CHAPTER- I

INTRODUCTION

1.1 Background of the Study

Nepal is one of the developing country of the world. Nepal's decade-long civil conflict, ongoing political instability, poor governance, and weak structural reforms have retarded economic growth. Per capita GDP has barely increased in the past decade ad the country remains one of the poorest in the world with a 2004/05 GDP per capita below US $300. The economy of developing countries is based on agriculture therefore; agriculture is the largest sector and backbone of the Nepalese economy. It is the major source of livelihood for a majority of the country's population. Approximately 80 percent of Nepal's population is tied up with agriculture. Its contribution to the GDP is 39 percent. Nepal Government has given priority to the agriculture because there is less possibility of development in other sectors. So, since 5th economic development plan, Nepal Government has given priority in agriculture but the expected change in this sector is still not achieved.

The economic condition of the country cannot be improved only with the development of agriculture so that, industrial and commercial development is essential. All round development of the country can be possible with the development of industry and business. Unemployment problem can be solved and resources can be utilized properly by the help of industry.

The history of our industrial development is not so long. Nowadays some large scale and medium scale industries are being also established. The contribution of industrial production is about 10 percent in the GDP. There are different types of business organization in the country out of which joint stock companies are largest. They collect necessary capital from the public by selling their shares and debentures. The transaction of share in the market is increasing. Nepal stock exchange, in short NEPSE is only authorized institution for share transaction. It works as mediator between the seller and purchaser of shares in the open market. The company can issue the share after registration in the NEPSE. All the interested investors can invest their saving in the share of companies with the help of NEPSE for effective and smooth share transaction. The share transaction is the indicator of the trend of national

economy. The investors should analyses the financial position of the company before purchasing their share on the basis of risk and return relationship.

After the adaptation of liberal economic policy many business institutions were established in private and public sectors. In this condition Nepalese security market is also avidly developed which encouraged investors to invest their money in various types of security. When the saving is converted into profitable investment then risk is a associated with the profitability of that investment. Thus, risk and return always is a significant analysis to every investor. "To maximize the share price, the financial manager must learn to assess two key determinants, risk and return. Each financial decision present certain risk and return characteristics and the unique combination of characteristics has an impact on share price" (Gitman, 2001:236). Here, the study is concerned with risk and return associated with common stock investment however there are various types of financial assets to be invested i.e. treasury bill, long term bonds, preferred stock, etc. "Common stock represents commitment on the part of a corporation to pay periodically what ever its board of directors deems appropriate as a cash dividend." (Shrestha, 1995:1). Investors of common stock are the ultimate owners of the company collectively, they own the company and ultimate risk is associated with ownership. So, the common stock is known as risky security. Thus, before the investment made in common stock, investor must consider the risk associated with their investment and to do so, they need to define the risk properly. "Risk refers to a set of unique outcomes for a given event which can be assigned probabilities, while uncertainty refers to the outcomes of given events which are too unsure to be assigned probabilities" (Khan and Jain, 207:12.2). In other words "Risk is a pornography which is hard to define but it will be known if we see it. Investor went to be back higher return to invest in common stock, but their expected return may not be changed in realities. This uncertainty is the major risk to the investor in stock market investment (Van Horn, 2000:89).

The return on investment is usually as dividend plus any change in market price of share and it is usually expressed in percentage. Both dividend and change in market price are uncertain items. So, the actual return on investment in common stock may differ substantially from the expected return. Thus, return from common stock is of two types i.e. dividend received and price appreciation of investment. To invest in

common stock the following investment procedure need to be considered (Sharpw, W.F. , Alexander, G.J. and Bailey, J.V. , 2005:11)

      i) Set investment policy

      ii) Perform security analysis

      iii) Construct a portfolio

      iv) Revising the portfolio

      v) Evaluate the performance of portfolio

i) Set Investment Policy:

The first step of the investment process is to set the investment policy. It involves determining the investor's objectives and the amount of his or her investable wealth. Investment objectives should be stated in terms of both risk and return. This step involves the indentification of the potential categories of financial assets for consideration in the ultimate portfolio. This identification will be based on the investment objectives, amount of investable wealth, and tax status of the investor.

ii) Perform Security Analysis:

The second step of the investment process is to perform security analysis. Security analysis involves examining a number of individual securities (or groups of securities) within the broad categories of financial assets. The purpose for conducting such examinations is to identify those securities that currently appear to be mispriced. There are two main approaches to security analysis. They are:

a) Technical analysis

b) Fundamental analysis

iii) Construct a Portfolio:

The third step of the investment process is construction f portfolio. Construction of portfolio involves identification of specific securities in which to invest, along with the proportion of investable wealth to be put into each security.

iv) Revise the portfolio:

The fourth step of the investment process is portfolio revision. Portfolio revision involves both realize that the currently held portfolio is not optimal ad specifying

another portfolio to hold with superior risk-return characteristics. The benefits o the revision. The revision of the portfolio of the portfolio constitutes the repetition of all the above three steps.

v) Evaluate the portfolio Performance:

The fifth step of the investment process is portfolio performance evaluation. It involves determination of the actual performance of a portfolio in terms of risk and return and compares the performance with that of an appropriate "benchmark" portfolio.

The investment activity must consider the following dimensions:

i) Maximization of expected return for varying levels of risk.

ii) Minimize the risk for varying level of expected return.

The set of portfolio meeting these two conditions is known as the efficient set (also known as the efficient portfolio).

Under the Markowitz portfolio theory, an investor invest in those portfolio a) which have the highest return of portfolio at similar level of risk and b) which have the lowest risk at similar level of portfolio return. Thus, the portfolio giving the highest return at a similar level of risk and the lower risk at a similar level of return are called dominant portfolios.

In context of Nepal, many investors invest their money on single security without considering the investment process and calculating risk. Though some of the investors invest in two or more it is found that they don't make any analysis of portfolio before selection of such securities of invest. They invest their money in different securities on the basis of expectation and assumptions of individual security rather than analysis of portfolio. So, it is a must to make them well acquainted with these tools along with their practical implication on investment decisions and evaluation.

Generally, investors are risk averse; they are always seeking higher return for more risk as risk premium. So, primary problem in investment is to identify the security

which has low risk and high return. However, return can not increase substantially; risk can reduce by diversification of funds in different stock making a portfolio. Well diversified portfolio can eliminate the unsystematic risk, which is not explained by generally market movement. Systematic risk, which is associated with change in return on market as whole can not be avoided by , are obviously and important concept in investment and hence to be provided to investors to motivate them to invest rationally.

Commercial Bank

In general, bank means an institution that accepts deposits in different account and provides loans of different types. Many changes have taken place in the functions of a bank from the initial stages of its development to present day. There are many types of bank which do not accept deposits such as central bank and industrial bank.

The modern complex economic system can not function without bank. The banking system has facilitated the personal transactions such as deposit and remittance of money, and lending and borrowing of money. It has made easier to develop agriculture, industry and trade. At the same time it has helped to accelerate the peace of economic development. The bank helps in mobilization and allocation of scarce resources, which are essential for economic development.

When a bank performs multiple tasks, the efficiency and effectiveness of work become weak. Hence, different bank are established with different purpose and in different categories. Among them commercial bank are only the focus of this study.

The commercial bank is the oldest form of bank. There are various changes in the original concept and functions of commercial bank. In general, banks mean the commercial banks. In other words, the bank that collect deposit , advance loans and provide wide range of financial service are called commercial bank. Commercial banks are established as a joint stock company with a view to earn profit. Thus, banks are regarded as the heart of modern economy. It is because they mobilize resources by collecting deposit and chanalise those resources to productive sector by granting loans.

In Nepal, for a very long time the development of bank was affected by the rule of Rana Government and the slowdown in the Nepalese economy. There are 29 commercial banks listed in Nepal Rastra Bank :

Name	Estd.	Head office
1) Nepal Bank Ltd.	B.S. 1994-7-30	Kathmandu
2) Rastriya Banijya Bank	B.S. 2022-10-10	,,
3) Agriculture Development Bank	B.S. 2024-10-17	"
4) Nabil Bank Ltd.	B.S. 2041-03-29	"
5) Nepal investment Bank	B.S. 2042-11-26	"
6) Standard Chartered Bank	B.S. 2043-10-16	"
7) Himalayan Bank	B.S 2049-10-05	"
8) SBI Bank Ltd.	B.S. 2050-03-23	"
9) Nepal Bangladesh Bank	B.S. 2051-02-23	"
10) Everest Bank Ltd.	B.S. 2051-07-10	"
11) Bank of Kathmandu	B.S. 2051-11-28	"
12) Nepal Credit & commerce	B.S. 2053-06-28	Bhairahawa
13) Lumbini Bank Ltd.	B.S. 2055-04-01	Narayanghat
14) Nepal Industrial & commercial	B.S. 2055-04-05	Biratnagar
15) Machhapuchre Bank	B.S. 2057-06-17	Pokhara
16) Kumari Bank	B.S. 2057-12-21	Kathmandu
17) Laxmi Bank Ltd.	B.S. 2058-12-21	Birgunj
18) Siddharth Bank Ltd.	B.S. 2059-09-09	Kathmandu
19) Global Bank	B.S. 2063-09-18	Birgunj
20) Citizen Bank	B.S. 2064-01-07	Kathmandu
21) Prime Commercial Bank	B.S. 2064-06-07	"
22) Sunrise Bank	B.S. 2064-06-25	"
23) Bank of Asia	B.S. 2064-06-25	"
24) Development Credit Bank	B.S. 2065-02-12	"
25) NMB Bank ltd.	B.S. 2065-02-20	"
26) Kist Bank Ltd.	B.S. 2066-01-24	"
27) Janta Bank Ltd.	B.S. 2066-12-23	"
28) Megha Bank	B.S. 2067	Kathmandu

In the study four banks has selected as sample. As short introduction the selected of banks has given as follows:

Nabil Bank Limited

Nabil bank limited, the first foreign joint venture bank of Nepal standard operation in July 1984. Nabil was incorporated with the objective of extending international standard modern banking services to various sectors of the society. Pursuing its objective, Nepal provides a full range of commercial banking services through its 19 points of representation across the kingdom 2 over 170 reputed correspondent banks across the globe.

Nabil as a pioneer in introducing many innovative products 2 marketing concepts in the domestic banking sectors, represents a milestone in the banking history of Nepal as it started on era of modern banking with customers satisfaction measured by highly qualified & experienced management team. Bank is fully equipped with modern technology which includes ATMs, credit card state-of art world- renowned software from infosys technologies system Banglore, India interne\t banking system & tele banking system.

Everest Bank Limited

Everest bank Limited (EBL) started its operations in 1994 with a view and objective of extending professionalized & efficient banking services to various segments of the society. The bank is providing customer- friendly services through its branch network. All the branches of the bank are connected through anywhere Branches Banking system (ABBA), which enables customers for operational transactions from any branches.

With an aim to help Nepalese citizens working abroad, the bank has entered into arrangements with banks & finance companies in different countries like UAE, Kuwait, Bahrain, Qatar, Saudi Arabia, Malaysia, Singapore & U.K. Bank has set-up its representative offices at New Delhi (India) to support Nepalese citizen remitting money & advising banking related services.

Joint Venture partner

Punjab National Bank (PNB) its, joint venture partner (holding 20% equity in the bank) is the largest national bank in India. With its process virtually in all the important centers at India, Punjab National Bank offers a wide variety of banking services which include corporate & personal banking, industrial finance, agricultural finance, financing trade & international banking. Among the clients of the bank are India conglomerates medium & small Industrial units, experaters, non- resident Indial & multinational companies. The large presence & resource base have helped the bank to build strong links with trade & industry.

Himalayan Bank Limited

Himalayan Bank was established in 1993 in joint venture with Habib Bank Limited of Pakistan. Despite the cut-through competition in the Nepalese banking sectors, Himalayan bank has been able to maintain a lead in the primary banking activities-loans & deposits.

Legacy of Himalayan lives n in an institution that's known throughout Nepal for its innovative approaches to merchandising & customer service, Product such as premium saving savings account, HBL propriety card & millionaire deposit scheme besides services such ATMs & tele banking were first introduced by HBL- other financial institution in the country have been following its lead by introducing. Similar products & services. Therefore, we stand for the innovations that it bring about in this country to help its customers besides modernizing the banking sectors. With the highest deposit base & loan portfolio amount private sector banks & extending guarantees to correspondent banks, it believe it obviously lead the banking sectors of Nepal. The most recent of HBL by bankers' Alamance as country's no. 1 Bank easily confirms its claim.

All branches of HBL are integrated into Globus (Developed by Temenos) the single banking software, where the bank has made substantial investments. This has helped the bank provide service like 'Any Branch Banking Facility' interest banking & SMS banking. Living up to the expectation & aspiration of the customers & other stakeholders of millionaire deposit scheme, small business enterprises loan, pre-paid

card, international travel Quota credit card consumer finance through credit card & on live TOEFL, SAT, IELTS, etc. fee payment facility are some of the products & services. HBL also has a dedicated offsite 'Disaster Recovery Management System . Looking at the number of Nepalese workers abroad & their need for formal money transfer software Himal Remit TM. By deputing its, in the middle fast & Gurlf region, HBL is the biggest inward remittance handling bank in Nepal. All this only reflects that HBL has an outside – in rather than inside . Out approach where customers' needs & wants stand first.

Standard Chartered Bank Nepal

Standard chartered bank Nepal limited has been 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 having an ownership of 75% in the company with 25% shares of the largest international bank currently operating in Nepal.

Standard chartered has a history of over 150 years in banking and operation in many of the worlds fasted- growing markets with an extensive global net work of over 1750 branches (including subsidiaries, associates & joint ventures) in over 70 countries in the Asia pacific region, south Asia, the middle East, Africa, the united Kingdom & the America. As one of the worlds' most international banks, Standard chartered employs almost 75000 people, representing over 115 nationalities, worldwide. This diversity lies the heart of the bank's values & supports the banks growth as the world increasingly becomes one market.

With 18 points of representation, 23 ATMS across the country & with more than 350 local staff standard bank Nepal Ltd. is in a position to serve its customers through an extensive domestic network. In addition the global network of standard chartered group gives the bank a unique opportunity to provide truly international banking services in Nepal.

Standard chartered bank Nepal limited offers a full range of banking products & service in consumers banking, wholesale & SME banking catering to a wide range of customers encompassing individuals, mid- market local corporate, multination, large

public sector companies, government corporations, airlines, hotels as well as the DO banking segment comparing of embassies, aid agencies, NGOs &/ INGOs.

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

Corporate social responsibility in an integral part of standard chartered's ambition to become the world's best international bank & is the mainstay of the bank's values. The bank believes in delivering shareholders value in a socially, ethically an environmentally responsible manner. Standard's chartered throughout its long history has played an active role in supporting those communities in which its customers & staff live. It concentrates on projects that assist children, particularly in the areas of health & education. Environmental projects are also occasionally considered. It supports non- governmental organizations involving charitable community activities. The group touched two major initiatives in 2003 under its 'Believing in Life' campaign- 'Living With HIV/AIDS' & 'Seeing is Believing'.

1.2 Focus of the Study

The main focus of study in the portfolio analysis of commercial banks listed in NEPSE by taking 4 banks. The study is basically concerned with diversification of risk by making portfolio in investments. The study ultimately focuses on to suggest the way to attain sustainable profit by minimizing the considerable risk. For this purpose return on assets (ROA), return on equity (ROE), arithmetic mean, standard deviation, coefficient of variation, Karl Pearson's correlation coefficient, portfolio analysis on the basis of return on equity, diversification of risk on the basis of return on equity are analyzed to give an idea about how the benefits of diversification could be attained to avoid future loss of investment in common stock.

1.3 Statement of the Problem

Nowadays, investment has become risky job by the cause of sharply growing competition. So, to protect the investor's investment from risk of bankruptcy, it is necessary to analyze portfolio. There should address some problems which give direction to the study. And, the study will be meaningful. Also, it helps to researchers, brokers, investors & common people who want to know about it.

Investor should get enough information related to risk- return as well as portfolio analysis of investing sectors where they are willing to invest their fund investor in Nepal are not getting enough information related to their sectors. So, they are suspected to invest their fund.

To avoid these kinds of uncertainties, a study is necessary. So my study's statements of the problems are as follows:

1) What is the return percentage on investment?
2) What is the risk & return position of Nepalese commercial banks?
3) What is the financial performance in terms of portfolio risk & return of Nepalese Commercial banks?
4) Can the bank diversify the risk by investing in port folio?
5) What kind of relation does exist with risk and return?
6) Does the portfolio of assets of commercial banks help to reduce the risk?
7) What is the effect of portfolio on return?

1.4 Objectives of the study

Main objective of the study is to find out portfolio behavior of the sampled banks. It also will help to researchers, investors & brokers, as well as organizations which are our sample for the research. So, the specific objectives of the study arte listed below:

i) To find out percentage return on investment.
ii) To know risk & return position of Nepalese commercial banks.
iii) To know about the financial performance in terms of portfolio risk & return of Nepalese commercial banks.
iv) To analyze whether risk is diversifiable by investing portfolio or not.
v) To suggest an recommend on the basis of major findings.

