RISK AND RETURN ANALYSIS

(AN APPLICATION OF CAP MODEL IN NEPALESE COMMERCIAL BANKS

WITH SPECIAL REFERENCE TO NABIL, NIBL AND SCBNL BANKS)

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CAMPUS ROLL NO. 911/065

TU REGD. NO. 7-2-478-397-2005

SECOND YEAR SYMBOL NO. 391036

A THESIS SUBMITTED TO:

OFFICE OF THE DEAN

FACULTY OF MANAGEMENT

TRIBHUVAN UNIVERSITY

KATHMANDU, NEPAL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF MASTER IN BUSINESS STUDIES (MBS)

APRIL, 2013

RECOMMENDATION

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DECLARATION

I hereby declare that this thesis entitled **"Risk and Return Analysis (An Application of CAP Model in Nepalese Commercial Banks With Special Reference to NABIL, NIBL, and SCBNL Banks)" s**ubmitted to the Office of the Dean, faculty of management, T.U is my original work and that, to the best of my knowledge and belief. it is done for the partial fulfillment of the requirement for the Master Degree in Business Studies (M.B.S.) under the supervision of **Achyut Raj Bhattari, Asso. Prof**. of Shanker Dev Campus. It contains no materials previously published or written by another person nor material which to substantial extent has been accepted for the award of any other degree of a university or other institution of higher learning, expect where due acknowledgement is made in the acknowledgements.

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Acknowledgement

The successful completion of the thesis, "Risk and Return Analysis and An Application of CAP Model in Nepalese Commercial Banks with special reference to NABIL, NIBL and SCBNL Banks" has been possible due to strong assistance and aid, which we have been endowed upon by different personalities. I would like to express my heartfelt gratitude toward all those who have directly or indirectly offered me their helping hand.

It's a great honor for us to be provided with the opportunity to make an attempt for the comprehensive study Research Methodology. So, I would like to thank Shanker Dev Campus for providing us this opportunity. It is a great pleasure of mine, preparing this thesis, in partial fulfillment required for Master Degree (MBS- 2nd Year). This report is based on the valuable guidance and opinions along with the financial reports of the Banks.

I would like to express my honest gratitude to our Asso. Prof. Achyut Raj Bhattarai for his untiring help and supervision for successful completion of this project.

I further acknowledge here my debt of gratitude to well-wishers and above all my friends Mr. Shankar Nepal, Mr. Hemanta Shrestha, Mr. Yadav Bhandari, Ms. Sarita Poudel and my sister Ms. Chetana Panthi whose co-operation and encouragement strengthened me to complete this attempt. I would be failing in my duty if I do not express my gratitude to my family whose unending inspiration and immense love have carried me through to the present status.

I would also like to thank all the staffs of my college for their constant support.

I hope this small effort of mine will be great value to those who are involved particularly in the study of application of CAPM in Nepal and all other future researchers of this area of Finance.

To err is human, so we would like to express my apology for all seen and unseen errors that might exist in the project and project report and lay open doors for any suggestions. Thank you.

Sadhana Panthi

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List of Abbreviations used

SCBNL	=	Standard Chartered Nepal Bank Ltd.
NABIL	=	NABIL Bank Limited
NIBL	=	Nepal Investment Bank Limited
CAPM	=	Capital Assets Pricing Model
NEPSE	=	Nepal Stock Exchange
SEBON	=	Security Exchange Board of Nepal
ATM	=	Automatic Teller Machine
B.S.	=	Bikram Sambat
EPS	=	Earning Per Share
MPS	=	Market Price Per Share
FY	=	Fiscal Year
i.e	=	That is
Ltd	=	Limited
Pvt.	=	Private
MBS	=	Master of Business Studies
No.	=	Number
NRB	=	Nepal Rastra Bank
Rs.	=	Nepalese Rupee
Govt.	=	Government
T.U	=	Tribhuvan University
SD	=	Standard Deviation
C.V	=	Coefficient of Variation
%	=	Percentage

CHAPTER – I
INTRODUCTION

1.1 Background of the Study

It is argued that the financial sector is a lifeline of all economic activities. The financial sector in itself is just one economic pursuit which thrives on financing to other economic activities. Just like every economic activity it has to use resource efficiently on the one hand and market its product/services on the other hand across the range of customers outreach and affordability. Financial business is crossing national boundaries and has encompassing the global spectrum these days. Globalization of the financial sector has installed further threats and opportunities to improve the level of services offered by these institutions.

Development in the financial term is the efficient flow and generation of the funds in the most productive sectors. The nation having effective funds collection from nooks and corners of the country and investing in the productive areas are the economic heroes at the present scenario. European and the American economies are the best example of this argument. Besides it, security against risk is also vital concern while making investment. Thus the very basic and important elements for an investment are fund as well as security.

As the Nepalese economy is in developing phase so in order to speed up the pace of development, financial sectors have crucial roles. They can pool scattered savings for capital formation. The public investors are interested to invest their savings in the common stocks of the financial institutions. As a result such institutions' shares are being traded among the investors in secondary market in larger volume every day.

Every business enterprise requires short term, intermediate term and long term capital funds for the smooth operation and expansion of organisational activities. Among such funds - long term funds are highly significant for future growth and prosperity. Most of the organisations generate these types of funds from financial market. The purpose of

financial market in an economy is to allocate savings efficiently during the period of time a day, a week or a quarter to parties who use funds for investment in real assets or for consumption. (Vanhorne, 2000) Financial markets facilitate the transfer of funds from savers to those who wish to invest in capital goods. Financial markets can also be defined as the centers or arrangements that provide facilities for buying and selling of financial claims and services. They enable individuals to choose more effectively between current and future consumption. Borrowing enables to consume more whereas lending enables them to postpone consumption. Further the interaction between buyers and sellers in a financial market determines the price of the assets or alternatively the return demanded by investors to invest in the company. Firms raise further capital if the return on their investments exceeds the return demanded by investors. The financial markets provide liquidity to investors. Again financial markets can discipline underperforming managements; the prevailing stock price of a company reflects the opinion of all market participants regarding the outlook for the company under current management.

In short, financial market refers to money market and capital market.

Money market refers to short term financial assets markets, which facilitate liquidity and marketability of securities. The fluctuation of money market interest rates reflects the demand and supply of funds in competitive market. The development of an efficient money market requires the development of institutions, instruments and operating procedures that facilitate widening and deepening of the market and allocation of short term resources with minimum transaction costs and minimum of delays. Thus money markets are the markets for short term highly liquid debt securities (Pandey; 1997: 421)

Capital market facilitates the allocation of funds between saver and borrowers, this allocation will be optimum if the capital market has efficient pricing mechanism. If the capital market is efficient the current share prices of companies fully reflect available information and there is no question of share being under priced or overpriced. Capital market is mainly concerned with those private savings, individuals as well as corporate, those are turned into investments through new capital issues and also new public loans

floated by government and semi government bodies. In the capital market demand comes from agriculture, industry, trade and government while supply comes from the individual or corporate savings institutional investors and surplus of governments. The saving institutions like banks, investment companies, specialized financial corporations and stock exchanges are some of the important constituents of capital market.

Investment is defined simply to be the sacrifice of current consumption for future consumption whose objective is to increase future wealth. The general principle is that the investment can be retired when cash is needed. The decision to investment now is a most crucial decision as the future level of wealth is not certain. Time and risk are two conflicting attributes involved in the investment decision. Broadly investment alternatives fall into two categories, real assets and financial assets. Real assets are tangible while financial assets involve contracts written on pieces of papers such as common stocks, bonds and debentures.

It is always discussed that the participation of the private sectors plays even more important roles for the economic development. But, Nepal has not been able to achieve the desired income so far which is due to the par capital market situation of the nation and due to the late initial stage of modem economy. Capital market generates and liquidates the security as per the requirement. So it is the reason, extension of capital market is only the way to productive mobilization of the funds. But unfortunately, Nepalese capital market do not has efficient communication network even today.

Financial assets are bought and sold in organized security markets. Organized security markets exist to facilitate the exchange of financial assets. Specialized markets may also exist to deal in specific type of securities such as bond markets, stock markets and government bond markets. In Nepal, Stock Exchange limited is the only organized stock market facilitating the trading of corporate securities, mainly common stocks.

When security exchange center converted into Nepal stock exchange (NEPSE) in 1993, the objective of this institution became; to import free marketability and liquidity to the

government and corporate securities by facilitating a transaction in its only trading floor through market intermediaries i.e. brokers as well as market makers.

Economic development depends upon development in the area of industrial, financial, agricultural and social services, which requires huge amount of investment. Financial sector is a medium through which scattered savings and investable resources are converted into actual investment. Financial sector provides sufficient funds through issuing share capital, debt capital, granting short term and long-term loans. But the required knowledge towards the financial activities is lacking in our country. Even educated people do not know about financing and investing activities.

The capital market is also regarded as the financial market and the security market. It is the market where financial assets having a time to maturity of typically more than one year are traded. Organized stock exchanges, over the counter market, third market and fourth markets are the major capital market. Capital market is the mechanism designed to facilitate the exchange of financial assets by orders of buyers and sellers of securities together.

The Principle of Risk

The treatment of risk in the CAPM refines the notions of systematic and unsystematic risks developed by Harry M. Markowitz in the 1950s. Unsystematic risk is the risk to an asset's value caused by factors that are specific to an organization, such as changes in senior management or investment portfolios. For example, specific senior employees may make good or bad decisions or the same type of investment utilized may have different reliabilities at two different portfolios. In general , unsystematic risk is present due to the fact that every company is endowed with a unique collection of assets, ideas, personnel ,etc., whose aggregate productivity may vary.

A fundamental principle of modern portfolio theory is that unsystematic risk can be mitigated through diversification. That is, by holding many different assets, random fluctuations in the value of one will be offset by opposite fluctuations in another. For

example, if one company makes a bad policy decision, its lost customers will go to a different company establishment offering similar services. The investor in both companies will find that the losses in the former investment are balanced by gains in the latter.

Systematic risk is that which cannot be removed by diversification. The risk represents the variation in an asset's value caused by unpredictable economic movements. This type of risk represents the necessary risk that owners of a firm must accept when launching an enterprise regardless of strategies or executive ability, a firm's profitability will be influenced by economic trends.

As explained by Walter (1993), the banking business is a business of managing risks. Although the exact meaning of risk depends on the context, the term generally refers to the possibility of a loss or other undesirable outcome. The economist Knight (1921) makes an important distinction between risk and uncertainty. According to this interpretation, risk pertains to situations where the decision maker can assign mathematical probabilities to the randomness which he is faced with whereas uncertainty refers to situations in which this randomness cannot be expressed in terms of mathematical probabilities. Keynes (1973) illustrates this distinction by noting that the outcome of a game of roulette is risky but not uncertain. In contrast, the prospect of war is uncertain because there is no scientific basis on which to form any calculable probability. Since risk has such a profound impact on society, proper measurement and management of risk are of crucial importance for economic growth and technological progress. These intricate tasks are further complicated by the dynamic nature of risk.

This thesis is about the measurement of risk and return of the selected banks. While the importance of risk in games of chance was already recognized centuries ago, the concept was not applied to stock markets until Harry Markowitz developed his portfolio selection theory in the 1950s, for which he received the "Nobel Prize in Economics" in 1990 (joint with William Sharpe and Merton Miller). Markowitz (1952) argues that investors will only hold mean-variance efficient portfolios, which means that the portfolios should

maximize expected returns for a given level of risk. The key element of portfolio theory is the concept of diversification which says that the risk of a portfolio can be reduced by allocating wealth across different stocks as long as their prices do not move together perfectly. The risk of a portfolio, measured by its return variance, therefore not only depends on the variances of the individual stocks in the portfolio, but also on the covariance between these securities. In fact, because of diversification, the portfolio variance is more dependent on these covariance terms than on the individual risks.

1.2 Profile of the Sample Banks

a. NABIL Bank Limited

Nabil Bank Limited, the first foreign joint venture bank of Nepal, started operations in July 1984. Dubai Bank Limited was the initial foreign Joint-venture partner with 50 percent equity investment. Later on, the shares owned by Dubai Bank Limited (DBL) were transferred to Emirates Bank International Limited, Dubai by virtue of its annexation with the later. The bank is managed by Emirates Bank International Limited in accordance with the Joint venture and Technical Services Agreement between Nepali promoters and Dubai Bank Limited. Nabil was incorporated with the objective of extending international standard modern banking services to various sectors of the society. Pursuing its objective, Nabil provides a full range of commercial banking services through its 47 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 history of Nepal as it started an era of modern banking with customer satisfaction measured as a focal objective while doing business.

Operations of the bank including day-to-day operations and risk management are managed by highly qualified and experienced management team. Bank is fully equipped with modern technology which includes ATMs, credit cards, state-of-art, world-

renowned software from Infosys Technologies System, Banglore, India, Internet banking system and Telebanking system.

(b) Standard Chartered Bank Nepal Ltd.

Standard Chartered Bank Nepal Limited has been in operation in Nepal since 1987 when it was initially registered as a joint-venture operation. Today the Bank is an integral part of Standard Chartered Group who has 75% ownership in the company with 25% shares owned by the Nepalese public. The Bank enjoys the status of the largest international bank currently operating in Nepal. Standard Chartered Group employs almost 75,000 people, representing over 115 nationalities in over 70 countries in the Asia Pacific Region, South Asia, the Middle East, Africa, the United Kingdom and the Americas. This diversity lies at the heart of the Bank's values and supports the Bank's growth as the world increasingly becomes one market.

With strong organic growth supported by strategic alliances and acquisitions and driven by its strengths in the balance and diversity of its business, products, geography and people, Standard Chartered is well positioned in the emerging trade corridors of Asia, Africa and the Middle East.

An integral part of the only international banking Group currently operating in Nepal, the Bank enjoys an impeccable reputation of a leading financial institution in the country. With 19 points of representation and 23 ATMs across the Kingdom and with around 425 local staff, Standard Chartered Bank Nepal Ltd. is in a position to serve its customers through a large domestic network. In addition to which the global network of Standard Chartered Group gives the Bank a unique opportunity to provide truly international banking in Nepal. Standard Chartered Bank Nepal Limited offers a full range of banking products and services in Wholesale and Consumer banking, catering to a wide range of customers encompassing individuals, mid-market local corporate, multinationals, large public sector companies, government corporations, airlines, hotels as well as the DO segment comprising of embassies, aid agencies, NGOs and INGOs.

The Bank has been the pioneer in introducing 'customer focused' products and services in the country and aspires to continue to be a leader in introducing new products in delivering superior services. It is the first Bank in Nepal that has implemented the Anti-Money Laundering policy and applied the 'Know Your Customer' procedure on all the customer accounts.

(c) Nepal Investment Bank Limited

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

With the decision of Credit Agricole Indosuez to divest, a group of companies comprising of bankers, professionals, industrialists and businessmen, has acquired on April 2002 the 50% shareholding of Credit Agricole Indosuez in Nepal Indosuez Bank Ltd.

The name of the bank has been changed to Nepal Investment Bank Ltd. upon approval of bank’s Annual General Meeting, Nepal Rastra Bank and Company Registrar’s office with the following share holding structures

- 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).

We believe that NIBL, which is managed by a team of experienced bankers and professionals having proven track record, can offer you what you're looking for. We are sure that your choice of a bank will be guided among other things by its reliability and professionalism.

1.3 Statement of the Problem

Making investment is sometimes profitable and less risky and sometimes less profitable and more risky. Choosing the best alternative, when there are number of similar investment alternatives, is even more difficult job. Every investment is not safe. All the investment has certain level of risk. The fundamental issue is how to select the best combination of risk and return to maximize the wealth of shareholders. The tough part of the decision making under uncertainty is deciding how much extra return should be required to accept a measurable risk. Every investment decision is based on past experiences for the future expectations. It is always not possible to predict perfect forecast for the future incident. All investment decisions carry a degree of risk along with return. So in this case proper analysis of past trends of the market and future expectations are only the base of rational investment decision.

In Nepal, the listing of shares in NEPSE and their trading in the stock market is a recent phenomenon. A low trading volume, absence of professional brokers, early stage of growth, limited movement of share prices, and limited information available to investors characterize the Nepalese stock market. A number of researches are available on government owned public enterprises but researches on enterprises whose stocks are listed in NEPSE and traded in stock market are yet to come up in Nepal. Viewed in this way this study is expected to provide at least some inside into application of CAPM in Nepal. Most of the investors are even unknown about the stock market. Some are claiming that the financial institutions, intermediaries and brokers are cheating them. It arise a question whether Nepalese investors make their investment by studying the market and risk return status of the securities they choose or they just gamble to make the profit. The price of stock is very much sensitive in a free market economy. Many factors affect the value of stock directly or indirectly. Risk associated with the return should be analyzed before making any investment. Whether the stock prices of Nepalese commercial banks are correctly priced or not is another aspect of the study.

Nepalese stock market has experienced a noticeable growth during last decade. However, market has confronted many difficulties. Even, investors have difficulties in choosing the best securities and create a well-diversified portfolio. The brokers misadvise them. They only see market price while making investment. They do not analyze risk factors associated with the return. In most cases, they have considered stock market as an important gambling place to make fortunes overnight without considering how such irrational behavior can put them possibly into greater loss.

To invest in stock one should know what the accurate price of stocks is. For this, the theoretical as well as market condition should be known clearly and about the determinants of the stock price. According to the theory, stock price in market is guided by the intrinsic value, which is calculated with the inputs- dividend, required rate of return of investors and growth in dividends. The stock prices are assumed to remain in security market line. And if it is not so, they strive towards this line and come to the equilibrium. If the expected rate of return from stock and required rate of return is not equal in such case the price of stock may be over priced or under priced. Hence, the location of the expected return may lie above or below the security market line. The stocks firstly traded in the primary market by the issuing corporation and these securities are traded in the secondary market by the investors and the stockholders. Since common stock do not guarantee for dividend and capital gain, it needs courage to invest on it. For the guarantee of return a proper analysis of risk and return should be performed of the prevailing market atmosphere.

However, the research study seeks answer to the followings:

- How can risk and returns be determined in selected banks of Nepal? Do the banks with higher mean expected returns have higher risks?
- What is the nature of capital gain yields and dividend yields in Nepalese Stock Market? How do they involve over a period of time?
- What are the realized rates of return in Nepalese Stock Market?

- What is the market return in Nepal? What are the required rates of return based on CAPM for the selected banks of Nepal? How can CAPM equation be estimated for the selected banks?
- How can beta be estimated in the selected banks of Nepal? How can they be compared across different selected banks?
- What are the required rates of return and expected rates of return in selected Nepalese commercial banks? How can they be compared?
- How can a total risk be partitioned into systematic and unsystematic risks in Nepalese banks? How can they be computed and compared?
- What is risk diversification? How can risk be diversified?
- Is it better to invest only in single stock or it is better to make a portfolio?

1.4 Objectives of the Study

The primary objective of this research is to study the application of CAPM in context of Nepal. This is because anticipation of risk and return is the serious concern for any sort of investments. Apart from the primary objective, research paper will also specify the systematic measures of analyzing the risk and return to interpret the present status of commercial banks of the country. Statistical and financial tools shall be used for the purpose of meeting the objectives. The major objectives of the study are:

- Assess the present status of portfolio management of sample commercial banks in terms of risk and return
- To see the risk and return of selected banks
- To compute and analyze capital gain yields and dividend yield of the selected banks
- To compute and analyze beta and CAPM equations of the selected banks
- To compare the required rates of return with expected rates of return
- To see covariance and correlation between the returns of stocks of commercial banks

- To see systematic and unsystematic risks of the selected banks
- To evaluate the common stock of listed commercial banks in terms of risk and return.

1.5 Limitations of the Study

The study holds some methodological and conceptual limitations. In addition, inadequate coverage of industries, time taken, reliability of statistical tools used and other variable, are few other things which are not included in the study.

