

# CHAPTER-1

## 1. INTRODUCTION

### 1.1 Background of the Study

The knowledge of economic situation is very important for every country for its economic development. Possibility of overall development depends upon economic condition of the country. Economic growth facilitates the financial condition of the country. Financial institution plays an important role in the economic growth and the development of the country. The tremendous growth in the number of financial institute in Nepal has been witnessed in the two last decades. Nepal is the country whose pace of economic growth is quite slow and economists of the country are making enough endeavors to accelerate economic growth.

The history of modern banking system in Nepal began in 1937 A.D With the establishment of Nepal bank limited (NBL) as the first commercial bank in Nepal. Commercial bank plays a vital role in the economic development of the country. It provides capital for the development of industry, trade, business and other resources deficit sector by investing the saving collected as deposit. Commercial banking provides numerous services to their customer in view of facilitating their economic and social life .The accepting deposit, providing loan, investment capital formation, security of wealth, price stability, transfer of fund, monetization of economics etc are its main function. Hence e the commercial banks play an important role in the modern economy.

Commercial bank play major role in capital formation by collecting spread financial resources from various sources and invests them to different commercial and economic activities. Bank have catalytic role in the process of economic development. Thus, a key factor in the country is the mobilization of domestic resources and their investment for productive use to the various sectors. To make it more effective, commercial banks should formulate sound investment policies, which help maximize quality and quantity of investment and eventually contribution to the economic growth of a country.

The economic development is possible only when domestic resources are properly mobilized and utilized. Similarly for integrated and speedily development of the country the competitive banking and financial services should reach every corner of the country. Every bank invests its money in some profitable financial sector, which may results in profitable business in the long run. An investment is the commitment of money that is expected to generate addition money. A good investment policy has a positive impact on economic development of the country and vice-versa.

Therefore the commercial development of the country depends upon a well equipped and proper banking system. This helps bank to analyze and evaluate their working capital management. They can efficiently and effectively complete their rivals and retain their customers and shareholder.

### **1.1.1 Meaning of Commercial Bank**

Commercial bank is back bone of the country; Commercial bank is an institution which is engaged in monetary transaction. It receives deposit of money from having saving and lending to those whose need money for some purpose. Commercial bank also involve in a number of agency services e.g. remitting and collecting cash on behalf of clients, opening bank drafts and L/C facilities, under writing share of newly established companies etc. in short of bank help people in every sector of economic e.g. trade, industry agriculture etc. commercial bank also buy corporate bond and government bond. Its primary liabilities are deposit and primary assets are loans and bonds.

It is said that word bank is derived from an Italian word "BANCO" which mean a bench, which was used for keeping record and exchange of money. First bank was established in England which name is 'Bank of England'. Bank is the financial institution which deals with money by accepting various types of deposit from public and provides various types of loan by creating credit, Banking also helps to increase employment. It also allow for a variety of deposit account, such as checking, saving and time deposit. These institutions are run to make a profit and owned by a group of individual or institution. Commercial bank can be contrasted with investment banking firm such as brokerage firms, which generally involved in arranging for sale of corporate or municipal securities.

The main objectives of all the bank are development of trade, commerce, industry and human economic condition. Since trade and commerce are the prime factor of the economic growth. There are different definitions about the bank.

***"Bank as an establishment for the custody of money."***

***"A commercial bank refers to such type of bank other than specified bank related to corporate, agriculture, industrial, and other which deal in money exchange, accepting deposit and advancing loan etc."***

Commercial banks are the heart of the financial system. They make fund available through their lending and investing activities to borrower, individuals, business firms and services for producer to customers and financial activities of the government. There` are commercial banks are those financial institution which collects loan against proper securities for their productive purpose.

### **1.1.2 Development of Commercial Bank in Nepal**

The history of banking system came in Nepal through the establishment of "Nepal bank limited" in 1994 B.S. Before this kaushi Toshakhana, set up during the region of Prithvi Narayan Shah and Tejarath adda, set up during the region of Ranoddip shah. Under the Tejarath system loan are given to people against adequate security of ornaments. This system also granted loan to government employees. Such loans were repayable installment. Thus the Tejarath system may be adeptly considered as the foundation of modern banking system.

Nepal bank limited is the first commercial bank in Nepal with 51% government equity and 49% owned by public. It was established under the special banking Act, 1993 having elementary function of commercial bank. Because of Non-existence of a central bank in the country, Nepal Bank Limited had to act as its own central Bank and keep enough resources in the hand for meeting emergencies. The first central Bank was established in 2013 B.S. under Nepal Rastra Act, 2013 with an objective of supervising, protecting, and directing the function of commercial banking activities. To fulfill the -growing credit requirement of the country, the commercial bank Rastriya Banijya Bank" was established in 2023 B.S. under Rastriya Banijya Bank Act, 2021 with fully government equity that of authorized capital of Rs. 10 million and paid up capital of Rs. 2.5 million.

These days commercial bank have covered the huge area of an economic of a country. After 2040 B.S. the Joint Venture Banks has been established. The first JVBs established was "Nepal Arab Bank Limited" in 2041 B.S. which was proved to be a milestone in the history of banking. Later it was renamed as "NABIL Bank Limited" since 1s' January 2002. The second Joint Venture Bank, "Nepal Indosuez Bank Limited" was established in 2043 B.S. after incorporation of Nepal Indosuez Bank Limited, a new joint venture bank under the name of "Nepal Grindlays Bank Limited" was established in 10th Magh 2043 B.S. and there are many more JVBs in Nepal which help to increase financial condition of country.

### **1.1.3 Function of Commercial Bank**

The principal and primary function of banks is to serve as intermediaries in the making of payments. In so doing they transform inactive money capital into active, that is, into capital yielding' a profit; they collect all kinds of money revenues and earn profit by lending it on mainly in business organization, industrial and agricultural sectors and investing in government bonds. Therefore, the main function of commercial bank is to mobilize idle resources in productive areas by collecting it from scattered sources and generating profit.

There are many functions performed by commercial banks. The following are the main functions performed by the commercial banks:

**i. Accepting Deposits**

Commercial banks accept deposits in three forms namely, current, saving and fixed deposits.

**(a) Current Deposit:**

Current deposit is also known as demand deposit whereby the banker incurs the obligation of paying money on demand. The bank does not pay any interest on such deposit.

**(b) Saving Deposit:**

It is the deposit that is collected from general savers, small depositors and low-income depositors. The bank usually pays small interest to the depositors against their deposits.

**(c) Fixed Deposit-**

Fixed deposit is the one in which a customer is required to keep a fixed amount with bank for a specified period. It is deposited by those who do not need money for stipulated period. The bank pays higher rate of interest on such deposit.

**ii. Advancing Loans**

Commercial banks mobilize funds by accepting all kinds of deposits and then providing money to those who are in need of it by granting overdrafts; discounting bills of exchange or promissory notes in the form of loans and advances. Direct loans and advances are given to all types of persons against used to carry on very limited banking-like activities. There were also moneylenders and merchants partially fulfilling the requirements of the general public.

**iii. Agency Services**

A commercial bank provides a range of agency services. It undertakes the payment of subscriptions, premiums, rents etc. It also collects checks, bills, promissory notes, dividends, interests etc. on behalf of its customers. In some cases, it also acts as correspondent or representative of its customers, other banks and financial institutions.

**iv. Credit Creation**

It is one of the most important functions of the commercial bank. It accepts deposits and advances loans. When the bank advances loans, it opens an account to draw the money by cheque according to the borrower's need. By granting loan, the bank creates credit or deposit.

## **V. Other Functions**

Besides, above-mentioned major functions, commercial banks also perform other functions as follows:

### **a. Assist in Foreign Trade:**

By discounting the bills of exchange commercial banks assists in foreign trade and helps exporters to receive money in the native currency.

### **b. Offers Security Brokerage Services:**

These days most of commercial banks have begun to marketing of security brokerage services offering customers the opportunity to buy the stocks, bonds and other securities without having to go to a security dealer or broker.

### **c. Financial Advising:**

Many banks offer a wide range of financial advisory services from helping in financial planning and consulting business managers.

## **1.1.4 Role of Commercial Bank**

Commercial banks are fundamental to a developed economic and are unintentional agent of monetary policy. Commercial banks must be able to forecast the effects of government policy on overall economic activity, interest rate and risk in the order to manage their deposit or money.

The establishment of new commercial bank has brought an environment of healthy competition in front of the existing commercial bank. The increased competition forces the existing bank to improve their quality and extend their services by simplifying procedures and by training, motivating their own staff to respond to the new challenges. These banks have been contributing in line with the thrust of economic liberalization and financial sector reform i.e. making the financial system more competitive, efficient and profitable.

The various role of commercial bank begin performed in Nepal can be classified as below:

- i.** Healthy competitive
- ii.** Foreign investment
- iii.** New Bank Technique
- iv.** Contribution of nation economy

## **1.1.5 Brief Profile on the sample Commercial Bank Taken under study**

### **a. Bank of Kathmandu Limited**

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

today become a landmark in the Nepalese banking sector by being among the few commercial banks which is entirely managed by Nepalese professionals and owned by the general public. So, Bank of Kathmandu Limited has become a prominent name in the Nepalese banking sector BOK's authorized capital, issued and paid up capital are Rs. 1,000,000,000; Rs 606,173,300 and 603,141,300 respectively. It has 60, 31,413 numbers of shares (promoter + public) and currently eighteen branches around the country.

**b. Everest Bank Limited (EBL)**

Everest Bank Limited started its operation in 1994 with a view and objective of extending professionalized and efficient banking service to various segments of the society. In the beginning of its establishment, it was managed by United Bank of India Limited. Later on EBL joined hands with Punjab National Bank (PNB), India as its joint venture partner. in 1997 A.D. The present chairman of EBL is Mr. B.K Shrestha.

The shareholder of Everest Bank Limited is consisted of three different investors namely the Nepalese promoters 50%, Punjab National Bank 20%, and General public 30%. Initially at the time of establishment, the Bank had an authorized capital of Rs. 750 million and paid up capital of Rs. 455 million. The numbers of shareholders are 24,222 with par value of Rs. 100 per share.

EBL has a interconnected Domestic network of 47 Branches, 27 collection counters and 60 ATM. They provides pioneer of online banking in Nepal. The account holders of EBL can transact through more than 5700 Branches and 6000 ATMs of Punjab National bank, India .For its excellence in banking services, it was recently awarded the “Best Bank Award 2011” amongst all bank in India by the leading corporate magazine, business India.

**c. NABIL Bank Limited (NABIL)**

NABIL Bank Limited is the first commercial bank established in Joint Venture investment in Nepal. This bank was established in 2041 B.S. under the Commercial Bank Act, 2021. Dubai Bank Limited was initial foreign Joint venture partner with 50% equity investment. The shares owned by Dubai Bank Limited were transferred to Emirates Bank International Limited, Du5ai. Later, Emirates Bank International Limited sold its entire stock to National Bank Limited Bangladesh. Hence, 50% of equity shares of NABIL Bank Limited are held by, National Bank Limited, Bangladesh and out of another 50% shares; Financial institutions has taken 20% and remaining 30% were issued to general public in Nepal. Authorized capital and paid up capital of NABIL Bank Limited are Rs. 500 million and Rs. 491.6544 million. The numbers of Shareholders of this bank are 5076 with par value of Rs. 100 each.

#### **d. Himalayan bank Limited (HBL)**

Himalayan Bank was established in 1993 in joint venture with Habib Bank Limited of Pakistan. Himalayan Bank has been able to maintain a lead in the primary banking activities likely Loans and Deposit. Product such as premium savings account, HEL proprietary card and Millionaire Deposit Scheme besides services such as ATMs and Tele-banking were first introduction by Himalayan Bank Limited.

All branches of HBL are integrated into Globus (development by Temenos), the single Banking software where the bank has made substantial investment. This has helped the bank provide services like 'Any Branch Banking Facility' Internet banking and SMS Banking Living up to the expectation and aspiration of the customer and other stakeholders of being innovative, HBL very recently introduced several new product and service. Millionaire Deposit scheme, small Business Enterprises Loan, pre-paid visa card, International Travel Quota credit card, consumer finance through card and online TUEFL, SAT, IELTS etc. fee payment facility are some of the product and services HBL has developed exclusive and proprietary online money transfer software-Himal Remit TM. In Middle East and Gulf region, HBL is the biggest inward remittance handling Bank in Nepal.

#### **e. Nepal Investment Bank Limited (NIBL)**

Nepal Investment Bank Limited was established at 21 January 1986 as a third joint venture bank under the Company Act 1964. Initially the bank was managed by 'Banque Indosuez' Paris in accordance with Joint Venture and technical services. Fifty percent of the shares of Nepal Indosuez Bank Limited held by Credit Agricole Indosuez was sold to the Nepalese promoters on April 25, 2002 as per the transaction record of NEPSE. After this divestment of share by Nepalese owners, the name of the company was changed to Nepal Investment Bank Limited by its 15th annual general meeting held on May 31, 2002. Out of total equity shares of Nepal Investment, Bank Limited, 50% shares are held by a group of companies, 15% by commercial banks, another 15% by financial institutions and remaining 20% by public. Authorized capital of NIBL is Rs. 270 million and issued and paid up capital are Rs. 169.9845 respectively.

### **1.2 Statement of the Problem**

In every research, there are some problems. The research is done as the solution to the problem. Hence, we can say that problems gives rise to the necessity of research joint venture banks are operationally more efficient, having better performance while comparing with local bank, but they face many problem.

Most of the commercial bank invests their fund in the limited area to achieve highest amount of profit. With prevailing economic condition in the country, there has been lower investment in the agriculture, manufacturing, industrial and other productive sectors, which is not satisfactory to meet the economic growth of the present period.

They hesitate to invest in the long-term projects. They are much more safety minded. Therefore, they follow conservative loan policy.

Further portfolio management activities of Nepalese commercial bank are in development stage. The reason behind not using such activities by commercial bank may be due to unawareness about portfolio management and its usefulness, hesitation of taking risk and lack of proper techniques to run such activities in the best and successful manner.

The main focus of the statement of the problem is stressed toward the comparative study of portfolio management of the selected JVBs viz. Bank of Kathmandu, Everest Bank, NABIL Bank, Himalayan Bank, Nepal investment Bank. All the five mentioned JVBs have been competing in the same economic environment and financial market. Similarly, all the five banks are operating successfully under computerized system to meet the growing competition in banking system.

### **1.3 Objective of the study**

The primary objective of the study is to identify the existing problem of the working capital management of selected different joint venture banks. Moreover, following are the special objective of the study.

- i.** To analyze the existing situation of portfolio management of Commercial Bank.
- ii.** To compare the risk and return on investment of the Commercial Banks.
- iii.** To find the sensitivity of the stock of the sample banks.
- iv.** To examine the trend of investment in different sector.
- v.** To evaluate and interpret the financial performance of selected banks in terms of investment strategies.

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

The portfolio analysis of banks attempts to address upon the selection of the assets for the construction of portfolio. While allocating the assets for a Portfolio, an investor should compare the relationship between the assets. Their realized return and expected return should be taken into account and correlation between the securities provides the possibilities of eliminating some risk without reducing potential returns.

The success and prosperity of any bank heavily relies upon the successful investment of its available resources into the profitable sector. So successful formulation and effective implementation of investment policy is the prime prerequisite for successful performance of Joint Venture Banks. Hence, the main significance of this study of investment portfolio analysis of Nepalese Commercial Banks is to help how to minimize risk on investment, and maximize the return through portfolio analysis.



This study is also significant for the number of reasons. Firstly, it examines the existing situation of Portfolio Management of Nepalese Commercial Banks. Second, it examines the investment and loan and advance portfolio of Commercial Banks. Last but not the least, it provides the literature to the researcher who wants to carry on future research in this field.

### **1.5 Need and Importance of the Study**

This Study is important particular is important to various group but is particular is directed to a certain group of people and organization. The portfolio analysis of banks attempts to address upon the selection of the assets for the construction of portfolio. While allocating assets for a portfolio, an investor should compare the relationship between the assets. Their realized return and expected return should be taken into account and correlation between the securities provides the possibilities of eliminating some risk without reducing potential return.

The study of portfolio analysis will be helpful to go deeply into the various matters as to why the performance of their bank is better or worse than other joint venture banks. For the shareholders the portfolio analysis of this bank are also important to know how these funds are utilizing and to what extent they are gaining. The study will thus, help to identify the productivity of their scarce source. The outsiders such as depositors, investors, stock brokers, debtors, competitors, merchant bankers etc are also made aware whether to deposit or not? To finance or not?

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### **1.6 Limitation of the Study**

The limitations of the study are as follows:

- i. The risk of the banks is measured by standard deviation of the return of the banks.
- ii. The reliability of conclusion of the study is based upon the accuracy of secondary data.
- iii. This study has been done covering the six year data.
- iv. This study is basically concerned with portfolio analysis of commercial banks. It does not consider other financial analysis of the banks.
- v. The unavailability of latest data for study is in the website of related banks.

### **1.7 Research Methodology**

Research methodology is the way in which the data are collected for the research project. It refers to the various sequential steps to be adopted by a researcher in studying a problem with certain objectives in view. It describes the method and process

applied in the entire subject of the study. It is the way to systematically solve the research problem (Kothari; 1990: 39)

It includes different dependent and independent variables, types of research design, research questions and hypothesis sample, data collection activities, technique of analysis etc. Thus, research methodology is the process of arriving at the solution of the problem through planned and systematic dealing with the collection, analysis and interpretation of facts and figures. It describes the methods and process applied in the entire aspects of the study.

This chapter has been divided into five sections. First section presents the research design of the study while the second section deals with the nature of population and samples. Third section consists of the nature and sources of data and four sections explain data collection and processing techniques. The final section deals with data analysis tools.

### **1.7.1 Research Design**

Research design is a plan, structure and strategy of investigations conceived so as to obtain answers to research questions and to control variances. (Wolf; 1975: 51). It is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. Considering the objectives of the study, the analysis is based on certain research design. In order to achieve objectives, descriptive and analytical research design has been adopted. Descriptive research design describes the general pattern of the investors, business environment, problem of portfolio management etc. The analytical research design makes analysis of the information and data. Most of the data and information of the study were concerned with past phenomenon. So it can be regarded as historical research.

It covers the data from the fiscal year 2005/06 to 2010/11. It deals with the study of portfolio analysis of commercial banks in Nepal. As the title of the study suggests it is more analytical and empirical and less descriptive.

### **1.7.2 Population and Sample**

The population of the study is all the commercial banks listed in NEPSE. Until now total numbers of commercial banks listed in NEPSE are 32. Hence, these 31 commercial banks are the population of the study. For study, five commercial banks are taken as sample. The samples are selected by lottery method. The selected sample banks for the analysis are as follows:

- i.** Bank of Kathmandu Limited
- ii.** Everest Bank Limited
- iii.** NABIL Bank Limited

- iv. Himalayan Bank Limited
- v. Nepal Investment Bank Limited

### **1.7.3 Sources of Data**

This study is mainly based on secondary data. The various required data for the study are collected from concerned banks, Nepal Rastra Bank, NEPSE, SEBO/N and different libraries. Similarly, the required micro-level data are derived from annual reports of selected banks and websites of banks as well as NEPSE. In addition to above, supplementary data and information was collected from different library such as library of Post Graduate Campus, Nepal Commercial campus, T.U Central library, Library of NRB, NEPSE, SEBO etc. Likewise, various data and information were collected from the periodical economic journals and from other published and unpublished reports. Similarly, informal enquiries and dialogue with authorities of related institutions are also other sources of data. The major sources of data and information are as follows:

- i. Economic survey, Ministry of Finance
- ii. Quarterly Economic Bulletin, NRB
- iii. Macro Economic Indicators of Nepal, NRB
- iv. Annual reports SEGO Nepal
- v. Journal of Finance
- vi. Journal of Business
- vii. Website of NEPSE
- viii. Website of different Commercial Banks

### **1.7.4 Data Collection Procedure**

Almost the data necessary for the research is collected from secondary sources. However, opinion has also been taken from the concerned officers or authorities to obtain more information and reality about the various published data, investment policies of the banks, portfolio concept in the field of investment etc. Similarly, official publications like Economic Survey, Annual Reports, Banking and Non-banking Financial Statistics, Economic Bulletin etc. were obtained from respective offices.

The data obtained from the various sources cannot be directly used in their original form because they need to be verified and simplified for the purpose of analysis. Hence, in this study available data, information, figures and facts were checked, rechecked, edited and tabulated for computation. All gathered data and information are properly synthesized, arranged, tabulated and calculated in accordance with the requirement of the study.

### **1.7.5 Data Analysis Tools**

In order to ascertain investment analysis of any firm, various analytical tools can be used. According to the nature of statement of data, suitable or appropriate tools make

the analysis more effective and significant for achieving objective. Two tools; 1) financial and 2) statistical can be used in this study.

#### **1.7.5.1 Financial Tools**

As this study is related to investment portfolio analysis, financial tools are more applicable. Financial tools are those, which are used for the analysis, and interpretation of financial data. These tools can be used to get the precise knowledge of a business which in turn, are fruitful in exploring the strengths and weaknesses of the investment policies and strategies. For the sake of analysis, following financial tools have been used in order to meet the purpose of the study.

- i.** Risk and Return on Individual Investment Assets and Investment Portfolio.
- ii.** Financial ratios
- iii.** Risk and Return on Individual Investment Assets and Investment Portfolio
  - a. Return on Government Securities
  - b. Return on Share and Debenture
  - c. Return on Loan and Advances
  - d. Return on Portfolio
  - e. Risk on Individual Assets
  - f. Risk on Portfolio
- iv.** Financial Ratios
  - a. Total Investment to Total Deposit Ratio
  - b. Investment on Government Securities to Total Outside Investment Ratio:
  - c. Investment on Loan and Advances to Total Outside Investment Ratio
  - d. Investment on Share and Debenture to Total Outside Investment Ratio
  - e. Return on Total Assets Ratio

#### **1.7.5.2 Statistical Tools**

Various statistical tools can be used to analyze the data available to the researcher. To support this study, statistical tools such as holding period return, mean return, standard deviation, co-efficient of variation and trend analysis have been used for analyzing and evaluating various data, which are as follows.

- a. Arithmetic Mean
- b. Coefficient of Variation (C.V.)
- c. Least Square Linear Trend
- d. Covariance
- e. Karl Pearson's Correlation of Coefficient

#### **1.8 Organization of the study**

The whole study has been divided into five chapters. Each devoted to some aspects of the study of portfolio analysis of Nepalese Joint Venture banks namely Bank of

Kathmandu Limited, Everest Bank Limited, NABIL Bank Limited, Himalayan Bank Limited and Nepal Investment Bank Limited. Each chapter contains:

Chapter 1: Introduction

Chapter 2: Review of literature

Chapter 3: Research Methodology

Chapter 4: Presentation and Analysis of data

Chapter 5: Summary, Finding, Conclusion and Recommendation.

### **Chapter 1: Introduction**

First chapter is introduction, which includes general background, statement of problem, objective of the study, significance of the study, limitation of the study, research methodology and organization of the study.

### **Chapter 2: Review of Literature**

This chapter is directed towards the review of literature of related studies, which contains conceptual framework and review of related studies in general, review of the theories of the concerned topic, review of books, review of related articles and review of legislation related to Commercial Banks.

### **Chapter 3: Research Methodology**

This chapter describes the research methodology employed in the study. It includes research design, nature and source of data, population and samples, method of data analysis, various statistical and financial tools, definition of key terms.

### **Chapter 4: Presentation and Analysis of data**

This chapter is devoted to presentation, analysis, interpretation and scoring the empirical findings out of the study through definite course of research methodology. It consists of investment operation of commercial banks, trend analysis, ratio analysis, risk and return on investment, correlation and portfolio performance.

### **Chapter 5: Summary of findings, conclusion and Recommendation**

This chapter contains summary, conclusion and recommendation of the study. This chapter presents the major findings. It also offers recommendation and several directions for future research.

## **CHAPTER TWO**

### **2. REVIEW OF LITERATURE**

This chapter deals with review of literature relating to "Portfolio Analysis" in more detail and description manner, which gives theoretical aspects of the study. For this study various books, journal, article and past thesis were also reviewed. Every possible effort has been done to grasp knowledge and information that are available. Before analyzing the literature on portfolio analysis this chapter also attempts to focus on assets pricing model. Literature review is basically a 'stock-taking' of available literature in one's fields of research. Research is a continuous process and hence the procedure and the finding may power or ability of analysis and interpretation of data, a research must review the literature about his field of study.

#### **2.1 Conceptual Review**

##### **2.1 .1 Concept of Investment**

"Investment, in its broadest sense, means the sacrifice of current dollars for future dollars. Two different attributes are generally involved: time and risk. The sacrifice takes place in the present and is certain. The reward comes later, if at all, and the magnitude is generally uncertain". (Sharpe, Alexander and Bailey; 2001: 1)

Investment is a commitment of money and other resources that are expected to generate additional money or resources. Return is the primary motive of investment, but it always entails some degree of risk.

Investment generally involves real investment or financial investment. Investment in tangible assets like buildings, automobiles, machinery and factories is real investment. Investment in financial assets like common stocks, bonds and debentures is financial investment. Real assets are generally less liquid than financial assets.

Investment involves long-term commitment and waiting for reward. "An investment may be defined as the current commitment of funds for a period of time to derive a future flow of funds that will compensate the investing unit for the time funds are committed, for the expected rate of inflation and also for the uncertainty involved in the future flow of funds".(Frank and Reilly-, 1972).

"The word investment brings fourth vision of profit, risk, speculation and wealth". (Cheney & Mosses-, 1992: 6). The above definition is broader, because, Cheney and Mosses have concluded all behaviors consisted of profit, risk, speculation and wealth as investment. According to this, certain profit is gained after some risk bearing with view to maximize wealth and managing speculation of wealth.

Therefore, these definitions quoted above, suggest that an investment regards with the

allocation and mobilization of funds for certain coming time-intervals, so as to generate some extra benefit or extra attachment with mobilized funds.

### **2.1.2 Investment Portfolio**

"Portfolio is a collection of different types of securities in different sectors". (Weston & Brigham;1982:245). Portfolio Management is related to the efficient portfolio investment in financial assets. Portfolio Analysis considers the determination of future risk and return in holding various blends of individual securities.

"Portfolio theory deals with the selection of optimal portfolios; that is portfolio that provides the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return". (Weston & Copeland; 1992). It has been developed for the financial assets, including equity shares, preference shares and debentures of companies. Thus making investment from the selected optimal portfolio i.e. the portfolio that provides the highest rate of return with least possible amount of risk is the real investment portfolio.

Portfolio investment refers to an investment that combines several assets. The modern portfolio theory explains the relationship between assets risk and return. The theory is founded on the mechanics of measuring the effect of an asset on risk and return of portfolio. Portfolio investment assumes that the mean and variance of returns are the only two factors that the investor cares. Based on this assumption, we can say that rational investor always prefers the highest possible mean return for a given level of risk or the lowest possible level of risk for a given amount of return. Portfolio, technically known as efficient portfolios, is a superior portfolio. The efficient portfolios is a functions of not only risk and return of individual asset included, but also the effect of relationship among the asset on the sum total of portfolio risk and return.

Investment portfolio of commercial banks is the holding of securities and investment in financial assets i.e. bond, stock, loan etc. Therefore, commercial banks must invest its deposits and other funds to profitable, secured, stable and marketable sectors. Investment policy helps the bank in efficient investment operation ensuring maximum return with minimum risk. Thus, investment is the most important function of commercial bank. It is the long-term commitment of bank in the uncertain and risky environment. Therefore, to maximize the profit bank should invest in that type of securities, which are commercial, durable, market stable, transferable and high market price.

Similarly, to minimize risk a bank must diversify its investment in different sectors. If bank invest its fund in different securities, it will be able to reduce risk and maximize the return.

### **2.1.3 Introduction to Portfolio Analysis**

"A portfolio simply represents the practice among the investment of having their funds in more than one asset. The combination of investment asset is called a portfolio". (Weston & Brigham; 1982: 245). If investor holds a well-diversified portfolio, then his concern should be the expected return and risk of portfolio rather than individual assets or securities. The portfolio theory provides a normative approach to the investors' decision to investment in assets or securities.

"Most financial assets are not held in isolation, rather they are held as parts of portfolios. Portfolio theory deals with the selection of optimal portfolios i.e. portfolios that provide the highest possible return for any specified degree of risk or the lowest possible risk for any specified rate of return". (Weston and Copeland; 1992: 366)

Portfolio analysis considers the determination of future risk and return in holding various blends of individual securities.

Portfolio Risk Analysis is the process of measuring and assessing our portfolio's exposure to market risk. Financial Portfolio offers us three views on risk, allowing us to compare our portfolio to the market portfolio in terms of Risk-Adjusted Return, Value-at-Risk, and Market Risk Exposure.

The portfolio of assets usually offers advantage of reducing risk through diversification. A stock or securities held, as part of a portfolio is less risky than the same stock held in isolation. Thus, portfolio analysis helps to develop a portfolio that has the maximum return at whatever level of risk the investor considers appropriate.

### **2.1.4 Objectives of Portfolio Analysis**

The objectives of portfolio analysis are to analyze different individual assets and delineate efficient portfolio. Hence, the portfolio manager's task is to select the investment weights that will result in dominant investments, analyze the risk, return data describing each investment candidate, and determine what assets to buy, what not buy and what to sell short. The main objectives of portfolio management are as follows.