1.5 Significance of the Study

Though, the study is related with portfolio analysis of commercial banks. But it will help different people by different ways by the cause of their different interest way of perceiving, different sectors & situational boundaries.

The study specifically will be significant for investors who are searching the information as well as portfolio analysis of sampled banks. In the contest of Nepal, to invest in every sector, people are suspected by the cause of lack of information & ignorance of portfolio behavior of commercial banks. So, it will be a milestone for them.

For the researcher it will be a guideline as literature review. And for researcher, it will be bridge to fill gap conducted the study before & after this research. Bankers also will be benefited by this study. They will able to know return on assets & return on equity ratio in terms of individual as well as portfolio risk & return and diversification of risk about their banks. By that they may improve their existing position, if they feel that it should be improved. Lastly the people who want to know the risk and return and diversification of risk, they will be benefited by this study.

1.6 Limitation of the study

The study should not be vague, so, every study has some limitation. The limitation gives the study meaning, effectiveness, right direction & punctuation. This also has some limitation are as follows:

   (a) The study is only concerned with portfolio analysis of sampled banks.
   (b) Thu study is basically based on secondary data.
   (c) Only four commercial banks taken as sample.
   (d) This study is conducted only for suggestion, not for direction.
   (e) The study period covers only 5 fiscal year beginning from F/Y 2061/62 to 2065/66 or (2004/2005 to 2008/09)

1.7 Organization of Study

The whole study is divided into the following fie chapters:

Chapter -1

This chapter includes background of the study, focus of the study, statement of the problem, objectives of the study, significance of the study, Limitation of the study and organization of the study.

Chapter - 2

This chapter provides the conceptual foundation of the study. It includes the review of previous related books, journals, article, dissertations and previous published and unpublished thesis on the related field of the study.

Chapter -3

In the third chapter "Research methodology", research design, sources of data, population , sample, financial & statistical variable ad respondents profile have been presented.

Chapter -4

In this chapter data presentation, interpretation and analysis of data will be done.

Chapter -5

This chapter contains summary, conclusion and recommendations. Here, summary, conclusion and recommendations of the study have been briefly explained.

- At the end, bibliography & appendices have been annexed.

CHAPTER-II
Review of the Literatures

Review of Literature means reviewing research studies or other relevant propositions in the related area of the study so that all the past studies, their conclusions & deficiencies may be known & further research can be conducted. It is an integral & mandatory process in research works.

This section includes theoretical reviews & reviews of the previous studies.

2.1 Theoretical Reviews

2.1.1 Risk and Return Theory

The return from an investment cannot be thought without the risk factor. Since the future is uncertain, there is always a chance that the returns will be either more or less than expected. The greater variation in returns, the greater the risk factors. Risk is related to a situation in which the decision maker knows the probabilities of the various uncertainties.

Thapa and Koirala (2006) state as risk needs to be measured in an objective way in order to know whether it justifies a specific rate of return. An investor requires a higher return from a risky project in order to compensate for the risk. The main aim is to maximize the returns with a given level of risk or to minimize the risk with a given level return. Therefore for this purpose that returns and risks need to be measured.

There is the relationship between expected return and the expected level of associated risk. The nature of the relationship is that as the level of expected risk increases, the level of expected return also increases. The opposite is true as well. Lower levels of expected returns. This risk-return relationship is characterized as being a direct relationship or a positive relationship.

Various factors play roles to make the actual return and such factors are known as sources of risk. Francis, (2000), the factors or sources of risk are as follows:

1. 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.

2. Interest Risk

It is the potential variability of a return caused by changes in the market interest rates. Market interest rate rises, the value of an asset (Bond) will decrease. A higher interest rate means a higher discount rate and a higher discount rate causes a lower present value of any asset.

3. Default Risk

Default risk is related to the probability that some or all of the initial investment will not be returned. The degree of default risk is closely related to the financial condition of the company issuing the security and the security is rank in claims on assets in the event of default or bankruptcy.

4. Call ability Risk

Some securities are issued with a call provision that is a company may call back the securities issued before their maturity. The call ability risk is the portion of a securities total variability of return that derives from the possibility that the issue may be called.

5. Convertibility Risk

Convertibility risk is that portion of the total variability of return from a convertible bond or convertible preferred stock that reflects the possibility that the investment may be converted into the issuer's common stock at a time or under terms harmful to the investor's best interests.

6. Bull-Bear Market Risk

The various market forces make securities price upward and downward. The upward trend of market price (Bull Market) and downward trend of market price (Bear market) create a long lasting source of investment risk.

7. Industry Risk

Industry risk is that portion of an investment's total variability of return caused by events that affect the products and firms that make ups and downs to the industry. Some of the factors which affect all the firms in an industry may be the industry's life cycle, international tariffs or quotas, industry-related taxes and availability of industry related raw materials. For Nepalese textile industry is facing the same industry risk in the future because the quota provided the US is going to expire.

8. Management Risk

A company's management and Board of Directors are involved in the decisions ranging from product innovation and production methods to financing and acquisitions. All these decisions made by the management materially affect the risk faced by investors. Sometimes, the management may make a decision, which turns out to be wrong later on. For example, the poor management of Nepal Bank Limited arouses the investment risk to the shareholders. The share price continuously fell and had to de-list from the Nepal Stock Exchange. This has been creating risk to the investors.

Since, management errors are difficult to analyze, investors can reduce their risk by buying shares in those corporations in which the executives have the significant equity investment instead of buying shares in the corporation in which executives have no equity investment.

9. Political Risk

Political risk is the portion of assets' total variability of return caused by changes in the political environment (domestic and international as well as the internal changes

of the company).The current Nepalese political environment has made a significant impact on the investment to increase losses.

10. Purchasing Power Risk

Purchasing power risk is the variability of return an investor suffers because of inflation. Inflation is measured by percentage change in the Consumer Price Index (CPI) over the period. The consumer price index is calculated by collecting the prices of consumer goods. This index, in Nepal, is calculated by Nepal Rastra Bank (NRB).

2.1.2 Diversification & portfolio Analysis

Risk may be measurable & diversifiable. Diversifiable means the risk may be avoided partially or totally. To diversify the risk, investors can allocate his fund in different sectors. It means that the investor can make portfolio by investing different securities. There is a popular saying that" do not put all eggs in a single basket" so portfolio is combination of securities. The objective of the portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate. Combination of securities can be made in many ways. They are as follows: (Ibid)

> 1) Simple Diversification
> 2) Diversification across Industries
> 3) Superfluous Diversification
> 4) Simple Diversification across Quality Rating Categories
> 5) Markowitz Diversification

A portfolio is the combination of investment in financial assets. The portfolio is the holding of securities and investment in financial assets as bonds, stocks. Portfolio management is related to efficient portfolio investment in financial assets.

If a person holds the stocks of two different companies, such holding is called two stock portfolios. In portfolio, analyze the degree of risk of stocks held. A stock held as a part of portfolio is less risky than the same stock held in isolation. So an individual investor can reduce the degree of risk of holding the stocks in portfolio. Such

investors are not interested in the risk and return on a particular single stock. They are interested in risk and return of an individual security, in terms of how it affects the risk and of the portfolio in which it is held. In other words, the investor attempts to minimize the risk b making a portfolio which ultimately raises the value of his investment. (Sources: Thapa & Koirala, 2006)

The basic portfolio model was developed by Harry Markowitz, who derived the expected rate of return for a portfolio of assets and an expected risk measure. Markowitz (1952) stated several assumptions regarding investor behavior:

1. Investors consider each investment alternative as being represented by a probability distribution of expected returns over some holding period.
2. Investors maximize one-period expected utility, and their utility curves demonstrate diminishing marginal utility of wealth.
3. Investors estimate the risk of the portfolio on the basis of variability of expected returns.
4. Investors base decisions solely on expected return and risk, so their utility curves are a function of expected return and expected variance (or standard deviation)of returns only.
5. For a given risk level, investors prefer higher returns to lower returns. Similarly, for a given level of expected return, investors prefer less risk to more risk.
6. Under these assumptions, a single asset or portfolio of assets is considered to be efficient if no other asset or portfolio offers higher expected return with the same (or lower) risk, or lower risk with the (or higher) expected return.

By the help of portfolio, risk can be diversified. In this context, it can be cleared through a proverb," do not put all eggs in one basket". It means that one can lose all eggs if some unlikely event occurs. So we can say that risk cannot be diversified by investing in a single asset. Obviously, risk can be diversified by forming portfolio. Thus, the objective of the portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate. Combination of securities can be made in many ways. They are as follows:

1. Simple Diversification

Simple diversification can be defined as "not putting all the eggs in one basket". Simple diversification is the random selection of securities that are to be added to a portfolio. Simple diversification reduces a portfolio's total diversifiable risk to zero and only the undiversifiable risk remains. It was found in many research studies that 10-15 securities in a portfolio would bring adequate returns. So this approach assumes that an investor can expect a reasonable return for a given level of risk. (Sources: Thapa, Bhattrai & Basnet, 2008)

Francis (2003) says about simple diversification as simple diversification was analyzed using random selections and equal weighting to simulate the techniques a naïve investor might employ. Using these naïve techniques to implement simple diversification does not nullify its ability to reduce risk in a diversified portfolio. (p.229)

2. Diversification Across Industries

Diversification across industries means securities are selected from different industries rather from a single industry to form a portfolio. In the context of Nepalese financial market, Nepal Stock Exchange ((NEPSE) has categorized the listed securities into eight sectors that are commercial Bank, Development Banks, Finance Companies, Insurance Companies, Manufacturing and Processing Companies, Trading Companies, Hotel Companies and others. Every sector is known as an industry. Under diversification across industries, securities are taken from many different industries to form portfolio.(Sources: Thapa et. al 2008)

Francis (2003) further says about diversification across industries, Some investment counselors advocate selecting securities from different industries to achieve better diversification. It is certainly better to follow this advice than to select all the securities in a portfolio from one industry. But, empirical research has shown that diversifying across industries is not much better than simply selecting securities randomly.

3. Superfluous Diversification

Superfluous diversification is the extended form of simple diversification. In the simple diversification, 10-15 securities are selected for a portfolio while superfluous diversification include more than that of simple diversification. But no further risk reduces from this diversification. It refers to the investors spreading himself in many investments on his portfolio. The investor finds it impossible to manage the assets on his portfolio because the management of a large number of assets requires knowledge of the liquidity of investment, return the tax liability and this will become impossible without specialized knowledge. He also finds it both difficult and expensive to look after a large number of investments. If he plans to switch over investments by often selling and buying assets expecting a high rate of return, he involves himself in high transaction cost and more money will be spent in managing superfluous diversification. It will be very difficult for him to measure the return on each of these investments. All those problems may result in inadequate return. (Sources: Thapa et. al 2008)

Francis (2003) says about superfluously diversified portfolio in this way, although more money is spent to manage a superfluously diversified portfolio, there will be must likely no concurrent improvement in the portfolio's performance. Thus, superfluous diversification may lower the net return to the portfolio's owners after the portfolio's management expenses are deducted.(p.232)

4. Simple Diversification across Quality Rating Categories

The securities available in the market are rated on the basis of default risk by rating agencies. Under this technique the portfolio is formed from same quality rating assets.

Francis (2003) describes as the highest quality portfolio of randomly diversified stock was able to achieve lower levels of risk than the simply diversified portfolios of lower quality stocks.(p.234)

5. Markowitz Diversification

Markowitz (March 1952)says diversification is the combining of assets, which are less than perfectly positively correlated in order to reduce portfolio risk without sacrificing portfolio returns.(p.89)

It can sometimes reduce risk below the undiversifiable level. Markowitz diversification is more analytical than simple diversification and considers assets' correlations (or co variances). The lower the correlation between assets, the more that Markowitz diversification will be able to reduce the portfolio's risk.

2.2 Review of the Related Journal

Okonkwo (2003) has conducted a study" Analysis of the portfolio behavior of black-owned commercial banks". This study differs because it did not seek to compare the economic performance of black-owned banks to non-black-owned banks. Rather, the study bank loans, using profit maximization versus the loan accommodation principles models.

According to this study," The economics history of African-Americans reveal that the first financial institution-the first black-owned bank in the United States- was the 'Capital Savings Bank' established in Washington, D.C. October 1888 followed by the Savings Bank of the Grand Fountain, United Order, True Reformers which opened April 1889. Their primary functions of financial, institutions, one of which is to help finance the purchase of homes and other related activities."(Ibid)

These studies can be loosely group into two types. One group of studies focused on the impact of these banks on the economic development in their service areas. Essentially, did these banks accomplish the twin objectives of black economic efficiency (operating efficiency) and long-term survival prospects of black-owned to non-black owned banks?

This study investigates two alternative hypotheses about black-owned commercial portfolio behavior using aggregate date for all black-owned banks. These are the accommodation principle which is derived from the old "real bills doctrine" or

"commercial loan theory" espouses the following the bank earning assets should be limited to (a) short loans and (b) to self liquidating loans related to the production and distribution of goods and services. Demand for such bank loans determines their portfolio behavior.

Now, I want to write the nature and source of the data used for this study. Data on interest rates and Gross Domestic Product were extracted from various issue of the President Economic Report. The data on loans and demand deposits came from various issues of Black Enterprise Magazine and FDIC Records. It is pertinent to mention that after 1994, the data for loans and demand deposits are for the 25 largest black-owned banks (financial institutions). This study covers the time period from 1970 to 2001.

At last but not least, the result suggests that, the management of black-owned commercial banks is straddling both approaches to asset choice.

2.3 Reviews of the previous studies

Shrestha (1998) studied portfolio management in commercial bank theory and practice. Shrestha has stressed the investors having lower income portfolio management may be limited to small saving income. But on the other hand Portfolio management means to invest funds in various schemes of mutual funds like deposits. Shares and debentures for the investors with surplus income. Therefore institutional investors. Large investors would like to select a best mix of investment assets and subject to the following aspects:

   i) Higher return which is comparable with alternative opportunities are available according to the risk class of investor.
   ii) Good liquidity with adequate safety on investment.
   iii) Certain capital gains.
   iv) Maximum tax concession
   v) Flexible investment
   vi) Economic and efficient investment.

On the basis of the above aspects investors are expected to develop following strategy.

1. Do not hold any single security; try to have a portfolio of different securities.

2. Do not put all the eggs in one basket i.e. to have a diversified investment.

3. Choose such a portfolio of securities, which ensures maximum returns with minimum risk or lower return with added objective wealth maximization. In order to prepare structure and modus operandi of effective portfolio management.

Shrestha has presented following approach to adopt.

To find out the investing assets (generally securities) having scope for better returns depending upon individual characteristics like age, health need deposition, liquidity and tax liquidity etc.

1. To find out the risk of securities depending upon the attitude of investors towards risks.

2. To develop alternative investment strategies for selecting a better portfolio which will ensure a trade- off between risk and return so as to attain the primary objectives of wealth maximization at lower risk.

3. To identify variety of securities for investment to refuse volatility of returns and risk.

Yadav (2002) has done analysis of saving, investment and capital market and it's various determinants of Nepalese enterprise by using the properties of portfolio formed on savings, investments and capital formation. This study has examined the relationship between Saving , investment and capital formation through regression analysis taking 39 enterprises from the fiscal year 1995/96 to 1999/00. Yadav's study has revealed positive relationship between saving and GDP investment and GDP capital formation and GDP and these variables has positive relation with tax revenues, foreign and exports.

Chhetry (2003), has conducted a thesis" A study of application of portfolio theory in financial institutions of Nepal" for the fulfillment of master's degree. The study is based on secondary data analysis. Necessary data was taken from the NEPSE (1995-1999). Chhetry has made this research with fifteen financial institutions. The main objectives of Chhetry's research were shown below.

1. To examine the application of portfolio theory in financial institution of Nepal.

2. To examine whether the risk can be diversified by investing in portfolio of assets.

3. To examine the differentiation of risky ness inherent in any single asset held in Portfolio from the risky ness of that held in isolation.

The study used statistically as well as ratio analysis the data in this research work to fulfill this study's objectives. The studies pointed out various findings are given below.

1. The portfolio risk of fifteen financial institutions was diversified.

2. The portfolio risk of fifteen financial institution were less than the average risk of the 15 financial institution.

3. The relationship between risk & return was negative for insurance & finance company where as banking industry shows positive relationship between risk & return.

Bhatta (2003), undertook the study" Portfolio management of listed finance companies in Nepal". The study of Bhatta is a new concept in portfolio management of Nepalese companies. Under the study, the main objective was to study and analyze the existing situation of portfolio management of listed finance companies in Nepal. The study used secondary as well as primary data through opinion survey. The study period is 7 year from 1997 to 2002. The study used 20 percent samples and analyzed data in order to fulfill the set objective.