Major limitations however, are mentioned below:

- Risk and return of only common stock is considered.
- The study incorporates data from past 6 years.
- The study area is limited to three commercial banks only.
- The study has been conducted within a short period of time.
- Variation in data published from different sources like NEPSE and company itself has been a major limitation.
- The study is based in the secondary data such as annual report of the selected companies other related journals, previous thesis, magazines, books etc.

1.6 Significance of the Study

This study is a basic research on the application of CAPM in context of Nepal. It provides the framework of minimizing the risk by investing in different alternatives. The research study will give correct information about Nepalese stock market and may contribute to the analytical power of the investors. It helps to find out the expected rate of return and the required rate of return on each particular company by considering the year end price and the dividend yield.

The study provides us the knowledge about diversifiable risk and undiversifiable risk associated in the investment decision with the help of different statistical tools. CAPM is the basic study criterion which helps us to find out the valuation of the stock through beta

coefficient and required rate of return. The full text of this model has been presented in further chapters.

In this way the study gives the entire knowledge about the concept of risk and return and the application of CAPM model.

1.7 Focus of the Study

The study is basically focused upon the comparative application of capital assets pricing model in commercial banks of Nepal. Out of 32 commercial banks only three commercial banks are taken for the purpose of comparison on the basis of CAP Model.

The research is done using various statistical tools for the analysis of risk and return of the selected commercial banks.

The study focuses on the following research:

- It helps to find out and compare the expected rate of return and required rate of return of the selected companies.
- It helps to find out the standard deviation of the selected companies and compare the variability of these organizations.
- It helps in measuring the risk per unit of return which provides a more meaningful basis for comparison when the expected return on the two alternatives is the same.
- It helps to partition the total risk of the individual stock into diversifiable and undiversifiable risk.
- It helps in the valuation of stock through beta coefficient and required rate of return.
- It enables us to diversify the risks by investing in various stocks.

1.8 Organization of the Study

The study has been organized into five chapters, each devoted to some aspects of the CAPM in Nepal. The rationale behind this kind of organization is to follow a simple research methodology approach. The titles of each of these chapters are as follows:

Chapter One, Introduction

It is the introductory part of the study. As already mentioned, this chapter described the major issues to be investigated along with the objectives and scope of the study. The limitation of this research work is also included in the chapter.

Chapter Two, Literature Review

This chapter is devoted to theoretical analysis and brief review of related and pertinent literature. It includes a discussion on the conceptual framework and review of the major studies.

Chapter Three, Research Methodology

The research methodology employed in the study is described in chapter three. This chapter deals with the nature and sources of data, list of the selected companies, the model of analysis of the study.

Chapter Four, Presentation & Analysis of Data

The fourth chapter deals with the presentation and analysis of data. Basically the descriptive analysis is done for this research work.

Chapter Five, Summary & Conclusion

Lastly summary and conclusions of the study are presented in chapter five. This chapter presents major findings along with other empirical evidences. It also offers several avenues for future research. The exhibits and bibliography are incorporated at the end of study

CHAPTER II
REVIEW OF LITERATURE

2.1 Conceptual Framework

Various writers have defined the theoretical aspect of risk and return in various ways which are taken into consideration in this chapter and main focus is given to the application of capital assets pricing model in the banking sectors of Nepal.

2.1.1 Concept of Return and Risk

There are different motives for investment. The most prominent among all is to earn a return on investment. However, selecting an investment on the basis of return is not enough. The fact is that most investors invest their funds in more than one security suggest that there are other factors, besides return, and they must be considered. The investor not only like return but also dislike risk, so what is required is:

i. Clear understanding of what risk and return are,
ii. What creates them, and
iii. How can they be measured?

Return

The return is the basic motivating force and the principal reward in the investment process. The return may be defined in terms of (i) realized return, i.e., the return which has been earned and (ii) expected return, i.e., the return which investor anticipates earning over some future investment period. The expected return is a predicted or estimated return and may or may not occur. The realized return in the past allow an investor to estimate cash inflows in terms of dividend, interest, bonus, capital gains, etc, available to the holder of the investment. The return can be measured as the total gain or loss to the holder over a given period of time and may be defined as a percentage return on initial amount invested. With reference to investment in equity shares, return consist

of the dividends and the capital gain or loss at the time of sale of these shares. (Bhattarai; 2010:115)

Risk

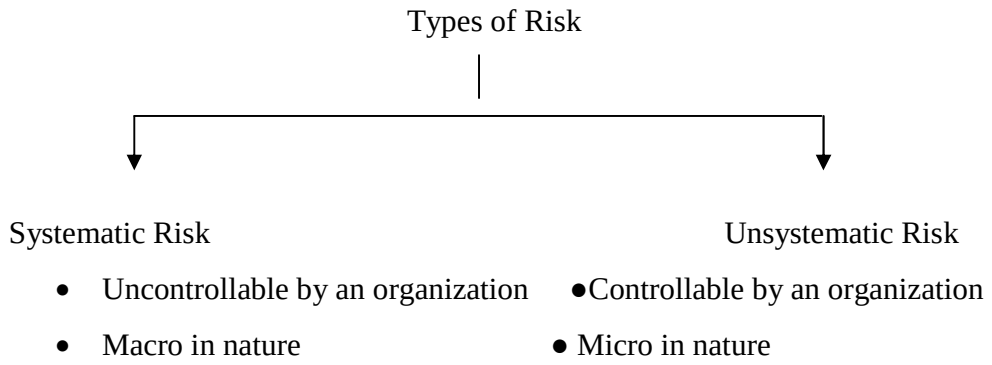
Risk in a financial analysis is the variability of return. Risk in investment means, future returns from an investment are unpredictable. The concept of risk may be defined as the possibility that the actual return may not be same as expected. In other words, risk refers to the chance that the actual outcome (return) from an investment will differ from an expected outcome. With reference to a firm, risk may be defined as the possibility that the actual outcome of a financial decision may not be same as estimated. The deviation between the expected and actual return brings variability in the return and the variability is termed as risk. The higher the deviation between expected and actual return, the higher will be the risk. "Risk, in other words, is defined as uncertainty of returns and if there is certainty there is no risk at all. Risk and return in investment go together and without risk no more return can be expected." (Bhattarai; 2010:120)

An activity in which an entity puts some financial resources with an expectation of amplified returns is known as investment activity. For any investment the major concern for investors is always the “return”. But as we know that the return is a function of the future and the future is always uncertain so one can never be sure about the returns associated with some investment.

2.1.2 Types of Risk

The different types of risk can be classified under two main groups, viz,

Systematic risk
Unsystematic risk



2.1.2.1 Systematic Risk

Systematic risk is due to the influence of external factors on an organization. Such factors are normally uncontrollable from an organization's point of view. Systematic risk is macro in nature as it affects large number of organization operating under a similar stream or same domain. It cannot be planned by an organization. Types of systematic risk are:

i. Interest Rate Risk

It is the potential variability of a return caused by changes in the market interest rates. Market interest rate influences the value of an asset and hence its return. If the market interest rate rises, the value of an asset will decrease. A higher interest rate means a higher discount rate and a higher discount rate cause a lower present value of any asset.

Interest rate risk is further classified as:

- Price Risk
- Reinvestment Rate Risk

ii. Market Risk

Market risk is associated with consistent fluctuations seen in the trading price of any particular shares or securities. That is, it is a risk that arises due to rise or fall in the trading price of listed shares or securities in the stock market. The market risk is further classified into the following types:

- Absolute Risk

- Relative Risk
- Directional Risk
- Non- Directional Risk
- Basis Risk
- Volatility Risk

iii. Purchasing Power or Inflationary Risk

Purchasing power risk is also known as inflation risk. It is so, since it originates from the fact that it affects purchasing power adversely. Inflation erodes the purchasing power of the rupees and increases the investment risk. It is not desirable to invest in securities during an inflationary period. The types of purchasing power or inflationary risk are:

- Demand Inflation Risk
- Cost Inflation Risk

2.1 2.2 Unsystematic Risk

Unsystematic risk is due to the influence of internal factors prevailing within an organization. Such factors are normally controllable from an organization's point of view. Unsystematic risk is micro in nature as it affects only a particular organization. It can be planned, so that necessary actions can be taken by the organization to mitigate the risk. The types of unsystematic risk are:

i. Business or liquidity Risk

Liquidity risk is associated with uncertainty created by the inability to sell the investment quickly for cash. The return variability will increase if price discounts and sales commission are to be given in order to liquidate assets in time. The less the liquidity, the greater will be the risk. So, two, factors- price and time are associated with liquidity. It is further classified into two types.

- Asset Liquidity Risk
- Funding Liquidity Risk

ii. Financial or Credit Risk

The risk arises due to the change in capital structure of an organization. The capital structure mainly comprises of three ways by which funds are sourced for projects, which are: owned funds, borrowed funds, and retained earnings. Financial risk is further classified into following types.

- Exchange Rate Risk
- Recovery Rate Risk
- Credit Event Risk
- Non-Directional Risk
- Sovereign Risk
- Settlement Risk

iii. Operational Risk

Operational risks are the business process risks failing due to human errors. This risk will change from industry to industry. It occurs due to breakdowns in the internal procedures, people, policies and systems. The operational risk is further classified into following types.

- Model risk
- People risk
- Legal risk
- Political risk

Source: www.scribd.com

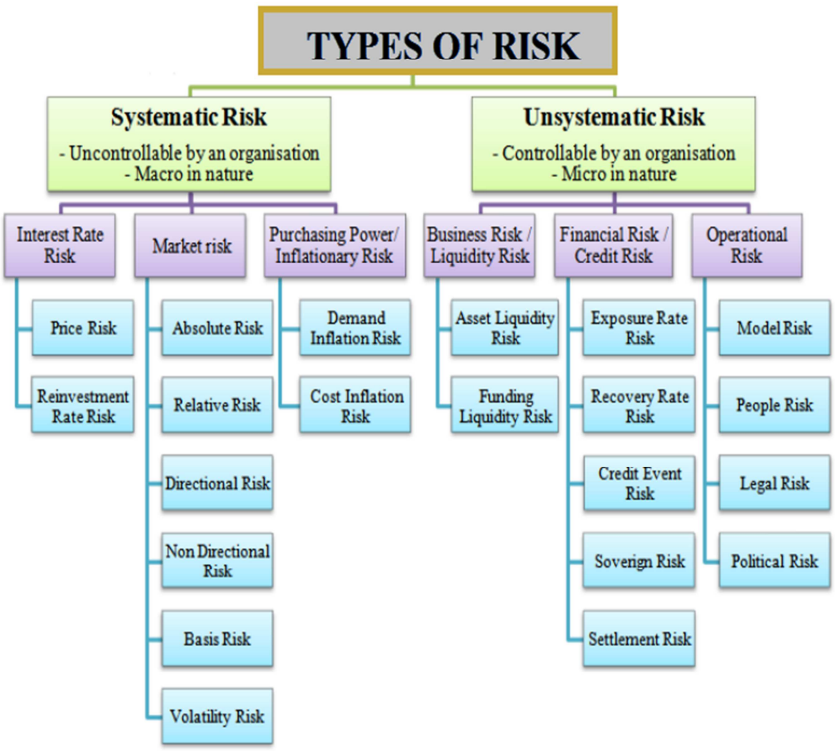


Fig 2.1 Types of Risk

Source: www.scribd.com

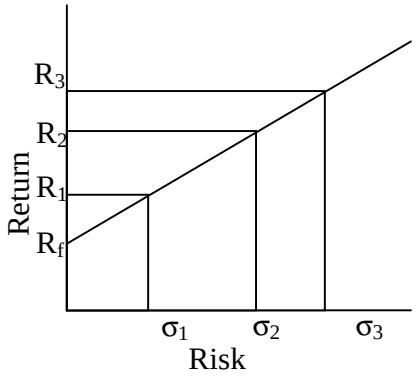
2.2 Relation between Risk and Return

Investors are generally risk averse. This implies that risky investment must offer higher expected return than less risky investment in order to make the people buy and hold them. The risk aversion attitude of investors portfolio theory was developed and being very important subject in the field of finance. Any individual investment may differ substantially from the adverse risk and return statistics. That is why it is prudent to investigate any assets before investing. (Francis; 1991: 560)

The relationship between the risk and return is described by investors' perception about risk and their demand for compensation. No investors will like to invest in risky assets

unless he/she is assured of adequate compensation for the 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 relationship between risk and risk premium. (Lorie et al. 1983:103) defines the observe difference in both the levels and variability of the rates of return across securities are indicative of the underlying risk return relation in the market.

Fig. 2.2 Relation between risk and return



The figure represents a higher premium for higher risk in a linear fashion indicating a premium of (R_1-R_f) for σ_1 degree of risk (R_2-R_f) for σ_2 degree of risk and so on. The assumption of linear relationship states the risk premium increase or decrease in proportion to a change in level of risk. R_f stands for return on risk free security. The partial interest is the difference in rates of return across securities, since they provide valuable clues to the market's trade-off between risks and return scientific progress in any field depends on accrues measurement. Many measurements are interesting in them, by their most important scientific role is to test the validity of theory. Since most financial theory is focused on an explanation of the level, structure and behavior of rates of return, their accurate measurement is essential if the theory is to be tested and improved.

"Rational investors would agree that an investment's required return should increase as the risk of investment increase. Most investors would also agree how the expected rate of return should be calculated." (Cheney and Moses; 1995: 41).

2.3 Measurement of Risk

"The measurement of risk has always been a subject for debate. This disagreement primarily stamps the various ways investors perceives risk." (Cheney and Moses; 1995: 40). Financial analysts and statisticians prefer to use a quantitative risk surrogate called the variance of return.

2.3.1 Standard Deviation (σ) and Coefficient of Variation (C.V)

Standard deviation means a measure of the tightness, or variability of a set of outcomes. In other words, standard deviation is the square root of the variance of the rates of return. “The variance of an asset's rates of return equals the sum of the product of squared deviation of each possible rate or return from the expected rate of return multiplied by the probability that the rate of return occurs" (Francis; 1991: 568). The standard deviation can be expressed mathematically as:

$$\sigma = \sqrt{\sum_{t=1}^{n} P_1 (R_t - \overline{R})^2} = \sqrt{Var(R_t)}$$

A standard deviation can sometimes be misleading in comparing the risk or uncertainty surrounding alternatives if they differ in size. To adjust for the size or scale, the standard deviation can be divided by the expected return to compare the coefficient of variance (C.V.) "If risk is measured by the standard deviation hen risk per unit of expected return can be measured by the coefficient of variation (C.V.) "(Cheney and Moses; 1995: 41)

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

"If rate of return should increase as the risk increase, the C.V. provides a quick summary of the relative trade-off between expected return and risk." (Cheney and Moses; 1995:43) "The relative measure of dispersion based on standard deviation is called coefficient of variation. It measures the risk per unit of return. The larger the C.V., the larger the relative risk of the investment." (Pant and Chaudhary; 2055:118)

2.3.2 Beta Coefficient

The beta coefficient (β), a measure of systematic risk, can be calculated using following formula:

$$\text{Beta Coefficient } (\beta i) = COV_{iM}/\sigma_M^2$$

Where, COV_{iM} = covariance between the return of an individual asset and market return

σ_M^2 = variance of the market returns.

2.4 Portfolio Analysis

“An investor wants to minimize the risk of investment and maximize return but it is not possible by investing in single asset. He/she needs to invest in two or more securities. This collection of securities is called portfolio”. (Bhattarai; 2010:136)

The portfolio analysis begins where the security analysis ends and this fact have important consequences for investors. "Portfolios, which are combination of securities, may or may not take on the aggregate characteristics of their individual parts". (Bhalla; 2000: 47) Investment position is undertaken with goal of earning some expected rate of return. Investors seek to minimize inefficient deviations from this expected rate of return. Diversification is essential to creation of an efficient investment because it can reduce the variability or returns around the expected return.

According to Francis, 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 analyzed by the

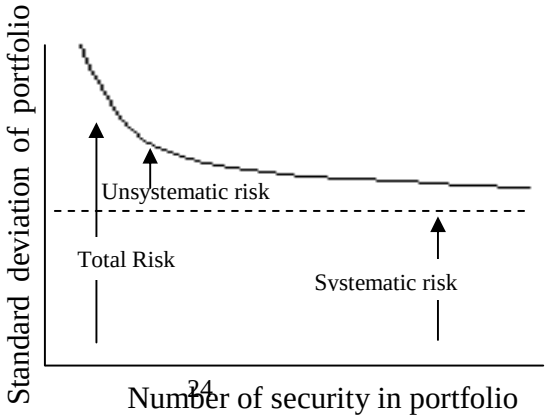
portfolio analyst. The objective of portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor seems appropriate. All information available to the securities analyst is supposed to be summarized in the risk return statistics describing the investment candidates. (Francis; 1991: 564) Investors rarely place their entire wealth in a single asset rather they construct a portfolio. Portfolio is simply an investment made on two or more than two securities. Portfolio analysis considers the determination of future risk and return in holding various blends of individual securities.

"Diversification is essential to the creation of an efficient investment because it can reduce the variability of returns around the expected return". (Francis; 1991; 570)

There are two broad sources of uncertainty. The first is due to overall market risk-change in nation's economy, tax reforms act a change in world energy situation, business cycle, the inflation rate, interest rates, exchange rates and so forth. None of these macro economic factors can be predicted with certainty. These risks affect securities affects overall and consequently, cannot be diversified away. Even the investors who hold a well-diversified portfolio will be exposed to this type of risk. The second risk component, however, is unique to a particular company being independent of economic political and other factors that affects securities in a systematic manner. By diversification unsystematic risk can be reduced and even eliminated if diversification is efficient. Therefore, not all of the risk involved in holding a stock is relevant, part of it can diversified away.

Fig. 2.3 Unsystematic and Systematic Risk

$$\text{Var (Rj)} = b^2 \text{ var } (R_{m,t}) + \text{Var } (E_{i,t})$$



Unsystematic risk is reduced at a decreasing rate towards zero as more randomly selected securities are added to the portfolio. "Various studies suggest that 15 to 20 stocks selected randomly are sufficient to eliminate most of the unsystematic risk of a portfolio. Thus a substantial reduction in unsystematic risk can be achieved with a relatively moderate amount of diversification". (Van Horne; 1998: 69)

2.5 Capital Asset Pricing Model (CAPM)

The most important aspect of risk is the overall risk of the firm as viewed by investors in the marketplace. The overall risk significantly affects investment opportunities and even more important, the owners' wealth. The basic theory that links together risk and return for all assets is commonly called the capital asset pricing model (CAPM). In other words, CAPM is model that provides framework to determine the required rate of return on the assets and indicates the relationship between the return and risk of the assets. The required rate of return specified by CAPM helps in valuing an asset. One can also compare the expected (estimated) rate of return on assets with its required rate and determine whether the assets are fairly valued. (Pandey; 1997: 96). "CAPM is an equilibrium assets pricing theory that shows that equilibrium rates of expected return on all risky assets are the function of their covariance with market portfolio." (Jaffe; 1998: 893)

The CAPM is a model for pricing an individual security or a portfolio. For individual securities we make use of the SML and its relation to expected return and systematic risk (beta) to show how the market must price individual securities in relation to their security risk class. The SML enables us to calculate the reward-to-risk ratio for any security in relation to that of the overall market. Therefore, when the expected rate of return for any security is deflated by its beta coefficient, the reward –to-risk ratio for any individual security in the market is equal to the market reward-to-risk ratio.

Moreover, It is an economic model for valuing stocks, securities, derivatives and/or assets by relating risk and expected return .CAPM is based on the idea that investors

demand additional expected return (called the risk premium)if they are asked to accept additional risk. The CAPM model says that this expected return that these investors would demand is equal to the rate on a risk-free security plus a **risk premium** .If the expected return does not meet/beat the required return, the investors will refuse to invest and the investment should not be undertaken.