#### **Primary Objectives:-**

- i. Maximization of Profit
- ii. Minimization of Risk

#### **Secondary Objectives:-**

- i. Regular return
- ii. Stable incomes
- iii. Appreciation of capital
- iv. Liquidity
- v. Easy Marketability



- vi. Safety of investment
- vii. Tax planning :- Capital gain tax, income tax and wealth tax

### 2.1.5 Portfolio Risk and Return

Portfolio analysis considers the determination of future risk and return in holding various blends of individual- securities. "Each asset's expected return and risk, along with the expected return and risk for other assets and their interrelationships, are important inputs in portfolio selection. In order to construct efficient portfolios, the investor must be able to qualify the portfolios' expected return and risk". (Cheney & Mosses; 1992: 651)

#### 2.1.5.1 Portfolio Return

"The expected return of a portfolio is the weighted average of the expected returns of the individual assets in the portfolio. The weights are the proportion of the investor's wealth invested in each asset and the sum of the weights must equal to one". (Cheney & Mosses; 1992: 652)

The portfolio expected return is defined in equation as follows:

$$R_p = W_A R_A + W_B R_B \dots \dots \dots + W_N R_N$$

Where,

- $R_p$  = Portfolio expected returns
- $W_A$  = Weight of investment invested in stock 'A'
- $W_B$  =Weight of investment invested in stock 'B'
- $R_A$  = Expected return for stock 'A'
- $R_B$  = Expected return for stock 'B'

#### 2.1.5.2 Portfolio Risk

The portfolio risk is measured by either variance or the standard deviation of returns. "The portfolio risk is affected by the variance of return as well as the covariance between the return of individual assets included in the portfolio and respective weights". (Pradhan-, 1992: 295)

The variance of returns from portfolio made up an asset is defined by' following equation.

$$\text{Variance}(\sigma_p^2) = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(r_A r_B)$$

$$\sigma_p = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B COV(r_A r_B)}$$

Where,

- $\sigma_p$  = Standard deviation of Portfolio rate of return
- $COV(r_A r_B)$  = Covariance of returns between asset A & B
- $\sigma_A$  = Standard deviation of return on asset A
- $\sigma_B$  = Standard deviation of return on asset B

The covariance is related to correlation coefficient as shown in equation:

$$COV(r_A r_B) = \rho_{AB} \sigma_A \sigma_B$$

Where,

$\rho_{AB}$  = Correlation Coefficient between variable A & B.

### **2.1.6 Diversification of Risk**

"Diversification is the one important means that control portfolio risk. Investments are made in a wide variety of assets so that exposure to the risk of any particular security is limited. By placing one's eggs in many baskets, overall portfolio risk actually may be less than the risk of any component security considered in isolation". (Bodie & Marcus, 2004: 162)

Diversification of portfolio helps to minimize risk. If investors invest their fund in more securities, they can reduce risk and maximize the return. However, even with large number of stocks, investors cannot avoid altogether risk, since virtually all securities are affected by the common macro economic factors. Some different diversification techniques for reducing portfolio's risk are as follows:

#### **2.1.6.1 Simple Diversification**

Simple diversification can be defined as "not putting all the eggs in one basket" or "spreading the risks". (Francis-, 2003: 228). It 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 un-diversifiable risk, remains.

Diversification can also be experienced by combining securities from different industries. It is certainly better to follow this advice than to select all the securities in a portfolio from one industry. Nevertheless, empirical research has shown that diversifying across industries is not much better than simply selecting securities randomly.

#### **2.1.6.2 Superfluous Diversification**

Under simple diversification, maximum risk reduction is attained through inclusion of 10 to 15 assets in the portfolio. If we add, further more assets in the portfolio, such diversification is called superfluous diversification and should be avoided. The investor finds it impossible to manage the assets in his portfolio because the management of a large number of assets requires knowledge of the liquidity of each investment return, tax liability and thus becomes impossible without specialized knowledge. Superfluous diversification will usually result in the following portfolio management problems:

- i.** Impossibility of good portfolio management
- ii.** Purchase of lackluster performers
- iii.** High search costs
- iv.** High transaction costs.

Although more money is spent to manage a superfluous diversified portfolio there will most likely to be 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.

### **2.1.6.3 Simple Diversification across Quality Rating Categories**

Diversification of portfolio is also possible across the quality rating assets or securities. Different rating agencies rate different companies and their assets based on possibility of default risk. In this technique, assets are selected randomly from the homogeneous quality rating. The standard deviations of portfolios of different homogeneous quality rating attained different level of risk. The highest quality portfolio randomly diversified stocks was able to achieve lower levels of risk than the simply diversified portfolios of lower quality stocks. This result reflects the fact that default risk is part of total risk. The higher-quality portfolios contain assets with less default risk. Thus, portfolio managers can reduce portfolio risk to lower levels than those attainable with simple diversification by not diversifying across lower-quality assets.

### **2.1.6.4 Markowitz Diversification**

"Markowitz diversification may be defined as combining assets that are less than perfectly positively correlated in order to reduce portfolio risk without sacrificing portfolio return". (Weston & Brigham; 1987: 194). It is more analytical than simple diversification and considers assets correlation or covariance in portfolio formation. It shows that lower the correlation between assets, the more that the diversification will be able to reduce the portfolio risk.

### **2.1.7 Covariance, Correlation' Coefficient and Portfolio Risk**

"Portfolio risk can be measured by using covariance of return of securities in portfolio. Covariance is a statistical measure of the relationship between two random variables. A positive value for covariance indicates that the securities returns tend to move in the same direction and negative value indicates that returns of two securities move in opposite side. If the value of covariance is zero, there is little or no relationship between the returns for two securities". (Sharpe, Alexander & Bailey, 2001:180). The square root of the coefficient of determination is called the correlation coefficient " $\rho$ ". It is defined as the covariance between the dependent and independent variables divided by the product of their standard deviation (Weston & Copeland ; 1992: 372).

$$\rho_{ij} = \frac{COV(r_i r_j)}{\sigma_i \sigma_j}$$

Where,

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

$COV(r_i r_j)$  = Covariance of return between securities i and j

$\sigma_i$  = Standard deviation of return for security i

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

Correlation coefficient always lies between -1 and +1. A value of -1 represent perfect negative correlation and a value of +1 represent positive correlation. (Sharpe, Alexander & Bailey: 2001: 180).

## 2.2 Review of Related Studies

This section is developed to the review of major related literature concerning the portfolio analysis. For this study, various books, journals, articles and past

### 2.2.1 Review of Markowitz's Portfolio Selection Module

According to Markowitz, the portfolio theory establishes a relationship between a portfolio's expected return and its level of risk as the criterion for selecting the optimum portfolio, to find the efficient set of portfolios and select the most efficient one. The portfolio manager will need to know the expected returns and the risk of these returns for the individual securities.

The portfolio model developed by Markowitz is based on the following reasonable assumptions (Markowitz, 1952: 77):

- i. The expected return from an asset is the mean value of a probability distribution of future returns over some holding period.
- ii. The risk of an individual asset or portfolio is based on the variability of returns (i.e. standard deviation of variance).
- iii. Investors depend solely on their estimates of return and risk in making their investment decision. This means that an investor's utility (indifference) curves are only a function of expected return and risk.
- iv. Investors adhere to the dominance principle. That is, for any given level of risk, investors prefer assets with a higher expected return to assets With a lower expected return; for assets with the same expected return, investors prefer lower to higher risk.

According to Markowitz, the expected return of the portfolio is the weighted average of the expected return of the individual assets in the portfolio. The weights are proportion of the investors wealth invested in each asset. And sure of the weights must be equal one. (Cheney & Moses; 1992: 651)

$$R_p = W_A R_A + W_B R_B \dots \dots \dots + W_N R_N$$

Where,

$R_p$  = Portfolio expected returns

$W_A$  = Weight of investment invested in stock 'A'

$W_B$  =Weight of investment invested in stock 'B'

$R_A$  = Expected return for stock 'A'

$R_B$  = Expected return for stock 'B'

According to Markowitz, the portfolio risk is measured by either variance or the standard deviation of returns. "The Portfolio (Dlio risk is affected by the variance of return as well as the covariance between the return of individual assets included in the portfolio and respective weights".(Pradhan; 1992;295)

The variance of returns from portfolio made up an asset is defined by following equation:

$$\text{Variance } (\sigma_p^2) = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \text{COV}(r_A r_B)$$

$$\sigma_p = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \text{COV}(r_A r_B)}$$

Where,

$\sigma_p$  = Standard deviation of Portfolio rate of return

$\text{COV}(r_A r_B)$  = Covariance of returns between asset A & B

$\sigma_A$  = Standard deviation of return on asset A

$\sigma_B$  = Standard deviation of return on asset B

### 2.3 Review of International Journals

Edward J. Kane and Stephen A. Buser (1979) in their study entitled "Portfolio Diversification at Commercial Bank' deal how a firm performs a useful function by holding a portfolio of efficiently priced securities.

According to them, it is rational for a firm to engage in prior round of asset diversification on behalf of its shareholder's even when all assets are priced efficiently and available for direct purchase by shareholders. As a way of testing their perspective empirically, they estimated regression model designed to explain the number of distinct of U.S. treasury and federal agency debt held in a time series of cross sections of large U.S. commercial Banks. They interpret the systematic pattern of diversification observed for large U.S. Commercial Banks as evidence that bank stockholders for a relatively uniform diversification clientele. For firm, marginal benefits from diversification takes reductions in the cost equity funds offered by its specific clientele of stockholders. To maximize the value of the firm, these benefits must be weighed against the explicit and implicit marginal cost of diversification.

Buser draws following concluding remarks (Kane & Buser; 1979: 19):

- i. Even wealthy investors should be sensitive to administrative costs associated with selection, evaluation, managing Find continually keeping track of a large number of securities.
- ii. Coordinately high levels of information risk, some benefits of form-produced diversification might not be reproducible by individual investors acting on their own.

- iii. Investors with even modest resources, the stock of financial institutions should be relatively less attractive than the stock of that avoid extensive diversification costs by engaging in specialized activities.

**Paul D. Berger and Zvi Bodie ('1979)** has presented and proved three propositions regarding "portfolio selection in a winner-take-all environment". The three propositions discussed by them are as follows (Berger & Bodie; 1979:233):

**Proposition 1:**

Any investor seeking to maximize the expected utility of his wealth will select a portfolio, which maximize the expected utility of his wealth. He will select a portfolio, which maximizes the probability of his winning the contest i.e. of yielding the highest return. This shows regardless of the investor's attribute toward risk.

**Proposition 2:**

If no short or buying on margin is allowed, then the probability of a portfolio of two or more securities beating every single security in the portfolio is zero.

**Proposition 3:**

If there are more than two securities to choose, one cannot select the optimal security. Therefore, comparison will be the best among the respective series of pair.

According to them, the single most important behavioral implication of the propositions above is, that an individual engaged in a winner-take-all investment contests would tend not to diversify his portfolio, even if he is risk adverse. It is a conjecture that is very highly positively correlated, so as the approximates a single stock as closely as possible.

## **2.4 Review of Legal Provisions**

The legal provisions have significant impact on the establishment of Commercial Banks, their mobilization and utilization of resources. In Nepal, Nepal Rastra Bank, as a central bank, directs the banks and other financial institutions. Plans, policies, directions, rules and regulations from NRB are major subject to operate the commercial banks. To allocate and mobilize the deposit collected by commercial banks in different sectors and different areas of the country, NRB formulates fundamental rules, regulations, directives, policies etc. For that purpose, NRB has formulated Commercial Bank Act 2031. All the Commercial Banks have to confirm to the legal provisions specified in the Commercial Bank Act 2031 and other rules and regulations formulated to facilitate the smooth running of commercial banks. These directives have direct or indirect impact while making decision to mobilize bank's deposits in different sectors of the nation. Here, the directions, rules and regulations formulated by NRB in terms of investment by Commercial Banks are briefly mentioned below:

**i. Provisions for Investment in Priority Sector**

NRB directs Commercial Banks to extend loan and advances amounting at least 12 percent of their total outstanding credit to the priority sector including deprived sector. NRB has included agricultural sector, cottage and small industry sector, service oriented sector and co-operative sectors as a priority sector for investment. This provision is totally based on the objective for uplifting living standard of people in remote and village area.

**ii. Provision for Investment in Deprived Sector**

Commercial banks also compulsorily need to extend their credit and investment in the deprived sectors such as co-operative institution and rural development banks that are licensed by NRB. According to the provision, the commercial banks must require to extend the following proportion of their total outstanding loan to deprived sector.

**Table 2.1**  
**Deprived Sector Credit ceiling**

S.N	Name of Banks	Required deprived sector lending (as % of Total outstanding Loan)
1	Nepal Bank Ltd.	3%
2	Rastriya Banijya Bank	3%
3	NABIL Bank Ltd.	3%
4	Nepal Investment Bank Ltd.	3%
5	Standard Chartered Bank Ltd	3%
6	Himalayan Bank Ltd.	3%
7	Nepal SBI Bank Ltd.	3%
8	Nepal Bangladesh Bank Ltd.	3%
9	Everest Bank Ltd.	3%
10	Bank of Kathmandu Ltd.	3%
11	Nepal Credit & Commerce Bank Ltd	3%
12	Lumbini Bank Ltd.	3%
13	Nepal Industrial & Commercial Bank Ltd.	3%
14	Machhapuchhre Bank Ltd.	3%
15	Kumari Bank Ltd.	3%
16	Laxmi Bank Ltd	3%
17	Siddhartha Bank Ltd	3%
18	Agriculture Development Bank	3%
19	Global Bank Limited	3%
20	Citizen Bank International Limited	3%

21	Prime Bank Limited	3%
22	Bank of Asia Nepal Limited	3%
23	Sunrise Bank Limited	3%
24	NNB Bank Limited	3%
25	DCBL Bank Limited	3%
26	Krist Bank Limited	3%
27	Janata Bank Limited	3%
28	Megha Bank Limited	3%
29	Commerz & Trust Bank Limited	3%
30	Civil Bank Limited	3%
31	Century Commercial Bank Limited	3%

*Sources; Economic Report, NRB, 2002*

**Note:** Until having the deprived sector lending obligation below the ratio of 3 percent, commercial banks require to increase such ratio by additional 0.5 percent basis point every year until the ratio becomes 3 percent. However, the commercial banks that had already met the lending ratio at 3 percent could continue the same every year.

### **iii. Guidelines for Investment in Stocks and Securities**

Commercial Banks are also required to minimize exposures to risks involved in investing the deposits of the savers and other financial resources at their disposal in earning assets.

### **Statistical Information and Reporting:**

Commercial Banks are required to compile and submit their financial reports keeping in view.

- a. Nepal Rastra Bank Act.
- b. Commercial Bank Act.
- c. International Accounting System
- d. Nature and types of their respective transaction
- e. Directives of the Nepal Rastra Bank
- f. Monetary and Financial Statistics Manual 2000 of the IMF

### **iv. Investment Management Regulation:**

A commercial bank formulating a written policy may decide to invest in shares and securities of an organized institution. However, such investment is restricted to 10% of paid up capital of the organization. However, the cumulative amount of such investment in all the companies in which the bank has financial interest shall be limited to 20% of the paid up capital of the bank. Nevertheless, the total amount of investment



in share and securities of organized institution is restricted to 30% of the paid up capital of the bank. (Directives to Commercial Bank: 81)

Likewise, Commercial Banks are not allowed to invest in any shares, securities, and hybrid capital investment issued by any banks and financial institutions licensed by NRB. Where such investment exists prior to issuance of this directive, such investment should be brought within the restrictive limitation by the fiscal year 2060/61. However, investment on Rural micro finance development Bank's shares are not comes under such restriction.

#### **v. Provision for Minimizing Liquidity Risk**

Commercial Banks are required to monitor their liquidity risk. This is to minimize risk inherent in the activities and portfolio of the banks. According to the, regulation, a gap found between maturing assets and maturing liabilities based on maturity period. Maturity period such as 0-90, 91-180, 181-270, 271-365 days and above 1 year are classified for the purpose of checking.

### **2.5 Review of Nepalese Journals and Articles**

**Sunity Shrestha** (1995), in her study "Portfolio Behavior of Commercial Banks in Nepal" has made remarkable efforts to examine various portfolio behavior of Commercial Bank in Nepal such as investment portfolio, liability portfolio, assets portfolio etc. According to her, investment of Commercial Banks when analyzed individually; were observed that Nepalese domestic banks invest in government securities, national saving bond, debentures and company's shares. Based on this study she found that the supply of bank credit was expected to depend on total deposit, lending rate, bank rate, lagged variables and dummy variables. Similarly, demand of bank credit was assumed to be affected by national income, lending rate, Treasury bill rate End other variables. The resources of commercial banks were expected to be relating with variables like total deposit, cash reserve requirement, bank rate and lending rate. Following are conclusions based on her finding:

- i. The relationship of banks portfolio variables as found to be best explained by log-linear equations.
- ii. Demand of deposit for commercial banks in Nepal is positively affected by the GDP from non-agriculture and the deposit rate and lending rate of interest.
- iii. The investment of commercial banks on government securities has been observed to be affected by total deposit, cash reserve requirements, Treasury bill rates and lending rates.
- iv. The investment of commercial banks in shares and securities are normal and not found to have strategic decisions towards investment in shares and securities.
- v. The loan loss ratio has been found to increase with low recovery of loan.

**Shekhar Bahadur Pradhan** (1996) has presented a short glimpse on investment in different sectors and its problems and prospects through his article 'Deposit Mobilization: Its Problem and Prospects'.

He quoted that deposit is the life-blood of any financial institution, be it commercial bank, finance company, co-operative or non-government organization. He further adds in consideration of most of banks and finance companies, the latest figure does produce a strong feeling that a serious review must be made of problems and prospects of deposit sectors. Leaving few joint venture banks, other organizations rely heavily on the business deposit and credit disbursement.

Pradhan has pointed out some problems for the prosperity of deposit mobilization in Nepalese context, they are:-

- i. Most of the Nepalese people do not save in institutional manner due to the lack of good knowledge. However, they are very much used of saving; be it in the form of cash or ornaments. Their reluctance of deal with institutional system is governed by the lower level of understanding about financial organization process, withdrawal system and so on.
- ii. Unavailability of the institutional services in rural areas.
- iii. Due to lesser office hours of banking system people prefer holding the cash in the personal possession.
- iv. No more mobilization and improvement of the employment of deposits and the loan sectors.

**Pradhan has also recommended for the prosperity of deposit mobilization, which are as follow:**

By Providing Sufficient institutional services in the rural areas

- i. By adding service hours system to banks
- ii. NRB could also organize program to develop skilled manpower
- iii. By spreading co-operatives to the rural areas to develop mini branch service

**Shiba Raj Shrestha** (1998) has given a short glimpse on the "Portfolio Management in Commercial Bank, Theory and Practice."

He emphasize on importance of portfolio management for both individual as well as institutional investors. According to him, investors would like to select a best mix of investment assets subject to following aspect:

- i. Higher return which is comparable with alternative opportunities available according to risk class of investor.
- ii. Good liquidity with adequate safety of investment
- iii. Certain capital gains

- iv. Maximum tax concession
- v. Flexible investment
- vi. Economic, efficient and effective investment mix.

According to Shrestha, the above considerations are very useful for an effective investment decision. Similarly for Successful investment, he has concluded some strategies as follow:

- i. Do not hold single securities. Do not rely on single investment alternative i.e. try to have a portfolio of different securities.
- ii. Have a diversified investment i.e. make investment in different sectors.
- iii. Always select such a portfolio of securities, which ensures maximum return with minimum risk with added objective of wealth maximization.

Similarly, the approaches to be adopted for designing a good portfolio and its management, pointed by Shrestha are:

- i. Find the investible assets having scope for better returns depending upon individual characteristic like age, health, need, disposition liquidity etc.
- ii. Analyze the attitude of investment towards risk.
- iii. Develop alternative investment strategies for selecting a better portfolio, which will ensure a tradeoff between risk and return to attach the primary objectives of wealth maximization at lower risk.
- iv. Identify the securities for investment and risk from investment.

He has mentioned short transitory view on portfolio management in Nepalese Commercial Banks. He pointed that the portfolio management activities of Nepalese Commercial Banks at present are in growing stage. However, on the other hand most of the banks at present are in growing stage. However, on the other hand most of the banks are not doing such activities so far because of following reasons:

- i. Unawareness of the client about the service available
- ii. Hesitation of taking risk by the clients to use such facility.
- iii. Lack of proper techniques to run such activity in the best and successful manner
- iv. Less developed capital market and availability of few financial instruments in the financial market.

Because of above mentioned problems the Commercial Banks have very limited opportunity for exercising the portfolio management. Even considering the attraction of deposits joints venture banks are facing problems since most investors have not developed full confidence of putting money in fixed time deposit certificate of various maturing and sizes.

He has drawn following conclusion for smooth running and operation of banks and financial institutions:

- i. The survival of the banks depends upon its own financial health and various activities
- ii. In order to develop and expand the portfolio management activities successfully the investment management methodology of a portfolio manager should reflect high standards and give their clients the benefits of global strengths local insights and product philosophy.
- iii. With the discipline and systematic approval to the selection of appropriate countries, financial assets and the management of various risk, the portfolio manager could enhance the opportunity for each investor (client) to earn superior returns over times
- iv. The Nepalese Banks having greater network and access to national and international capital markets have to go for portfolio management activities for the increment of their fee based income as well as to enrich the client base and to contribute in national economy.

**Yogendra Timilsina** (2002) has published an article on “ Managing Investment Portfolio”. He is however, confronted with the problems of managing investment portfolio particularly in time of economic slowdown like ours. A ration investor would like to diversify his investment in different classes of assets to minimize risk and earn reasonable rate of return.

Commercial banks have continuously been reducing interest rates on deposits . Many depositors are exposed to the increasing risk of non-refund of their deposits. Many depositors are exposed to the increasing risk of non-refund of their deposits because of the mismanagement in some of the banks and financial institutions and accumulation of huge non-performing assets with them.

Few depositors of cooperative societies lost their deposits because some of these cooperatives were closed down because of their liability to refund public deposits. An investor in days of crisis has to make an effort to minimize the risk and at least earn a reasonable rate of return on his aggregate investment.

An investment in equity share can earn dividend income as well as capital gain in the form of bonus share and right share until an investor holds it capital profit hence he sells it in the stock market. As return from equity investments have fluctuated within a very wide range, investors feel it much difficult to balance risk and rewards in their equity portfolio. In fact, investors in equality shares should invest for a reasonable long period in order to manage the risk.

Making investment in fixed deposits with commercial banks is a normal practice among the common people. Normally fixed deposits with banks are considered risk-less, but they also are not hundred percentage free of risk. You should select a bank to put your deposit therein, which has sound financial health and high credibility in

banking business. In time of crisis if you select a sick bank to deposit, your money there is high probability that your money could not be returned back.

An investor may have option of making investment in government bonds or debentures. In history, we have examples that a government can nationalize the private property of its citizens, cancel out old currency notes, and can convert the new investment into some conditional instrument. However, in democracy there is no probability that the government would default to repay money back. This is comparatively risk free investment, but yields low return.

An investor has to evaluate the risk and return of each of the investment alternatives and selects an alternatives, which has lower degree of risk and offer at least reasonable of return. One can draw a safe side conclusion to invest all the money he has only in government securities, but this is not a rational decision. An investor who does not try to maximize return by minimizing the possible risk is not a rational investor. On the other hand , one can place over-confidence on equity investment and assume high risk by investing the whole money in equity shares. Stock market these days is much dwindling and notoriously unpredictable, therefore, this too is not a wise decision. Therefore, a portfolio, which consists of only one class of finance assets, is not a good portfolio.

**Chandra Thapa**, (2003), in his article entitled “Managing Banking Risks” presented different types of risks generally faced by commercial banks and accomplished the subsequent issues. Banking and financial services are among the faster growing industries in the developed world and also emerging as corner stone's for other developing and underdeveloped nations as well.

According to Thapa, the primary function of a bank is to trade risk. Risk cannot be avoided by the bank but can only be managed. There exist different types of risks. Among them interest rate risk is one of the most common risk the banks face owing to the volatility of the interest rate in the market.

Another risk banks face commonly is the trading risk or market risk. Banks has to productively manage their excess liquidity by investing in various securities, in foreign currencies and in other assets for instance swaps, option etc.

Credit risk is one of the most significant risks, which the banks face particularly in underdeveloped country like Nepal because our financial system is mostly depended on banks. Hence, it is crucial that the bankers should manage such risks prudently since not only hampers the particular banks on concern but also badly affects the growth prospects of the entire economy. Credit risk is of two types: diversifiable risk and un-diversifiable risk.

Off balance risk owing to the creation of contingent liabilities, should be managed by a prudent analysis of the bank official materializing such contingent contacts. Similarly, technological changes are frequently faced by banks. Therefore, for the smooth operation banks should adopt technological up-gradation from time to time.

Maintaining proper liquidity is the most difficult problem as the demand of cash is uncertain. To avoid such risk. the central bank has initiated the regulation, whereby the banks need to maintain reserve in their vault and a certain specified percentage of the total deposit with central bank.

He concludes with that risk management of the banks is not only crucial for optimum tradeoff between risk and profitability but is also one of the deciding factors for the overall business investment leading to growth of economy. Managing such risks not only needs sheer professionalism at the organizational level but an appropriate environment also needs to be developed. Some of the major environmental problems of Nepalese banking sector is undue government intervention (in state-owned banks), relatively weak regulatory frame, although significant improvement has been made in the last five year but still not competitive enough when we consider the international standard, meager corporate governance and the biggest of all is lack of professionalism (especially commitment). The only solution to mitigate the banking risk is to develop the badly needed commitment, eradication of corrupt environment, especially in disbursement of lending, and to formulate prudent and conducive regulatory framework.

## **2.6 Reviews of Thesis**

Several thesis works have been conducted by various students regarding the various aspects of Commercial Banks. Some of them which are supposed to be relevant for this study are presented below:

**Jagdish Basnet** (2002), in his Masters Degree thesis entitled "Portfolio Management of Joint Venture Banks in Nepal" has made an effort to identify the situation of portfolio management of Joint Venture Banks in Nepal. The specific objectives of his research are: to analyze the risk and return ratio of Commercial Banks; to evaluate the financial performance of Joint Venture Banks; to survey the existing situation of portfolio management and finally to provide the suggestive package based on the analysis of the data.

His analysis shows that the mean investment to total deposits ratio of Nepal Bangladesh Bank Limited is lowest i.e. 12.87% where as Everest Bank Limited has highest i.e. 29.36% among four Joint Venture Banks. The mean liquidity fund balance to total deposits ratio shows Standard Chartered Bank Nepal Limited has good liquidity position among selected banks. The major finding of his study shows that the ratios of Everest Bank Limited are more consistent among four Joint Venture Banks. However,

Everest Bank Limited is investing very high amount of fund on Government securities. It also has the highest risky asset in comparison to the four banks.

He concluded, that while allocating funds of Joint Venture Banks into different components of banking assets having different degree of risk and varied rate of return should be verified in such a way that would maximize return and minimize risk. So portfolio condition of Joint Venture Banks should carefully be examined from time to time as far as possible. From- his study, he found that those banks got better result that managed the portfolio properly.

**Kishor Poudel** (2002), conducted a research on the topic "Liquidity and Investment Position of Joint Venture Commercial Banks in Nepal". The basic objective of his study was to evaluate liquidity and investment position of Joint venture Banks with special reference to everest Bank Limited (EBL) and NABIL bank Limited. The secondary objectives of his study were to assess the factor affecting customers' with-drawl and to examine invest-liquidity policy of both banks. He found that liquidity position of EBL is comparatively better than that of NABIL. Nevertheless, EBL, has not been successful for mobilization of fund on investment in comparison with NABIL. Growth rate of investment of EBL has been recorded significantly higher than NABIL's however, significant different in mobilization high while it is negative in case of NABIL. It means NABIL has given priority to profitability than liquidity. It has utilized fund to investment instead of holding liquid assets. Cash flow from operating activities of NABIL is sound as its profitability is higher than EBL's . He future found that the banks do not have constant and consistent liquidity an investment policy. There is no standard and uniform rate or ratio for maintaining liquid assets by the commercial banks. A commercial bank at its own judgment may decided to maintain an appropriate level of liquid assets.

**Prakash Shrestha** (2003), conducted a research entitled "Portfolio Analysis on Investment of Nepalese Commercial Banks" by using 8 years data from FY 1994/95 to 2001/02. The main objective of his study was to analyze, examine and interpret portfolio technique followed by Commercial Banks on their investment in various sectors. The other specific objectives are: to evaluate comparative financial performance of selected Commercial Banks in terms of investment strategies, to analyze the way commercial banks manage their risk and return on investment using portfolio concept and to find out trend of investment in different sectors.

He found that almost Commercial Banks wanted to invest in short-term basis in which return is not fixed. They hesitate to invest in long-term government securities that provide regular constant return. The total investment to total deposit ratio of selected Commercial Banks shown that Standard Chartered Bank Nepal Limited (SCBNL) is the most successful in utilizing its resources on investment than other Commercial Banks.

Similarly, on the basis of return on total assets, SCBNL utilized its overall resources efficiently than other banks. To some extent, all Commercial Banks seem to be interested in using their deposits in purchasing, government securities, even there is less return. The risk and return on shares and debentures are higher than other assets. The annual rate of return on shares and debentures of Commercial Banks show wide fluctuations ranging from -23.78% to 104.50%. These fluctuations in returns are caused mainly by the volatility of capital yield.

He concluded based on the analysis and the findings of his study that commercial banks are not seemed to be capable of investing their funds in more profitable sectors. Most of the commercial banks are interested to invest their fund in more liquid and less risky sectors. Commercial banks are found unable to apply scientific approach for investment diversification and portfolio management.