After analyzing the secondary data, the study conduced, "Expected market return is lower in comparison to market risk, so market is highly risky place to invest." Moreover, the study found. All the listed six finance companies stock are under priced. So investors need to buy these stocks. In most of cases, portfolio management of listed finance companies in Nepal is not systematically organized. The process of determining the division of a corporate investor's portfolio among available classes is heavily based on experience. To reduce portfolio risk, most industries techniques. The major objective of portfolio management is to minimize risk. Generally 2.5 years time horizon is appropriate for portfolio in most cases, In Nepalese stock market; it is found that passive portfolio strategy is more suitable than active strategy to achieve better results. Majority of the corporate investors depends on fundamental analysis

than technical analysis for portfolio securities selection. Corporate investors revise portfolio time to using experience.

Khania (2003), has studies on "Investment portfolio Analysis of Joint venture banks". The study is based on five joint venture banks and they are NABIL, SCBNIL, HBL, NBBL and EBL. The general study of the present study is to identify the current situation of investment portfolio of joint venture banks in Nepal. The objective is to analyze the risk and return ratio of commercial banks, to evaluate the financial performance of joint venture banks and portfolio structure of Nabil bank for investment between loan investments. Investments in real fixed assets and investment in financial assets. The major finding of the analysis is Nabil is investing the highest amount of funds on NRB bond as compare to other joint venture banks (i.e. 3%).Beta coefficient of HBL is lowest among all the banks so the systematic risk of HBL is low. The coefficient of correlation between loans and advances in private sector and portfolio return of joint venture banks come out to be r_{xy} =-0.6 therefore it indicates that there is negative correlation between loans and advances in private sector and portfolio return of five joint venture banks in Nepal.

Crab's (2003), study is based on systematic risk with capital assets pricing model (CAPM).The CAPM states that the expected return on asset is the sum of the return on risk free asset and the return commensurate with the assets market risk. There are many assumptions underlying the CAPM which are beyond this study but the basic premise is that investor hold diversified portfolios of all market securities and the return on a given investment is determined by the risk free rate and the assets co-variance with the market portfolio. The equation which is used in this study is given below.

$$Ki = RF + bi \ (Km - RF)$$

Where, Ki =Expected rate of return of security (i), RF= Risk free rate of return, Km = Market return, ꙅ i= Systematic risk or Beta of security (i)

This study found greater the beta, the more sensitive are the returns on the stock to changes in the returns on the market as a whole.

Mustafa (2003) has conducted a research about" Portfolio Management of listed joint venture banks in Nepal. The study period is of 7 year from 1994/95to 2000/01. This

study used secondary data analysis with four joint venture banks. The main objectives of Mustafa's are given below.

1. To examine the risk ness of Nepalese joint venture banks.
2. To analysis the risk return ratio of commercial banks.
3. To evaluate the financial performance of joint venture banks.

This study used statistical tools to analysis the data in this research work to fulfill the above objectives. This study found various finding based on analysis of data. There are few major finding which are given below:

1. The mean investment of joint ratios of Everest Bank limited is higher among banks.
2. Everest Bank Limited is the highest risky among four joint venture banks.
3. Standard Charted Bank Nepal Limited is the best among sample banks.

"Portfolio management of commercial banks in Nepal" by Shrestha (2004) meets the stated objective of the study descriptive cumulative analytical research design has been adopted. According to him all the historical closing stock prices of banks, percentage of cash and stock dividend, and NEPSE index for the seven years (1997 to 2003) including the market capitalization of the banks for 2003 are enumerated. The objective of the research were to evaluate common stock and beta for analysis of systematic risk with common stock prices and identify the range for true beta true alpha of listed commercial bank under present study in terms of risk and return. The study findings are presented under different sub headings such as investment, risk and return analysis optimal portfolios etc. The study summarized that the investment in single assets is extremely volatile. Construction of portfolio can diversify such volatility to some extent. Using the tools developed by Sharpe, Treynor and Jenson, stocks of the banks in terms of risk and return associated to the stocks have been evaluated in this study. Researcher found that majority of the risk adverse investors find minimum variance portfolio yielding optimal satisfactions. Single index model of shape has however; identified only three stocks are applicable for the construction of the optimal portfolio using. The mode, the stocks of SBI, HBL, and SCBL with respective weighs of 30, 68 and 29 percent respectively are required for constructions of the optimal portfolio and the return derived from the same is 58.98 percent with standard deviation of the returns of 61.65 percent.

Shrestha (2004), has studies on "Optimal portfolio investment in Nepal". The main theme of this study is to analyze rationalities of portfolio theory in context of Nepalese Security market. Always investor tries best to make sure return is not cent percent sure or investment will not ruin. The study mainly focused on the specific sector of market currently listing in NEPSE for last 6 years and this study mainly based on the different categories. This study is based on the companies listed in NEPSE and applies the different categories. This study is based on secondary data as well as primary data of 6 years collected by small survey of 25 investors main objectives of this study is to find out and analyze the major problem of investor regarding selection of optimal portfolio, by develop understanding for portfolio investment. This study tries to analyze the risk and return market sensitivity, composition of risk and pricing status of securities, and to suggest the measure for the improvement of investment rationalities. Investor should be aware of risk and return. This research helps them to find out the degree of risk associated with the stock systematic and unsystematic risk estimation of stock.

Tiwari (2007), has prepared a research intitled "Risk and Return Analysis of Selected Finance Companies Listed in Nepal" on the specific object to analysis the risk and return associated with the common stock of six finance companies. They are Kathmandu Finance Co. Ltd., Samjana Finance Co. Ltd., National Finance Co. Ltd., Citizen Investment Trust, Ace Finance Co. Ltd. and Peoples Finance Co. Ltd. His research has been based on the collected data from the secondary source. Nepal Stock Exchange (NEPSE) Ltd. is the main organization, which provides most of the data required for the study from year 1998 to 2002. For analyzing the data, he has used various statistical techniques of simple liner regression as well as other financial tools. The major findings of his study were as follows:

1. All the finance company have positive expected return as well as most of the finance company has the return near to the average.
2. All the investment involved certain amount of risk (i.e. standard deviation) as well as most of the finance companies have the risk less than the average.
3. The value of best suggests majority of finance company stock volatility is less than the market volatility and they are defensive stock.

4. Some finance companies securities have highest value of CV (3.49). Although many of the finance companies CV is less than the average CV (1.77) but not in acceptable level.

5. There is positive relationship between expected return and deferent measure of risk of the finance company

6. The return of majority of finance companies has higher degree of positive correlation with the return of other companies.

7. The overall effect of portfolio on risk and return shows mixed result. It means the portfolio helps to increase the return in some case but in some case it has also decreased the result up to negative level. But in other hand, neatly in all case it has helped to decrease the level of risk up to some extent.

Acharya (2007), has conducted the study in the title" Portfolio Management in financial Institutions of Nepal". In research 5 banks, 3 Insurance companies and 5 finance companies have taken as sample. Data are collected from 1999 to 2004.The objectives of the research are as follows:

1. To examine the risk and return of Nepalese financial institutions.

2. To evaluate the financial performance in terms of portfolio risk and return of Nepalese financial institutions.

3. To examine risk can be diversified by investing portfolio.

From the portfolio analysis of financial institution the researcher has made following conclusions:

1. The portfolio risk of five banks is found to be diversified. The portfolio risk is less than the average risk five banks based on return on assets and return on equity.

2. In case of finance companies too the portfolio is application. Here the portfolio risks of combined five firms are less than the average risk derived from return on assets and return on equity. In other words, for finance company also the portfolio risk can be diversified.

3. Among insurance companies also the portfolio theory is also applicable. It presents the portfolio of risk is diversified under returns on assets and return on equity.

Finally the correlation coefficient of risk and return of the firm under banks, finance companies and insurance companies is negatively correlated each in two portfolio ratios on assets and return on equity.

From the above result of portfolio analysis, it can be observed that the portfolio management in case of randomly selected under banks finance companies and insurance companies are positive. In other words in case of Nepalese finance institutions too, the portfolio risk can be diversified. It is one of the positive factors in case of, Nepal's capital market. Through the capital market of Nepal is not so developed, the portfolio risk is diversified.

Acharya (2008), has conducted a study in title "Portfolio Analysis of Joint venture commercial Banks in Nepal". In research 5 commercial banks have taken as sample. Data are collected from 2000/01 to 2004/05. Data Analysis tools of this study are expected return, standard deviation, covariance, correlation coefficients, Beta coefficient, portfolio standard deviation etc. The objectives of the research are as follows:

1. To analyze the total loan & advance portfolio profit on total assets ratio profit on holder's fund ratio, return & risk of the common stock, portfolio risk & return, the present status of portfolio management by investors etc.
2. to calculate EPS of sampled banks:
3. To state the pricing situation (under –priced or over priced) of common stocks and recommending whether they should be bought or sold short. From the analysis of joint venture commercial banks the researcher has found the major findings are as follows:
   a. The mean ratio of loans and advances to total deposits of EBL is the highest NBL & EBL have invested above industry average. HBL & NABIL have invested below than industry average and ACBL has invested low amount of loans & advances through its total assets.
   b. SCBL has earned, NABIL earned return above than industry average & NBBL has earned lowest return among the sampled banks.
   c. The mean EPS of SCBNL is the highest & EPS of NBBL has lowest mean among the selected commercial banks.

Atreya (2009), conducted a study in the title "Comparative Analysis of financial performance of Himalayan Bank ltd.(HBL) & Standard Charted Bank Limited (SCBNL)". IN research, it clear by title that two banks have taken as sample. Data are collected from F/Y 2002/03 to 2006/07. Tools of this study are liquidity ratio. Activity turn over ratio, profitability ratio capital structure ratio or leverage ratio, invisibility ratio, income & expenditure analysis & satisfied tools are arithmetic mean & correlation analysis.

The objectives of the research are as follows:

1) To analysis the liquidity ratios, activity ratios, profitability ratios of Standard Charted Bank Nepal Ltd. & to provide suggestive framework for their improvement.

2) To study the comparative financial strength & weakness of two joint venture banks & their viability.

3) To suggest measures for their effective & efficient financial performance.

The major findings are as follows:

1) HBL seems relatively better than that of SCBL although the banks liquidity portion is satisfactory. In case of utilization of assets both banks have been efficient in utilizing most part of their total assets in portfolio generating purpose but comparing both bank, HBL has better performance than SCBNL for utilizing assets.

2) In case of net profit to total assets ratio of SCBNL is found higher than HBL on an average. On the basis of capital structure portion SCNBL has better position than HBL.

3) SCNBL seems much better in terms of offering dividend to its shareholders as compared with SCNBL has provided better service to its customers than that of HBL.

CHAPTER- III
Research Methodology

In this section, an attempt has been made to explain various sequential steps that were adopted during the course of studying a problem with the research objectives. It tends to solve the search problem in a systematic way. Hence, all adopted research methods which are used in this report, are mentioned. It covers quantitative methodologies in a greater extent and also uses the descriptive part based on both technical aspects and logical aspect. This research tries to perform a well designed quantitative and qualitative research in a very clear and direct way using both financial and statistical tools.

3.1 Research Design

Suitable research design has been adopted to collect and analysis the data in a manner that aims to combine relevance to the research purpose with economy in procedure.

The research design is the conceptual structure. In this study, all collected data are presented in tabulated form with diagram and various financial and statistical tools have been used to analysis the data. The analysed data have been interpreted for the conclusions.

3.2 Nature & sources of data

Each research project has its on data needs and sources. Data are very important to analysis, evaluate and prepare the reports. Thus, the required data are obtained from several sources to prepare this thesis report. Some required data arte collected through interview , observations, or experiments and some data are collected from internal sources i.e. , sales, information , accounting data, internally generated research reports etc. and some data are collected from books, periodicals, published reports, data services and computer data banks.

Here, the most of the collected data of this study is based on secondary data which are provided by Nepal Stock Exchange and individual web-side of Banks Which are included as sample in this study.

3.3 Population & sample

There are 24 commercial banks listed in NEPSE which have been regarded as the population of this study. The population of the commercial banks listed in NEPSE is as follows:

1. Nabil Banks Ltd.
2. Nepal Investment Bank Ltd.
3. Standard Chartered Bank Nepal Ltd.
4. Himalayan Bank Ltd.
5. Nepal SBI Bank Ltd.
6. Nepal Bangladesh Bank Ltd.
7. Everest Bank Ltd.
8. Bank of Kathmandu Ltd.
9. Nepal Ind. & Commercial Bank Ltd.
10. Machchhapuchhre Bank Ltd.
11. Laxmi Bank Ltd.
12. Kumari Bank Ltd.
13. Lumbini Bank Ltd.
14. Nepal Credit and commerce Bank Ltd.
15. Siddhartha Bank Ltd.
16. Globel Bank Ltd.
17. Citizens Bank International Ltd.
18. Prime Commercial Bank Ltd.
19. Bank of Asia Nepal Ltd.
20. Sunrise Bank Ltd.
21. NMB Bank Ltd.
22. Kist Bank Ltd.
23. Agriculture Development Bank Ltd.
24. Development Credit Bank Ltd.

      (Sources: www.nepalstock exchange Ltd.)

Sample

Because of various limitations, analysis of whole population is not possible. Thus, following convenience commercial banks are selected as the sample for research purpose. The data will be taken from fly 2004/2005 to 2008/2009

  i) Nabil Bank Ltd.

  ii) Standard Chartered Bank Nepal Ltd.

  iii) Himalayan Bank Ltd.

  iv) Everest Bank Ltd.

3.4 Data Analysis tool

Several tools & techniques have been used to analyse the primary and secondary data collected from various sources for obtaining the logical conclusion. Following statistical and financial tools have been used in this thesis to analyse the data:

3.4.1 Ratio Analysis

A. Financial Tools

Return on Assets (ROA)

Return on assets in an indicator of how profitable a company is before leverage, and is compared with companies in the same industry. Since the figure for total assets of the company depends on the carrying value of the assets, some caution is required for companies whose carrying value may not correspond to the actual market value. Return on assets is a common figure used for comparing performance of financial institutions (such as banks), because the majority of their assets will have a carrying value that is close to their actual market value. Return on assets is not usefull for comparisons between industries because of factors of scale and peculiar capita requirements (such as reserve requirements in the insurance and banking industries).

It is a financial tool to measure the profitability of a company. It is calculated to know what the assets of a company producing. It is determined by the following formula.

$$ROA = \frac{NetIncome}{TotalAssets}$$

The Return on equity (ROE)

Return on equity is in influencing factor to the inventors to invest in the concerned sector. So, it should be conformed by the investor before investment. How to calculate this variable is possible through the help of net income and common equity . So , it is expressed here in formula, which is used to calculate ROE.

$$ROE = \frac{NetIncome}{CommonEquity}$$

Return on Net-Worth (RONW)

This is also an influencing factor to the investor to know more about the net worth situation of company through the help of net profit and worth like this:

$$RONW = \frac{Net\,\Pr ofit}{Net - worth}$$

Single period rate return (Rt)

Return is total gain or loss an investment over a given period of time. In other words, the retune is the difference between terminal (ending) value and initial (beginning) value plus cash receive during the given period. The return can be measured in rupees or percentage. The rupees return on an investment is called absolute return while percentage return on an investment is called the rate of return or relative return. The rate of return can be calculated as below.

$$Rt = \frac{p_1 - p_0 + D_1}{p_0}$$

Where, P_1 = Rate of return for time period.

P_o = Starting stock price

P_1 = Ending stock price

D_1 = Cash dividend for time t.

Average return, $\bar{R}_t = \dfrac{\sum\limits_{t=1}^{n} Rt}{n}$

Where Rt is the return for time period t & n is the number of periods.

Expected Portfolio Return, E (R$_p$)

A portfolio means combination of two or more securities (assets). The expected rate of return on Portfolio is weighted average rate of the expected rate of return on assets comprising the portfolio. The weight, which add up to 1, reflect the fraction of total portfolio invested in each assets. Thus there are two determinants of portfolio return, expected rate of return on each asset in the relative share of each asset in the portfolio. Symbolically the expected return for a n-asset portfolio is defined by,

$$E(RP) = w_1 E(R_1) + W_2 E(R_2) \ldots\ldots\ldots\ldots + W_n E(Rn)$$

Where

E(Rp) = the expected return on portfolio

n = The number of stocks in the portfolio

Wj = the proportion of the portfolio invested in stock j

E(Rj) = the expected return on stock j

Portfolio Risk (Two Assets Portfolio)

Total risk is measure in terms of variance ($\dagger^2$) or standard deviation ($\dagger$) of returns. Unlike portfolio expected return, portfolio variance (or standard deviation) is not the weighted average of variance (or standard deviation) of return on individual assets. The overall risk of the portfolio includes the interactive risk of an asset relative to the other, measured by the covariance of return. The covariance, in turn, depends on the correlation between returns on assets in the portfolio. The total risk of a portfolio made up two assets is defined by

Variance: $\dagger^2 P = \sum\limits_{i=1}^{n} \sum\limits_{j=1}^{n} = W_i W_j \dagger_i \dagger_j . rij$

Standard deviation: $\sigma p = \sqrt{\sum_{i=1}^{n}\sum_{j=1}^{n} WiWj\sigma i\sigma jrij}$

Where,

σi = The standard deviation of security i

σj = the standard deviation of security j

Wi = the proportion of portfolio devoted by security j.

rij = correlation between the securities I & j.