The total risk of security can be viewed as consisting of two parts:

Total security risk = non-diversifiable risk + diversifiable risk

Diversifiable risk, which is sometimes called unsystematic risk, represents the portion of an asset's risk associated with random causes that can be eliminated through diversification. It is attributable to firm-specific events, such as strikes, lawsuits, regulatory actions, loss of a key account, and so forth.

Non-diversifiable risk, which is also called systematic risk, is attributable to market factors that affect all firms. Factors such as war, inflation, international incidents, and political events account for non-diversifiable risk. An investor can create a portfolio of assets that will eliminate all, or virtually all, diversifiable risk; the only relevant risk in non-diversifiable risk, which reflects the contribution of an asset to the risk of the portfolio. The measurement of non-diversifiable risk is thus of primary importance in selecting those assets possessing the most desired risk-return characteristics.

Beta Coefficient (b) is used to measure non-diversifiable risk. It is an index of the degree of movement of an asset's return in response to a change in the market return. The beta coefficient for an asset can be found by examining the asset's historical returns relative to the return for the market. The market return is the return on the stock portfolio of all traded securities. The return on a portfolio of the stocks in Standard and Poor's 500 Stock composite Index or some similar stock index is used to measure the market return. The

beta coefficient for the market is considered to be equal to 1.0; all other betas are viewed in relation to this value. Asset betas may take on values that are either positive or negative, but positive betas are the norm. The majority of beta coefficients fall between 0.5 and 2.

Using the beta coefficient, to measure non-diversifiable risk, the CAPM is given as below:

$$K_j = R_F + [b_j \times (K_m - R_F)]$$

Where: K_j = required return on asset j; R_F = risk-free rate of return; bj = beta coefficient or index of non-diversifiable risk for asset j; Km = market return; the return on market portfolio of assets.

The required return on an asset, Kj, is an increasing function of beta, bj that measures non-diversifiable risk. In other words, the higher the risk, the higher the required return, and vice versa. The model can be broken into two parts, viz risk-free rate (R_F) and the risk premium [b_j X (K_m - R_F)]. The (K_m-R_F) portion of the risk premium is called the market risk premium, since it represents the premium the investor must receive for taking the average amount of risk associated with holding the market portfolio of assets. (Pandey; 1997: 98)

2.5.1 Assumptions of CAPM

CAPM envisages the relationship between risk and the expected rate of return on a risky security. It provides the frame work to price individual securities and determines the required rate of return for individual security. It is based on a number of simplifying assumptions. The important assumptions are (Pandey; 1997: 96)

Market efficiency

The capital market efficiency implies that share price reflect all available information. Also, individual investors are not able to affect the prices of securities. This means that there are large numbers of investors holding small amount of wealth.

Risk aversion and mean-variance optimization

Investors are risk-averse. They evaluate security's return and risk in terms of the expected return and variance or standard deviation respectively. They prefer the highest expected return for a given level of risk. This implies that investors are mean variance optimizer and they form efficient portfolios.

Homogeneous expectations

All the investors have the same expectations about the expected return and risks of the securities. Investors have homogenous expectations (beliefs) about asset returns.

Single time period

Investors are risk averse individuals who maximize the expected utility of their end of period wealth. Hence the model is a one period model.

Risk free rate

All investors can lend and borrow at a risk free rate of interest. They form portfolios from publicly traded securities like shares and bonds (Pandey; 1997; 96).

2.5.2 Some Comments on CAPM

The capital asset pricing model generally relies on historical data to estimate required returns. The betas, which are developed by using data for the given asset as well as for the market, may or may not actually reflect the future variability of returns. Therefore, the required returns specified by the model can be viewed only as rough approximations.

Analysts and other users of betas commonly make subjective adjustments to the historically determined betas in order to reflect their expectations of the future when such expectations differ from the actual risk-return behaviors of the past.

The CAPM was actually developed to explain the behavior of security prices and provide a mechanism whereby investors could assess the impact of a proposed security investment on their portfolio's overall risk and return. This is actually based on an assumed efficient market in which there are many small investors, each having the same information with respect to securities; there are no restrictions on investment, no taxes, and no transactions cost and all investors view securities similarly and prefer higher returns and lower risk, while this perfect world appears unrealistic.

In spite of the fact that the risk-return trade-off described by CAPM is generally applicable to all assets, it provides a useful conceptual framework for evaluating and linking risk and return. An awareness of this trade-off and an attempt to somehow capture and consider risk as well as return in financial decision making should aid the financial manager in achieving the goal of owner wealth maximization. (www.megaessays.com)

2.6 Review of Related Studies

2.6.1 Review of Books, Journals and Articles

There is growing empirical evidence that multiple factors are cross sectionally correlated with average returns in the United States (Rouwenhorst, 1999). Measured over long time periods, small stocks earn higher average returns than large stocks (Bank. 1981) show that value/stocks with high book-to-market (B/M) earning to price (E/P); on cash flow to price (C/P) outperform growth stocks with low B/M, E/P or C/P.

The interpretation of the evidence is strongly debated. Some believe that the premiums are a compensation for pervasive risk factors; others attribute them to firm characteristics

or inefficiency in the way market incorporate information into prices. Yet others average that survivorship or data snooping may bias the premiums.

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

Rouwenhorst attempted to answer two sets of questions. The first set of three questions concerns the existence of expected return premiums; (i) do the factors that explain expected return differences in developed equity markets also describe the cross section of expected returns of emerging markets firms? (ii) Are the returns factors in emerging markets primarily local or they having global components as well? (iii) How does the emerging market evidence contribute to the international evidence from developed markets that similar return factors are present markets around the world? (Rouwenhorst, 1999)

The second set of questions of the paper includes (iv) is there a cross sectional relationship between liquidity and average returns in emerging markets? (v) Are the return factors in emerging markets cross section ally correlated with liquidity?

About the data Rowenhorst stated that: as of April 1997 the Emerging market: Database (EMDB) of the IFC contains data on more than 2200 firms from 31 emerging markets, but not all are included in the sample. Eleven countries are excluded because of insufficient return histories, which leave 1705 firms in the 20 countries that the IFC tracks for at least seven years. For some firm's monthly closing process and dividends is

available dating back to 1975. Starting at various points during 1980s the IFC expanded its reporting to include monthly time series for price-to-book ratios, price-earning ratios, market capitalization, trading volume and the number of days per month that a stock a traded. Total returns are calculated as the sum of the divided return and price appreciation, using prices scaled by a capital adjustment factor, which the IFC computes to correct for price effects associated with stock splits, stock dividends, and right issues. Many emerging markets have firms with multiple classes of shares carrying different ownership restrictions. Firms with multiple share classes are treated as a single value weighted portfolio of the outstanding equity securities.

Rouwenhorst (1997) in his article namely ' *Local Returns Factors and Turnover in Emerging Stocks Markets*' conclude that 'The return factors in emerging markets are qualitatively similar to those in developed markets: small stocks outperform growth stocks and emerging markets socks exhibit momentum. There is no evidence that local market betas are associated with average returns. The low correlation between the country return factors suggests that the premiums have a strong local character. Furthermore, global exposures cannot explain the average factor returns of merging markets. There is little evidence that the correlation between the local factor portfolios have increased, which suggests that the factors responsible for the increase of emerging market country correlation are separate from those that drive the difference between expected return within these markets. A Bayesian analysis of premiums in developed and emerging markets shows that, unless one has strong prior beliefs to the contrary, the empirical evidence favors the hypotheses that size, momentum, and values strategies are compensated the relationship between expected returns and share turnover characteristics of the local returns factors portfolios. There is no evidence of a relation between expected returns and turnover, in emerging markets. However, beta size momentum, and value is positively cross section ally correlated with turnover in emerging markets. This suggests that the return premiums do not simply reflect a compensation for liquidity'.

The study by Rouwenhorst does not consider the analysis of a single security. It has been analyzed the return factors in worldwide stock markets. Hence the article contributes in the area of risk and return analysis in common stock investment (Rouwenhorst; 1999: 1439-1462)

In journal of The Risk Finance by Michael Power (2004) on the topic: "*Risk Management in Banking Sector"* raises the issue of risk management in the banking sector. According to him, Risk should be taken as one of the challenges of the banking industry but it is not sufficient to minimize the potential disasters. Banking risk should be managed as a separate part of the management.

2.6.2 Review of Nepalese Studies

An article by Bhattarai (2005) on the topic: "*Define your objectives before buying stock*" in New Business Age has given way to invest in securities according to investor objective. Stock market is perhaps poorly understood among Nepalese investors. Its development remains almost impossible unless the people accept it as a way of their life. For this, first of all they have to know what stock market is and how it functions. If it is not understood, it cannot attract the interests of the investors. Thus, investors' awareness about stock market and their rights are also essential.

People invest in share market for different purposes. If someone is not clear about his/her purpose, the strategy followed can be wrong and the benefits are not satisfactory, or there s/he may incur a loss. So, it is necessary to define our objective first and then start playing with the market. Some possible objectives would be to maximize dividend income, to maximize capital gain in short run, to maximize total gain and to minimize risk. A proper setting of objectives helps to identify the category of shares that help to accomplish set of objectives. If we observe stock market regularly, we find various patterns of movement in different stocks. Thus setting clearly defined objectives will help to gain from such movement.

Investors who want to maximize their dividend income would do better by investing in the shares in which more shares at a less amount of commission can be purchased. But those investors who want to maximize their return by capital gain in the short run, it is better to avoid investing in shares of finance and insurance companies because their share price is found to fluctuate less as compared to the banks. In case of stocks that do not fluctuate much, it will be difficult to cover the transaction costs.

Capturing a capital gain in short run requires a selection of highly fluctuating companies or newly listed companies such as BOK, LBL, MBL, NBBL, NCCBL. These price changes can provide a handsome capital gain to the investors but it further requires a regular collection of information and regular contact with brokers. Similarly, the shares of newly listed banks are found to fluctuate more compared to old banks. For example: NCC.

The next fundamental objective of buying securities is for the purpose of borrowing. Investors can borrow by using shares as collateral. Banks and finance companies provide 50% of the market price of shares. To borrow in this way, one should have those securities that promise certain return as well as growth. Such stocks are those of SCBNL, Nabil Bank Ltd, Bishal Bazzar Co. Ltd, Unilever Nepal Ltd and NIBL. Therefore, it is better to buy these high priced stocks if investors intend to borrow by pledging them. Such borrowing can be used to buy more stocks and the selection of such stock will again depend on the purpose for which you want to buy them.

If the objective is to minimize the risk, investors require selecting stocks that remain less fluctuating in the market. For example, Bishal Bazaar Company Ltd, Himalayan Bank Ltd, Bottlers Nepal Ltd, Rastriya Beema Sansthan are unilever Nepal Ltd., are found to be such stocks." (New Business Age, May 2005; 65)

Mr. Shiva Raj Shrestha (2055 B.S) in his article "*Portfolio Management in Commercial Banks*: *Theory and Practice*" revealed 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 investment mix

In the 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 approached to find out the risk of securities depending upon the attitude of investors towards risk, to develop alternative investment strategies for selecting 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 continuous research and analysis and proper management information system to get success in portfolio management in Nepalese joint venture banks, he concludes 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, we have constrained the portfolio management of most of the joint venture banks .(Nepal Bank Patrika; Baishakh, 2055)

Mr. Narayan Prasad Paudel (2002) undertook 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 this study.

Mr. Paudel conducted the study with the objective of whether shares of commercial banks were correctly priced by analyzing the realized rates of return and the required rate 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 return 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, NSBIB, NBBL, EBL and BOK were underpriced.

Based on the standard deviation of the return on shares of EBL could be considered a high risk security. The standard deviation of the return on shares of HBL was the lowest one on the basis of CV, the share of BOK had the lowest risk per unit return, the highest being with the shares of Nabil. 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.

2.6.3 Review of Related Research Studies and Thesis

Following unpublished thesis are reviewed to prepare this research.

Mr. Jagadish Basnet (2003) had submitted his thesis on "*Portfolio Management of Joint Venture Banks in Nepal with reference to NBBL, HBL, SCBNL, and EBL*" His research **major objectives** were:

- To identify the situation of portfolio management of joint ventures banks in Nepal.
- To evaluate the investment and advances portfolio of joint venture banks.

The **major findings** of the study were as follows.

- Among the four joint venture banks, NBBL invested very high amount of funds in government securities. The share and debenture stood second position in the investment portfolio.
- The calculated value of beta coefficient (β) of the SCBNL 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 to the four banks. HBL had a very nominal risk than market.
- SCBNL is the best and EBL is least performer among the four joint venture banks

Pradip Raj Panta (2006) entitled "*Risk and Return analysis of listed commercial banks in Nepal*".

The **major objectives** of the study were:

- To analyze the current status of risk and return of the listed commercial banks in Nepal
- To analyze the diversifiable and undiversifiable risk and return on the common stocks of listed commercial banks.

- To examine whether the shares of sample commercial banks are correctly priced or not.
- To analyze the portfolio return and risk of the sample commercial banks.
- To assess the present status of portfolio management of sample commercial banks

The **findings** were:

- The share of NABIL offered the highest average rate of return i.e., 63.47% with highest risk i.e. 88.99% whereas the share of NIBL offered the lowest average rate of return i.e., 14.95% with the risk i.e., 37.87%. On the basis of average rate of return, the share of NABIL seemed to be best for investment. Considering the overall market, however, the shares of all the commercial banks were attractive for investment.
- Coefficient of variation can depict the exact position of risk per unit of return. Lower CV is preferable. It seemed that the CV of SCBNL was the highest and of HBL was the lowest among all. So, investors retaining the stocks of SCBNL should assume more risk than any other.
- From the results, co-variances between the returns of SCBNL, HBL, NIBL and NABIL with the overall market returns are 9.53%, 13.02%, 7.99%, and 10.99% respectively. As a covariance between two variables measures the absolute association between them; there is the highest absolute association between the returns of HBL and market. Among all, NABIL has the second largest association, and at last NIBL has the least association with market.
- The positive correlation coefficients observed in the statistical results revealed that if the return on shares of the entire commercial banks moves below its average return and vice versa. The correlation coefficient of all commercial banks are less than 1, which indicates that return on individual stocks move less than the proportionate movements of the returns on overall market.
- The stocks of SCBNL, NIBL and NABIL appeared to be defensive stock in their beta coefficients are less than one. However, the stock of HBL has been found to be aggressive and more volatile since its beta coefficient is 1.07. On the basis of

beta coefficient, the stock of HBL is more risky and the stocks of SCBNL, NIBL and NABIL are less risky than market. Stocks of NIBL are least risky among all.

- Comparing each other, the stocks of HBL has the highest systematic risk i.e., 13.99% whereas the stock of NIBL has the lowest systematic risk. On the basis of systematic risk, the stocks of the NIBL are more attractive than others. The stocks of HBL appear more risky.
- It seems that 64% variability of returns of the common stocks of SCBNL is systematic or caused by market factors. Likewise, 60% risk of HBL is the result of market factor and 36% and 12.5% of NIBL and NABIL are due to market factors. These cannot be reduced. The stock of NABIL has the greatest unsystematic risk and SCBNL has the least unsystematic risk. Out of total risks of SCBNL, HBL, NIBL and NABIL, are 36%, 40%, 36%, and 87.5% are unsystematic or company specific which can be diversified away with an optimal portfolio construction. There is the highest company specific risk of the stocks of NABIL i.e. 69.30%. From the unsystematic risk perspective, the management errors or company specific weakness of NABIL are the highest among all.
- The stocks of commercial banks are under priced since their required rates of return are less than their average rate of returns. So, the investors are required to take long position to make profit from the common stocks of commercial banks.

The thesis submitted by Diwash Aryal (2007) entitled "*Investment decisions in NEPSE with reference to Capital Assets Pricing Model*".

The **major objective** of the study was to develop framework for investing in stocks available in the Nepal Stock Exchange with the use of CAPM.

The **major findings** were:

- The required rate of return calculated by using CAPM relationship gives the level of required return to justify the level of risk inherent in the investment alternative. It is the benchmark for investment decision. In the analysis of stocks, it is the

basis for determining over pricing and under pricing of stocks in capital market. Here in the analysis unilever has highest underpriced security followed by Mahalaxmi finance Co. Ltd,. Everest insurance Co. Ltd. Nepal Awas Bikas Bitta Co. Ltd, Shree ram sugar mills ltd.etc in the same way the least attractive company were Necon Air Ltd followed by Taragaon Regency Hotel led, Harisiddhi Bricks and tiles Factory.

- On the basis of sector wise analysis of CAPM. We found that banking, finance, manufacturing and processing sectors have undervalued security considering the required and expected rate of return and hotel; trading and other insurance sector have overvalued securities.

The thesis submitted by Hem Raj Bhandari (2007) entitled *"Risk and Return analysis of common stock of selected banks of Nepal with reference to NABIL, NIBL, EBL AND BOK"* has focused on various aspects of return and risk on common stock investment.

Major Objectives of the Study were:

- To assess the risk and return on common stock investment of commercial banks.
- To analyze the various aspects of return and risk of common stock investment.
- To evaluate the common stock of listed commercial banks in terms of risk and return
- To identify the covariance and correlation between the returns of common stocks of commercial banks
- To examine the relationship between the dividend and market price of stock with risk and return.

The **findings** of the study were:

- The expected return on common stock of BOK is maximum i.e., 70.36% due to effect of increase in price of share in the secondary market and it is also affected by the issue of bonus share. The expected return of NIBL is minimum i.e.,

30.93%. The minimum return is due to the decreased in share price and distribution of low amount of dividend per share.

- The risk of assets can be measured quantitatively using statistics SD and CV. SD is the strong statistical device to measure total risk involve in an investment that consists of both market risk and diversifiable risk. More ever, it is expected that SD and CV denotes the volatility rate of return therefore, total investment risk associated with common stock investment of difference selected companies are 46.56%, 29.44%, 30.3% and 23. 34% of NABIL, NIBL, EBL and BOK respectively.
- From the price evaluation of stock of commercial banks of four commercial banks are under priced. There is no stock in equilibrium (i.e. the stock market is not in equilibrium and all the stock in the market are striving towards equilibrium) and correctly price (i.e. expected rate of return of the stock of NABIL and EBL due to negative beta coefficient of stock.
- From the analysis of correlation coefficient of stock, there is no perfect positive and negative correlation coefficient between the stocks of two banks which is determined with the help of co-variance. NIBL and BOK have highest degree of positive correlation and NABIL and NIBL has the lowest degree of positive correlation coefficient. But from calculation, we found some stock of banks have negative correlation it seems better because negative correlated stocks can reduce total risk considerably.

Likewise, the study conducted by Sudip Tamang, (2009) on *"Risk and return analysis of commercial banks in Nepal"* conducted by taking eight commercial banks as sample.

According to his studies **major objectives** were:

- To determine whether the shares of commercial banks are correctly priced or not by analyzing required rate of return using the capital assets pricing model
- To identify the qualitative factors that are inhabiting NEPSE

Some of the **major findings** were as follows:

- In Nepalese capital market, the contribution of the real sector is negligible. Banking and financial sector occupy majority of pie in terms of capitalization and turnover.
- Most of the listed companies rarely publish their financial statement comprehensively within a specified period.

Another study done by J.B Sapkota (2010) entitled *"Risk and return analysis in common stock investment"* focusing eight commercial banks in Nepal.

The **main objective** of the study was:

- To analyze the risk and return of the common stock in Nepalese stock market.