**Dinesh Bhatta** (2003), has conducted a research work on the topic, "Portfolio management of listed Finance Companies in Nepal." The main objective of the study was to identify the present situation of portfolio management of finance companies in Nepal with the help of risk, return and other relevant variables. The other specific objectives of study are to compare the risk and return of common stock and their portfolio; to study the volatility of different stock of finance companies and to recommend few key practical implications based on the analysis of the data.

Using Capital Market Line, he found United Finance and Capital Market Limited (UFCML) has the highest expected portfolio return (11.27%) and risk (32.97%) but Peoples Finance Limited (PFL) has the lowest expected portfolio return (5.43%) and risk (6.20%). Similarly, National Finance Company Limited (NFCL) has the great performance but Peoples Finance Limited has lower performance. NFCL stock is highly correlated (0.971) with market than that of other finance companies. In most of cases coefficient of determinants of all these finance companies have greater than 0.50 (50%) means portion of systematic risk is higher than the unsystematic portion. It is also found that generally the portfolio management of listed finance companies in Nepal is not systematically organized. In the context of portfolio risk and return of finance companies, investors have to bear higher portfolio risk to increase little bit of portfolio return.

He concluded that the volatility of different securities in Nepalese capital market was the major problem to manage the portfolio. Since Nepalese stock market is in developing stage, the fundamental analysis is more effective for the selection of portfolio than the technical analysis. He further added, "To achieve better result, passive strategy is more suitable than the active strategy in Nepalese stock market". Due to the lack of specific knowledge of portfolio selection, majority of corporate investors select conventional stock bond mix.



**Durgamani Sharma** (2004), conducted a study on "Portfolio Management of listed Commercial Banks and Insurance Companies in Nepal" in the year 2004 is also related with the study. The main objective of his study was to analyze the risk and return of the common stock of Commercial Banks and Insurance Companies. He has also analyzed the diversifiable and un-diversifiable risk of common stock as well as portfolio return and risk.

Based on risk and return, he found that the shares of all the Commercial Banks are attractive for investment compared to Insurance Companies. The conflicting political and economic scenario has the adverse impact on economic activities of the companies. Therefore, Insurance Companies are unable to effectively manage its portfolio.

The researcher realized that the risk per unit of return of market is very high. So the overall market return can be regarded as attractive with respect to its risk. He also concluded that the unsystematic risk of all the companies was high in comparison to total risk.

**Parsuram Prasad Poudel** ( 2005) in his research entitled” A Comparative study on Investment Behavior Adopted By NABIL Limited and Himalayan Bank Limited” has a main objective to comparatively analyze, examine, interpret and evaluate the total investment behavior of NABIL bank and Himalayan Bank. The study is mainly concentrated on whether both banks have been Successfully operating their collected funds are investment in various sector, various alternative or not. The specific objectives of his study are to comparatively present the investment behavior of sample banks; to examine and interpret SWOT of both banks and to suggest for best performance in future based on finding.

He found that investment on share and debenture by both banks are lower in comparison with other alternatives. Similarly, both of the banks concentrated to invest on loan and advances and purchase of bills. Comparatively, the investment policy of NABIL seems to be aggressive than that of Himalayan Bank. Both of the banks have kept unnecessary cash and bank balance in comparison with Total Investment, which they can invest in other productive alternatives. Based on current ratio analysis, Himalayan Bank Limited is in safe side. Because, NABIL has kept more liquidity. Comparatively, NABIL needs to increase deposit. Average total deposit position of NABIL is lower than Himalayan Bank Limited.

He concluded that investment aspects of both banks are satisfactory. As the established banks in Nepal, both should increase their investment in shares and debentures to motivate other firms too. Although there was more investment made by Himalayan bank there is no growth in net profit. Because of effective management of investment

made by NABIL bank, its investment seems to be highly yielding as compared to Himalayan Bank Limited.

**Natasha Shrestha** (2005), in her research entitled "Portfolio Analysis on Common Stock of Commercial Banks in Nepal" is related to this study. The main objective of the study was to find out the level of portfolio risk and return on investment of common stock of Commercial Banks. The other objectives were to find out the trend of NEPSE index, to analyze the risk and return of common stock of reviewed banks and to find out the best portfolio from NEPSE. The study was focused on portfolio analysis of four commercial banks.

She found that the expected return of HBL stock is highest i.e. 53.68% and NABIL is lowest i.e. 32.72% among the banks. The risks of NBBL is highest i.e. 93% and SCBNL has a lowest risk i.e. 55.42%. The correlation of stock, return and market shows that all of the banks' stocks are highly positive correlated with the market. The correlation values of common stock of all bank with the market is nearly equal to +1. The stock price of all four listed Commercial Banks were higher than NEPSE average price of stock. Similarly, the stock prices of four commercial banks were in fluctuating trend than NEPSE index.

She concluded that investment on common stock is a risky job. It does not guarantee both return and principal. So, investor should be acquainted with associated risk and workout their attitude towards the riskiness of various investment Strategies.

### **Research Gap**

Very few research work has been conducted in this topic. No specific research has yet been able to go in-depth of the topic and successfully accomplished the specific objectives of the research work. All of the previous research on portfolio management have been based on only showing the risk and return analysis of the stocks of Commercial Banks. Previous research studies focused mainly on common stock investment of Commercial Banks but none of the researches has concentrated on Government Securities, Loan and Advances, and Shares and Debentures. By the lapse of time, many new alternatives for investment have been introduced and the previous research has become obsolete. Hence, this research has analyzed the existing situation of portfolio management.

## **CHAPTER-THREE**

### **3. RESEARCH METHODOLOGY**

Research methodology is the way in which the data are collected for the research project. It refers to the various sequential steps to be adopted by a researcher in studying a problem with certain objectives in view. It describes the method and process applied in the entire subject of the study. It is the way to systematically solve the research problem (Kothari; 1990: 39)

It includes different dependent and independent variables, types of research design, research questions and hypothesis sample, data collection activities, technique to analysis etc. Thus, research methodology is the process of arriving at the solution of the problem through planned and systematic dealing with the collection, analysis and interpretation of facts and figures. It describes the methods and process applied in the entire aspects of the study.

This chapter has been divided into five sections. First section presents the research design of the study while the second section deals with the nature of population and samples. Third section consists of the nature and sources of data and four, sections explain data collection and processing techniques. The final section deals with data analysis tools.

#### **3.1 Research Design**

Research design is a plan, structure and strategy of investigations conceived so as to obtain answers to research questions and to control variances. (Wolf,1975: 51). It is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. Considering the objectives of the study, the analysis is based on certain research design. In order to achieve objectives, descriptive and analytical research design has been adopted. Descriptive research design describes the general pattern of the investors, business environment, problem of portfolio management etc. The analytical research design makes analysis of the information and data. Most of the data and information of the study were concerned with past phenomenon. So it can be regarded as historical research.

It covers the date from the fiscal year 2005/06 to 2010/11. It deals with the study of portfolio analysis of commercial banks in Nepal. As the title of the study suggest: it is more analytical and empirical and less descriptive.

### **3.2 Population and Samples**

The population of the study is all the commercial banks listed in NEPSE. Until Now total numbers of commercial banks listed in NEPSE are 32. Hence, these 32 commercial banks are the population of the study. For this study, four commercial banks are taken as sample. The samples are selected by lottery method. The selected sample banks for the analysis are as follows:

- i. Bank of Kathmandu Limited
- ii. Everest Bank Limited
- iii. NABIL Bank limited
- iv. Himalaya Bank Ltd.
- v. Nepal Investment Bank Limited

### **3.3 Sources of Data**

This study is mainly based on secondary data. The various required data for the study are collected from concerned banks, Nepal Rastra Bank, NEPSE, SEBO/N and different libraries. Similarly, the required micro-level data are derived from annual reports of selected banks and websites of banks as well as offices.

The data obtained from the various sources cannot directly used their original form because they need to be verified and simplified for the purpose of analysis. Hence, in this study available data, information, figures and facts were checked, rechecked, edited and tabulated for computation. All gathered data and information are properly synthesized, arranged, tabulated and calculated in accordance with the requirement of the study.

### **3.4 Data Collection Procedure**

Almost the data necessary for the research is collected from secondary sources. However, opinion has also been taken from the concerned officers or authorities to obtain more information and reality about the various published data, investment policies of the banks, portfolio concept in the field of investment etc. Similarly, official publications like Economic Survey, Annual Reports, Banking and Non-banking Financial Statistic, Economic Bulletin etc. were obtained from respective offices.

The data obtained from the various sources cannot directly used their original form because they need to be verified and simplified for the purpose of analysis. Hence, in this study available data, information, figures and facts were checked, rechecked, edited and tabulated for computation. All gathered data and information are properly synthesized, arranged, tabulated and calculated in accordance with the requirement of the study.

### 3.5 Data Analysis Tools

In order to ascertain investment analysis of any firm, various analytical tools, can be used. According to the nature of statement of data, suitable or appropriate tools make the analysis more effective and significant for achieving Objective. Two tools; financial and statistical can be used in this study.

#### 3.5.1 Financial Tools

As this study is related to investment portfolio analysts, financial tools are more application. Financial tools are those, which are used for the analysis and interpretation station of financial data. These tools can be used to get the precise knowledge of a business which in turn is fruitful in exploring the strengths and weaknesses of the investment policies and strategies. For the sake of analysis, 'Mowing financial tools have been used is order to meet the purpose of the study.

- i. Risk and return on individual investment assets and investment portfolio
- ii. Financial Ratios

##### 3.5.1.1 Risk and Return on Individual Investment Assets and Investment Portfolio

###### i. Return on Government Securities:

The return n government securities are computed by dividing interest income on government securities by total investment on government securities, which can be presented as:

$$\text{Return on Government. Securities } (R_g) = \frac{\text{Interest Income from Government}}{\text{Total Investment on Government Securities}}$$

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###### ii. Return on Share and Debenture

The return on shares and Debentures considers dividend yield and capital gain yield i.e. change in market price. The dividend yield is only a partial indication of the return: hence, the return on Share and Debenture significantly depends on the change in its Share Price (Pandey; 1997- 332). The formula for calculating the return on Shares and Debentures is as follow:

$$\text{Return on Shares and Debentures}(R_s) = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$$

Where,

$P_t$ = Closing Price per Share at Period t

$P_{t-1}$ = Closing Price per Share at Period t-1

$D_t$ = Dividend per Share at Period t

**iii. Return on Loan and Advances**

The commercial banks provides loan and advances in various sectors like agriculture, industry, commercial sectors and other important sector. The return on loan and advances. can be calculated by dividing total interest earned from loan and advances to total amount of loan and advances. This can be stated as:

$$\text{Return on Loan and Advances (R}_1\text{)} = \frac{\text{Interest earned from Loan and Advances}}{\text{Total Investment on Loan and Advances}}$$

**iv. Return on Portfolio**

The return on portfolio is simply the weighted average of the expected returns of the individual assets in the portfolio. The weights are the proportion of the investor's wealth invested in each asset.

$$\text{Return on Portfolio (R}_p\text{)} = \sum_{i=1}^n W_i \times R_i$$

Or

$$R_p = W_1R_1 + W_2R_2 \dots \dots \dots W_nR_n$$

Where,

R<sub>p</sub> = Return on Portfolio

W<sub>1</sub> = The proportion of total fund invested in asset i

R<sub>1</sub> = Expected return on asset i

W<sub>1</sub> and W<sub>2</sub> =Weights for asset 1 and 2

R<sub>1</sub> and R<sub>2</sub> = Expected returns for asset 1 and 2

**v. Risk on Individual Assets**

The riskiness of securities depends on the variability of rates of-return. The variability of rates of return defined as the extent of the deviation of individual rates of return from the average rate of return. Risk is measured with -the help of standard deviation. Standard deviation is defined as the positive square root of the mean of the square of the deviation taken from arithmetic mean. (Bajracharya ; 1999: 177).

Risk on individual assets or standard deviation for assets can be calculated using historical returns with this equation:

$$\text{Standerd Deviation (}\sigma\text{)} = \sqrt{\frac{\sum(R - \bar{R})^2}{n}}$$

Where,

R = Rate of return on individual assets

R= Average rate of return on individual assets

n= Number of years or observations.

#### vi. **Risk on Portfolio**

The expected risk on portfolio is a function of the proportions invested in the components, the riskiness of the components and correlation of returns on the component securities. It is measured in terms of variance or standard deviation as follows.

$$\sigma_P = \sqrt{\sum_{i=1}^n \sum_{j=1}^n W_i W_j COV_{ij}}$$

For three assets

$$\sigma_P = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + W_C^2 \sigma_C^2 + 2COV_{AB} W_A W_B + 2COV_{AC} W_A W_C + 2COV_{BC} W_B W_C}$$

Where,

$W_A, W_B, W_C \rightarrow$  Weight of assets A, B and C

$\sigma_A, \sigma_B, \sigma_C \rightarrow$  Standard Deviation of assets A, B and C

$COV_{AB} \rightarrow$  Covariance between assets A and B

$COV_{BC} \rightarrow$  Covariance between assets B and C

$COV_{AC} \rightarrow$  Covariance between assets A and C

### 3.5.1.2 Financial Ratios

A numerical or quantitative relationship between two items or variables of the financial statement is known as ratio analysis. In other words, the relationship between two accounting figures expressed in mathematical term is known as financial ratio. Ratio analysis is used to compare a firm's financial performance and status to that of other firms or to itself on time (Gitman ; 1988: 275). Since this study is mainly focused on portfolio analysis of commercial banks, only few ratios which are related to investment of commercial banks are taken to the purpose of the study.

#### i. **Total Investment to Total Deposit Ratio**

This ratio is used to measure the ability of banks to successfully mobilize the total deposits of investment. This ratio can be calculated by dividing total investment by total deposits. It can be stated as:

$$\text{Total investment to Total Deposit Ratio} = \frac{\text{Total Investment}}{\text{Total Deposit}}$$

**ii. Investment on Government Securities to Total Outside Investment Ratio:**

This ratio shows that the banks' investment on government securities in comparison to the total outside investment. It can be calculated by dividing investment on government securities by total outside investment.

$$\begin{aligned} & \text{Investment on Government Securities to Total Investment Ratio} \\ & = \frac{\text{Investment on Government Securities}}{\text{Total Outside Investment}} \end{aligned}$$

**iii. Investment on Loan and Advances to Total Outside Investment Ratio**

This ratio shows that the banks' investment on loan and advances out of total outside investment. It can be calculated by dividing loan and advances by total outside investment.

$$\begin{aligned} & \text{Investment on Loan and Advances to Total Outside investment Ratio} \\ & = \frac{\text{Investment on Loan and Advances}}{\text{Total Outside Investment}} \end{aligned}$$

**iv. Investment on Share and Debenture to Total Outside Investment Ratio**

This ratio shows that the banks' investment on shares and debentures of other companies. It can be calculated by dividing investment on share and debenture by total outside investment i.e.

$$\begin{aligned} & \text{Investment on Share and Debenture to Total outside Investment} \\ & = \frac{\text{Investment on Share and Debenture}}{\text{Total Outside Investment}} \end{aligned}$$

**v. Return on Total Assets Ratio**

This ratio measures the profitability-with respect to total assets. It is calculated by dividing Net Profit After Tax by Total Assets.

$$\text{Return on Total Assets} = \frac{\text{NPAT}}{\text{Total Assets}}$$

**3.5.2 Statistical Tools**

Various statistical tools can be used to analyze the data available to the researcher. To support this study, statistical tools such as holding period return, mean return, standard deviation, co-efficient of variation- end treed analysis have been used for analyzing and evaluating various data, which a-e as follows:

**i. Arithmetic Mean**

Arithmetic mean is the most popular and commonly used statistical tool. It is the ratio of the sum of all the observations to the number of observation. Let  $X_1, X_2, X_3$  denotes



'n' variate values of the random variable X, then the arithmetic mean denoted by  $\bar{X}$  is defined by the following formula.

$$\bar{X} = \frac{X_1 + X_2 + X_3 + \dots + X_n}{n} = \frac{\sum X}{n}$$

Where,

$\bar{X}$  = Arithmetic mean

$\sum X$  = Sum of the observations

n=Number of observations

The arithmetic mean is a single value of selected series which represents them in average. Out of the various central tendencies, a mean is one of the useful tools to find out the average value of the given data.

### ii. Coefficient of Variation (C.V.)

Coefficient of Variation measures risk per unit of expected return. The CV is calculated by dividing standard deviation of return by the expected return as follows:

$$CV_i = \frac{\sigma_i}{R_i} \times 100$$

Where,

$\sigma_i$  = Standard deviation of securities i

$R_i$  = Average returns on security i.

### iii. Least Square Linear Trend

There are things in nature that show gradual increase or decrease over the period. The basic tendency of an enterprise to increase or decrease with the passage of time is known as - trend. A widest and most commonly used method to describe the trend is the method of least square. Under this a trend line is fitted to the data and the line obtained by this method is the line of best fit. As per this method, the trend line between the dependent variable y and the independent variable x be represented by,

$$y = a + bx$$

Where,

Y=Dependent variable

a = y- intercept

b = Slope of the trend line

x = Independent variable (time)

To determine the straight-line trend, we have to determine the value of a and b . To make calculation easy the deviation of the independent variable is taken from the middle of the time period. So that  $\sum x = 0$  then the value of a and b can be calculated by,

$$a = \frac{\sum y}{n}, b = \frac{\sum xy}{\sum x^2}$$

If it is not possible, then we have to solve following two normal equations:

$$\sum y = na + b \sum x \dots \dots \dots (1)$$

$$\sum xy = a \sum x + b \sum x^2 \dots \dots \dots (2)$$

Where,

N= Number of periods or years for which data are given.

**iv. Covariance**

According to the portfolio theory, consideration must be given not only to the risk of the individual assets in the portfolio but also to the degree to which the return of assets co-vary or move together. So to find out portfolio risk covariance is used which can be measured by following ways-

$$COV_{AB} = r_{AB} \times \sigma_A \times \sigma_B$$

Where,

COV<sub>AB</sub> = Covariance between asset A and asset B

r<sub>AB</sub>= Correlation coefficient between asset A and asset B

**v. Karl Pearson's Correlation of Coefficient**

Karl Pearson's method, popularly. known as Pearsonian coefficient of correlation, is most widely used in practice. The correlation coefficient between two variables x and y usually denoted by r<sub>xy</sub> is a numerical measure of linear relationship between them and is defined by

$$r_{XY} = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \times \sqrt{n \sum y^2 - (\sum y)^2}}$$

r<sub>xy</sub> =Correlation coefficient between variable x and y

n= Number of observations

The Pearsonian correlation coefficient lies always between -1 and +1. When r = +1, there is perfect positive correlation. Similarly, if r = -1 , there is perfect negative correlation between the variables. And, it has a zero value i.e. r=0, when there is no correlation between the variables.

## CHAPTER FOUR

### 4. DATA PRESENTATION AND ANALYSIS

This chapter is devoted to the presentation, analysis, interpretation and scoring the empirical findings of the study through definite course of research methodology. To obtain the objectives of the study, various financial and statistical tools have been used. In the course of analysis, data gathered from the various sources have been inserted in the tabular form according to their homogeneous nature. The various tables presented for the analysis purpose have been shown in annexes. Necessary diagrams and graphs have been used to clarify the actual! position of the banks. In this section, the investment portfolio of commercial banks is analyzed with the help of the following tools:

- i. Risk and return analysis of individual investment assets and investment portfolio
- ii. Analysis of ratio
- iii. Least Square Linear Trend Analysis

#### 4.1 Investment Portfolio Risk and Return Analysis of Commercial Bank

Risk is an important element in the analysis of investment. Therefore, it needs to be properly analyzed. Investment with greater risk requires a higher return than investment with lower risk. The relationship between risk and return is described by individual's perception about risk and their demand for compensation.

The main purpose of risk and return analysis is to evaluate investment performance and to explore combination of investment that maximize returns, minimize risk or achieve both. Risk plays a central role in the analysis of investments. Commercial Banks or Investors generally do not invest their money in only one risky asset. Instead, they hold a portfolio of many assets with the hope of diversifying the investment risk. In the context of portfolio, the contribution of each asset to the portfolio risk is the portion of relevant risk of the asset.

The measurement of return in rupees or percentage is a simple statistical process while the measure of risk involves a complex process. Risk can be measured in many ways using various statistical techniques such as range, semi-inter quartile range, mean deviation, standard deviation, coefficient of variance etc. Among the T1, standard deviation is widely used to measure risk on investment.

In this section, standard deviation and coefficient of variation are taken as the measuring tools of risk and mean return is taken as measuring tool to measure expected return. Then the efforts have been made to explore the effects of portfolio diversification..

#### 4.1.1 RETURN ON INDIVIDUAL INVESTMENT

##### 4.1.1.1 Return on Government Securities

Government securities are the fixed income securities issued by the government. These securities are among the safest of all investments as the government is unlikely to default on interest or principal repayments. The return on government securities such as Treasury Bills, Development Bonds, and National Saving Bonds etc. can be calculated as follows:

The return on Government Securities is computed by dividing interest income on Government Securities by Total Investment on Government Securities i.e.

Return on Government Securities:

$$(R_g) = \frac{\text{Interest income from Government Securities}}{\text{Total Investment on Government Securities}}$$

The average rate of return on Government Securities

$$\bar{R}_g = \frac{\sum_{t=1}^n R_g}{n}$$

Where,

n = No. of historical years (Periods)

**Table 4.1**

**Return on Government Securities of BOK (in million)**

F.year	Interest Income on Govt. Securities	Investment on Govt. Securities	Return on Govt. Securities (R <sub>g</sub> )
2005/06	114.320	2658.369	4.30%
2006/07	108.590	2332.041	4.66%
2007/08	84.961	2113.223	4.02%
2008/09	116.737	1744.977	6.69%
2009/10	115.510	2954.932	3.91%
2010/11	208.109	4002.138	5.20%
Total	748.227	15805.680	28.78%
Average	124.705	2634.28	4.80%

*Source: Annual report of BOK bank and Appendix 2*

The table 4.1 shows the return on government securities of BOK. It shows that in an average BOK generate 4.80% return on investment made on government securities. It also shows that the return on government securities of BOK has no any fixed trend. During the study period, the highest return is 6.69% in 2008/09 and lowest return is 3.91% in 2009/10.

**Table 4.2**  
**Return on Government Securities of EBL (Rs. in Millions)**

<b>F.year</b>	<b>Interest Income on Govt. Securities</b>	<b>Investment on Govt. Securities</b>	<b>Return on Govt. Securities (Rg)</b>
2005/06	97.272	3548.617	2.74%
2006/07	128.566	4704.632	2.73%
2007/08	180.219	4821.605	3.74%
2008/09	289.765	5146.046	5.63%
2009/10	238.993	4354.353	5.49%
2010/11	362.263	7145.017	5.07%
Total	1297.078	29420.270	2540%
Average	216.180	4903.378	4.23%

*Source: Annual Reports of EBL and Appendix 2*

The table 4.2 shows the return on government securities of EBL. It shows that in an average EBL generate 4.23% return on investment made on government securities. It also shows that the return on government securities has no any fixed trend. During the study period, the highest return is 5.63% in 2008/09 and lowest return is 2.73% in 2006/07.

**Table 4.3**  
**Return on Government Securities of NABIL (Rs. in Millions)**

<b>F.year</b>	<b>Interest Income on Govt. Securities</b>	<b>Investment on Govt. Securities</b>	<b>Return on Govt. Securities (Rg)</b>
2005/06	130.197	2301.463	5.66%
2006/07	132.229	4808.348	2.75%
2007/08	198.442	4646.883	4.27%
2008/09	269.187	3706.102	7.26%
2009/10	332.871	7973.664	4.17%
2010/11	519.929	8745.231	5.95%
Total	1582.855	32181.691	30.06%
Average	263.809	5363.615	5.01%

*Source: Annual Reports of NABIL and Appendix 2*

The table 4.3 shows the return on government securities of NABIL. It shows that in an average NABIL generate 5.01% return on investment made on government securities. It also shows that the return on government securities' of NABIL is highly fluctuating. During the study period, the highest return is 7.26% in 2008/09 and lowest return is 2.75% in 2006/07.

**Table 4.4**  
**Return on Government Securities of HBL (Rs. in Millions)**

<b>F.Year</b>	<b>Interest Income on Govt. Securities</b>	<b>Investment on Govt. Securities</b>	<b>Return on Govt. Securities (Rg)</b>
2005/06	172.242	5144.313	3.35%
2006/07	191.559	6454.873	2.97%
2007/08	201.310	7471.668	2.69%
2008/09	354.949	4212.300	8.43%
2009/10	216.036	4465.372	4.84%
2010/11	389.104	6407.363	6.07%
Total	1525.200	34155.889	28.35%
Average	254.200	5692.648	4.73%

*Source: Annual Reports of HBL and Appendix 2*

The table 4.4 shows the return on government securities of HBL. It shows that in an average HBL generate 4.73% return on investment made on government securities. It also shows that the return on government securities of HBL is highly fluctuating. During the study period, the highest return is 8.43% in 2008/09 and lowest return is 2.69% in 2007/08.

**Table 4.5**  
**Return on Government Securities of NIBL (Rs. in Millions)**

<b>F.Year</b>	<b>Interest Income on Govt. Securities</b>	<b>Investment on Govt. Securities</b>	<b>Return on Govt. Securities (Rg)</b>
2005/06	82.420	2522.300	3.27%
2006/07	78.494	3256.400	2.41%
2007/08	99.991	3155.000	3.17%
2008/09	140.698	2531.300	5.56%
2009/10	169.620	4201.850	4.04%
2010/11	258.387	4294.600	6.02%
Total	829.610	19961.450	24.47%
Average	138.268	3326.908	4.08%

*Source: Annual report of NIBL and Appendix 2*

The table 4.5 shows the return on government securities of NIBL. It shows that in an average NIBL generate 4.08% return on investment made on government securities. It also shows that the return on government securities is not consistent. During the study period, the highest return is 6.02% in 2010/11 and lowest return is 2.41% in 2006/07.

**Table 4.6**  
**Return on Government Securities of Banking Industry (In Million)**

<b>F.year</b>	<b>Interest Income on Govt. Securities</b>	<b>Investment on Govt. Securities</b>	<b>Return on Govt. Securities (Rg)</b>
2005/06	1733.8	57539.1	3.01%
2006/07	1841.2	64443.0	2.86%
2007/08	2040.5	71495.5	2.85%
2008/09	2635.1	68902.0	3.82%
2009/10	3585.4	79079.6	4.53%
2010/11	5388.1	100267.5	5.37%
Total	17224.1	441726.5	22.44%
Average	2870.68	73621.08	3.74%

*Source: Banking and Financial Statistics of NRB and Appendix 2*

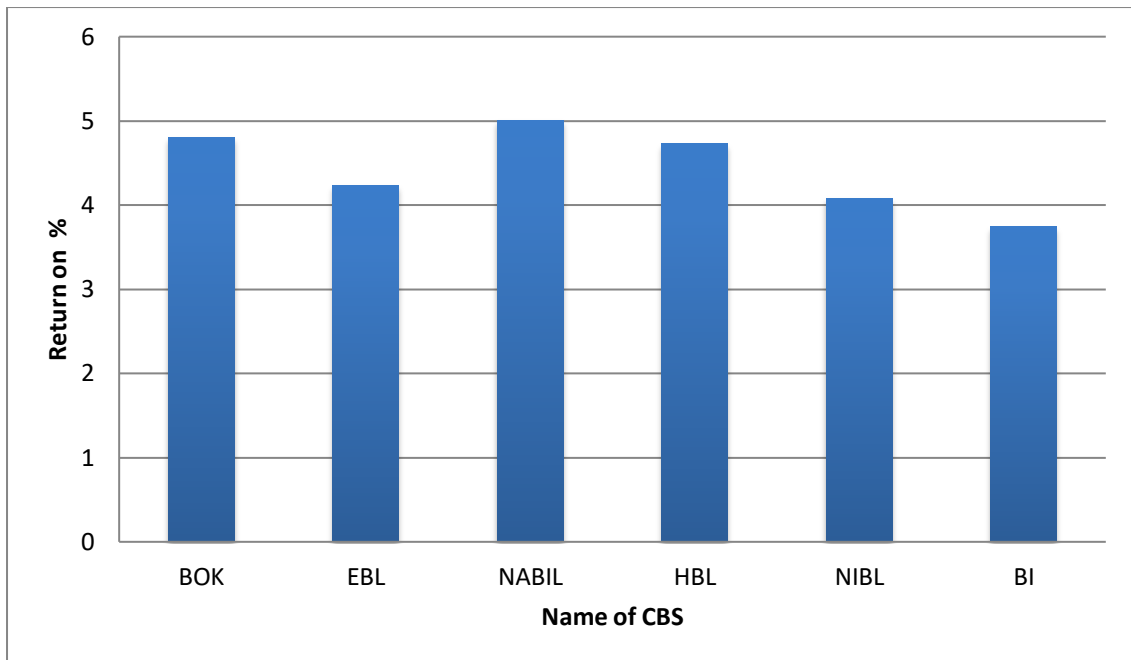
The table 4.6 shows the return on government securities of Banking industry. It shows that in an average Banking industry generate 3.74% return on investment made on government securities. It also show that the return on government securities is not consistent. During the study period, the highest return is 5.37% in 2010/011 and lowest return is 2.85% in 2007/08.