Minimum Risk Portfolio

Risk Minimizing weight for portfolio can be found by

$$WA = \frac{\sigma B^2 \text{-rAB} \times \sigma A \times \sigma B}{\sigma^2 A + \sigma^2 B - 2\times rAB \times \sigma A \times \sigma B}$$

Where, WA = Optimal weight to invest in security A

WB = Optimal weight to invest in security B

σA = Standard deviation of security A

σB = Standard deviation of security B.

B. Statistical Tools

Variance

Variance is defined as simple average of square deviation taken from expected return. It shows the average of square variability of the expected return from the actual return. The variance is weighted average of square deviation in the case of probability distribution of possible future return is given. On other hand, the variance is arithmetic mean when historical data is used, the variance is denoted by σ^2 (read as sigma square). The variance is used to measure the total risk in the expected return. Therefore, higher variance compared to lower variance indicates higher total risk. The variance can be calculated using the following formula.

$$\text{Variance} = \sigma i^2 = \sum_{t=1}^{n} \frac{(R - \overline{R})}{N\text{-}1}$$

Standard deviation

It is a statistical measure of the variability of a distribution of return around its mean. It is the square root of the variance and measures the unsystematic risk of the stock investment.

$$\text{Standard deviation} = \sigma j = \sqrt{\sum_{t=1}^{n} \frac{(Rj - \overline{Rj})}{n-1}}$$

Coefficient of Variation (CV)

The co-efficient of variance measure relative risk per unit in expected return i.e. risk associates with each percent of expected return. The risk averter investors select the alternative investment, which has lower value of co-efficient of variation. The co-efficient of variation is denoted by CV and it can be defined as below.

$$\text{Coefficient of variation (cvj)} = \frac{\sigma j}{E(Ri)}$$

Covariance (Cov)

The covariance is a statistical tools which is used to measure how the return of two assets very or more together. The positive value of covariance between return of two assets indicates that the returns of the assets moves in same direction. On other hand, the negative value of covariance between return of two assets indicates that the return of these assets move in opposite directions. The value of covariance between return of risky and risk free assets is always zero. It can be measured using the following formula.

$$\text{Covariance} = cov(AB) = \frac{1}{n-1} \sum_{t=1}^{n} [RA - \overline{RA}][RB - \overline{RB}]$$

Where, n = no. of observations

RA = Return for asset A

RB = Return for asset B

t = time period

$\overline{RA}$ = historical average return for asset A

$\overline{RB}$ = historical average return for asset B

Correlation Coefficient

The correlation is also a measure of the relationship between two assets. Its values are limited between the range of +1 and -1. Correlation and covariance are related by the following equation:

$$\text{Correlation coefficient} = rAB = \frac{COV(AB)}{\dagger A \dagger B}$$

CHAPTER - IV
PRESENTATION AND ANSLYSIS OF DATA

This chapter is the body part of the study. The main objective of the study is to analyze portfolio behavior in commercial banks of Nepal. In order to fulfill this objective the course of research methodology has been attempted to follow which is explained in the chapter there. Now this study has tried to analyze portfolio behavior. This chapter concerned with the presentation & interpretation of colleted data. The study analyze descriptive as well as analytical. There are three parts in this chapter. First part deals with financial performance of Nepalese commercial bank that shows mean standard deviation & coefficient of variation under return on assets & return on equity ratio. Second part deals with the portfolio analysis which presents portfolio risk & return as well as correlation coefficient between the banks on the basis of return on assets & return on equity. And third part deals with diversification of risk which shows risk can be reduced through diversification of risk which shows risk can be reduced through diversification.

4.1 Financial performance of Nepalese commercial Banks

This part present ratio analysis which is very important tools of financial analysis. It is the process of establishing the significant relationship between the items of financial statement to performance & financial position of firm. In this chapter, the year wise net income, net worth & total assets (in million) shown to calculate return on assets & equity. And, mean, standard deviation & coefficient of variation are calculated under return on assets & analyze the financial performance of Nepalese commercial Banks.

Table no. 4.1

List of year wise net worth, net income & total Assets in million.

S.N.	Year	Name of Bank	Net Income (in million)	Net worth (in million)	Total assets
1	2004/05	NABIL	519.00	1658.00	17186.33
2	2005/06	"	635.00	1875.00	22329.97
3	2006/07	"	674.00	2057.00	27253.39
4	2007/08	"	764.50	2437.20	37132.76
5	2008/09	"	1031	2875	43867.40
6	2004/05	EBL	170.80	692.60	11732.52
7	2005/06	"	237.20	822.80	15959.28
8	2006/07	"	296.40	1061.50	21432.57
9	2007/08	"	451.20	1581.20	27149.34
10	2008/09	"	638.7	2003.6	36916.85
11	2004/05	HBL	308.28	2568.39	27418.16
12	2005/06	"	457.44	2885.59	29460.39
13	2006/07	"	491.82	2942.23	33519.14
14	2007/08	"	635.85	3195.42	36175.53
15	2008/09	"	752.83	3119	39413
16	2004/05	SCBL	539.20	1582.42	21781.68
17	2005/06	"	658.76	1754.14	25776.33
18	2006/07	"	691.67	2116.35	28596.69
19	2007/08	"	818.92	2492.55	33335.79
20	2008/09	"	1025.11	3052.47	40587.47

Sources:

www.nabilbank.ltd.

www.standardchartedbank.ltd.

www.everestbank.ltd

www.himalayanbank.ltd

4.1.1 a) Return on Total Assets Ratio

The ratio is determined by dividing net profit after tax by total assets. This ratio measures the probability with respect to the total assets invested in commercial banks. the higher ratio usually indicates efficiency in utilizing its overall resources and vice versa. This part shows risk and return analysis of sample banks chosen($\overline{X}$).Standard deviation (σ)is measured for total risk and coefficient of variation is calculated for risk per unit which are presented under this topic.

The given Table 4.2 shows risk and return on basis of return on assets under commercial banks. They are Nabil Bank ltd, Everest Bank limited, Himalayan Bank limited and Standard Charted Bank limited.

Table 4.2

Risk and Return of commercial Banks on the basis of Return on Assets(%)

List of mean, standard deviation & coefficient of variation

Year	NABIL	EBL	HBL	SCBL
2004/05	3.02	1.46	1.12	2.48
2005/06	2.84	1.49	1.55	2.56
2006/07	2.47	1.38	1.47	2.42
2007/08	2.01	1.66	1.73	2.46
2008/09	2.54	1.73	1.91	2.53
Mean x	2.54	1.54	1.56	2.49
S.D.	0.36	0.13	0.0854	0.05
C.V.	0.14	0.0844	0.55	0.02

Table 4.2 shows the mean return, standard deviation & coefficient of variation. The mean return of NABIL is 2.54 percent which is the highest return among the sampled banks. Same way standard deviation of NABIL is highest than others banks, in figure is 0.36. Coefficient of variation of NABIL 0.14 which shows risks that to earn more return one should take more risk. In other words, We can say that NABIL bank has better financial performance on the basis of return on assets ratio. The mean return of EBL is 1.54 percent & coefficient of variation of EBL are sampled banks. Standard deviation & coefficient of variation of EBL are 0.13 & 0.0844. These variables

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indicate that EBL has more risk with so lowest return. Coefficient of variation of EBL is the highest among sampled banks so, EBL has poor financial performance . The mean return HBL & SCBL are 1.56 & 2.49 standard deviation are 0.0854 & 0.05. Respectively, sameway, coefficient of variation of EBL & SCBL are 0.0844 & 0.02.
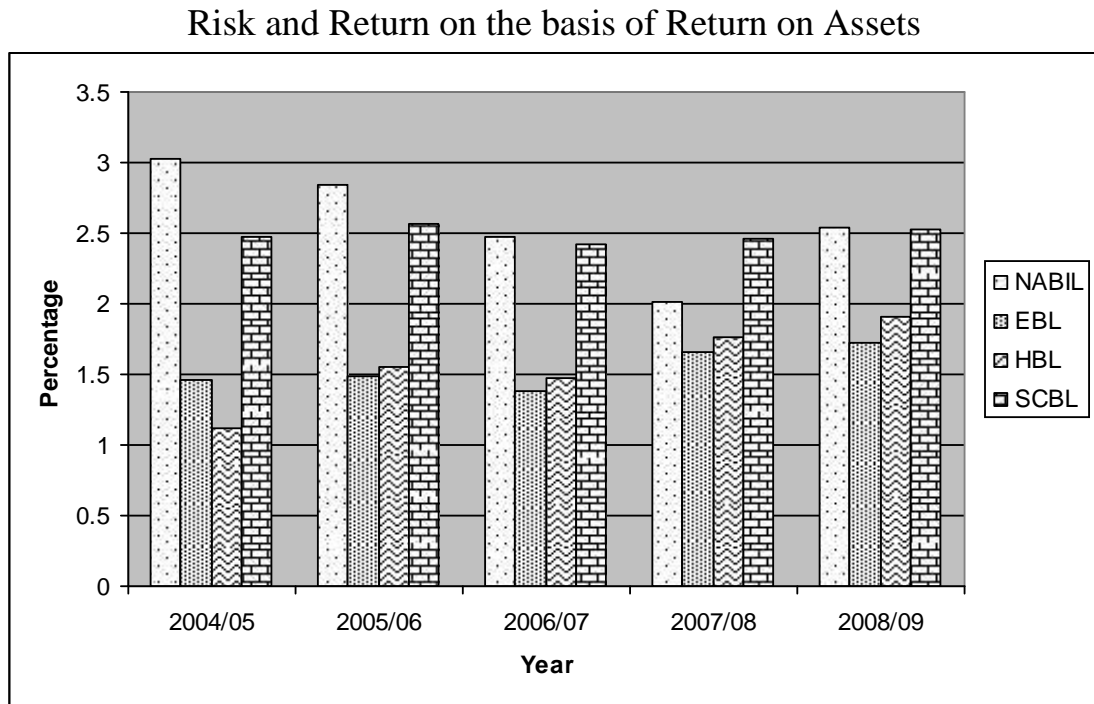
Risk and Return on the basis of Return on Assets

Fig. no. 4.1

4.1.2 B) Return on Equity Ratio

The equity ratio is calculated by dividing net profit available to shareholders equity (net worth). This one of the important ratio to judge whether the firm has earned satisfactory return for its equity holders or not. This ratio reveals how well the firm has used the resources of the owners to earn profit. So the higher ratio is more preferable for the stock holders, which represents the sound management efficient mobilization of the owner's equity, under this part risk & return analysis of the sample banks for the study are presented with respect to their return on equity.

Risk & return on the basis of return on equity of commercial banks NABIL bank limited, Everest bank limited, Himalayan Bank limited & Standard Charted Bank Limited are presented in table 4.3.

Table 4.3

Risk & Return on the basis of return on equity (%) of commercial banks.

List of mean, standard deviation & coefficient of variation

Year	NABIL	EBL	HBL	SCBL
2004/05	31.30	24.66	12.00	34.07
2005/06	33.87	28.83	15.58	37.55
2006/07	32.77	27.92	16.72	32.68
2007/08	31.36	28.54	19.90	32.61
2008/09	35.86	31.88	24.14	33.58
Mean x	33	28.37	17.72	34.1
S.D.	1.71	2.30	4.08	1.81
C.V.	0.05173	0.0811	0.230	0.053

From the table 4.3 we know that SCBL has better performance since it has 34.1 percent of mean return which is the higher mean return among the banks. Standard deviation & coefficient of variation of SCBL are 1.81 & 0.053 respectively. And , HBL has poor financial performance because it has 17.72 percent mean return & standard deviation & coefficient also high (i.e. 4.08 & 0.230 resp.) . So, we can say that HBL is very risky & poor in term of return. Mean return of NABIL & EBL are 33 & 28.37 percent & standard deviation are 1.71 & 2.30. Which comparing these two banks NABIL has for better financial performance in terms of mean return as well as risk & per unit risk coefficient of variation of EBL is high. The coefficients of variation of those two banks are 0.05173 & 0.0811 respectively.
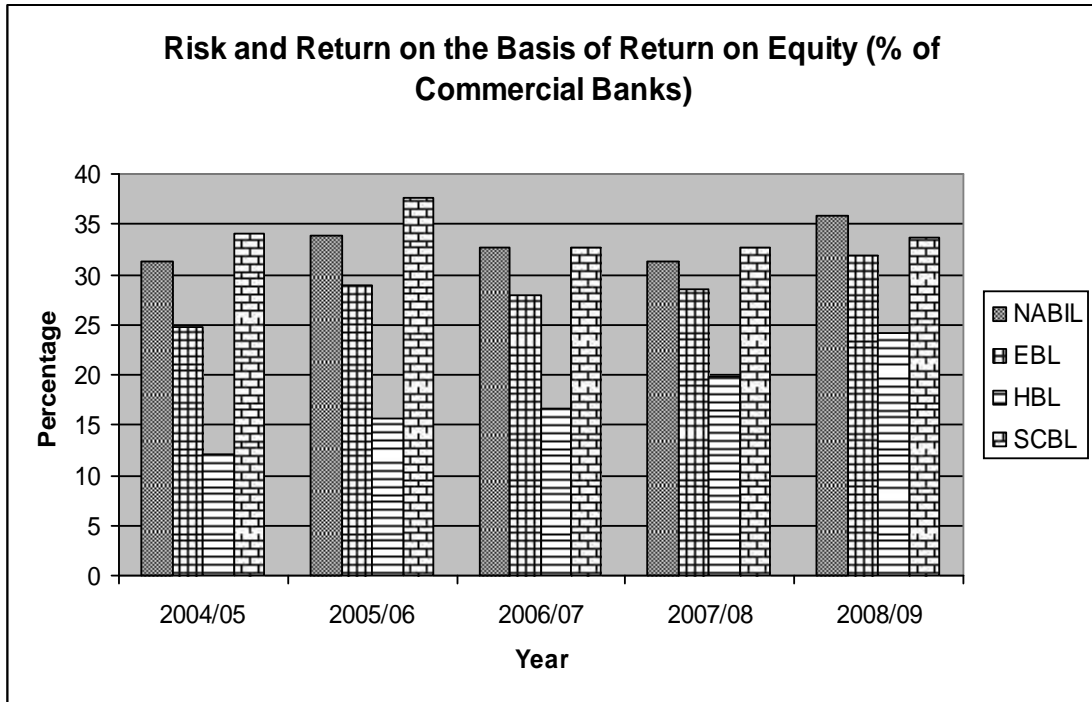
Fig. No. 4.2

4.2 Portfolio Analysis

Portfolio analysis includes portfolio risk comparison with weighted average risk & portfolio return it also includes correlation between the banks. In this topic correlation, respective weight portfolio standard deviation & portfolio mean return on the basis of return on assets & return on equity.

4.2.1 a) Portfolio Risk & Return on the basis of return on assets

This part includes a table which contains correlation, weight, average return, portfolio return, Average risk, portfolio risk. The aim of this table is to analyze banks performance in terms of portfolio risk & portfolio return with understanding their relation. For that, correlations also have shown between the banks which have made different portfolios.

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Table 4.4

Portfolio Risk & Return on the basis of Return on Assets under commercial banks

List of variables in portfolio Analysis

Combination of Banks	Correlation	Weight (%)	Weight (%)	Average Return %	Portfolio Return %	Average Risk %	Portfolio Risk %	Covariance
NABIL & EBL	-0.4509	0.201	0.799	2.0440	1.74	0.25	0.0954	-0.0211
NABIL & HBL	-0.2043	0.745	0.255	2.050	2.29	0.61	0.3090	-0.0628
NABIL & SCBL	0.4111	-0.042	1.042	2.515	2.49	0.21	0.0480	0.0074
EBL & HBL	0.2532	1.016	-0.016	1.55	1.54	0.49	0.129	0.0281
EBL & SCBL	0.3846	0.020	0.980	2.015	2.47	0.090	0.050	0.0022
HBL & SCBL	0.0655	-0.0015	1.0015	2.025	2.49	0.452	0.0557	0.0036

The portfolio result presenting table 4.4 indicates the combination of banks those combinations are NABIL & EBL, NABIL & HBL, NABIL & SCBL, EBL & HBL , EBL & SCBL and HBL & SCBL where as their correlation are -0.4509, -0.02043, 0.04111, 0.2532, 0.3846 & 0.0655 respectively. Some combination have negative correlation such as NABIL & EBL and NABIL & HBL other combination have positive correlation.

The portfolio return increased than average return in the combination such as NABIL & HBL, EBL & SCBL & HBL & SCBL. And other combinations of banks such as NABIL & EBL, NABIL & SCBL and EBL & HBL have decreased portfolio return than average return.