Some of the **major findings** were as follows:

- Banking industry is the biggest one in terms of market capitalization and turnover. Expected rate of return on the common stock of Nepal Bank Ltd is maximum (66.99%) and common stock of Nepal SBI limited is found minimum.
- In this regard, common stock of NBL is most risky and common stock of NSB is less risky. In the context of industries, expected return of finance and insurance industry is found highest expected return of banking industry in 60.83%.

Another thesis submitted by Sagun Neupane (2011), entitled *"Risk and Return analysis with reference to listed commercial banks in Nepal"* is also related to this study.

The **major objective** is the comparison of risk and return of the commercial banks.

For this his **major findings** were:

- The return is the income received on a stock investment, which is usually expressed in percentage expected return on the common stock of SCBNL is maximum (i.e. 128.60%), which is very high rate of return. In reality this rate

exists only due to the effect of unrealistic annual return because of the issue of bonus share and increase in share price. Similarly, expected return of the common stock of Himalayan Bank Ltd is found minimum (i.e. 28.94%)

- On the basis of S.D., common stock of NBBL is most risky because of its lowest S.D. and common stock of HBL is least risky because of its lowest S.D . On the other hand, we know that CV is more rational basis for investment decisions, which measures risk per unit return. On the basis of CV common stock of NABIL is the best among all banks; NABIL has 0.86 unit of risk per unit of return. However, common stock of NABIL has the highest risk per unit return (i.e. 1.2729)

2.7 Research Gap

The purpose of this research is to develop some expertise in one's area, to see what new contributions can be made and to receive some ideas, knowledge and suggestions in relation to risk and return. The previous thesis 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. Hence, it is clear that new research cannot be found on that exact topic i.e risk and return analysis and an application of CAP model in commercial banks of Nepal. Therefore, to fulfill gap, this research is 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 different procedures of measuring risk of the commercial banks. Our main research problem is to analyze whether the commercial banks are able to minimize the risk along with the return or not. To achieve the main objective various financial and statistical tools are used.

Similarly, trend analysis of MPS, DPS, return and others are reviewed to make this research complete. Therefore, the study is useful to concerned bank as well as different people, such as shareholders, investors, policy makers etc.

CHAPTER III
RESEARCH METHODOLOGY

3.1. Introduction

This chapter deals with the methods used while conducting research work. It briefly explains about the overall procedures including the type of data collected, how they were analyzed and how the findings were derived from those data. It also explains what type of research was conducted.

Research is a knowledge building process. It generates new knowledge which can be used for different purpose. Research is undertaken not only to solve a problem existing in the work setting but also to add or contribute to the general body of knowledge in a particular area of interest to the researcher. Methodology is the research method used for investigation. "Research methodology refers to the various sequential steps to be adopted by a researcher in studying a problem with certain objective in view."(Kothari; 1989:30) Research methodology is the way of doing and completing research work. It is the way to solve research problem systematically. The study is more analytical and empirical. It covers quantitative methodology using financial and statistical tools. The study is mainly based on secondary data gathering from respective annual reports from concerned banks and from NEPSE.

3.2 Research Design

Research design is a controlling media for the collection of data and it helps to collect the accurate information which is related to risk and return on common stock of commercial selected banks of Nepal for this study. Research design is the plan structure and strategy of investigation conceived so as to obtain answer to research questions and to control variance.

In this study, the research is based on the recent historical data. So it is a historical research and covers the data from the fiscal year 2006/07 to 2011/2012 A.D. The analytical research design has been included in this study. For analytical purpose the annual reports and financial statements of related commercial banks are collected. Therefore this study is more analytical and empirical and less descriptive.

3.3 Population and Sample

More than 135 listed companies from various sectors like banking, insurance, development banks, finance companies, trading companies, hotels and airlines in NEPSE represents the total population. However, this study is concentrated in three commercial banks only. The banks are selected on the basis of data availability and also because banking industry represent the financial sector too.

The selected companies provide a platform to compare the differences in the stock price, risk, expected return, required rate of return which finally reflects investors' attitude towards these sectors. The selected companies are as follows.

Table 3.1

List of Banks selected for the study

Sectors	Name of the Company	Years Selected	No. of Observations
Banks	NABIL Bank Limited	2006 to 2012	7
	Standard Chartered Bank Limited	2006 to 2012	7
	Nepal Investment Bank Limited	2006 to 2012	7
	Total		21

3.4 Sources of Data

The study is mainly based on secondary data. Data related to market price of stock, market capitalization, movement of NEPSE index, etc has been taken from related websites of NEPSE and also from financial reports of commercial banks. Besides, the secondary data have been acquired from various other sources like:

- Annual reports of concerned commercial banks
- Trading reports published by Nepal Stock Exchange Ltd.
- Material published in paper and magazines
- Internet/ web source
- Relevant journals, articles and books available in published/unpublished form
- Other related books and booklets of concerned banks

3.5 Data Collection Procedure

The collection of data is done through the various reports published by Security Exchange Board and also by visiting the websites of the banks. The types of data collected through these reports are Market price per share, dividend distribution, Market Capitalization, risk free rate etc.

3.6 Method of Data Analysis

The various financial and statistical tools have been used to analyze and interpret the data. The brief explanations of the tools used are as follows:

(a) Expected return of common stock E (R_J)

The present study one of the main object is to determine the expected return on investment in common stock. The expected rate of return is based upon the expected cash receipt and expected capital appreciation. Expected rate of return is obtained by arithmetic mean of the past year return. The expected return of common stock is calculated by using the following formula.

$$E(R_J) = \overline{R_J} = \frac{\sum R_j}{N}$$

Where,

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

N = Number of years

R_j = Realized rate of return on common stock 'j'

(b) Required Rate of return, [(E (R_j)]

The capital assets pricing model is used to determine the equilibrium expected rate of return (required rate of return). It is the return investor expects for bearing the certain risk on his investment. The CAPM is undoubtedly the most successful model to link the risk and expected return of capital assets. According to the CAPM, the differences in risk premium assets are due to differences in the systematic risk of the assets. This risk is called beta and measures the sensitivity of the return of an asset relative to the movement in the market return. Given the risk free rate, CAPM predicts that the expected return of an asset is an upward sleeping linear function of its beta. Required rate of return of an asset is calculated by using the following formula

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

Where,

$\sum (R_j)$ = Required rate of return of an assets 'J'

R_f = Risk free rate

$\sum(R_m)$ $=R_m$ = Expected overall return for the market portfolio

β_j = Beta coefficient for security 'J

(c) Beta Coefficient (β)

The standard deviation is a measure of total risk of the assets i.e. it measures the dispersion of returns around the mean return. Total risk can be classified as the

diversifiable (nonsystematic) and non-diversifiable (systematic) risk. Making portfolio between the securities can diversify the diversifiable portion of total risk. But on the other hand non-diversifiable risk is created from the market related factors. This risk cannot be diversified away and investor should expect to receive additional return associated with the systematic risk. The systematic risk can be measured. Since the sources of systematic risk are market persuasive. It is logical to measure systematic risk as the covariance between the return of individual assets or portfolio and the return of the market portfolio, which consists of all risky assets. This measure of systematic risk is represented by beta (β). Securities with beta above market beta (βm=1) are classified as more risky (aggressive) and the securities with betas less than market beta as less risky (defensive) in comparison with the market risk. The beta coefficient is calculated by using the following formula.

$$B_j = \frac{Cov\,(R_j R_m)}{\sigma m^2} = \frac{Cov_{jm}}{\sigma_m^2}$$

Where,

β_j = Beta coefficient of stock 'j'

COV_{jm}= Covariance between R_j and R_m and is equal to

$$Cov_{jm} = \frac{\sum \left(R_j - \overline{R_j}\right)\left(R_m - \overline{R}_m\right)}{N-1}$$

σ^2_m = Variance of market return

(d) Correlation coefficient

Correlation analysis refers to the techniques used in measuring the degree of relationship of movement of securities' return. Correlation is a relative measure of relationship that is bounded by +1.0 and -1.0. It is a statistical measure of the extent to which the returns on any two securities are related, however, it denotes only association not causation. Covariance and correlation are closely related. Correlation analysis reduces the range of

uncertainty and measures in one figure the degree of relationship existing between the stocks. The correlation coefficient is determined by using the following formula.

$$\gamma_{AB} = \frac{Cov(r_j, r_i)}{\sigma_i \cdot \sigma_j} = \frac{\sigma ij}{\sigma_i \cdot \sigma_j}$$

Where,

γ_{AB} = Correlation between the return of stock i & j

(e) Standard Deviation (σ)

Standard deviation is the most popular and most useful measure of dispersion and gives uniform, correct and stable results. The chief characteristic of standard deviation is that it is based on mean return, which gives uniform and dependable results. It is an absolute measure of variation. Mainly it measures the chances of deviation from the expected mean return. The main advantage of standard deviation is that the uncertainties can be summarized into a single, easily calculated number and the main drawback is that it coincides possible return above the expected return to be as risky as returns below the expected return. Thus the standard deviation is defined as the positive square root of average sum of squares of deviations from the arithmetic mean of distribution. Alternatively it can be calculated as a weighted deviation from the expected return considering both the rate of return and probabilities associated with the return. The large is the standard deviation the greater is the volatility of the return from any investment. The standard deviation is calculated using the following formula.

$$\sigma_j = \sqrt{\frac{\sum \left(R_j - \overline{R_j}\right)^2}{N-1}}$$

Where,

σ_j = Standard deviation of return on stock 'j' during the time period n

R_j = Realized rate of return on stock 'j' at time’t’

R_j = Expected rate of return on stock 'j'

(f) Coefficient of Variation (C.V.)

Standard deviation is an absolute measure of dispersion. The relative measure of variation based on the standard deviation is known as the coefficient of variation. Coefficient of variation measures the risk per unit of expected return. It is an independent unit so observation can be compared with the help of C.V. for their variability. Lesser the C.V. more is the uniformity or consistently of the return. The coefficient of variation is calculated using the following formula.

$$C.V. = \frac{\sigma_1}{R_1}$$

Where,

C.V. = Coefficient of variation

σ = Standard deviation of return on common stock 'J'

R_j = Expected rate of return on stock 'J'

3.7 Definition of the Terms

(a) Market Price of Stock (P)

Market price of stock is determined by demand and supply forces. NEPSE Quote three prices namely high low and close each day. In the present study closing price of common stock at the end of fiscal year (16^{th} July) is used as market price of stock, which has a specific time span of one year. The study focuses in an annual basis.

(b) Dividend Yield

Dividend yield explains the relationship between the market price of the stock and the return provided by the enterprise in the form of dividend in the respective year. It is also known as ordinary gain. Here, stock dividend is also converted into cash dividend.

Therefore, total dividend is equal to cash dividend plus stock dividend. It is calculated as:

$$R = \frac{DPS}{MVPS} \times 100$$

Where,

DPS = Dividend per Share (cash dividend + stock dividend)

MVPS = Market Value per Share (Beginning price)

Cash equivalent of stock dividend is calculated as:

Cash equivalent stock dividend = SDR × Ending MPS

Where,

SDR = Stock Dividend Rate

(C) Capital Gain or Loss Yield

It is the appreciation (or depreciation) in the price of the asset. The capital gain or loss is the difference between the purchase price and the price at which the asset can be or is sold.

$$\text{Capital gain yield} = \frac{Ending\ price - Beginning\ price}{Beginning\ price} \times 100$$

(d) Return on Common Stock Investment (R)

The return to shareholders is the touchstone of financial analysis. The return to common stock investment is defined as the average of the sums of the dividend yield plus capital gains per year over the measurement period.

Return is the income received on an investment plus any change in market price, usually expressed as a percent of the beginning market price of investment. The return on common stock invested is calculated by using the following formula.

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

Where

R = Actual rate of return on common stock at time t

D_t = Dividend yield during time't'

P_t = price of stock at time't'

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

(e) Systematic Risk

It is also known as undiversifiable risk. This risk is that portion of total variability in return caused by market factors (also called market risk) that simultaneously affect the prices of all securities. Undiversifiable risk occurs due to the changes in the macro economic factors like interest rate, inflation, investors' expectations, GDP, etc. moreover, it is the causes of external environment (political, economic, sociological and technological) of the firm.

Undiversifiable risk is that part of the total risk that cannot be eliminated by allocating capital to a diversified portfolio if investments. A statistical measure of undiversifiable risk index is beta coefficient.

$$\text{Beta Coefficient } (b_j) = \frac{\text{Cov}(r_i, r_m)}{\sigma^2 m}$$

Where,

b_i = beta coefficient of ith asset,

$\sigma^2 m$ = variance of market return

$\text{Cov}(r_i, r_m)$ = covariance between the returns of security and market

(f) Unsystematic Risk

Unsystematic risk is also known as diversifiable risk. This type of risk is unique to an organization and can be largely eliminated by holding a diversified portfolio if

investment. Diversifiable risk occurs through the events like labour strikes, management errors, inventions, advertising campaigns, availability of raw materials etc.

More precisely, the unsystematic risk is unique to each firm; an efficiently diversified portfolio of securities can successfully eliminate most of the unsystematic risk inherent in individual securities.

3.8 Partitioning of Total Risk

Partitioning risk is the division of the total risk (variance) into systematic and unsystematic components.

Total risk = Unsystematic Risk – Systematic risk

$$Var(r_j) = b_j^2 Var(r_m) + Var(e)$$

Alternatively,

$$\sigma_j^2 = b_j^2 \sigma_m^2 + \sigma_e^2$$

Where,

σ_e^2 = variance of standard error

σ_j^2 = Total risk of 'j' stock

$b_j^2 \sigma_m^2$ = Systematic risk

3.9 Portfolio Risk and Return

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

3.9.1 Portfolio Return E (R_P)

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

Symbolically,

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

Where,

$E(R_P)$ = Expected return on portfolio

W_i = Weight or proportion of fund invested in i^{th} security

W_j = Weight or proportion of fund invested in j^{th} security

3.9.2 Portfolio Risk

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

$$\sigma_{P=} \sqrt{W_{i^2}\sigma_{i^2} + W_{j^2}\sigma_{j^2} + 2COV_{ij}W_iW_j}$$

Where,

σp = Standard deviation of portfolio

σ_i^2 = Variance of return of security (i)

σ_j^2 = Variance of return of security (j)

W_i = Weight or proportion of security (i)

W_j = Weight or proportion of security (j)

COV_{ij} = Covariance between return of assets i and j

ρ_{ij} = correlation coefficient between the return of security i and j

3.9.3 Minimum Variance Portfolio

It is the portfolio of stock that will minimize the possible unsystematic risk. This portfolio is also known as optimal portfolio. An investor can develop many portfolios from the available (limited) fund and each portfolio gives its own standard deviation and expected return but what proportion of investment in two different assets give minimum (lowest) variance (risk) that is calculated using following equation.

$$W_i = \frac{\sigma j^2 - COV_{ij}}{\sigma i^2 + \sigma j^2 - 2\ COV_{ij}}$$

3.10 Trend Analysis

The arrangement of statistical data chronologically (according to occurrence of time) is known as time series and the statistical analysis of this chronological variation is termed as Time Analysis. It helps to know the past behavior of data in certain span of time interval. On the basis of these past trends, one can make plan in forthcoming days. This least square method is the most popular and widely used mathematical method of measuring trend. This is frequently used for future prediction. There are various types of curves that may be used to describe the given data but in this text. An attempt has been made to discuss only the fitting linear trend by the least square method.

Let, the equation of Trend Analysis would be,

Y= a+ bx

Where,

Y= the given value of the variable in time series. It is a dependent variable.

a= intercept of trend line or y-intercept

b= slope of trend line

x= time variable

In order to study and evaluate the investment made so far in stocks of the given banks, trend analysis has been done on the basis of return and dividend yield. The trend analysis is however, limited to eight years period from 2006/07 to 2013/14 A.D.

CHAPTER IV
DATA PRESENTATION AND ANALYSIS

4.1 Introduction

In this chapter raw form of data of the selected banks, collected from various sources are changed to an understandable presentation using tools mentioned in the previous chapter i.e. Research Methodology. This chapter is the heart of this study that is fully related to analysis and interprets various outcomes. The analysis of data consists of organizing; tabulating and performing risk return analysis of common stock.

This chapter has tried to analyze and diagnose the deviation of return on stock, its systematic risk associated with market and unsystematic risk inherent in itself.

4.2 Analysis of Securities

Secondary data are the data, which are already analyzed, concerned to the subject. In this regard the data related to the analysis like yearend price of stock, dividend yield, risk free rate, market capitalization of stock are taken into consideration to get the result using different statistical tool related to CAPM.

4.2.1 Risk Free Rate (Rf)

Risk free rate is the real rate of return by which an investment grows annually after adjusting for inflation if there is no risk associated with the investment. The average realized rate of return of 364 day Treasury bill for the period 2006/2007 through 2011/2012 has been taken as the proxy for the risk free rate of return (Rf). Thus, risk free rate of return used in our study is evident from the Table 4.1

Table 4.1

Risk Free Rate of Return

Fiscal Year	364 –Day Treasury Bills Rate
2006/07	3.50
2007/08	5.49
2008/09	6.06
2009/10	7.85
2010/11	8.35
2011/12	2.94
Total	34.19
Av. Return on T-bill (Rf)	5.70

Source: Quarterly economic bulletin (2012-07), Nepal Rastra Bank.

4.2.2 Analysis of Market Price per Share (MPS)

Market price per share is the main data of this study. The three price records are available (i.e. high, low and closing price) of each year. So either average prices of (high and low) or closing price can be used. Main argument of average price is it represents the price of whole year. However, to get the real average volume and price of each transaction in the stock and duration of time of each transaction in the whole year are essential. It is very difficult to obtain all these information and average of high and low price is not reliable and representative information. Hence the closing price is used as market price of stock, which has specific time span of one year and the study is based on annual basis.

Table 4.2

MPS OF SELECTED BANKS

(Rs.)

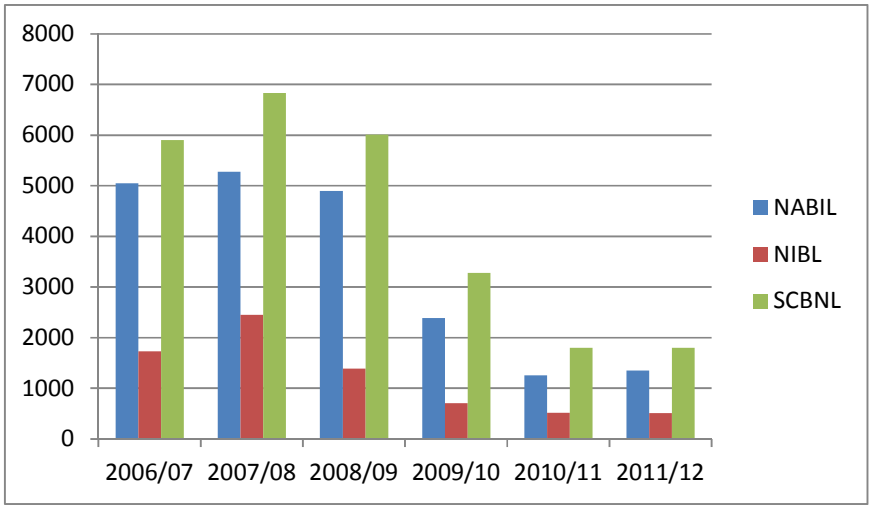
Fiscal Years	NABIL	NIBL	SCBNL
2006/07	5050	1729	5900
2007/08	5275	2450	6830
2008/09	4899	1388	6010
2009/10	2384	705	3279
2010/11	1252	515	1800
2011/12	1355	511	1799

Data Source: yearly annual reports

From the above table it is clear that the SCBNL has highest MPS among the selected banks whereas NIBL has the least MPS. From the given MPS of the banks we can know that the MPS of NIBL and SCBNL in last two years is decreasing.

