CHAPTER I

INTRODUCTION

1.1. General Background:-

Nepal has agriculture-dominated economics where most of the populations are engaged in farming. As more Nepal is a country which whole activities of the most rural areas are non-mechanized its mainstream of economy. Therefore, it is obvious that contribution of this sector in national economy is huge. Nevertheless, 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. In the service sector, the banking industry is growing in high rate than it was anticipated. In this competitive environment, the 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 institutions 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.

In present global scenarios, many commercial banks are mode of trading through partnership among nations and also sort of negotiations between groups of industries and traders to achieve mutual exchange of goods and services for sharing comparative advantages. Nepal is a member of WTO and agreed for global partnership for the financial activities. This incorporates accessibility of multinational companies and others financial institutions in its home land. In this regards, portfolio analysis is the best instrumental tool for checking the strength and weaknesses of financial institutions to invest on them.

The term 'portfolio' simply means collection of investments. It is the planning and devising strategies for the implementation of an individual or a business goal and seeing the implementation of such strategies. It is the management of financial responsibilities (upon investment) at the same time of risks while working on the possible outcome (which the investor always hopes as positive and favorable) of his investment. The portfolio is the holding of securities and investment in financial assets. i.e. bond, stock. For an investor, through stock exchange will be collected of shareholding in different companies. For a property investor, portfolio will be a collection of buildings. To financial manager with in an industrial company portfolio will be apparent that the actual nature of the components of a portfolio demands on the population of opportunities from which the selection has been made. An investor's objective is to make maximum return from his/her fund at the lowest risk, By investing in a single asset, investor cannot achieve his/her objective but it is only possible through portfolio. A portfolio is simply a combination of two or more securities or assets. By the help of portfolio, risk can be diversified. In this context, it can be cleared through a proverb "don't put all eggs in a single basket". It means that one can lose all the eggs if some unlikely occurs. So it can be said that risk cannot be diversified by investing in a single

asset. Obviously, risk can be diversified by forming portfolio.

Diversification is a risk management technique that mixes a wide variety of investment within a portfolio. It is designed to minimize the impact of any one security on overall portfolio performance. Diversification in investments can be achieved in many different ways. Individuals can diversify across one type of asset classification-such as stocks. To do this, one might purchase shares in leading companies across many different (and unrelated) industries.

Since the pioneering work of Markowitz (1959), portfolio theory has been applied to common stocks. The traditional objectives of maximizing returns for given levels of risk or minimizing risk for given levels of return have guided efforts to achieve effective diversification of portfolios. 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.

Thus, the objective of the portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate. The investors take the decision whether the financial instruments are giving higher optimum return or not.

The financial instruments i.e. bonds, stocks are traded in securities market. Stock market is the largest financial market in all over the world where stocks of various business organizations are traded. It has the greatest role in development of financial system. The capital market consists up i) Primary market-in which new securities are traded and ii) Secondary market-in which pre-owned securities are traded. Once the securities are issued into primary market, then they are traded

in secondary market. The commercial banks are the business organizations whose shares are traded in the stock market, and the banks also invest in capital market to have sustainable positive return. The way of making decision regarding this investment in capital market is called portfolio investment management.

Commercial banks today exist in all parts of the world and are looked upon as a viable alternative system which has many things to offer. While it was initially developed to fulfill the needs of public, these banking has now gained universal acceptance. The commercial bank is the bank that offers services to the general public and to companies.

Banks in Nepal are acting as a bridge in provide a major source of financial intermediation. They have tried to be a market leader by gaining strength assets management and providing unique updated services to attract spare funds. The collected funds (as deposits) are used as investments. The investments must be use in the efficient way in order to compete in the business market.

In such phenomenon, Portfolio Analysis is the one of the most important way of having efficient investment in financial assets. The main theme, high level of return in lower level of risk, of portfolio helps to select the best investment alternative to commercial banks.

In this way, it can be said that, by analysis of portfolio commercial banks would have the right decision in selection of best investment alternative and efficient way of using funds.

Here, we are going to analyze the portfolio risk and return of common stock of sample commercial banks. Likewise, the research would focus on the subject matter of total risk of common stock of sample commercial banks. They are as follows:-

- ➤ Himalayan Bank Ltd.
- ➤ NABIL Bank Ltd.
- ➤ Everest Bank Ltd.

➢ Bank of Kathmandu Ltd.

➢ Nepal Investment Bank and

➢ Nepal SBI Bank Ltd.

1.2 Profile of sampled banks:

Himalayan Bank Ltd:

Himalayan Bank Limited is one of the largest and oldest private-sector commercial banks in the country. The bank is known for; inter alia, professionalism, quality service delivery, quality human resources, innovation and technology. The bank has been consistently growing over the last 19 years, and stands as one of the biggest banks in the country today.

Himalayan Bank Limited holds of a vision to become a Leading Bank of the country by providing premium products and services to the customers, thus ensuring attractive and substantial returns to the stakeholders of the Bank.

On the portfolio size, the bank's loan portfolio, comprising a healthy mix of diversified sectors as of mid-July 2009 stands at Rs. 25.51 billion. The deposit portfolio of the bank as of mid-July 2009 stands at Rs. 34.68 billion, which is one of the biggest portfolios held by commercial banks in the country. The bank possibly has one of the best mixes in deposits comprising saving deposits, fixed deposits, current deposits and current call deposits. Low-cost savings deposits that are much more stable in nature and that are collected from thousands of customers contribute the most to overall deposit portfolio of the bank, thus reflecting the trust of general public. Owing to this strength, the bank has been able to maintain a healthy spread. The bank's operating profit as of mid-July 2009 registered a growth of 21.47 percent vis-a-vis the previous corresponding fiscal year-end. Similarly, the bank has been posting healthy and constant growth rates in distribution of bonus shares and dividends to its shareholders.

Moreover, the bank possibly holds the best foreign currency deposit portfolio

in the entire banking industry. Among others, the business of inward remittances, now considered a separate line of business in the banking industry, has been constantly rising, creating opportunities for the bank to make a good deal of foreign exchange gains and fee based incomes through foreign exchange transactions and through trade finance activities.

The consistent growth of the bank has been possible due to the visionary board members coupled with the efficient management team working cohesively together for the betterment of the institution as a whole. The workforce of the bank is considered one of the best in the industry. The bank has adopted a proactive policy and so does not lag behind in securing any business opportunity that comes its way to capitalizes on it so as to enhance its profitability. The product range of the bank is constantly growing and existing products and services are continuously evolving in a manner that would suit the requirements of the customers.

On the technology side, the bank has one of the best core banking softwares in the world in Temenos, version t24r8. It is the availability of this high-end software that has equipped the leveraged its technological investments by providing modern banking services such as SMS banking and Internet banking for its customers. Similarly, the bank possesses a wide network of 40 ATMs spread across the country. In order to cater to as many as diversified customers as possible, the bank has been constantly increasing its branch network; currently, the bank has a network of 23 branches located in various strategic hubs of the country. Card business of the bank now stands as one of the most important payment solutions for its customers. The bank offers cards in all forms-credit cards, debit cards and prepaid cards and is an associate member of VISA and MasterCard. As the market around us involves with popularity of cards on the rise, the bank has been able to attract thousands of new customers each year and the profitability from the card business is increasing year after year. Similarly, the bank is one of the best and biggest providers of remittance services amongst the commercial banks in the

country. The bank has deployed a number of representative offices across the globe and has also appointed hundreds of agents across the country to deliver funds to beneficiaries at their doorstep in time. The online funds transfer channel popularly known as HimalRemit, backed up by a wide network of agents across the country, has helped the bank provide an end-to-end remittance service for its customers.

The bank's constant growth over the last 19 years has been possible through its strategic approach quality manpower, investors in technology and constantly-evolving products and services.

Nabil Bank Ltd:
Nepal Arab Bank Ltd., the first foreign joint venture commercial bank of Nepal, started operations in July 1984. NABIL was incorporated with the objectives of extending international standard modern banking services to various sectors of the society. NABIL provides a full range of commercial banking services through its 19 points of representation across the kingdom and over 170 reputed correspondent banks across the globe.

NABIL, as a pioneer in introducing many innovative products and marketing concepts in the domestic banking sector, represents a milestone in the banking industry of Nepal as it started era of modern banking with customer satisfaction measured as a focal objective while doing business.

Highly qualified and experienced team of NABIL bank manages day- to- day operations and risk management. Bank is fully equipped with modern technology. Which includes ATMs, credit cards, state-of-art, world-renowned software from Info-sys Technologies System, Bangalore, India, Internet banking system and Tele-banking system. NABIL Bank is providing full-fledged commercial banking services to its clients.

From its inception period in 1984 as the first joint venture bank, to commence operations in the Nepal, the bank have been a leader in terms of bringing the very

best international standard banking practices, products and services to the country. Today, mission of the bank is to be the Bank of 1ˢᵗ choice to al of its stakeholders and customers. For the customers, it want to be the first choice in meeting all the financial requirements, for stakeholders, it want to be the investment of choice, for regulators, it want to be an example of model bank, it want to be an outstanding corporate as an employer with whom to build career. To achieve this mission, it has a core set of values by which we live. The values are C.R.I.S.P. i.e.-Customer Focused, Result Oriented, Innovative, Synergetic and Professional. They are committed to live our values everyday in everything we do, for it is, these values that make uniquely NABIL Bank.

NABIL bank is a full services bank providing an entire range of products and services, starting with deposit accounts in local and foreign currency, Visa and Master Card dominated in Rupees and dollars, Visa Electron debit Cards, Personal Lending Products for Auto, Home and personal loans, Trade finance products, Treasury Services and Corporate financing. Main aim is to be able to meet customer's entire gamut of financial requirements that is why it provides us in being 'Your Bank at Your Services'.

Everest Bank Ltd:

EBL was started its operations in 1994 with a view and objective of extending professionalized and efficient banking services to various segments of the society. EBL joined hands with Punjab National Bank, India as its joint venture partner in 1997. PNB is the latest nationalized banks in India having 110 yrs. of banking history and with more than 4500 offices all over the India. Drawing its strength from its joint venture partner, EBL has been steadily growing in its sizes and operations and established itself as a leading private sector bank. EBL is ranked as No.2 bank by NRB as per CAMELS.

Despite fragile law and order situation especially during last 3-4 years, the

bank has recorded speculator performance. As per audited accounts of F/Y 2009/10, the bank's operating profit was Rs. 1349.1million registering a growth of 25.67% over the previous year. The bank's credit recorded a growth of nearly 15.07% over the last year reaching a figure of Rs. 28156.4 million. Similarly total deposits of the bank posted a growth of 10.83% amounting to Rs. 36932.3 million over the preceding year. This sustained growth of the bank is attributable to its strong systems and procedures. Professional approach, quality lending and highly motivated staff members.

The bank is providing its services through a wide network of 37 branches across the nation and over 300 correspondents across the globe. All the major branches of the bank are connected through anywhere branch banking system(ABBS), a facility which enables a customer to do banking transactions from any of the branches irrespective of their having accounts in others branch. The bank in association with smart choice technology (SCT) providing ATM services for its customers. EBL debit card can be accessed at more than 50 ATMs and over 300 point of sales across the nation. The bank is also managing the SCT ATM at Tribhuvan International Airport for the convenience of the customers and travelers. The first and only bank in Nepal to place ATM outlet at the Airport.

EBL is playing a pivotal role in facilitating remittance to and from across the globe. Being the first Nepalese bank to open a representative office in Delhi, India, the Nepalese in India can open the account in Nepal from the designation branches of Punjab national Bank and remit their savings economically through banking channel to Nepal. The bank has a draft drawing arrangement 175 branches of PNB over India with an aim to help Nepalese citizens working abroad; the bank has entered into arrangements with bank and finance companies in different countries. This enables quich remittance of funds by the Nepalese citizens like UAE, Kuwait, Bahrain, Quatar, Saudi Arabia, Malaysia, Singapore and UK.

The bank recognizes the value offering a complete range of service. Bank

have pioneered in extending various customer friendly product such as: Home loan, Educational loan, EBL flexi Loan, EBL property plus(Future lease rentals), home equity loan, car loan, loan against shares, loan against life Insurance policies and loan for professionals. EBL have always endeavored in delivering innovative products suiting the consumer's requirements and needs to satisfy its customers.

Bank of Kathmandu Ltd.

Bank of Kathmandu Limited (BOK) has become a prominent name in the Nepalese banking sector since 1995. The Bank of Kathmandu is committed to delivering quality service to customers, generating good return to shareholders, providing attractive incentives to employees and serving the community through stronger corporate social responsibility endeavor. BOK has today become a landmark in the Nepalese banking sector by being among the few commercial banks which is entirely managed by Nepalese professionals and owned by the general public.

BOK started its operation in March 1995 with the objective to stimulate the Nepalese economy and take it to newer heights. BOK also aims to facilitate the nation's economy and to become more competitive globally.

The bank is successful in achieving a growth of about 14% in loans to Rs. 17 billion and a growth of 12% in deposits to Rs. 20 billion iin F/Y of 2009/10 in spite of unfavorable internal conditions as well as the absence of adequate security and clear policies which discouraged inflow of foreign investment thereby preventing large projects from coming into operation. BOK is also successful in achieving growths of about 20% and 10% respectively in operating and net profits in F/Y of 2009/10, that is, Rs. 880 million and Rs. 510 million, despite the

prevailing adverse circumstances. In comparison to 28 branches of the bank at the end of last year, The BOK has added nine more during in the course of this financial year thereby bringing a total to 37 branches into operation. In addition, six extension counters are in operation and at the time of this report, The BOK also have been successful in providing consistent service to its valued clients through 41 own ATMs.

Nepal Investment Bank Ltd.

Nepal Investment Bank Ltd. (NIBL), previously Nepal Indosuez Bank Ltd., was established in 1986 as a joint venture between Nepalese and French partners. The French partner (holding 50% of the capital of NIBL) was Credit Agricole Indosuez, a subsidiary of one the largest banking group in the world.

With the decision of Credit Agricole Indosuez to divest, a group of companies comprising of bankers, professionals, industrialists and businessmen, had acquired on April 2002 the 50% shareholding of Credit Agricole Indosuez in Nepal Indosuez Bank Ltd. The name of the bank has been changed to Nepal Investment Bank Ltd. upon approval of bank's Annual General Meeting, Nepal Rastra Bank and Company Registrar's office with the following shareholding structure.

- A group of companies holding 50% of the capital
- Rashtriya Banijya Bank holding 15% of the Capital.
- Rashtriya Beema Sansthan holding the same percentage.
- The remaining 20% being held by the General Public (which means that NIBL is a Company listed on the Nepal Stock Exchange).

Nepal SBI Bank Ltd.

Nepal SBI Bank Ltd. (NSBL) is the first Indo-Nepal joint venture in the financial sector sponsored by three institutional promoters, namely State Bank of India(SBI), Employees Provident Fund(EPF)and Agricultural Development Bank Ltd.(ADBL)through a Memorandum of Understanding signed on 17th July 1992. NSBL was incorporated as a public limited company at the Office of the Company Registrar on April 28, 1993 under Regn. No. 17-049/50 with an Authorized Capital of Rs.12 Crores and was licensed by Nepal Rastra Bank on July 6, 1993 under license No. NRB/l.Pa./7/2049/50. NSBL commenced operation with effect from July 7, 1993 with one full-fledged office at Durbar Marg, Kathmandu with 18 staff members. The staff strength has since increased to 511. Under the Banks & Financial Institutions Act, 2063, Nepal Rastra Bank granted fresh license to NSBL classifying it as an "A" class licensed institution on April 26, 2006 under license No. NRB/I.Pra.Ka.7/062/63. The Authorized,Issued and Paid-Up Capitals have been increased to Rs. 200 Crores,Rs. 186.93 Crores and Rs. 186.93 Crores, respectively. In terms of the Technical Services Agreement concluded between SBI and the Bank, SBI provides management support to the bank through its 3 expatriate officers including Managing Director who is also the CEO of the Bank. A core management team viz. Central Management Committee (CENMAC) consisting of the Managing Director, Chief Operating Officer, Chief Financial Officer and Assistant General Manager(Credit) oversees the overall banking operations in the Bank. ADBL divested its stake in the Bank by selling its entire 5% promoter shares to SBI on 14th June, 2009. Consequently,the Bank's corporate status has undergone change from its previous status as a Joint-venture Bank to a Foreign Subsidiary Bank of SBI.Presently fifty five percent of the total share capital of the Bank is held by the SBI, fifteen percent is held by the EPF and thirty percent is held by the general public

1.3 Statement of the problem

Banking sector has always been the promising sector giving high return and value to its promoters and shareholders; their down looking financial scenarios has created very less investment alternatives and comparatively lower down. Our country showed several banks within short period of time fighting for small amount of market share. This requires excessive force making high operational cost. Due to stiff competition between the banks increases the volume of deposit and loans and investment. It has been because of excessive availability of financial institutions. The competition is the burning issue in the country due to emergence of many commercial banks. It has also warned the individual investors, who invest in financial sector that they should make the best decision to get the high level of return from their investments.

In this kind of situation to be in safer side, the individual investors might be investing their available funds in the government backed investments such as:- Treasury bills, which yield lower rate of return in comparison to others. The government's securities are assumed to be risk free assets. In this context,

The Portfolio analysis is one of the major tools to check the financial health of the different companies as well as minimize the risk and maximize the return from the investments. From the analysis of portfolio of different companies, investors would get the best option available to them for investment in the market.

This research study is concerned with the portfolio formation and analysis from the individual investors' point of view.

. The main attempt of this research is to answer the following questions.

a) What are the total loan and advances portfolio of sampled banks along with non performing loan?

b) What are the return on the total assets ratio and return on shareholder's fund ratio of sample banks?

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c) What are the EPS of sampled banks?

d) What are the return and risk of the common stocks of sample commercial banks?

e) Whether the shares of sampled commercial banks are correctly priced or not?

f) What are the portfolio return and risk of common stock of sample commercial banks from individual investors' point of view with respect to various weights?

These are key issues in investment decisions of individual investors. Hence, this study deals with those problems in term of risk and return characteristics and portfolio concepts.

1.4 Objectives of the Study:-

The main objective of this study is to analyze the current status of risk and return of common stock analysis of sample commercial banks. However, the specific objectives are as follows:

a) To analyze the total loan and advances portfolio of sampled banks along with non performing Loan.

b) To analyze profit on total assets ratio and profit on share holder's fund ratio of sample banks.

c) To analyze the EPS of sampled banks

d) To analyze the return and risk of the common stocks of the sample commercial banks

e) To identify the pricing situation of common stocks of sample commercial banks (under priced-over priced)

f) To analyze the portfolio return and risk of the sample commercial banks with respect to random weights.

g) To assess the present status of portfolio management by investors.

1. 5 Significance of the Study

First of all, it is the fact that this study is undertaken to apply the theoretical concepts and knowledge of financial management to the practical field as a partial fulfillment of the requirement of Masters of Business Studies (MBS) under Faculty of Management, Tribhuvan University.

Moreover, investment practices under the organized stock exchanges are heading progressively in Nepal. But very few studies and researches have been undertaken regarding the stock market. Since we are moving towards the free and open market economy, such studies have become more significant. Due to growing no. of investors-individual as well as corporate, such type of studies helps them to make rational investment decision. Hence this study assesses the risk and returns characteristics of the common stocks of commercial banks that have listed their shares in NEPSE to make them eligible for trading in secondary market. Hence, It's a part of continues research process to be undertaken in the country.

After the restoration of multi party democracy and introduction of economic liberalization, public involvement in securities investment has tremendously increased. But most of the individual investors are not aware about risk associated

with the return from the stocks. They are just making investment decisions based on hearsay and rumors. Systematic investment practices do not getting practiced. In such a situation, this study determines the diversifiable risk, Undiversifiable risk, market volatility of return and so on. Likewise this study will assess whether the market price of listed stocks are correctly priced or not. After all, the findings based on fundamental analysis of this study will be beneficial to all the prospective investors who wish to make investment in the securities of commercial banks. Moreover, respective institutions under study, the official of stock market, brokers, market makers, and university graduates professors can use the findings of this study.

1.6 Limitations of the Study

Though this study has been attempt to an accurate and deficiency free, the use of different financial and statistical models for the analysis of Portfolio of commercial banks may have rendered it quite reliable. The empirical analysis have been done only for a period of five years and this may serve as a constraint for future studies made on this subject. Every research has more or less limitation. Lack of experiences, time, financial resources and up to date information are the main limitations of the study. For the completion of this study, some facts are to be considered as the limitation. These are presented as below:

- The study only concerns with portfolio investment on common stock of commercial banks.
- This study is based on secondary data. Accuracy depends upon the data collection and provided by the banks.
- Data of the stocks of the respective banks traded in NEPSE within the last five years (2005/6 to 2009/10) are only considered.
- The companies that have published their financial statement have only been considered.
- Only six commercial banks out of 32 investments of the listed companies are

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considered.

- Only some specified statistical tools are used, such as: Average, Covariance, Correlation, and Standard Deviation, variance, coefficient of variation etc.

1.7 Organization of the study:

This study has been organized into five chapters. Each chapter has its importance and deals with importance aspect of the study.

The first chapter presents the Introduction of the study. It includes various aspects of present study like general background, Introduction, profile of sampled banks, statement of problem, objectives of the study, limitations of the study, significance of the study, and organization of the study.

The second chapter includes the conceptual frameworks, review of literatures with the study of related books, journal and thesis.

The third chapter is Research methodology which deals on research design, nature & sources of data, selection of enterprises, method of analysis, and definition of key problems.

The fourth chapter attempt to analyze and evaluate data with the help of analytical tools and interpret all the results into the units of empirical result. The fifth chapter covers on the results and finding obtained from earlier chapter and recommends some suggestions.

CHAPTER II

CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

The review of literature is a crucial aspect of planning of the study. It provides the foundation of developing a comprehensive theoretical framework from which hypothesis can be developed for testing (Woelf and Pant, 2002:35)

In this chapter mainly the basic literature on the portfolio analysis is reviewed. It also includes literature regarding on the previous studies done outside the country. This section is devoted to review major related literature concerning portfolio analysis.

Section first describes about conceptual framework. The review of foreign studies other than India and Nepal has been presented in section two and review of major studies in India in section third. The fourth section describes a brief review of empirical works in the context of Nepal and Fifth section has concluding remarks.

2.1 Theoretical Framework

The primary concern of this study is to focus on portfolio management theories; diversification or asset allocation concepts; and risk and return characteristics of common stocks of commercial banks. Theoretical aspects of return and risk are explained in this chapter. Furthermore, some books and journals related to financial management and other related studies. In Nepal, independent researchers have not yet been undertaken in this field. Hence, some select Masters Degree Thesis has only been reviewed.

2.1.1 Investment

An Investment is a commitment of funds made in the expectation of some positive rate of return. If the investment is properly undertaken, the return will

be commensurate with the risk the investor assumes. (Donald E. Fischer and Ronald J. Jordan, 1998)

Investment in its broadcast sense means the sacrifice of current dollars for future dollars. Two different attributes are generally involved; time and risk. The sacrifice takes place in present and is certain. The reward comes later, if it all and the magnitude are generally uncertain. (Sharpe, Alexander & Bailey)

Investment Process

The investment process describes how an investor makes decisions about what securities to invest in, how extensive their investments should be, and when they should be made. The investment process involves five steps:-PACRE [P=Policy; A=Analysis; C=Construction of portfolio; R=Return; E=Evaluation] the formal investment process includes:

1. Set Investment policy: It involves determining the investor's objectives and amount of his or her investable wealth. Investment objective should be stated in terms of both risk and return.