The portfolio risk of all combination of banks is less than average risk. In case of risk diversify; portfolio risk is highly diversified in strongly negative correlated banks in comparison of positively correlated firms. Thus risk can be diversified by investing in those assets which have strong negative correlation.
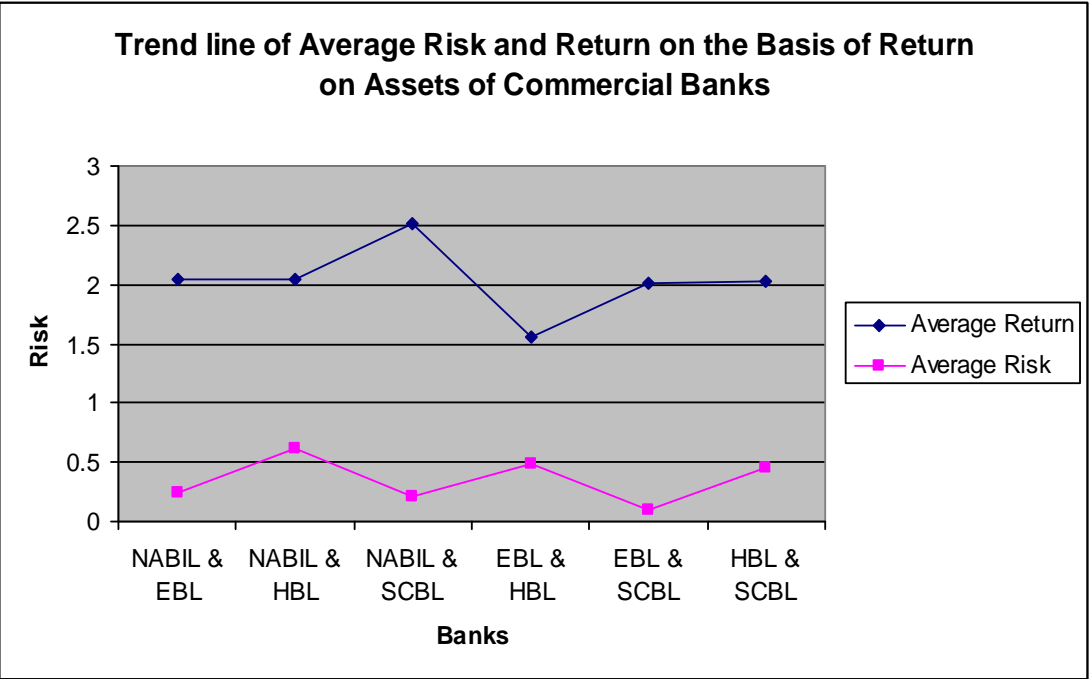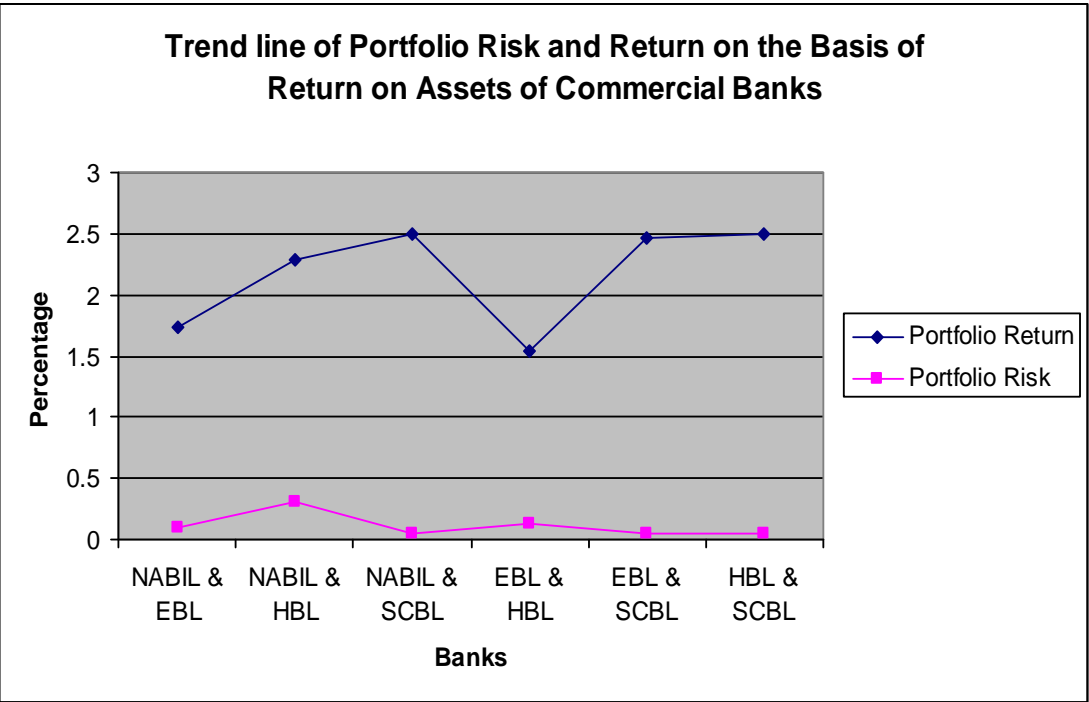
Fig. no. 4.3

Fig. No. 4.4

4.2.2 b) Portfolio Risk & Return on the basis of return on Equity

This part shows table related with portfolio risk & return on the basis of return on equity. The aim of this table is to analyze banks performance in terms of portfolio risk & return with correlation.

Table 4.5

Portfolio Risk & Return of commercial banks on the basis of Return on Equity

List of Variables used in portfolio Analysis

Combination of Banks	Correlation	Weight (%)	Weight (%)	Average Return %	Portfolio Return %	Average Risk %	Portfolio Risk %
NABIL & EBL	0.803	1.127	-0.127	30.69	33.60	2.005	1.813
NABIL & HBL	0.677	1.177	-0.177	25.36	35.70	2.90	1.61
NABIL & SCBL	0.281	0.539	0.461	33.55	33.51	1.76	1.40
EBL & HBL	0.880	1.548	-0.548	23.05	34.21	3.19	3.16
EBL & SCBL	0.081	0.422	0.578	31.24	31.68	2.005	1.36
HBL & SCBL	0.336	0.231	0.769	25.91	30.32	2.95	1.39

Table 4.5 shows the portfolio risk and return of commercial banks on the basis of return on equity. There are six combination of banks none of them have negative correlation, some are highly correlated others are less correlated combinations like as EBL&HBL,NABIL& EBL and NABIL& HBL are highly correlated with the correlation of 0.880, 0.803 and 0.677 respectively. Other combinations such as EBL& SCBL, NABIL & SCBL and HBL& SCBL are less correlated with the correlation of 0.081, 0.281 and 0.336 respectively.

The portfolio increased than average return in the combination of banks such as NABIL & EBL, NABIL & HBL, EBL & HBL, EBL & SCBL and HBL & SCBL have decreased portfolio return than average return.

The portfolio risk of all combination of banks is less than average risk. None of the combination has negative correlation. Some combinations are highly positively correlated; it implies that the portfolios cannot diversify the risk as negatively correlated banks.
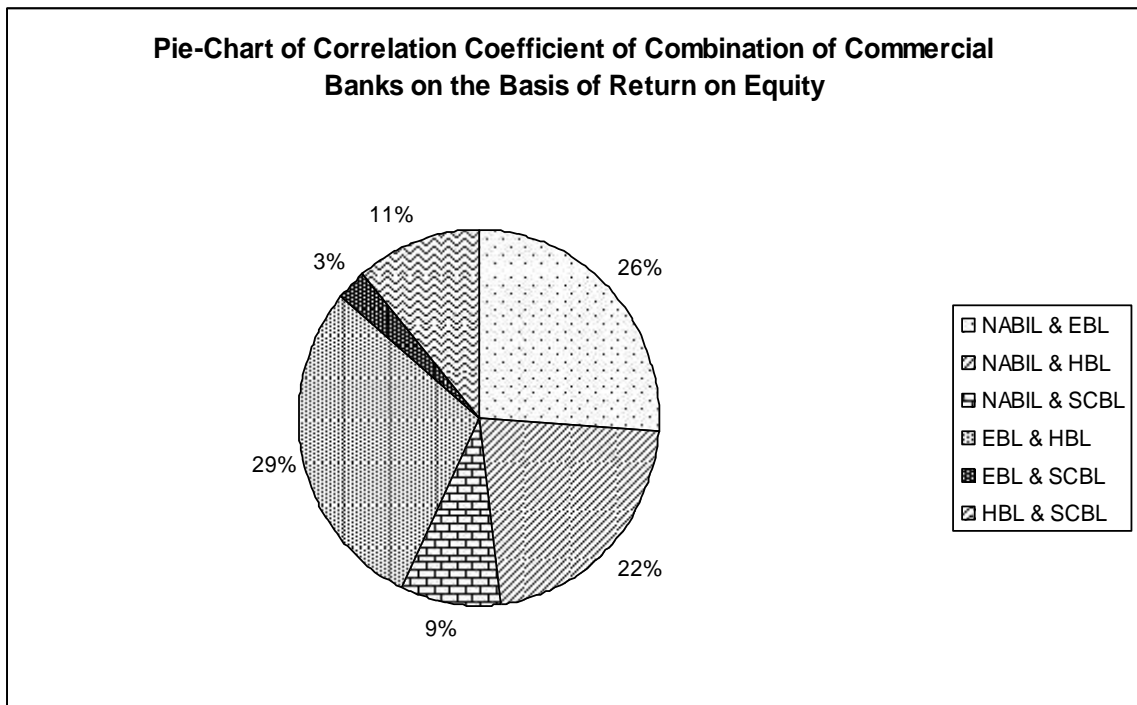
Pie-Chart of Correlation Coefficient of Combination of Commercial Banks on the Basis of Return on Equity

Fig. no. 4.5

4.3 Diversification of Risk

The topic diversification of risk includes that risk can be diversified by investing. This part consisting of two section is fully devoted to analysis of diversification of risk under different banks on the basis of return on and & on the basis of return on equity.

4.3.1 Diversification of Risk on basis of Return on Assets

This section contains a table of percentage reduction in portfolio risk on the basis of return on assets where portfolio risk & average risk have been compared.

Table 4.6

Diversification of Risk on the basis of Return on Assets of the commercial banks.

Combination of Banks	Average Risk %	Portfolio Risk %	Percentage Reduction in portfolio risk
NABIL & EBL	0.25	0.0954	61.84
NABIL & HBL	0.61	0.3090	49.34
NABIL & SCBL	0.21	0.0480	77.14
EBL & HBL	0.49	0.129	73.67
EBL & SCBL	0.090	0.050	44.44
HBL & SCBL	0.452	0.0557	87.68

Table 4.6 shows that two of the combination of banks such as NABIL & EBL , NABIL & SCBL, EBL & HBL , HBL & SCBL are able to reduce more than 50 percent portfolio risk and other combinations. have reduced less than 50 percent portfolio risk. such As NABIL & HBL, EBL & SCBL.
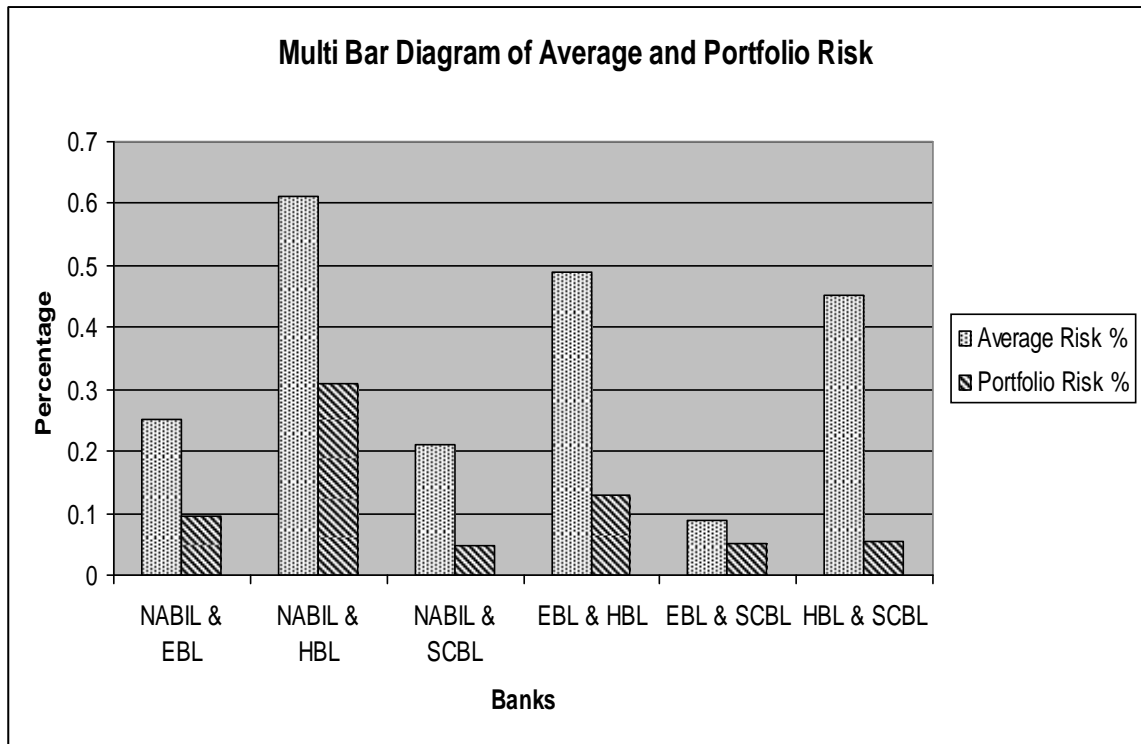
Fig. no. 4.6

4.3.2 Diversification of Risk on the basis of Return on Equity

This part also devoted to compare risk between average risk & portfolio risk on the basis of return on equity . It contains a table which reveals that portfolio of different banks can diversify the risk. The table also shows the reduced percentage of risk after making portfolio.

Table 4.7

Diversification of Risk on the basis of Return on Equity

Combination of Banks	Average Risk %	Portfolio Risk %	Percentage Reduction in portfolio risk
NABIL & EBL	2.005	1.813	9.58
NABIL & HBL	2.90	1.61	44.48
NABIL & SCBL	1.76	1.40	20.45
EBL & HBL	3.19	3.66	14.74
EBL & SCBL	2.0055	1.36	33.82
HBL & SCBL	2.95	1.39	52.88

It is presented in table 4.7 out of 6, 2 combinations of banks have reduced more than 50 percent risk. Those combinations are NABIL & EBL , EBL & HBL, NABIL & SCBL , EBL & SCBL and NABIL & HBL have reduced 9.58, 14.74, 20.45, 33.82, 44.48 percent risk respectively.
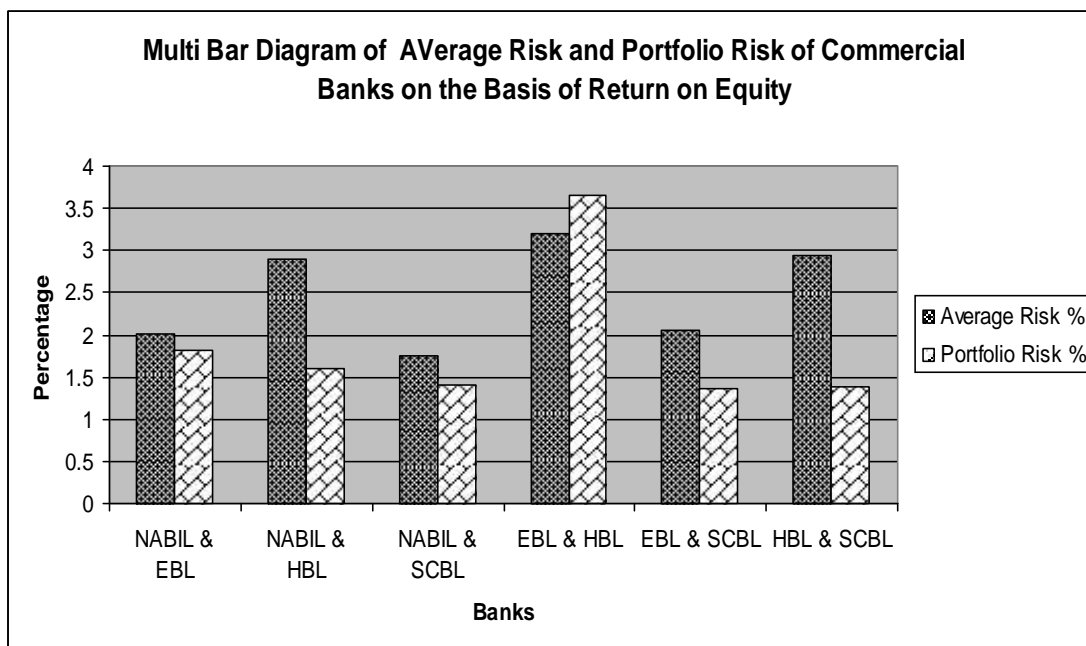
Fig. no. 4.7

4.4 Major finding of the study

The major finding of the study are as follow:

a) On the basis of Return on Assets

1. NABIL has the highest mean return (2.54) as well as risk (0.36) and EBL has lowest mean return (1.54) as well as risk (0.013). The mean return of SCBL is 2.49 and risk is 0.05. C.V. of SCBL (0.02) is lower than the c.v. of NABIL (0.14).