The facts can be more clearly expressed in the bar diagram:

Fig. 4.2 MPS of Selected Banks



4.2.3 Analysis of Earning Per Share (EPS)

Earnings per share are generally considered to be the single most important variable in determining a share's price. It is also a major component used to calculate the price –to-earning valuation ratio.

For example, assume that a company has a net income of Rs. 25 million. If the company pays out Rs. 1 million in preferred dividend and has 10 million shares for half of the year and 15 million shares for the other half, the EPS would be Rs. 1.92 (24/12.5). First, the Rs. 1 million is deducted from the net income to get Rs. 24 million, and then a weighted average is taken to find the number of shares outstanding (0.5× 10M+ 0.5×15M =12.5M). An important aspect of EPS is that it often ignores the capital that is required to generate the earnings (net income) in the calculation. Two companies could generate the same EPS but one could do so with less equity investment – that company would be more efficient at using its capital to generate income and all other things being equal would be a better company. Investors also need to be aware of earning manipulation that will affect the quality of the earnings number. It is important not to rely on any one financial measure, but to use it in conjunction with statement analysis and other measures. It is the portion of the company's profit allocated to each outstanding share of common stock. Earnings per Share serve as an indicator of a company's profitability.

Table 4.3

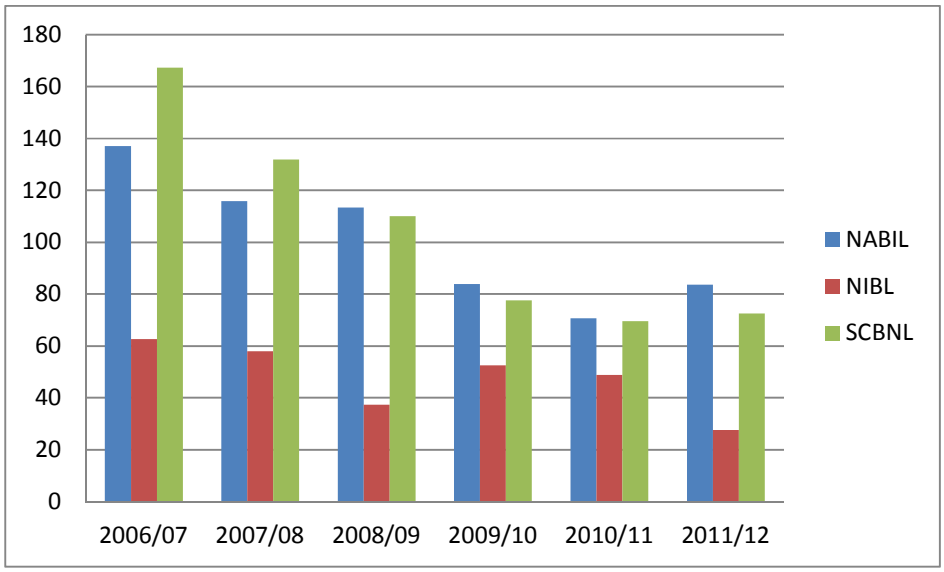
EPS of selected Banks

Amount in '000'

Fiscal Years	NABIL	NIBL	SCBNL
2006/07	137.08	62.57	167.37
2007/08	115.86	57.87	131.92
2008/09	113.44	37.42	109.99
2009/10	83.81	52.55	77.65
2010/11	70.67	48.84	69.51
2011/12	83.57	27.6	72.60

Source: yearly annual report

Fig. 4.3 EPS of Selected Banks



From the above table the SCBNL earns the highest earning per share and NIBL earns the least among the selected commercial banks. In the year 2011/12 EPS of NABIL is the highest among all. The investors are interested in their earning per share, which is an indicator for investment decision.

4.2.4 Analysis of Dividend per Share (DPS)

There are no problems to take the dividend amount if a company declares only cash dividend. But if company declares stock dividend (Bonus share), it is difficult to obtain the amount of total dividend that really shareholder has gained. In this case, they get extra number of shares as dividend and simultaneously price of stock declines as a result of increased number of stocks.

The dividend per share of the selected banks including stock dividend after conversion of it into cash dividend has been presented in the given table.

Table 4.4

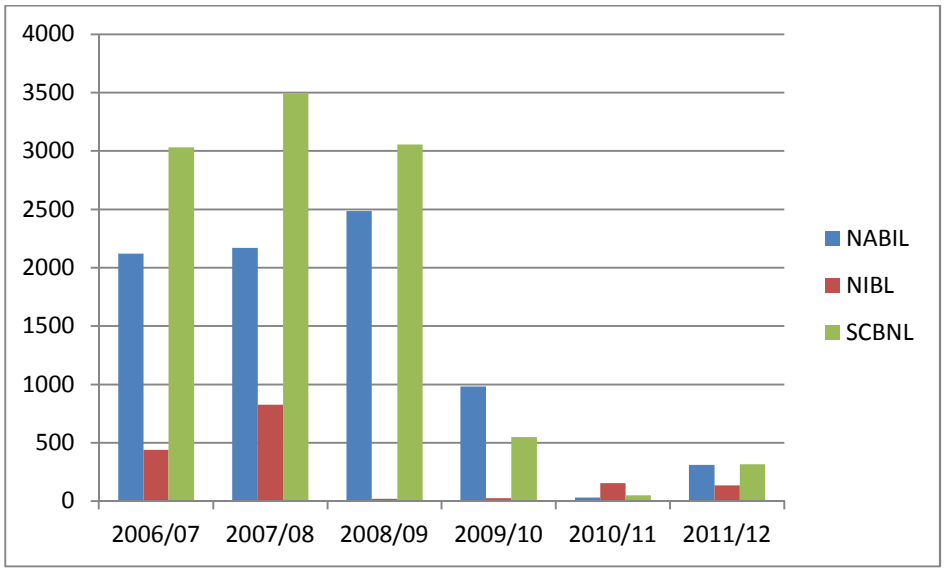
Total Dividend of Selected Banks

Amount in '000'

Fiscal Years	NABIL			NIBL			SCBNL		
	Cash Div	Stock Div	Total Div	Cash Div	Stock Div	Total Div	Cash Div	Stock Div	Total Div
2006/07	100	2020	2120	5	432.25	437.25	80	2950	3030
2007/08	60	2110	2170	7.5	816.585	824.085	80	3415	3495
2008/09	35	2449.5	2484.5	20	0	20	50	3005	3055
2009/10	30	953.6	983.6	25	0	25	55	491.85	546.85
2010/11	30	0	30	25	128.75	153.75	50	0	50
2011/12	40	271	311	5	127.75	132.75	45	269.85	314.85

(Source: Appendix 1)

Fig. 4.4 Total Dividend of Selected Banks



From the above figure, it is clear that SCBNL distributes the highest DPS. In the beginning of the two years SCBNL has distributed Rs. 80 as cash dividend. Its dividend has been decreased in the last four years and finally reached to Rs. 45. But in the fiscal

year 2010/11 the DPS of NIBL is highest i.e. Rs. 153.75. In this year both the banks NABIL and SCBNL has not distributed stock dividend. In the year 2011/12 all these banks have distributed stock dividend and cash dividend. The bank distribute stock dividend instead of cash dividend to increase the number of share and share amount.

4.2.5 Dividend Yield

Dividend yield explains the relationship between the market price of the stock and the return provided by the enterprise in the form of dividend in the respective year. The calculated dividend yield of the given banks is shown in the below table.

Table 4.5

Dividend Yield of selected banks

(In %)

Fiscal Years	NABIL	NIBL	SCBNL
2006/07	94.65	34.70	80.26
2007/08	42.97	47.66	59.24
2008/09	47.10	0.82	44.73
2009/10	20.08	1.80	9.10
2010/11	1.26	21.81	1.52
2011/12	24.84	25.78	17.49

(Source: Appendix 2)

From the above table it can be seen that the dividend yield of all these three banks distributed every year. This dividend includes both cash dividend and stock dividend. In the year 2011/12 the dividend yield of NIBL is the highest followed by NABIL and SCBNL.

4.2.6 Capital Gain or Loss Yield

It is the appreciation (or depreciation) in the price of the asset. The capital gain or loss is the difference between the purchase price and the price at which the asset can be or is

sold.

$$\text{Capital gain yield} = \frac{Ending\ price - Beginning\ price}{Beginning\ price} \times 100$$

Table 4.6

Capital gain yield of selected banks

(In %)

Fiscal Years	NABIL	NIBL	SCBNL
2006/07	125.45	37.22	56.29
2007/08	4.46	41.70	15.76
2008/09	-7.13	-43.35	-12.00
2009/10	-51.34	-49.21	-45.44
2010/11	-47.48	-26.95	-45.11
2011/12	8.23	-0.78	-0.06

(Source: Appendix 3)

From the above table we come to know that in the earlier year there was capital appreciation of the banks but latter there was capital loss. But in the year 2011/12 NABIL is able to make capital appreciation by 8.23%.

4.2.7 Ordinary Gain Yield or Interest or Dividend Yield

It is the periodic cash receipt or the dividend received each year. It includes both stock dividend and cash dividend. It is calculated as:

$$\frac{\text{Total dividend}}{\text{Beginning Price}} \times 100$$

Table 4.7

Ordinary gain yield of selected banks

(In %)

Fiscal Years	NABIL	NIBL	SCBNL
2006/07	94.65	34.70	80.26
2007/08	42.97	47.66	59.24
2008/09	47.10	0.82	44.73
2009/10	20.08	1.80	9.10
2010/11	1.26	21.81	1.52
2011/12	24.84	25.78	17.49

(Source: Appendix 2)

From the above table we come to know that the bank always distributes its dividend. Earlier year the ordinary gain yield was higher compare to the latter years. In the year 2010/11 NIBL has given the highest dividend yield i.e 21.81% whereas others are minimal. But in the year 2011/12 all these banks have given considerable dividend yield.

4.3 Analysis of Risk and Return in Nepalese Commercial Banks

The expected rate of return is the increase in the expected after tax value of the initial investment over the holding period. The overall rate of return can be decomposed into capital appreciation and dividend components. The return on an investment of a company's stock is usually dividend plus change in market price of share (Capital appreciation plus cash receipt). Capital appreciation means the difference between ending value and beginning value of an investment. The actual returns of investment in common stock may differ substantially, since; both capital appreciation and dividend receipt on common stock is uncertain item. The relationship between different levels of returns and their relative frequencies is called a probability distribution. The expected return on an investment is the mean value of its probability distribution of returns.

4.3.1 Expected Rate of Return

Expected rate of return measures the likely return one would realize in the forthcoming period. Return on investment consists of two components. The first component that usually comes is the periodic cash receipts (cash dividend and stock dividend). The second component is the appreciation (or depreciation) in the price of the stock. Theoretically, it is the summation of all likely rates of return divided by the number of observations. Here, expected rate of return of individual stock is calculated from their historic realized rate of returns.

Table 4.8

Expected Rate of Return of NABIL Bank

(In %)

YEAR	Capital Gain Yield	Ordinary Gain Yield	Total Return
2006/07	125.45	94.65	220.10
2007/08	4.46	42.97	47.43
2008/09	-7.13	47.10	39.97
2009/10	-51.34	20.08	-31.26
2010/11	-47.48	1.26	-46.22
2011/12	8.23	24.84	33.07
Total Return			263.09
ΣRj/N (%)			43.85

(Source: Appendix 4)

From the above calculations we come to know that the ordinary gain of NABIL is always high but there comes capital loss in the year 2008/09 to 2010/11. That is why its return is also negative in those years. But in the year 2011/12 its return is 33.07%. The expected return of NABIL is found to be 43.85%.

Table 4.9

Expected Rate of Return of NIBL Bank

(In %)

YEAR	Capital Gain Yield	Ordinary Gain Yield	Total Return
2006/07	37.22	34.70	71.92
2007/08	41.70	47.66	89.36
2008/09	-43.35	0.82	-42.53
2009/10	-49.21	1.80	-47.41
2010/11	-26.95	21.81	-5.14
2011/12	-0.78	25.78	25
Total Return			91.3
ΣRj/N (%)			15.22

(Source: Appendix 4)

From the above calculation, we come to know that the NIBL bank always has ordinary gain but there comes capital loss in the year 2008/09 to 2011/12. Due to capital loss its returns are also negative in the same years, but in the year 2011/12 return is positive. Expected return of NIBL bank is 15.22%

Table 4.10

Expected Rate of Return of SCBNL Bank

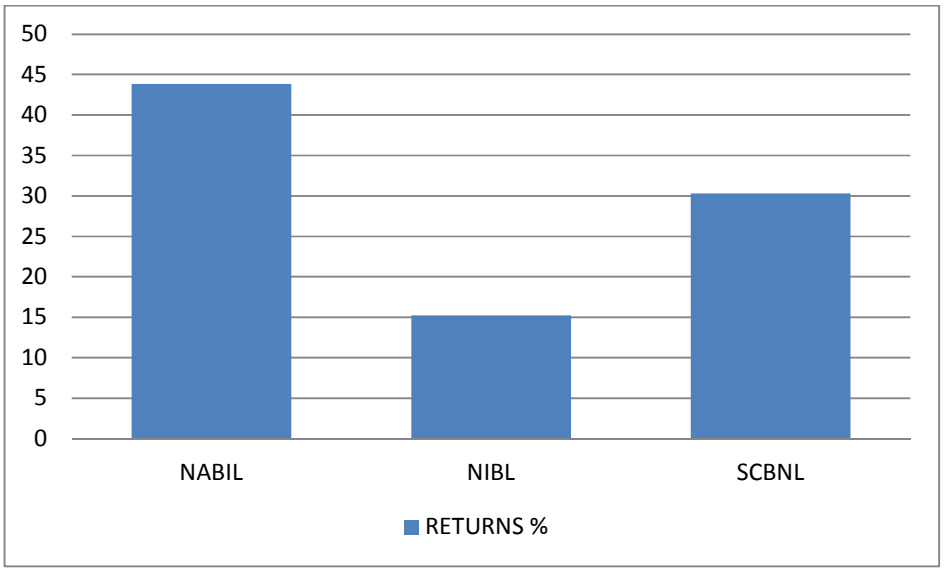
(In %)

YEAR	Capital Gain Yield	Ordinary Gain Yield	Total Return
2006/07	56.29	80.26	136.60
2007/08	15.76	59.24	75.00
2008/09	-12.00	44.73	32.70
2009/10	-45.44	9.10	-36.30
2010/11	-45.11	1.52	-43.60
2011/12	-0.06	17.49	17.43
Total Return			181.84
ΣRj/N (%)			30.31

(Source: Appendix 4)

From the above calculation, we come to know that the SCBNL bank always has ordinary gain but there comes capital loss in the year 2008/09 to 2010/12. Due to capital loss its return are also negative but in the year 2011/12 its return is positive because of higher ordinary gain and lower capital loss. Expected return of SCBNL bank is 30.31%

Fig. 4.5 Expected rate of returns of selected banks



From the above figure, it is clear that NABIL yields the highest rate of return i.e. 43.85% followed by SCBNL with 30.31% return. And NIBL has the least expected rate of return with 15.22%. Every investor's interest is to have the highest rate of return. In the order of hierarchy of investment it is better to invest in NABIL, SCBNL and NIBL.

4.3.2 Determination of Risk

It is a statistical tool to measure risk on stock. It tells us how the returns on stock are dispersing from its average return. Risk is perceived 'variability' of returns and is the deviation between the actual return and the expected return. Such variability, statistically, is measured by standard deviation or variance. The standard deviation and the variance

are equally acceptable and conceptually equivalent quantitative measures of an asset's total risk.

Table 4.11

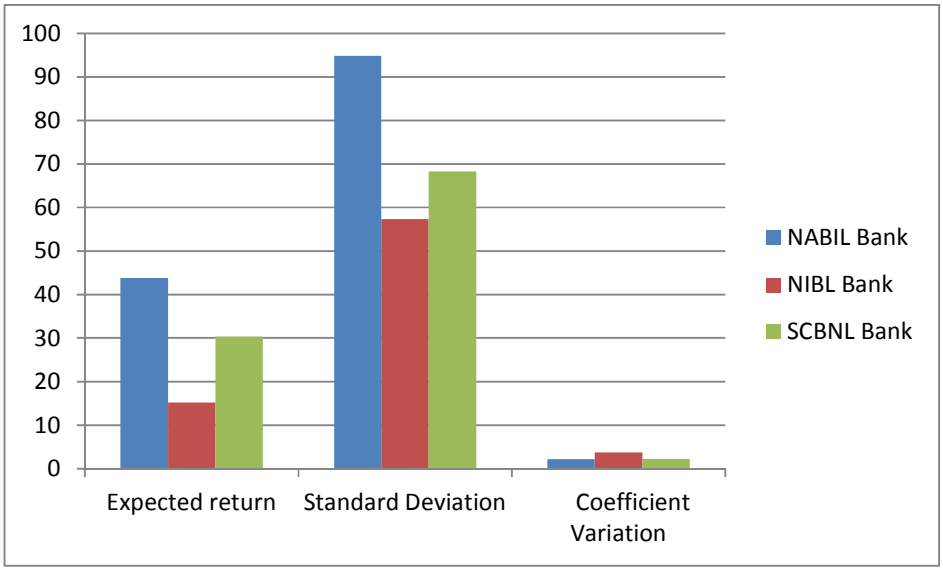
Expected Return, Standard Deviation and Coefficient of Variation of Selected Banks

Name of the Banks	Expected return	Standard Deviation	Coefficient Variation
NABIL Bank	43.85	94.83	2.16
NIBL Bank	15.22	57.41	3.77
SCBNL Bank	30.31	68.36	2.26

(Source: Appendix 4 &5)

Fig. 4.6

Expected Return, Standard Deviation and Coefficient of Variation of selected Banks



4.3.2.1 Expected Return

An expected return is the return from an asset that investors expect they will earn over some future period. It is a predicted return, subject to uncertainty, and may or may not occur. The expected return is calculated on the basis of historical return i.e. realized return. From the above table we can see that the expected return of NABIL bank (i.e., 43.85%) is the highest. SCBNL gives 30.31% return and NIBL has the least return with

15.22%. While making decision of making investment in the stocks by analyzing return it is better to invest in NABIL bank due to its highest return.

4.3.2.2 Standard Deviation

Standard Deviation is the best measure of dispersion. It is an improvement over the mean deviation and is free from the defects of other measures of dispersion. The standard deviation is defined as the positive square root of the arithmetic mean of the squared deviations from their arithmetic mean of a set of values. Standard Deviation measures the magnitude of the difference between best possible return and worst possible return. It is the measure of risk of a company's stock. Smaller the Standard Deviation, lower the riskiness of the stock. Thus, the Standard Deviation is a weighted average of the deviation from the expected value, and it provides an idea of how far above or below the expected value the actual value is likely to be.

Among the listed Banks analyzed, NABIL has the highest standard deviation of 94.83%. SCBNL standard deviation is 68.36% and NIBL has the least standard deviation of 57.41%. After analyzing the deviation of the selected banks, we come to the conclusion that the investment in the stock of NIBL is least risky than investment in SCBNL and NABIL. Also, investment in NABIL could be proved very risky and its stock is likely to be more volatile compared to others.

4.3.2.3 Coefficient of Variation

The Coefficient of variation (C.V) is another measure of risk. It is simply standard deviation divided by the expected return. The coefficient of variation shows the risk per unit of return, and it provides a more meaningful basis for comparison when the expected returns on two alternatives are not the same. To most people, this is a common sense – return is "good", risk is "bad", and consequently investors want as much return and as little risk as possible. But to choose between two investments when one has the highest expected rate of return but the other has the lower Standard Deviation, we have the other

measure of risk, the coefficient of variation (C.V). Higher the C.V more risky the investment and lower the C.V lesser the risk in investment.