**Table 4.7**  
**Return on Government Securities of sample Banks and Banking Industry (In Percentage)**

<b>Fiscal year</b>	<b>BOK</b>	<b>EBL</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking industry</b>
2 005/06	4.30	2.74	5.66	3.35	3.27	3.01
2006/07	4.66	2.73	2.75	2.97	2.41	2.86
2007/08	4.02	3.74	4.27	2.69	3.17	2.85
2 00 8/09	6.69	5.63	7.26	8.43	5.56	3.82
2009/10	3.91	5.49	4.17	4.84	4.04	4.53
2010/11	5.20	5.07	5.95	6.07	6.02	5.34
Mean Return(Rg)	4.80	4.23	5.01	4.73	4.08	3.74

*Source: Annual Reports of CBs and Appendix 2*

**Figure 4.1**  
**Return on Government Securities of sample Banks and Banking Industry**



From the above analysis, the average return on government securities of BOK, EBL, NABIL, HBL, NIBL and Banking Industry is 4.08%, 4.23%, 5.01%, 4.73%, 4.08 and 3.74% respectively. It is found that NABIL has highest mean return on government securities among five sample banks. Likewise, HBL has moderate mean return on government securities while NIBL has lowest mean return on government securities.

From the above table, it is clear that all five selected commercial banks has higher mean return on government securities than the mean return on government securities of Banking Industry.

#### **4.1.1.2 Return on Loans and Advances**

Loan and advances are the main sources of income for commercial banks. The facility of granting loan and advances is one of the main services, which customers of the commercial banks can enjoy. Hence, in order to realize their objectives, the commercial banks invest in various sectors like agriculture, industry, commercial sectors, service sectors and other important sectors.

The return on investment in the form of loan and advances can be calculated as follows:  
 Return on Loan and Advances,



$$R_L = \frac{\text{Interest income on Loan and Advance}}{\text{Investment on loan and Advance}}$$

The average rate of return on Loan and advances

$$\bar{R}_l = \frac{\sum_{t=1}^n R_l}{n}$$

**Table 4.8**  
**Return on Loan and Advances of BOK bank (Rs. in Million)**

<b>F.Year</b>	<b>Interest Income on Loan &amp; Advance</b>	<b>Investment on Loan &amp; Advance</b>	<b>Return on Loan &amp; Advance</b>
2005/06	550.144	7259.083	7.58%
2006/07	645.651	9399.328	6.87%
2007/08	887.299	12462.637	7.12%
2008/09	1199.081	14647.297	8.19%
2009/10	1707.544	16664.931	10.25%
2010/11	2169.223	17468.192	12.42%
Total	71589.420	77901.468	52.43%
Average	1193.157	12983.578	8.74%

*Source: Annual Reports of BOK and Appendix 3*

The above table 4.8 shows the return on loan and advances of BOK. It shows that in an average BOK generate 8.74% return on investment made on loan and advances. The table also shows that the income received from loan and advances of BOK is increasing. The highest return within the study period is 12.42% in fiscal year 2010/011 and the lowest return is 6.87% in fiscal year 2006/07.

**Table 4.9**  
**Return on Loan and Advances of EBL ( in Millions)**

<b>F.year</b>	<b>Interest Income on Loan &amp; Advance</b>	<b>Investment on Loan &amp; Advance</b>	<b>Return on Loan &amp; Advance</b>
2005/06	770.827	9801.308	7.86%
2006/07	967.178	13664.081	7.08%
2007/08	1329.695	18339.086	7.25%
2008/09	1852.128	23884.674	7.75%
2009/10	2801.332	27556.356	10.17%
2010/11	2869.810	31057.691	12.46%
Total	11590.970	124303.196	52.57%
Average	1931.828	20717.199	8.76%

*Source: Annual Reports of EBL Bank and Appendix 3*

The above table 4.9 shows the return on loan and advances of EBL. It shows that in an average the EBL generate 8.76% return on investment made on loan and advances. The table also shows that the income received from loan and advances of EBL is increasing. The highest return within the study period is 12.46% in fiscal year 2010/011 and the lowest return is 7.08% in fiscal year 2006/07.

**Table 4.10**  
**Return on Loan and Advances of NABIL ( in Million)**

<b>F.Year</b>	<b>Interest Income on Loan &amp; Advance</b>	<b>Investment on Loan &amp; Advance</b>	<b>Return on Loan &amp; Advance</b>
2005/06	964.689	12922.543	7.47%
2006/07	1302.122	15545.778	8.38%
2007/08	1907.261	21365.053	8.93%
2008/09	2182.647	27589.933	7.91%
2009/10	3368.728	32268.873	10.44%
2010/11	4479.060	38034.098	11.78%
<b>Total</b>	<b>14204.507</b>	<b>147726.278</b>	<b>54.91%</b>
<b>Average</b>	<b>2367.418</b>	<b>24621.046</b>	<b>9.15%</b>

*Source, Annual Reports NABIL and Appendix 3*

The above table 4.10 show the return on loan and advances of NABIL. It shows that in an average NABIL generate 9.15% return on investment made on loan and advances. The table also shows that the income received from loan and advances of NABIL is increasing. The highest return within the study period is 11.78% in fiscal year 2010/011 and the lowest return is 7.47% in fiscal year 2005/06.

**Table 4.11**  
**Return on Loan and Advances of HBL ( in Millions)**

<b>F.year</b>	<b>Interest Income on Loan &amp; Advance</b>	<b>Investment on Loan &amp; Advance</b>	<b>Return on Loan &amp; Advance</b>
2005/06	1140.687	14642.560	7.79%
2006/07	1242.850	16997.997	7.31%
2007/08	1444.245	1949.520	7.41%
2008/09	1861.045	24793.000	7.51%
2009/10	2836.251	27980.629	10.14%
2010/11	3843.312	31566.977	12.18%
<b>Total</b>	<b>12368.390</b>	<b>135478.838</b>	<b>52.34%</b>
<b>Average</b>	<b>2061.398</b>	<b>22579.806</b>	<b>8.72%</b>

*Source: Annual Reports of HBL and Appendix 3*

The above table 4.11 shows the return on loan and advances of HBL. It shows that in an average HBL generate 8.72% return on investment made on loan and advances. The

table also shows that the income received from loan and advances of HBL is increasing. The highest return within the study period. is 12.18 % in fiscal year 2010/11 and the lowest return is 7.31% in fiscal year 2006/07.

**Table 4.12**  
**Return on Loan and Advances of NIBL ( in Million)**

<b>F.year</b>	<b>Interest Income on Loan &amp; Advance</b>	<b>Investment on Loan &amp; Advance</b>	<b>Return on Loan &amp; Advance</b>
2005/06	964.689	12776.208	7.55%
2006/07	1302.122	17286.427	7.53%
2007/08	1907.261	26996.652	7.06%
2008/09	2906.055	36241.207	8.02%
2009/10	4303.311	40318.308	10.67%
2010/11	5425.843	41095.515	13.23%
Total	16819.281	174714.317	54.06%
Average	2803.214	29119.053	9.01%

*Source: Annual Report of NIBL and Appendix 3*

The above table 4.12 shows the return on loan and advances of NIBL. Shows that in an average of NIBL generate 9.01%, return on investment made on loan and advances. The table also shows that the income received from loan and advances of NIBL is increasing. The highest return within the study period is 13.23% in fiscal year 2010/11 and the lowest return is 7.06% in fiscal year 2007/08.

**Table 4.13**  
**Return on Loan and Advances of Banking Industry ( in Million)**

<b>F.Year</b>	<b>Interest Income on Loan &amp; Advance</b>	<b>Investment on Loan &amp; Advance</b>	<b>Return on Loan &amp; Advance</b>
2005/06	12783.3	173383.4	7.37%
2006/07	19210.9	228951.9	8.39%
2007/08	23634.10	302913.4	7.80%
2008/09	15554.2	398143.0	3.91%
2009/10	49334.9	467107.2	10.56%
2010/11	65522.6	522853.3	12.53%
Total	186040	2093352.2	50.56%
Average	31006.67	348892.03	8.43%

*Source: Banking and Financial Statistics of Banking Industry and Appendix 3*

The above table 4.13 shows the return on loan and advances of Banking Industry. Shows that in an average the Banking Industry generate 8.43%, return on investment

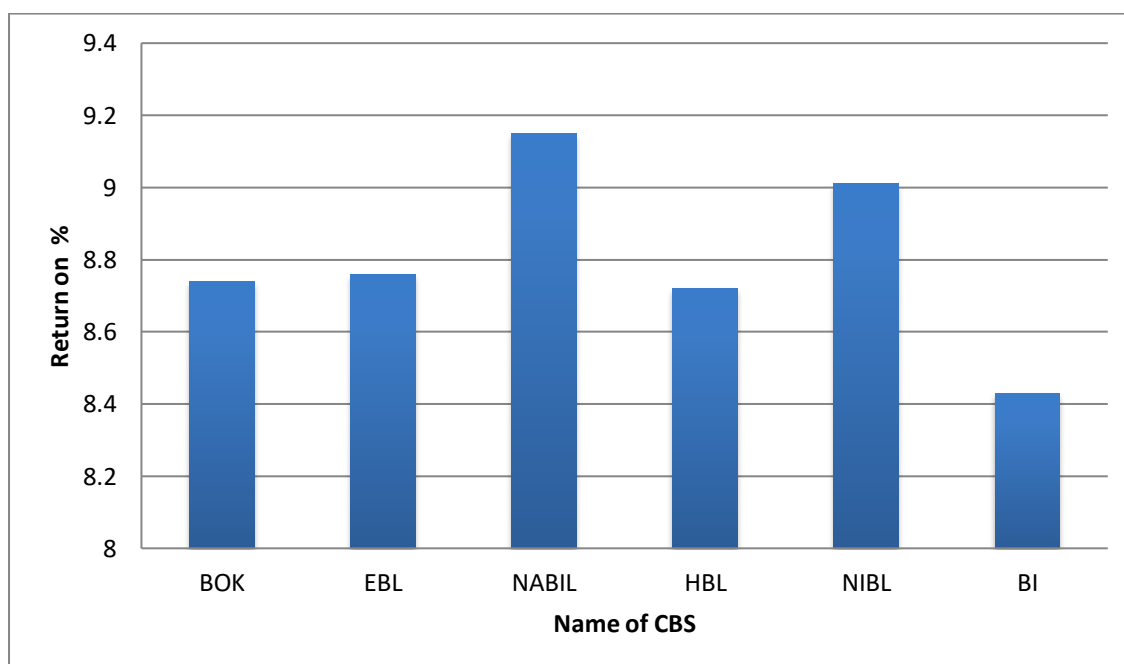
made on loan and advances. The table also shows that the income received from loan and advances of Banking Industry is fluctuating. The highest return within the study period is 12.52% in fiscal year 2010/11 and the lowest return is 3.91% in fiscal year 2008/09.

**Table 4.14**  
**Return on Loan and Advances of Sample Banks and Banking Industry**  
(In Percentage)

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBL</b>	<b>NAB IL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2 005/06	7.58	7.86	7.47	7.79	7.55	7.37
2006/07	6.87	7.08	0.08	7.31	7.53	8.39
2007/08	7.12	7.25	0.09	7.41	7.06	7.80
2 00 8/09	8.19	7.75	7.91	7.51	8.02	3.91
2009/10	10.25	10.17	10.44	10.14	10.67	10.56
2010/11	12.42	12.46	11.78	12.18	13.23	12.53
Mean Return	8.74	8.76	9.15	8.72	9.01	8.43

*Source - Annual Reports of CBs and Appendix 3*

**Figure 4.2**  
Return on Loan and Advances of Sample Banks and Banking Industry



From the above analysis, the average return on loan and advances of BOK, EBL, NABIL, HBL, NIBL and Banking Industry is 8.74%, 8.76%, 9.15%, 8.72% , 9.01% and 8.43% respectively. It is found that NABIL has highest mean return on loan and advances among five sample banks. Likewise, EBL occupied second position securing 8.76% return on loan and advances, which is slightly lower than NABIL while HBL has lowest mean return on loan and advances.

From the above table. it is clear that all five sample banks have higher mean return on loan and advances than the mean return on loan and advances of Banking Industry.

#### **4.1.1.3 Return on Shares and Debentures**

The return on shares and debentures consists of dividend yield and capital gain yield (change in market price) i.e. return is the combination of capital gain yield and dividend yield. Capital gain (loss) yield can be calculated by difference between this year price and last year price with respect to the last year price. Dividend yield can be calculated by dividend per share divided by market price per share. Market return is the mean return of the selected companies, which is represented by the market return of the study.

The information about dividend received and capital gain yield by the commercial banks are not available sufficiently. Without such information, calculation of return on shares and debenture cannot be performed properly. The general assumption has been established to calculate the necessary return on shares and debentures by using market return i.e. the average market return on shares and debentures is the average return of bank from the investment on shares and debentures.

Market return can be obtained by taking differences between the markets indexes divided by closing market index in time n-1. Here dividend is ignored.

$$\text{Market return } R_s = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where,

$R_s$  = Return on market

$P_t$  = NEPSE index at time t

$P_{t-1}$  = NEPSE index at time t -1

$$\text{Average Return on Shares and Debentures } (\bar{R}_s) = \frac{\sum R_s}{n}$$

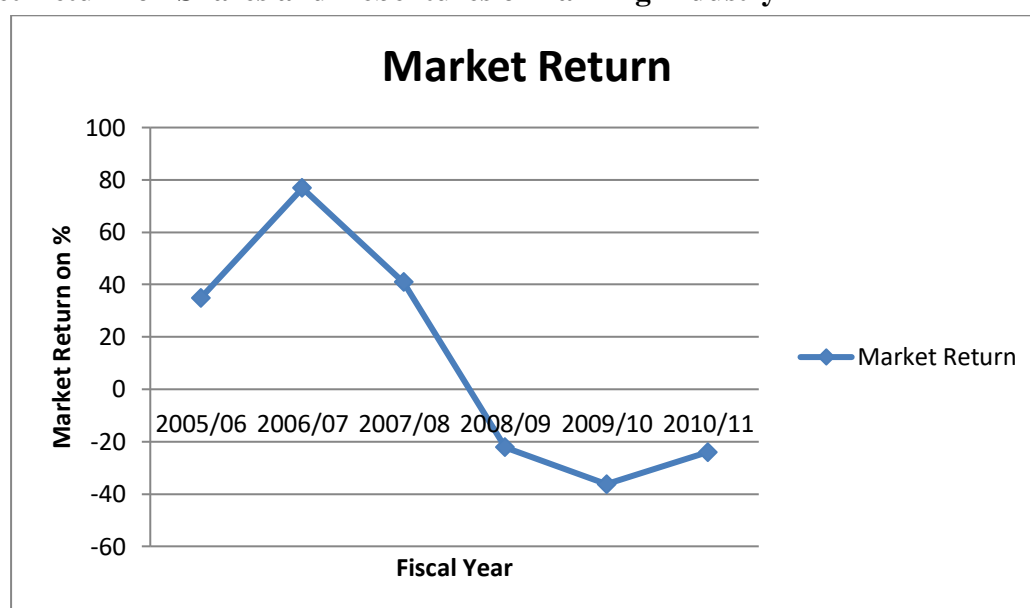
**Table 4.15**  
**Market Return on Shares and Debentures of Banking Industry (In Percentage)**

Fiscal Year	NEPSE Index	Market Return
2005/06	386.83	34.94
2006/07	683.95	76.81
2007/08	963.39	40.86
2008/09	749.10	-22.24
2009/10	477.73	-36.23
2010/11	362.85	-24.05
Total		70.09
Average		11.68

*Source: SEBO and Appendix 6 (a)*

**Figure 4.3**

**Market Return on Shares and Debentures of Banking Industry**



The table 4.15 listed above shows the return on shares and debentures of Banking Industry which is widely fluctuating i.e. -22.24% in the fiscal year 2008/09 and 76.81 % in the fiscal year 2006/07. These fluctuations in returns are mainly due to the volatility of the shares prices in the market. The changes in dividends also contributed to the variability of the return on shares in some extent.

The average market return on, share and debenture of Banking Industry is 11.68% during the review period. It is higher than the rate of return on other assets like government securities and loan and advances i.e. 11.68% > 3.47% and 8.43%.

#### **4.1.2 Risk on Individual Investment**

##### **4.1.2.1 Risk on Government Securities**

The risk on Government Securities is computed as follows-

$$\text{Risk on Government Securities } (\sigma_g) = \sqrt{\frac{\sum_{t=1}^n (R_g - \bar{R}_g)^2}{n-1}}$$

$R_g$  = Return on government securities

$\bar{R}_g$  = Average rate of return on government securities

$\sigma_g$  = Standard deviation of return on government securities

n = No of historical years (periods)

**Table 4.16**  
**Risk on Government Securities of BOK (In Percentage)**

Fiscal year	Return on Govt. Security ( $R_g$ )	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2005/06	0.043	-0.5	0.25
2006/07	0.0466	-0.14	0.0196
2007/08	4.02	-0.78	0.6084
2008/09	6.69	1.89	3.5721
2009/10	3.91	-0.89	0.7921
2010/11	5.2	-0.4	0.16
Total	28.78		5.4022
Average( $R_g$ )	4.8		
S.D( $\sigma_g$ )		1.039	

Source: Annual reports of BOK and Appendix 4.

The above table 4.16 shows the risk i.e. standard deviation of return on government securities of BOK. It reveals that the risk on investment on government securities of BOK is 1.039%, which shows the riskiness of return on government securities.

**Table 4.17**  
**Risk on Government Securities of EBL (In Percentage)**

Fiscal year	Return on Govt. Security ( $R_g$ )	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2005/06	2.74	-1.49	2.2201
2006/07	2.73	-1.5	2.25
2007/08	3.74	-0.49	0.2401
2008/09	5.63	1.4	1.96
2009/10	5.49	1.26	1.5876
2010/11	5.07	0.84	0.7056
<b>Total</b>	<b>25.40</b>		<b>8.9634</b>
<b>Average</b>	<b>4.23</b>		
S.D( $\sigma_g$ )		1.339%	

Source: Annual reports of EBL and Appendix 4.

The above table 4.17 shows the risk i.e. standard deviation of return on government securities of EBL. It reveals that the risk on investment in government securities of EBL is 1.339%, which shows the riskiness of return on government securities.

**Table 4.18**  
**Rick on Government Securities of NABIL (In Percentage)**

Fiscal year	Return on Govt. Security ( $R_g$ )	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2005/06	5.66	0.65	0.4225
2006/07	2.75	-2.26	5.1076
2007/08	4.27	-0.74	0.5476
2008/09	7.26	2.25	5.0625
2009/10	4.17	-0.84	0.7056
2010/11	5.95	0.94	0.8836
Total	30.06		12.7294
Average	5.01		
S.D( $\sigma_g$ )		1.596%	

*Source : Annual Report of NABIL and Appendix 4.*

The above table 4.18 shows the risk i.e. standard deviation of return on government securities of NABIL. It reveals that the risk on investment on government securities of NABIL is 1.596%, which shows the riskiness of return on government securities.

**Table 4.19**  
**Rick on Government Securities of HBL(In Percentage)**

Fiscal year	Return on Govt. Security ( $R_g$ )	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2005/06	3.35	-1.38	1.9044
2006/07	2.97	-1.76	3.0976
2007/08	2.69	-2.04	4.1616
2008/09	8.43	3.7	13.69
2009/10	4.84	0.11	0.0121
2010/11	6.07	1.34	1.7956
Total	28.35		24.6613
Average( $R_g$ )	4.73		
S.D( $\sigma_g$ )		2.221	

*Sources :Annual Report of HBL and Appendix 4.*



The above table 4.19 shows the risk i.e. standard deviation of return on government securities of HBL. It reveals that the risk on investment on government securities of HBL is 2.221%, which shows the riskiness of return on government securities.

**Table 4.20**  
**Rick on Government Securities of NIBL(In Percentage)**

Fiscal year	Return on Govt. Security ( $R_g$ )	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2005/06	3.27%	-0.81	0.6561
2006/07	2.41	-1.67	2.7889
2007/08	3.17	-0.91	0.8281
2008/09	5.56	1.48	2.1904
2009/10	4.04	-0.04	0.0016
2010/11	6.02	1.94	3.7636
Total	24.47		10.2287
Average	4.08		
S.D( $\sigma_g$ )		1.430	

*Sources: Annual Report of NIBL and Appendix 4.*

The above table 4.20 shows the risk i.e. standard deviation of return on government securities of NIBL. It reveals that the risk on investment on government securities of NIBL is 1.430%, which shows the riskiness of return on government securities.

**Table 4.21**  
**Rick on Government Securities of Banking Industry (In Percentage)**

Fiscal year	Return on Govt. Security ( $R_g$ )	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2005/06	3.01	-0.73	0.5329
2006/07	2.86	-0.88	0.7744
2007/08	2.85	-0.89	0.7921
2008/09	3.82	0.08	0.0064
2009/10	4.53	0.79	0.6241
2010/11	5.37	1.63	2.6569
Total	22.44		5.3868
Average	3.75		
S.D( $\sigma_g$ )		1.038	

*Sources : Banking and financial statistics of NRB and Appendix 4.*

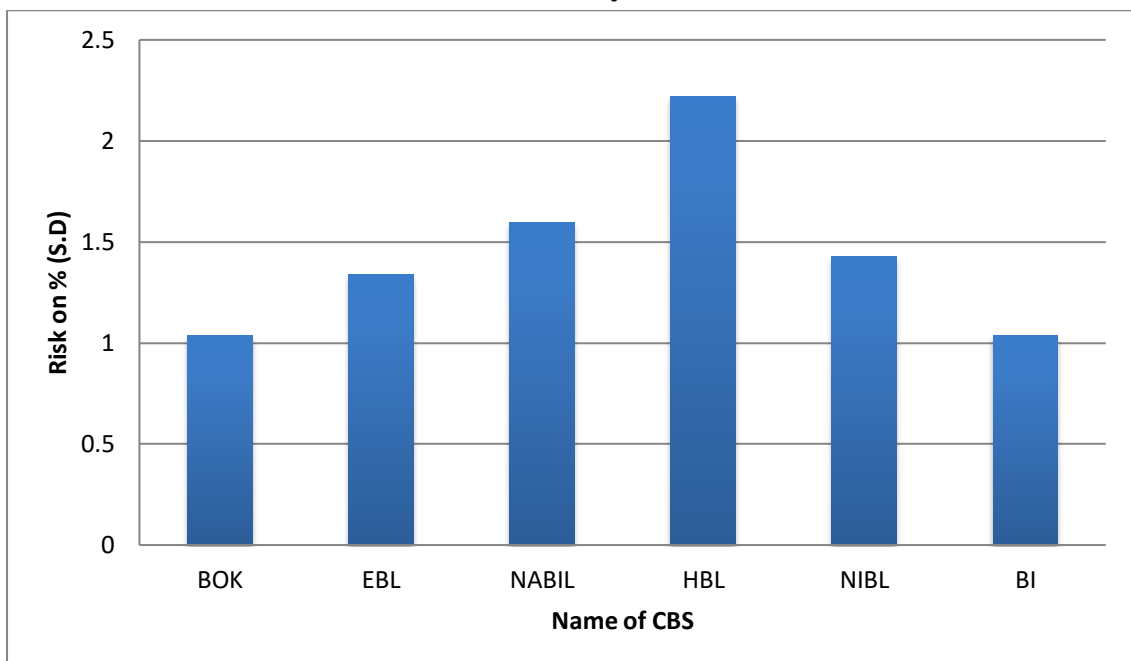
The above table 4.21 shows the risk i.e. standard deviation of return on government securities of Banking Industry. It reveals that the risk on investment on government securities of Banking Industry is 1.038%, which shows the riskiness of return on government securities.

**Table 4.22**  
**Risk and Return on Government Securities of Sample Banks and Banking Industry (In Percentage)**

<b>Fiscal year</b>	<b>BOK</b>	<b>EBL</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking industry</b>
2 005/06	4.30	2.74	5.66	3.35	3.27	3.01
2006/07	4.66	2.73	2.75	2.97	2.41	2.86
2007/08	4.02	3.74	4.27	2.69	3.17	2.85
2 00 8/09	6.69	5.63	7.26	8.43	5.56	3.82
2009/10	3.91	5.49	4.17	4.84	4.04	4.53
2010/11	5.20	5.07	5.95	6.07	6.02	5.34
Mean Return( $R_g$ )	4.80	4.23	5.01	4.73	4.08	3.74
S.D( $\sigma_g$ )	1.039	1.339	1.596	2.221	1.430	1.038%

Source Annual reports of CBs and Appendix 4

**Figure 4.4**  
**Risk and Return on Government Securities of Sample Banks and Banking Industry**



The above table 4.22 shows the risk i.e. standard Deviation of return on government securities of Banking Industry is 1.038%. Similarly, the risk on government securities of BOK, EBL, NABIL, HBL, and NIBL is 1.039%, 1.339%, 1.596%, 2.221%, 1.430% and 1.038% respectively. From the above analysis, it is found that HBL has the highest risk on government securities among five selected commercial banks. Likewise, NABIL,

NIBL and EBL have moderate risk on government securities while BOK has lowest risk on government securities.

From the above table, it is clear that all five sample banks have higher risk on government securities than the risk on-government securities of Banking Industry.

#### 4.1.2.2 Risk on Loan and Advances

The risk on investment on loan and advances can be calculated as follows:

$$\text{Standard deviation of return on Loan and Advances}(\sigma_L) = \sqrt{\frac{\sum(R_L - \bar{R}_L)^2}{n-1}}$$

Where,

$R_L$  = Return on Loan and Advances

$\bar{R}_L$  = Average rate of return on Loan and Advances

$\sigma_L$  = Standard deviation of return on Loan and Advances

n = No. of historical years (Periods)

**Table 4.23**  
**Risk on Loan and Advances of BOK(in Percentage)**

Fiscal year	Return on Loan and Advances ( $R_L$ )	$(R_L - \bar{R}_L)$	$(R_L - \bar{R}_L)^2$
2005/06	7.58	-1.16	1.3456
2006/07	6.87	-1.87	3.4969
2007/08	7.12	-1.62	2.6244
2008/09	8.19	-0.55	0.3025
2009/10	10.25	1.51	2.2801
2010/11	12.42	3.68	13.5424
Total	52.43		23.5919
Average( $R_L$ )	8.74		
S.D( $\sigma_L$ )		2.17	

*Source: Annual reports of BOK and Appendix 5*

The above table 4.23 shows the risk i.e. standard deviation of return on loan and advances of BOK. It reveals that the risk on investment on loan and advances of BOK is 2.17% that shows the riskiness of return on loan and advances.

**Table 4.24**  
**Risk on Loan and Advances of EBL(In Percentage)**

<b>Fiscal year</b>	<b>Return on Loan and Advances (<math>R_L</math>)</b>	<b><math>(R_L - \bar{R}_L)</math></b>	<b><math>(R_L - \bar{R}_L)^2</math></b>
2005/06	7.86	-0.9	0.8
2006/07	7.08	-1.68	2.8224
2007/08	7.25	-1.51	2.2801
2008/09	7.75	-1.01	2.2801
2009/10	10.17	1.41	1.9881
2010/11	12.46	3.7	13.69
Total	52.57		22.6107
Average( $R_L$ )	8.76		
S.D( $\sigma_L$ )		2.13	

*Source: Annual reports of EBL and Appendix 5*

The above table 4.24 shows the risk i.e. standard deviation of return on loan and advances of EBL. It reveals that is the risk on investment on loan and advances of EBL is 2.13%, which shows, the riskiness of return on loan and advances.

**Table 4.25**  
**Risk on Loan and Advances of NABIL(In Percentage)**

<b>Fiscal year</b>	<b>Return on Loan and Advances (<math>R_L</math>)</b>	<b><math>(R_L - \bar{R}_L)</math></b>	<b><math>(R_L - \bar{R}_L)^2</math></b>
2005/06	7.47%	-1.68	2.8224
2006/07	8.38%	-0.77	0.5929
2007/08	8.93%	-0.22	0.0484
2008/09	7.91%	-1.24	1.5376
2009/10	10.44	1.29	1.6641
2010/11	11.78	2.68	6.9169
Total	54.91		13.5823
Average( $R_L$ )	9.15		
S.D( $\sigma_L$ )	1.65		

*Source: Annual reports of NABIL and Appendix 5*

The above table 4.25 shows the risk i.e. standard deviation of return on loan and advances of NABIL. It reveals that the risk on investment on loan and advances of NABIL is 1.65% that shows the riskiness of return on loan and advances.

**Table 4.26**  
**Risk on Loan & Advance of HBL(In Percentage)**

<b>Fiscal year</b>	<b>Return on Loan and Advances (<math>R_L</math>)</b>	<b><math>(R_L - \bar{R}_L)</math></b>	<b><math>(R_L - \bar{R}_L)^2</math></b>
2005/06	7.79	-0.93	0.8649
2006/07	7.31	-1.41	1.9881
2007/08	7.41	-1.31	1.7161
2008/09	7.51	-1.21	1.4641
2009/10	10.14	1.42	2.0164
2010/11	12.18	3.46	11.9716
Total	52.34		20.0212
Average( $R_L$ )	8.72		
S.D( $\sigma_L$ )	2.00		

*Source: Annual reports of HBL and Appendix 5*

The above table 4.26 shows the risk i.e. standard deviation of return on loan and advances of HBL. It reveals that the risk on investment on loan and advances of HBL is 2.00% that shows the riskiness of return on loan and advances.