2. The portfolio risk has diversified in all combination of banks. But portfolio return increased in two combinations of banks comparing with average return. The portfolio return of four combination of banks have decreased by 14.87 %, 0.99 %, 0.65 % are NABIL & EBL, NABIL & SCBL, and EBL& SCBL respectively. The portfolio return of remaining two combination of banks have increased by 11.70 % , 22.58 % and 22.96 are NABIL & HBL , EBL & SCBL and HBL & SCBL respectively. And, highest risk diversified portfolio is the combination of HBL & SCBL by 87%. C.V. of the combinations of NABIL & EBL, NABIL & SCBL, NABIL & HBL, EBL & SCBL , HBL & SCBL and EBL & HBL are 5.48%, 1.93%, 13.49%, 2.02% , 2.24% and 8.38% respectively.

3. Two combinations have negative correlation. The combinations are NABIL & EBL(-0.4509) and NABIL & HBL(-0.2043). Remaining four combinations have positive correlation.

b) On the basis of Return on Equity:

1) The mean return of SCBL is the highest mean return among the banks, i.e. 34.1%. But, the standard deviation of NABIL is the lowest among the banks, i.e. 1.71%. While comparing c.v. of these banks, the c.v. of NABIL (0.052) is less than the c.v. of SCBL (0.053).

2) The portfolio risk reduced in all the combinations of banks and portfolio return increased in all combination of banks except two combinations. The combinations whose portfolio return have increased by 9.48% , 40.77% , 1.40%, and 17% are NABIL & EBL , NABIL & HBL, EBL & HBL , EBL & SCBL and HBL & SCBL respectively. Remaining two portfolio' returns have decreased by 0.12 NABIL & SCBL . The highest increment of portfolio return is in the combination of EBL & HBL but highest risk diversification is in the combination of HBL & SCBL. So, here decision may conflict. In this case, c.v. is best way to make correct decision. C.V. of EBL & HBL and HBL & SCBL are 10.70% & 4.58% respectively.

3) All combinations have positive correlation.

CHAPTER - V
SUMMARY CONCLUSION & RECOMMENDATIONS

5.1 Summary

The investment design is one of the important part of financial management, it concerns with the determination of optimal investment project to maximize shareholders wealth. Determination of optimal portfolio of assets concerns with rational evaluation of each alternatives they involve risk & return,

Investor always wants to secure a higher level of return with lower level of risk, portfolio theory states that risk can be diversified by investing in different assets. The risk derives from the total investment by investing in portfolio of assets is less than the risk derives from the total investment by investing in single assets. Investor wants secure a higher return should also assume a high risk & assuming lower risk they should remain satisfied with lower return. This depicts that there is positive relationship between risk & return.

On the basis of these assumption that is the risk can be diversified. by investing in portfolio of assets & there in positive relationship between risk & return some models such as portfolio selection model, capital assets pricing model have emerged but still there is a lack of knowledge about the diversification of portfolio risk & the relationship between risk & return with reference some Nepalese commercial bank have selected for the study.

The study was conducted to analysis the portfolio management in commercial banks of Nepal. For this purpose 4 commercial banks have selected for the study based on 5 years data from 2004/2005 to 2008/2009.

The main objective of the study is analysis of financial performance in terms of portfolio risk and return in Nepalese commercial banks. And some auxiliary objectives are as follows:

1) To examine the risk and return of Nepalese commercial banks.
2) To examine risk diversify ness in investing portfolio.

This study has used ratio analysis and statistical tools. In ratio analysis return on assets (ROA) and return on equity (ROE) where computed to present profitability ratios in statistical tools arithmetic mean ,standard deviation, coefficient of variation. To calculate the profitability ratios and other measures published financial statement of the sample banks were obtained from Nepal Stock Exchange through internet website www.nepalstock.com, security board of Nepal and individual website of sampled banks (www.ebl.com, Himalayanbank.ltd.com, nabilbank.com, standard charted bank ltd.com). The financial statement of the year 2004/2005 to 2008/2009 have used in the study.

Although, this study is descriptive as well as analytical, under these assumptions this study involves risk and return of different commercial banks. Arithmetic mean, standard deviation and coefficient of deviation have calculated to measure single asset's risk and return. Same way, portfolio risk and return have calculated making different combinations to know the portfolio behavior of sample banks. Diversification of risk also have examined on investment.

5.2 Conclusions

The result of portfolio analysis lead to some important conclusions, the portfolio risk of four banks, is found to be diversified. The portfolio risk is less than the average risk of four banks based on return on assets & return on equity. So, here conclusions also divided in two ways. They are as follows:

    a. On the basis of return on assets:

        a. NABIL has the highest mean return but risk & CV of SCBL is lower than NABIL. So, SCBL is superior than NABIL & it has better financial performance comparing with NABIL.

        b. Among the portfolio, none of the combination can dominate other in terms of risk & return both. So, here may conflict in decision. In this case, CV is the best way to make correct decision. Here, CV of EBL & SCBL is the lowest among the combinations. Therefore, the combination of EBL & SCBL is the optimum portfolio for investment.

        c. Two combinations have negative correlation. Investing in these combinations more risk can be diversified than investing other positive correlation combinations.

b. On the basis of Return on Equity

    a. The mean return of SCBL is the highest mean return but in terns of risk NABIL has the lowest risk. Such condition, risk & return may not base factor for decision. So, here CV may be suitable factor for decision. CV of NBAIL is lower than the CV of SCBL. So, NABIL is the best for investment.

    b. Combination of EBL & HBL has highest portfolio return & lowest portfolio risk among the combination of banks. Therefore, combination of EBL & HBL should be selected for investment.

    c. All combinations are positively correlated. Therefore, here risk cannot be diversifying as negatively correlated combinations.

5.3 Recommendations

Based on the analysis of data, major finding and conclusion of the study the following suggestions & recommendations are prescribed to improve the present financial portfolio position on Nepalese commercial banks.

1) The return on assets ratio of HBL & EBL are lowest among the four sample banks. So HBL & EBL are recommended to make optimum management which reduces operating cost & will improve financial performance.

2) Again, the return on equity ratio of HBL is lowest among the commercial banks. so, HBL is recommended to manage share capital & shareholders reserve & make attempts to increase net profit to achieve better financial performance.

3) Major weakness of the financial institutions are inefficient management system, low productivity. Lack of transparency & tortoise pace in decision making etc. such weaknesses caused low return high risk. Thus, such financial institutions are recommended to change their policy & strategy to make quick decision.

4) The study suggests that an efficient portfolio results minimum risk & sustainable return. So, investors are recommended to select the assets which have higher returns, minimum proportion of systematic risks negative correlation to make efficient portfolio among the securities in the market.

5) At last but not least, investors are recommended to diversify their fund to reduce risk. For that purpose, negatively correlated firms should be selected to make

proper construction of portfolio which reduces potential risk. While making efficient portfolio market movement or socio portfolio change also be considered.

5.4 Future Guidelines

While conducting this study I've got some problems that should not be in research field. So, for the further study in this field, I have go some clues. I hope these clues may help new researchers who are interested in this field. Those clues or guidelines can be presented as follows:

1) It would be better if the researchers collected more than five years data.

2) To get greater inside into the effect of portfolio management no. of companies should be increased.

3) According to this study, the Himalayan banks performance in very poor. So, far the new   researcher to find out the root cause of the poor performance of HBL may be a suitable topic.

4) For better result more analyzing method should be used.

5) For better performance, business organization should use minimum requirement of business ethics.

6) Study of international companies would be better.

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Annex "A"

Table 1

List of year wise net worth, net income & total Assets in million.

S.N.	Year	Name of Bank	Net Income (in million)	Net worth (in million)	Total assets
1	2004/05	NABIL	519.00	1658.00	17186.33
2	2005/06	"	635.00	1875.00	22329.97
3	2006/07	"	674.00	2057.00	27253.39
4	2007/08	"	764.50	2437.20	37132.76
5	2008/09	"	1031	2875	43867.40
6	2004/05	EBL	170.80	692.60	11732.52
7	2005/06	"	237.20	822.80	15959.28
8	2006/07	"	296.40	1061.50	21432.57
9	2007/08	"	451.20	1581.20	27149.34
10	2008/09	"	638.7	2003.6	36916.85
11	2004/05	HBL	308.28	2568.39	27418.16
12	2005/06	"	457.44	2885.59	29460.39
13	2006/07	"	491.82	2942.23	33519.14
14	2007/08	"	635.85	3195.42	36175.53
15	2008/09	"	752.83	3119	39413
16	2004/05	SCBL	539.20	1582.42	21781.68
17	2005/06	"	658.76	1754.14	25776.33
18	2006/07	"	691.67	2116.35	28596.69
19	2007/08	"	818.92	2492.55	33335.79
20	2008/09	"	1025.11	3052.47	40587.47

Sources:

www.nabilbank.ltd.

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Calculation of mean, standard deviation, coefficient of variation, correlation coefficients, optimal weight, portfolio risk and return under return on assets.

Return on assets of NABIL

ROA $_{NABIL}$ in 2004/2005 = $\dfrac{Net income}{Total Assets} = \dfrac{519}{17186.33} = 0.03020$ or 3.02%

ROA $_{NABIL}$ in 2005/2006 = $\dfrac{Net income}{Total Assets} = \dfrac{635}{223329.97} = 0.02844$ or 2.84%

ROA $_{NABIL}$ in 2006/2007 = $\dfrac{Net income}{Total Assets} = \dfrac{674}{27253.39} = 0.02473$ or 2.47%

ROA $_{NABIL}$ in 2007/2008 = $\dfrac{Net income}{Total Assets} = \dfrac{746.50}{37132.76} = 0.02010$ or 2.01%

ROA $_{Nabil}$ 2008/09 = $\dfrac{Net income}{Total Assets} = \dfrac{1031}{43867.40} = 0.02350$ or 2.35%

Arithmetic mean of NABIL

$(\overline{X}_{NABIL}) \quad = \dfrac{\sum X}{N} = \dfrac{3.02 + 2.84 + 2.47 + 2.01 + 2.35}{5} \quad = 2.54\%$

Standard deviation of NABIL

$(\dagger NABIL) = \sqrt{\dfrac{\sum (x - \overline{x})^2}{N}}$

$=$

$\sqrt{\dfrac{(3.02 - 2.54)^2 + (2.84 - 2.54)^2 + (2.47 - 2.54)^2 + (2.01 - 2.54)^2 + (2.35 - 2.54)^2}{5}}$

$= \sqrt{\dfrac{0.6423}{5}}$

$= \sqrt{0.1285}$

$= 0.36$

Coefficient of variation of NABIL:

$(C.V. \ NABIL) = \dfrac{\dagger}{\overline{x}} = \dfrac{0.36}{2.54} = 0.14$

Return on assets of EBL

$$\text{ROA EBL in 2004/2005} = \frac{Net income}{total assets} = \frac{170.80}{11732.52} = 0.01456 \text{ or } 1.46\%$$

$$\text{ROA EBL in 2005/2006} = \frac{Net income}{total assets} = \frac{237.20}{15959.28} = 0.01486 \text{ or } 1.49\%$$

$$\text{ROA EBL in 2006/2007} = \frac{Net income}{total assets} = \frac{296.40}{21432.57} = 0.01329 = 1.38\%$$

$$\text{ROA EBL in 2007/2008} = \frac{Net income}{total assets} = \frac{45120}{27149.34} = 0.01662 = 1.66\%$$

$$\text{ROA EBL in 2008/2009} = \frac{Net income}{total assets} = \frac{638.7}{36916.85} = 0.01730 = 1.73\%$$

Arithematic mean of EBL

$$(\overline{xEBL}) = \frac{\sum X}{N} = \frac{1.46 + 1.49 + 1.38 + 1.66 + 1.73}{5} = 1.544 = 1.54\%$$

Standard deviation of EBL

$$\dagger \text{ EBL} = \sqrt{\frac{\sum (x - \overline{x})^2}{N}}$$

$$= \sqrt{\frac{(1.46 - 1.54)^2 + (1.49 - 1.54)^2 + (1.38 - 1.54)^2 + (1.66 - 1.54)^2 + (1.73 - 1.54)^2}{5}}$$

$$= \sqrt{\frac{0.085}{5}}$$

$$= \sqrt{0.017}$$

$$= 0.13$$

Coefficient of variation of EBL

$$(\text{C.V. EBL}) = \frac{\dagger}{\overline{X}} = \frac{0.13}{1.54} = 0.0844$$

Return on assets of HBL in 2004/2005 $= \frac{Net\,income}{total\,assets} = \frac{308.28}{27418.16} = 0.01124$ or 1.12%

Return on assets of HBL in 2005/2006 $= \frac{Net\,income}{total\,assets} = \frac{457.44}{29460.39} = 0.01553$ or

1.55%

Return on assets of HBL in 2006/2007 $= \frac{Net\,income}{total\,assets} = \frac{491.82}{33519.14} = 0.01467$ or

1.47%

Return on assets of HBL in 2007/2008 $= \frac{Net\,income}{total\,assets} = \frac{635.85}{36175.53} = 0.01758$ or

1.76%

Return on assets of HBL in 2008/2009 $= \frac{Net\,income}{total\,assets} = \frac{752.83}{39413} = 0.01910$ or 1.91%

Arithmetic mean of HBL

$$(\overline{X}\,HBL) = \frac{\sum X}{N} = \frac{1.12 + 1.55 + 1.47 + 1.76 + 1.91}{5} = \frac{7.81}{5} = 1.562 \, or \, 1.56\%$$

Standard deviation of HBL

$$\dagger HBL = \sqrt{\frac{(X - \overline{X})^2}{N}}$$

$$= \sqrt{\frac{(1.12 - 1.56)^2 + (1.55 - 1.56)^2 + (1.47 - 1.56)^2 + (1.76 - 1.56)^2 + (1.91 - 1.56)^2}{5}}$$

$$= \sqrt{\frac{0.3643}{5}}$$

$$= \sqrt{0.7286}$$

$$= 0.854$$

Coefficient of variation of HBL

C.V. of HBL $= \dfrac{\dagger}{\overline{X}} = \dfrac{0.854}{1.56} = 0.547$ or 0.55

Return on assets of SCBL

Return on assets of SCBL in 2004/2005 $= \dfrac{Netincome}{totalassets} = \dfrac{539.20}{21781.68} = 0.0248$ or 2.48%

Return on assets of SCBL in 2005/2006 $= \dfrac{Netincome}{totalassets} = \dfrac{658.76}{25776.33} = 0.0256$ or 2.56%

Return on assets of SCBL in 2006/2007 $= \dfrac{Netincome}{totalassets} = \dfrac{691.67}{28596.69} = 0.0242$ or 2.42%

Return on assets of SCBL in 2007/2008 $= \dfrac{Netincome}{totalassets} = \dfrac{818.92}{33335.79} = 0.0246$ or 2.46%

Return on assets of SCBL in 2008/2009 $= \dfrac{Netincome}{totalassets} = \dfrac{1025.11}{40587.47} = 0.02526$ or 2.53%

Arithmetic mean of SCBL

$\overline{X}SCBL = \dfrac{\sum X}{N} = \dfrac{2.48 + 2.56 + 2.42 + 2.46 + 2.53}{5} = \dfrac{12.45}{5} = 2.49$ or 2.49%

Standard deviation of SCBL

$\dagger SCBL = \sqrt{\dfrac{\sum(x - \overline{x})^2}{N}}$

$= \dfrac{\sqrt{(2.48 - 2.49)^2 + (2.56 - 2.49)^2 + (2.42 - 2.49)^2 + (2.46 - 2.49)^2 + (2.53 - 2.49)^2}}{5}$

$= \sqrt{\dfrac{0.0124}{5}}$

$= \sqrt{0.0025}$

$= 0.05$

Coefficient of variation of SCBL

C.V. of SCBL $= \dfrac{\dagger}{\overline{X}} = \dfrac{0.05}{2.49} = 0.02$

Table 2

Risk and Return of commercial Banks on the basis of Return on Assets(%)

List of mean , standard deviation & coefficient of variation

S.N.	Name of Banks	Return on Assets					Mean $\overline{X}$	S.D.	C.V.
		2004/05	2005/06	2006/07	2007/08	2008/09			
1	NABIL	3.02	2.84	2.47	2.01	2.54	2.54	0.36	0.14
2	EBL	1.46	1.49	1.38	1.66	1.73	1.54	0.13	0.0844
3	HBL	1.12	1.55	1.47	1.76	1.91	1.56	0.854	0.55
4	SCBL	2.48	2.56	2.42	2.46	2.53	2.49	0.05	0.02