From the table we can observe that the CV of NABIL bank is 2.16, NIBL 3.77 and SCBNL 2.26. Coefficient of Variation (C V) helps to make the correct decision for selecting the stocks to make investment. This helps to select the investment which has less risk on per unit return. From the above analysis, it is clear that, it would be very correct decision to make investment in NABIL. Here its CV is lowest among these three i.e. 2.16. Although the CV of SCBNL is also lower, in comparison with NABIL. We have to prefer NABIL for SCBNL. Its return is also lower than that of NABIL.

4.4 Market Risk and Return

A portfolio consisting of all stocks is called market portfolio. The market return is simply the weighted average of all expected return on the individual assets in the portfolio. Market return is the summation of market capital gain and average market dividend yield. As the number of securities in the portfolio increases, the Standard Deviation of portfolio return decreases, but at decreasing rate. The risk of the portfolio has been divided into two parts. The parts that can be reduced through diversification are defined as unsystematic risk, while the part that cannot be eliminated is defined as systematic or market risk.

Table 4.12

Calculation of Annual Market Return

(In %)

Fiscal Years	Rate of Return
2006/07	76.81
2007/08	40.85
2008/09	-22.24
2009/10	-36.23
2010/11	-24.05
2011/12	7.41
Total Return	42.56
~~X~~	7.09
S.D of returns	44.06
CV of Returns	6.2

(Source: Appendix 6)

Fig. 4.7 Annual Market Return

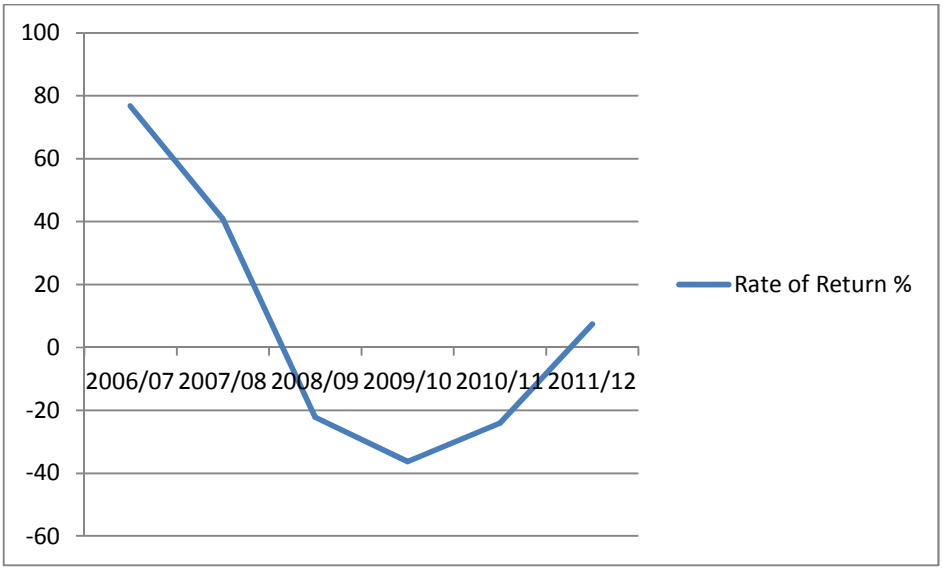


Table 4.7 presents the Market Return of NEPSE for different years calculated on the basis of NEPSE index. The calculated market return in the year 2006/07 is 76.81%. Similarly, the NEPSE market return during the year 2007/08 is 40.85%, in 2008/09 (-22.24%), in 2009/10 (-36.23%) in 2010/11 (-24.05%), and in 2011/12 (7.41%). So, the averages NEPSE return during the six years period comes out to be 7.09%, Standard Deviation 44.06% and Coefficient of Variation (CV) 6.2.

4.5 Comparison of Return and Risk of each bank with market

There is only one stock exchange in Nepal on market risk and return. The program has been started by Nepal Government to return capital converted securities. Stock exchange center Nepal 1993 has been working as a non- profit organization opening under a securities exchange act 1983. The overall market movement of the country is represented by market index or NEPSE index. The return and risk of market is the average return and risk of all the securities available in the market.

Table 13

Comparison of Risk and Return of each bank with market

%	Market	NABIL	NIBL	SCBNL
Return	7.09	43.85	15.22	30.31
S.D	44.06	94.83	57.41	68.36
CV	6.2	2.16	3.77	2.26

(Source: Appendix 4, 5 &6)

The returns of the banks are comparatively higher than that of market, whereas risks are also higher. We can see that CV of market is higher than that of banks. Therefore, investing in banks is profitable.

4.6 Analysis of Beta

The risk associated with any investment alternative can be classified into diversifiable (unsystematic) and undiversifiable (systematic) risk. Diversifiable risk is firm specific risk that results from the inefficiencies inherent within the firm while undiversifiable risk result from the macro economic factors like inflation , war, business cycle, epidemic, earthquake etc which all affects business units in an economy. Hence cannot be eliminated at all. While diversifiable risk can be eliminated to a large extent by increasing the number of securities in a portfolio. The relevant risk for an investor is the only undiversifiable risk. The market compensates only for the undiversifiable risk. The correct measure of undiversifiable risk is beta coefficient, b.

The tendency of a stock to move up and down with the market is reflected in its beta coefficient. Beta (b) is a key element of CAPM. An average –risk stock is defined as the one that tends to move up and down in step with the general market as measured by some index such as the Dow Jones industrials, the S&P 500, or the New York Stock Exchange index, NEPSE index. Such a stock will, by definition have a beta of 1.0 which indicates that, in general if a market falls by 10%, the stock will likewise fall by 10%. A portfolio of such b=1.0 stocks will move up and down the broad market averages, and it will be just as risky as the market.

Hence, beta measures a stock's volatility relative to average stock, which by definition has b=1.0 Beta coefficient of a stock is defined as its contribution to the riskiness of a portfolio. Stock's beta coefficient shows how the stock would affect the riskiness of a diversified portfolio.

Since, beta measures the variability of a stock's return with respect to the market return, the slope of a regression line of the stock's historic return against market return can be used to estimate beta. For the purpose of the study, the following statistical relationship is used to calculate the slope of regression line has been used to measure of the stock's beta

Table 4.14

Beta Analysis

Name of the bank	Beta	Comparison with market	Remarks
NABIL	1.91	>1	Aggressive
NIBL	1.20	>1	Aggressive
SCBNL	1.45	>1	Aggressive

(Source: Appendix 7)

The realized return of stock with beta equals to 1.0 fluctuates with the market equally in the same direction. The return of the stock having beta greater than1.0 fluctuates more than the return of the market portfolio and those of the ones with beta less than 1.0 fluctuates less than the return of the market.

To make investment choices, many professionals and investors use beta to compare stock's market risk of that of other stocks and the market as a whole. As per CAPM, expected return should relate to its degree of systematic risk and not to its degree of total risk systematic risk is the thing that matters to investors holding a well-diversified portfolio. Market Sensitivity of stock is explained by its beta coefficient, measures of systematic risk. Beta measures a stock's volatility, the degree to which a stock price fluctuates in relation to the overall market.

Here, the beta of NABIL, NIBL and SCBNL is 1.91, 1.20, and 1.45 respectively. Beta of all the selected banks are greater than one i.e. its beta is greater than that of market. Therefore only aggressive investors want to invest in the securities of these banks. In this type of investment there is high risk and high return.

4.7 Computation of Expected Rate of Return and Required Rate of Return using SML or CAPM:

The significant contribution of the Capital Asset Pricing Model (CAPM) is that it provides a measure of the risk of an individual security, which is consistent with portfolio

theory. It enables us to estimate the undiversified risk of a single asset and compare it with the diversifiable risk in a well-diversified portfolio.

The capital Market Line (CML) and the Security Market Line (SML) are merely different pictures of the same market equilibrium. The CML may be used for determining the required return only for those efficient portfolio that are perfectly correlated with the market portfolio because they fall on the CML but the 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 undiversified risk (measure by b and expected return).

Comparison of an equilibrium expected rate of return (required rate of return) with the expected rate of return provides a basis for investment decision. If the required rate of return is higher than expected rate of return, stock is said to be overpriced and an investor sold the held stock or may involve in short selling strategy. If the required rate of return is lower than expected rate of return a stock is said to be under priced security and an investor make buying strategy for this type of stock.

In short,

-expected rate of return> Required Rate of Return=Under Priced

-Expected Rate of Return=Required Rate of Return=Correct Priced

-Expected Rate of Return<Required Rate of Return=Overpriced

For the price evaluation we have to calculate the required rate of return. The required rate of return can be calculated as:

$$E(Rj) = Rf + [E(Rm) - Rf]\,\beta j$$

Where,

Rf =Risk Free Rate of Return

E (Rm) =Expected market rate of return

In the above equation the risk free rate of return is needed to determine. The interest rate of Treasury bill issued by NRB is taken as Rf in Nepal. As suggested by Treasury bill section of NRB, the t-bill rate comes to be approximately 5.70% at the current period.

Hence, the requirements for the equation are:

Rf=risk free rate of return=5.70%

E (Rm) =Expected market rate of return= 7.03%

Table 4.15

Comparison of Required rate of return and Expected rate of return

Name Of the Banks	Beta	Market Return	Required Rate of Return $E(Rj) = Rf + [E(Rm) - Rf]\ \beta$	Expected Rate of Return	Price Evaluation
NABIL	1.91	7.09	8.35	43.85	Underpriced
NIBL	1.20	7.09	7.37	15.22	Underpriced
SCBNL	1.45	7.09	7.72	30.31	Underpriced

(Source: Appendix 8)

From Table 4.15, it can be seen that, all the banks have higher expected return than the required rate of return, which indicates that their stock price are under- priced. NABIL has expected return of 43.85% compared to its required rate of return of 8.35%. NIBL has 15.22 % of expected return compared to 7.37% required rate of return and SCBNL has expected rate of return of 30.31% compared to its required rate of return of 7.72%.

Since all the stocks are underpriced, the commercial banks are in demand and there are investment opportunities in these stocks. The investors can gain from buying the underpriced stocks. But the price of the stock will increase only up to the point where expected rate of return is equal to required rate of return.

4.8 Partition of Total Risk

Total risk is the combination of diversifiable and undiversifiable risk.

Total risk = Undiversifiable risk + Diversifiable risk

$\sigma(R_{j,}) = COV\ (R_jR_m)/\sigma m + \sigma\ (e)$

Or, Diversifiable risk = Total risk- Unsystematic risk

The table below shows the segregation of total risk into diversifiable and undiversifiable risk.

Table 4.16

Calculation of Undiversifiable Risk and Diversifiable Risk

Name of the	Total Risk (%)	Undiversifiable Risk (%)	Diversifiable Risk (%)
Banks	σj	$COV\ (R_jR_m)/\sigma m$	$\sigma\ (e)$
NABIL	94.83	84.33	10.5
NIBL	57.41	52.82	4.59
SCBNL	68.36	63.70	4.66

(Source: Appendix 9)

The table presents the portion of undiversifiable risk and diversifiable risk in the total risk of the banks. Among the banks, NABIL has the highest portion of undiversifiable risk i.e 84.33% compared to NIBL 52.82% and SCBNL 63.70%. This risk is related to macro economic factors. It cannot be eliminated by allocating capital to a diversified portfolio of investments. The portion of diversifiable risk can be eliminated because it is related to micro economic factors.

4.9 Portfolio Analysis

Portfolio theory was proposed by Harry M. Markowitz. The theory gives the concept of diversification of risk by investing in more than single stock. Markowitz's diversification

helps the investors to attain a higher level of expected return than any other risk reduction techniques. The main aim of portfolio is reduction of systematic risk from which investor can take more benefit. For example the risk can be minimized by investing in common stock of NABIL and NIBL rather than investing only in NABIL or in NIBL. In making a portfolio investment, the total fund is divided into proper amount or weight for different securities. The total weight of portfolio is equal to 100%.

4.9.1 Portfolio of two securities (NABIL and NIBL Bank)

Table 4.17

Calculation of Covariance

NABIL	NIBL	NABIL × NIBL
R_{NA}-Σ(R_{NA})	R_{NI}-Σ(RNI)	[R_{NA}-Σ(R_{NA})] [R_{NI}-Σ(RNI)]
176.25	58.68	10342.35
3.58	74.18	265.56
-3.88	-57.72	223.95
-75.11	-62.62	4703.39
-90.07	-20.32	1830.22
-10.78	9.78	-105.43
Total		17260.04

We have,

$$COV_{NA\ NI} = \frac{[R_{NI}-\Sigma(R_{NI})]\,[R_{NA}-\Sigma(R_{NA})]}{N-1}$$

$$= \frac{17260.04}{6-1}$$

$$= 3452$$

Now, calculation of portfolio risk

$$\sigma_P = \sqrt{W_{NA^2}\sigma_{NA^2} + W_{NI^2}\sigma_{NI^2} + 2COV_{NANI}W_{NA}W_{NI}}$$

Where, weight of NABIL Bank is calculated as under.

$$W_{NA} = \frac{\sigma NI^2 - COV_{NANB}}{\sigma NA^2 + \sigma NI^2 - 2\,COV_{NANB}}$$

$$= \frac{57.41^2 - 3452}{94.83^2 + 57.41^2 - (2\times 3452)}$$

$$= \frac{-156.09}{12288.64 - 6904}$$

$$= \frac{-156.09}{5384.64}$$

$$= -0.029$$

$\therefore W_{NI} = 1 - (-0.029)$

$= 1.029$

Therefore weight of NABIL bank is -0.029 and NIBL bank is 1.029

We can calculate the portfolio risk as,

$$\sigma_P = \sqrt{W_{NA^2}\sigma_{NA^2} + W_{NI^2}\sigma_{NI^2} + 2COV_{NANI}W_{NA}W_{NI}}$$

$$\sqrt{(-0.029)^2 \times 94.83^2 + (1.029)^2 \times 57.41^2 + 2 \times 3452 \times (-0.029) \times (1.029)}$$

$$=\sqrt{7.56 + 3489.84 - 206.02}$$

$$=\sqrt{3291.38}$$

= 57.37%

Calculation of portfolio return, $E(R_P) = W_{NA} \times E(R_{NA}) + W_{NI} \times E(R_{NI})$

= (-0.029) × 43.85% + (1.029) × 15.22%

= -1.27% + 15.66%

= 14.39%

Calculation of Coefficient of Variation (CV) = σ_p / $E(R_P)$

= 57.37/14.39

=3.99

From appendix 5, Investing only in the C.S. of NABIL there is risk of 94.83% and investing only in the C.S. of NIBL there is risk of 57.41%. However, investing in both the securities in the ratio of -0.029:: 1.029, the total risk reduces to 57.37% which is lower than the risk before diversification. Since the weight of NABIL is negative, this shows that the stock of NABIL must be sold and the amount receive from selling those stocks must used in purchasing the stocks of NIBL bank.

The return calculated from the given portfolio comes to be 14.39% and the CV is 3.99.

4.9.2 Portfolio of two securities (NABIL and SCBNL Bank)

Table 4.18

Calculation of covariance

NABIL	SCBNL	NIBL × SCBNL
R_{NA}-Σ(R_{NA})	R_{SC}-Σ(R_{SC})	[R_{NA}-Σ(R_{NA})] [R_{SC}-Σ(R_{SC})]
176.25	106.29	18733.61
3.58	44.7	160.03
-3.88	2.39	-9.27
-75.11	-66.61	5003.08
-90.07	-73.91	6657.07
-10.78	-12.88	138.85
Total		30683.37

We have,

$$COV_{NA\ SC} = \frac{[R_{NA}-\Sigma(R_{NA})]\,[R_{SC}-\Sigma(R_{SC})]}{N-1}$$

$$= \frac{30683.37}{6-1}$$

$$= 6136.67$$

Now, calculation of portfolio risk

$$\sigma_P = \sqrt{W_{NA^2}\sigma_{NA^2} + W_{SC^2}\sigma_{SC^2} + 2COV_{NASC}W_{NA}W_{SC}}$$

Where, weight of NABIL Bank is calculated as under,

$$\therefore W_{NA} = \frac{\sigma SC^2 - COV_{NASC}}{\sigma NA^2 + \sigma SC^2 - 2\,COV_{NASC}}$$

$$= \frac{68.36^2 - 6136.67}{94.83^2 + 68.36^2 - (2 \times 6136.67)}$$

$$= \frac{-1463.58}{1392.48}$$

$$= -1.05$$

$W_{SC} = 1 - (-1.05)$

$= 2.05$

We can calculate the portfolio risk as,

$$\sigma_P = \sqrt{W_{NA^2}\sigma_{NA^2} + W_{SC^2}\sigma_{SC^2} + 2COV_{NASC}W_{NA}W_{SC}}$$

$$= \sqrt{(-1.05)^2 \times 94.83^2 + (2.05)^2 \times 68.36^2 + 2 \times 6136.67 \times (-1.05) \times (2.05)}$$

$$= \sqrt{9914.48 + 19638.66 - 26418.36}$$

$$= \sqrt{3134.78}$$

$= 55.99\ \%$

Calculation of portfolio return, $E(R_P) = W_{NA} \times E(R_{NA}) + W_{SC} \times E(R_{SC})$

$= (-1.05) \times 43.85\% + (2.05) \times 68.36\%$

$= -46.04\% + 140.14\%$

$= 94.10\%$

Calculation of Coefficient of Variation (CV)

$= \sigma_p / \ E(R_P)$

$= 55.99/94.10$

$= 0.60$

From appendix 5, Investing only in the C.S. of NABIL there is risk of 94.83% and investing only in the C.S. of SCBNL there is risk of 68.36%. However, investing in both the securities in the ratio of -1.05:: 2.05, the total risk reduces to 55.99% which is lower than before diversification. Since the weight of NABIL is negative, this shows that the stock of NABIL must be sold and the amount receive from selling those stocks must used in purchasing the stocks of SCBNL bank.

The return calculated from the given portfolio comes to be 94.10% and the CV is 0.60.

4.9.3 Portfolio of two securities (SCBNL and NIBL Bank)

Table 4.19

Calculation of covariance

SCBNL	NIBL	SCBNL × NIBL
R_{SC}-Σ(R_{SC})	R_{NI}-Σ(R_{NI})	[R_{SC}-Σ(R_{SC})] [R_{NI}-Σ(R_{NI})]
106.29	58.68	6237.10
44.7	74.18	3315.85
2.39	-57.72	-137.95
-66.61	-62.62	4171.12
-73.91	-20.32	1501.85
-12.88	9.78	-125.97
Total		14962

We have,

$COV_{SC\ NI} = \frac{[R_{SC}-\Sigma(R_{SC})]\,[R_{NI}-\Sigma(R_{NI})]}{N-1}$

$= \frac{14962}{6-1}$

$= 2992.4$

Now, calculation of portfolio risk

$$\sigma_P = \sqrt{W_{SC^2}\sigma_{SC^2} + W_{NI^2}\sigma_{NI^2} + 2COV_{SCNI}W_{SC}W_{NI}}$$

Where, weight of NABIL Bank is calculated as under,

$\therefore W_{SC} = \frac{\sigma NI^2 - COV_{SC\ NI}}{\sigma NI^2 + \sigma SC^2 - 2\ COV_{SCNI}}$

$= \frac{57.41^2 - 2992.4}{57.41^2 + 68.36^2\ -(2\times 2992.4)}$

$= \frac{303.51}{1984.20}$

$= 0.15$

$\therefore W_{NI} = 1 - 0.15$

$= 0.85$

We can calculate the portfolio risk as,

$$\sigma_P = \sqrt{W_{SC^2}\sigma_{SC^2} + W_{NI^2}\sigma_{NI^2} + 2COV_{SCNI}W_{SC}W_{NI}}$$

$=\sqrt{0.15^2 \times 68.36^2 + 0.85^2 \times 57.41^2 + 2 \times 2992.4 \times 0.15 \times 0.85}$

$= \sqrt{105.14 + 2381.29 + 763.06}$

$= \sqrt{3249.49}$

$= 57\ \%$

Calculation of portfolio return, $E(R_P) = W_{SC} \times E(R_{SC}) + W_{NI} \times E(R_{NI})$

$= 0.15 \times 30.31\% + 0.85 \times 15.22\%$

$= 4.55 + 12.94$

$= 17.49\%$

Calculation of Coefficient of Variation (CV)

$= \sigma_p / E(R_P)$

$= 57/17.49$

$= 3.26$

From appendix 5, Investing only in the C.S. of SCBNL there is risk of 68.36% and investing only in the C.S. of NIBL there is risk of 57.41%. However, investing in both the securities in the ratio of 0.15:: 0.85, the total risk reduces to 57% which is lower than before diversification.