2. Perform Security Analysis: It involves examining several individual securities or groups of securities within the broad categories of financial assets previously identified. There are two main approaches to security analysis, are Technical Analysis and Fundamental Analysis.

3. Construct a Portfolio: The third step in the investment process, portfolio construction, involves identifying those specific assets in which to invest, as well as determining the proportions of the investor's wealth to put into each one. Here, the issue of selectivity, timing and diversification need to be addressed by the investors.

4. Revise the Portfolio: Portfolio revision involves both realizing that the currently held portfolio is not optimal and specifying another portfolio to hold with superior risk-return characteristics. The investor must balance the costs of

moving to the new portfolio against benefits of the revision. The revision of the portfolio constitutes the repetition of all previous three steps.

5. Evaluate the Performance of the Portfolio: It involves determining periodically how the portfolio performed, in terms not only the return earned but also the risk experienced by the investors.

2.1.2Common Stock:

Common stock represents equity or an ownership position in a corporation. It is a residual claim, in the sense that creditors and preference shareholders must be paid as scheduled before common stock holders can receive any payments. In Bankruptcy, common stock holders are in the principal entitled only to any value remaining after all other claimants have been satisfied. (Sharpe, 2002). But Common stock provides a cushion for creditors if losses occur on dissolutions.

Common stock holders are entitled certain rights, which are as follows:

- Voting rights

- Preemptive rights

- Residual rights

- Limited liability

- Right to income and distribution of additional shares.

a) Common Stock Values

Common stock values are either denoted by par value, book value or market value. These three terms are different and their rupee amount differs.

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

Book Value: The sum of the cumulative retained earnings and other entries such as common stock and capital contribution in excess of par value under the stock holder's equity is the book value of equity.

Book Value of Equity= Cumulative retained earnings+ Capital contributed in excess of par+ Common stock

The Book Value per Share is obtained by dividing the book value of the equity by the no. of shares outstanding. Higher profit indicates that higher Book Value of stock.

Market Value: The value of share in secondary market traded between investors and traders is the market value. Market value is the consequence of demand and supply. It is influenced by various factors such as economic and industry conditions, expected earnings and dividends, market and company risk considerations.

b) Return on Common Stock

   i) Single period Holding rate of return:
   The investment return is defined as the after tax increase value of the initial investment. The increase in value can come from two sources; a direct cash payment to the investor or an increase in the market value of

investment relative to the original purpose. The rate of return over the holding period, or holding period rate of return (HPR) is computed as:

HPR= EP-BP+ Cash Receipts +Stock Dividend +Right issue offering

$$\frac{}{\text{Beginning Price}}$$

Where,

EP= Ending Price

BP= Beginning Price

Holding period returns are often calculated for periods other than one year, for this reason, the length of the holding period must always be indicated for a specific HPR, Many HPR over periods shorter or longer than one year are annualized. In general, if the length of the holding period is not specified, it is assumed to be one year.

ii) Annualized Holding period Return

Holding period returns measure mentioned above is useful with an investment horizon of the one year or less. For longer periods, it is better to calculate rate of return as an investment yield. The yield calculation is present value based and this considers the time value of money.(Van Horne and Wochowiez, 1998) HPRs are reported as an annual equivalent, one possible measure of annualized HPR might be the average of several HPRs such as:

$$HPR \quad = \quad \frac{\sum (HPR_t)}{n}$$

However, the simple arithmetic averaging ignores the compounding effect that results in the first period's return is reinvested. In addition, the result of an arithmetic average return can be distorted if there are large differences in the rate of return across time period. Large difference in the periodic rates of return over longer investments horizon will cause the arithmetic rate of return to be misleading.

The geometric mean rate of return does not suffer from this flow. The geometric mean rate of return HPR $\overline{g}$ is defined as the rate of return that would make the initial investment equal to the ending investment value. Annualized rate of return is calculated as:

$$\text{Annual Rate of Return (R)} = (1+\text{HPR})^{1/n}-1$$

iii) Required Rate of Return

When setting the required rate of return on investment, an investor must consider the real rate of return, expected inflation, and risk. Because consumption is foregone today, the investor is entitled to a rate of return that compensates for this deferred consumption. Since the investor expect to receive an increase in the real goods purchased later, and assuming for the moment, zero inflation and risk, the required rate could equal the real rate of returning in which case it would represent the pure time value of money. The capital markets determine this rate based upon the supply of money to be invested relative to the demand or borrowed money (Cheney and Mose, 1995).

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

The required rate of return using CAPM/SML is:

$$\text{Required rate of return (K)} = \overline{R_f} + (R_m - \overline{R_f})\ ß$$

iv) Expected Rate of Return

If an investment is to be made, the expected rate of return or the expected holding period return, should be equal to or greater than the required rate of return for that investment. The expected rate of return is based upon the expected cash receipts (e.g. dividends or interest) over the holding period and the expected ending or selling price. The expected rate of return is an ex-ante or unknown future return.

If the investor can describe the possible variable that will influence each of the possible rate of return and assign probabilities to these outcomes, the expected rate of return should equal the weighted of the various possibilities. Listing the possible investment assigning probabilities to each of these outcomes is the same as creating a probability distribution in statistics. Probability Distribution are used to describe possible outcomes and to assign individual probabilities, from zero (On chance of occurring) to one (Full certainty that the outcome will happen), to each possible outcome.

The investor has forecast possible outcomes, each based upon a possible start of the economy. Each economic start will result in a different expected rate of return. Subjective probabilities are assigned to each outcome. The overall expected rate of return, E (HPR) can be calculated as a weighted average of the three forecasts:

$$E\ (HPR) = \sum$$

c) Risk on common stock

Different people interpret uncertainties and risks in different ways. It is simply a lack of definite outcome or chance of losing something due to presence of some unfavorable conditions; however, risk is the product of uncertainty. Although risk arises from uncertainty, its magnitude depends upon the degree of variability in uncertain cash flows and it is measured in terms of standard deviation.

In a world of uncertainty, expected return may not be realized. Risk can be thought of as the possibility that the actual return from holding a security will deviate from the expected return. The greater the magnitude of deviation and greater the probability of its occurrence, the greater is said to be the risk of the security (Van Horne, 2000).

Financial analysts and statistician prefer to use a quantitative risk surrogate called the variance of returns, denoted by Var. (r). The variance of an asset's rate of return equals the sum of the products of the squared deviations of each possible rate of return from the expected rate of return multiplied by the probability that the rate of return occurs (Francis, 1998: 12-13)

$$\underline{\text{Var. (r)}} \quad = \sum P_1 \left[r_1 - E(r_1) \right]^2$$

$$= P_1[r_1 - E(r_1)]^2 + P_2[r_2 - E(r_2)]^2 + \ldots\ldots\ldots + P_T[r_T - E(r_T)]^2$$

The square root of the variance of the rates of return is called the standard deviation (ơ) of the rate of return.

$$\text{Standard Deviation (ơ)} \quad = \quad \sqrt{\text{Var(r)}}$$

The standard deviation and the variance are equally acceptable and conceptually equivalent quantitative measures of an asset's total risk.

(d) Sources of Investment Risk

Every investment involves uncertainties that make future investment returns risky. The sources of uncertainty that contribute to invest risk are (Francis, 1998: 3-10)

i) **Interest Rate Risk**: It is defined as the potential variability of returns caused by changes in the market interest rates. If market interest rates rise or fall, then the investors' present value will fall or rise. Present value moves inversely with changes in the market rate of interest. The interest rate risk affects the prices of bonds, stocks, real estate, gold, puts, calls, future contrasts, and other investments as well.

ii) **Purchasing Power Risk**: It is the variability of return an investor suffers because of inflation. Economists measure the rate of inflation by using a price index. The percentage change in the consumer price index is a widely followed measure of rate of inflation.

iii) **Bull-Bear Market Risk**: It arises from the variability in market returns resulting from alternating bull and bear market forces. When a security index rises fairly and consistently from a low point, called a tough, for a period of time. This upward trend is called a bull market. The bull market ends when the market index reaches a peak and starts a downward trend. The period during which the market declines to the next trough is called a bear market. Bull markets that usually rise more than enough to compensate for the bear market losses follow bear market. But the alternating bull and bear market forces create a potential source of investment risk.

iv) **Management Risk**: Errors made by business managers can harm those who invested in their firms. Forecasting management errors are difficult work that may not be worth the effort and, as a result, imports a

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needlessly skeptical outlook. Agency theory provides investor with an opportunity to replace skepticism with informed insights as they endeavor to analyze subjective management risks.

v) **Default Risk**: Default risk is that portion of an investments' total risk that results from changes in the financial integrity of the investment. The variability of returns that investors experience as a result of changes in creditworthiness of a firm in which they invested is their default risk.

vi) **Liquidity Risk**: Liquidity risk is that portion of an assets' total variability of return which results from price discounts given or sales commissions paid in order to sell the asset without delay.

vii) **Call ability Risk**: Some bonds and preferred stocks are issued with a call provision. Issuers like the call provision because it allows them to buy back outstanding preferred stocks and/or bonds with the funds from a new issue if market interest rates drop below the risk level being paid on the outstanding securities. But, whatever the issuing company gains by calling in on issue is gained at the expense of the investors who have their securities called. That portion of a security's total variability of returns that derives from the possibility that the issue may be called is the call ability Risk. Call ability risk commands a risk premium that comes in the form of a slightly higher average rate of return. This additional return should increase as the risk that the issue would be called increases.

viii) **Convertibility Risk**: Conversion is a contractual stipulation that is included in the terms of original security issue. This provision alters the variability of returns from the affected security. Convertibility risk is that portion of the total variability of return from a convertible bond or preferred stock that reflects the possibility that the investment may be converted into the issuer's common stock at a time or under terms

harmful to the investor's best interests.

ix) **Political Risk**: Political risk arises from the exploitation of a politically weak group for the benefit of a politically strong group, with the effects of various to improve their relative position increasing the variability of return from the affected asset regardless of whether the charges that causes political risk are sought by political or by economic interest, the resulting variability of return is called political risk if it is accomplished through legislative, judicial or administrative branches of the government. Political risk can be international as well as domestic.

x) **Industrial Risk**: Industrial risk is that portion of investments total variability of return caused by events that affect the products and firms that make up an industry. The stage of the industry's life cycle, international tariffs and/or quotas on the products produced by an industry, product or industry related taxes; industry wise labor union problems, environment restrictions, raw material availability, and similar factors interact and affect the entire firm in an industry simultaneously. As a result of these commonalities, the price of the securities issued by competing firms tends to rise and fall together.

The above-mentioned uncertainties are the major sources of investment risk. Moreover, there might be numerous minor sources of investment risk. The above said major sources are of additive nature which add up to total risk i.e. variance.

2.1.3 Trade-off between Risk and Return

Risk is complicated subject and needs to be properly analyzed. The relationship between risk and return is described by investor's perception about risk and their demand for compensation. No investor will like to invest in risky assets unless he is assured of adequate compensation for the assumption of risk.

Therefore, it is the investors required risk premiums that establish a link between risk and return. In a market dominated by rational investor, higher risk will command by rational premiums and the trade-off between the two assumes a linear relationship between risk and risk premium.

i) Utility Functions and Investors Choice

The best mix of expected return and standard deviation for a security portfolio depends on the investor's utility function. If you are risk adverse investor who associate risk with divergence from expected value of return, your utility function might be depicted in the following figure. The expected return is plotted on the vertical axis, while the standard deviation is along the horizontal. The curves are known as indifference curves; the investor is indifferent between any combination of expected return and standard deviation on a particular curve. In other words, a curve is defined by that combination of expected return and standard deviation that result in a fixed level of expected utility (Van Horne, 2000).

Greater the slope of indifference curves; more adverse the investor is to risk. Each successive curve represents a higher level of expected utility. It is important to note that the exact shape of the indifference curve will not be the same for different investor. While the curves for risk-adverse investors will be upward sloping, a variety of shapes are possible, depending on the risk preference of the individual. As an investor, you want to hold that portfolio of securities that places you on the highest indifference curve.

Investors are risk adverse. As a result, high-risk assets must offer investors high returns to induce them to make the riskier investment. The assumption of linear relationship states that the risk premium must increase or decrease in proportion to a change in level of risk. It also indicates-Higher the risk, higher the return and lower the risk lower the return.

2.1.4 Portfolio Analysis

i) Portfolio and Diversification

According to Clark Francis, investment positions are undertaken with the goal of earning some expected rate of return. Investors seek to minimize inefficient deviations from this expected rate of return. Diversification is essential to the creation of an efficient because it can reduce the variability of returns around the expected return (Francis, 1998).

The term 'Portfolio' simply means collection of investments. For an investor, through the stock exchange will be a collected of shareholding in different companies. For a property investor, portfolio will be a collection of buildings. To a financial manager with in an industrial company, portfolio will be a collection of real capital projects. It will be apparent that the nature of the components of a portfolio demands on the population of opportunities from which the selection has been made.

Feorge B. Cohen defined the portfolio management as: Portfolio management is the art of handling a pool of funds so that it not only preserves its original worth but also overtime appreciates in value and yields an adequate return consistent with the level of risk assumed (Feorge, 1996).

Portfolio is simply a combination of two or more securities or assets (Francis. 1998).

The portfolio manager seeking efficient investments works with two

kinds of statistics-expected return statistics and risk statistics. The expected return and risk statistics for individual assets are the exogenously determined input data analyzed by the portfolio analyst. The objective of portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate (Van Horne and Wochowiez, 1998).

Diversification is a risk management technique that mixes a wide variety of investment within a portfolio. It is designed to minimize the impact of any one security on overall portfolio performance. Diversification is possibly the greatest way to reduce the risk. This is why mutual funds are so popular (www.investopedia.com).

Diversification means reducing the investment risk by dividing the investment among the variety of assets. Diversification helps to reduce risk because different investments will rise and fall independent of each other. The combinations of these assets more often than not will cancel out each other's fluctuation, there of reducing risk.

Diversification in investments can be achieved in many different ways. Individuals can diversify across one type of asset classification-such as stocks. To do this, one might purchase shares in the leading companies across many different (and unrelated) industries. Many other diversification strategies are also possible. You can diversify your portfolio across different types of assets (Stocks, bonds, and real estate for example) or diversify by regional decisions (such as state, region, or country).Thousands of opinions exists. (www.ameritrade.org)

Diversification is important for every investor. In fact, it is so important that in 1990, Harry M. Markowitz won the Nobel Prize largely for his work on diversification. (www.nefe.com)

The common saying "Don't put all your eggs in one basket" is the principle of diversification. Because all investment carry with them some level of risk. It is important to diversify and spread your money into many different investments.

Investors can reduce their potential for loss through diversification. The key to diversification is age-old adage, "Don't put all of your eggs in one basket". The main point of diversification is to reduce risk rather than improve expected

return. This is the power of diversification: The whole is greater than the sum of its parts (www.dfaus.com).

Diversification can help to reduce portfolio risk by eliminating unsystematic risk for which investors are not rewarded. Investors are rewarded for taking market risk. By choosing securities of different companies in different industries, we can minimize the risks associated with a particular company's "Bad luck". Diversification among companies, industries and asset classes affords the investors the greatest protection against business risk, financial risk and volatility.

Investments whose price movement is opposite each other are negatively correlated. When negatively correlated assets are combined with in a portfolio, the portfolio volatility is reduced.

There are some different diversification techniques for reducing a portfolio risk (Francis, 1998)

 1. Simple Diversification:

>   Simple diversification can be defined as "Not putting all the eggs in one basket" or "Spreading the risks." But it does not eliminate risk by creating a simple diversified portfolio.

2. Diversification across Industries:

>   Some Investment counselors advocate selecting securities from different industries to achieve better diversification. But, empirical research has shown that diversifying across industries is not much better than simply selecting securities randomly since all industries are highly correlated with one another.

3. Superfluous Diversification:

>   If 10 or 15 different assets are selected for a portfolio, the maximum risk reduction benefits from simple diversification have most likely been

attained. Further spreading of the portfolio's assets is superfluous diversification and should be avoided.

4. Simple Diversification across Quality Rating Categories

Quality rating measure defaults risk essentially the risk of bankruptcy. The highest quality portfolio of randomly diversified stock was able to achieve lower levels of risk than the simply diversified portfolios of lower-quality stocks. This result reflects the fact that default risk (as measured by the quality ratings) is the part of total risk. The higher quality portfolios contain assets with less default risk. This finding suggests that portfolio managers can reduce portfolio risk to level lower than attainable with simple diversification by not diversifying across lower-quality assets.

2.1.5 Markowitz Portfolio Selection Model

A portfolio is a collection of securities. There exists a problem of portfolio selection. Investors face a problem of selecting optimal portfolio from a set of possible portfolios. Hence, it is often referred to as portfolio selection problem. Harry M. Markowitz put one solution to this problem forth in 1952, when he published a landmark paper that is generally viewed as the origin of the modern portfolio theory approach to investing.

Markowitz's approach begins by assuming that an investor has a given sum of money to invest at the present time. This money will be invested for a particular length of time known as the investor's holding period. At the end of holding period, the investor will sell the securities purchased at the beginning of that period.

Markowitz's model is a theoretical framework for the analysis of risk-return choices. Decisions are based on the concept of efficient portfolio. A portfolio is said to be efficient when it provides maximum expected return for the same level of risk or provides minimum risk for the same level of return. Markowitz diversification is more analytical than simple diversification and considers

assets' correlation (or covariance). The lower the correlation between assets, the more that Markowitz diversification will be able to reduce the portfolio's risk.

a) Portfolio Theory Assumption

The portfolio selection model developed by Harry M. Markowitz is based on several assumptions regarding investor's behavior (Bhalla, 2001).

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

ii) Investors maximize one period-expected utility and poses utility curve. This demonstrates diminishing marginal utility of wealth.

iii) Individual estimates the risk on the basis of the variability of expected returns.

iv) Investors base decisions solely on expected return and variance of returns only.

v) For a given risk level, investors prefer high returns to lower returns. Similarly, for a given level of expected return, investors prefer less risk to more risk.

2.1.6 The Sharpe and Litner Study

Unlike the Markowitz study, William Sharpe & John Litner, also deals with the relationship between the expected the expected return, unavoidable risk and valuation of securities(Sharpe, William F., 1996). Sharpe & Litner developed "The Capital Assets Pricing Model" (CAPM). This model provides the intellectual basis for a number of the current practices in the investment

industry. Although many of these practices are based on various extensions and modifications of the CAPM, a sound understanding of the original version is necessary in order to understand them. CAPM is based on the following assumptions:

1. All investors have the same one period horizon.

2. Information is freely and instantly available to all investors.

3. There is risk-free rate, at which an investor may either lend money or borrow money.

4. The risk-free rate is the same for all investors.

5. Taxes and transaction costs are irrelevant.

6. Investors are never satiated, so when given a choice between two other identical portfolios, they will choose the one with the higher expected return.

7. Individual assets are infinitely divisible.

8. Investors are risk averse, so when a choice between two otherwise identical portfolios, they will choose the one with the lower standard deviation.

9. Investors evaluate portfolios by looking at the expected returns & standard deviations of the portfolios over a one period horizon.

10. Investors have 'Homogeneous Expectation' means that they have the same perceptions in regard to the expected returns, standard deviations, and covariance of securities.

2.1.7 The Security Market Line

In market equilibrium, the relationship between an individual security's expected rate of return and its systematic risk, as measured by Beta (ß), will be linear. The relationship is known as 'Security Market Line'. Under the assumptions of the Sharpe & Litner i.e. the CAPM, all securities lie on along this line.

The security market line can be illustrated as follows:

Figure 1
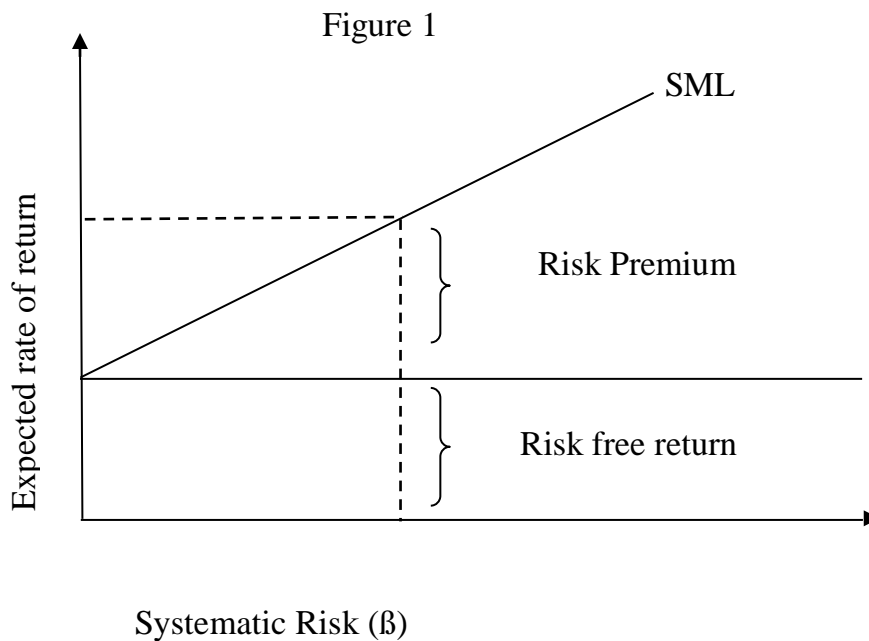
The study states that, the SML is a straight line connecting the Rf (Risk free) point of Market portfolio. Since the risk premium is proportional to stock betas, the risk free securities, such as the treasury bills, which have

zero betas, commanding no premium. On the other hand, the market portfolio whose beta is 1 commands the risk premium or Rm-Rf. The figure shows that the SML moves upwards, indicating higher premium for higher risk as beta increase.

The Sharpe and Litner study presents a useful analysis but management of investment portfolio is a difficult and a complete task. It requires not only a critical evaluation and appraisal of general economic conditions, relative position of different industries, financial and other strengths of a particular firm but also an understanding of the pattern of behavior of stock exchange prices.

2.1.8 Capital Asset Pricing Model (CAPM)

Capital Asset Pricing Model (CAPM) is a descriptive model of how assets are priced. The major implication of the model is that the expected return of assets will be related to a measure of risk for that asset known as beta. The exact manner in which expected return and beta are related is specified by the CAPM.

The capital assets pricing model stated that the expected risk premium on each investment is proportional to their beta coefficient. This means that each investment should lie on the sloping security market line connecting Treasury bills and Market Portfolio (Myers & Brealey, 2003). In market equilibrium a security will be expected to provide a return commensurate with its unavoidable risk. This is simply the risk that cannot be avoided by diversification. The greater the unavoidable risk of a security, greater the return that investors will expect from the security. The relationship between expected return and unavoidable risk, and the valuation of securities that follows, is the essence of the capital asset

pricing model (CAPM). This model was developed by William F. Sharpe (1990, Nobel Prize winner in economics) and John Litner in the 1960s, and it has had important implications for finance ever since (Van Horne, 2000).

The CAPM used to calculate the required rate of return for stock j is:

$$E(Rj) \quad = \quad Rf+[E(Rm)-Rf]ßj$$

Where,

E(Rj) = The expected or ex-ante return on the jth risky asset

Rf   = The rate of return on a risk less asset

E(Rm) = The expected or ex-ante return on the market portfolio

ßj = Cov. (Rj, Rm)/Var(Rm)= a measure of the undiversifiable risk of the jth security

The greater the beta of a security, greater the risk and the greater the expected return required. Likewise, the lower the beta, lower the risk, the more valuable it becomes and the lower the expected return required.