**Table 4.27**  
**Risk on Loan and Advances of NIBL(In Percentage)**

<b>Fiscal year</b>	<b>Return on Loan and Advances (<math>R_L</math>)</b>	<b><math>(R_L - \bar{R}_L)</math></b>	<b><math>(R_L - \bar{R}_L)^2</math></b>
2 005/0 6	7.55	-1.46	2.1316
2006/07	7.53	-1.48	2.1904
2007/08	7.06	-1.95	3.8025
2 00 8/0 9	8.02	-0.99	0.9801
2009/10	10.67	1.66	2.7556
2010/11	13.23	4.22	17.8084
Total	54.06		29.6686
Average( $R_L$ )	9.01		29.6686
S.D( $\sigma_L$ )	2.44		

*Source: Annual reports of NIBL and Appendix 5*

The above table 4.27 shows the risk i.e. standard deviation of return on loan and advances of NIBL. It reveals that the risk on investment on loan and advances of NIBL is 2.44%, which shows the riskiness of return on loan and advances.

**Table 4.28**  
**Risk on Loan and Advances of Banking Industry(in Percentage)**

<b>Fiscal year</b>	<b>Return on Loan and Advances (<math>R_L</math>)</b>	<b><math>(R_L - \bar{R}_L)</math></b>	<b><math>(R_L - \bar{R}_L)^2</math></b>
2 005/06	7.37	-1.06	1.1236
2006/07	8.39	-0.04	0.0016
2007/08	7.80	-0.63	0.3969
2 00 8/09	3.91	-4.52	20.4304
2009/10	10.56	2.14	4.5369
2010/11	12.53	4.14	16.81
Total	50.56		43.2994
Average( $R_L$ )	8.43		
S.D( $\sigma_L$ )	2.94		

*Source: Banking and Financial Statistics of NRB and Appendix*

The above table 4.28 shows the risk i.e. standard deviation of return on loan and advances of Banking Industry. It reveals that the risk on investment on loan and advances of Banking Industry is 2.94% that shows the riskiness of return on loan and advances.

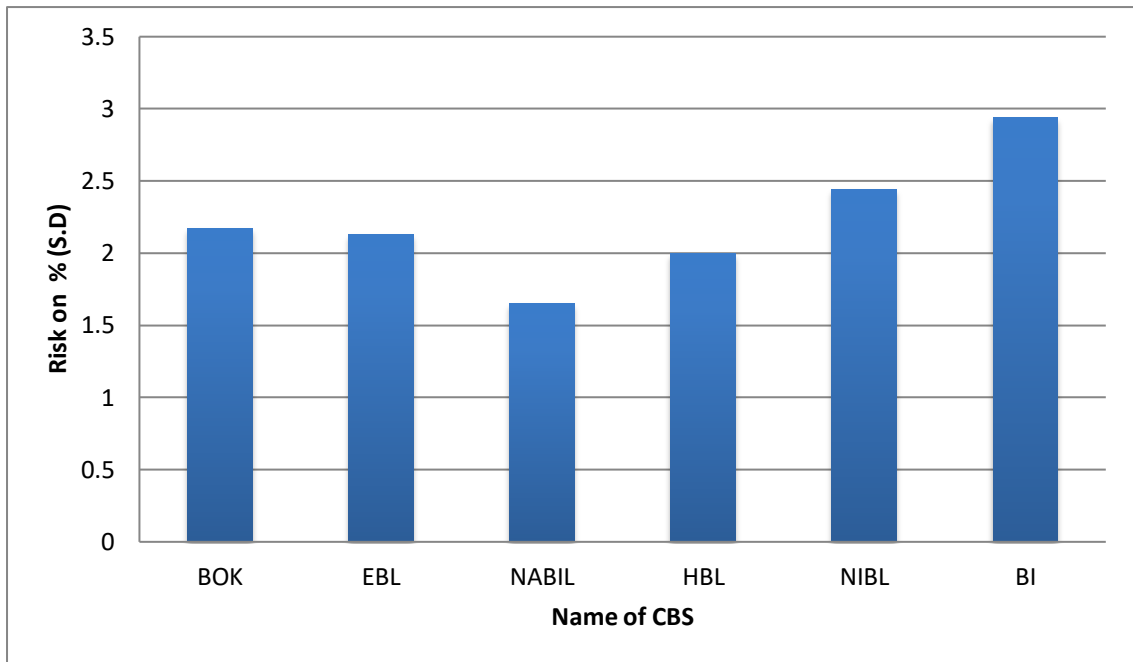
**Table 4.29**  
**Risk and Return on Loan and Advances of Sample Banks and Banking "Industry**  
**(in Percentage)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBL</b>	<b>NAB IL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2 005/0 6	7.58	7.86	7.47	7.79	7.55	7.37
2006/07	6.87	7.08	8.38%	7.31	7.53	8.39
2007/08	7.12	7.25	8.93%	7.41	7.06	7.80
2 00 8/0 9	8.19	7.75	7.91	7.51	8.02	3.91
2009/10	10.25	10.17	10.44	10.14	10.67	10.56
2010/11	12.42	12.46	11.78	12.18	13.23	12.53
Mean Return	8.74	8.76	9.15	8.72	9.01	8.43
S.D( $\sigma_L$ )	2.17	2.13	1.65	2.00	2.44	2.94

Source: Annual reports of CBs and Appendix 5

**Figure – 4.5**

**Risk and Return on Loan and Advances of Sample Banks and Banking Industry**



The above table 4.29 shows the risk i.e. standard deviation of return on loan and advances of Banking Industry is 2.94% Similarly, the risk on loan and advances of BOK, EBL, NABIL HBL, and NIBL is 2.17, 2.13, 1.65, 2.00 and 2.44 respectively. From the above analysis, it is found that NIBL has highest risk on loan and advances among four commercial banks. Likewise, BOK, EBL and NABIL have moderate risk on loan and advances while NIBL has lowest risk on loan and advances.

From the above table, it is clear that all five selected commercial banks have higher risk on loan and advances than that of the risk on loan and advances of banking industry.

#### 4.1.2.3 Risk on Shares and Debentures

Market risk can be calculated as follows:

$$\text{Risk on Shares and Debentures } (\sigma_s) = \sqrt{\frac{\sum(R_s - \bar{R}_s)^2}{n}}$$

Where,

$R_s$  = Return on Shares and Debentures

$\bar{R}_s$  = Average rate of return on Shares and Debentures

$\sigma_s$  = Standard deviation of return on Shares and Debentures

n= No. of historical years (Periods)

**Table 4.30**

**Risk on Shares and Debentures of Banking Industry (In Percentage)**

Fiscal Year	NEPSE index	Market Return (Rs)	$(R_s - \bar{R}_s)$	$(R_s - \bar{R}_s)^2$
2005/06	386.83	34.94	23.26	541.0276
2006/07	683.95	76.81	65.13	4241.9169
2007/08	963.39	40.86	29.18	851.4724
2008/09	749.10	-22.24	-33.92	1150.5664
2009/10	477.73	-36.23	-47.91	2295.3681
2010/11	362.85	-24.05	-35.73	1276.6329
Total		70.09		10356.9843
Average(Rs)		11.68		
S.D( $\sigma_s$ )	45.51			

*Source: Annual reports of CBs and Appendix 6 (b)*

The table 4.30 listed above reveals that risk i.e. standard deviation of return on shares and debentures of Banking Industry. The standard deviation of return on shares and debentures of Banking Industry is 45.51%. The standard deviation shows more risk than investment on government securities and loan and advances i.e. 45.51% > 1.038% and 2.94% respectively. Therefore, it is clear that investment on shares and debenture is more risky.

#### 4.1.3 Return or Investment Portfolio

The expected return on portfolio (Rp) is simply the weighted average of the expected return on the individual assets in the portfolio with the weights being equal to the proportion of investment in each asset. Commercial' Banks invests their funds in government securities, loan and advances and shares and debentures. The weights of the investment on various assets and portfolio return can be calculated as follows:



Calculation of Portfolio Return:

$$(R_p) = \sum W \times R$$

$$= W_1 \times R_1 + W_2 \times R_2 + W_3 \times R_3$$

Proportion Weight (W)  $\frac{\text{Investment in each Asset}}{\text{Total Outside Investment}}$

Where,

$W_1$  = Proportion of investment on government securities

$W_2$  = Proportion of investment on loan and advances

$W_3$  = Proportion of investment on shares and debentures

$R_1$  = Return on government securities

$R_2$  = Return on loan and advances

$R_3$  = Return on shares and debentures

**Table 4.31**  
**Portfolio Return on Investment of BOK(In Percentage)**

S.N	Assets	Average Rate of Return (R)	Proportion Weight (W)
1	Return on Govt. Securities (R <sub>g</sub> )	4.80	0.1678
2	Return on Loan & Advance (R <sub>L</sub> )	8.74	0.8262
3	Return on Share & Debentures (R <sub>s</sub> )	11.68	0.0054
	Portfolio Return (R <sub>p</sub> )	8.095%	

Source-L: Annual reports of BOK and Appendix 7(a)

From above table 4.31 the expected return on portfolio of BOK is 8.095% which is more greater than that of average rate of return on investment on government securities i.e.  $8.095 > 4.80$ . However, it is less than that of average rate of return on investment on loan and advances i.e.  $8.095\% < 8.74\%$  and share and debentures i.e.  $8.095 < 11.68\%$ .

**Table 4.32**  
**Portfolio Return on investment of EBL (Percentage)**

S.N	Assets	Average Rate of Return (R)	Proportion Weight (W)
1.	Return on Govt. Securities (R <sub>g</sub> )	4.23	0.1924
2.	Return on Loan & Advances (R <sub>L</sub> )	8.76	0.8047
3.	Return on Share & Debenture (R <sub>s</sub> )	11.68	0.0029
	Portfolio Return (R <sub>p</sub> )	7.897	

Source.- Annual reports of EBL and Appendix 7(b)

From the above table 4.32 the expected return on portfolio of EBL is 7.897 which is considerably more than that of the mean rate of return on investment on government securities i.e.  $7.897\% > 4.23\%$  but less than that of mean rate of return on investment on loan and advances i.e.  $7.897\% < 8.79\%$  and shares and debentures i.e.  $7.89\% < 11.68\%$ .

**Table 4.33**

**Portfolio Return on investment of NABIL (Percentage)**

S.N	Assets	Average Rate of Return (R)	Proportion Weight (W)
1.	Return on Govt. Securities (R <sub>g</sub> )	5.01	0.1766
2.	Return on Loan & Advances (R <sub>L</sub> )	9.15	0.8105
3.	Return on Shares & Debenture (R <sub>s</sub> )	11.68	0.0129
	Portfolio Return (R <sub>p</sub> )	8.452%	

Source.- Annual reports of NABIL and Appendix 7(c)

From the above table 4.33, the expected return on portfolio of NABIL is 8.452 which is considerably more than that of the mean rate of return on investment on government securities i.e.  $8.452\% > 5.01\%$  but less than that of mean rate (return on investment on loan and advances i.e.  $8.452\% < 9.15\%$  and shares and debentures i.e.  $8.452\% < 11.68\%$ ).

**Table 4.34**

**Portfolio Return on investment of HBL (Percentage)**

S.N	Assets	Average Rate of Return (R)	Proportion Weight (W)
1.	Return on Govt. Securities (R <sub>g</sub> )	4.73	0.2008
2.	Return on Loan & Advance (R <sub>L</sub> )	8.72	0.7965
3.	Return on Shares & Debenture (R <sub>s</sub> )	11.68	0.0027
	Portfolio Return (R <sub>p</sub> )	7.927	

Source.- Annual reports of HBL and Appendix 7(d)

From the above table 4.34, the expected return on portfolio of HBL is 7.927 which is considerably more than that of the mean rate of return on investment on government securities i.e.  $7.927\% > 4.73\%$  but less than that of mean rate (return on investment on loan and advances i.e.  $7.927\% < 8.72\%$  and shares and debentures i.e.  $7.927\% < 11.68\%$ ).

**Table No: 4.35****Portfolio Return on Investment of NIBL (In percentage)**

S.N	Assets	Average Rate of Return (R)	Proportion Weight (W)
1.	Return on Govt. Securities (R <sub>g</sub> )	4.08	0.1024
2.	Return on Loan & Advance (R <sub>L</sub> )	9.01	0.8960
3.	Return on Shares & Debenture (R <sub>s</sub> )	11.68	0.0016
	Portfolio (R <sub>p</sub> )	8.509	

Source: Annual reports of NIBL and Appendix 7(e)

From the above table 4.35, the expected return on portfolio of NIBL is 8.509 which is considerably more than that of the mean rate of return on investment on government securities i.e.  $8.509\% > 4.08\%$  but less than that of mean rate ( return on investment on loan and advances i.e.  $8.509\% < 9.01\%$  and shares and debentures i.e.  $8.509\% < 11.68\%$ ).

**Table 4.36****Portfolio Return on Investment of Banking Industry (In Percentage)**

S.N	Assets	Average Rate of Return (R)	Proportion Weight (W)
1.	Return on Govt. Securities (R <sub>g</sub> )	3.74	0.1585
2.	Return on Loan & Advance (R <sub>L</sub> )	8.43	0.7510
3.	Return on Shares & Debenture (R <sub>s</sub> )	11.68	0.0905
	Portfolio (R <sub>p</sub> )	7.981	

Source: Banking and Financial Statistics of NRB and Appendix 7(f)

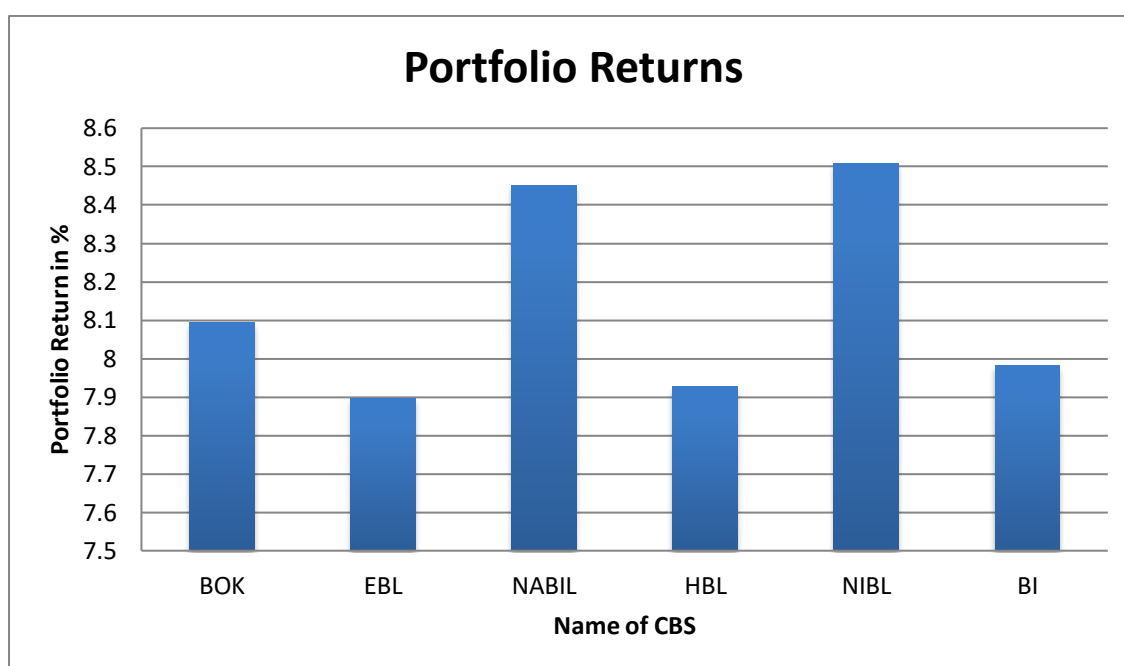
From the above table 4.36 the portfolio return on investment of Banking Industry is found to be 7.981% which is considerably more than that of the mean rate of return on investment on government securities i.e.  $7.981\% > 3.74\%$  but less than that of mean rate of return on investment on loan and advances i.e-  $7.981\% < 8.43\%$  and shares and debentures i.e.  $7.981\% < 11.68\%$ .

**Table 4.37**  
**Portfolio Return on Investment of Sample Banks and Banking Industry**  
**(In Percentage)**

Assets	BOK	EBI	NABIL	HBL	NIBL	Banking Industry
Return on Govt. Securities ( $R_g$ )	4.80	4.23	5.01	4.73	4.08	3.74
Return on Loan & Advance ( $R_l$ )	8.74	8.76	9.15	8.72	9.01	8.43
Return on Shares & Debentures ( $R_s$ )	11.68	11.68	11.68	11.68	11.68	11.68
Portfolio Returns ( $R_p$ )	8.095	7.897	8.452	7.927	8.509	7.981

*Source - Annual report of CBs and Appendix 7*

**Figur4.6**  
**Portfolio Return on Investment of Sample Banks and Banking Industry**



The above table 4.37 shows that the portfolio return on investment of BOK, EBL, NABIL, HBL and NIBL is 8.095%, 7.897%, 8.452%, 7.927% and 8.509% respectively. From the above analysis, it is found that NABIL has highest portfolio return on investment on various assets among five commercial banks. Because NABIL is investing 81.05% of its total outside investment in loan, and advances and 1.29% of its total outside investment on shares and debentures which generate higher return and only 17.66 % of its total outside investment on government securities which generate lower return.

Like-wise, EBL has the lowest portfolio return i.e. 7.897% among five commercial banks. Because EBL has invested only 80.47% of its total outside investment on loan and advances and 0.29% of its total outside investment on shares and debentures that generate higher return but it has invested higher portion i.e. 19.24% of its total outside investment on government securities, which generate lower return.

Similarly, BOK, HBL and NIBL have moderate portfolio return on investment on various assets. The portfolio return on investment of NABIL, BOK and NIBL is greater than that of portfolio return on investment of Banking Industry but the portfolio return on investment of HBL is equal to Banking Industry.

From the above calculation, it is clear that NABIL has used the optimum combination of portfolio on investment than other sample banks because the portfolio return on investment of it is highest among five selected banks as well as Banking Industry. However, EBL is unable to use the better combination of portfolio on investment because its portfolio return on investment is lowest among five commercial banks.

#### **4.1.4 Risk on Investment Portfolio**

Expected risk on a portfolio is a function of the proportions invested in the components, the riskiness of the components and correlation of returns on the component securities. It is measured by standard deviation. However, the standard deviation of portfolio is not simply the weighted average of standard deviation of individual securities. The association of movement of returns of two securities affects the portfolio risk. The degree to which the assets return move together is measured by the covariance. Hence, by combining the Fr ensures of individual assets risk, relative asset weights and the co-movement of assets returns (covariance) the risk of the portfolio can be estimated. Therefore, before calculating portfolio risk on investment, correlation coefficient and co-variance between two assets return should be calculated.

Calculation of Correlation Coefficient

Correlation coefficient between government securities and loan and advances

#### **Calculation of correlation coefficient and covariance between various investment securities of BOK**

Correlation coefficient between government securities and Loan and Advance

$$r_{gL} = \frac{n \sum R_g R_L - \sum R_g \sum R_L}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_L^2 - (\sum R_L)^2}}$$

Correlation coefficient between government securities and shares and debentures

$$r_{gs} = \frac{n \sum R_g R_s - \sum R_g \sum R_s}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}}$$

Correlation coefficient between loan and advances and shares and debentures:

$$r_{LS} = \frac{n \sum R_L R_s - \sum R_L \sum R_s}{\sqrt{n \sum R_L^2 - (\sum R_L)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}}$$

Calculation of covariance

Covariance between government securities and Loan and Advance

$$COV_{gL} = r_{gL} \times \sigma_g \times \sigma_L$$

Covariance between loan and advances and shares and debentures

$$COV_{LS} = r_{LS} \times \sigma_L \times \sigma_S$$

Covariance between government securities and shares and debentures

$$COV_{gs} = r_{gs} \times \sigma_g \times \sigma_s$$

Where,

$R_g$  = Return on government securities

$R_L$  = Return on loan and advances

$R_s$  = Return on shares and debentures

$\sigma_g$  = Standard deviation of return on government securities

$\sigma_L$  = Standard deviation of return on loan and advances

$\sigma_s$  = US Standard deviation of return on shares and debentures

Calculation of Standard Deviation of Portfolio Investment:

The standard deviation of portfolio investment ( $\sigma_p$ ) can be calculated as follows-

$$\sigma_p = \sqrt{W_g^2 \times \sigma_g^2 + W_L^2 \times \sigma_L^2 + W_S^2 \times \sigma_S^2 + 2COV_{gL} \times W_g \times W_L + 2COV_{LS} \times W_L \times W_S + 2COV_{gs} \times W_g \times W_S}$$

**Table 4.38**

**Portfolio Risk on Investment of BOK (In Percentage)**

S.N.	Assets	Risk (S.D)	Correlation Coefficient
1.	Risk on Govt. Securities	1.039	$r_{gL}=0.10$
2.	Risk on Loan and Advances	2.17	$r_{gs} = -0.33$
3.	Risk on Share & Debenture	45.51	$r_{LS}=-0.77$
	Portfolio Risk ( $\sigma_p$ )		1.63

Source: Annual reports of BOK, Appendix 8 and 9

From the above table 4.38 the expected risk of the portfolio i.e. standard deviation of BOK is 1.63% which is considerably more than the expected risk on investment on government securities i.e.  $1.63\% > 1.039\%$ , loan and - advances i.e.  $1.63\% < 2.17\%$  and shares and debentures i.e.  $1.63 < 45.51\%$ . The risk of investment portfolio of BOK has considerably reduced due to the negative correlation between returns of investment on government securities and shares and debentures ( $r_{gs} = -0.33$ ) and loan and advances and shares and debentures ( $r_{ls} = -0.77$ ) and lower correlation between the returns of investment on government securities and loan and advances ( $r_{gl} = 0.10$ ).

So; it is clear from the above analysis that lower the correlation coefficients lower the risk of the portfolio i.e. combining assets with negative correlation ( $r < 0$ ) will significantly reduce the risk of the portfolio.

**Table 4.39**  
**Portfolio Risk on Investment of EBL**

S.N	Assets	Risk (S.D)	Correlation Coefficient
1.	Risk on Govt. Securities	1.339	$r_{gL} = 0.57$
2.	Risk on Loan & Advance	2.13	$r_{gs} = -0.93$
3.	Risk on Share & Debentures	45.51%	$r_{ls} = -0.70$
	Portfolio Risk	1.77	

*Source: Annual reports of EBL, Appendix 8 and 9*

From the above table 4.39 the expected risk of the portfolio i.e. standard deviation of EBL is 1.77% which is considerably less than the expected risk on investment on shares and debentures i.e.  $1.77\% < 45.51\%$  and loan and advances i.e.  $1.77\% < 2.13\%$  but more than the expected risk of investment on government securities i.e.  $1.77\% > 1.339\%$ . The risk of investment portfolio of EBL has considerably reduced due to the lower correlation between returns of investment on government securities and loan and advances ( $r_{gl} = 0.57$ ) and negative correlation between returns of investment on loan and advances and shares and debentures ( $r_{ls} = -0.70$ ) return of Investment on government securities and shares and debentures ( $r_{gs} = -0.93$ ).

So, it is clear from the above analysis that lowers the correlation coefficient, lower the risk of the portfolio i.e. combining assets with negative correlation ( $r < 0$ ) will significantly reduce the risk of the portfolio.

**Table 4.40**  
**Portfolio Risk on Investment of NABIL**

S.N	Assets	Risk (S.D)	Correlation Coefficient
1.	Risk on Govt. Securities	1.596	$r_{gL} = -0.07$
2.	Risk on Loan & Advances	1.65	$r_{gs} = -0.62$
3.	Risk on Share & Debenture	45.51%	$r_{ls} = -0.56$
	Portfolio Risk	1.04	

Source: Annual reports of NABIL, Appendix 8 and 9

From the above table 4.40 the expected risk of the portfolio i.e. standard deviation of NABIL is 1.04% which is considerably less than the expected risk on investment on government securities i.e.  $1.04\% < 1.596\%$ . But less than the expected risk on loan and advances i.e.  $1.04\% < 1.65\%$  and shares and debentures i.e.  $1.04\% < 45.51\%$ . The risk of investment portfolio of NABIL has considerably reduced due to the negative correlation between returns of investment on government securities and shares and debentures ( $r_{gs} = -0.62$ ) and returns of investment on loan and advances and shares and debentures ( $r_{ls} = -0.56$ ) and returns of investment on government securities and loan and advances ( $r_{gl} = -0.07$ ).

So, it is clear from the above analysis that lower the correlation coefficient, lower the risk of the portfolio i.e. combining assets with negative correlation ( $r < 0$ ) will significantly reduce the risk of the portfolio.

**Table 4.41**  
**Portfolio Risk on Investment of HBL**

S.N	Assets	Risk (S.D)	Correlation Coefficient
1.	Risk on Govt. Securities	2.221	$r_{gl} = 0.30$
2.	Risk on Loan & Advances	2.00	$r_{gs} = -0.76$
3.	Risk on Share & Debentures	45.51	$r_{ls} = -0.66$
	Portfolio Risk		1.68

Source - Annual reports of HBL, Appendix 8 and 9

From the above table 4.41 the expected risk of the portfolio i.e. standard deviation of HBL is 1.68% which is considerably less than the expected risk on investment on loan and advances i.e.  $1.68\% < 2.00\%$  and shares and debentures i.e.  $1.68\% < 45.51\%$  and expected risk of investment on government securities i.e.  $1.68\% < 2.221\%$ . The risk of investment portfolio of HBL has reduced due to the lower correlation between returns of investment on Government securities and loan and Advances ( $r_{gl} = 0.30$ ) and negative correlation between loan and advances and shares and debentures ( $r_{ls} = -0.66$ ) and returns of investment on government securities and shares and debentures ( $r_{gs} = -0.76$ ).



So, it is clear from the above analysis that is lower the correlation coefficient, lower the risk of the portfolio i.e. combining assets with negative correlation ( $r < 0$ ) will significantly reduce the risk of the portfolio.

**Table No. 4.42**  
**Portfolio Risk on Investment of NIBL**

S.N	Assets	Risk (S.D)	Correlation Coefficient
1.	Risk on Govt. Securities	1.430	$r_{gl} = 0.69$
2.	Risk on Loan & Advances	2.44	$r_{gs} = -0.84$
3.	Risk on Share & Debenture	45.51	$r_{ls} = -0.69$
	Portfolio Risk	2.24	

Source - Annual reports of NIBL, Appendix 8 and 9

From the above table 4.42 the expected risk of the portfolio i.e. standard deviation of NIBL is 2.24% which is considerably less than the expected risk on investment on loan and advances i.e.  $2.24 < 2.44\%$  and shares and debentures i.e.  $2.24\% < 45.51\%$  and expected risk of investment on government securities i.e.  $2.24\% > 1.43\%$ . The risk of investment portfolio of NIBL has reduced due to the lower correlation between returns of investment on Government securities and loan and Advances ( $r_{gl} = 0.69$ ) and negative correlation between loan and advances and shares and debentures ( $r_{ls} = -0.69$ ) and returns of investment on government securities and shares and debentures ( $r_{gs} = -0.84$ ).

So, it is clear from the above analysis that is lower the correlation coefficient, lower the risk of the portfolio i.e. combining assets with negative correlation ( $r < 0$ ) will significantly reduce the risk of the portfolio.

**Table 4.43**  
**Portfolio Risk on Investment of Banking Industry**

S. No.	Assets	Risk (S.D.)	Correlation Coefficient
1	Risk on Govt. Securities	1.038%	$r_{gl} = 0.61$
2	Risk on Loan and Advances	2.94%	$r_{gs} = -0.84$
3	Risk on Shares and Debentures	45.51%	$r_{ls} = -0.21$
	Portfolio risk	4.16%	

Source: Banking and Financial Statistics of NRB, Appendix 8 and 9

From the above calculation, i.e expected risk of the portfolio i.e. standard deviation of Banking Industry found to be 4.16% which is considerably less than the expected risk on investment on shares and debentures i.e.  $4.16\% < 45.51\%$  and more than the expected

risk of investment on government securities i.e. 4.16%>1.038% and loan and advances i.e. 4.16%>2.94%. The risk on investment portfolio of Banking Industry has reduced due to the lower Correlation between returns of investment on government securities and loan and advances ( $r_{gl} = 0.61$ ) and with shares and debentures ( $r_{gs} = -0.84$ ) and between loan and advances and shares and debentures ( $r_{ls} = -0.21$ ).