The return calculated from the given portfolio comes to be 17.49% and the CV is 3.26.

After the analysis of making the three types of portfolio by taking two banks at a time, we find the risk to be reduced to some extent. We can say that the risk has been diversified by making investment into different portfolio. While choosing the best portfolio among those which has been made, it would be rationale through coefficient of variation. Here, CV of portfolio (NABIL and NIBL) is 3.99, CV of portfolio of (NABIL and SCBNL) is 0.60 and CV of portfolio of (SCBNL and NIBL) is 3.26. We find that portfolio (NABIL and NIBL) is riskiest than the portfolio (SCBNL and NIBL) whereas we find that portfolio (NABIL and SCBNL) is least risky because it's CV it lowest compare to the other two.

4.10 Trend Analysis

Trend analysis is an analysis of financial ratio over time used to determine the pattern of growth. Trend analysis informs about the future expected values of studied variables. It gives a glimpse of future expected value if the same growth level is achieved. This information is crucial for management to make decision regarding future.

The study has further provided a trend analysis chart showing various financial indicators.

4.10.1 Trend Analysis of Dividend Yield

Dividend Yield of the three banks are forecasted with the help of trend analysis. Future dividend yield of the banks are shown in the table 4.15 as follows.

Table 4.20

Trend Analysis of Total Diviednd Yield

Banks	Intercept (a)	Slope (b)	Years							
			2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
NABIL	38.48	-14.32	74.28	59.96	45.64	31.32	17	2.68	-11.64	-25.96
NIBL	22.1	-3.462	30.755	27.293	23.831	20.369	16.907	13.445	9.983	6.521
SCBNL	35.39	-14.93	72.715	57.785	42.855	27.925	12.995	-1.935	-16.865	-31.795

(Source: Appendix 10)

Fig 4.8 Trend analysis of Dividend Yield

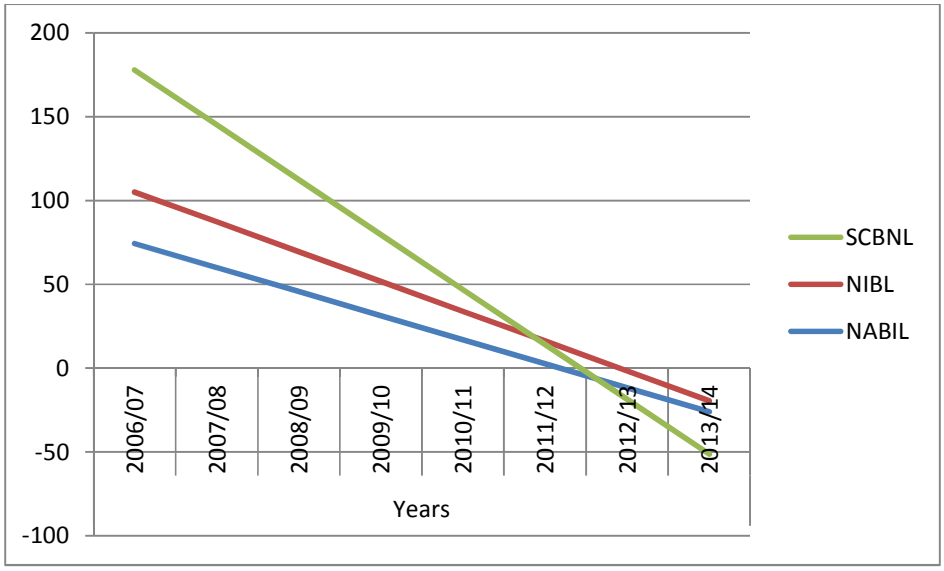


Table 4.20 and figure 4.8 predicts the dividend yield of the three mentioned commercial banks for the coming four years on the basis of current five years period. Slope of NABIL bank is positive, so that dividend yield is in increasing trend. But the slope of SCBNL and NIBL are negative, so that the dividend yield is in decreasing trend. Among the given banks NABIL has higher forecasted dividend yield.

4.15.2 Trend Analysis of Return

Return of the three mentioned banks are forecasted with the help of trend analysis. Future return of the banks are shown in the table as follows:

Table 4.21 Trend analysis of Return

Banks	Intercept (a)	Slope (b)	Years							
			2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
NABIL	43.85	-36.78	135.8	99.02	62.24	25.46	-11.32	-48.1	-84.88	-121.66
NIBL	15.22	-14.94	52.57	37.63	22.69	7.75	-7.19	-22.13	-37.07	-52.01
SCBNL	30.305	-29.16	103.205	74.045	44.885	15.725	-13.435	-42.595	-71.755	-100.92

(Source: Appendix 10)

Fig 4.9 Trend analysis of Return

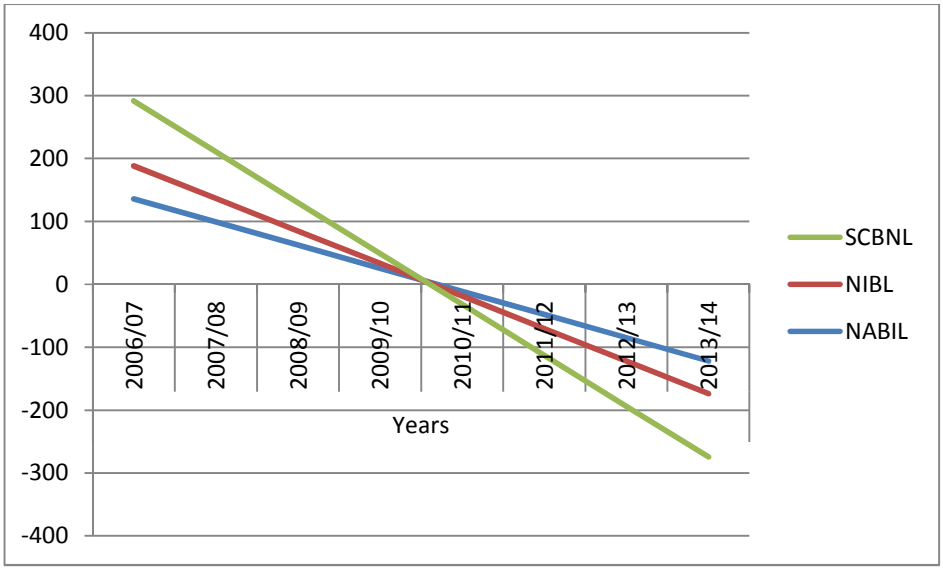


Table 4.21 and figure 4.9 predicts future return of the three mentioned commercial banks of the two coming years on the basis of six current years period. Slope of the banks are negative , so that the return are also negative.

4.11 Major Findings

The major findings which emerge from this study are as follows.

1. MPS of the selected banks is in decreasing order from the year 2006/7 to 2011/12. In this case too, MPS of SCBNL is the highest.

2. EPS of the given banks is also decreasing from year to year. We can observe that the EPS of SCBNL is highest in the year 2006/07 i.e Rs. 167.37. The EPS of NABIL in the year 2011/12 is highest i.e. Rs. 83.57.

3. NABIL bank has distributed Rs. 100 as cash dividend in the year 2006/07 which is the highest. And after that it has distributed Rs. 60, Rs. 35, Rs. 30, Rs. 30 and Rs. 40 in the consecutive years. Whereas its stock dividend is 40% in the year 2006/07 and 2007/08, 50% in 2008/09, 40% in 2009/10. In the year 2010/11 it has

not distributed any stock dividend. But at the end it has distributed 20% stock dividend.

4. NIBL bank has distributed Rs. 5 as cash dividend in the year 2006/07 which is the least. And after that it has distributed Rs. 7.50, Rs. 20, Rs. 25, Rs. 25 and Rs.5 in the consecutive years. Whereas its stock dividend is 25% in the year 2006/07, 33.33% in 2007/08. NIBL has not distributed any stock dividend in the 2008/09 and 2009/10. At the end of the year 2010/11 and 2011/12 it distributed 25% as stock dividend.

5. SCBNL bank has distributed Rs. 80 as cash dividend in the year 2006/07 and 2007/08. And after that it has distributed Rs. 50, Rs. 55, Rs. 50 and Rs. 45 in the consecutive years. Whereas its stock dividend is 50% in the year in the year 2006/7 to 2008/09 and 15% in 2009/10. SCBNL has not distributed any stock dividend in the year 2010/11. It has distributed 15% stock dividend in the year 2011/12.

6. After conversion of stock dividend into cash dividend, the calculated DPS of SCBNL bank (i.e. Rs. 3495) is the highest in the year 2007/08 but in the year 2010/11 DPS of NIBL is highest (i.e. Rs. 153.75). It is because NABIL and SCBNL have not distributed any stock dividend in that year.

7. Among the three selected banks the expected return of Nabil Bank Limited is highest (i.e. 43.85%). Whereas the expected return of NIBL and SCBNL is 15.22% and 30.31%.

8. The risk of an asset can be measured quantitatively using statistical tools as standard deviation and coefficient of variation. That can be used to measure the variability of assets return. Standard deviation is the strong statistical device to

measure total risk involve in an investment that consists of both market risk and diversifiable risk. More ever, it is expected that SD and CV denotes the volatility of the rate of return. Therefore total investment risk of the selected banks is 94.83%, 57.41% and 68.36% of NABIL, NIBL and SCBNL respectively. The return seems fluctuating every year resulting higher variation. The ranking of the company from lower risk to higher risk can be found as NIBL, SCBNL and NABIL. As the fact higher the risk higher will be the return is applicable.

9. The Coefficient of variation shows that the variation is the measurement of risk for our purpose low variation is good for us. CV of NABIL bank is 2.16 and NIBL is 3.77 and SCBNL is 2.26. Here, CV of NABIL is lowest; therefore investment in NABIL followed by SCBNL and NIBL is good.

10. The NEPSE Index is used as a measure of return of market. Here the market return indicates that there, is positive movement, till 2006/2007 to 2007/08 but it declines thereafter till 2010/2011. Also, the average NEPSE return during six year period is 7.09% and C.V is 6.2.

11. The beta coefficient of market is always equal to one. Therefore the banks beta coefficient is always compared with the market return. The beta coefficient of NABIL is 1.91, NIBL is 1.20 and SCBNL is 1.45. Beta of the selected banks is greater than one therefore; the aggressive investors prefer such type of investment.

12. To know whether the stock price is overpriced or underpriced, we use to compare the expected return with required rate of return. For this SML is used in CAPM model. In the selected banks, the expected rate of return is 43.85%, 15.22% and 30.31% of NABIL, NIBL and SCBNL respectively. The required rate of return is

8.35%, 7.37% and 7.72% of NABIL, NIBL and SCBNL respectively. Here, required rate of return of all three banks are smaller than the expected rate of return so the stocks are underpriced. Therefore, buying strategy is to be followed.

13. The systematic risk or undiversifiable risk of the banks is related to macro economic factors. These factors affect the prices of the securities. The systematic risk of NABIL is highest 84.33% followed by SCBNL and NIBL with 52.82% and 63.70% respectively.

14. The portfolio constructed by taking two banks at a time is made for minimizing the risk. Portfolio made by taking NABIL and NIBL have 57.37% risk. Portfolio made by taking NABIL and SCBNL have 55.99% risk. SCBNL and NIBL have 57% risk.

15. The return of portfolio made from NABIL and NIBL have 14.39%. Return of portfolio made from NABIL and SCBNL have 94.10%. Return made from SCBNL and NIBL is 14.49%.

16. CV of portfolio (NABIL and NIBL) is 3.99. CV of portfolio (NABIL and SCBNL) is 0.60. CV of portfolio (SCBNL and NIBL) is 3.26.

17. The portfolio constructed by taking NABIL and SCBNL has the lowest CV. Therefore, this is the best portfolio constructed.

The above mentioned major findings conclude that there are differences in expected return, required return and risk situation in the selected banks and it shows the real performance of the selected banks. It can also be seen that the investment in all these three banks are profitable.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The present study has been carried out with the objective of analyzing the risk and returns and the application of CAPM in Nepalese banks. Accordingly, relevant literature was received and the study was carried out following the suitable methodology. A brief explanation of all procedures and efforts has been summarized up in this chapter along with conclusion drawn and suggestions recommended.

5.1 Summary

In recent days, risk and return is being central focus of finance. Before investment on any security the risk and return analysis is performed. Being the speculative nature, common stock is taken for analyzing risk and return. The common stock is the most risky security. An investment in common stock of a company cannot insure the annual return and the return of principal. Dividends are paid to the stock holders only if there will be earning available to equity share holder. In Nepal, there are not various types of securities but due to development of banking industry and manufacturing industry, there is sufficient common stock to attract Nepalese investors.

There is a positive relationship between risk and return. The higher the level of risk, the higher will be the rate of return. Hence, from the viewpoint of investors, the attitude of risk varies from investors to investors. Most of the investors are risk averter; hence they do not like to bear addition risk and such type of investor want to invest in secured and safe return security. On the contrary, a risk taking investor can maximize his return by taking additional risk. In other words, we can say that every investment has the risk factor and we should minimize the risk to maximize the return. An appropriate portfolio should be constructed instead of investing in a single security. This helps to reduce systematic risk or diversifiable risk. The rate of return expected from any investment proposal is the sum of risk free rate of return and the premium paid to the additional level of risk taken.

The level of risk is not easy to measure. However, different scholars have suggested various statistical tools like standard deviation, variance, coefficient of variation, beta coefficient, correlation coefficient, and so on.

The study mainly aims at application of CAPM in Nepalese commercial banks. For this it has taken three commercial banks for reference viz. NABIL Bank, NIBL Bank, SCBNL Bank. Here, expected return and required return are calculated. Also, the undervalued and overvalued stocks are identified and the strategy to be followed is suggested. This research also attempts to make the best possible portfolio for risk diversification and describes about its usefulness.

After analyzing the data and all above calculations following conclusions and recommendations are made.

5.2 Conclusion

Investment in the stock market is the major portion of this study which involves tradeoff between risk and return. The study is focused upon the application of CAPM in stock valuation. The CAPM has recommended the investors to buy the share of listed banks.

The following conclusions have been drawn from this research work:

Considering the overall market return and risk, the shares of all the commercial banks are attractive for investment. However, common stock of NABIL seems more attractive among all considering risk per unit return. Investors retaining the stocks of SCBNL should assume more risk than any others.

The returns on common stocks of all the commercial banks in F/Y 2006/07 were highest among the sampled years. The political and economic scenario is worsening day by day and it has the adverse effect on the economic activities of the companies.

Coefficient of Variation (CV) helps to make the correct decision for selecting the stocks to make investment. This helps to select the investment which has less risk on per unit

return. CV suggests making investment in NABIL. Its CV is lowest among the three banks. Its standard deviation is also lower but return is highest.

The overall market return cannot be regarded as attractive with respect to its risk. The risk per unit return is very high which proves that the market is more risky than the common stocks of commercial banks.

Beta of all the selected banks are greater than one, therefore all the stocks are aggressive in nature.

The required rate of return by using CAPM enables us to estimate the undiversified risk of a single asset and compare it with the diversifiable risk in a well diversified portfolio. It provides a unique relationship between undiversified risks. Comparison of an equilibrium expected rate of return (required rate of return) with the expected rate of return provides a basis for investment decision. Here, the stocks of all three banks are underpriced. Therefore, the commercial banks stocks are in demand and there are investment opportunities in these stocks.

The unsystematic risk of all the banks is high in comparison to total risk. It seems that the variability returns of the common stock of banks are bank specific. The banks specific risk can be diversified away with a well-diversified portfolio.

The portfolio made by the combination of NABIL and SCBNL is best since its return is highest with lowest risk. Also the risk per unit return of this portfolio is lowest.

5.3 Recommendations

Suggestion is the output of the whole study. It helps to take corrective action in their activities in future. This study may be helpful for the individual investors who are going to invest in stocks of the banks to some extent. On the basis of above analysis and findings, following suggestions are recommended.

Before making any investment decision in the security, proper analysis of the individual bank and the whole market is essential. General knowledge about general economic condition, government tax policy, political situation of nation etc is necessary which affect the price of the share.

Before thinking about higher return, risk associated with return should also be analyzed. There is a trend of just purchasing the stocks on the basis of rumors i.e. the stocks of commercial banks are largely traded in the market. Because of lack of information and knowledge of investment, investors are making investment blindly. Therefore there should be continuous flow of information about the investment policy.

The under priced common stock should be purchased and the overpriced stock should be sell. Here, all the common stock of listed banks is found to be underpriced. So, the study recommends the investors to purchase the common stocks of banks.

From the above study we find that the investors should reduce their unsystematic risk by diversifying their funds in more than one stock of different banks by making a portfolio. The study eliminates the habit of investors investing in a single type of common stock. However, making portfolio investment in the stock with higher return and negatively correlated should be selected and the portfolio revision is also necessary of certain interval of time to get best return at lower risk. From the study portfolio between common stock of NABIL and SCBNL is recommended to construct.

The data provided by NEPSE and the company itself are different in some cases. It creates confusion to the possible investors about actual financial condition of the company. The value of assets and liabilities should not be manipulated by the company to show the under profitability or over profitability.

The listed companies should operate their activity smoothly. They should publish their annual reports and information timely and correctly, which will help the investors to take the investment decision on their common stocks.

None of the industry (stock market) can develop and raise their business in the disturbance and instability condition of political situation of the country and unfavorable rule and regulation of government. Therefore, the government should monitor the activities of stock market (over monitoring also would be harmful to develop the industry) and manipulating stock holders. The rule and regulation regarding stock market should be amended time to time and making various policy for implementing rules and regulations.

The investment strategy adopted by Nepalese investors is passive. They just hold the securities and wait for dividend. Hence, active strategy should be followed to gain from the transactions.