In market equilibrium, the relationship between an individual security's expected rate of return and its systematic risk, as measured by beta, will

be linear. The relationship is known as the security market line (Van Horne, 2000). When the CAPM is graphed in a figure, it is called the security Market Line (SML). In equilibrium, all securities must be priced so that they fall on the SML. The fact is that they have different variances, which are irrelevant for determining their expected return, because total risk contains a diversifiable component, which is not priced in market equilibrium. SML may be used to explain the required rate of return on all securities whether or not they are efficient. The SML provides a unique relationship between Un-diversifiable risk (measured by beta) and expected rate of return. Hence, if we can accurately measure the beta of a security, we can estimate its equilibrium risk-adjusted rate of return.

The CAPM or SML is an equilibrium theory of how price and measure risk. It has many applications for capital budgeting, asset valuation, determination of cost of equity capital and the explaining risk in the structure of interest rates.

The logic of the SML equation is that the required return or any investment is the risk free return plus a risk adjustment factor. The risk adjustment factor is obtained by multiplying the risk premium required for the market return by the riskiness of the individual investment. If the returns on the individual investment fluctuate by exactly the same degree as the returns on the market as a whole, the beta for the security is one. In this situation, the required rate of return on individual is the same as the required return on the total market. The slope of SML measures the risk premium.

William F. Sharpe in his Autobiography states, "The CAPM is built using an approach, familiar to every micro economist. First, one assumes some sort of maximizing behavior on the part of participants in the

market; then one investigates the equilibrium conditions under which such markets will clear. Since Markowitz, had provided a model for the requisite maximizing behavior, it is not surprising that I was not alone in exploring its implications for market equilibrium. Sometimes in 1963, I received an unpublished paper from Jack Treynor containing somewhat similar conclusions. In 1965, John Litner published his important paper with very similar results. Later, Jan Mossin published a version that obtained the same relationships in a more general setting".

i) **Assumptions of the CAPM**

Capital market theory (CMT) uses portfolio theory; thus the assumptions underlying portfolio theory also pertain to the CAPM. The additional assumption underlying CMT and CAPM appear less realistic than the portfolio theory assumptions. The assumptions of CMT are as follows (Cheney & Moses, 1995).

1) All investors are risk- averse. Thus, all investors seek to be on the efficient frontier.
2) There are no constraints on the amount of money that can be borrowed or lent. Borrowing and lending occur at the identical risk-free rate.
3) All investors have identical beliefs about the expected returns and risk of assets and portfolios; that is all investors have homogeneous expectations.
4) All investors have a common investment horizon, whether it is one month, quarter year, half year, one year or whatever.
5) All the investments are infinitely divisible and marketable; that is. it is possible to buy or sell any portfolio of an asset or portfolio.

6) Taxes and transaction costs do not exist. That is, there is no a tax effect, costs of acquiring information or transaction costs associated with buying or selling securities. These are often referred to as perfect market assumptions. Markets are assumed to be competitive; therefore, the same investment opportunities are available to all investors.

7) There is no unanticipated change in inflation or interest rates.

8) The capital markets are in a state of equilibrium or striving toward equilibrium. There are no under priced or over priced securities; if under pricing or over pricing exists, the price will move to correct this disequilibria situation.

ii) Under and Over Valuation

In market equilibrium, the CAPM implies an expected return-risk relationship for all individual securities (the security market line). If an individual security has an expected return-risk combination that places it above the security line, it will be undervalued in the market. That is, it provides an expected return in excess of that required by the market for the systematic risk involved: $Rj > R_f + [E(R_m)-R_f] ß_j$.

As a result, the security will be attractive to investors. According to the theory, the increased demand will cause the security market line and, thereby, for $R_j = R_f + [E(R_m)-R_f] ßj$.

An overvalued security is characterized by an expected return-risk combination that places it below the security market line. This security is unattractive, and investors holding it will sell it and those not holding it will avoid it. The price will fall and expected return will rise until their inconsistency with the security market line and with equilibrium pricing (Van Horne, 2000).

2.1.9 Portfolio Performance Evaluation

i. Sharpe's Portfolio Performance measure

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

$$S_i = \frac{\text{Risk Premium}}{\text{Total risk}} \quad \frac{r_j\text{-R}}{\sigma_i}$$

Where,

S_i = Sharpe index of portfolio performance for portfolio i.

r_j = Average return from portfolio i.

σ_i = Standard deviation of returns for portfolio i.

R = Risk-less rate of interest.

r_j-R is the premium for portfolio i. The risk premium is the additional return over and above the risk-less rate that is paid to induce investors to assume risk.

Sharpe's index of performance generates one number that is determined by both the risk and the return of the portfolio or other investment being evaluated (Francis, 1998).

ii) Treynor's Portfolio Performance Measure

Jack Treynor conceived an index of portfolio performance that is based on systematic risk, as measured by portfolio's beta coefficients. He suggests measuring a portfolio's return relative to its systematic risk rather than relative to its total risk, as does the Sharpe measure. Treynor's index is ascertained as (Francis, 1998)

$$T_p = \frac{\text{Risk Premium}}{\text{Systematic Risk Index}} \qquad \frac{r_j - R}{\beta p}$$

Where,

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

r_j = Average returns from portfolio i.

βp = Systematic risk index of returns for portfolio i.

R = Risk less rate of interest.

iii) Jensen's Portfolio Performance Measure

Dr. Michael C.Jenson has modified the characteristics regression line to make it useful as a one-parameter investment performance measure. The basic random variables in Jenson's model are risk premium, such as (Francis, 1998):

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

Where,

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

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

R_t = risk-less rate observed in period t.

2.2 Review of Journals, Articles and websites:

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. However, Here are some websites and foreign research which are somehow related to this research..

American Association of Individual investors (AAII) under the 'Investing Basis' describes: It is important to understand how personal circumstances affect the investment decisions. If these factors make no differences we could simply publish one suggested portfolio for everyone to follow. However, your tolerance for risk, your return needs (Whether income or growth), the length of time you can remain invested and your tax status all have an important effect on the kinds of investments. Investment profile is the beginning of the asset allocation process, which consists of dividing your portfolio among the major asset categories of stocks, bonds and cash. The asset allocation decision that you make here will have a far more effect on your overall portfolio return. Make allocation decisions with the major categories. For instance, stock portfolio can be divided among large capitalization stocks, small capitalization stocks and international stocks. Once these decisions are reached, you will be ready to make selection among the various investment options. Lastly, once you have setup your investment portfolio, you must monitor it making changes, when appropriate. Every investment portfolio, you must monitor it making changes, when appropriate. Every investor wants the highest assured return possible. But as we have seen returns aren't certain and different investors have varying degree of uncertainty that they are willing to accept (www.aaii.com)

The investor return is a measure of growth in wealth resulting forms that investment. This growth measure is expressed in % forms to make it

comparable across large and small investors. Stock returns may be riskier or more volatile. But this concept is a difficult one to express simply. To do so, we borrow a concept from statistics, called standard deviation. It is a single measure, allowing quantifying asset return by risk, and it also provides the basis for investor's decisions about portfolio choice (Getzman, 1999).

John Warner under the article 'Diversify is still the manager's Mantra' states, some investors got a rude shock in 1995. They thought global diversification would maximize opportunities while reducing their risks. Instead, investors who sank all their saving into a mutual fund indexed to the American Standard & Poor's 500-stock Index earned 37%, compared with 12.5% for sophisticates who put their money in funds composed of international stocks and bonds.

But many money managers are betting that 1995 will turn out to have been exception. They argue that Wall Street's gains were brought about partly by an endemic dollar that didn't revive until late summer. American's love affair with their own high technology issues also fueled the rise. Now, the step run up in US stock prices has many investors chanting their mantra of global diversification more loudly than ever. Some allocates are shifting their resources to capture the greater gains they expect overseas. Indeed, the best way to exploit the benefits of falling rates around the world may be carved up a portfolio into fairly even slices (www.businessweek.com).

Mr. Warner further reiterates that asset allocates favor Southeast Asia as a region to comb for bargains. In emerging markets of the Pacific Rim, including Malaysia, Thailand and Indonesia, Fremont Global Haddick recommends liquid stocks such as Banks and utilities. These stand to gain from lower inflation and falling interest rates and are trading at the low to midpoint of their historical valuation ranges. He further named John F.H. Trott; London based chief international investment officer of Bessemer Trust Co., which is putting the biggest portion of his 20% allocation of non-US stocks in New Zealand and

Australia. John F.H. Trot believes industrial and banking shares there are better bys than the bigger, more commonly held resource stocks.

They further argue that many investors mistakenly assume that diversification works by the gross number of holdings rather than by holding stocks with low correlation. Investors are overconfident of their stock- picking skills. However, some stocks might be overpriced in the market.

In Dec. 1968, a journal of Finance paper concluded that investors should doubt the economic justification of increasing portfolio sizes beyond 10 or so securities (Evans and Archer, 1968). A similar study from the same era found that 90 percent of the benefit could be captured by just 32 stocks (Fisher and Lorie, 1970).

By 2000, a newer study found that even 60-stock portfolios achieve less than 90 % of full diversification (Surz and Mitchell, 2000). A study undertaken by Burton Malkiel, John Campbell, Yexiao Xu, and Martin Lettau argues that a dramatic increase in the volatility of individual stocks and declining correlation of stocks within the S&P 500 Index has led to a significant increase in the number of securities needed to achieve the same level of portfolio risk (Feorge, 1996). They found that, for the two decades prior to 1985, to reduce to 10 % the excess standard deviation (a measure of diversifiable portfolio risk), a portfolio would have has to consist of at least 20 stocks. From 1986 to 1997, the figure increased to fifty (www.pks-thecpau.com).

In the article of 'Portfolio management in Commercial Banks: Theory and Practice' in 1998(2055BS) Mr. Shrestha revealed that the Portfolio management becomes very important both for individual 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 gains

✓ Maximum tax concessions

✓ Flexible investment

✓ Economic, efficient and effective of investment mix.

In view of above aspects, Mr. Shrestha stated that the investors try to hold a well-diversified portfolio that helps to achieve those benefits. Investors want to increase their return by making investment in different sectors with certainty.

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

He further stated that the commercial banks need competent manpower for continues research and analysis and proper management information system to get success in portfolio management and customers' confidence. Regarding the portfolio management in Nepalese joint venture banks, he concluded that the portfolio management activities of Nepalese Commercial Banks at present are in nascent stage. Due to less developed capital market, unavailability of sufficient financial instruments in financial market, lack of proper techniques to run portfolio management activities in the best and successful manner etc constrained the portfolio management of most of the joint venture banks.

An independent study entitled "Investing in Shares of Commercial Banks in Nepal: An assessment of Return and Risk Elements" is found to be relevant in the context of the study.

Mr. Paudel conducted the study with the objective of whether the shares of commercial banks were correctly priced by analyzing the rates of returns and the required rated of return using the CAPM.

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

On the basis of this study, it was found that the shares of BOK offered the highest realized rate of return. It was also found that none of the share prices were in equilibrium. The prices of the shares of SCBNL, NBBL, EBL and BOK were underpriced.

Based on the standard deviation of the returns on shares of EBL could be considered as a high-risk security. The standard deviation of the returns on the shares of HBL was the lowest one on the basis of CV; the share of BOK had the lowest risk per unit of return. It was also observed that the systematic risk was negative with the shares of NABIL. Therefore, the total risk on the return on shares of NABIL was due to company specific characteristics rather than market pervasive. Return on all the shares except NABIL had positive correlation with the return on market (Poudel, 2002).

A thesis entitled "Assessment of performance of Listed Companies in Nepal was undertaken by Mr. Gopal P. Bhatta and submitted to Faculty of Management, Tribhuvan University. The relevant objective of the study was to analyze the performance of listed companies in terms of expected rate of return and company specific risk, required rate of return, systematic risk and diversification of risk through portfolio context.

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Mr. Bhatta employed descriptive as well as analytical methodology with five years data from 1987 to 1991 of 10 listed companies. He summarized, Investors in Nepal have not yet practiced to invest in portfolio of securities. An analysis of two securities portfolio shows that the risk can be totally minimized if the correlation is perfectly negative. In this situation, the risk can be totally diversified but when there is perfectly positive correlation between the returns of two securities, the risk is Undiversifiable. The analysis shows some correlation negative and some has positive one. Negative correlation between securities returns is preferred for diversification of risk (Bhatta, 1995).

The study entitled "Risk and Return Analysis in Common Stock Investment" with special reference to banking industry is also found relevant with this study. The relevant objective of the study was to analyze the risk and return of the common stocks in Nepalese stock market.

In his findings, he summarized, banking industry is the biggest one in terms of market capitalization and turnover. Expected return on the common stocks of Nepal Bank Limited was maximum (i.e. 66.99%) and common stock of SBI Bank Ltd. found minimum. In this regard, common stock of Nepal Bank Limited is most risky and common stock common stock of SBI Bank Ltd. is least risky. In the context of industries, expected return of finance and insurance industry is found highest. Expected return of banking industry is 60.83% (Sapkota, 1999).

The study "Risk and Return on Common Stock Investment of Commercial Banks in Nepal" conducted by Mr. Sudeep Upadhyaya and submitted to Faculty of Management, TU in 2001, is somehow related with this study. The main objectives of the study were to assess the risk associated with returns on common stock investment of the listed commercial banks on the basis of selective financial tools; to evaluate common stocks of listed commercial banks 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.

Mr. Jagdish Basnet undertook the study "Portfolio Management of Joint Venture Banks in Nepal" in 2002. The study is somehow related to this research.

Among various objectives, the relevant one related with this research was to identify the situation of portfolio management of joint venture banks in Nepal. Furthermore, another related specific objective was to evaluate the investment and advances portfolio of joint venture banks.

Mr. Basnet chooses NBBL, HBL, SCBNL and EBL as a sample. The study covered the eight years data from 1994 to 2001 in order to achieve the study objectives:

The major findings of the study were:

- Among The four joint venture banks, NBBL is invested very high amount of its fund in government securities. The shares and debenture stood second position in the investment portfolio.

- The calculated value of beta coefficient of the standard & Chartered Bank Nepal Limited was 0.37. The bank was less risky asset in the market.

- HBL, NBBL and EBL all were defensive stocks.

- The Everest Bank Limited was the highly risky asset in comparison the four banks. HBL had very nominal risk than market.

  He further concluded, Standard & Chartered Bank Nepal Limited is the best and Everest Bank is least performer among four Joint Venture Banks (Basnet, 2002).

  Mr. Roopak Joshi undertook his thesis work entitled "Investor's Problem in Choice of Optimum Portfolio of Stocks in Nepal Stock Exchange" in July 2002. The main objective of the study was to find out and analyze

the major problems of investors facing regarding the selection of most profitable stocks in NEPSE. Mr. Joshi used historical common stocks data in order to achieve the objectives. He reiterated portfolio management is a new concept for Nepalese investors. Due to lack of sufficient information, proper investment is not possible. Proper investment needs huge information internal as well as external. The stock market of Nepal is also in growing stage only. The only one stock exchange located in Kathmandu. Traditional cry system for trading stocks, limited number of securities broker, lack of opportunity of investment and many reasons are there, which are acting as barrier of development of NEPSE.

Mr. Joshi further stated that Nepalese investors don't know in which stock to make investment and how to construct a portfolio. Many brokers are not willing to provide information to the investors. Investors are trading the securities mostly under the pressure of brokers (Joshi, 2002).

A thesis entitled "Analysis of Risk and Return on Common Stock Investment of Insurance Companies" was undertaken by Neelam Thapa and submitted to Faculty of Management, Tribhuvan University. The relevant objectives of the study were to analyze risk and return of other relevant variables that help in making decisions.

The study is based on secondary data of five Insurance Companies covering five years data commencing from F/Y of 2053 -2054 BS. The major findings of the study were as:

- Because of the higher expected return associated with the common stocks, Nepalese Investors are attracted towards it.
- The standard Deviation, which measures the risk of an asset shows that most of the companies are risky. As higher risk must be associated with higher return, it is so only in the case of Everest Insurance Company and

Himalayan General insurance Company where as United Insurance Company and Premier Insurance Company is providing higher returns at lower risk.

- The beta coefficient, which is the measure of systematic risk, reveals that Nepal Insurance Company has highest beta and Premier Insurance Company has least beta (Thapa, 2003).

Mr. Dipesh Bhatta undertook the study "Portfolio Management of Listed finance Companies in Nepal". The study of Mr. Bhatta is a new concept in Portfolio management of Nepalese Companies.

Under the study, the main objective was to study and analyze the existing situation of risk and return analysis of listed finance companies in Nepal. He used secondary data from 1997 to 2002 as well as primary data through opinion survey. He used 20% samples and analyzed data in order to fulfill the set objectives.

After analyzing the secondary data, he concluded that expected market return is lower in comparison to market risk, so market is highly risky place to invest. (Bhatta, 2003).

Mr. Dadhi Raj Aryal conducted the study "Portfolio Analysis on Common Stock Investment of Joint Venture Banks in Nepal" in 2008.

The main objective of the study was to fulfill the 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.

The major findings of the study are: The NABIL bank has the highest rate of return i.e.56.06%/ where as HBL has the lowest return among

studied rate of return i.e. 17.95%/. The market capitalization of SCBNL is in the highest position. 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%.

The thesis entitled "Portfolio Analysis of Investment Pattern of Commercial Banks in Nepal" in 2009 by Mr. Rijal, Rabindra. The study was conducted to fulfill the gap between borrowings and lending banks rather goes for investment. From the above study the researcher founds the gap that researcher has failed to analyze the financial performance of commercial banks in terms of investment strategies. In this study overall commercial banks' performance are evaluated.

2.3 Justification of the Study

From the above study, it can be said that portfolio investment is one of the challenging problem for Nepalese investors as well as commercial banks. There was found some research in the related topic but no research was found in detailed analysis of portfolio management of some listed commercial banks. Related articles and thesis have already been reviewed which helps to this study.

The purpose of this research is to develop some expertise in one's area, to see what new contribution can be made and to receive some ideas, knowledge and suggestions in relation to latest information of portfolio management. The previous studies can't be ignored because they provide the foundation to the present study. In other words, there has to be

continuity in research. This continuity in research is ensured by linking the present study with the past research studies. Here it is clear that the new research cannot be found on that exact topic, i.e. on Portfolio Analysis of Commercial Banks in Nepal. Therefore, to fulfill this gap, the research has selected. To complete this research work: many books, journals, articles and various published and unpublished dissertations are followed as guideline to make the research easier and smooth. In this regard, here we are going to analyze the portfolio analysis of commercial banks, which are considered only Himalayan Bank Ltd., NABIL Bank Ltd., Everest Bank Ltd., Bank of Kathmandu Ltd., Standard chartered Bank and Nepal Rastriya Banijya Bank. Our main research problem is to analyze the portfolio return and risk of common stock of sample commercial banks from individual investor's point of view with respect to various weights. To achieve this main objective, various financial and statistical tools are used to make this research complete. The unique data with the above mentioned study that it includes the non-performing loan status of the sampled banks with the corresponding year. Therefore, this study is useful to the concern banks as well as different persons; such as share holders, investors, policy makers, stockbrokers, state of government etc.

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CHAPTER III

RESEARCH METHODOLOGY

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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.

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 2009/10. It relates with the study of risk, return and portfolio analysis of commercial banks that based on 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 average model etc. All the data used in this study have been taken from related sources. The study is purely empirical due to purely historically data. The Risk, return and portfolio analysis of common stock of commercial banks 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

Population of this study includes all the commercial banks operated in Nepal. At the present, there are Thirty-Two Commercial Banks operated in the market out of which 24 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 six banks are taken under study. This study is based on the portfolio analysis on common stock investment of six 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. The convenient random sampling method has been employed to choose the banks.

The sample commercial banks are listed in Table: 3.1

Table: 3.1 Sample of Commercial Banks

Category	Population Size	Sample Size	Sample Companies
Commercial Banks	32	6	1. Himalayan Bank Ltd. 2. NABIL Bank Ltd. 3. Everest Bank Ltd. 4. Bank of Kathmandu Ltd. 5. Nepal SBI Bank Ltd. 6. Nepal Investment Bank Ltd.

We have chosen these banks as sample because of these reasons:

➢ They have updated profile
➢ Their stocks are regularly traded.
➢ The information is easily available.
➢ They are reputed and high valued by customers.
➢ These all banks are joint-venture banks.

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, 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, libraries, official Website of NEPSE(www.nepalstock.com) and previous research reports.

3.5 Data Analysis Tools

Under this research, financial as well as statistical tools are used to analyze the gathered data and information.

3.5.1 Return and Risk Analysis of Individual Stocks

a) Return Analysis of Individual Stocks

i) Market Price of Share (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).

ii) Dividend Per Share (DPS)

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 MPS

Where,

MPS = Market Price of Share

Symbolically "D" detonates Dividend

iii) Return on Common Stock (Rj)

The return on common stock is the percentage increase/decrease in share price and any cash receipts such as dividends (cash and valuation of stock dividend) over a specific period of time. Here, one year holding period return (Rj) has been calculated as stated below.

$$\text{HPR } (\mathbf{Rj}) = \frac{(EP-BP) + \text{Cash Dividends} + \text{Value of Stock Dividend}}{BP} \times 100\%$$

Where,

EP = Ending Price or Closing Price of this year

BP = beginning price or closing price of previous year

iv) Expected Return on Common Stock: E (Rj)

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 Commercial banks.

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

Symbolically

$$E(Rj) = \frac{\Sigma Rj}{n}$$

Where,

E (Rj) = Expected rate of return on stock 'j'.

n = Number of years that the return is taken.

Σ = Sign of summation.

b) Risk Analysis of Common Stock

i) Standard Deviation (σ)

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. Standard Deviation is denoted by Sigma (σ). Symbolically,

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\Sigma[(Rj\text{-}E(Rj)]^2}{n\text{-}1}}$$

Where,

σj = Standard deviation of returns on stock 'j' during the period n.

ii) 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,

$$\text{C.V.} = \frac{\sigma j}{Rj} \text{ x 100\%}$$

3.5.2 Return and Risk Analysis of Market

a) Return analysis of Market

i) Return on Market

Annual return on market is the average return of market based on the index of market. This is denoted by Rm. It is the value weighted index and comprises of all the stocks listed in NEPSE. The NEPSE index is used for the study.

Annual Market Return (Rm) = $\dfrac{\text{Ending NEPSE return - beginning NEPSE return}}{\text{Beginning NEPSE return}}$

ii) Expected Return on Market (E(R_m))

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

Average Market Return   E(Rm) = $\dfrac{\Sigma\ (Rm)}{n}$

Where,

E(R_m) = Summation of annual market returns

n = No. of observations

b) Risk Analysis of market

iii) Risk of Market return

Risk of market return is the calculated as variance of market return. This is computed as:

Variance of return on market (σ^2) = $\dfrac{\Sigma[(Rm-E(Rm)]^2}{n-1}$

c) Market Sensitivity Analysis

i) Co-variance

The co-variance measures how two variables co-vary. It is a measure of absolute association between two variables. Here, the co-vary between the returns of individual stocks and the market return will be measured by co-variance. This is computed as:

$$\text{Cov. } (Rj, Rm) = \frac{\Sigma[(Rj-E(Rj))] [(Rm-E(Rm))]}{n-1} = \rho j.m \; \sigma j \; \sigma m$$

If two variables are independent, then their covariance is zero.

ii) Correlation Coefficients (ρ)

Correlation coefficient is a measure of the relative association between two variables. It can be taken on a value ranging from –1 to +1. It describes how much linear co-movement exists between two variables. Correlation between stock and the market is computed as:

$$\rho j.m = \frac{Cov(Rj,Rm)}{\sigma j \; \sigma m}$$

The assumptions of correlation coefficient:

1)If $Corr_{jm}$is positive, the returns on security j and market tend to be large at the same time and small at the same time.