Annex B

Covariance of NABIL&EBL

$$\text{(Cov. NABIL,EBL)} = \frac{\sum (XNABIL - \overline{X}NABIL)(XEBL - \overline{X}EBL)}{N}$$

$$= $$

$$\frac{(0.48) \times (-0.080) + (0.30) \times (-0.050) + (-0.070) \times (-0.16) + (-0.53) \times (0.12) + 0 \times 0.19}{5}$$

$$= \frac{-0.1058}{5}$$

$$= -0.0211$$

Covariance of NABIL & HBL

$$\text{(Cov.NABIL,HBL)} = \frac{\sum (XNABIL - \overline{X}NABIL)(XHBL - \overline{X}HBL)}{N}$$

$$= $$

$$\frac{(0.48) \times (-0440) + (0.30) \times (-0.01) + (-0.070) \times (-0.090) + (-0.53) \times (0.20) \times (0) \times (0.35)}{5}$$

$$= \frac{-02112 + (-0.0030) + 0.0063 + (-0.1060) + 0}{5}$$

$$= \frac{-0.3139}{5}$$

$$= -0.0628$$

Covariance of NABIL & SCBL

$$\text{(Cov.NABIL,SCBL)} = \frac{\sum (XNANIL - \overline{X}NABIL)(XSCBL - \overline{X}SCBL)}{N}$$

$$= $$

$$\frac{0.48 \times (-0.01) + 0.30 \times 0.070 + (-0.070) \times (-0.070) + (-0.530) \times (-0.030) + (0) \times 0.040}{5}$$

$$= \frac{-0.0048 + 0.0210 + 0.0049 + 0.0159 + 0}{5}$$

$$= \frac{0.0370}{5}$$

$$= 0.0074$$

Covariance of EBL& HBL

$$(\text{Cov.EBL,HBL}) = \frac{\sum (X_{EBL} - \overline{X}_{EBL})(X_{HBL} - \overline{X}_{HBL})}{N}$$

$$= $$

$$\frac{(-0.80) \times (-0.440) + (-0.50) \times (-0.010) + (-0.160) \times (-0.090) + (0.12) \times 0.20 + 0.190 \times 0.350}{5}$$

$$= \frac{0.0350 + 0.0005 + 0.0144 + 0.240 + 0.0665}{5}$$

$$= \frac{0.1406}{5}$$

$$= 0.0281$$

Covariance of EBL& SCBL

$$(\text{Cov.EBL,SCBL}) = \frac{\sum (X_{EBL} - \overline{X}_{EBL})(X_{SCBL} - \overline{X}_{SCBL})}{N}$$

$$= $$

$$\frac{(-0.080) \times (0.01) + (-0.050) \times (0.070) + (-0.160) \times (-0.070) + (0.120) \times (-0.030) + (0.190) \times (0.040)}{5}$$

$$= \frac{-0.0008 - 0.0035 + 0.0112 - 0.0036 + 0.0076}{5}$$

$$= \frac{0.0109}{5}$$

$$= 0.0022$$

Covariance of HBL & SCBL

$$(\text{Cov.HBL,SCBL}) = \frac{\sum (XHBL - \overline{X}HBL)(XSCBL - \overline{X}SCBL)}{N}$$

$$=$$

$$\frac{(-0.440) \times (-0.01) + (-0.010) \times 0.070 + (-0.090) \times (-0.070) + (0.20) \times (-0.030)) + 0.35 \times 0.040}{5}$$

$$= \frac{0.0180}{5}$$

$$= 0.036$$

Correlation coefficient between NABIL& EBL

$$(\text{x}NABIL, EBL) = \frac{Cov.(NABIL, EBL)}{\dagger NABIL \times \dagger EBL} =$$

$$\frac{-0.0211}{0.36 \times 0.13}$$

$$= -0.4509$$

$$(\text{x}NABIL, HBL) \times \frac{1}{\dagger NABIL \times \dagger HBL} = \frac{-0.0628}{0.36 \times 0.854} = -0.2043$$

$$(\text{x}NABIL, SCBL) = \frac{Cov(NABIL, HBL)}{\dagger NABIL \times \dagger SCBL} = \frac{0.0074}{0.36 \times 0.05} = 0.4111$$

$$(\text{x}EBL, HBL) = \frac{Cov(EBL, HBL)}{\dagger EBL \times \dagger HBL} = \frac{0.0281}{0.13 \times 0.854} = 0.2532$$

$$(\text{x}EBL, SCBL) = \frac{Cov.(EBL, SCBL)}{\dagger EBL \times \dagger SCBL} = \frac{0.0025}{0.13 \times 0.05} = 0.3846$$

$$(\text{x}HBL, SCBL) = \frac{Cov.(HBL, SCBL)}{\dagger HBL \times \dagger SCBL} = \frac{0.00288}{0.854 \times 0.05} = 0.0655$$

Optimal weight of NABIL

$$(\text{WNABIL}) = \frac{\sigma^2 HBL - Cov.NABIL, HBL}{\sigma^2 HBL + \sigma^2 NABIL - 2Cov.NABIL, HBL}$$

$$= \frac{(0.854)^2 - (-0.0628)}{(0.854)^2 + (0.36)^2 - 2(-0.0628)}$$

$$= 0.745$$

Optimal weight of HBL (WHBL) = 1-WNABIL = 1-0.745 = 0.255

Return on portfolio of NABIL& HBL

rp = wNABIL $\times \overline{X}$ NABIL+ wHBL $\times \overline{X}$ HBL =0.745×2.54+0255×1.56 = 2.29%

Standard deviation of NABIL& HBL on portfolio

$$\sigma p = \sqrt{wNABIL^2 \sigma NABIL + wHBL^2 \sigma HBL^2 + 2COV.NABIL, HBL \times wNABIL \times wHBL}$$

$$= \sqrt{(0.745)^2 \times (0.36)^2 + (0.255)^2 \times (0.854)^2 + 2 \times (-0.0628) \times (0.745) \times (0.255)}$$

$$= \sqrt{0.0955}$$

$$= 0.3090$$

Optimal weight of NABIL

$$(\text{wNABIL}) = \frac{\sigma^2 EBL - Cov.NABIL, EBL}{\sigma^2 EBL + \sigma^2 NABIL - 2Cov.NABIL, EBL}$$

$$= \frac{(0.13)^2 - (-0.0211)}{(0.13)^2 + (0.36)^2 - 2 \times (-0.0211)}$$

$$= 0.201$$

Optimal weight of EBL (wEBL) = 1-wNABIL = 1-0.201 = 0.799

Return on portfolio of NABIL & EBL

rp = wNABIL × $\overline{X}$ NABIL+wEBL× $\overline{X}$ EBL = 0.201 ×2.54+0.799×1.54 = 1.74%

Standard deviation of NABIL & EBL on portfolio:

$$\dagger P = \sqrt{W^2 NAIBIL \times \dagger^2 NABIL + W^2 EBL \times \dagger^2 ENL + 2\,cov.NABIL, EBL \times WNABIL \times WEBL}$$

$$= \sqrt{(0.201)^2 \times (0.36)^2 + (0.799)^2 \times (0.13)^2 + 2 \times (-0.0211) \times 0.201 \times 0.799}$$

$$= \sqrt{0.0091}$$

$$= 0.0954$$

Optimal weight of NABIL on portfolio of NABIL & SCBL

$$(wNABIL) = \frac{\dagger^2 SCBL - cov.NABIL, SCBL}{\dagger^2 SCBL + \dagger^2 NABIL - 2\,cov.NABIL, SCBL}$$

$$= \frac{(0.05)^2 - (0.0074)}{(0.05)^2 + (0.36)^2 - 2 \times (0.0074)} = -0.042$$

wSCBL = Optimal of SCBL = 1 - wNABIL = 1 - (-0.042) = 1.042

Return on portfolio of NABIL & SCBL

rp = wNABIL × $\overline{X}$ NABIL + wSCBL × $\overline{X}$ LSCBL

$\quad$ = -0.042×2.54 + 1.042 × 2.49

$\quad$ = 2.49%

Standard deviation on portfolio of NABIL & SCBL

$\dagger P =$

$$\sqrt{w^2 NABIL \times \dagger^2 NABIL + w^2 SCBL \times \dagger^2 SCBL + 2.cov.NABILSCBL \times wNABIL \times wSCBL}$$

$$= \sqrt{(-0.042)^2 \times (0.36)^2 + (1.042)^2 \times (0.05)^2 + 2 \times (0.0074) \times (-0.042) \times 1.042}$$

$$= \sqrt{0.0023}$$

$$= 0.0480$$

Optimal weight of EBL

$$(wEBL) = \frac{\dagger^2 HBL - Cov.EBL, HBL}{\dagger^2 HBL + \dagger^2 EBL - 2\text{cov}.EBLHBL}$$

$$= \frac{0.854^2 - 0.0281}{(0.854)^2 + (0.13)^2 - 2 \times 0.0281} = 1.016$$

Optimal weight of HBL = 1-1.016 = -0.016 = (1-wEBL)

Return on portfolio of EBL & HBL

$$rp = wEBL \times \overline{X} EBL + wHBL \times \overline{X} HBL$$

$$= 1.016 \times 1.54 + (-0.016) \times 1.56 = 1.54\%$$

Standard deviation on portfolio of EBL & HBL

$$rp = \sqrt{w^2 EBL \times \dagger^2 EBL + w^2 HBL \times \dagger^2 HBL + 2\text{cov}.EBLHBL \times wEBLwHBL}$$

$$=$$

$$\sqrt{(1.016)^2 \times (0.13)^2 + (-0.016)^2 \times (0.854)^2 + 2 \times (0.0281) \times (1.016) \times (-0.016)}$$

$$= \sqrt{0.0167}$$

$$= 0.129$$

Optimal weight of EBL On portfolio of EBL & SCBL

$$(w\ EBL) =$$

$$\frac{\dagger^2 SCBL - Cov.EBL, SCBL}{\dagger^2 SCBL + \dagger^2 EBL - 2COV.EBL, SCBL} = \frac{(0.05)^2 - 0.0022}{(0.05)^2 + (0.13)^2 - 2 \times 0.0022} = 0.020$$

Optimal weight of SCBL =1-0.020 = 0.980

Return on portfolio of EBL& SCBL

$$rp = wEB\ L \times \overline{X} EBL + wSCBL \times \overline{X} SCBL = 0.020 \times 1.54 + 0.980 \times 2.49 = 2.47\%$$

Standard deviation on portfolio of EBL& SCBL

$$\sigma P = \sqrt{w^2 EBL \times \sigma^2 EBL + w^2 SCBL \times \sigma^2 SCBL + 2 \times COV.EBL, SCBL \times wEBL \times wSCBL}$$

$$= \sqrt{(0.020)^2 \times (0.13)^2 + (0.980)^2 \times (0.05)^2 + 2 \times 0.0022 \times 0.020 \times 0.980}$$

$$= \sqrt{0.0025}$$

$$= 0.050$$

Optimal weight of HBL on portfolio HBL& SCBL

$$\sigma^2 SCBL - CovHBL, SCBL \times \frac{1}{(\sigma^2 HBL + \sigma^2 SCBL - 2Cov.HBL, SCBL}$$

$$= \frac{\left(\left((0.05)^2\right) - 0.0036\right)}{(0.854)^2 + (0.05)^2 - 2 \times 0.0036}$$

$$- 0.0015$$

Optimal weight of SCBL = 1-w HBL = 1-(-0.0015) = 1.0015

Return on portfolio of HBL & SCBL

rp = w HBL $\times \overline{X}$ HBL +w SCBL$\times \overline{X}$ SCBL = -0.0015×1.56+1.0015×2.49 = 2.49%

Standard deviation on portfolio of HBL & SCBL

$$\sigma P = \sqrt{w^2 HBL \times \sigma^2 HBL + w^2 SCBL \times \sigma^2 SCBL + 2Cov.HBL, SCBL \times wHBL \times wSCBL}$$

$$= \sqrt{(-0.0015)^2 \times (0.854)^2 + (1.0015)^2 \times (0.05)^2 + 2 \times 0.0036 \times (-0.0015) \times (1.0015)}$$

$$= \sqrt{0.0031}$$

$$= 0.0557$$

Here Average Return $= \dfrac{ErpNABIL + ErpEBL}{2} = \dfrac{2.54 + 1.54}{2} = 2.040 \& SOON$

Average Risk $= \sigma NABIL + \sigma EBL \times \dfrac{1}{2} = \dfrac{0.36 + 0.13}{2} = 0.25 \ \& \ SO\ ON.$

Table 3

List of variables in portfolio Analysis

combination of Banks	correlation	weight (%)	weight (%)	Average Return %	Portfolio Return %	Average Risk %	Portfolio Risk %	Covariance
NABIL & EBL	-0.4509	0.201	0.799	2.040	1.74	0.25	0.0954	-0.0211
NABIL & HBL	-0.2043	0.745	0.255	2.050	2.29	0.61	0.3090	-0.0628
NABIL & SCBL	0.4111	-0.042	1.042	2.515	2.49	0.21	0.0480	0.0074
EBL & HBL	0.2532	1.016	-0.016	1.55	1.54	0.49	0.129	0.0281
EBL & SCBL	0.3846	0.020	0.980	2.015	2.47	0.090	0.050	0.0022
HBL & SCBL	0.0655	-0.0015	1.0015	2.025	2.49	0.452	0.0557	0.0036

ANNEX C

Calculation of mean, standard deviation, coefficient of variation, correlation coefficient, optimal weight, portfolio risk and return under return on equity.

Return on Equity

(ROE-NABIL in 2004/2005) $= \dfrac{netincome}{networth} = \dfrac{519}{1658} = 0.3130 \, or \, 31.30\%$

(ROE-NABIL in 2005/2006) $= \dfrac{netincome}{networth} = \dfrac{635}{1875} = 0.3387 \, or \, 33.87\%$

(ROE-NABIL in 2006/2007) $= \dfrac{netincome}{networth} = \dfrac{674}{2057} = 0.3277 \, or \, 32.77\%$

(ROE-NABIL in 2007/2008) $= \dfrac{netincome}{networth} = \dfrac{764.50}{2437.20} = 0.3137 \, or \, 31.36\%$

ROE-NABIL in 2008/2009) $= \dfrac{netincome}{networth} = \dfrac{1031}{2875} = 0.3586 \, or \, 35.86\%$

Table 4

Diversification of Risk on the basis of Return on Assets of the commercial banks.

Combination of Banks	Average Risk %	Portfolio Risk %	Percentage Reduction in portfolio risk
NABIL & EBL	0.25	0.0954	61.84
NABIL & HBL	0.61	0.3090	49.34
NABIL & SCBL	0.21	0.0480	77.14
EBL & HBL	0.49	0.129	73.67
EBL & SCBL	0.090	0.050	44.44
HBL & SCBL	0.452	0.0557	87.68

Arithmetic mean of NABIL Bank

$(\overline{X} \, NABIL) = \dfrac{\sum X}{N} = \dfrac{31.30 + 33.87 + 32.77 + 31.36 + 35.86}{5} = 33\%$

Standard deviation of NABIL

$$\dagger NABIL = \sqrt{\frac{\sum (X - \overline{X})^2}{N}}$$

$$= \sqrt{\frac{(31.3 - 33)^2 + (33.87 - 33)^2 + (32.77 - 33)^2 + (31.36 - 33)^2 + (35.86 - 33)^2}{5}}$$

$$= \sqrt{\frac{14.569}{5}}$$

$$= \sqrt{2.9138}$$

$$= 1.7070$$

Coefficient of variation of NABIL

$$\text{C.V. NABIL} = \frac{\dagger}{X} = \frac{1.7070}{33} = 0.05173$$

Return on equity of EBL

$$(\text{ROE-EBL in 2004/2005}) = \frac{netincome}{networth} = \frac{170.8}{692.60} = 0.2466 \text{ or } 24.66\%$$

$$(\text{ROE-EBL in 2005/2006}) = \frac{netincome}{networth} = \frac{237.20}{822.80} = 0.2883 \text{ or } 28.83\%$$

$$(\text{ROE-EBL in 2006/2007}) = \frac{netincome}{networth} = \frac{296.40}{1061.50} = 0.2792 \text{ or } 27.92\%$$

$$(\text{ROE-EBL in 2007/2008}) = \frac{netincome}{networth} = \frac{451.20}{1581.20} = 0.2854 \text{ or } 28.54\%$$

$$(\text{ROE-EBL in 2008/2009}) = \frac{netincome}{networth} = \frac{638.7}{2003.60} = 0.3188 \text{ or } 31.88\%$$

Arithmetic mean of EBL

$$\left(\overline{X}\,EBL\right) = \frac{\sum X}{N}$$

$$= \frac{24.66 + 28.83 + 27.92 + 28.54 + 31.88}{5} = \frac{141.839}{5} = 28.37\%$$