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APPENDICES

Appendix 1

Calculation of Total Dividend

1. NABIL BANK

Year	Cash Dividend (%)	Stock Dividend (%)	Total Dividend (%)
2006/07	100	40	140
2007/08	60	40	100
2008/09	35	50	85
2009/10	30	40	70
2010/11	30	–	30
2011/12	40	20	60

(Source: www.nabilbank.com)

Conversion of Stock Dividend into Cash Dividend

=Stock dividend× MPS

Year	Market Price Per Share (MPS in Rs)	Stock Dividend (Rs.)
2006/07	5050	0.40×5040 = 2020
2007/08	5275	0.40×5275 = 2110
2008/09	4899	0.50×4899 = 2449.5
2009/10	2384	0.40×2384 = 953.6
2010/11	1252	–
2011/12	1355	0.20×1355 =271

Total Dividend = Stock Dividend + Cash Dividend

Year	Total Dividend (Rs)
2006/07	2120
2007/08	2170
2008/09	2484.5
2009/10	983.6
2010/11	30
2011/12	311

2. NIBL BANK

Year	Cash Dividend (%)	Stock Dividend (%)	Total Dividend (%)
2006/07	5	25	30
2007/08	7.50	33.33	40.83
2008/09	20	-	20
2009/10	25	-	25
2010/11	25	25	50
2011/12	5	25	30

(Source: www.nibl.com.np)

Conversion of Stock Dividend into Cash Dividend

Year	Market Price Per Share (MPS in Rs)	Stock Dividend (Rs)
2006/07	1729	0.25×1729 = 432.25
2007/08	2450	0.3333×2450 = 816.585
2008/09	1388	0
2009/10	705	0
2010/11	515	0.25×515 = 128.75
2011/12	511	0.25×511 = 127.75

Total Dividend = Stock Dividend + Cash Dividend

Year	Total Dividend (Rs)
2006/07	437.25
2007/08	824.085
2008/09	20
2009/10	25
2010/11	153.75
2011/12	132.75

3. SCBNL BANK

Year	Cash Dividend (%)	Stock Dividend (%)	Total Dividend (%)
2006/07	80	50	130
2007/08	80	50	130
2008/09	50	50	100
2009/10	55	15	70
2010/11	50	-	50
2011/12	45	15	60

(www.standardchartered.com.np)

Conversion of Stock Dividend into Cash Dividend

Year	Market Price Per Share (MPS in Rs)	Stock Dividend (Rs)
2006/07	5900	0.50×5900 = 2950
2007/08	6830	0.50×6830 = 3415
2008/09	6010	0.50×6010 = 3005
2009/10	3279	0.15×3279 = 491.85
2010/11	1800	0
2011/12	1799	0.15×1799 = 269.85

Total Dividend = Stock Dividend + Cash Dividend

Year	Total Dividend (Rs)
2006/07	3030
2007/08	3495
2008/09	3055
2009/10	546.85
2010/11	50
2011/12	314.85

APPENDIX 2

Calculation of Dividend Yield

1. **NABIL BANK**

Year	Market Price Per Share(MPS in Rs)	Total Dividend (Rs)	Dividend Yield (%)
2005/06	2240	-	-
2006/07	5050	2120	94.65
2007/08	5275	2170	42.97
2008/09	4899	2484.5	47.10
2009/10	2384	983.6	20.08
2010/11	1252	30	1.26
2011/12	1355	311	24.84

$\therefore$ DY = Dividend/ Beg. MPS

Where, DY = Dividend Yield

2. **NIBL BANK**

Year	Market Price Per Share (MPS in Rs)	Total Dividend (RS)	Dividend Yield (%)
2005/06	1260	-	-
2006/07	1729	437.25	34.70
2007/08	2450	824.085	47.66
2008/09	1388	20	0.82
2009/10	705	25	1.80
2010/11	515	153.75	21.81
2011/2	511	132.75	25.78

3. SCBNL BANK

Year	Market Price Per Share (MPS in Rs)	Total Dividend (RS)	Dividend Yield (%)
2005/06	3775	-	-
2006/07	5900	3030	80.26
2007/08	6830	3495	59.24
2008/09	6010	3055	44.73
2009/10	3279	546.85	9.10
2010/11	1800	50	1.52
2011/12	1799	314.85	17.49

APPENDIX 3

Calculation of Capital Gain Yield

1. NABIL BANK

Year	Ending MPS	Beginning MPS	Capital Gain Yield %
2005/06	2240	-	-
2006/07	5050	2240	125.45
2007/08	5275	5050	4.46
2008/09	4899	5275	-7.13
2009/10	2384	4899	-51.34
2010/11	1252	2384	-47.48
2011/12	1355	1252	8.23

$\therefore$ CG = $\frac{\text{end MPS-beg.MPS}}{\text{beg. MPS}}$

Where, CG = Capital Gain

2. NIBL BANK

Year	Ending MPS	Beginning MPS	Capital Gain Yield %
2005/06	1260	-	-
2006/07	1729	1260	37.22
2007/08	2450	1729	41.70
2008/09	1388	2450	-43.35
2009/10	705	1388	-49.21
2010/11	515	705	-26.95
2011/2	511	515	-0.78

3. SCBNL BANK

Year	Ending MPS	Beginning MPS	Capital Gain Yield %
2005/06	3775	-	-
2006/07	5900	3775	56.29
2007/08	6830	5900	15.76
2008/09	6010	6830	-12.00
2009/10	3279	6010	-45.44
2010/11	1800	3279	-45.11
2011/12	1799	1800	-0.06

APPENDIX 4

Calculation of Expected Rate of Returns of Selected Banks

Return = capital gain yield + dividend yield

or,

$$Rj = \frac{Pt+1-Pt+Ct}{Pt}$$

$$\Sigma Rj = \frac{\Sigma Rj}{N}$$

1. NABIL BANK

Year	Market Price Per Share(MPS in Rs)	Total Dividend (Rs)	Returns(Rj) (%)
2005/06	2240	-	-
2006/07	5050	2120	220.10
2007/08	5275	2170	47.43
2008/09	4899	2484.5	39.97
2009/10	2384	983.6	-31.26
2010/11	1252	30	-46.22
2011/12	1355	311	33.07
Total (ΣRj)			**263.09**
(ΣRj) %			**43.85%**

2. NIBL BANK

Year	Market Price Per Share(MPS in Rs)	Total Dividend (Rs)	Returns(Rj) (%)
2005/06	1260	-	-
2006/07	1729	437.25	71.90
2007/08	2450	824.085	89.40
2008/09	1388	20	-42.50
2009/10	705	25	-47.40
2010/11	515	153.75	-5.10
2011/12	511	132.75	25
Total (ΣRj)			**91.3**
(ΣRj) %			**15.22%**

3. SCBNL BANK

Year	Market Price Per Share(MPS in Rs)	Total Dividend (Rs)	Returns(Rj) (%)
2005/06	3775	-	-
2006/07	5900	3030	136.60
2007/08	6830	3495	75
2008/09	6010	3055	32.70
2009/10	3279	546.85	-36.30
2010/11	1800	50	-43.60
2011/12	1799	314.85	17.43
Total (ΣRj)			**181.84**
(ΣRj) %			**30.31%**

APPENDIX 5

Calculation of Standard Deviation and CV

Standard deviation= $\sqrt{\frac{\sum[Rj-\overline{Rj}}{N-1}}$

1. **NABIL BANK**

Year	Returns(Rj) (%)	Rj -ΣRj	$[Rj -ΣRj]^2$
2006/07	220.10	176.25	31064.06
2007/08	47.43	3.58	12.82
2008/09	39.97	-3.88	15.05
2009/10	-31.26	-75.11	5641.51
2010/11	-46.22	-90.07	8112.60
2011/12	33.07	-10.78	116.21
Total	**263.09**		**44962.25**

ΣRj = 43.85%

Variance = $\frac{44962.25}{6-1}$

= 8992.45

Standard Deviation = √8992.45

= 94.83%

Coefficient of Variation (CV) = $\frac{\sigma j}{\Sigma Rj}$

= 94.83/43.85

= 2.16

2. NIBL BANK

Year	Returns(Rj) (%)	Rj -ΣRj	$[Rj -ΣRj]^2$
2006/07	71.90	56.68	3212.62
2007/08	89.40	74.18	5502.67
2008/09	-42.50	-57.72	3331.60
2009/10	-47.40	-62.62	3921.26
2010/11	-5.10	-20.32	412.90
2011/12	25	9.78	95.65
Total	**91.30**		**16476.7**

ΣRj = 15.22%

Variance = $\frac{16476.7}{6-1}$

= 3295.34

Standard Deviation = √3295.34

= 57.41%

Coefficient of Variation (CV) = $\frac{\sigma j}{\Sigma Rj}$

= 57.41/15.22

= 3.77

3. SCBNL BANK

Year	Returns(Rj) (%)	Rj -ΣRj	$[Rj -ΣRj]^2$
2006/07	136.60	106.29	11297.56
2007/08	75	44.7	1998.09
2008/09	32.70	2.39	5.71
2009/10	-36.30	-66.61	4436.89
2010/11	-43.60	-73.91	5462.69
2011/12	17.43	-12.88	165.89
Total	**181.84**		**23366.83**

ΣRj = 30.31%

Variance = $\frac{23366.83}{6-1}$

= 4673.366

Standard Deviation = √4673.366

= 68.36%

Coefficient of Variation (CV) = $\frac{\sigma j}{\Sigma Rj}$

= 68.36/30.31

= 2.26

APPENDIX 6

Calculation of expected return, standard deviation and coefficient of variation of market

Year	NEPSE Price Index (Rs)	NEPSE Return (Rm)%
2005/06	386.83	-
2006/07	683.95	76.81
2007/08	963.36	40.85
2008/09	749.10	-22.24
2009/10	477.73	-36.23
2010/11	362.85	-24.05
2011/12	389.74	7.41
Total		**ΣRm = 42.56 i.e, 7.09%**

Standard Deviation

Year	NEPSE Returns(Rm) (%)	Rm -ΣRm	$[Rm - \Sigma Rm]^2$
2006/07	76.81	69.72	4860.88
2007/08	40.85	33.76	1139.74
2008/09	-22.24	-29.33	860.25
2009/10	-36.23	-43.32	1876.62
2010/11	-24.05	-31.14	969.70
2011/12	7.41	0.32	0.10
Total	**42.56 i.e, 7.09%**		**9707.29**

Variance = $\frac{9707.29}{6-1}$

= 1941.46

Standard Deviation = $\sqrt{1941.46}$

= 44.06%

CV = $\frac{\sigma j}{\Sigma Rj}$

= 44.06/7.09 = 6.2

APPENDIX 7

Calculation of Beta

1. **NABIL BANK**

Year	RN -ΣRN	RM -ΣRM	[RN -ΣRN] [RM-ΣRM]
2006/07	176.25	69.72	12288.15
2007/08	3.58	33.76	120.86
2008/09	-3.88	-29.33	113.80
2009/10	-75.11	-43.32	3253.77
2010/11	-90.07	-31.14	2804.78
2011/12	-10.78	0.32	-3.45
Total			**18577.91**

$$COV_{NM} = \frac{\Sigma [(Rj - \Sigma Rj)(Rm - \Sigma Rm)]}{N-1}$$

$$= \frac{18577.91}{6-1}$$

$$= 3715.58$$

$$B_N = \frac{COVRjRm}{\sigma m^2}$$

$$= \frac{3715.58}{44.06^2}$$

$$= 1.91$$

2. NIBL BANK

Year	RNI -ΣRNI	RM -ΣRM	[RNI -ΣRNI] ×[RM - ΣRM]
2006/07	58.68	69.72	4091.17
2007/08	74.18	33.76	2504.32
2008/09	-57.72	-29.33	1692.93
2009/10	-62.62	-43.32	2712.70
2010/11	-20.32	-31.14	632.76
2011/12	9.78	0.32	3.13
Total			**11637.01**

$$COV_{NI\,M} = \frac{\Sigma\,[(RNI - \Sigma RNI)\,(RM - \Sigma RM)]}{N-1}$$

$$= \frac{11637.01}{6-1}$$

$$= 2327.40$$

$$B_{NI} = \frac{COVRjRm}{\sigma m^2}$$

$$= \frac{2327.40}{44.06^2} = 1.20$$

3. SCBNL BANK

Year	RS -ΣRS	RM -ΣRM	[RS -ΣRS] [RM-ΣRM]
2006/07	106.29	69.72	7410.54
2007/08	44.7	33.76	1509.07
2008/09	2.39	-29.33	-70.10
2009/10	-66.61	-43.32	2885.55
2010/11	-73.91	-31.14	2301.56
2011/12	-12.88	0.32	-4.12
Total			**14032.5**

$$COV_{SM} = \frac{\Sigma [(RS - \Sigma RS)(RM - \Sigma RM)]}{N-1}$$

$$= \frac{14032.5}{6-1}$$

$$= 2806.5$$

$$B_S = \frac{COVRjRm}{\sigma m^2}$$

$$= \frac{2806.5}{44.06^2}$$

$$= 1.45$$

APPENDIX 8

Calculation of required rate of return of selected banks

1.NABIL Bank

$\Sigma Rj = R_f + [\Sigma(Rm) - R_f] \beta_j$

Where,

R_f = 5.70%
$\Sigma(Rm)$ = 7.09 %
β_M = 1.91

= 5.70+ [7.09-5.70] 1.91
= 8.35%

2. NIBL Bank

We have,
R_f = 5.70%
$\Sigma(Rm)$ = 7.09 %
β_j = 1.20

= 5.70+ [7.09-5.70] 1.20
= 7.37%

3.SCBNL Bank

We have,
R_f = 5.70%
$\Sigma(Rm)$ = 7.09 %
β_j = 1.45

= 5.70+ [7.09-5.70] 1.45
= 7.72%

APPENDIX 9

Partition of Total Risk

Total Risk = Undiversifiable Risk + Diversifiable Risk

Or, $\sigma_j = \frac{COV (R_j R_m)}{\sigma_m}$

$= \sigma(e)$

i.e, Total Risk – Undiversifiable Risk = Diversifiable Risk

1. **NABIL Bank**

$\sigma_N = 94.83\%$

$COV (R_N R_M) = 3715.58$

$\sigma_M = 44.06\%$

Undiversifiable Risk = $\frac{COV (R_N R_M)}{\sigma_M}$

$= \frac{3715.58}{44.06}$

$= 84.33\%$

Diversifiable Risk = Total Risk – Undiversifiable Risk

$= 94.83 – 84.33$

$= 10.5\%$

2. **NIBL Bank**

$\sigma_{NI} = 57.41\%$

$COV (R_{NI} R_M) = 2327.40$

$\sigma_M = 44.06\%$

Undiversifiable Risk = $\frac{COV (R_{NI} R_M)}{\sigma_M}$

$= \frac{2327.40}{44.06}$

= 52.82%

Diversifiable Risk = Total Risk – Undiversifiable Risk

= 57.41-52.82

= 4.59%

3. SCBNL Bank

σ_S = 68.36%

COV ($R_S R_M$) = 2806.5

σ_m = 44.06%

Undiversifiable Risk = $\frac{\text{COV } (R_j R_m)}{\sigma_m}$

= $\frac{2806.5}{44.06}$

= 63.70%

Diversifiable Risk = Total Risk – Undiversifiable Risk

= 68.36 – 63.70

= 4.66%

APPENDIX 10

Calculation of Trend Analysis of Dividend Yield

1. **NABIL Bank**

Year	X=x-A	Dividend (Y)	X^2	XY
2006/07	-2.5	94.65	6.25	-236.625
2007/08	-1.5	42.97	2.25	-64.455
2008/09	-0.5	47.1	0.25	-23.55
2009/10	0.5	20.08	0.25	10.04
2010/2011	1.5	1.26	2.25	1.89
2011/12	2.5	24.84	6.25	6.21
TOTAL		230.9	17.5	-250.6

Now, Assume A= 2008.5

$a = \frac{\Sigma Y}{N}$ =38.48 $b = \frac{\Sigma XY}{X^2}$ = 14.32

For 2006/07
Y= a+bx
= 74.28

For 2007/08
Y=a+bx
= 59.96

For 2008/09
Y=a+bx
= 45.64

For 2009/10
Y=a+bx
= 31.32

For 2010/11
Y= a+bx
= 17

For 2011/12
Y=a+bx
= 2.68

For 2012/13
Y=a+bx
= -11.64

For 2013/14
Y=a+bx
= -25.96

2. **NIBL Bank**

Year	X=x-A	Dividend (Y)	X^2	XY
2006/07	-2.5	34.7	6.25	-86.75
2007/08	-1.5	47.66	2.25	-71.49
2008/09	-0.5	0.82	0.25	-0.41
2009/10	0.5	1.8	0.25	0.9
2010/2011	1.5	21.81	2.25	32.715
2011/12	2.5	25.78	6.25	64.45
TOTAL		132.57	17.5	-60.59

Now, Assume A= 2008.5

$a = \frac{\Sigma Y}{N} = 22.10$ $b = \frac{\Sigma XY}{X^2} = -3.462$

For 2006/07	For 2007/08	For 2008/09	For 2009/10
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= 30.755	= 27.293	= 23.831	= 20.369

For 2010/11	For 2011/12	For 2012/13	For 2013/14
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= 16.907	= 13.445	= 9.983	= 6.521

3. SCBNL Bank

Year	X=x-A	Dividend (Y)	X^2	XY
2006/07	-2.5	80.26	6.25	-200.65
2007/08	-1.5	59.24	2.25	-88.86
2008/09	-0.5	44.73	0.25	-22.365
2009/10	0.5	9.1	0.25	4.55
2010/2011	1.5	1.52	2.25	2.28
2011/12	2.5	17.49	6.25	43.725
TOTAL		212.34	17.5	-261.32

Now, Assume A= 2008.5

$a = \frac{\Sigma Y}{N} = 35.39$ $b = \frac{\Sigma XY}{X^2} = -14.93$

For 2006/07	For 2007/08	For 2008/09	For 2009/10
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= 72.715	= 57.785	= 42.855	= 27.925

For 2010/11	For 2011/12	For 2012/13	For 2013/14
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= 12.995	= -1.935	= -16.865	= -31.795

Calculation of Trend Analysis of Return

1. NABIL Bank

Year	X=x-A	Return (Y)	X^2	XY
2006/07	-2.5	220.10	6.25	-550.25
2007/08	-1.5	47.43	2.25	-71.145
2008/09	-0.5	39.97	0.25	-19.985
2009/10	0.5	-31.26	0.25	-15.63
2010/2011	1.5	-46.22	2.25	-69.33
2011/12	2.5	33.07	6.25	82.675
TOTAL		263.09	17.5	-643.665

Now, Assume A= 2008.5

$a = \frac{\Sigma Y}{N}$ =43.85 $b = \frac{\Sigma XY}{X^2}$ = -36.78

For 2006/07
Y= a+bx
= 135.8

For 2007/08
Y=a+bx
= 99.02

For 2008/09
Y=a+bx
= 62.24

For 2009/10
Y=a+bx
= 25.46

For 2010/11
Y= a+bx
= -11.32

For 2011/12
Y=a+bx
= -48.1

For 2012/13
Y=a+bx
= -84.88

For 2013/14
Y=a+bx
= 121.66

2. NIBL Bank

Year	X=x-A	Return (Y)	X^2	XY
2006/07	-2.5	71.90	6.25	-179.75
2007/08	-1.5	89.40	2.25	-134.1
2008/09	-0.5	-42.50	0.25	21.25
2009/10	0.5	-47.40	0.25	-23.7
2010/2011	1.5	-5.10	2.25	-7.65
2011/12	2.5	25	6.25	62.5
TOTAL		91.3	17.5	-261.45

Now, Assume A= 2008.5

$a = \frac{\Sigma Y}{N}$ = 15.22 $b = \frac{\Sigma XY}{X^2}$ = -14.94

For 2006/07	For 2007/08	For 2008/09	For 2009/10
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= 52.57	= 37.63	= 22.69	= 7.75

For 2010/11	For 2011/12	For 2012/13	For 2013/14
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= -7.19	= -22.13	= -37.07	= 52.01

3.**SCBNL Bank**

Year	X=x-A	Return (Y)	X^2	XY
2006/07	-2.5	136.60	6.25	-179.75
2007/08	-1.5	75	2.25	-134.1
2008/09	-0.5	32.70	0.25	21.25
2009/10	0.5	-36.30	0.25	-23.7
2010/2011	1.5	-43.60	2.25	-7.65
2011/12	2.5	17.43	6.25	62.5
TOTAL		181.84	17.5	-261.45

Now, Assume A= 2008.5

$a = \frac{\Sigma Y}{N}$ =30.305 $b = \frac{\Sigma XY}{X^2}$ = -29.16

For 2006/07	For 2007/08	For 2008/09	For 2009/10
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= 72.715	= 74.045	= 44.885	= 15.725

For 2010/11	For 2011/12	For 2012/13	For 2013/14
Y= a+bx	Y=a+bx	Y=a+bx	Y=a+bx
= -13.435	= -42.595	= -71.755	= -100.92