1 - W_h = 1 - 1.9767 = -0.9767$$

$$\# \bar{R}_p = W_h \bar{R}_h + W_{nb} \bar{R}_{nb}$$

$$= (1.9767) \times 0.1412 + (-0.9767) \times 0.2720$$

$$= 0.2791 - 0.2657 = 0.0134$$

$$\# \sigma_p = \sqrt{W_h^2 \sigma_h^2 + W_{nb}^2 \sigma_{nb}^2 + 2W_h W_{nb} \text{Cov.}(R_h, R_{nb})}$$

$$= \sqrt{(1.9767)^2 \times 0.0278 + (-0.9767)^2 \times 0.0278 + 2 \times 1.9767 \times (-0.9767) \times 0.0404}$$

$$= \sqrt{0.2576 - 0.2657} = 0.0134$$

## APPENDIX- 10

### Calculation of Portfolio Risk and Return of EBL & NBBL:

Fiscal Year	$(R_e - \bar{R}_e)$	$(R_{nb} - \bar{R}_{nb})$	$(R_e - \bar{R}_e)(R_{nb} - \bar{R}_{nb})$
2001/02	-0.6360	-0.2644	0.1681
2002/03	-0.2476	-0.0221	0.0055
2003/04	0.2440	0.0776	0.0189
2004/05	0.3560	0.1858	0.0661
2005/06	0.2848	0.0230	0.0065
<b>Total</b>			$\sum (R_e - \bar{R}_e)(R_{nb} - \bar{R}_{nb}) =$ 0.2651

$$\# \text{ Cov. } (R_e, R_{nb}) = \frac{(R_e - \bar{R}_e)(R_{nb} - \bar{R}_{nb})}{n \cdot Z1} = \frac{0.2651}{5 \cdot Z1} = 0.0663$$

$$\# W_e = \frac{\sigma_e^2 \cdot Z \text{Cov.}(R_e, R_{nb})}{\sigma_e^2 \cdot \Gamma + \sigma_{nb}^2 \cdot Z \text{Cov.}(R_e, R_{nb})}$$

$$= \frac{0.1833 \cdot Z0.0663}{0.1833 \cdot \Gamma 0.0278 \cdot Z2 + 0.0663} = 1.4904$$

$$\# W_{nb} = 1 - W_e = 1 - 1.4904 = -0.4904$$

$$\# \bar{R}_p = XW_e \bar{R}_e + \Gamma W_{nb} \bar{R}_{nb}$$

$$= 1.4904 (0.3290) + (-0.4904) (0.2720)$$

$$= 0.4903 + 0.1334$$

$$= 0.6237$$

$$\# \rho = \frac{XW_e \bar{R}_e + \Gamma W_{nb} \bar{R}_{nb} - \bar{R}_p}{\sqrt{W_e^2 \sigma_e^2 + \Gamma^2 W_{nb}^2 \sigma_{nb}^2 + 2W_e \Gamma W_{nb} \text{Cov}(R_e, R_{nb})}}$$

$$= \frac{1.4904(0.3290) + (-0.4904)(0.2720) - 0.6237}{\sqrt{(1.4904)^2(0.1833) + (-0.4904)^2(0.0278) + 2(1.4904)(-0.4904)(0.0663)}}$$

$$= \frac{0.4072}{\sqrt{0.1360 - 0.0969}} = 0.5691$$

## APPENDIX- 11

**Calculation of Correlation Coefficient between each Bank:**

$$\text{We know that: } \rho_{AB} = \frac{\text{Cov}(R_A, R_B)}{\sigma_A \sigma_B}$$

S. No:	Portfolio	$\text{Cov}(R_A, R_B)$	$\sigma_A$	$\sigma_B$	$\rho_{AB}$
1.	NABIL & SCBL	0.1468	0.4502	0.4202	0.7760
2.	NABIL & HBL	0.1149	0.4502	0.2567	0.9942
3.	NABIL & EBL	0.1910	0.4502	0.4281	0.9910

4.	NABIL & NBBL	0.0705	0.4502	0.1667	0.9394
5.	SCBL & HBL	0.0858	0.4202	0.2567	0.7954
6.	SCBL & EBL	0.1316	0.4202	0.4281	0.7316
7.	SCBL & NBBL	0.0409	0.4202	0.1667	0.5839
8.	HBL & EBL	0.1082	0.2567	0.4281	0.9846
9.	HBL & NBBL	0.0404	0.2567	0.1667	0.9441
10.	EBL & NBBL	0.0663	0.4281	0.1667	0.9290

## **APPENDIX- 12**

Portfolio Performance Measure:

### **Calculation of Sharpe's Portfolio Performance Measure:**

S. No:	Portfolio	Return ( $\bar{R}_P$ )	$\dagger_P$	$S_P \times \frac{\bar{R}_P - ZKrf}{\dagger_P}$
1.	NABIL & SCBL	0.2519	0.4172	0.5002
2.	NABIL & HBL	0.3408	0.6974	0.4267
3.	NABIL & EBL	0.0337	0.5123	-0.0185



4.	NABIL & NBBL	0.4686	0.5908	0.7200
5.	SCBL & HBL	0.3373	0.4828	0.6091
6.	SCBL & EBL	0.3128	0.3813	0.7070
7.	SCBL & NBBL	0.3557	0.4555	0.6860
8.	HBL & EBL	0.5711	0.6570	0.8035
9.	HBL & NBBL	0.5448	0.3579	1.4015
10.	EBL & NBBL	0.6237	0.5691	0.3405

**Where,**

Risk free rate of return ( $K_{rf}$ ) = 4.32%