2)If $Corr_{jm}$ is negative, relatively large return of security j is associated with relatively small return of market.

3)If $Corr_{jm}$ is zero, the return of security j is uncorrelated to the return on market. Movement on the return of security j appear unrelated to movements in the return of market.

iii) **Beta coefficient** (β)

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. Because the market is the well diversified portfolio. It measures the sensitivity of a stock's return on the market portfolio. Symbolically,

$$\text{Beta coefficient } (\beta im) = \frac{\text{Cov}(Rj,Rm)}{\text{Var}(Rm)}$$

Where,

βj = Beta co-efficient for stock 'j'.

Cov (Rj,Rm)= Covariance between returns on stock j return of market.

$\sigma^2 m$ = Variance of market return.

Individual stocks can be classified as aggressive or defensive or average on the basis of beta coefficients.

Beta coefficients	Stock Classification	Degree of Risk
Less than 1	Defensive Stock	Less risky than the market
Exactly 1	Average Stock	Equally risky as the market
Greater than 1	Aggressive stock	More risky than the market

3.5.3 Portfolio Analysis

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.

i) Portfolio Return (Rp)

The return on portfolio represents weight of individual investment multiplied with expected return of that investment and so on. When two or more return is combined and multiplied with each weight then that return is known as portfolio return. The return of a portfolio (Rp) is calculated as:

● In case of two assets

The Return on Portfolio $(Rp) = w1 \cdot E(R1) + w2 \cdot E(R2)$
and,

● In case of three assets

The return of a portfolio $(Rp) = w1 \cdot E(R1) + w2 \cdot E(R2) + w3 \cdot E(R3)$

● In case of four assets

The return of a portfolio $(Rp) = w1 \cdot E(R1) + w2 \cdot E(R2) + w3 \cdot E(R3) + w4 \cdot E(R4)$

ii) Portfolio Risk (σp)

Total Portfolio risk is measured by the variance of the portfolio's rate of return distribution. 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

Variance of portfolio $(\sigma^2\mathbf{P})$ = $w1^2 \cdot \sigma1^2 + w2^2 \cdot \sigma2^2 + 2 \cdot w1 \cdot w2 \cdot Cov (R1. R2)$

or

Variance of portfolio $(\sigma^2\mathbf{P})$ = $w1^2 \cdot \sigma1^2 + w2^2 \cdot \sigma2^2 + 2 \cdot w1 \cdot w2 \cdot \sigma1 \cdot \sigma2 \cdot \rho12$

●In case of three assets

Variance of portfolio $(\sigma^2\mathbf{P})$ = $w1^2 \cdot \sigma1^2 + w2^2 \cdot \sigma2^2 + w3^2 \cdot \sigma3^2 + 2 \cdot w1 \cdot w2 \cdot Cov (R1. R2) + 2 \cdot w2 \cdot w3 \cdot Cov (R2. R3) + 2 \cdot w1 \cdot w3 \cdot Cov (R1. R3)$

or

Variance of portfolio $(\sigma^2\mathbf{P})$ = $w1^2 \cdot \sigma1^2 + w2^2 \cdot \sigma2^2 + w3^2 \cdot \sigma3^2 + 2 \cdot w1 \cdot w2 \cdot \sigma1 \cdot \sigma2 \cdot \rho12 + 2 \cdot w2 \cdot w3 \cdot \sigma2 \cdot \sigma3 \cdot \rho23 + 2 \cdot w1 \cdot w3 \cdot \sigma1 \cdot \sigma3 \cdot \rho13$

●In case of four assets

Variance of portfolio $(\sigma^2\mathbf{P})$ = $w1^2 \cdot \sigma1^2 + w2^2 \cdot \sigma2^2 + w3^2 \cdot \sigma3^2 + w4^2 \cdot \sigma4^2 + 2 \cdot w1 \cdot w2 \cdot Cov (R1. R2) + 2 \cdot w1 \cdot w3 \cdot Cov (R1. R3) + 2 \cdot w1 \cdot w4 \cdot Cov (R1. R4) + 2 \cdot w2 \cdot w3 \cdot Cov (R2. R3) + 2 \cdot W2 \cdot w4 \cdot Cov (R2. R4) + 2 \cdot W3 \cdot w4 \cdot Cov (R3. R4)$

CHAPTER – FOUR
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. This chapter deals with the presentation and analysis of the returns and risks of common stocks of six commercial banks. Basically, this chapter is divided into three parts.

The first part is to calculate and analyze the various ratios i.e. loans and advances to total deposit ratio with Non-Performing Loan (NPL), loan and advances to total assets ratio with NPL, return on total assets ratio, return on shareholders' fund ratio, earning per share.

The second part deals with risk and return analysis of the selected banks and at the end computation of two, three and four assets portfolio analysis and analysis on the basis of risk and return of selected banks.

In the third part, risk and return characteristics of common stocks of the above mentioned commercial banks have been analyzed and interpreted on the basis of secondary data. Return and risk characteristics of the two assets, three assets and four assets portfolio have been formed from and have also been analyzed on the behalf of the individual investors. Side by side, situation of the price of the common stocks of each bank has been calculated to indicate whether they are overpriced or under priced. Tables, diagrams and charts have been used to reveal the information precisely as demanded by the analysis.

4.1 Analysis of Ratios

Ratio analysis is one of the most important tools to evaluate the financial performance. Financial ratios are calculated from the profit and loss account and the balance sheet of the selected commercial banks.

In this section only important financial ratios are computed to compare and analyze the financial performance of the selected banks.

4.1.1 Loans and Advances to Total Deposit Ratio

Loans and advances consist of loans, advances, cash credit, overdrafts, local and foreign bills purchases and discounts. The total deposit consists of current deposit, Saving deposits, fixed deposits, money at call & short notice and other deposits. Loans & advances to total deposits ratio of EBL, NABIL, HBL, NSBI, NIB and BOK is presented in table no. 1.

Table 4.1.1: Loan and advances ratio and NPL

F/Y	Particu-lars	EBL		NABIL		HBL		NSBI		NIB		BOK	
		LA/TD	NPL	LA/TD	NPL	LA/TD	NPL	LA/TD	NPL	LA/TD	NPL	LA/TD	NPL
2005/06	RATIO(%)	73.44	1.27	68.63	1.38	55.27	6.60	74.91	6.13	69.62	2.07	71.42	2.72
2006/07	RATIO(%)	77.44	0.80	68.13	1.12	56.57	3.61	87.94	4.56	72.56	2.37	78.25	2.51
2007/08	RATIO(%)	78.56	0.68	68.18	0.74	61.23	2.36	92.93	3.83	79.90	1.12	80.51	1.86
2008/09	RATIO(%)	73.43	0.48	73.87	0.80	71.49	2.16	55.84	2.02	78.86	0.58	82.65	1.27
2009/10	RATIO(%)	76.24	0.16	69.53	1.47	74.39	3.52	51.48	1.48	81.74	0.62	83.90	1.51
	MEAN(%)	75.82	0.68	69.67	1.10	63.79	3.65	72.62	3.6	76.54	1.35	79.35	1.97
	SD(%)	2.33		2.41		8.70		18.58		26.86		4.93	
	CV(%)	3.073		8.37		13.64		25.58		35.09		6.21	

Industry Average: 72.96

Industry CV: 15.33

Industry Average NPL: 2.06

NPL: Non Performing Loan

This ratio measures the extent to which the banks are successful to mobilize outsider's fund, i.e. total deposits in loans and advances for the purpose of profit generation.

Loan & advances to Total Deposits Ratio is calculated by dividing Loans & Advances by Total Deposits. This can be stated as:

The table listed in table no. 1 shows that the mean loans & advances to total

deposits ratio of BOK is the highest, i.e. 79.35% among the six commercial banks over the review period NIB has second highest loan and advances to total deposit ratio of 76.54%. NABIL, EBL and NSBI have moderate mean loans and advances ratio i.e.69.67%, 75.82% & 72.62% respectively. Similarly HBL has the lowest mean i.e.63.79% loans and advances ration. The industry average mean is 72.96 %.

EBL, NIB and BOK are above than industry average i.e. 75.82>72.96, 76.54>72.96 and 79.35>72.96. Similarly HBL, NABIL and NSBI are below than industry average i.e. 63.79<72.96, 69.67<72.96 and 72.62<72.96 respectively.

However the coefficient of variation in the ratios of EBL is the lowest i.e. 3.073%. It means that the ratio of EBL is the most uniform among the six commercial banks. Similarly the coefficient of variation in the ratios of NIB is the highest i.e. 35.09%. It indicates that the variability of the ratios of Nepal Investment Bank is least uniform among six commercial banks. The variability of the ratios of BOK, NABIL, HBL and NSBI are moderate taking 6.21 %, 8.37%, 13.64% and 25.58% respectively.

From the above description, it can be concluded that EBL has mobilized its funds to loans and advances most effectively among six commercial banks. NABIL BOK, HBL and NSBI are moderate in mobilizing funds. Likewise NIB has mobilized its deposits to loans and advances least effectively among the six commercial banks.

The Non-performing Loan plays a vital role in the overall performance of the bank. Thus while making an investment in any bank; every investor should analyze the total non-performing loan out of total loan of the respective bank. This will help to have right decision. From the above table it reveals that the average NPL of HBL is highest among the sampled six commercial banks during the research period. From the data it is cleared that the invest in the stock of EBL would be rewarding as it has the mean loan and advances to total deposit ratio

above than industry level as well as the least NPL and least risky too. It doesn't mean that the other banks are not eligible for investment. As we analyze the NPL trend the BOK has the improvement while the NSBI is not so effective. HBL is totally ineffective to minimize its NPL during the research period. Thus rational investors should invest in each stock after analyzing every aspects related to profit of the organization.

4.1.2 Loans & Advances to Total Assets Ratio

Loans and Advances consist of loans, advances, overdrafts, local & foreign bills purchases, cash credit, and discounts. The total assets include total assets of on balance sheet items.

On this ratio, higher ratio indicates the higher utilization of resources in relation to total assets and yields a higher return for the banks.

The relationship between the loans and advances to total Assets ratio is shown as:

Total Loan and Advances/ Total Assets

The Following table no. 2 shows the ratios of loans & Advances to total assets of EBL, NABIL, HBL, NSBI, NIB and BOK.

Table: 4.1.2 Loan and advances to total assets ratio

F/Y	Particulars	EBL		NABIL		HBL		NSBI		NIB		BOK	
		LA/TA	NPL	LA/TA	NPL	LA/TA	NPL	LA/TA	NPL	LA/TA	NPL	LA/TA	NPL
2005/06	RATIO(%)	60.75	1.27	54.86	1.38	50.76	6.60	63.22	6.13	61.78	2.07	59.58	2.72
2006/07	RATIO(%)	60.42	0.80	53.53	1.12	51.50	3.61	72.40	4.56	64.40	2.37	64.64	2.51
2007/08	RATIO(%)	65.94	0.68	56.58	0.74	53.92	2.36	74.16	3.83	70.82	1.12	70.15	1.86
2008/09	RATIO(%)	64.39	0.48	60.94	0.80	62.70	2.16	51.75	2.02	69.47	0.58	71.06	1.27
2009/10	RATIO(%)	66.95	0.16	60.33	1.47	65.05	3.52	47.21	1.48	71.45	0.62	70.84	1.51
	MEAN(%)	63.69	0.68	57.25	1.10	56.78	3.65	61.75	3.6	67.58	1.35	67.25	1.97
	SD(%)	2.979		3.28		6.63		13.51		4.266		5.04	
	CV(%)	4.677		5.73		11.67		21.88		6.31		7.49	

Industry average   : 62.38

Insustry CV   : 9.63

Industry NPL   : 2.06

LA: Total Loan and Advances

NPL: Total Non-Performing Loan

The above comparative table shows that the ratios of commercial banks are in fluctuating trend throughout the review period. The mean loans and advances to total assets ratio of NIB is the highest i.e. 67.58%. among the six commercial banks. BOK has the second highest and very near to the ratio of NIB i.e. 67.25%. Similarly, NABIL, EBL and NSBI have the moderate mean ratio. HBL has the lowest mean loans and advances ratio among the six commercial banks i.e.56.78%. The industry average mean is 62.38%. EBL, NIB and BOK are above than industry average i.e. 63.69>62.38, 67.58>62.38 and 67.25>62.38 respectively. Similarly HBL, NABIL and NSBI are below than industry average

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i.e. 56.78<62.38, 57.25<62.38 and 61.75<62.38 respectively.

The coefficient of variation in the ratios of EBL is the lowest i.e. 4.677%. It means that the ratio of EBL is the most consistent among the six banks. Similarly, the coefficient of variation in the ratios of NSBI is the highest i.e. 21.88%. it indicates that ratio of NSBI is the least consistent among the six commercial banks. The variability of the ratios of NABIL, NIB, BOK and HBL are moderate taking 5.73%, 6.31%, 7.49% and 11.67% respectively.

By looking the trend of loan and advances of all banks with respect to total assets it is cleared that the ratio is in increasing trend and at quite satisfactory level. One investor shouldn't invest his money on the stock only analyzing the total loan and advances ratio with total assets but the total non performing assets attach with this advances should also be analyzed. As we analyze only the loan and advances ratio the decision goes in favor ofNIB's side. But unlikely the decision goes to EBL if the NPL is considered as evaluation criteria. Thus, while the total loan and advances ratio is analyzed one should not forget to assess the NPL attach with the total loan and advances outflow.

Thus the analysis of loan and advances ratio in portfolio management without the assessment of NPL out of Total loan and advances outflow would be meaningless.

4.1.3 Return on Total Assets Ratio

The relationship between Net profit and Total assets measures the profitability in according to Total assets. Thus, it seems to be vital for measuring the financial performance of the bank. The higher ratio of the bank indicates the efficiency of the bank in using its resources. This ratio is calculated by dividing Net profit after tax by Total Assets. This can be shown as:

Net profit After Tax/ Total Assets

Table 4.1.3: Return on total assets ratio

F/Y	Particulars	EBL	NABIL	HBL	NSBI	NIB	BOK
2005/06	RATIO(%)	1.49	3.23	1.55	0.90	1.64	1.65
2006/07	RATIO(%)	1.38	2.72	1.47	1.83	1.82	1.80
2007/08	RATIO(%)	1.65	2.32	1.76	1.44	1.79	2.04
2008/09	RATIO(%)	1.73	2.55	1.91	1.05	1.70	2.25
2009/10	RATIO(%)	2.09	2.37	1.19	1.03	2.2	2.18
	MEAN(%)	1.67	2.64	1.57	1.25	1.83	1.98
	SD(%)	0.2724	0.383	0.2768	0.38	0.22	0.2539
	CV(%)	16.31	14.50	17.63	30.55	11.96	12.82

Industry Average: 1.82
Industry CV : 17.29
The Table :3 shows the ratios of return on Total Assets of EBL, NABIL, HBL, NSBI, NIB and BOK.

The mean return of NABIL is the highest i.e. 2.64%. This is above than industry average(1.82). Similarly, the mean return of NSBI is the lowest i.e. 1.25 which is below than industry average. The mean return on total assets of NIB and BOK are above than industry level i.e.1.83>1.82, 1.98>1.82. The mean return on total assets of EBL and HBL are below than industry i.e.1.67<1.82, 1.57<1.82 respectively.

The coefficient of variation of NSBI is the highest among the six commercial banks i.e. 30.55%. Similarly, the CV of NIB is the lowest among the six commercial banks i.e. 11.96%. The industry average CV is 17.29%. It indicates that the variability of the ratios of NIB is the least uniform among the six commercial banks. Likewise the CV of HBL is also above than industry level and the ratios of EBL, NABIL and BOK are below than industry average. It indicates that the variability of the ratio of NIB is the most uniform among the six commercial banks. The variability of the ratios of EBL, NABIL, HBL and BOK are in moderate position i.e. 16.31%, 14.50%, 17.63% and 12.82% respectively.

According to the above analysis, it can be concluded that the NABIL is in the best profitability position in relation to return on total assets ratio among the six commercial banks. EBL, HBL, NIB and BOK are in moderate profitability position. Likewise, NSBI is in the poor profitability position in relation to total assets ratio among the six commercial banks.

4.1.4 Return on Shareholders' Fund Ratio

The return on shareholders' fund indicates the benefit of the investments in equity share capital. The relation between Net profit after tax and shareholders' fund can be shown as:

Net profit after tax/ Shareholders' Fund

The shareholders' fund is the portion of incomes left to the internal equities after all costs, charges, and expenses have been deducted. The shareholders' fund includes paid up capital, general reserves, and retained earnings of surplus and general loan loss provision.

Table: 4.1.4 Return on Shareholders' Fund Ratio

F/Y	Particulars	EBL	NABIL	HBL	NSBI	NIB	BOK
2005/06	RATIO(%)	19.80	28.86	29.67	12.04	24.76	48.93
2006/07	RATIO(%)	19.57	37.53	27.85	22.10	26.68	43.45
2007/08	RATIO(%)	21.35	31.42	29.62	17.64	25.93	59.86
2008/09	RATIO(%)	24.36	27.93	29.95	18.58	23.05	54.74
2009/10	RATIO(%)	26.25	29.70	16.31	16.05	28.00	43.06
	MEAN(%)	22.26	31.09	26.68	17.28	25.68	48.93
	SD(%)	2.93	3.83	3.17	3.67	1.88	7.85
	CV(%)	13.18	12.32	11.88	21.23	7.34	16.05

The ratio of Net profit after tax and shareholders' fund measures the capability of the banks to utilize its owner's fund. It shows whether the firm has earned a satisfactory return for its equity holder or not. Higher of this ratio is more satisfactory level to stockholders.

In the table 4, it has showed that the ratios of return on shareholders' fund of six commercial banks are in fluctuating trend throughout the review period. The mean ratio of BOK is the highest i.e. 48.93%. The ratios of EBL, NABIL, HBL and

NSBI are in moderate position i.e. 22.26%, 31.09%, 26.68% and 25.68% respectively. The ratio of NSBI is the lowest among the six commercial banks i.e.17.28%. The industry average is 28.65%. The ratio of NABIL is above than industry aveage i.e. 31.09>28.65. The ratios of EBL, HBL, NSBI and NIB are below than industry average i.e. 22.26<28.65, 26.68<28.65, 17.28<28.65 and 25.68<28.65 respectively.

Likewise, the coefficient of variation of NIB is the lowest and below than industry average i.e. 7.34<12.00. This shows that the variability of the ratios of NIB is the most uniform among the six commercial banks. The coefficient of variation of NSBI is the highest and above than industry average i.e.21.23>12.00. It indicates that the variability of the return on shareholders' fund of NSBI is the least uniform. The variability of the return on Shareholders' fund ratios of EBL, NABIL, HBL and BOK are in moderate position i.e. 13.18%, 12.32%, 11.88% and 16.05% respectively.

From the above analysis, it can be concluded that the BOK is in the best profitability position in relation to shareholders' fund among the six commercial banks. NABIL is somehow in best position since it has higher mean ratio as well as moderate CV of 12.32% which is very near to industry level. EBL, HBL and NIB are in moderate position in relation to shareholders' fund. Similarly, NSBI is in the lowest profitability position in relation to shareholders' fund among the six commercial banks.

4.1.5 Per Share Income (EPS)
It measures the profitability of the common shareholders' investment. Per share income shows the profit available to the equity shareholders as per share. It can be shown as:

EPS = Earning available for equity share/ No. of equity share.

Table 4.1.5: per Share Income (EPS)

F/Y	Particulars	EBL	NABIL	HBL	NSBI	NIB	BOK
2005/06	Rs.	62.78	129.21	59.24	18.27	59.35	43.67
2006/07	Rs.	78.42	137.08	60.66	39.35	62.57	43.50
2007/08	Rs.	91.82	108.31	62.74	28.33	57.87	59.94
2008/09	Rs.	99.99	106.76	61.90	36.18	37.42	54.68

2009/10	Rs.	100.16	78.61	31.80	23.69	52.55	43.08
	MEAN(%)	86.63	111.99	48.90	29.16	53.95	48.97
	SD(%)	16.00	22.80	14.98	8.69	9.93	7.83
	CV(%)	18.47	20.36	30.64	29.81	18.39	16.00

Industry Average 63.26
Industry CV 22.28

On the table 5, we can see that the NABIL has highest mean EPS of 111.99%. This is above than industry average. It has also the lower CV than industry average i.e.20.36<22.28. This indicates that NABIL is very high Uniform throughout the period. Similarly, EBL has the highest EPS than industry average i.e. 86.63>63.26 and lowest CV than industry average i.e. 18.47<22.28. it indicates that the data are more uniform.

NSBI has the lowest EPS than industry average i.e.29.16<63.26 and highest CV than industry average i.e.29.81>22.28. It indicates that the data of NSBI are not satisfactory.

HBL has the lowest EPS than of 48.90. which is below than industry average. It has CV of 30.64%. this is above than industry average i.e 30.64>22.28 and the data of HBL are not satisfactory.It indicates that there have been fluctuation over the review period. The mean EPS of BOK and NIB are also found below than the industry level i.e.48.97<63.26, 53.95<63.26.BOK and NIB also has lower CV than industry level i.e.16.00<22.28, 18.39<22.28 respectively.

From the above analysis, we can conclude that NABIL and EBL are more satisfactory among the six commercial banks. They both have higher level Mean EPS and lower level of CV.

4.2. Estimates Market Parameter
In this section, Risk and return characteristics on the common stocks of individual companies, market sensitivity of the stocks, expected rate of return, required rate of return have been analyzed.

To analyze the risk and return characteristics, the market return and market standard deviation factors are most important. For the purpose of analysis, the NEPSE indexes for the six years data are taken into consideration.

4.2.1 Risk and Return Analysis of Common Stocks

The percentage increase or decrease in share price and any cash receipts such as dividends (Cash and valuation of stock dividend)over a specific time period is called the return on common stock. Here, one year holding period return (Rj) has been used to analysis of common stock. This is stated as:

$$\text{HPR } (\mathbf{Rj}) = \frac{(EP\text{-}BP) + \text{Cash Dividends} + \text{Value of Stock Dividend}}{BP} \times 100\%$$

Where,
EP = Ending price or closing price of the year
BP = Beginning price or closing price of previous year

The single period rate of return is the total return during the holding period. It is denoted by 'R' of holding period rate of return. It is the total return on what the investor would receive during the holding period stated as a percent of investment price at the start of the holding period.

Again, the mean or average returns of the commercial banks have been calculated using the following formula of the simple average as:

$$E(Rj) = \frac{\Sigma Rj}{n}$$

Where,
E (Rj) = Expected rate of return on stock 'j'.
n = Number of years that the return is taken.
Σ = Sign of summation.

The risk factor is the possibility of actual return from a stock may deviate from the expected rate of return. It is measured by standard deviation or variance(Square of standard deviation).