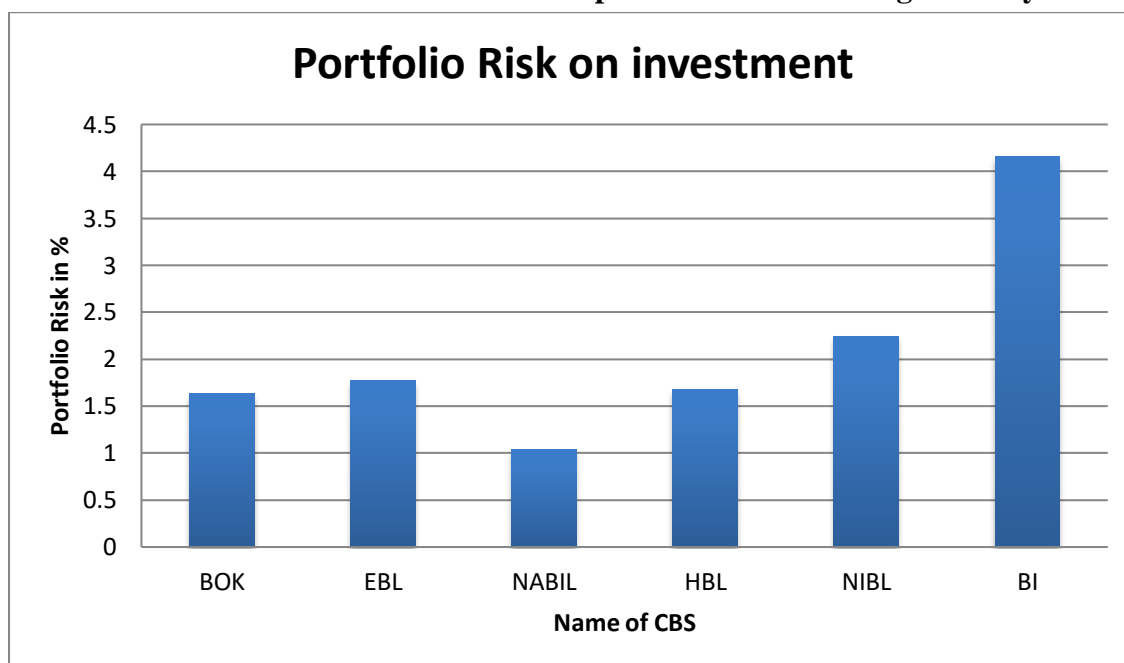
**Table 4.44**  
**Portfolio Risk on Investment of Sample Banks and Banking Industry**  
**(In Percentage)**

Assets	BOK	EBL	NABIL	HBL	NIBL	Bank Industry
Risk on Government Securities	1.039	1.339	1.596	2.221	1.430	1.038
Risk on Loan and Advances	2.17	2.13	1.65	2.00	2.44	2.94
Risk on Shares & Debentures	45.51	45.51	45.51	45.51	45.51	45.51
Portfolio Risk	1.63	1.77	1.04	1.68	2.24	4.16

Source: Annual reports of CBs and Appendix 9

**Figure 4.7**

**Portfolio Risk on Investment of Sample Banks and Banking Industry**



The above table 4.44 shows that the portfolio risk on investment of BOK, EBL, NABIL, HBL, NIBL and Banking Industry is 1.63%, 1.77%, 1.04%, 1.68%, 2.24 and 4.16% respectively. From the above analysis, it is found that NIBL has highest portfolio risk on investment on various assets among five commercial banks. Likewise, HBL, NABIL and EBL have moderate portfolio risk on investment on various assets

while BOK has lowest portfolio risk on investment on various assets. However, the portfolio risk on investment of all selected commercial banks is lower than that of portfolio risk on investment of Banking Industry.

From the above calculation it is clear that investing the total funds on loan and advances and shares and debentures is more risky than that of investment on government securities. However, average return on investment on loan and advances and shares and debentures is more than that of average return on investment on government securities. Therefore, investing wealth in more than one security helps to minimize risk.

## **4.2 Analysis of Ratios**

Ratio analysis is the process of establishing the significant relationship between the variables of financial Statement to provide a meaningful understanding of the performance and financial position of the firm. As a tool of financial analysis, ratio can be expressed in terms of percentage. With the help of ratio analysis, the qualitative judgment can be done very easily and timely regarding financial performance of the firm. In this section, major ratios that are related to the investment mechanism of commercial banks are calculated and analyzed.

### **4.2.1 Total Investment to Total Deposit Ratio**

This ratio is used to measure the ability of banks to successfully mobilize the total deposits of investment. This ratio can be calculated by dividing total investment by total deposits. It can be stated as:

$$\text{Total Investment to Total Deposit Ratio} = \frac{\text{Total Investment}}{\text{Total Deposit}}$$

In general, high ratio is the indicator of high success to mobilize the banking funds as investment and vice-versa.

The following table 4.39 shows the ratios of total investment to total deposits of sample commercial banks and Banking Industry.

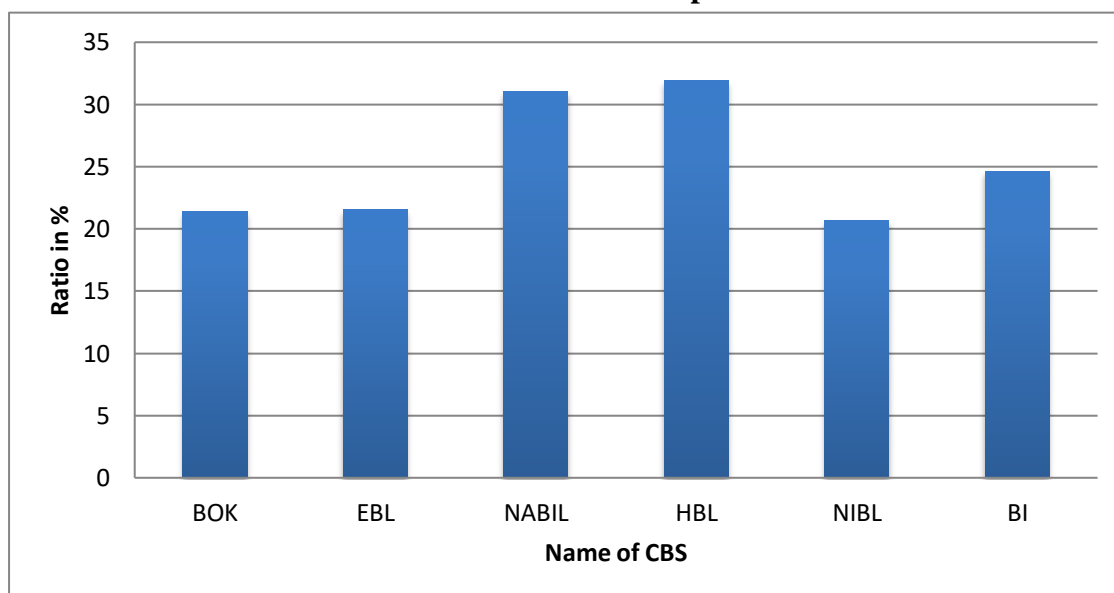
**Table 4.45**  
**Total Investment to Total Deposit Ratio (Percentage)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBL</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	32.18	30.43	31.93	41.10	29.60	28.21
2006/07	24.15	27.41	38.32	39.35	26.57	27.71
2007/08	20.24	21.10	31.14	41.89	19.95	25.57
2 00 8/09	15.39	17.85	28.99	25.12	15.85	23.22
2009/10	16.09	13.56	29.53	22.45	17.24	21.25
2010/11	20.39	18.81	26.32	21.43	14.81	21.75
Mean	21.41	21.53	31.04	31.89	20.67	24.62
S.D	5.63	5.75	3.71	8.99	5.54	2.74
C.V	26.30	26.71	11.95	28.19	26.80	11.13

Source: Annual reports of CBs and Appendix 10

**Figure 4.8**

**Total Investment to Total Deposit Ratio**



The comparative table listed above shows that the total investment to total deposit ratio of Banking Industry has quite fluctuating trend throughout the study period. During the study period, the highest ratio is 28.21 % in fiscal year 2005/06 and the lowest ratio is 21.25% in fiscal year 2009/10. The-mean ratio of Banking Industry is 24.62%.

Likewise, among the five selected commercial banks, the mean total investment to total deposit ratio of HBL is highest i.e. 31.89%. Similarly, NABIL stood at the second position with 31.04% and EBL & BOK stood at the third and fourth position with 21.53% & 21.41%. NIBL has the lowest ratio i.e. 20.67%.

From the above table it is clear that all five sample banks have higher investment to total deposit ratio than average ratio of banking industry. Based on average ratio, it can be said that all four selected banks have better capacity to mobilize its deposit on investment.

Likewise, the coefficient of variation of NABIL is the lowest i.e. 11.95%. It concludes that the variability of the ratios of NABIL is the most consistent among the five commercial banks. HBL has higher inconsistent among the five sampled banks i.e. 28.19 % because of its higher the coefficient of variation.

From the above analysis, it is clear that NABIL is the most successful bank in utilizing its resources/investments on the investment among the selected banks. Similarly, NIBL is moderate in utilizing its investment. BOK and EBL are not so successful in utilizing resources on investment.

#### 4.2.2 Investment on Government Securities to Total outside Investment Ratio

This ratio is very useful to know in which extent the commercial banks are successful in mobilizing their total outside investment in different types of government securities to maximize the income. This ratio is calculated by dividing investment on government securities by total outside investment. A high ratio indicates the efficiency of the firm in utilizing collected deposits to government securities and vice-versa.

Investment on Government Securities to Total outside investment Ratio

$$= \frac{\text{Investment on Government Securities}}{\text{Total outside investment}}$$

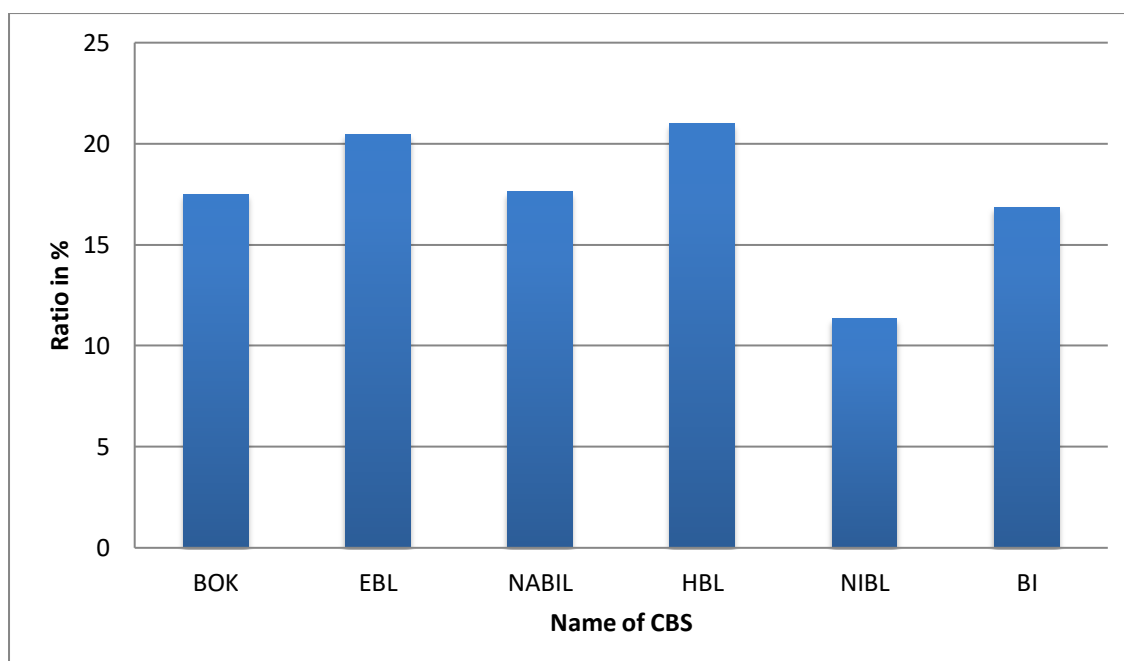
**Table 4.46**

#### **Government Securities to Total outside Investment Ratio (in percentage)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBL</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	26.54	26.54	15.01	25.95	16.47	22.52
2006/07	19.73	25.58	23.30	27.44	15.82	19.98
2007/08	14.39	20.73	17.65	27.61	10.44	17.36
2 00 8/09	10.57	17.66	11.71	14.48	6.52	13.03
2009/10	15.03	13.60	19.64	13.73	9.42	13.20
2009/11	18.61	18.65	18.33	16.83	9.45	14.96
Mean	17.48	20.46	17.61	21.01	11.35	16.84
S.D	5.03	4.50	3.62	6.09	3.60	3.50
C.V	28.78	21.99	20.56	28.99	31.72	20.78

Source: Annual reports of CBs and Appendix 11

**Figure 4.9**  
**Government Securities to Total outside Investment Ratio**



The above table no. 4.46 reveals that the mean of investment on government securities to total outside investment ratio of Banking Industry is 16.84%. The standard deviation and coefficient of variation of the ratio is 3.50% and 20.78% respectively. The table shows that the ratio of government securities total outside investment is not in fixed trend.

Among five selected banks, HBL has the highest investment on government securities to total outside investment. It means HBL utilizes highest percentage of total outside investment into government securities i.e. 21.01%. Similarly, NIBL invests lowest part of total outside investment into government securities because it has lowest investment on government securities to total outside investment ratio i.e. 11.35%.

The coefficient of variation of NIBL is the highest i.e. 31.72%. That shows that the ratios of NIBL are the least consistent. NABIL has the lowest CV i.e. 20.56%. It depicts -hat the given ratios of NABIL is the most consistent among five commercial banks.

From the above analysis, it can be concluded that the mobilization' of total outside investment into government securities of HBL is higher among other commercial banks -hat is proved by the highest ratios and lower CV. Similarly, EBL, NABIL and BOK have moderate position. However, NIBL has the weakest position for mobilization of total outside investment into government securities.

### 4.2.3 Investment on Loan and Advances to Total outside Investment Ratio

This ratio is very useful to know to what extent the banks are successful in mobilizing their total outside investment on loan and advances for profit generating purposes. This ratio is calculated by dividing investment on loan and advances by total outside investment.

Investment on loan and Advances to Total outside investment Ratio

$$= \frac{\text{Investment on loan and Advances}}{\text{Total outside investment}}$$

A high ratio of loan and advances to total outside investment indicates better mobilization of depositor's funds on loan and advances and vice versa. Nevertheless it should be noted that too high ratio might not be better from its liquidity point of view.

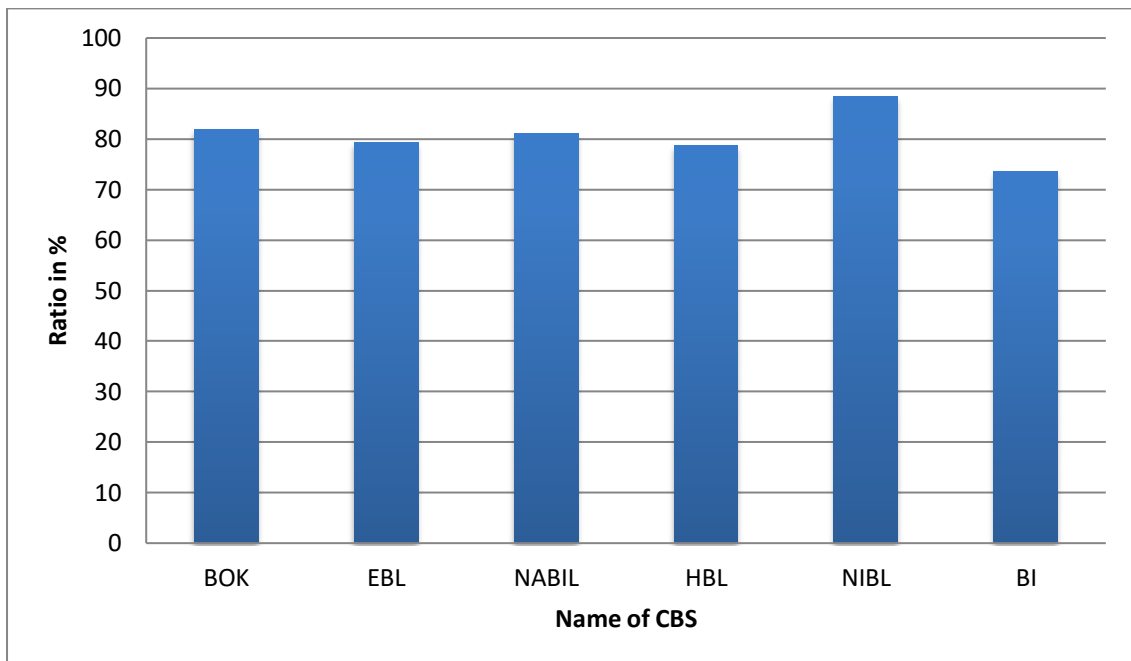
**Table 4.47**

**Loan and Advances to Total outside Investment Ratio (In Percentage)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBL</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	72.49	73.31	84.31	73.85	83.42	67.84
2006/07	79.51	74.31	75.31	72.25	84.00	70.10
2007/08	84.84	78.84	81.13	72.06	89.36	73.55
2008/09	88.69	81.99	87.17	85.20	93.32	75.31
2009/10	84.77	86.08	79.50	86.03	90.43	77.10
2009/11	81.21	81.06	79.71	82.93	90.39	78.03
Mean	81.92	79.27	81.19	78.72	88.49	73.66
S.D	5.13	4.42	3.77	6.10	3.59	3.66
C.V	6.26	5.58	4.64	7.75	4.06	4.97

Source: Annual reports of CBs and Appendix 12

**Figure4.10**  
**Loan and Advances to Total outside Investment Ratio of CBs**



The above table no. 4.47 reveals that the mean of loan and advances to total outside investment ratio of Banking Industry is 73.66%. The standard deviation and coefficient of variation of the ratio is 3.66% and 4.97% respectively. The table shows that the ratio of loan and advances to total outside investment is not in fixed trend.

Among the five selected banks, the mean loan and advances to total outside investment ratio of NIBL is the highest i.e. 88.49%. Similarly, BOK stood at the second position taking 81.92% and EBL, HBL, NABIL stood at the moderate position with 79.27%, 78.72% & 81.89% respectively

The coefficient of variation of NIBL is the lowest. It shows NIBL seems to be more consistent in investing its total outside investment in loan and advances. HBL is less consistent in investing its total outside investment in loan and advances because its C.V. is highest among five banks.

#### **4.2.4 Investment on Shares and Debenture to Total Outside Investment Ratio**

The ratio between investment on shares and debentures and total outside investment reflects the extent to which the bank: are successful to mobilize their total outside investment on purchase of shares and debenture of other companies. It is obtained by dividing investment on shares and debentures by total outside investment.



Investment on Shares and Debentures to Total outside investment Ratio

$$= \frac{\text{Investment on Shares and Debentures}}{\text{Total outside investment}}$$

A higher ratio indicates more portion of investment on shares and debentures out of total outside investment and vice-versa.

**Table 4.48**

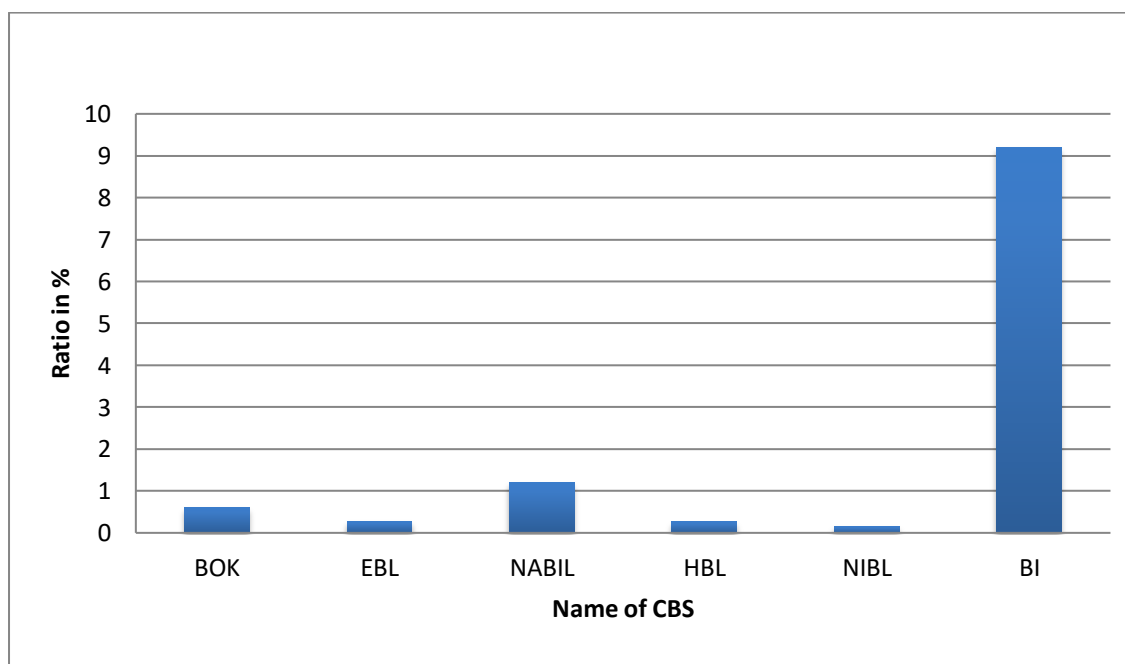
**Shares and Debentures to Total outside Investment Ratio (In Percentage)**

Fiscal year	BOK	EBL	NABIL	HBL	NIBL	Banking Industry
2005/06	0.97	0.75	0.68	0.20	0.12	9.64
2006/07	0.76	0.11	1.39	0.31	0.17	9.02
2007/08	0.78	0.43	1.23	0.33	0.20	9.09
2008/09	0.75	0.35	1.12	0.32	0.17	11.65
2009/10	0.20	0.32	0.85	0.24	0.15	8.80
2010/11	0.19	0.29	1.96	0.23	0.16	7.00
Mean	0.61	0.28	1.21	0.27	0.16	9.2
S.D	0.30	0.11	0.41	0.05	0.02	1.37
C.V	49.18	39.29	33.88	18.52	12.50	14.89

*Source: Annual reports of CBs and Appendix 13*

**Figure 4.11**

**Shares and Debentures to Total outside Investment Ratio**



Investment on Shares and Debentures to Total Outside Investment Ratio of CBs. The comparative table listed above reveals that the investment on shares and debentures to total outside investment ratio of Banking Industry has fluctuating trend. It shows that Banking Industry invest very low ' portion of its total outside investment on shares and debentures of other companies. Among five commercial banks, NABIL has highest ratio on shares and debenture to total outside investment i.e. 1.21%. That means among five commercial banks, NABIL utilized highest percentage of total outside investment on share and debentures. Similarly, NIBL has lowest ration on share and debenture to total outside investment ratio i.e. 0.16% that means NIBL invest lowest portion of total outside investment on shares and debentures.

Likewise, the coefficient of variation of BOK is highest i.e. 49.18%. This shows that the ratio of the bank is less consistent and more variable. The lowest C.V. of NIBL shows that it has least variability in investment on-shares and debentures to total outside investment. From the above analysis, it can be concluded that the commercial banks are not successful to mobilize their resources in the field of shares and debentures of other companies. They invested very nominal percentage of total outside investment on shares and debenture of other companies.

Lastly, it can also be concluded that the investment on shares and debentures to total outside investment ratio of selected five commercial banks is very low compared to the ratio of Banking Industry. The ratio of total industry is 9.20% where as the five selected commercial banks have the ratio less than 0.30%.

#### **4.2.5 Return on Total Asset Ratio**

This ratio measures the profitability of the banks with respect to the total assets. This ratio seems to be vital for measuring financial performance of the firms or shows the efficiency of banks in using its overall resources. The higher ratio indicates the effective utilization of resources in different sectors and yields a higher return for the banks. This ratio is calculated by dividing the net profit after tax by total assets, which can be stated as:

$$\text{Return on Total Asset Ratio} = \frac{\text{Net Profit After Tax}}{\text{Total Assets}}$$

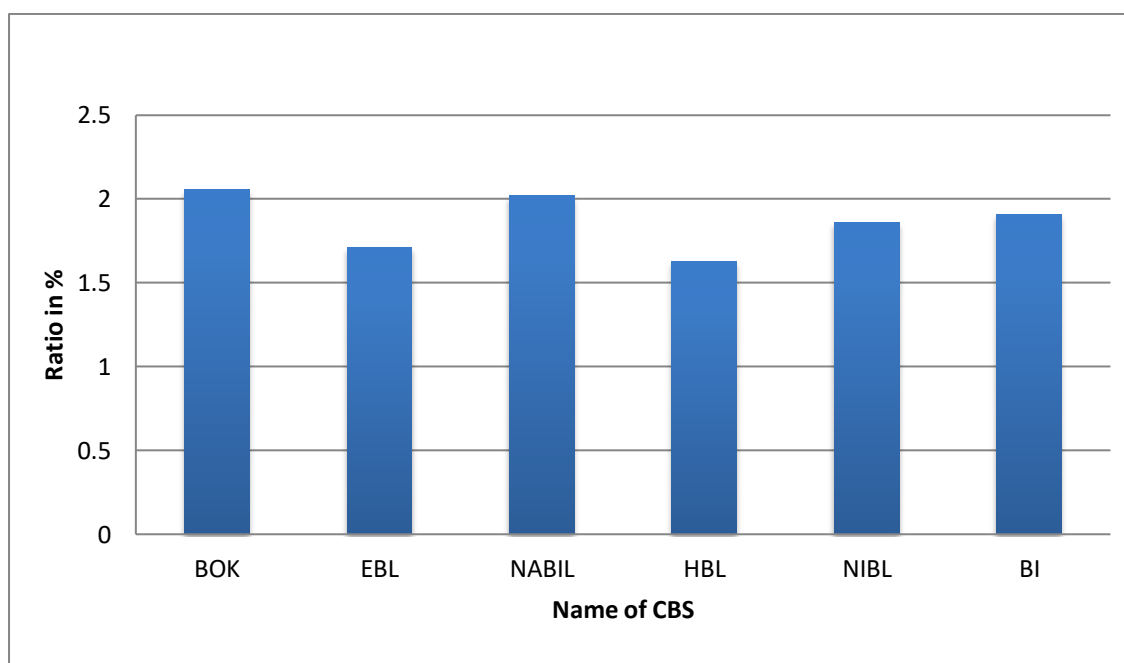
The returns on total assets of different commercial banks are listed below.

**Table 4.49**  
**Return on Total Asset Ratio of CBs (I Percentage)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBL</b>	<b>NAB IL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	1.65	1.49	1.57	1.55	1.64	2.05
2006/07	1.80	1.38	1.84	1.47	1.82	1.82
2007/08	2.04	1.66	1.88	1.76	1.79	2.11
2008/09	2.25	1.73	2.35	1.91	1.70	1.76
2009/10	2.18	2.01	2.19	1.19	2.21	1.95
2010/11	2.44	2.01	2.30	1.91	2.02	1.78
Mean	2.06	1.71	2.02	1.63	1.86	1.91
S.D	0.27	0.24	0.28	0.26	0.20	0.13
C.V	13.11	14.04	13.86	15.05	10.75	6.81

*Source: Annual reports of CBs and Appendix 14*

**Figure 4.12**  
**Return on Total Asset Ratio of CBs**



The table no. 4.49 shows that the mean return on total asset ratio of Banking Industry is 1.91%. The standard deviation and C.V. of the ratio are 0.13% and 6.81% respectively. During the study period, BOK earned the highest ratio i.e. 2.25%. While examining the mean ratio, BOK has the highest ratio i.e. 2.06% and HBL has the lowest ratio i.e. 1.63% among five commercial banks.

The lowest C.V. of NIBL i.e. 10.75% shows that the return on total assets of NIBL is the most consistent than other banks. Similarly, the highest C.V. in the ratios of HBL

i.e. 15.05% shows the return on total assets of HBL is highly variable among five banks.

Finally, it can be concluded that BOK is the best bank in relation to return on total assets ratio. That means the BOK utilized its overall resources efficiently than other banks. Similarly, the ratio of NABIL also reflects that it is also successful in utilization of overall resources. The profitability position of NIBL is the weakest in relation to return on total assets during study period among five commercial banks.

### **4.3 Trend Analysis**

Trend analysis is a statistical tool that highlights the previous-trend and forecasts for a future with the help of past and present information. The purpose of trend analysis in this section is to analyze the trend of total investment and investment on various assets such as government securities, loan and advances and shares and debentures of commercial banks and forecast for the next 5 years.

Here, method of least square is used to determine trend value. Under this method, the trend line between the dependent variable  $y$  and the independent variable  $x$  (i.e. time) be represented by

$$y_c = a + bx$$

Where,

$y_c$  = Dependent Variable

$a$  =  $y$  – intercept

$b$  = Slope of the trend line

$x$  = Independent variable

To make calculation 'easier, the deviation of the independent variable (i.e. time) are taken from the middle of the time period so that  $\sum x = 0$  . Then the value of  $a$  and  $b$  can be easily calculated by using following formula:

$$a = \frac{\sum y}{n} \text{ and } b = \frac{\sum xy}{\sum x^2}$$

#### **4.3.1 Trend Analysis of Investment on Government Securities**

In this section, an attempt is made to calculate the trend values of investment on government securities of sample banks and Banking Industry. The efforts has been made to analyze total investment on government securities of commercial banks for 6 years from 2005 to 2011 and forecast of the same for next 6 years till 2017. The trend values of investment on government securities of selected commercial banks and banking industry are shown in the following table.