Standard deviation of EBL

$$\dagger EBL = \sqrt{\frac{\sum (X - \overline{X})^2}{N}}$$

$$=$$

$$\sqrt{\frac{(24.66 - 28.37)^2 + (28.83 - 28.37)^2 + (27.92 - 28.37)^2 + (28.54 - 28.37)^2 + (31.88 - 28.37)^2}{5}}$$

$$= \sqrt{\frac{26.5212}{5}}$$

$$= \sqrt{5.3054}$$

$$= 2.30$$

Coefficient of variation of EBL

$$\text{C.V. EBL} = \frac{\dagger}{X} = \frac{2.30}{28.37} = 0.0811$$

Return on equity of HBL

$$(\text{ROE-HBL in 2004/2005}) = \frac{netincome}{networth} = \frac{308.28}{2568.39} = 0.120 \text{ or } 12.0\%$$

$$(\text{ROE-HBL in 2005/2006}) = \frac{netincome}{networth} = \frac{457.44}{2885.59} = 0.1585 \text{ or } 15.85\%$$

$$(\text{ROE-HBL in 2006/2007}) = \frac{netincome}{networth} = \frac{491.82}{2942.23} = 0.1672 \text{ or } 16.72\%$$

$$(\text{ROE-HBL in 2007/2008}) = \frac{netincome}{networth} = \frac{635.85}{3195.42} = 0.1990 \text{ or } 19.90\%$$

$$(\text{ROE-HBL in 2008/2009}) = \frac{netincome}{networth} = \frac{752.83}{3119} = 0.2414 \text{ or } 24.14\%$$

Arithmetic mean of HBL

$$(\overline{X} \text{ HBL}) = \frac{\sum X}{N} = \frac{12 + 15.85 + 16.72 + 19.90 + 24.14}{5} = 17.72\%$$

Standard deviation of HBL

$$†HBL = \sqrt{\frac{\sum (X - \overline{X})^2}{N}}$$

$$=$$

$$\sqrt{\frac{(12 - 17.72)^2 + (15.85 - 17.72)^2 + (16.72 - 17.72)^2 + (19.90 - 17.72)^2 + (24.14 - 17.72)^2}{5}}$$

$$= \sqrt{\frac{83.1841}{5}}$$

$$= \sqrt{16.63682}$$

$$= 4.08$$

Coefficient of variation of HBL

$$\text{C.V. HBL} = \frac{†}{\overline{X}} = \frac{4.08}{17.72} = 0.230$$

Return on Equity SCBL

$$(\text{ROE-SCBL in 2004/2005}) = \frac{netincome}{networth} = \frac{539.20}{1582.42} = 0.3407 \text{ or } 34.07\%$$

$$(\text{ROE-SCBL in 2005/2006}) = \frac{netincome}{networth} = \frac{658.76}{1754.14} = 0.3755 \text{ or } 37.55\%$$

$$(\text{ROE-SCBL in 2006/2007}) = \frac{netincome}{networth} = \frac{691.67}{2116.35} = 0.3268 \text{ or } 32.68\%$$

$$(\text{ROE-SCBL in 2007/2008}) = \frac{netincome}{networth} = \frac{818.92}{2492.55} = 0.3261 \text{ or } 32.61\%$$

$$(\text{ROE-SCBL in 2008/2009}) = \frac{netincome}{networth} = \frac{1025.11}{3052.47} = 0.3358 \text{ or } 33.58\%$$

Arithmetic mean of SCBL ($\overline{X}$ SCBL) $= \dfrac{\sum X}{N}$

$$= \frac{34.07 + 37.55 + 32.68 + 32.61 + 33.58}{5}$$

$$= 34.1\%$$

Standard deviation of SCBL

$$†SCBL = \sqrt{\frac{\sum (X - \overline{X})^2}{N}}$$

$$=$$

$$\sqrt{\frac{(34.07 - 34.1)^2 + (37.55 - 34.1)^2 + (32.68 - 34.1)^2 + (32.61 - 34.1)^2 + (33.58 - 34.1)^2}{5}}$$

$$= \sqrt{\frac{16.4103}{5}} \;=\; \sqrt{3.28206} \;=\; 1.81$$

Coefficient of variation of SCBL

$$\text{C.V. SCBL} = \frac{†}{\overline{X}} = \frac{1.81}{34.1} = 0.053$$

Table 5

List of mean, standard deviation & coefficient of variation

S.N.	Name of Banks	Return on Equity					Mean $\overline{X}$	S.D.	C.V.
		2004/05	2005/06	2006/07	2007/08	2008/09			
1	NABIL	31.30	33.87	32.77	31.36	35.86	33	1.71	0.05173
2	EBL	24.66	28.83	27.92	28.54	31.88	28.37	2.30	0.0811
3	HBL	12.0	15.58	16.72	19.90	24.14	17.72	4.08	0.230
4	SCBL	34.07	37.55	32.68	32.61	33.58	34.1	1.81	0.053

ANNEX D

Covariance of NABIL & EBL

$$(\text{cov.NABIL, EBL}) = \frac{\sum (XNABIL - \overline{X}NABIL)(XEBL - \overline{X}EBL)}{N}$$

$$= \frac{-1.7 \times (-3.71) + (0.87) \times (-0.46) + (-0.23) \times (-0.45) + (-1.64) \times 0.17 + (2.86)) \times 3.51}{5}$$

$$= \frac{15.7770}{5}$$

$$= 3.1554 \text{ or } 3.16$$

Correlation coefficient between NABIL & EBL

$$(xNABIL, EBL) = \frac{Cov.(NABIL, EBL)}{\dagger NABIL \times \dagger EBL}$$

$$= \frac{3.16}{1.71 \times 2.30}$$

$$= 0.803$$

Covariance of NABIL& EBL

$$(\text{Cov.NABIL,HBL}) = \frac{\sum (XNABIL - \overline{X}NABIL)(XHBL - \overline{X}HBL}{N}$$

$$=$$

$$\frac{-1.7 \times (-5.72) + (0.87) \times (-2.14) + (-0.23) \times (-1) + (-1.64) \times 2.18 + 2.86 \times 6.68}{5}$$

$$= \frac{23.6218}{5}$$

$$= 4.72$$

Correlation coefficient between NABIL& HBL

$$(xNABIL, HBL) = \frac{Cov(NABIL, HBL)}{\dagger NABIL \times \dagger HBL}$$

$$= \frac{4.72}{1.71 \times 4.08}$$

$$= 0.677$$

Covariance of NABIL & SCBL

$$Cov.(NABIL, SCBL) = \frac{\sum (XNABIL - \overline{X}NABIL)(XSCBL - \overline{X}SCBL)}{N}$$

$$=$$

$$\frac{-1.7 \times (-0.03) + (0.87) \times (3.45) + (-0.23) \times (-1.42) + (-1.64) \times (-1.49) + (2.86) \times (-0.52)}{5}$$

$$= \frac{4.3355}{5}$$

$$= 0.87$$

Correlation coefficient between NABIL & SCBL

$$(xNABIL, SCBL) = Cov.(NABIL, SCBL) \times \frac{1}{\dagger NABIL \times \dagger SCBL}$$

$$= \frac{0.87}{1.71 \times 1.81}$$

$$= 0.281$$

Covariance of EBL & HBL

$$Cov.(EBL, HBL) = \frac{\sum (XEBL - \overline{X}EBL)(XHBL - \overline{X}HBL)}{N}$$

$$=$$

$$\frac{-3.71 \times (-5.72) + (0.46) \times (-2.14) + (-0.45) \times (-1.0) + (0.170) \times 2.18 + 3.15 \times 6.42}{5}$$

$$= \frac{41.2786}{5}$$

$$= 8.26$$

Correlation coefficient between EBL & HBL

$$(xEBL, HBL) = \frac{Cov.(EBL, HBL)}{\dagger EBL \times \dagger HBL}$$

$$= \frac{8.26}{2.30 \times 4.08}$$

$$= 0.880$$

Covariance of EBL& SCBL

$$\text{Cov.(EBL,SCBL)} = \frac{\sum (XEBL - \overline{X}EBL)(XSCBL - \overline{X}SCBL)}{N}$$

$$=$$

$$\frac{-3.71 \times (-0.030) + (0.460) \times (3.450) + (-0.450) \times (-1.42) + (0.170) \times (-1.450) + 3.51 \times (-0.520)}{5}$$

$$= \frac{-1.8390}{5}$$

$$= -0.3678$$

Correlation coefficient between EBL & SCBL

$$(\text{x}EBL, SCBL) = \frac{COV.(EBL, SCBL)}{†EBL \times †SCBL} = \frac{-0.3678}{2.30 \times 1.81}$$

$$= 0.081$$

Covariance of HBL& SCBL

$$\text{Cov.(HBL,SCBL)} = \frac{\sum (XHBL - \overline{X}HBL)(XSCBL - \overline{X}SCBL)}{N}$$

$$=$$

$$\frac{(-5.72) \times (-0.03) + (-2.14) \times (3.45) + (-1) \times (-1.42) + 2.18 \times (-1.49) + 6.42 \times (-0.52)}{5}$$

$$= \frac{-12.38}{5}$$

$$= -2.48$$

Correlation coefficient between HBL & SCBL

$$(\text{x}HBL, SCBL) = \frac{Cov.(HBL, SCBL)}{†HBL \times †SCBL}$$

$$= \frac{-2.48}{4.08 \times 1.81}$$

$$= 0.336$$

Optimal weight of NABIL for the portfolio of NABIL& EBL

(wNABIL) =

$$\sigma^2 EBL - Cov.NABIL, EBL \times \frac{1}{(\sigma^2 EBL + \sigma^2 NABIL - 2COV.NABIL, EBL)}$$

$$= \frac{(2.30)^2 - 3.16}{(2.30)^2 + (1.71)^2 - 2 \times 3.16}$$

$$= 1.127$$

Optimal weight of EBL(wEBL) = 1-1.127 = -0.127

Return on portfolio of NABIL & EBL

$rp = wNABIL \times \overline{X} NABIL + wEBL \times \overline{X} EBL$ = 1.127×33+(-0.127)×28.37 = 33.60%

Standard deviation on portfolio of NABIL & EBL

$$\sigma P = \sqrt{w^2 NABIL \times \sigma^2 NABIL + w^2 EBL \times \sigma^2 EBL + 2Cov.NABIL, EBL \times wNABIL \times wEBL}$$
$$= \sqrt{(1.127)^2 \times (1.71)^2 + (-0.127)^2 \times (2.30)^2 + 2 \times 3.16 \times (1.127) \times (-0.127)}$$
$$= \sqrt{3.2866}$$
$$= 1.813$$

Optimal weight of NABIL for the portfolio of NABIL & HBL

$$wNABIL = \frac{\sigma^2 HBL - Cov.NABIL, HBL}{\sigma^2 HBL + \sigma^2 NABIL - 2Cov.NABIL, HBL}$$

$$= \frac{(4.08)^2 - 4.72}{(4.08)^2 + (1.71)^2 - 2 \times 4.72}$$

$$= 1.177$$

Optimal weight of HBL = 1-1.177 = -0.177

Return on portfolio of NABIL & HBL

$rp = wNABIL \times \overline{X} NABIL + wHBL \times \overline{X} HBL$

$= 1.77 \times 33 + (-0.177) \times 17.72$

$= 35.70\%$

Standard deviation on portfolio of NABIL & HBL

$$\dagger P = \sqrt{w^2 NABIL \times \dagger^2 NABIL + w^2 HBL \times \dagger^2 HBL + 2COV.NABIL, HBL \times wNABIL \times wHBL}$$
$$= \sqrt{(1.77)^2 \times (1.71)^2 + (-0.177)^2 \times (4.08)^2 + 2 \times 4.72 \times 1.77 \times (-0.177)}$$
$$= \sqrt{2.6085}$$
$$= 1.61$$

Optimal weight of NABIL for the portfolio of NABIL & SCBL

$$(wNABIL) = \frac{\dagger^2 SCBL - \text{cov}.NABIL, SCBL}{\dagger^2 SCBL + \dagger^2 NABIL - 2\text{cov}.NABIL, SCBL}$$

$$= \frac{(1.81)^2 - 0.87}{(1.81)^2 + (1.71)^2 - 2 \times 0.87} = 0.539$$

Optimal weight of SCBL (wSCBL) = 1 - 0.539 = 0.461

Return on Portfolio of NABIL & SCBL

$$\text{rp} = wNABIL \times \overline{X} \text{ NABIL} + wSCBL \times \overline{X} \text{ SCBL}$$
$$= 0.539 \times 33 + (0.461) \times 34.1$$
$$= 33.51\%$$

Standard deviation on Portfolio of NABIL & SCBL

$$\dagger P =$$
$$= \sqrt{(0.539)^2 \times (1.71)^2 + (0.461)^2 \times (1.81)^2 + 2 \times 0.87 \times 0.539 \times (0.461)}$$
$$= \sqrt{1.9781}$$
$$= 1.40$$

Optimal Weight of EBL for the portfolio of EBL & HBL

$$(wEBL) = \frac{\dagger^2 HBL - \text{cov}.EBL, HBL}{\dagger^2 HBL + \dagger^2 EBL - 2\,\text{cov}.EBL, HBL}$$

$$= \frac{(4.08)^2 - 8.26}{(4.08)^2 + (2.30)^2 - 2 \times 8.26} = 1.548$$

Optimal weight of HBL (wHBL) = 1 -1.548 = -0.548

Return on portfolio of EBL & HBL

$rp = wEBL \times \overline{X} EBL + wHBL \times \overline{X} HBL$

$= 1.548 \times 28.37 + (-0.548) \times 17.72$

$= 34.21\%$

Standard deviation of portfolio of EBL & HBL

$$\dagger p = \sqrt{w^2 EBL \times \dagger^2 EBL + W^2 HBL \times \dagger^2 HBL + 2COV.HBL, EBL \times WEBL \times WHBL}$$

$$= \sqrt{(1.548)^2 \times (2.30)^2 + (-0.548)^2 \times (4.08)^2 + 2 \times 8.26 \times 1.548 \times (-0.548)}$$

$$= 3.66$$

Optimal weight of EBL for the portfolio of EBL & HBL

$$(wEBL) = \dagger^2 SCBL - CoV.EBL, SCBL \times \frac{1}{(\dagger^2 SCBL + \dagger^2 EBL - 2Cov.EBL, SCBL)}$$

$$= \frac{(1.81)^2 - (-0.3678)}{(1.81)^2 + (2.30)^2 - 2 \times (-0.3678)} = 0.422$$

Optimal weight of SCBL = 1- 0.422 = 0.578

Return on portfolio of EBL &SCBL

$rp = wEBL \times \overline{X} EBL + wSCBL \times \overline{X} SCBL$

$= 0.422 \times 28.37 + 0.578 \times 34.1$

$= 31.68\%$

Standard deviation on portfolio of EBL& SCBL

$$\dagger P = \sqrt{w^2 EBL \times \dagger^2 EBL + w^2 SCBL \times \dagger^2 SCBL + 2COV.EBL, SCBL \times wEBL \times wSCBL}$$

$$= \sqrt{(0.422)^2 \times (2.30)^2 + (0.578)^2 \times (1.81)^2 + 2 \times (-0.3678) \times 0.422 \times 0.578}$$

$$= \sqrt{1.8564}$$

$$= 1.36$$

Optimal weight of HBL on the portfolio of HBL& SCBL

$$(wHBL) = \frac{\dagger^2 SCBL - COVHBL, SCBL}{\dagger^2 SCBL + \dagger^2 HBL - 2COV.HBL, SCBL}$$

$$= \frac{(1.81)^2 - (-2.48)}{(1.81)^2 + (4.08)^2 - 2 \times (-2.48)}$$

$$= 0.231$$

Optimal weight of SCBL = 1- 0.231 = 0.769

Return on portfolio of HBL & SCBL

rp = wHBL × $\overline{X}$ HBL +wSCBL× $\overline{X}$ SCBL

$$= 0.231 \times 17.72 + 0.769 \times 34.1$$

$$= 30.32\%$$

Standard deviation on portfolio of HBL& SCBL

$$\dagger P = \sqrt{w^2 HBL \times \dagger^2 HBL + w^2 SCBL \times \dagger^2 SCBL + 2COV.HBL, SCBL \times wHBL \times wSCBL}$$

$$= \sqrt{(0.231)^2 \times (4.08)^2 + (0.769)^2 \times (1.81)^2 + 2 \times (-2.48) \times 0.231 \times 0.769}$$

$$= \sqrt{1.94}$$

$$= 1.39$$

Table 6

List of Variables used in portfolio Analysis

combination of Banks	correlation	weight (%)	weight (%)	Average Return %	Portfolio Return %	Average Risk %	Portfolio Risk %
NABIL & EBL	0.803	1.127	-0.127	30.69	33.60	2.005	1.813
NABIL & HBL	0.677	1.177	-0.177	25.36	35.70	2.90	1.61
NABIL & SCBL	0.281	0.539	0.461	33.55	33.51	1.76	1.40
EBL & HBL	0.880	1.548	-0.548	23.05	34.21	3.19	3.66
EBL & SCBL	0.081	0.422	0.578	31.24	31.68	2.055	1.36
HBL & SCBL	0.336	0.231	0.769	25.91	30.32	2.95	1.39

Table 7

Diversification of Risk on the basis of Return on Equity

Combination of Banks	Average Risk %	Portfolio Risk %	Percentage Reduction in portfolio risk
NABIL & EBL	2.005	1.813	9.58
NABIL & HBL	2.90	1.61	44.48
NABIL & SCBL	1.76	1.40	20.45
EBL & HBL	3.19	3.66	14.74
EBL & SCBL	2.055	1.36	33.82
HBL & SCBL	2.95	1.39	52.88