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. Standard Deviation is denoted by Sigma **(σ)**.
Symbolically,

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\Sigma[(Rj\text{-}E(Rj)]^2}{n\text{-}1}}$$

Variance $= (\sigma_j)^2$

Similarly, coefficient of variation of returns, C.V.$(R_j) =$

$$\frac{\sigma_j}{\overline{R_j}} \times 100\%$$

Table : 4.2.1 Overall Market Index

Year	NEPSE Index (NI)	Rm(%)	Rm-E(Rm) (%)	Rm-E(Rm) (%)^2
2004/05	286.67		-	
2005/06	386.86	34.95	16.13	260.1769
2006/07	683.95	76.80	57.98	3361.6804
2007/08	963.36	40.85	22.03	485.3209
2008/09	749.10	-22.24	-41.06	1685.9236
2009/10	477.23	-36.29	-55.11	3037.1121
	Total	94.07		8830.2139
N=5	E(Rm)% =	18.82%	Var.(Rm)(%)	2207.55

Standard Deviation of market return $(\sigma_m) = \sqrt{\text{Variance } (R_m)} = 46.98\%$

In the above table, market return(Rm) of the stock is 18.82%, the market standard deviation of the stock is 16.96%. average risk free rate is 4.75%(From NRB data).

Calculation of Expected rate of return, beta coefficients and required rate of return of selected commercial banks.

EBL

Cov$(R_E,R_m) = \Sigma[(R_m - \overline{R_m})(R_E - \overline{R_E})]/n-1$

$= 11045.0449/3$

$= 3681.68$

Beta Coefficient $(B_E) = $ Cov$(R_E,R_m)/ (\sigma_m)^2$

$= 3681.68/2207.55$

$= 1.67$

Required rate of return $\Sigma(R_E) = R_f + [E(R_m) - R_f] B_E$

$= 4.75 + (18.82-4.75)1.67$
$= 28.25\%$
: The required rate of return of EBL is 28.25%.
: The expected rate of return is 27.28%

Calculation of Expected rate of return, beta coefficients and required rate of return of selected commercial banks.

NABIL

$$\text{Cov}(R_{NABIL}, R_m) = \Sigma[(R_m - \overline{R_m})(R_{NABIL} - \overline{R_{NABIL}})]/n-1$$

$$= 16056.508/3$$

$$= 5352.17$$

Beta Coefficient $(B_N) = \text{Cov}(R_{NABIL}, R_m)/(\sigma_m)^2$

$$= 5352.17/2207.55$$

$$= 2.42$$

Required rate of return $\Sigma(R_{NABIL}) = R_f + [E(R_m) - R_f] B_N$

$$= 4.75 + (18.82-4.75)2.42$$
$$= 38.80\%$$
: The required rate of return of NABIL is 38.80%.
: The expected rate of return is 63.35%

Calculation of Expected rate of return, beta coefficients and required rate of return of selected commercial banks.
HBL

$$\text{Cov}(R_H, R_m) = \Sigma[(R_m - \overline{R_m})(R_H - \overline{R_H})]/n-1$$

$$= 9428.1885/3$$

$$= 3142.73$$

Beta Coefficient $(B_H) = \text{Cov}(R_H, R_m)/(\sigma_m)^2$

$$= 3142.73/2207.55$$

$$= 1.42$$

Required rate of return $\Sigma(R_H) = R_f + [E(R_m) - R_f] B_H$

$$= 4.75 + (18.82-4.75)1.42$$
$$= 24.73\%$$
: The required rate of return of HBL is 24.73%.

: The expected rate of return is 25.28%

Calculation of Expected rate of return, beta coefficients and required rate of return of selected commercial banks.
NSBI

$$Cov(R_{SBI},R_m) = \Sigma[(R_m - \overline{R_m})(R_{SBI} - \overline{R_{SBI}})]/n-1$$

$$= 13113.5468/3$$

$$= 4371.1823$$

Beta Coefficient $(B_{SBI}) = Cov(R_{SBI},R_m)/(\sigma_m)^2$

$$= 4371.18/2207.55$$

$$= 1.98$$

Required rate of return $\Sigma(R_{SBI}) = R_f + [E(R_m) - R_f] B_{SBI}$

$$= 4.75 + (18.82-4.75)1.98$$
$$= 32.61\%$$
: The required rate of return of NSBI is 32.61%.
: The expected rate of return is 49.69%

Calculation of Expected rate of return, beta coefficients and required rate of return of selected commercial banks.
NIB

$$Cov(R_{NIB},R_m) = \Sigma[(R_m - \overline{R_m})(R_{NIB} - \overline{R_{NIB}})]/n-1$$

$$= 11126.8479/3$$

$$= 3708.95$$

Beta Coefficient $(B_{NIB}) = Cov(R_{NIB},R_m)/(\sigma_m)^2$

$$= 3708.95/2207.55$$

$$= 1.68$$

Required rate of return $\Sigma(R_{NIB}) = R_f + [E(R_m) - R_f] B_{NIB}$

$$= 4.75 + (18.82-4.75)1.68$$
$$= 28.39\%$$

: The required rate of return of NIB is 28.25%.
: The expected rate of return is 16.30%

Calculation of Expected rate of return, beta coefficients and required rate of return of selected commercial banks.

BOK

$Cov(R_B, R_m) = \Sigma[(R_m - \overline{R_m})(R_B - \overline{R_E})]/n-1$

$= 9861.0351/3$

$= 3287.01$

Beta Coefficient $(B_B) = Cov(R_B, R_m)/(\sigma_m)^2$

$= 3287.01/2207.55$

$= 1.49$

Required rate of return $\Sigma(R_B) = R_f + [E(R_m) - R_f] B_B$

$= 4.75 + (18.82-4.75)1.49$
$= 25.71\%$
: The required rate of return of BOK is 25.71%.
: The expected rate of return is 33.58%

Table 4.2.2: Summary of the above calculations

Name of banks	Expected returns(E(Rⱼ))	Required rate of return	Beta coeffient(Bⱼ)
EBL	27.28%	28.25%	1.67
NABIL	63.35%	38.80%	2.42
HBL	25.28%	24.73%	1.42
NSBI	49.69%	32.61%	1.98
NIB	16.30%	28.39%	1.68
BOK	33.58%	25.71%	1.49
Industry Average	**35.91%**	**29.75%**	**1.78**

According to the above calculations, the industry average beta coefficient is 1.78, which is higher than market index (i.e. 1.00). The beta coefficient of NABIL is 2.42, which is the highest beta coefficient among the six commercial banks. Therefore NABIL has the highest systematic risk in the industry. Similarly, HBL has the lowest beta coefficient among the six commercial banks. I.e.1.42. It indicates that the HBL has the higher systematic risk than market index and lowers

than industry average. NSBI has the second highest beta coefficient i.e.1.98, which is higher than industry average i.e. 1.98>1.78. It indicates that the NSBI has the second highest systematic risk and higher than industry average. Similarly, EBL, HBL, NIB and BOK have the beta coefficient of 1.67, 1.42, 1.68 and 1.49 respectively, which are below than industry average i.e. 1.67<1.78, 1.42<1.78, 1.68<1.78 and 1.49<1.78. it indicates that the EBL, HBL, NIB and BOK have the less systematic risk but high volatile than the market.

Expected (Mean) return is the average of capital gain yield and dividend yield. The Industry average mean is 35.91%. The Expected return of NABIL is the highest i.e. 63.55%. Which is the highest and above than the industry average i.e. 63.55>35.91% among the six commercial banks. NIB has the lowest mean return and lower than industry average i.e. 16.30<35.91%. It indicates that NIB's performance has been worse during the study period as compare to other commercial banks. EBL, HBL and BOK all have the lower mean return than industry average. NSBI has the second highest mean which is above than industry level i.e. 49.69>35.91%HBL has the second lowest mean return among the six commercial banks and is below than industry average. i.e. 25.28< 35.91%.

NABIL has the highest beta coefficient i.e.2.42, thus it requires highest return among the six commercial banks i.e. 38.80 %. Similarly, NSBI has the second highest beta coefficient i.e. 1.98 and it has second highest required rate of return i.e. 32.61 %. NIB has the beta coefficient of 1.68 and has required rate of return of 28.39%. Similarly, EBL, HBL and BOK have the beta coefficient of 1.67, 1.42, 1.49 respectively and required rate of return of 28.25%, 24.73% and 25.71% respectively.

Table 4.2.3: Average rates of return, variances, SD and CV of commercial banks.

Name of Banks	Expected return	Variance (Ri)	S.D.	CV(%)
EVEREST BANK LTD.	27.28	5018.25	70.83	2.59
NABIL BANK LTD.	63.35	13532.31	116.33	1.84
HIMALAYAN BANK LTD.	25.28	3782.31	61.50	2.43
NEPAL SBI BANK LTD.	49.69	6911.01	83.13	1.67
NEPAL INVESTMENT BANK LTD.	16.30	5046.45	71.04	4.36
BANK OF KATHMANDU LTD.	33.58	5737.79	75.75	2.25

In the table 8, it has showed that the average or mean of the NABIL is 63.35% over the four years of study period starting from mid July 2006 to mid July 2010 with variance of returns of 13532.31 and standard deviation of 116.33%. The

coefficient of variation obtained by dividing the standard deviation of returns by mean returns was obtained as 1.84 for the NABIL bank. Similarly the mean return for the EBL was obtained as 27.28% with variance of 5018.25 and standard deviation of returns of 70.83%. The coefficient of variation for the bank was 2.59. Likewise, the average mean of HBL was found to be 25.28% for the past four years with variance of 3782.31 and standard deviation of returns of 61.50%. The coefficient of variation for the bank was obtained as 2.43.

On the basis of table depicted above, NABIL has the highest expected return and NIB has the lowest expected return. However, the coefficient of variation for the NIB was the highest and NSBI was the lowest coefficient of variation of returns.

Figure 4.2.1: Expected rate of returns, SD and CV of commercial banks
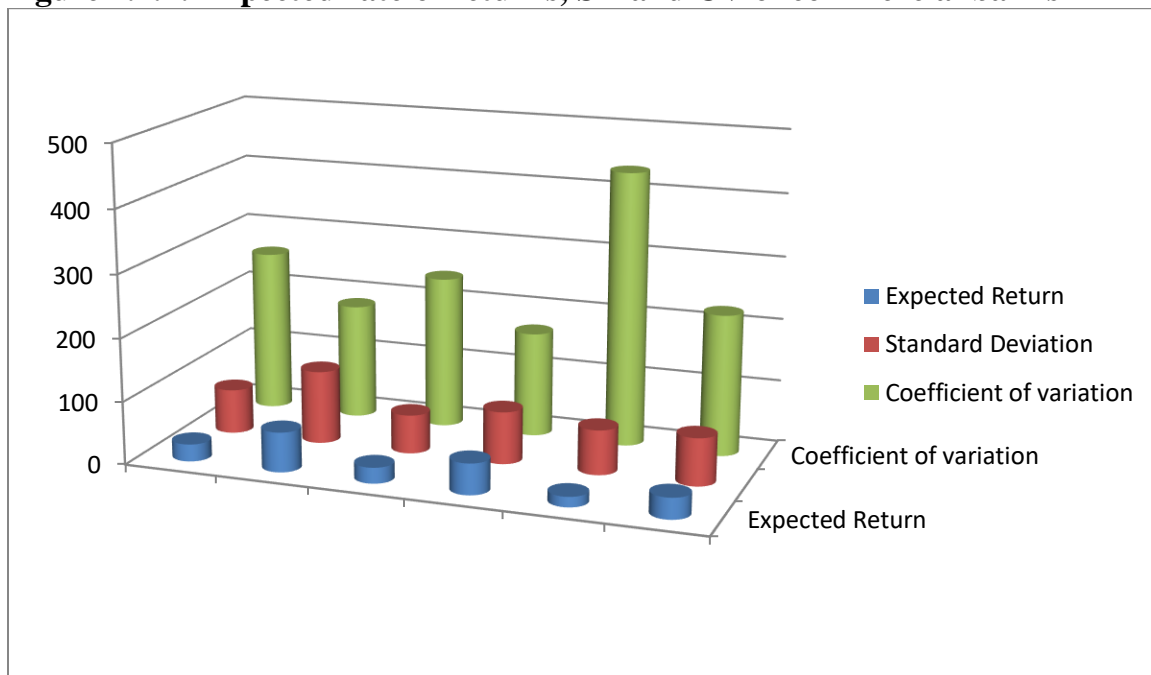
From the above mentioned figure, it is cleared that NABIL has the highest and NIB has the lowest expected returns over the period. Similarly, NABIL also has the a highest standard deviation of returns and HBL has the lowest standard deviation of returns. It seems that investors investing in shares of NABIL got higher level of return and the highest risk.

4.2.2 Market Sensitivity of Stocks

Co-variance measures how the returns on common stock of individual companies and market co-vary. It measures the absolute association between two variables. Likewise, the correlation coefficient measures the relative association between two variables. The correlation between two variables always lies within the limit of -1 to +1. However, in typical case, where the correlations among the individual

stocks are positive, but less than +1.0 some, but not all, risk can be eliminated.

The variability of security's return with the return of the overall market is called systematic risk and it cannot be avoided. It is un-avoidable risk due to the market affecting factors and measured by beta coefficient. Beta depicts the sensitivity of the security's excess returns to that of market portfolio.

The calculated co-variance, correlation and beta coefficients of the stocks of commercial banks are presented in table 9

Beta coefficient (βim) = $\dfrac{Cov(Rj,Rm)}{Var(Rm)}$

Cov. (Rj, Rm) = $\dfrac{\Sigma[(Rj\text{-}E(Rj)]\,[(Rm\text{-}E(Rm)]}{n\text{-}1}$ = ρj.m σj σm

Variance of return on market (σ^2) = $\dfrac{\Sigma[(Rm\text{-}E(Rm)]^2}{n\text{-}1}$

Standard Deviation (σ) = $\sqrt{\dfrac{\Sigma[(Rj\text{-}E(Rj)]^2}{n\text{-}1}}$

Table 4.2.4: Covariance and Beta Coefficients of Commercial Banks

Name of the banks	Cov(R_j, R_m)	βim	Remarks
EBL	3681.68	1.67	AGGRESSIVE STOCK
NABIL	5352.17	2.42	AGGRESSIVE STOCK
HBL	3142.73	1.42	AGGRESSIVE STOCK
NSBI	4371.18	1.98	AGGRESSIVE STOCK
NIB	3708.95	1.68	AGGRESSIVE STOCK
BOK	3287.01	1.49	AGGRESSIVE STOCK

The data on the table 9, shows that the covariance of returns on stocks of respective banks with the return on market and the respective beta coefficients. On due course, the beta coefficient of NABIL was found to be 2.42, which indicates that the stock of NABIL is highly volatile as compared to the change in market circumstances and hence is the most aggressive stock. All stocks are aggressive stock, as given by the beta coefficient of more than one. As per the respective beta coefficients of the sampled banks all are more risky and NABIL was found as most risky one and HBL was found as the least risky(less volatile one) as compared to other banks. The beta coefficients of the respective banks are shown in figure 3 as below:

Figure 4.2.2: beta Coefficients of commercial banks
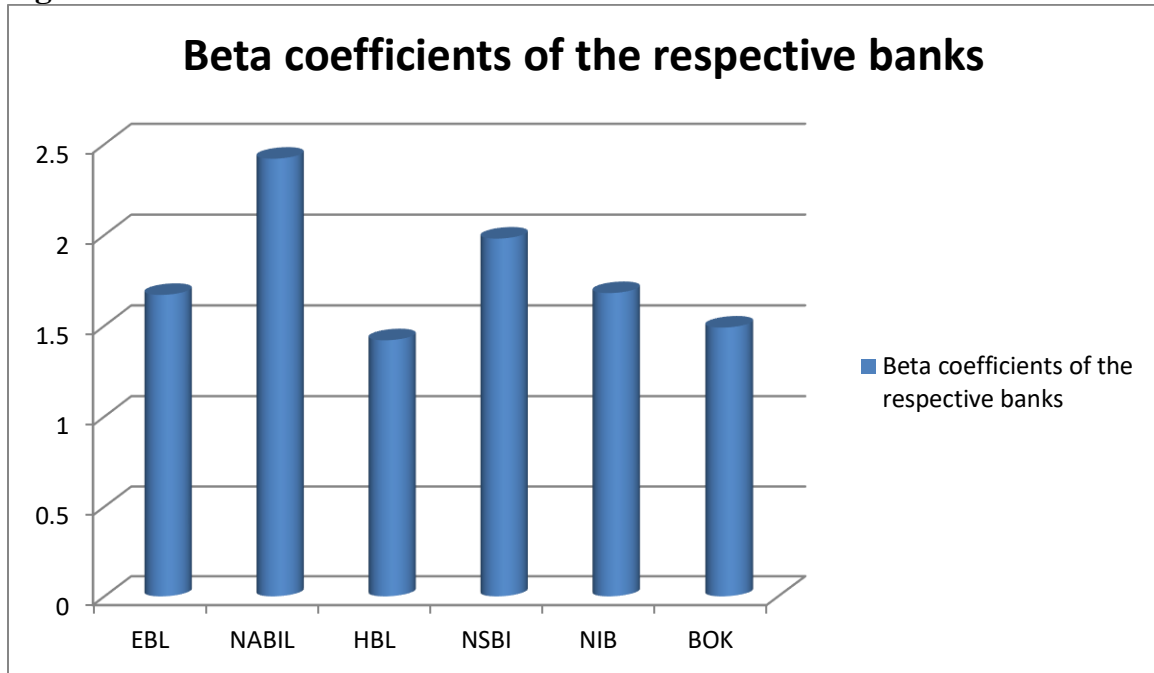
4.2.3 Systematic and Unsystematic Risk

The total risk is the combination of systematic and unsystematic risk. Total risk is measured by the variance of return. Systematic risk is also known as un-avoidable or un-diversifiable risk. It is caused by the market factors. Such as: a Political cause, socio-cultural causes, economical causes, technological causes est.

The combination of systematic and unsystematic risk can be shown on figure as:

Figure 4.2.3: Partition of Total Risk
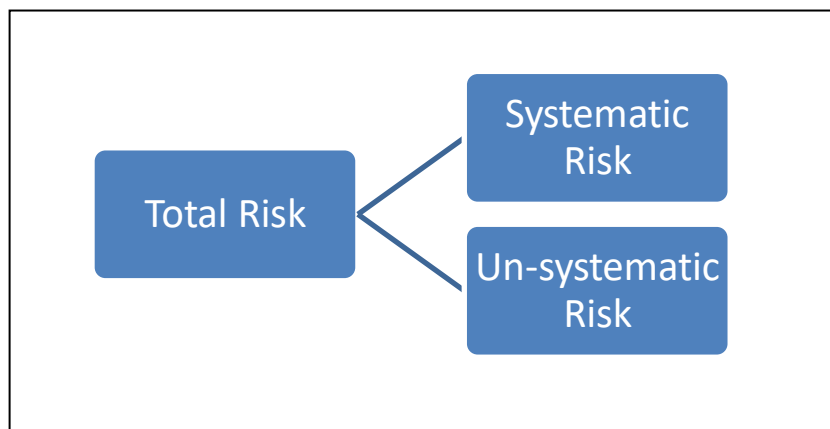
The systematic risk is computed as:

Systematic variance $= \beta^2 \, Var(R_m)$

The percentage of systematic risk, also called proportion is measured by coefficient of determination. The systematic risk is calculated as:

Proportion of systematic risk $= \dfrac{\text{Systematic risk}}{\text{Total Risk}} \quad \dfrac{\beta^2 \, Var(R_m)}{Var(R_i)}$

Similarly, unsystematic risk is known as avoidable or diversifiable risk or market non-specific risk. It is caused due to internal factors such as negligence of management, strikes called by union, etc.

Unsystematic Risk = Total Risk – Systematic Risk

$\qquad = Var(R_i) - \beta^2 \, Var(R_m)$

Table 4.2.5: Pricing situation of the stocks of the sampled banks

Name of Banks	R_f	Beta Coefficient	Required rate of return $R_i = R_f [E(R_m)-R_f] \, \beta_j$	Expected rate of return
EBL	4.75	1.67	28.25	27.28
NABIL	4.75	2.42	38.80	63.35
HBL	4.75	1.42	24.73	25.28
NSBI	4.75	1.98	32.61	49.69
NIB	4.75	1.68	28.39	16.30
BOK	4.75	1.49	25.71	33.58

The above table shows that the average risk free rate of five years as given by the interest rate on short term government 91-days treasury bills is 4.75 %(Annex.). The calculated required rate of returns on stocks as given by the table are 28.25%, 38.80%, 24.73%, 32.61%, 28.39% and 25.71% for the EBL, NABIL, HBL, NSBI, NIB and BOK respectively. The required rate of return on stock comprises of risk free rate of return plus extra return (Premium) for bearing risk. However, for four commercial banks except NIB and EBL have the average or expected rate of return obtained from the investments are found high as compared to the required rate of return using Capital Assets Pricing Model (CAPM) approach. This reveals that the stocks of the NABIL, HBL, NSBI and BOK are fruitful and hence they should be bought and not sold short. Thus, an investor can invest in all or either of these stocks as the prices of the banks' stock is growing in the future while making a rational portfolio NIB and EBL both stocks also gets consideration as it posses the least beta coefficient which lessen risk.

4.3 Formulation of two-asset portfolio

Diversification does nothing to reduce risk if the portfolio consists of perfectly positively correlated stocks. According to the methodology in chapter three, four portfolios of two banks at a time are formulated and their risks and returns have

been calculated respectively with respect to various weights. The banks regarding formation of portfolio were chosen on a lowest correlated stocks basis providing various options to the individual investors to reduce the risk.
The return of a portfolio (Rp) is calculated as:

● In case of two assets

The Return on Portfolio $(Rp) = w1 . E(R1) + w2 . E(R2)$
And,
Variance of portfolio $(\sigma^2 P) = w1^2. \sigma1^2 + w2^2. \sigma2^2 + 2. w1 . w2 . Cov (R1. R2)$
or
Variance of portfolio $(\sigma^2 P) = w1^2. \sigma1^2 + w2^2. \sigma2^2 + 2. w1 . w2 . \sigma1 . \sigma2 . \rho12$

Investment in EBL and BOK

	EBL	BOK
$E(R_1)$	27.28	
$E(R_2)$		33.58
σ_1	70.83	
σ_2		75.75
$Cov(R_1, R_2)$	3593.68	

W_1	W_2	Rp	σp	Remarks
1.00	0.00	27.28	70.83	Lowest return
0.80	0.20	28.54	67.75	
0.60	0.40	29.8	66.70	Lowest Risk
0.50	0.50	30.43	66.97	
0.40	0.60	31.06	67.77	
0.20	0.80	32.32	70.87	
0.00	1.00	33.58	75.75	Highest risk/ highest return

The above table shows the portfolio risks and returns consisting of the two banks EBL and BOK. The proportionate weights of investments in the stocks of two banks are chosen on a random basis. Putting all of the investments in stocks of BOK provides the highest return of 33.58% with the highest risk (standard deviation) of 75.75%. The lowest return on portfolio return is 27.28% with all of the investments in EBL's stock. The lowest risk on the portfolio at 60% investment in EBL and 40% investment in BOK provides the return of 29.80. The risk and return of the portfolio consisting of two banks seemed to be Increasing with the respective increase in investment in BOK. The risk has been significantly diversified with respect to the investment of 0.6 in EBL and 0.4 weights in BOK, because of positive correlation coefficient below than +1.0 between the returns of EBL and BOK i.e. 0.67.

Investment in NABIL and BOK

	NABIL	BOK
$E(R_1)$	63.35	
$E(R_2)$		33.58
σ_1	116.33	
σ_2		75.75
$Cov(R_1, R_2)$	4233.02	

W_1	W_2	R_p	$\sigma\ p$	Remarks
1.00	0.00	63.35	116.33	Highest risk/ highest return
0.80	0.20	57.39	101.22	
0.60	0.40	51.44	88.44	
0.50	0.50	48.46	83.27	
0.40	0.60	45.49	79.13	
0.20	0.80	39.53	74.62	
0.10	0.90	36.58	74.46	Lowest risk
0.00	1.00	33.58	75.75	lowest return

The above table shows that the portfolio risks and returns consisting of the two banks NABIL and BOK. The proportionate weights of investments in the stocks of two banks are chosen on a random basis. Putting all of the investments in the stocks of NABIL provides the highest return of 63.35% with the highest risk 116.33 %(Standard deviation). The lowest return on portfolio return is 33.58% with the respective entire investments in HBL's stock. . The risk has been significantly diversified with respect to the investment of 0.10 in NABIL and 0.90 weights in BOK, because of positive correlation coefficient below than +1.0 between the returns of NABIL and BOK of 0.67.