**Table No. 4.50**

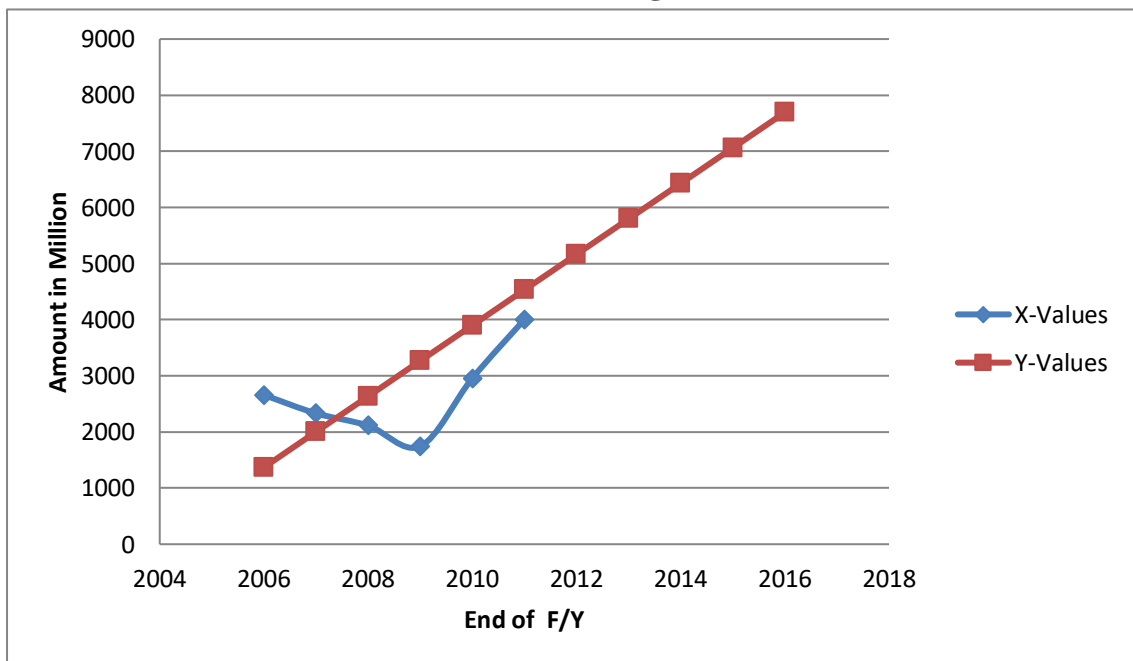
**Trend analysis of investment on government securities of BOK (Rs. in Millions)**

Year (t)	$x=(t - 2008)$	Actual Value	Trend Value $y_c = 2634.38 + 632.24x$
2006	-2	2658.369	1369.8
2007	-1	2332.041	2002.04
2008	0	2113.223	2634.28
2009	1	1744.977	3266.52
2010	2	2954.932	3898.76
2011	3	4002.138	4531.00
2012	4		5163.24
2013	5		5795.48
2014	6		6427.72
2015	7		7059.96
2016	8		7692.20
2017	9		8324.44

Source: Annual reports of BOK and Appendix 15 (a)

**Figure 4.13**

**Trend and Actual Value of investment on government securities of BOK**



The above table shows that 'a' i.e. y-intercept and 'b' i.e. slope of the trend line of investment on government securities of BOK are Rs.2634.28 million and Rs.632.34 million respectively. Since the slope of the trend line is positive, it shows that the investment on government securities BOK is increasing by Rs.632.34 million per year.

From the above equation, forecasted investment on government securities for- coming six years would be Rs.5163.24 million, Rs.5795.48 million, Rs. 6427.72 million, Rs.7059.96 million, Rs.7692.20 and Rs. 8324.44 million respectively. It has increased from Rs.1369.8 million to Rs.8324.44 million i.e. 6.08 times.

**Table No. 4.51**  
**Trend analysis of investment on government securities of EBL (Rs. in Millions)**

Year (1)	x=(t -2008)	Actual Value	Trend Value $y_c=2634.38+632.24x$
2006	-2	3548.617	2480.96
2007	-1	4704.632	3717.17
2008	0	4821.605	4953.38
2009	1	5146.046	6189.59
2010	2	4354.353	7425.8
2011	3	7145.017	8662.01
2012	4		9898.22
2013	5		11134.43
2014	6		12370.64
2015	7		13606.85
2016	8		14843.06
2017	9		16079.27

Source: Annual reports of EBL and Appendix 15 (b)

From the above table, the positive slope of trend line shows that the investment trend of EBL on government securities is in increasing trend. It is increasing by Rs.7310.72 million per year and is expected to reach Rs.16079.27 million at the end of year 2017. Therefore, it is clear that investment on government securities of EBL has increased 6.48 times ( $16079.27 / 2480.96=6.48$ ) during the period.

**Table No. 4.52**  
**Trend analysis of investment on government securities of NABIL (Rs. in Millions)**

Year (1)	x=(t -2008)	Actual Value	Trend Value $y_c =5363.62+1919.89x$
2006	-2	2301.463	1523.84
2007	-1	4808.348	3443.73
2008	0	4646.883	5363.62
2009	1	3706.102	7283.51
2010	2	7973.664	9203.40
2011	3	8745.231	11123.29
2012	4		13043.18
2013	5		14963.07
2014	6		16882.96
2015	7		18802.85
2016	8		20722.74
2017	9		22642.63

Source: Annual reports of NABIL and Appendix 15 (c)

From the above table, the positive slope of trend line shows that the investment trend of NABIL on government securities is in increasing trend. It is increasing by Rs.1919.89 million per year and is expected to reach Rs.22642.63 million at the end of year 2017. Therefore, it is clear that investment on government securities of NABIL has increased 14.86 times ( $22642/1523.84=14.86$ ) during the period.

**Table No. 4.53**

**Trend analysis of investment on government securities of HBL (Rs. in Millions)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c =5692.65+822.19x$
2006	-2	5144.313	4048.27
2007	-1	6454.843	4870.46
2008	0	7471.668	5692.65
2009	1	4212.30	6514.84
2010	2	4465.372	337.03
2011	3	6407.363	8159.22
2012	4		8981.41
2013	5		9803.60
2014	6		10625.79
2015	7		11447.98
2016	8		12270.17
2017	9		13092.36

Source: Annual reports of HBL and Appendix 15 (d)

From the above table, the positive slope of trend line shows that the investment trend of HBL on government securities is in increasing trend. It is increasing by Rs.6798.54 million per year and is expected to reach Rs.13092.36 million at the end of year 2017. Therefore, it is clear that investment on government securities of HBL has increased 3.23 times ( $13092.36/4048.27=3.23$ ) during the period.

**Table No. 4.54**

**Trend analysis of investment on government securities of NIBL (Rs. in Millions)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c =3326.91+816.73x$
2006	-2	2522.300	1693.45
2007	-1	3256.400	2510.18
2008	0	3455.000	3326.91
2009	1	2531.300	4143.64
2010	2	4201.850	4960.37
2011	3	4294.600	5777.10
2012	4		6593.83
2013	5		7418.56
2014	6		8227.129
2015	7		9044.02
2016	8		5860.75
2017	9		10677.48

Source: Annual reports of NIBL and Appendix 15 (e)

From the above table, the positive slope of trend line shows that the investment trend of NIBL or government securities is in increasing trend, It is increasing by Rs.816.73 million per year and is expected to reach Rs.10677.48 million at the end c year 2017. Therefore, it is clear that investment on government securities of NIBL has increased 6.30 times ( $10677.48/1693.45= 6.30$ ) during the period.

**Table 4.55**

**Trend Analysis of Investment on Govt. Securities of Banking Industry (Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c =73621.083+18333.78x$
2006	-2	57539.1	36953.52
2007	-1	64443.0	55287.3
2008	0	71495.5	73621.08
2009	1	68902.0	91954.83
2010	2	79079.6	110288.64
2011	3	100267.3	128622.42
2012	4		146956.2
2013	5		165289.98
2014	6		183623.76
2015	7		201957.54
2016	8		220291.32
2017	9		2386325.1

Source: Banking and Financial Statistics of NRB and Appendix 15 (f)

From the above table, the positive slope of trend line shows that the investment trend of Banking Industry on government securities is in increasing trend. It is increasing by Rs.18333.784million per year and is expected to reach Rs.238625.1 million at the end of year 2017. Therefore, it is clear that investment on government securities of Banking Industry has increased 6.46 times ( $238625.1/36953.52= 6.46$ ) during the period.

From the above trend analysis, finally it can be concluded that the investment on government securities of all five sample banks and Banking Industry is increasing. In comparison, increasing ratio on government securities of NABIL is highest among other sample banks i.e. it has increased 14.86 times of its investment on government securities during the period. While comparing with Banking Industry, the increasing ratio of NABIL and EBL is greater than that of Banking Industry i.e. (14.86 and  $6.48>6.46$ ) but HBL has lower increasing ratio than that of Banking Industry i.e.  $3.23<6.46$ ).

#### **4.3.2 Trend Analysis of Investment on Loan and Advances**

In this section, an attempt has been made to calculate the trend values of investment on loan and advances of sample banks and Banking Industry. The efforts has been made to analyze total investment on loan and advances of commercial banks for 6 years from 2005 to 2011 and forecast of the same for next 6 years till 2017. The trend values of



investment on loan and advances of selected commercial banks and Banking Industry are given in the following tables:

**Table 4.56**

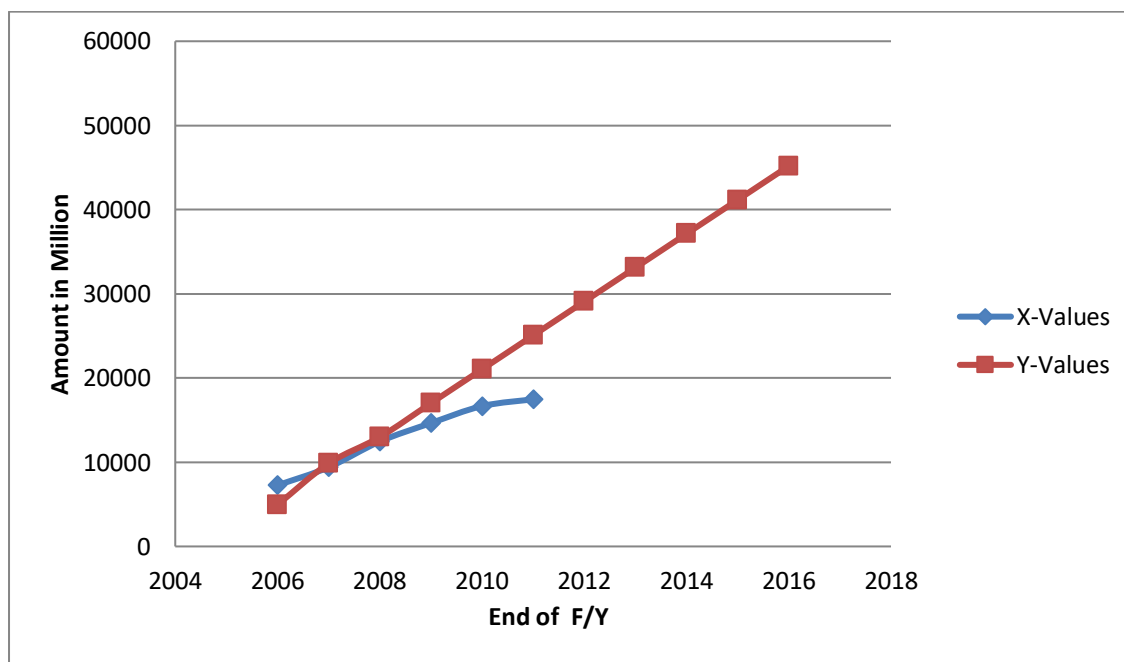
**Trend Analysis of Investment on Loan and Advances of BOK (Rs. in Million):**

Year (1)	$x=(t-2008)$	Actual Value	Trend Value $y_c = 12983.58 + 4224.43x$
2006	-2	7259.083	4943.72
2007	-1	9399.328	9858.15
2008	0	12462.637	12983.58
2009	1	14647.297	17008.01
2010	2	16664.931	21032.44
2011	3	17468.192	25056.87
2012	4		29081.30
2013	5		33105.73
2014	6		37130.16
2015	7		41154.59
2016	8		45179.02
2017	9		49203.45

Source: Annual reports of BOK and Appendix 15 (g)

**Figure 4.14**

**Trend and Actual Value of Investment on Loan and Advances of BOK**



From the above table, the positive slope of trend line shows that the investment trend of BOK on loan and advances is in increasing trend. It is increasing by Rs.4024.4 million per year and is expected to reach Rs.49203.45 million at the end of year 2017.

Therefore, it is clear that investment on loan and advances of BOK has increased 9.97 times (49203.45/ 4934.72) during the period.

**Table 4.57**

**Trend Analysis of Investment on Loan and Advances of EBL (Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_C =20717.20+7310.72x$
2006	-2	9801.308	6095.76
2007	-1	13664.081	13406.48
2008	0	18339.086	20717.20
2009	1	23884.674	28027.92
2010	2	27756.356	35338.64
2011	3	31057.691	42649.36
2012	4		49960.08
2013	5		57270.80
2014	6		64581.52
2015	7		71892.24
2016	8		79202.98
2017	9		86513.68

Source: Annual reports of EBL and Appendix 15 (h)

From the above table, the positive slope of trend line shows that the investment trend of EBL on loan and advances is in increasing trend. It is increasing by Rs.7310.72 million per year and is expected to reach Rs.86513.68 million at the end of year 2017.

Therefore, it is clear that investment on loan and advances of EBL has increased 14.19 times (86513.68 /6095.76=14.19) during the period.

**Table 4.58**

**Trend Analysis of Investment on Loan and Advances of NABIL (Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_C =24621.05+8675.74x$
2006	-2	12922.543	7269.57
2007	-1	15545.778	15945.31
2008	0	21365.053	24621.05
2009	1	27589.933	33296.79
2010	2	32268.873	41972.53
2011	3	38034.098	50648.27
2012	4		59324.01
2013	5		67999.75
2014	6		76675.49
2015	7		85351.23
2016	8		94026.97
2017	9		102702.71

Source: Annual reports of NABIL and Appendix 15 (i)

From the above table, the positive slope of trend line shows that the investment trend of NABIL on loan and advances is in increasing trend. It is increasing by Rs.1675.74 million per year and is expected to reach Rs.102702.71 million at the end of year 2017. Therefore, it is clear that investment on loan and advances of NABIL has increased 14.13 times ( $102702.71 / 7269.57 = 14.13$ ) during the period.

**Table 4.59**

**Trend Analysis of Investment on Loan and Advances of HBL (Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c = 22579.81 + 6798.54x$
2006	-2	14642.560	8982.73
2007	-1	16997.997	15781.27
2008	0	19497.520	22979.81
2009	1	24793.155	29378.35
2010	2	27980.629	36176.89
2011	3	31566.977	42975.43
2012	4		49773.97
2013	5		56572.51
2014	6		63371.05
2015	7		70169.59
2016	8		76968.13
2017	9		83766.67

Source: Annual reports of HBL and Appendix 15 (j)

From the above table, the positive slope of trend line shows that the investment trend of HBL on loan and advances is in increasing trend. It is increasing by Rs.6798.54 million per year and is expected to reach Rs.83766.67 million at the end of year 2017. Therefore, it is clear that investment on loan and advances of HBL has increased 9.32 times ( $83766.67 / 8982.73 = 9.32$ ) during the period.

**Table 4.60**

**Trend Analysis of Investment on Loan and Advances of NIBL (Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c = 29119.05 + 10385.55x$
2006	-2	12776.208	8347.95
2007	-1	17286.427	18733.50
2008	0	26996.652	29119.05
2009	1	36241.207	39504.60
2010	2	40318.308	49890.15
2011	3	41095.515	60275.70
2012	4		70661.25
2013	5		81046.80
2014	6		91432.35
2015	7		101817.90
2016	8		112203.45
2017	9		122589.00

Source: Annual reports of NIBL and Appendix 15 (k)

From the above table, the positive slope of trend line shows that the investment trend of NIBL on loan and advances is in increasing trend. It is increasing by Rs.90385.55 million per year and is expected to reach Rs.122589.00 million at the end of year 2017. Therefore, it is clear that investment on loan and advances of NIBL has increased 14.68 times ( $122589.00 / 8347.95 = 14.68$ ) during the period.

**Table 4.61**  
**Trend Analysis of Investment on Loan and Advances of Banking Industry**  
**(Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c$ $=348892.03+122378.87x$
2006	-2	173383.4	104134.29
2007	-1	228951.9	226513.16
2008	0	302913.4	348892.03
2009	1	398143.0	471270.9
2010	2	467107.0	593649.77
2011	3	522853.3	716028.64
2012	4		838407.51
2013	5		960786.38
2014	6		1083165.25
2015	7		1205544.12
2016	8		1327922.99
2017	9		1450301.86

Source: Banking and Financial Statistics of NRB and Appendix 15 (l)

From the above table, the positive slope of trend line shows that the investment trend of Banking Industry on loan and advances is in increasing trend. It is increasing by Rs.122378.87 million per year and is expected to reach Rs.1450301.86 million at the end of year 2017. Therefore, it is clear that investment on loan and advances of Banking Industry has increased 13.93 times ( $1450301.86/104134.29=13.93$ ) during the period.

From the above trend analysis, finally it can be concluded that the investment on loan and advances of all five sample banks and Banking Industry is increasing. In comparison, increasing ratio on loan and advances of NIBL is highest among sample banks i.e. it has increased 14.68 times of its investment on loan and advances during the period. EBL occupied second position in investment on loan and advances while BOK has occupied lowest position in investment on loan and advances i.e. it has increased only 5.05 times of its investment on loan and advances during the period. It is because BOK has invested low portion of its total outside investment on loan and advances. While comparing with Banking Industry, the increasing ratio of EBL, NABIL & IBL banks is greater than that of Banking industry i.e. (14.19,14.13 and 14.68 >13.93) and BOK and HBL are less than banking industry ie (9.97 and 9.32<13.93)

### 4.3.3 Trend Analysis of Investment on Shares and Debentures

In this section, an attempt has been made to calculate the trend values of investment on shares and debentures of sample banks and banking industry. The efforts has been made to analyze total investment on shares and debentures of sample banks and Banking Industry for 6 years from 2005 to 2011 and forecast of the same for next 6 years till 2017.

The trend values of investment on shares and debentures of sample banks and banking industry are shown in the following tables

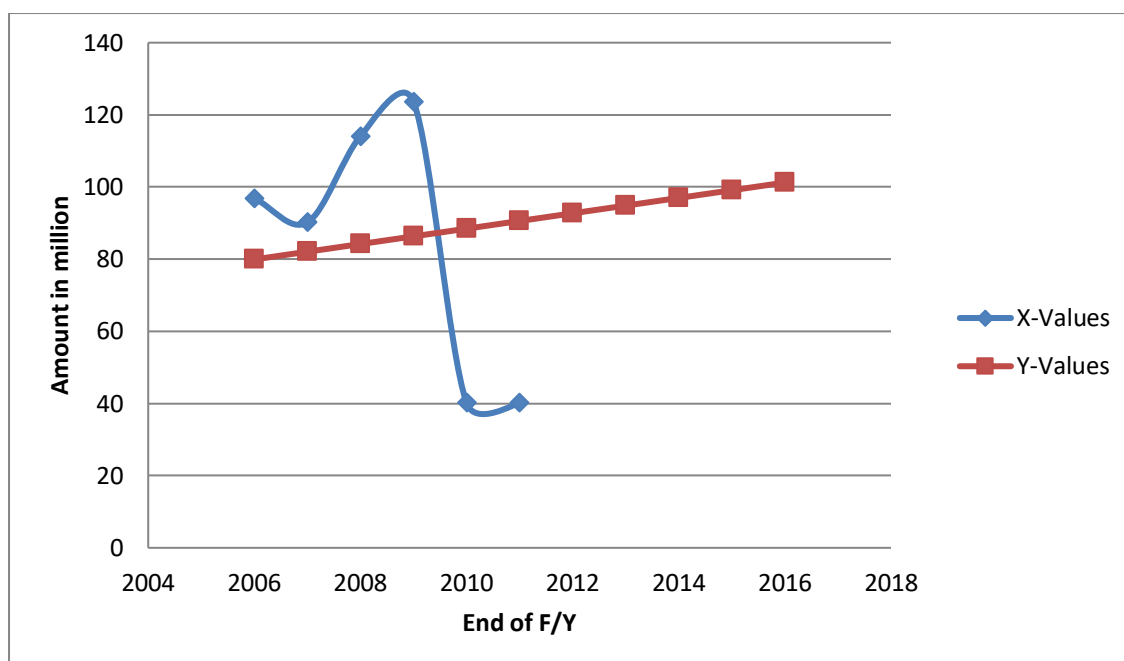
**Table 4.62**  
**Trend Analysis of Investment on Shares and Debentures of BOK**  
**(Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c$ $=84.19+2.13x$
2006	-2	96.868	79.93
2007	-1	90.169	82.06
2008	0	114.059	84.19
2009	1	123.671	86.32
2010	2	40.140	88.45
2011	3	40.140	90.58
2012	4		92.71
2013	5		94.84
2014	6		96.97
2015	7		99.10
2016	8		101.23
2017	9		103.36

Source: Annual reports of BOK and Appendix 15 (m)

**Figure 4.15**

**Trend and Actual Value of Investment on Shares and Debenture of BOK**



The above table shows that 'a' i.e. y-intercept and 'b' i.e. slope of the trend line of investment on shares and debentures of BOK are Rs. 84.188 million and Rs.2.134 million respectively. The slope of the trend line shows that the total investment of BOK is increasing by Rs.2.134 million per year.

From the above equation, forecasted investment on shares and debenture of BOK for coming six years would be Rs.92.71 million, Rs.94.84 million, Rs.96.97 million, Rs.99.10 million Rs.101.23 million and Rs. 103.36 million respectively. It has increased from Rs.79.93 million to Rs.103.236 million i.e. nearly 1.29 times.

**Table 4.63**

**Trend Analysis of Investment on Shares and Debentures of EBL Rs in million**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_c$ $=75.79+30.27x$
2006	-2	19.887	15.52
2007	-1	19.887	45.49
2008	0	101.152	75.76
2009	1	102.035	106.03
2010	2	102.035	136.30
2011	3	109.576	166.57
2012	4		196.84
2013	5		227.11
2014	6		257.38
2015	7		287.65
2016	8		317.92
2017	9		348.19

Source: Annual reports of EBL and Appendix 15 (n)

From the above table, the positive slope of trend line shows that the investment trend of EBL on shares and debentures is in increasing trend. It is increasing by Rs.30.27 million per year and is expected to reach Rs.348.19 million at the end of year 2017. Therefore, it is clear that investment loan and advances of EBL has increased 22.43 times ( $348.19 / 15.52 = 22.43$ ) during the period.

**Table 4.64**  
**Trend Analysis of Investment on Shares and Debentures of NABIL**  
**(Rs. in Million)**

Year (1)	x=(t -2008)	Actual Value	Trend Value $y_c = 392.09 + 176.97x$
2006	-2	104.192	38.15
2007	-1	286.958	215.12
2008	0	323.236	392.09
2009	1	354.931	569.06
2010	2	346.856	746.03
2011	3	936.386	923.00
2012	4		1099.97
2013	5		1276.94
2014	6		1453.91
2015	7		1630.88
2016	8		1807.85
2017	9		1984.82

Source: Annual reports of NABIL and Appendix 15 (o)

From the above table, the positive slope of trend line shows that the investment trend of NABIL on shares and debentures is in increasing -trend. It is increasing by Rs. 176.97 million per year and is expected to reach Rs.1984.82 million at the end of year 2017. Therefore, it is clear that investment on loan and advances of NABIL has increased 52.03 times ( $1984.82 / 38.15 = 52.03$ ) during the period.

**Table 4.65**  
**Trend Analysis of Investment on Shares and Debentures of HBL (Rs. in Million)**

Year (1)	x=(t -2008)	Actual Value	Trend Value $y_c = 77.41 + 19.20x$
2006	-2	39.909	39.01
2007	-1	73.424	58.21
2008	0	89.558	77.41
2009	1	93.883	96.61
2010	2	78.882	115.81
2011	3	88.787	135.01
2012	4		154.21
2013	5		173.41
2014	6		192.61
2015	7		211.81
2016	8		231.01
2017	9		250.21

Source: Annual reports of HBL and Appendix 15 (p)

Trend and Actual Value of Investment on Shares and Debentures of HBL From the above table, the positive slope of trend line shows that the investment trend of HBL on shares and debentures is in increasing -trend. It is increasing by Rs. 19.20 million per year and is expected to reach Rs.250.21 million at the end of year 2017. Therefore, it is clear that investment on loan and advances of HBL has increased 6.41 times ( $250.21 / 39.01 = 6.41$ ) during the period.

**Table 4.66**

**Trend Analysis of Investment on Shares and Debentures of NIBL (Rs. in Million)**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_C =52.79+18.19x$
2006	-2	17.738	16.41
2007	-1	35.253	34.60
2008	0	59.946	52.79
2009	1	64.279	70.98
2010	2	66.646	89.17
2011	3	72.912	107.36
2012	4		125.55
2013	5		143.74
2014	6		161.93
2015	7		180.12
2016	8		198.31
2017	9		216.50

Source: Annual reports of NIBL and Appendix 15 (q)

From the above table, the positive slope of trend line shows that the investment trend of NIBL on shares and debentures is in increasing -trend. It is increasing by Rs. 18.19 million per year and is expected to reach Rs.216.50 million at the end of year 2017. Therefore, it is clear that investment on loan and advances of NIBL has increased 13.19 times ( $2160.50 / 16.41 = 13.19$ ) during the period.

**Table 4.67**

**Trend Analysis of Investment on Shares and debentures of banking industry**

Year (1)	$x=(t -2008)$	Actual Value	Trend Value $y_C =42062.67+12070.37x$
2006	-2	24634.7	17921.93
2007	-1	29087.8	29992.3
2008	0	37459.3	42062.67
2009	1	61595.5	54133.04
2010	2	52697.3	66203.41
2011	3	46901.4	78273.78
2012	4		90344.15
2013	5		102414.52
2014	6		114484.89
2015	7		126555.26
2016	8		138625.63
2017	9		150696.00

Source- Banking and Financial Statistic of NRB and Appendix 15 (r)



From the above table, the positive slope of trend line shows that the investment trend of Banking Industry on shares and debentures is in increasing trend. It is increasing by Rs. 12070.374 million per year and is expected to reach Rs.150696.00 million at the end of year 2017. Therefore, it is clear that investment on shares and debentures of Banking Industry has increased 8.41 times ( $150696.00 / 17921.93 = 8.41$ ) during the period.

From the above trend analysis, finally it can be concluded that the investment on shares and debentures of all five sample banks and Banking Industry is increasing. In comparison, increasing ratio in shares and debentures of NABIL is highest among sample banks i.e it has increased 52.03 times of its investment on shares and debentures during the period. EBL occupied second position in investment on shares and debentures while BOK has occupied lowest position in investment on shares and debentures i.e. it has increased only 1.29 times of its investment on shares and debentures during the period. While comparing with Banking Industry, the increasing ratio of EBL, NIBL, NABIL, are greater than Banking Industry (i.e. 22.43, 52.03, 13.19 > 8.41) and BOK, HBL are lower than that of Banking Industry i.e. ( i.e. 1.29, 6.41, < 8.41. -

From the above trend analysis, finally it can be concluded that the investment of sample banks and Banking Industry on various assets like government securities, loan and advances and shares and debentures are in increasing trend.

While analyzing Banking Industry, the increasing ratio in shares and debentures ( $150696.00/17921.93=8.41$ times) is lowest than loan and advances ( $1450301.86/104134.29=13.93$  times) and highest than government securities ( $238625.1/36953.52=6.46$  times) It shows that investment on shares and debenture is increasing more rapidly than government security. Similarly, loan and advances is increasing more rapidly than government securities during the period of 2005 to 2017.

## CHAPTER - FIVE

### **5. SUMMARY, CONCLUSION AND RECOMMENDATION**

This chapter summarizes the whole study, draws the conclusion from the study and forwards recommendations for further improvement. Summary is a brief introduction of whole study. Conclusions are made based on the analysis of relevant data by using various financial and statistical tools that presents the strength, weakness, opportunities and threats of the commercial banks. Recommendations are presented in terms of suggestions, which are prepared based on findings and conclusion.

#### **5.1 Summary of the Study**

Commercial banks are major financial institutions, which occupy very important place in the framework of every economy. It plays vital role in capital formulation, proper utilization of collected funds and providing various types of banking services. Commercial banks collect money from public by providing sound interest and can earn profit by lending it in business organization, industry, agricultural sectors etc. Therefore, we can say the main task of commercial bank, is to mobilize idle resources in productive areas by collecting it from scattered sources and generating profit. Banks plays the role of intermediary between saving and investment and fulfills the credit needs of customers as well as investment requirements of savers. Thus, it is clear that efficient and stable banking systems are crucial for an orderly economic growth.

Successful formulation and effective implementation of investment policy is the prime requisite for the better performance of commercial banks. Similarly, good investment policy has a positive impact on economic development of the country and vice-versa. Bank should attract to its customers by implementing best or competitive investment policy. It helps to increase the quality of banking services as well as volume of quality deposits and its investment in various sectors. Investment management of a bank is guided by the investment policy adopted by the bank. The investment policy of the bank helps the investment operation of the bank to be efficient and profitable by minimizing the inherent risk. Therefore, the commercial bank must mobilize its deposits and other funds to profitable, secured, stable and marketable sectors so that it can earn a good profit.

The investment portfolio is a collection of securities. It simply represents the practice among the investors having their funds in more than one asset. Portfolio theory deals with the selection of optimal portfolio that is portfolio provides the highest possible return for any specified degree of risk or lowest possible risk for any specified return. The income or profit of the bank entirely depends upon its investment decision.

Considering this fact, the bank should never invest its funds in individual security alone, which is subject to too much depreciation and fluctuations. Banks should accept that types of securities, which are commercial, marketable, stable, liquid and profitable. A bank should not lay all its eggs on the same basket i.e. to minimize risk a bank must diversify its investment on different sectors and in different securities.

To attain the objectives of the study, various analysis such as risk and return analysis of individual assets as well as investment portfolio, ratio analysis and trend analysis have been done. Four commercial banks are taken as reference for the analysis. During, the research work, a brief review of literature has been conducted. For this, various textbooks and published journals have been reviewed. The required data for the study is collected from the concerned banks, NRB, NEPSE, SEGO and campus library. According to the need and objectives, the secondary data are compiled, processed, tabulated and graphed for the better presentation.

As per risk and return analysis, return on government securities is low but it has also lower risk. Similarly, loan and advances give more return than government securities but it has also higher risk than government securities. In the same way, share and debenture are also higher risky securities that give higher return than government securities and loan and advances.