Investment in NSBI and BOK

	NSBI	BOK
$E(R_1)$	49.69	
$E(R_2)$		33.58
σ_1	83.13	
σ_2		75.75
$Cov(R_1, R_2)$	3558.67	

W₁	W₂	Rp	σ p	Remarks
1.00	0.00	49.69	83.13	Highest risk/ highest return
0.80	0.20	46.47	76.09	
0.60	0.40	43.25	71.51	
0.50	0.50	41.63	70.29	
0.40	0.60	40.02	69.85	Lowest risk
0.20	0.80	36.80	71.33	
0.10	0.90	35.19	73.19	
0.00	1.00	33.58	75.75	Lowest return

The above table shows the portfolio risks and returns consisting of NSBI and BOK. The proportionate weights of investments in the stocks of two banks are chosen on a random basis. Putting all of the investments in stocks of NSBI provides the highest return of 49.69% with the highest risk (standard deviation) of 83.13%. The lowest return on portfolio is 33.58% with the entire investments in BOK's stock. The risk and return of the portfolio consisting of two banks seemed to be decreasing with respective decrease in investment in NSBI and the risk has been significantly diversified with respect to the investment of 0.40 in NSBI and 0.60 weights in BOK, because of positive correlation coefficient below than +1.0 between the returns of NSBI and BOK of 0.56

Investment in NABIL and NSBI

	NABIL	NSBI
$E(R_1)$	63.35	
$E(R_2)$		49.69
σ_1	116.33	
σ_2		83.13
$Cov(R_1, R_2)$	10544.54	

W₁	W₂	Rp	σ p	Remarks
1.00	0.00	63.35	116.33	Highest risk/ highest return
0.80	0.20	60.61	110.96	
0.60	0.40	57.88	105.06	
0.50	0.50	56.52	101.89	
0.40	0.60	55.15	98.56	
0.20	0.80	52.42	91.31	
0.10	0.90	51.05	87.35	
0.00	1.00	49.69	83.13	Lowest risk / lowest return

The above table shows the portfolio risks and returns consisting of NABIL and NSBI. The proportionate weights of investments in the stocks of two banks are

chosen on a random basis. Putting all of the investments in stocks of NABIL provides the highest return of 63.35% with the highest risk (standard deviation) of 116.33%. The lowest return on portfolio return is 49.69% with the entire investments in NSBI's stock. The risk and return of the portfolio consisting of two banks seemed to be decreasing with respective decrease in investment in NABIL. The risk has not been significantly diversified with respect to various random weights of perfectly positive correlation coefficient between returns of NABIL and NSBI.

4.4 Computation of risk and return for the three assets portfolio

For the three assets portfolio the following formula are used.

● In case of three assets

The return of a portfolio $(Rp) = w1 . E(R1) + w2 . E(R2) + w3 . E(R3)$

Variance of portfolio $(\sigma^2\mathbf{P}) = w1^2. \; \sigma1^2 + w2^2. \; \sigma2^2 + w3^2. \; \sigma3^2 + 2. \, w1 . w2 .$ Cov (R1. R2) + 2. w2 . w3 . Cov (R2. R3) + 2. w1 . w3 . Cov (R1. R3)

or

Variance of portfolio $(\sigma^2\mathbf{P}) = w1^2. \; \sigma1^2 + w2^2. \; \sigma2^2 + w3^2. \; \sigma3^2 + 2. \, w1 . w2 . \sigma1 . \sigma2 . \rho12 + 2. \, w2 . w3 . \sigma2 . \sigma3 . \rho23 + 2. \, w1 . w3 . \sigma1 . \sigma3 . \rho13$

●In case of four assets

Variance of portfolio $(\sigma^2\mathbf{P}) = w1^2. \; \sigma1^2 + w2^2. \; \sigma2^2 + w3^2. \; \sigma3^2 + w4^2. \; \sigma4^2 + 2. \, w1$

. w2 . Cov (R1. R2) + 2. w1 . w3 . Cov (R1. R3) + 2. w1 . w4 . Cov (R1. R4)+2.

w2 . w3 . Cov (R2. R3) +2. W2 . w4 . Cov (R2. R4)+ 2. W3 . w4 . Cov (R3. R4)

Investment in EBL, NABIL and BOK

	EBL	NABIL	BOK
$E(R_1)$	27.28		
$E(R_2)$		63.35	
$E(R_3)$			33.58
$\sigma1$	70.83		
$\sigma2$		116.33	
$\sigma3$			75.75
$Cov(R_1, R_2)$	7651.78		
$Cov(R_2, R_3)$		4233.02	
$Cov(R_1, R_3)$			3593.68

W₁	W₂	W₃	Rp	σ p	Remarks
0.8	0.1	0.1	31.52	72.71	Lowest Return
0.7	0.2	0.1	35.12	76.63	
0.7	0.1	0.2	32.14	71.20	
0.6	0.2	0.2	35.75	74.93	
0.5	0.3	0.2	39.36	78.89	
0.4	0.4	0.2	42.97	83.05	
0.3	0.5	0.2	46.57	87.39	
0.2	0.6	0.2	50.18	91.88	
0.333	0.333	0.333	41.36	78.27	
0.2	0.2	0.6	38.27	72.79	
0.2	0.1	0.7	35.29	71.08	Lowest Risk
0.1	0.5	0.4	47.83	84.24	
0.1	0.6	0.3	50.81	89.97	
0.1	0.7	0.2	53.79	96.49	
0.05	0.9	0.05	60.05	109.89	Highest Risk/Highest Return
0.05	0.05	0.9	34.75	73.73	
0.1	0.1	0.8	35.93	72.54	
0.1	0.8	0.1	56.76	103.64	

Figure 4.4.1: Figure of above calculations:
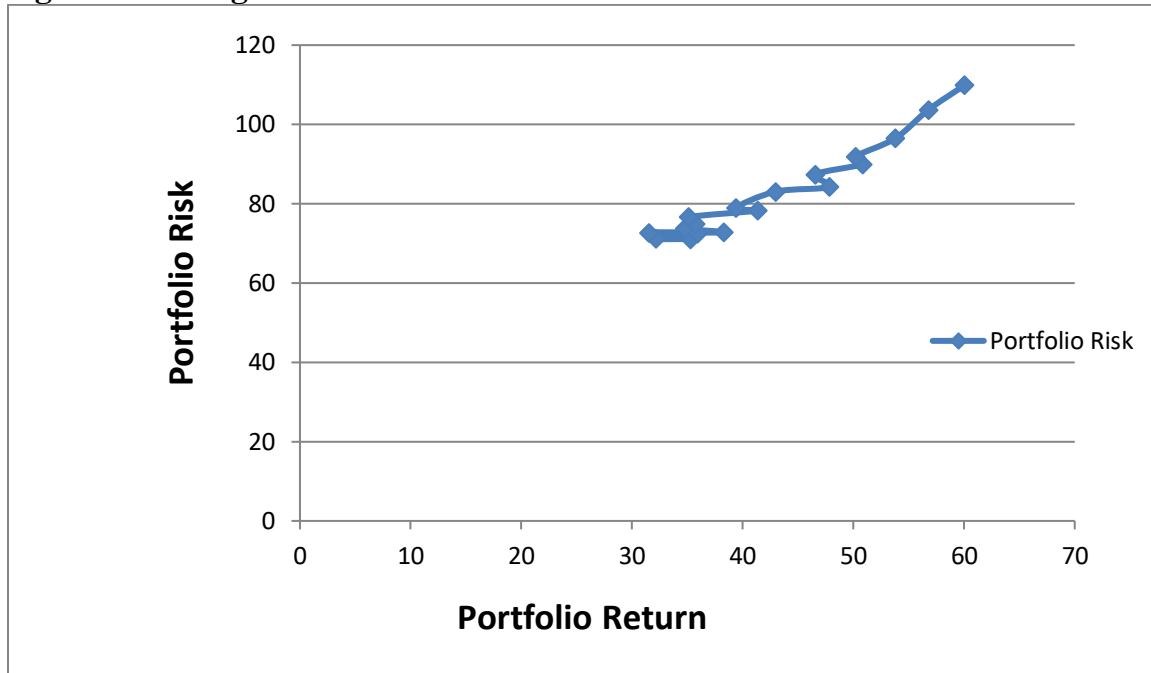
The above figure represents the various portfolio risks and returns with regards to various proportionate weights of investments in EBL, NABIL and BOK. The minimum risk portfolio weights of investment in stocks of EBL, NABIL and BOK on the basis of above calculations are 0.20 or 20%, 0.10 or 10% and 0.7 or 70% respectively. The minimum standard deviation obtained is 71.08% at a return of 35.29%. For risk seeking investors, investing higher amount in stocks of NABIL, where the amount of risk is also higher, can maximize the return. It is because NABIL has the highest performance in the market and its price also has been increasing frequently. Similarly, the calculated risk and return are plotted as shown in the figure above. Portfolio risk has been measured in Y-Axis as well as Portfolio return is measured in X-Axis. The curve below the minimum risk point is known as inefficient frontier and above the point is known as efficient frontier. Portfolio weights lying in inefficient frontier curve are not suitable for investment.

Investment in NABIL, HBL and BOK

	NABIL	HBL	BOK
$E(R_1)$	63.35		
$E(R_2)$		25.28	
$E(R_3)$			33.58
σ_1	116.33		
σ_2		61.50	
σ_3			75.75

91

$Cov(R_1, R_2)$ 6643.32
$Cov(R_2, R_3)$ 3221.91
$Cov(R_1, R_3)$ 4233.02

W₁	W₂	W₃	Rp	σ p	Remarks
0.8	0.1	0.1	56.56	102.76	Highest Risk/Highest Return
0.7	0.2	0.1	52.76	97.06	
0.7	0.1	0.2	53.59	95.61	
0.6	0.2	0.2	49.78	90.11	
0.5	0.3	0.2	45.97	84.73	
0.4	0.4	0.2	42.16	79.49	
0.3	0.5	0.2	38.36	74.42	
0.2	0.6	0.2	34.55	69.56	
0.333	0.333	0.333	40.69	75.38	
0.2	0.2	0.6	37.87	71.26	
0.2	0.1	0.7	38.70	65.67	
0.1	0.5	0.4	32.40	65.50	
0.1	0.6	0.3	31.57	64.99	
0.1	0.7	0.2	30.75	64.95	
0.05	0.9	0.05	27.59	63.41	Lowest Risk/Lowest Return
0.05	0.05	0.9	34.65	73.45	
0.1	0.1	0.8	35.73	71.91	
0.1	0.8	0.1	29.92	65.39	

Figure 4.4.2: Figure of above calculations:
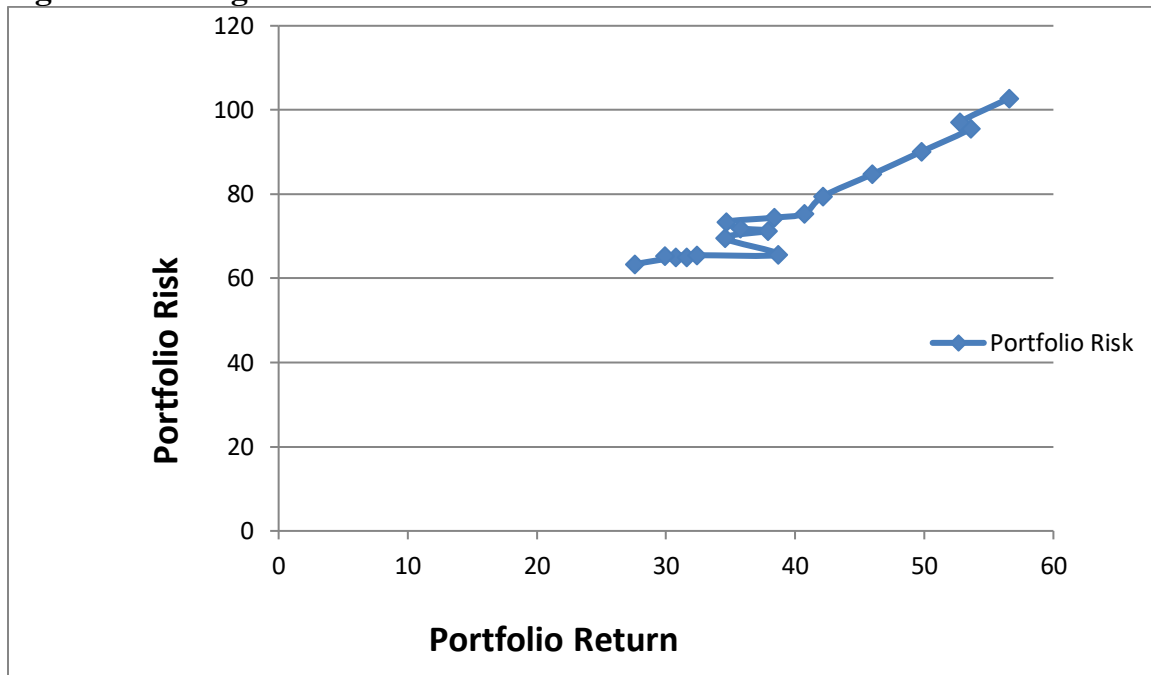
The above figure represents the various portfolio risks and returns with regards to various proportionate weights of investments in NABIL, HBL and BOK. The minimum risk portfolio weights of investment in stocks of NABIL, HBL and BOK on the basis of above calculations are 0.05 or 5%, 0.90 or 90% and 0.05 or 5% respectively. The minimum standard deviation obtained is 63.41% at a return of 27.59%. For risk seeking investors, investing higher amount in stocks of NABIL, where the amount of risk is also higher, can maximize the return. It is because NABIL has the highest performance in the market and its price also has been increasing frequently. Similarly, the calculated risk and return are plotted as shown in the figure above. Portfolio risk has been measured in Y-Axis as well as Portfolio return is measured in X-Axis. The curve below the minimum risk point is known as inefficient frontier and above the point is known as efficient frontier. Portfolio weights lying in inefficient frontier curve are not suitable for investment.

Investment in NABIL, NSBI and NIB

	NABIL	NSBI	NIB
$E(R_1)$	63.35		
$E(R_2)$		49.69	
$E(R_3)$			16.30
σ_1	116.33		
σ_2		83.13	
σ_3			71.04
$Cov(R_1, R_2)$	10544.54		
$Cov(R_2, R_3)$		5003.33	
$Cov(R_1, R_3)$			6345.74

| W_1	W_2	W_3	R_p	σ_p	Remarks
0.8	0.1	0.1	57.28	107.62	Highest Risk/Highest Return
0.7	0.2	0.1	55.91	104.87	
0.7	0.1	0.2	52.57	101.76	
0.6	0.2	0.2	51.20	99.01	
0.5	0.3	0.2	49.84	96.12	
0.4	0.4	0.2	48.47	93.07	
0.3	0.5	0.2	47.11	89.45	
0.2	0.6	0.2	45.74	86.43	
0.333	0.333	0.333	43.07	87.64	
0.2	0.2	0.6	32.38	78.75	
0.2	0.1	0.7	29.05	77.34	
0.1	0.5	0.4	37.7	78.95	
0.1	0.6	0.3	41.04	80.77	
0.1	0.7	0.2	44.37	82.79	
0.05	0.9	0.05	48.70	84.11	
0.05	0.05	0.9	20.322	72.20	Lowest Risk/Lowest Return
0.1	0.1	0.8	24.34	73.89	
0.1	0.8	0.1	47.71	84.99	

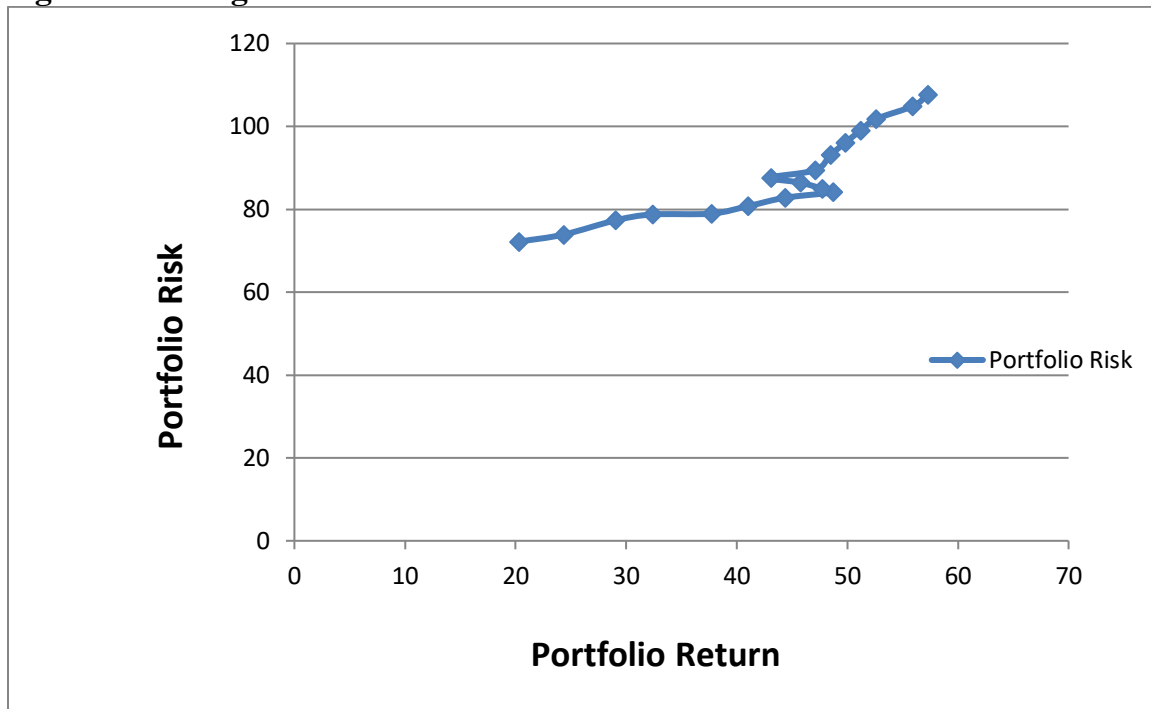**Figure 4.4.3: Figure of above calculations:**

The above showing figure represents the various portfolio risks and returns with regards to various proportionate weights of investments in NABIL, NSBI and NIB. The minimum risk portfolio weights of investment in stocks of NABIL, NSBI and NIB on the basis of above calculations are 0.05 or 5%, 0.05 or 5% and 0.90 or 90% respectively. The minimum standard deviation obtained is 72.20% at a return of 20.32%. For risk seeking investors, investing higher amount in stocks of NABIL, where the amount of risk is also higher, can maximize the return. It is because NABIL has the highest performance in the market and its price also has been increasing frequently. Similarly, the calculated risk and return are plotted as shown in the figure above. Portfolio risk has been measured in Y-Axis as well as Portfolio return is measured in X-Axis. The curve below the minimum risk point is known as inefficient frontier and above the point is known as efficient frontier. Portfolio weights lying in inefficient frontier curve are not suitable for investment because those stocks which are lying below the efficient frontier yield the lowest return on same risk.

4.5 Computation of risk and return for the four assets portfolio

●In case of four assets

The return of a portfolio (Rp) = w1 . E(R1) + w2 . E(R2) + w3 . E(R3) + w4 . E(R4)

Variance of portfolio $(\sigma^2 P)$ = w1². σ1²+ w2². σ2²+ w3². σ3² + w4². σ4² + 2. w1 . w2 . Cov (R1. R2) + 2. w1 . w3 . Cov (R1. R3) + 2. w1 . w4 . Cov (R1. R4)+2. w2 . w3 . Cov (R2. R3) +2. W2 . w4 . Cov (R2. R4)+ 2. W3 . w4 . Cov (R3. R4)

Investment in EBL, NABIL, HBL and BOK

	EBL	NABIL	HBL	BOK
E(R₁)	27.28			
E(R₂)		63.35		
E(R₃)			25.28	
E(R₄)				33.58
σ1	70.83			
σ2		116.33		
σ3			61.50	
σ4				75.75

Cov	EBL	NABIL	HBL	BOK
Cov(R₁, R₂)	7651.78			
Cov(R₁, R₃)		4244.00		
Cov(R₁, R₄)			3593.68	
Cov(R₂, R₃)				6643.32
Cov(R₂, R₄)	4233.02			
Cov(R₃, R₄)		3221.91		

W₁	W₂	W₃	W₄	Rp	σ p	Remarks
0.6	0.2	0.1	0.1	28.61	75.62	
0.5	0.2	0.2	0.1	34.76	74.64	
0.4	0.3	0.1	0.2	39.22	77.94	
0.3	0.3	0.2	0.2	39.02	77.01	

0.2	0.4	0.3	0.1	41.82	82.26		
0.1	0.2	0.4	0.3	35.62	70.13		
0.25	0.25	0.25	0.25	37.37	73.84		
0.1	0.1	0.5	0.3	31.79	65.76		
0.1	0.1	0.4	0.4	32.63	66.25		
0.1	0.1	0.3	0.5	33.46	67.20		
0.1	0.2	0.1	0.6	38.11	72.01		
0.2	0.1	0.6	0.1	30.34	67.02		
0.1	0.6	0.1	0.2	50.10	90.98		
0.05	0.1	0.05	0.8	35.83	72.22		
0.8	0.05	0.1	0.05	29.19	70.67		
0.05	0.8	0.05	0.1	56.67	103.2	Highest	Risk/Highest Return
0.1	0.05	0.8	0.05	27.80	64.19	Lowest	Risk/Lowest Return
0.1	0.7	0.1	0.05	51.28	95.83		

Figure 4.5.1: Figure of above calculations
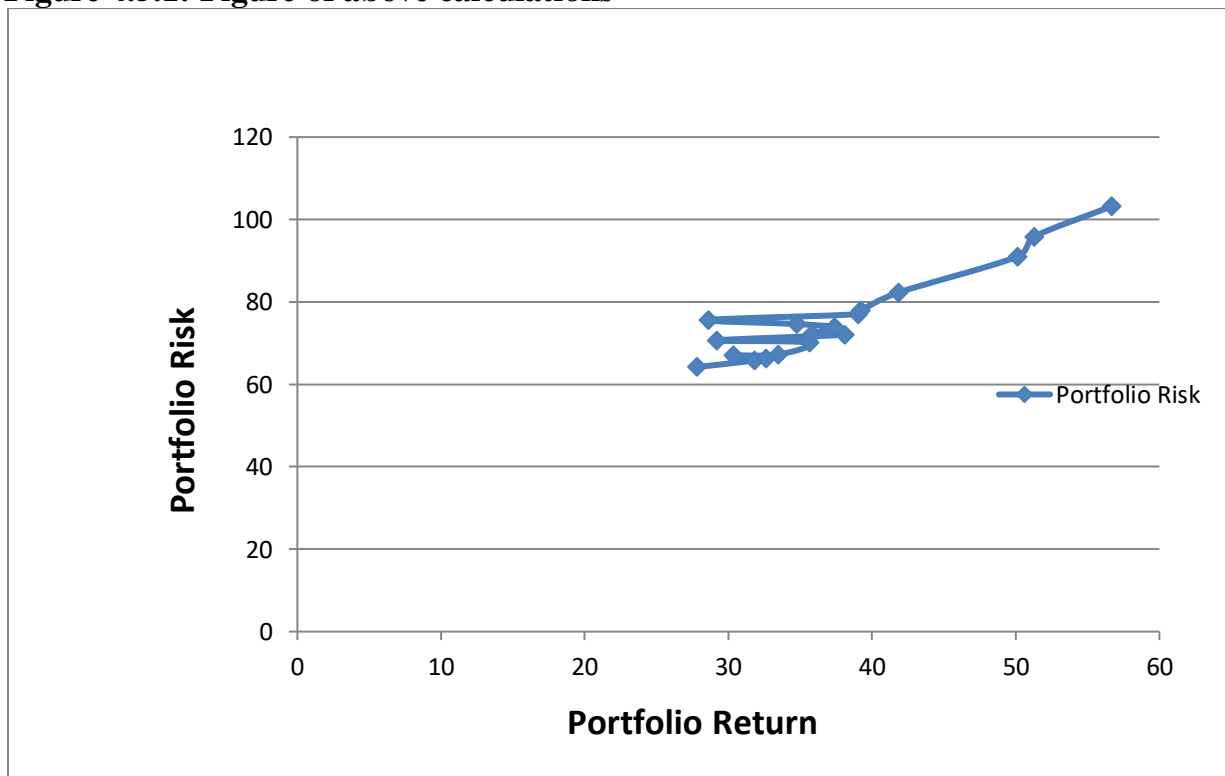
The above showing figure represents the various portfolio risks and returns with regards to various proportionate weights of investments in EBL, NABIL, HBL and BOK. The minimum risk portfolio weights of investment in stocks of EBL, NABIL, HBL and BOK on the basis of above calculations are 0.10 or 10%, 0.05 or 5%, 0.80 or 80% and 0.05 or 5% respectively. The minimum standard deviation obtained is 64.19% at a return of 27.80%. For risk seeking investors, investing higher amount in stocks of NABIL, where the amount of risk is also higher, can maximize the return. It is because NABIL has the highest performance in the market and its price also has been increasing frequently. Similarly, the calculated risk and return are plotted as shown in the figure above. Portfolio risk has been measured in Y-Axis as well as Portfolio return is measured in X-Axis.. The curve below the minimum risk point is known as inefficient frontier and above the point is known as efficient frontier. Portfolio weights lying in inefficient frontier curve are not suitable for investment because those stocks which are lying below the efficient frontier yield the lowest return on same risk.

4.6 Major Findings
On the basis of the above analysis and presentation, the major findings of the study are presented below:

Loan and Advances to Total Deposit Ratio
The average or mean ratio of loan and advances to total deposits of   BOK is the highest i.e. 79.35% among the selected six commercial banks, which is above than industry average i.e. 79.35>72.96. It can be concluded that BOK is providing high amount of loan and advance through its deposits. NIB has the second highest mean ratio i.e. 76.54%. This is also above than industry average level. Similarly, EBL also has higher mean ratio than industry average i.e. 75.82%. NABIL, HBL and NSBI have lower mean ratio than industry average i.e. 69.67 %< 72.96%, 63.79<72.96% and 72.62<72.96% respectively. The HBL has the lowest mean ratio among the selected commercial banks i.e. 63.79%, which is below than industry average. It indicates that HBL is providing low amount of loans and advances through its deposits.

Loan and Advances to Total Assets Ratio
The industry average of loan and advances to total assets is 62.38% during in this study. EBL, NIB and BOK have invested above than industry average i.e. 63.69>62.38%, 67.58>62.38% and 67.25% respectively. It indicates that EBL, NIB and BOK have invested high amount of loan and advances through its total assets. Similarly, NABIL, HBL and NSBI have invested below than industry average i.e. 57.25<62.38%, 56.78<62.38% and 61.75<62.38% respectively. HBL has the lowest mean ratio among the six commercial banks, is the indication of investing low amount of loans and advances through its total assets.

Return on Total Assets Ratio
According to the calculation of ratio of return on total assets, NABIL has earned

highest return i.e. 2.64% among the selected commercial banks, which is above than industry average i.e 2.64> 1.82%. Similarly, NIB and BOK has earned return above than industry average i.e. 1.83>1.82 and 1.98>1.82 respectively. EBL, HBL and NSBI have earned return below than industry average i.e. 1.67<1.82, 1.57<1.82 and 1.25<1.82 respectively. Where NSBI has earned lowest return among the commercial banks.

Return on Shareholders' Fund Ratio

Looking at the ratio of shareholders' fund, it can be concluded that BOK has the highest mean return i.e. 48.93% among the selected commercial banks. This is above than industry average i.e. 48.93>28.65%. It indicates that BOK's shareholder has got highest amount of return among the commercial banks. Similarly, NSBI has the lowest mean return i.e. 17.28%, which is below than industry average. it indicates that NSBI's shareholder has earned low amount of return. NABIL has the higher return on shareholders' fund than the industry average i.e. 31.09>28.65% where as EBL, HBL and NIB's shareholders have earned below than industry average i.e. 22.26<28.65%, 26.68<28.65% and 25.68<28.65%.

Earning Per Share

The industry average of EPS is 63.26%.The mean EPS of NABIL is the highest i.e. 111.99%, which is above than industry average and highest among the selected commercial banks. EBL has the higher EPS than industry average i.e. 86.63>63.26%. Similarly, NSBI has the lowest mean EPS and it is below than industry average. i.e. 29.16<63.26%. HBL, NIB and BOK have mean return lower than industry average i.e 48.90<63.26%, 53.95<63.26% and 48.97<63.26% respectively.

The Mean return, Required Rate of Return and Beta Coefficient

The mean return of NABIL is the highest i.e. 63.35% with the required rate of return of 38.80% and CV of 1.84. NIB has the lowest mean of 16.30% along with required rate of return of 28.39% and CV of 4.36. Similarly, the mean return of EBL, HBL, NSBI and BOK are 27.28%, 25.28%, 49.69% and 33.58% and CV of 2.59, 2.43, 1.67 and 2.25% respectively.

The beta coefficient of NABIL is the highest i.e. 2.42 and it requires highest return which it has earned i.e.63.35%. Similarly, NIB has the lowest beta coefficient i.e. 1.68. This has to earn 16.30%. EBL, HBL, NSBI and BOK have the beta coefficients of 1.67, 1.42, 1.98 and 1.49 and their required rate of return are 28.25%, 24.73%, 32.61% and 25.71% respectively. Beta coefficients of all the sampled are more than market index i.e. 1, so all the banks have aggressive nature in their stock.

CHAPTER V
SUMMARY. CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the study

This research study is concerned with the portfolio formation and analysis of the six sampled commercial banks named EBL, NABIL, HBL, NSBI, NIB and BOK from the individual investors' point of view.

Investing in securities is not an old tradition in our society. Most of the investors even don't know how to invest and take the position of short and long. Rather it is new and a challenging one for the individual investors. Investment in capital markets helps to pooling of funds from savers to demanders. It provides the best investment opportunities by transferring the funds from surplus saving to need based sectors through the transaction of financial instruments.

The stock market is the largest financial market where financial instruments are traded. Financial market consists two types i.e. primary market-in which newly issued securities of corporations and government bodies are offered to the investors for the first time and secondary market-in which pre-owned/already issued securities are traded. NEPSE is only the Secondary market in Nepal.

The price of stock is very much sensitive in a free market economy. The prices of stocks of commercial banks keep on changing haphazardly in the market. The market economy is affected by various factors such as political, socio-cultural, economical, technological etc. So the investment to be made in shares in the secondary market needs careful scrutiny and analysis of all the possible risk adjusted factors. The rational investors always follow the investment process in regarding to what marketable securities to invest, how to invest, when to invest and which option is best for them.

This study is based on the secondary data obtained from securities board, NEPSE, and the relevant sources. Out of recent 32 commercial banks only six commercial banks have been chosen on a random basis. The six sampled banks are EBL, NABIL, HBL, NSBI, NIB and BOK. Both descriptive as well as analytical research design have been applied in this research study. On due course, the individual risk and returns of the commercial banks for the period of five years from 2005/06 to 2009/10 has been calculated. Those risks and returns are analyzed and formed various portfolios consisting of two and three banks.

The mean loan and advances ratio of BOK is the highest whereas HBL has the least ratio regarding the same. The mean or average ratio of NIB is found to be 76.54% with a standard deviation of 26.86%, similarly, the average ratio of EBL,

NABIL, HBL and NSBI are obtained as 75.82%, 69.67%, 63.79% and 72.62 with standard deviations of 2.33, 2.41, 8.7 and 18.58% respectively. While the HBL has the highest and EBL has the lowest NPL regarding to the above mentioned ratio.

The mean loan and advances ratio to total assets of NIB is the highest whereas the HBL has the least ratio regarding the total loan and advances to total assets. The mean or average ratio of NIB is found to be 67.58 with a standard deviation of 4.26%. Similarly, the average ratio of EBL, NABIL, HBL, NSBI and BOK are 63.69%, 57.25%, 56.78%, 61.75% and 67.25% with standard deviations of 2.97%, 3.28%, 6.63%, 13.51% and 5.04% respectively. The NPL regarding with the total loan and advances of the EBL, NABIL, HBL, NSBI, NIB and BOK are 0.68, 1.10, 3.65, 3.6, 1.35 and 1.97 respectively.

The mean ratio regarding return on shareholder's fund of BOK is the highest i.e. 48.93%. The ratios of EBL, NABIL, HBL and NIB are in moderate position i.e. 22.26%, 31.09%, 26.68%, and 25.68%. The ratio of NSBI is the lowest among the six commercial banks i.e. 17.28%.

The mean EPS of NABIL is the highest i.e. Rs.111.99 among the six banks while the earning per share of NSBI is the lowest of all. The mean EPS of EBL, HBL, NIB and BOK are 86.63, 48.90, 53.95 and 48.97 respectively.

The mean or average rate of return of NABIL's stock has found to be 63.35% with a standard deviation of 116.33%. Similarly, the average rate of return on stocks of EBL, HBL, NSBI, NIB and BOK are obtained as 27.28%, 25.28%, 49.69%, 16.30% and 33.58% with standard deviation of 70.83%, 61.50%, 83.13%, 71.04% and 75.75% respectively. Likewise, the coefficient of variation for EBL, NABIL, HBL, NSBI, NIB and BOK are found to be 2.59, 2.43, 1.67, 4.36 and 2.25 respectively. This indicates that the risk per unit of return of NIB is the highest among the six banks.

The calculated beta coefficient of the NABIL's tock is most sensitive and highest in the market i.e.2.42. The beta coefficients of EBL, HBL, NSBI, NIB and BOK are 1.67, 1.42, 1.98, 1.68 and 1.49 respectively. The stocks of all sampled banks are aggressive as compared to the market.

The required rate of returns of six commercial banks EBL, NABIL, HBL, NSBI, NIB and BOK using CAPM approach are obtained as 28.25%, 38.80%, 24.73%, 32.61%, 28.39% and 25.71% respectively. Since the required rate of return of NABIL is highest than the industry average rate of return whereas the other sampled banks except NABIL are almost equal required rate of return with average rate of return. Thus, the stocks of NABIL, HBL, NSBI and BOK are

fruitful from the investor point of view. The stock of EBL and NIB are overpriced. The other sampled banks except EBL and NIB are lucrative to buy. Hence, investment can be made on stocks of any one of all except EBL & NIB. However, if investors follow the long position the decision can be change in favors of EBL and NIB too.

Two assets portfolios were formed with random weights of investment out of six commercial banks. Using the combination of six banks' stocks taken two in two assets at a time, four different combinations of portfolios was formed. The weights of investment in two banks were chosen on random basis with the total weight equal to 1.0.

The portfolio of two stocks containing the two banks were minimized to some extent at 66.70% of standard deviation with a return of 29.80% at portfolio consisting of weights of 0.60 in EBL and 0.40 in BOK. The correlation coefficients of returns on the stocks of EBL and BOK was +0.67. Likewise, the combination of assets which minimizes the risk is the NABIL and BOK. The risk minimized at 74.46% of standard deviation with a return of 36.56% at portfolio consisting of weights of 0.10 in NABIL and 0.90 in BOK. The correlation coefficient between these two banks is 0.48. Same way, the portfolio of two stocks containing two banks were minimized to some extent at 60.67% of standard deviation with a return of 26.94% at portfolio consisting weights of 0.80 in HBL and 0.20 in BOK. The correlation between these two banks is 0.69

The lowest standard deviation of three assets portfolio containing the weights of 0.2 in EBL, 0.1 in NABIL and 0.7 BOK obtained was 71.08% with return of 35.29%. Likewise, the lowest standard deviation of three assets portfolio containing the weights of 0.05 in NABIL, 0.9 in HBL and 0.05 in BOK The minimum risk from the given set of portfolio is 63.41with return of 27.59%.
Similarly, the lowest standard deviation of four assets containing the weights of 0.1 in EBL, 0.05 in NABIL, 0.8 in HBL and 0.05 in BOK obtained was 64.19 with return 27.80%.

The three assets and four assets portfolios were formed from the six commercial banks with proportionate weights of investment taken on a random basis. Using the combination of six banks' stocks taken three at three assets and four at four assets at a time, three different combinations of three assets and one combination of four assets portfolio were formed. The weights of investment in three banks were chosen on random basis with the total weight equal to 1.0. The respective returns and standard deviations obtained from such sets of portfolios were plotted in a graph to detect the efficient and inefficient frontier to invest.

The minimum standard deviation of four assets portfolio return obtained from the given set of portfolios formed by combination of four banks EBL, NABIL, HBL and BOK Was 64.19% providing the portfolio return of 27.80%. The minimum risk portfolio weight from the available ones was 0.10 in EBL, 0.05 in NABIL 0.8 in HBL and 0.05 in BOK. However, the investors depending upon their risk preferences can choose other possible efficient portfolios.

5.2. Conclusions:

On the basis of various calculations and analysis, we have reached at the following conclusion:

BOK has the highest loan and advances to total deposit ratio along with the lowest non-performing loan. It is because of the severely increment in investment of the bank. Similarly, the average loan and advances to total deposit ratio of HBL is found to be the least of all six banks due to the selective investment policy of the bank. NIB has the highest standard deviation (risk) of total loan and advances to total deposit ratio and EBL has the lowest risk (given by the standard deviation) at the same.

NIB has the highest average loan and advances to total assets ratio over the study period as compared to other five banks, it is because of severely increment in the investment of the bank. Similarly, the NPL of HBL is highest among the six banks due to the improper lending policy during the study period.

NABIL has the highest average return on total assets during the study period as compared to other five commercial banks. Standard deviation (risk) of NABIL also higher than other sampled bank which indicates that NABIL would be the right choice to invest to the rational investors. Similarly, BOK also would be the right option as it has return on total assets higher than the industry average and the risk indicator is also lower in compared with other sampled banks.

The ratios of return on shareholders' fund of six commercial banks are in fluctuating trend throughout the review period. Highest return on shareholders' fund of BOK holds the position to be the first option to the investor to invest. NSBI would be the last option among the six commercial banks for the investors as it has lowest average return on shareholders' fund..The highest standard deviation of BOK can replace it from the first option that depends upon the investors' choice.

The income per share of NABIL is the highest among the sampled bank while NSBI holds the last position. Everest, Investment, Bank of Kathmandu and Himalayan bank hold the second, third, fourth and fifth position in regards with

EPS.

NABIL has the highest average return over the study period as compared to other five banks. It is because of the severely increasing price of stocks of the bank. Similarly, the average return on NIB is found to be the least among the six commercial banks due to the decreasing price of stock during the study period. NABIL has the highest standard deviation (risk) of returns and HBL has the lowest risk on returns.

The average rate of returns on market is 18.82%. NABIL has the highest beta coefficient and HBL has the lowest beta coefficient. The beta coefficients reveal that the stocks of all sampled banks are aggressive and more sensitive than the market returns.

In a two banks stock portfolio, the risk was minimized to some extent at the weights of 0.80 in HBL and 0.20 in BOK. However, this option would be the best for risk averse investors. The NABIL can be the best option for risk bearing investors since it has highest return along with highest risk.

The required rate of return of banks using the capital assets pricing model approach suggests that the stocks of NABIL, HBL, NSBI and BOK are fruitful from the investors' point of view as they are underpriced. Hence they all, except EBL and NIB, for the investment as regards from investors' point of view. However if the investors take the long position in expectation of increase of market price in future EBL and NIB both can considered.

5.3 Recommendations

From the major findings and depth analysis of the risk and return, we recommend the following suggestions:

- The stocks of NABIL, HBL, NSBI and BOK are found underpriced; the investors should buy or hold long position on stocks of these banks.

- The beta coefficients of all the banks are higher than 1. Thus, the risks containing the set of these portfolios may not be able to reduce the portfolio risk while the remaining banks have the low beta coefficient and the combination of these banks would helps to minimize the portfolio risk.

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- The Nepalese stock market (NEPSE, SEBON) should take the some effective initiatives to control random fluctuation of the market price of share and establish the system of regulator monitoring and evaluating the stock market.
- Investors may choose any set of portfolio lying in efficient frontier curve depending upon their attitude towards risk but they should not invest their savings in shares haphazardly. They should get some expert advice before investing on shares.
- The decision made only viewing the single criteria would be the ridiculous thus the rational decision should be made by analyzing as more as variables as possible.
- Reliability of financial information has significant role in investment decision. In order to ensure the reliability of information regarding the performance of listed companies, international standard analysis and rating agency is required in Nepalese stock market.
- The principles of risk-return trade off should be applied before selecting the portfolios.
- Nepal Stock Exchange (NEPSE) and relevant companies should publish the daily activities accurately in details as monthly publication. It will benefit to researchers, security analysts and market participants to greater extent.
- To the further researchers, it is recommended to undertake the comprehensive study by various appropriate methods, related to the whole sector wise portfolio analysis.

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APPENDIX

EBL

Year ending mid July	2006	2007	2008	2009	2010
Paid-up Value per share (Rs.)	100	100	100	100	100
Closing market price per share (Rs.)	1379	2430	3132	2455	1630
Earning Per Share (Rs.)	62.78	78.42	91.82	99.99	100.16
Dividend Per Share (DPS)	25	10	20	30	30
Dividend as % of par Value	25	10	20	30	30
Stock Dividend (%)	-	20	10	-	-

NABIL

Year ending mid July	2006	2007	2008	2009	2010
Paid-up Value per share (Rs.)	100	100	100	100	100
Closing market price per share (Rs.)	2240	5050	5275	4899	2384
Earning Per Share (Rs.)	129.21	137.08	108.31	106.76	78.61
Dividend Per Share (DPS)	85	100	60	35	30
Dividend as % of par Value	85	100	60	35	30
Stock Dividend (%)	-	40	40	50	40

HBL

Year ending mid July	2006	2007	2008	2009	2010
Paid-up Value per share (Rs.)	100	100	100	100	100
Closing market price per share (Rs.)	1100	1740	1980	1760	816
Earning Per Share (Rs.)	59.24	60.66	62.74	61.90	31.80
Dividend Per Share (DPS)	30	15	25	12	11.84
Dividend as % of par Value	30	15	25	12	11.84
Stock Dividend (%)	5	25	20	31.56	25

NSBI

Year ending mid July	2006	2007	2008	2009	2010
Paid-up Value per share (Rs.)	100	100	100	100	100
Closing market price per share (Rs.)	612	1176	1511	1900	741
Earning Per Share (Rs.)	18.27	39.35	28.33	36.18	23.69
Dividend Per Share (DPS)	5	12.59	-	2.11	5
Dividend as % of par Value	5	12.59	-	2.11	5
Stock Dividend (%)	-	35	-	40	12.50

NIB

Year ending mid July	2006	2007	2008	2009	2010
Paid-up Value per share (Rs.)	100	100	100	100	100
Closing market price per share (Rs.)	1260	1729	2450	1388	705
Earning Per Share (Rs.)	59.35	62.57	57.87	37.42	52.55
Dividend Per Share (DPS)	20	5	7.5	20.00	25
Dividend as % of par Value	20	5	7.5	20.00	25
Stock Dividend (%)	35.46	25	33.33	-	-

BOK

Year ending mid July	2006	2007	2008	2009	2010
Paid-up Value per share (Rs.)	100	100	100	100	100
Closing market price per share (Rs.)	850	1375	2350	1825	840
Earning Per Share (Rs.)	43.67	43.50	59.54	54.68	43.08
Dividend Per Share (DPS)	18	20	2.11	7.37	15
Dividend as % of par Value	18	20	2.11	7.37	15
Stock Dividend (%)	30	-	40	40	15

Calculation of Holding Period rate of return

Everest Bank Ltd

Year	Closing MPS	DPS	Stock dividend(%)	Value of Stock Dividend	HPR(Rj)%
2006	1379	25			-
2007	2430	10	20%	626.4	122.36
2008	3132	20	10%	245.5	39.81
2009	24555	30			-20.66
2010	1630	30			32.38

NABIL Bank

Year	Closing MPS	DPS	Stock dividend(%)	Value of Stock Dividend	HPR(Rj)%
2006	2240	85	-	-	
2007	5050	100	40	2110	224.10
2008	5275	60	40	1959.6	44.44
2009	4899	35	50	1192	16.13
2010	2384	30	40	953.6	-31.26

Himalayan Bank

Year	Closing MPS	DPS	Stock dividend(%)	Value of Stock Dividend	HPR(Rj)%
2006	1100	30	5	87	-
2007	1740	15	25	495	104.54
2008	1980	25	20	352	35.46
2009	1760	12	31.56	257.53	2.50
2010	816	11.84	25	204	-41.37

Nepal SBI bank

Year	Closing MPS	DPS	Stock dividend(%)	Value of Stock Dividend	HPR(Rj)%
2006	612	5	-	-	-
2007	1176	12.59	35	528.85	180.63
2008	1511	-	-	-	28.48
2009	1900	2.11	40	296.4	45.50
2010	741	5	12.50	92.625	-55.86

Nepal Investment Bank

Year	Closing MPS	DPS	Stock dividend (%)	Value of Stock Dividend	HPR(Rj)%
2006	1260	20	35.46	613.10	-
2007	1729	5	25	612.5	86.23
2008	2450	7.5	33.33	462.6204	68.89
2009	1388	20	-	-	-42.53
2010	705	25	-	-	-47.40

Bank of Kathmandu Ltd.

Year	Closing MPS	DPS	Stock dividend (%)	Value of Stock Dividend	HPR(R_j)%
2006	850	18	30	412.5	-
2007	1375	20	-	-	64.12
2008	2350	2.11	40	730	124.15
2009	1825	7.37	40	336	-7.73
2010	840	15	15	126	-46.24

Calculation of Expected rate of return, SD, CV, Variance of diff. commercial banks
   EBL

Year	R_j	$[R_j-E(R_j)]$	$[R_j-E(R_j)]^2$
2006/07	122.36	95.08	9040.2064
2007/08	39.81	12.53	157.0009
2008/09	-20.66	-47.94	2298.2436
2009/10	32.38	-59.66	3359.3156
	$\sum(R_{j)} =$ 109.13		$\sum[R_j-E(R_j)]^2=15054.7665$

$E(R_j) = \sum(R_j)/n$
$= 109.13/4$
$=27.28$
$Var(R_j) = \sum[R_j-E(R_j)]^2 / n-1$
$= 15054.7665/4-1$
$=5018.25$
$SD = \sqrt{Var(Rj)}$
$ = \sqrt{5018.25}$
70.83%
CV = 2.59

NABIL

Year	R_j	$[R_j-E(R_j)]$	$[R_j-E(R_j)]^2$
2006/07	224.10	160.75	25840.5625
2007/08	44.44	-18.91	3575.5881
2008/09	16.13	-47.22	2229.7184
2009/10	-31.26	-94.61	8951.0521
	$\sum(R_j) = 253.41$		$\sum[R_j-E(R_j)]^2 = 40596.9311$

$E(R_j) = \sum(R_j)/n$
$= 253.41/4$
$= 63.35$
$Var(R_j) = \sum[R_j-E(R_j)]^2 / n-1$
$= 40596.9311/4-1$
$= 13532.31$
$SD = \sqrt{Var(Rj)}$
$= \sqrt{13532.31}$
116.33%
CV 1.84

HBL

Year	R_j	$[R_j-E(R_j)]$	$[R_j-E(R_j)]^2$
2006/07	104.54	79.26	6282.1476
2007/08	35.46	10.18	103.6324
2008/09	2.50	-22.78	518.9284
2009/10	-41.37	-66.65	4442.2225
	$\sum(R_j) = 101.13$		$\sum[R_j-E(R_j)]^2 = 11346.9309$

$E(R_j) = \sum(R_j)/n$
$= 101.13/4$
$= 25.28$
$Var(R_j) = \sum[R_j-E(R_j)]^2 / n-1$
$= 11346.9309/4-1$
$= 3782.31$
$SD = \sqrt{Var(Rj)}$
$= \sqrt{3782.31}$
61.50%
CV = 2.43

NSBI

Year	R_j	$[R_j-E(R_j)]$	$[R_j-E(R_j)]^2$
2006/07	180.63	130.94	17145.2836
2007/08	28.48	-21.21	449.8641
2008/09	45.50	-4.19	17.5561
2009/10	-55.86	-105.55	3120.3396
	∑(R_{j)} = 198.75		$\sum[R_j-E(R_j)]^2$=20733.0434

$E(R_j) = \sum(R_j)/n$
= 198.75/4
=49.69
$Var(R_j) = \sum[R_j-E(R_j)]^2 / n\text{-}1$
= 20733.0434/4-1
=6911.01
$SD = \sqrt{Var(Rj)}$
   $=\sqrt{6911.01}$
83.13%
CV = 1.67

NIB

Year	R_j	$[R_j-E(R_j)]$	$[R_j-E(R_j)]^2$
2006/07	86.23	69.93	4890.2049
2007/08	68.89	52.59	2765.7081
2008/09	-42.53	-58.53	3425.7609
2009/10	-47.40	-63.7	4057.69
	∑(R_{j)} = 65.19		$\sum[R_j-E(R_j)]^2$=15139.3639

$E(R_j) = \sum(R_j)/n$
=65.19 /4
=16.30
$Var(R_j) = \sum[R_j-E(R_j)]^2 / n\text{-}1$
= 15139.3639/4-1
=5046.45
$SD = \sqrt{Var(Rj)}$
   $=\sqrt{5046.45}$
71.04%
CV = 4.36

BOK

Year	R_j	$[R_j-E(R_j)]$	$[R_j-E(R_j)]^2$
2006/07	64.12	30.54	932.6916
2007/08	124.15	90.57	8202.9249
2008/09	-7.73	-41.31	1706.5161
2009/10	-46.24	-79.82	6371.2324
			$\sum[R_j-E(R_j)]^2$=17213.365
	$\sum(R_{j)} = 134.3$		

$E(R_j) = \sum(R_j)/n$
= 134.3/4
=33.58
$Var(R_j) = \sum[R_j-E(R_j)]^2 / n-1$
= 17213.365/4-1
=5737.79
$SD = \sqrt{Var(Rj)}$
    $=\sqrt{5737.79}$
75.75%
CV = 2.25

MARKET INDEX

Year	NEPSE Index (NI)	R_m(%)	$R_m-E(R_m)$	$[R_m-E(R_m)]^2$
2004/05	286.67		-	
2005/06	386.86	34.95	16.13	260.1769
2006/07	683.95	76.80	57.98	3361.6804
2007/08	963.36	40.85	22.03	485.3209
2008/09	749.10	-22.24	-41.06	1685.9236
2009/10	477.23	-36.29	-55.11	3037.1121
	Total	94.07		8830.2139
N=5	$E(R_m)\%$ =	18.82%	Var.(R_m)(%)	2207.55

Standard Deviation of market return $(\sigma_m) = \sqrt{Variance(R_m)}$ = 46.98%

Calculation of Covariance with market, beta coefficients and required rate of return of selected commercial banks.

EBL

Year	$[R_j\text{-}E(R_j)]$	$[R_m\text{-}E(R_m)]$	$[R_j\text{-}E(R_j)]\ [R_m\text{-}E(R_m)]$
2006/07	95.08	57.98	5512.7384
2007/08	12.53	22.03	276.0359
2008/09	-47.94	-41.06	1968.4164
2009/10	-59.66	-55.11	3287.8626
			11045.0449
	$\sum [R_j\text{-}E(R_j)]\ [R_m\text{-}E(R_m)]=$		

$$Cov(R_E, R_m) = \Sigma[(R_m - \overline{R_m})(R_E - \overline{R_E})]/n\text{-}1$$

$$= 11045.0449/3$$

$$= 3681.68$$

Beta Coefficient $(B_E) = Cov(R_E, R_m)/ (\sigma_m)^2$

$$= 3681.68/2207.55$$

$$= 1.67$$

Required rate of return $\Sigma(R_E) = R_f + [E(R_m) - R_f]\ B_E$

$$= 4.75 + (18.82\text{-}4.75)1.67$$
$$= 28.25\%$$
: The required rate of return of EBL is 28.25%.
: The expected rate of return of EBL is 27.28%

NABIL

Year	$[(R_J - E(R_J)]$	$[R_M - E(R_M)]$	$[(R_J - E(R_J)]\ [R_M - E(R_M)]$
2006/07	160.75	57.98	9320.2850
2007/08	-18.91	22.03	-416.5873
2008/09	-47.22	-41.06	1938.8532
2009/10	-94.61	-55.11	5213.9571
$\sum [R_j - E(R_j)]\ [R_m - E(R_m)]=$			16056.508

$$Cov(R_{NABIL},R_m) = \sum[(R_m - \overline{R_m})(R_{NABIL} - \overline{R_{NABIL}})]/n-1$$

$= 16056.508/3$

$= 5352.17$

Beta Coefficient $(B_N) = Cov(R_{NABIL},R_m)/(\sigma_m)^2$

$= 5352.17/2207.55$

$= 2.42$

Required rate of return $\sum(R_{NABIL}) = R_f + [E(R_m) - R_f]\ B_N$

$= 4.75 + (18.82-4.75)2.42$
$= 38.80\%$
: The required rate of return of NABIL is 38.80%.
: The expected rate of return is 63.35%

HBL

Year	[Rj-E(Rj)]	[Rm-E(Rm)]	[Rj-E(Rj)] [Rm-E(Rm)]
2006/07	79.26	57.98	4595.4948
2007/08	10.18	22.03	224.2654
2008/09	-22.28	-41.06	935.3468
2009/10	-66.65	-55.11	3673.0815
			9428.1885
	$\sum$ **[Rj-E(Rj)] [Rm-E(Rm)]=**		

$$Cov(R_H,R_m) = \Sigma[(R_m - \overline{R_m})(R_H - \overline{R_H})]/n-1$$

$$= 9428.1885/3$$

$$= 3142.73$$

Beta Coefficient $(B_H) = Cov(R_H,R_m)/ (\sigma_m)^2$

$$= 3142.73/2207.55$$

$$= 1.42$$

Required rate of return $\Sigma(R_H) = R_f +[E(R_m)- R_f] B_H$

$= 4.75 + (18.82-4.75)1.42$
$= 24.73\%$
: The required rate of return of HBL is 24.73%.
: The expected rate of return is 25.28%

NSBI

Year	$[R_j-E(R_j)]$	$[R_m-E(R_m)]$	$[R_j-E(R_j)]\ [R_m-E(R_m)]$
2006/07	130.94	57.98	7591.9012
2007/08	-21.21	22.03	-467.2563
2008/09	-4.19	-41.06	172.0414
2009/10	-105.55	-55.11	5816.8605
	$\sum [R_j-E(R_j)]\ [R_m-E(R_m)]=$		13113.5468

$$Cov(R_{SBI},R_m) = \Sigma[(R_m - \overline{R_m})(\ R_{SBI} - \overline{R_{SBI}})]/n-1$$

$= 13113.5468/3$

$= 4371.1823$

Beta Coefficient $(B_{SBI}) = Cov(R_{SBI},R_m)/ (\sigma_m)^2$

$= 4371.18/2207.55$

$= 1.98$

Required rate of return $\Sigma(R_{SBI}) = R_f +[E(R_m)- R_f]\ B_{SBI}$

$= 4.75 + (18.82-4.75)1.98$
$= 32.61\%$
: The required rate of return of NSBI is 32.61%.
: The expected rate of return is 49.69%

NIB

Year	$[R_j-E(R_j)]$	$[R_m-E(R_m)]$	$[R_j-E(R_j)]$ $[R_m-E(R_m)]$
2006/07	69.93	57.98	4054.5414
2007/08	52.59	22.03	1158.5577
2008/09	-58.53	-41.06	2403.2418
2009/10	-63.7	-55.11	3510.5070
	∑ [R$_j$-E(R$_j$)] [R$_m$-E(R$_m$)]=		11126.8479

$$Cov(R_{NIB},R_m) = \Sigma[(R_m -\overline{R}_m)(R_{NIB} -\overline{R}_{NIB})]/n-1$$

= 11126.8479/3

= 3708.95

Beta Coefficient $(B_{NIB}) = Cov(R_{NIB},R_m)/ (\sigma_m)^2$

= 3708.95/2207.55

= 1.68

Required rate of return $\Sigma(R_{NIB}) = R_f +[E(R_m)- R_f] B_{NIB}$

= 4.75 + (18.82-4.75)1.68
= 28.39%
: The required rate of return of NIB is 28.25%.
: The expected rate of return is 16.30%

BOK

Year	[Rj-E(Rj)]	[Rm-E(Rm)]	[Rj-E(Rj)] [Rm-E(Rm)]
2006/07	30.54	57.98	1770.7092
2007/08	90.57	22.03	1995.2571
2008/09	-41.31	-41.06	1696.1886
2009/10	-79.82	-55.11	4398.8802
			9861.0351
	∑ [Rj-E(Rj)] [Rm-E(Rm)]=		

$$\overline{} \qquad \overline{}$$

$Cov(R_B,R_m) = \Sigma[(R_m - R_m)(R_B - R_E)]/n-1$

$= 9861.0351/3$

$= 3287.01$

Beta Coefficient $(B_B) = Cov(R_B,R_m)/ (\sigma_m)^2$

$= 3287.01/2207.55$

$= 1.49$

Required rate of return $\Sigma(R_B) = R_f +[E(R_m)- R_f] B_B$

$= 4.75 + (18.82-4.75)1.49$
$= 25.71\%$
: The required rate of return of BOK is 25.71%.
: The expected rate of return is 33.58%

Summary of the above calculations

Name of banks	Expected returns(E(R$_j$))	Required rate of return	Beta coeffient(B$_j$)
EBL	27.28%	28.25%	1.67
NABIL	63.35%	38.80%	2.42
HBL	25.28%	24.73%	1.42
NSBI	49.69%	32.61%	1.98
NIB	16.30%	28.39%	1.68
BOK	33.58%	25.71%	1.49
Industry Average	**35.91%**	**29.75%**	**1.78**

Calculation of Covariance between CBs
EBL and NABIL

Year	$[(R_E - E(R_E)]$	$[R_N - E(R_N)]$	$[(R_E - E(R_E)] [R_N - E(R_N)]$
2006/07	95.08	160.75	15284.11
2007/08	12.53	-18.91	-236.9423
2008/09	-47.94	-47.22	2263.7268
2009/10	-59.66	-94.61	5644.4326
	$\sum [(R_E - E(R_E)] [R_N - E(R_N)]$		22955.3271

Cov $(R_E, R_N) = \sum [(R_E - E(R_E)] [R_N - E(R_N)] / $ n-1
= 22955.3271 / 4-1
7651.78

EBL and HBL

Year	$[(R_E - E(R_E)]$	$[R_H - E(R_H)]$	$[(R_E - E(R_E)]\,[R_H - E(R_H)]$
2006/07	95.08	79.26	7536.0408
2007/08	12.53	10.18	127.5554
2008/09	-47.94	-22.78	1092.0732
2009/10	-59.66	-66.65	3976.3390
			12732.0084
	$\sum [(R_E - E(R_E)]\,[R_H - E(R_H)]$		

$Cov(R_E, R_N) = \sum [(R_E - E(R_E)]\,[R_H - E(R_H)] / n-1$
$= 12732.0084 / 4-1$
$= 4244.00$

EBL and NSBI

Year	$[(R_E - E(R_E)]$	$[R_{NSBI} - E(R_{NSBI})]$	$[(R_E - E(R_E)]\,[R_{NSBI} - E(R_{NSBI})]$
2006/07	95.08	130.94	12449.7752
2007/08	12.53	-21.21	-265.7613
2008/09	-47.94	-4.19	200.8686
2009/10	-59.66	-105.55	6297.1130
			18681.9955
	$\sum [(R_E - E(R_E)]\,[R_{NSBI} - E(R_{NSBI})]$		

$Cov(R_E, R_{NSBI}) = \sum [(R_E - E(R_E)]\,[R_{NSBI} - E(R_{NSBI})] / n-1$
$= 18681.9955 / 4-1$
$= 6227.33$

EBL and NIB

Year	[(R_E −E(R_E)]	[R_{NIB}-E(R_{NIB})]	[(R_E −E(R_E)] [R_{NIB}-E(R_{NIB})]
2006/07	95.08	69.93	6648.9444
2007/08	12.53	52.59	658.9527
2008/09	-47.94	-58.53	2805.9282
2009/10	-59.66	-63.7	3800.3420
	∑ [(R_E −E(R_E)] [R_{NIB}-E(R_{NIB})]		13914.1673

Cov (R_E, R_{NIB}) = ∑ [(R_E −E(R_E)] [R_{NIB}-E(R_{NIB})]/ n-1
= 13914.1673 / 4-1
=4638.05

EBL and BOK

Year	[(R_E −E(R_E)]	[R_B-E(R_B)]	[(R_E −E(R_E)] [R_B-E(R_B)]
2006/07	95.08	30.54	2903.7432
2007/08	12.53	90.57	1134.8421
2008/09	-47.94	-41.31	1980.4014
2009/10	-59.66	-79.82	4762.0612
	∑ [(R_E −E(R_E)] [R_B-E(R_B)]		10781.0479

Cov (R_E, R_B) = ∑ [(R_E −E(R_E)] [R_B-E(R_B)]/ n-1
= 10781.0479 / 4-1
=3593.68

NABIL and HBL

Year	$[(R_N - E(R_N)]$	$[R_H - E(R_H)]$	$[(R_N - E(R_N)]$ $[R_H - E(R_H)]$
2006/07	160.75	79.26	12741.0450
2007/08	-18.91	10.18	-192.5038
2008/09	-47.22	-22.78	1075.6716
2009/10	-94.61	-66.65	6305.7565
	$\sum [(R_N - E(R_N)]$ $[R_H - E(R_H)]$		19929.9693

$Cov (R_N, R_H) = \sum [(R_N - E(R_N)] [R_H - E(R_H)]/ n-1$
$= 19929.9693 / 4-1$
$= 6643.32$

NABIL and NSBI

Year	$[(R_N - E(R_N)]$	$[R_{NSBI} - E(R_{NSBI})]$	$[(R_N - E(R_N)]$ $[R_{NSBI} - E(R_{NSBI})]$
2006/07	160.75	130.94	21048.6050
2007/08	-18.91	-21.21	401.0811
2008/09	-47.22	-4.19	197.8518
2009/10	-94.61	-105.55	9986.0855
	$\sum [(R_N - E(R_N)]$ $[R_{NSBI} - E(R_{NSBI})]$		31633.6234

$Cov (R_N, R_{NSBI}) = \sum [(R_N - E(R_N)] [R_{NSBI} - E(R_{NSBI})]/ n-1$
$= 31633.6234 / 4-1$
$= 10544.54$

NABIL and NIB

Year	$[(R_N -E(R_N)]$	$[R_{NIB}-E(R_{NIB})]$	$[(R_N -E(R_N)] [R_{NIB}-E(R_{NIB})]$
2006/07	160.75	69.93	11241.2475
2007/08	-18.91	52.59	-994.4769
2008/09	-47.22	-58.53	2763.7866
2009/10	-94.61	-63.7	6026.6570
	$\sum [(R_N -E(R_N)] [R_{NIB}-E(R_{NIB})]$		19037.2142

$Cov (R_N, R_H) = \sum [(R_N -E(R_N)] [R_{NIB}-E(R_{NIB})]/ n-1$
$= 19037.2142 / 4-1$
$=6345.74$

NABIL and BOK

Year	$[(R_N -E(R_N)]$	$[R_B-E(R_B)]$	$[(R_N -E(R_N)] [R_B-E(R_B)]$
2006/07	160.75	30.54	4909.3050
2007/08	-18.91	90.57	-1712.6787
2008/09	-47.22	-41.31	1950.6582
2009/10	-94.61	-79.82	7551.7702
	$\sum [(R_N -E(R_N)] [R_B-E(R_B)]$		12699.0547

$Cov (R_N, R_B) = \sum [(R_N -E(R_N)] [R_B-E(R_B)]/ n-1$
$= 12699.0547 / 4-1$
$=4233.02$

HBL and NSBI

Year	$[R_H-E(R_H)]$	$[R_{NSBI}-E(R_{NSBI})]$	$[R_H-E(R_H)] [R_{NSBI}-E(R_{NSBI})]$
2006/07	79.26	130.94	10378.3044
2007/08	10.18	-21.21	-229.0680

2008/09	-22.78	-4.19	95.4482
2009/10	-66.65	-105.55	7034.9075
	$\sum$ **[(R_H $-E(R_H)$] [R_{NSBI}-$E(R_{NSBI})$]**		17279.5921

Cov (R_H, R_{NSBI}) = $\sum$ [(R_H $-E(R_H)$] [R_{NSBI}-$E(R_{NSBI})$]/ n-1
= 17279.5921 / 4-1
=5759.864

HBL and NIB

Year	[R_H-$E(R_H)$]	[R_{NIB}-$E(R_{NIB})$]	[R_H-$E(R_H)$] [R_{NIB}-$E(R_{NIB})$]
2006/07	79.26	69.93	5542.6518
2007/08	10.18	52.59	567.9720
2008/09	-22.78	-58.53	1333.3134
2009/10	-66.65	-63.7	4245.6050
	$\sum$ **[(R_N $-E(R_N)$] [R_H-$E(R_H)$]**		11689.5422

Cov (R_H, R_{NIB}) = $\sum$ [(R_H $-E(R_H)$] [R_{NIB}-$E(R_{NIB})$]/ n-1
= 11689.5422 / 4-1
=3896.51

HBL and BOK

Year	[R_H-$E(R_H)$]	[R_B-$E(R_B)$]	[R_H-$E(R_H)$] [R_B-$E(R_B)$]
2006/07	79.26	30.54	2420.6004
2007/08	10.18	90.57	978.1560
2008/09	-22.78	-41.57	946.9646
2009/10	-66.65	-79.82	5320.0030

			9665.7240
	$\sum$ **[(R$_H$ −E(R$_H$)] [R$_B$-E(R$_B$)]**		

Cov (R$_H$, R$_B$) = $\sum$ [(R$_H$ −E(R$_H$)] [R$_B$-E(R$_B$)]/ n-1
= 9665.7240 / 4-1
=3221.91

NSBI and NIB

Year	[R$_{NSBI}$-E(R$_{NSBI}$)]	[R$_{NIB}$-E(R$_{NIB}$)]	[R$_{SBI}$-E(R$_{SBI}$)] [R$_{NIB}$-E(R$_{NIB}$)]
2006/07	130.94	69.93	9156.6342
2007/08	-21.21	52.59	-1115.4339
2008/09	-4.19	-58.53	245.2407
2009/10	-105.55	-63.7	6723.5350
	$\sum$ **[(R$_{NSBI}$ −E(R$_{NSBI}$)] [R$_{NIB}$-E(R$_{NIB}$)]**		15009.9760

Cov (R$_{NSBI}$, R$_{NIB}$) = $\sum$ [(R$_{NSBI}$ −E(R$_{NSBI}$)] [R$_{NIB}$-E(R$_{NIB}$)]/ n-1
= 15009.9760 / 4-1
=5003.33

NSBI and BOK

Year	[R$_{NSBI}$-E(R$_{NSBI}$)]	[R$_B$-E(R$_B$)]	[R$_{NSBI}$-E(R$_{NSBI}$)] [R$_B$-E(R$_B$)]
2006/07	130.94	30.54	3998.9076
2007/08	-21.21	90.57	-1920.9897
2008/09	-4.19	-41.31	173.0889
2009/10	-105.55	-79.82	8425.0010

			10676.0078
	$\sum$ **[R$_{NSBI}$-E(R$_{NSBI}$)] [R$_B$-E(R$_B$)]**		

$Cov (R_{NSBI}, R_B) = \sum [R_{NSBI}-E(R_{NSBI})] [R_B-E(R_B)]/ n-1$
$= 10676.0078/ 4-1$
$= 3558.67$

NIB and BOK

Year	[R$_{NIB}$-E(R$_{NIB}$)]	[R$_B$-E(R$_B$)]	[R$_{NIB}$-E(R$_{NIB}$)] [R$_B$-E(R$_B$)]
2006/07	69.93	30.54	2135.6622
2007/08	52.59	90.57	4763.0763
2008/09	-58.53	-41.31	2417.8743
2009/10	-63.7	-79.82	5084.5340
	$\sum$ **[(R$_{NIB}$ –E(R$_{NIB}$)] [R$_B$-E(R$_B$)]**		14401.1468

$Cov (R_{NIB}, R_B) = \sum [(R_{NIB} -E(R_{NIB})] [R_B-E(R_B)]/ n-1$
$= 14401.1468/ 4-1$
$= 4800.38$

Computation of average treasury bills rate (Risk free rate, R$_f$)

Fiscal Year	Risk free rate (R$_f$)
2005/06	3.95
2006/07	3.50
2007/08	3.33
2008/09	4.16
2009/10	8.82
Total	**23.76**
Average	**4.75**

Source: Banking and Statistics division, Nepal Rastra Bank, 2011

Nepse Index

Written by Nepal Bank News

Wednesday, 27 April 2011 12:17

NEPSE Index of total Market from FY 1993/94 to FY 2009/10

Fiscal Year	NEPSE Index (Points)	Increase or Decrease (Points)
1993/94	226.03	-
1994/95	195.48	(30.55)
1995/96	185.61	(9.87)
1996/97	176.31	(9.30)
1997/98	163.35	(12.96)
1998/99	216.92	53.57
1999/00	360.70	143.78
2000/01	348.43	(12.27)
2001/02	227.54	(120.89)
2002/03	204.86	(22.68)

2003/04	**222.04**	**17.18**
2004/05	**286.67**	**64.63**
2005/06	**386.86**	**100.19**
2006/07	**683.95**	**297.09**
2007/08	**963.36**	**279.41**
2008/09	**749.10**	**(214.26)**
2009/10	**477.73**	**(271.37)**

Source: **SEBON** *Annual Report 2008/09*