**With respect to ratio analysis,** different ratios related to investment portfolio have been used. The loan and advance to total outside investment of NIBL is the highest (88.49%) than other three sample commercial banks. Similarly, investment on government securities to total outside investment of HBL and investment on share & debentures to total outside investment as well as total investment to total deposit ratio of NABIL are the highest among other sample banks (i.e. 21.01 & 2.02). However, the profitability position of all other banks is lower than NABIL. The analysis shows that all sample commercial banks invested very nominal percentage of total outside investment on share and debenture of other companies.

**As per trend analysis,** investment on various assets like government securities, loan and advances and shares and debentures are in increasing trend. Increasing ratio of shares and debentures is greater than increasing ratio of loan and advances. Similarly, increasing ratio of loan and advances is greater than increasing ratio of government securities. From analysis, NABIL has highest investment on government securities (14.86 times) and NIBL has highest investment on loan and advances (14.68 times) comparatively to other sample banks. But in case of investment on share and debenture, NABIL is the highest investor among other banks. (ie 52.03 times)

## **5.2 Conclusion of the Study**

As per analysis and interpretation of data, following conclusions have been derived.

### **5.2.1 Risk and Return Analysis**

The general assumption is that there is little, risk on investment on government securities. It is proved from the above analysis. The standard deviation of government securities is lowest than standard deviation of other securities. The risk and return on shares and debentures both are higher the other assets. Hence, it is clear from analysis that investment on shares and debenture is highly risky than other assets.

- Portfolio return is slightly lower than average return from loan and advances and shares and debentures but higher than that of government securities. Similarly, the risk on investment portfolio is less than that of risk on shares and debentures and loan and advances but it is- higher than that of risk on government securities.

### **5.2.2 Ratio Analysis**

All sample banks gave first priority to invest their resources on loan and advances. Similarly, the sample banks gave second priority government securities and least priority to shares and debentures.

The sample banks are not successful to mobilize their resources on shares and debentures of other companies. They invest only nominal percentage of total outside investment on shares and debentures.

The return on total asset ratio shows that NABIL has utilized resources efficiently among all selected banks. The profitability position of NIBL, BOK & EBL is moderate while HBL is the weakest in profitability position during the study period.

### **5.2.3 Trend Analysis**

Investment on shares and debentures is increasing rapidly than investment on loan and advances. Similarly, investment on loan and advances is rapidly increasing than government securities.

The investment plan is the challenging matter for the commercial banks. The success of commercial banks heavily depends on planning of investment. The successful formulation and effective implementation of investment policy is the prime requisite for the good performance of commercial banks. Therefore, appropriate investment policy should be developed by utilizing the portfolio concept. Commercial banks must mobilize their resources on secured, stable, profitable, liquid and marketable securities

for achieving their goal. It is not possible to achieve such goal without using the concept of portfolio. Investment portfolio is risk-reducing mechanism, which helps to minimize risk and maximize return through diversification.

Based on the analysis and findings of the study, commercial banks seem to be unable to invest their funds in more profitable sectors. Commercial -banks are interested to invest their funds in more liquid assets and less risky sectors. The commercial banks seem to be unable to grasp the opportunities by making suitable combination of investment portfolio.

From risk and return analysis of individual investment assets, we can say that investment on loan and advances is much better than the investment on shares and debentures and investment on government securities because loan and advances provides fixed interest income. Hence, commercial banks are willing to invest their higher portion of resources on loan and advances in various economic sectors because return from loan and advances seems less volatile than other assets. On the other hand, return from -shares and debentures show wide fluctuation. Because of the high fluctuation of return on shares and debentures, CBs invested very nominal percentage of total investment funds into shares and debentures. This shows that commercial banks are more interested to invest their funds in less risky sectors.

From the resource utilization point of view, commercial banks mostly mobilize their resources on loan and advances. They give second priority to mobilize their fund on government securities. Only few amount of total outside investment is made on shares and debentures. More than 73.66% of total outside investment of Banking Industry is made on loan and advances. It is clear from the above descriptions that there are vast differences on investment in various sectors by commercial banks.

The trend analysis of commercial banks shows that investment on government securities, investment or loan and advances and investment on shares and debentures are in increasing trend. In comparison, increasing ratio on shares and debentures is highest than Loan and advances and government securities. It shows that investment on shares and debentures is increasing rapidly than investment on loan and advances. Similarly, investment on loan is more rapidly increasing than Government securities during the period of 2005 to 2017.

### **5.3 Recommendation of tie Study**

Based on the analysis, findings and conclusion of the study, tie following recommendations are suggested to overcome weakness, inefficiency and to improve the present fund mobilization and investment of commercial banks.

- i. From the study, all selected sample banks invested very low portion of its total outside investment on share and debenture of other companies. So, it is suggested to all selected sample banks to give some excess priority to investment on shares and debentures.
- ii. From the analysis, it is clear that given sample banks have not effectively utilized portfolio management concept. The compositions of investment of these banks are highly dominated by loan and advances. It does not generate adequate return for the banks. Therefore, in order to increase the return on investment they should compile an optimum portfolio of different securities. The study shows that the sample banks are not successful to invest their funds on various assets.
- iii. Nowadays there are various problems in resource mobilization of commercial banks. The performances of sample commercial banks do not seem to be satisfactory in terms of utilizing its resources efficiently in productive sectors. Therefore, all sample commercial banks need to identify the new investment sectors and make efficient investment in various sectors. In this condition different retail banking such as education loan, housing loan, automobile loan etc. would be profitable sector for investment of commercial banks.
- iv. The total investment fund, comparing it to total deposit of NIBL is low. Therefore, it needs to identify the new investment sectors and make efficient investment in various sectors.
- v. The profitability position of BOK is almost satisfactory but the investment on various assets of it is not more stable. Therefore, it is recommended to the bank to keep more stability and reduce the variability of investment.
- vi. HBL has utilized its total deposits more efficiently, than other sample banks. So, it should maintain its present investment position and try to diversify its investment on various assets.
- vii. The portfolio return of EBL should increase its investment on shares and debentures and loan and advances to increase its portfolio return.
- viii. The profitability position of BOK is the weakest in relation to return on total assets. Hence, the bank should utilize its overall resources effectively to gain the highest profit margins.

**Appendix -1**

**(a) Total Investment**

**(in Million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	3347.712	4200.515	6178.533	10889.031	5602.869	82,173.7
2006/07	2992.434	4984.314	8945.310	11822.985	6505.679	93,530.3
2007/08	3204.068	5059.558	9939.771	13340.177	6874.024	108,954.8
2008/09	2783.599	5948.480	10826.379	8710.691	7399.812	130,856.90
2009/10	3269.205	5008.308	13703.024	8444.910	8635.530	134,041.09
2010/11	4286.599	7734.928	13081.206	8769.939	7423.107	149,557.36
<b>Total</b>	<b>19910.617</b>	<b>32936.103</b>	<b>32374.223</b>	<b>61977.733</b>	<b>42441.021</b>	<b>699,114.65</b>
<b>Average</b>	<b>3318.436</b>	<b>5489.351</b>	<b>10445.705</b>	<b>10329.622</b>	<b>7073.504</b>	<b>116,519.11</b>

**(b) Total Deposit**

**(in Million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	10485.359	13808.445	19347.399	26490.852	18927.306	291,245.5
2006/07	12388.927	18186.253	23342.285	30048.418	24488.855	337,497.2
2007/08	15833.738	23976.299	31915.047	31842.789	34451.726	426,080.3
2008/09	18083.980	33322.946	37348.256	34681.345	46698.100	563,604.40
2009/10	20315.834	36932.310	46410.701	37611.202	50094.725	630,880.84
2010/11	21018.417	41127.914	49696.113	40920.627	50138.122	687,587.89
<b>Total</b>	<b>98126.255</b>	<b>167348.167</b>	<b>208059.801</b>	<b>201595.233</b>	<b>224798.834</b>	<b>2,936,896.13</b>
<b>Average</b>	<b>16354.376</b>	<b>27891.361</b>	<b>34676.634</b>	<b>33599.206</b>	<b>37466.472</b>	<b>489,482.69</b>

**(c) Investment on Government Securities**

**(in Million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	2658.369	3548.617	2301.463	5144.313	2522.300	57,539.1
2006/07	2332.041	4704.632	4808.348	6454.873	3256.400	64,443.0
2007/08	2113.223	4821.605	4646.883	7471.668	3155.000	71,495.5
2008/09	1744.977	5146.046	3706.102	4212.300	2531.300	68,902.0
2009/10	2954.932	4354.353	7973.664	4465.372	4201.850	79,079.6
2010/11	4002.138	7145.017	8745.231	6407.363	4294.600	100,267.3
<b>Total</b>	<b>15805.68</b>	<b>29720.27</b>	<b>32181.691</b>	<b>94155.889</b>	<b>19961.45</b>	<b>441,726.5</b>
<b>Average</b>	<b>2634.28</b>	<b>4953.378</b>	<b>5363.615</b>	<b>5692.648</b>	<b>3326.908</b>	<b>73,621.08</b>

**(d) Investment on Share and Debenture. (in million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	96.868	19.887	104.192	39.909	17.738	24,634.7
2006/07	90.163	19.887	286.958	73.424	35.253	29,087.8
2007/08	114.059	101.152	323.236	89.558	59.946	37,459.3
2008/09	123.751	102.035	354.931	93.883	64.271	61,595.5
2009/10	40.140	102.035	346.856	78.882	66.646	52,697.3
2010/11	40.140	109.576	936.386	88.787	72.912	46,901.4
<b>Total</b>	<b>505.127</b>	<b>454.572</b>	<b>2352.559</b>	<b>464,443</b>	<b>316.766</b>	<b>252,376</b>
<b>Average</b>	<b>84.188</b>	<b>75.762</b>	<b>392.093</b>	<b>77.407</b>	<b>52.794</b>	<b>42,062.67</b>

**(e) Investment on Loan and Advance (in million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	7259.083	9801.308	12922.543	14642.560	12776.208	173,383.4
2006/07	9399.328	13664.081	15545.778	16997.997	17286.427	228,951.9
2007/08	12462.637	18339.086	21365.053	19497.520	26996.652	302,913.4
2008/09	14647.297	23884.674	27589.933	24793.155	36841.207	398,143.0
2009/10	16664.931	27556.356	32268.873	27980.629	40318.308	467,107.2
2010/11	17468.192	31057.691	38034.098	31566.977	41095.515	522853.3
<b>Total</b>	<b>77901.468</b>	<b>124303.196</b>	<b>147726.278</b>	<b>135478.838</b>	<b>174714.317</b>	<b>2,093,352.2</b>
<b>Average</b>	<b>12983.578</b>	<b>20717.199</b>	<b>24621.046</b>	<b>22579.806</b>	<b>29119.053</b>	<b>348,892.03</b>

**(f) Total Outside Investment (in million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	10014.32	13369.812	15328.198	19826.782	15316.246	255,557.2
2006/07	11821.538	18388.600	20641.084	23526.294	20578.080	322,482.7
2007/08	14689.919	23261.843	2633.172	27058.746	30211.598	411,868.2
2008/09	16516.025	29132.755	31650.966	29099.338	3886.778	528,640.5
2009/10	19660.003	32012.744	40589.393	32524.883	44586.804	598,884.1
2010/11	21510.470	38312.284	47715.715	38063.127	45463.027	670,022.0
<b>Total</b>	<b>34212.275</b>	<b>154478.038</b>	<b>182260.528</b>	<b>170099.170</b>	<b>194992.533</b>	<b>2,787,454.7</b>
<b>Average</b>	<b>15702.046</b>	<b>25746.340</b>	<b>30376.755</b>	<b>28349.862</b>	<b>32498.756</b>	<b>464,575.8</b>



**(g) Interest Income on Government Securities (in million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	114.320	97.272	130.197	172.242	82.420	1,733.8
2006/07	108.590	128.566	132.229	191.559	99.991	1,841.2
2007/08	84.961	180.219	198.442	201.310	99.991	2,040.5
2008/09	116.737	289.765	269.187	354.949	140.698	2,635.1
2009/10	115.510	238.993	332.871	216.036	169.620	3,585.4
2010/11	208.109	362.263	519.929	389.104	258.387	5,388.1
<b>Total</b>	<b>748.227</b>	<b>1297.078</b>	<b>1582.855</b>	<b>1525.200</b>	<b>829.61</b>	<b>17,224.1</b>
<b>Average</b>	<b>124.705</b>	<b>216.180</b>	<b>263.809</b>	<b>254.200</b>	<b>138.268</b>	<b>2,870.68</b>

**(h) Interest Income on Loan & Advance (in million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	550.144	770.827	964.689	1140.687	964.689	12,783.3
2006/07	645.651	967.178	1302.122	1242.850	1302.122	19,210.9
2007/08	887.299	1329.695	1907.261	1444.245	1907.261	23,634.10
2008/09	1199.081	1852.128	2182.647	1861.045	2906.055	15,554.2
2009/10	1707.544	2801.332	3368.728	2836.251	4303.311	49,334.9
2010/11	2169.223	3869.810	4479.060	3843.312	5435.843	65,522.6
<b>Total</b>	<b>7158942</b>	<b>11590.97</b>	<b>14204.507</b>	<b>12368.39</b>	<b>16819.281</b>	<b>186,040</b>
<b>Average</b>	<b>1193.157</b>	<b>1931.828</b>	<b>2367.418</b>	<b>2061.398</b>	<b>2803.214</b>	<b>31,006.67</b>

**(i) Total Assets (in million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	12278.330	15959.285	22329.971	29460.390	21330.138	428,698.5
2006/07	14570.099	21432.574	27253.393	33519.141	27590.845	490,620.6
2007/08	17721.925	27149.343	37132.759	36175.532	38878.306	566,736.0
2008/09	20496.005	36916.849	43867.398	39320.322	53010.803	811,869.5
2009/10	23396.192	41382.761	52151.684	42717.125	57305.413	787,398.4
2010/11	24757.750	46236.212	58141.437	46736.204	58356.828	878,159.2
<b>Total</b>	<b>113220.301</b>	<b>189077.024</b>	<b>240876.642</b>	<b>227928.714</b>	<b>256467.333</b>	<b>3,963,482.2</b>
<b>Average</b>	<b>18870.050</b>	<b>31512.837</b>	<b>40146.107</b>	<b>37988.119</b>	<b>42744.556</b>	<b>660,580.37</b>

**(j) Net Profit after Tax****(in million)**

<b>Fiscal Year</b>	<b>BOK</b>	<b>EBI</b>	<b>NABIL</b>	<b>HBL</b>	<b>NIBL</b>	<b>Banking Industry</b>
2005/06	202.441	237.291	350.536	457.458	350.536	8,785.1
2006/07	262.387	296.409	501.399	491.823	501.399	8,946.9
2007/08	361.496	451.219	696.732	635.889	696.732	11,964.7
2008/09	461.735	638.733	1031.053	752.835	900.619	14,337.1
2009/10	509.263	831.766	1141.051	508.798	1265.950	15,363.0
2010/11	605.152	931.304	1337.745	893.115	1176.641	15,598.05
Total	2402.474	3386.722	5058.516	3739.918	4891.877	74,995.3
Average	400.412	564.454	843.086	623.320	815.313	12,499.22

**Source : Annual Reports of CBs (Balance Sheet) Appendix 16**

## Appendix -2

- a. Calculation of average return on government securities of BOK  
Here,

$$\bar{R}_g = \frac{\sum R_g}{N} = \frac{28.78}{6} = 4.80\%$$

- b. Calculation of average return on government securities of EBL  
Here,

$$\bar{R}_g = \frac{\sum R_g}{N} = \frac{25.40}{6} = 4.23\%$$

- c. Calculation of average return on government securities of NABIL  
Here,

$$\bar{R}_g = \frac{\sum R_g}{N} = \frac{30.06}{6} = 5.01\%$$

- d. Calculation of average return on government securities of HBL  
Here,

$$\bar{R}_g = \frac{\sum R_g}{N} = \frac{28.35}{6} = 4.73\%$$

- e. Calculation of average return on government securities of NIBL  
Here,

$$\bar{R}_g = \frac{\sum R_g}{N} = \frac{24.47}{6} = 4.08\%$$

- f. Calculation of average return on government securities of Banking Industry  
Here,

$$\bar{R}_g = \frac{\sum R_g}{N} = \frac{22.44}{6} = 3.74\%$$

**Sources: Average return of CBs ( Appendix 1)**

### Appendix -3

- a. Calculation of average return on loan and advantage of BOK

$$\bar{R}_L = \frac{\sum R_L}{N} = \frac{52.43}{6} = 8.74\%$$

- b. Calculation of average return on loan and advantage of EBL

$$\bar{R}_L = \frac{\sum R_L}{N} = \frac{52.57}{6} = 8.76\%$$

- c. Calculation of average return on loan and advantage of NABIL

$$\bar{R}_L = \frac{\sum R_L}{N} = \frac{54.91}{6} = 9.15\%$$

- d. Calculation of average return on loan and advantage of HBL

$$\bar{R}_L = \frac{\sum R_L}{N} = \frac{52.34}{6} = 8.72\%$$

- e. Calculation of average return on loan and advantage of NIBL

$$\bar{R}_L = \frac{\sum R_L}{N} = \frac{54.06}{6} = 9.01\%$$

- f. Calculation of average return on loan and advantage of Banking Industry

$$\bar{R}_L = \frac{\sum R_L}{N} = \frac{50.56}{6} = 8.43\%$$

**Sources: Average return of CBs ( Appendix 1)**

#### Appendix-4

- a. Calculation of Risk on Government securities of BOK

Here,

$$\sigma_g = \sqrt{\frac{\sum(R_g - \bar{R}_g)^2}{n - 1}} = \sqrt{\frac{5.4022}{6 - 1}} = 1.039\%$$

- b. Calculation of Risk on Government securities of EBL

Here,

$$\sigma_g = \sqrt{\frac{\sum(R_g - \bar{R}_g)^2}{n - 1}} = \sqrt{\frac{8.9634}{6 - 1}} = 1.339\%$$

- c. Calculation of Risk on Government securities of NABIL

Here,

$$\sigma_g = \sqrt{\frac{\sum(R_g - \bar{R}_g)^2}{n - 1}} = \sqrt{\frac{12.7294}{6 - 1}} = 1.596\%$$

- d. Calculation of Risk on Government securities of HBL

Here,

$$\sigma_g = \sqrt{\frac{\sum(R_g - \bar{R}_g)^2}{n - 1}} = \sqrt{\frac{24.6613}{6 - 1}} = 2.221\%$$

- e. Calculation of Risk on Government securities of NIBL

Here,

$$\sigma_g = \sqrt{\frac{\sum(R_g - \bar{R}_g)^2}{n - 1}} = \sqrt{\frac{10.2287}{6 - 1}} = 1.430\%$$

- f. Calculation of Risk on Government securities of Banking industry

Here,

$$\sigma_g = \sqrt{\frac{\sum(R_g - \bar{R}_g)^2}{n - 1}} = \sqrt{\frac{5.3868}{6 - 1}} = 1.038\%$$

Appendix -5

- a. Calculation of Risk on Loan and Advance of BOK

Here,

$$\sigma_L = \sqrt{\frac{\sum(R_L - \bar{R}_L)^2}{n - 1}} = \sqrt{\frac{23.5919}{6 - 1}} = 2.17\%$$

- b. Calculation of Risk on Loan and Advance of EBL

Here,

$$\sigma_L = \sqrt{\frac{\sum(R_L - \bar{R}_L)^2}{n - 1}} = \sqrt{\frac{23.6107}{6 - 1}} = 2.13\%$$

- c. Calculation of Risk on Loan and Advance of NABIL

Here,

$$\sigma_L = \sqrt{\frac{\sum(R_L - \bar{R}_L)^2}{n - 1}} = \sqrt{\frac{13.5823}{6 - 1}} = 1.65\%$$

- d. Calculation of Risk on Loan and Advance of HBL

Here,

$$\sigma_L = \sqrt{\frac{\sum(R_L - \bar{R}_L)^2}{n - 1}} = \sqrt{\frac{20.0212}{6 - 1}} = 2.00\%$$

- e. Calculation of Risk on Loan and Advance of NIBL

Here,

$$\sigma_L = \sqrt{\frac{\sum(R_L - \bar{R}_L)^2}{n - 1}} = \sqrt{\frac{29.6686}{6 - 1}} = 2.44\%$$

- f. Calculation of Risk on Loan and Advance of Banking Industry

Here,

$$\sigma_L = \sqrt{\frac{\sum(R_L - \bar{R}_L)^2}{n - 1}} = \sqrt{\frac{43.2994}{6 - 1}} = 2.94\%$$

## Appendix – 6

### a. Calculation of Market Return on Shares and Debentures of CBS

(In Percentage)

Fiscal Year	NEPSE Index	Market Return (R <sub>g</sub> )
2005/06	386.83	34.94
2006/07	683.95	76.81
2007/08	963.39	40.86
2008/09	749.10	-22.24
2009/10	477.73	-36.23
2010/11	362.85	-24.05
<b>Total</b>		<b>70.09</b>

Source : SEBO

Here,

$$\sum R_s = 70.09$$

Now,

$$\bar{R}_s = \frac{\sum R_s}{N} = \frac{70.09}{6} = 11.86\%$$

### b. Calculation of Market Risk on Shares and Debentures of CBS

(In Percentage)

Fiscal Year	NEPSE index	Market Return (R <sub>s</sub> )	(R <sub>s</sub> -R <sub>s</sub> )	(R <sub>s</sub> -R <sub>s</sub> ) <sup>2</sup>
2005/06	386.83	34.94	23.26	541.0276
2006/07	683.95	76.81	65.13	4241.9169
2007/08	963.39	40.86	29.18	851.4724
2008/09	749.10	-22.24	-33.92	1150.5664
2009/10	477.73	-36.23	-47.91	2295.3681
2010/11	362.85	-24.05	-35.73	1276.6329
<b>Total</b>		<b>70.09</b>		<b>10356.9843</b>

Source : SEBO

Here,

$$\sum (R_s - \bar{R}_s)^2 = 10356.9843$$

Now,

$$\sigma_s = \sqrt{\frac{\sum (R_s - \bar{R}_s)^2}{n - 1}} = \sqrt{\frac{10356.9843}{6 - 1}} = 45.51\%$$

## Appendix – 7

### a. Calculation of portfolio Return on investment of BOK

$$\begin{aligned}R_p &= \sum W \times R \\&= W_1 \times R_1 + W_2 \times R_2 + W_3 \times R_3 \\&= 0.1678 \times 4.80 + 0.8268 \times 8.74 + 0.0054 \times 11.68 \\&= 8.095 \%\end{aligned}$$

### b. Calculation of portfolio Return on investment of EBL

$$\begin{aligned}R_p &= \sum W \times R \\&= W_1 \times R_1 + W_2 \times R_2 + W_3 \times R_3 \\&= 0.1924 \times 4.23 + 0.8047 \times 8.76 + 0.0029 \times 11.68 \\&= 7.897 \%\end{aligned}$$

### c. Calculation of portfolio Return on investment of NABIL

$$\begin{aligned}R_p &= \sum W \times R \\&= W_1 \times R_1 + W_2 \times R_2 + W_3 \times R_3 \\&= 0.1766 \times 5.01 + 0.8105 \times 9.15 + 0.0129 \times 11.68 \\&= 8.452 \%\end{aligned}$$

### d. Calculation of portfolio Return on investment of HBL

$$\begin{aligned}R_p &= \sum W \times R \\&= W_1 \times R_1 + W_2 \times R_2 + W_3 \times R_3 \\&= 0.2008 \times 4.73 + 0.7965 \times 8.72 + 0.0027 \times 11.68 \\&= 7.927 \%\end{aligned}$$

### e. Calculation of portfolio Return on investment of NIBL

$$\begin{aligned}R_p &= \sum W \times R \\&= W_1 \times R_1 + W_2 \times R_2 + W_3 \times R_3 \\&= 0.1024 \times 4.08 + 0.8960 \times 9.01 + 0.0016 \times 11.68 \\&= 8.509 \%\end{aligned}$$

### f. Calculation of portfolio Return on investment of Banking Industry

$$\begin{aligned}R_p &= \sum W \times R \\&= W_1 \times R_1 + W_2 \times R_2 + W_3 \times R_3 \\&= 0.1585 \times 3.74 + 0.7510 \times 8.43 + 0.0905 \times 11.68 \\&= 7.981 \%\end{aligned}$$



## Appendix – 8

### a. Calculation of correlation coefficient and covariance between various investment securities of BOK

Fiscal Year	Return on govt. Securities(R <sub>g</sub> )	Return on Land & Advances(R <sub>L</sub> )	Return on Shares & Debenture	R <sub>g</sub> ×R <sub>L</sub>	R <sub>L</sub> ×R <sub>S</sub>	R <sub>g</sub> ×R <sub>S</sub>	R <sub>g</sub> <sup>2</sup>	R <sub>L</sub> <sup>2</sup>	R <sub>S</sub> <sup>2</sup>
2005/06	4.30	7.58	34.94	32.59	264.85	150.24	18.49	57.46	1220.80
2006/07	4.66	6.87	76.81	32.01	527.68	357.93	21.72	47.20	5899.78
2007/08	4.02	7.12	40.86	28.62	290.92	164.26	16.16	50.69	1669.54
2 00 8/09	6.69	8.19	-22.24	54.79	-182.15	-148.79	44.76	67.08	494.62
2009/10	3.91	10.25	-36.23	40.08`	-371.36	-141.66	15.29	105.06	1312.61
2010/11	5.20	12.42	-24.05	64.58	-298.70	-125.06	27.04	154.26	578.40
Total	28.78	52.43	70.90	252.67	231.24	256.92	143.46	481.75	11175.75

Now,

$$r_{gL} = \frac{n \sum R_g R_L - \sum R_g \sum R_L}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_L^2 - (\sum R_L)^2}} = \frac{6 \times 252.67 - 28.78 \times 52.43}{\sqrt{6 \times 143.46 - (28.72)^2} \times \sqrt{6 \times 481.75 - (52.43)^2}} = \frac{7.0846}{71.31845} = 0.10$$

$$r_{gs} = \frac{n \sum R_g R_s - \sum R_g \sum R_s}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 256.92 - 28.78 \times 70.09}{\sqrt{6 \times 143.46 - (28.72)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-475.6702}{1420.50929} = -0.33$$

$$r_{Ls} = \frac{n \sum R_L R_s - \sum R_L \sum R_s}{\sqrt{n \sum R_L^2 - (\sum R_L)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 231.24 - 52.43 \times 70.09}{\sqrt{6 \times 481.75 - (52.43)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-2287.3787}{2966.3087} = -0.77$$

Now,

$$COV_{gL} = r_{gL} \times \sigma_g \times \sigma_L = 0.10 \times 1.039 \times 2.17 = 0.225463$$

$$COV_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.33 \times 1.039 \times 45.51 = -15.604$$

$$COV_{LS} = r_{LS} \times \sigma_L \times \sigma_s = -0.77 \times 2.17 \times 45.51 = -76.04$$

**b. Calculation of correlation coefficient and covariance between various investment securities of EBL**

Fiscal Year	Return on govt. Securities(R <sub>g</sub> )	Return on Land & Advances(R <sub>L</sub> )	Return on Shares & Debenture	R <sub>g</sub> ×R <sub>L</sub>	R <sub>L</sub> ×R <sub>S</sub>	R <sub>g</sub> ×R <sub>S</sub>	R <sub>g</sub> <sup>2</sup>	R <sub>L</sub> <sup>2</sup>	R <sub>S</sub> <sup>2</sup>
2005/06	2.74	7.86	34.94	21.54	95.74	274.63	7.51	61.78	1220.80
2006/07	2.73	7.08	76.81	19.33	209.69	543.81	7.45	50.13	5899.78
2007/08	3.74	7.25	40.86	27.12	152.82	296.24	13.99	52.56	1669.54
2008/09	5.63	7.75	-22.24	43.63	-125.21	-172.36	31.70	60.06	494.62
2009/10	5.49	10.17	-36.23	55.83	-198.90	-368.46	30.14	103.43	1312.61
2010/11	5.07	12.46	-24.05	63.17	-121.93	-299.66	25.70	155.25	578.40
Total	25.40	52.57	70.09	230.62	12.21	274.20	116.49	483.21	11175.75

Now,

$$r_{gL} = \frac{n \sum R_g R_L - \sum R_g \sum R_L}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_L^2 - (\sum R_L)^2}} = \frac{6 \times 230.62 - 25.40 \times 52.57}{\sqrt{6 \times 116.49 - (25.40)^2} \times \sqrt{6 \times 483.21 - (52.57)^2}} = \frac{48.442}{85.41385} = 0.57$$

$$r_{gs} = \frac{n \sum R_g R_s - \sum R_g \sum R_s}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 12.21 - 25.04 \times 70.09}{\sqrt{6 \times 116.49 - (25.04)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-1707.026}{1828.11006} = -0.93$$

$$r_{LS} = \frac{6 \times 274.20 - 52.57 \times 70.09}{\sqrt{6 \times 483.21 - (52.57)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-2039.4313}{2903.42361} = -0.70$$

Now,

$$COV_{gL} = r_{gL} \times \sigma_g \times \sigma_L = 0.57 \times 1.339 \times 2.13 = 1.63$$

$$COV_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.93 \times 1.339 \times 45.51 = -56.67$$

$$COV_{LS} = r_{LS} \times \sigma_L \times \sigma_s = -0.70 \times 2.13 \times 45.51 = -67.86$$

c. Calculation of correlation coefficient and covariance between various investment securities of NABIL

Fiscal Year	Return on govt. Securities(R <sub>g</sub> )	Return on Land & Advances(R <sub>L</sub> )	Return on Shares & Debenture	R <sub>g</sub> ×R <sub>L</sub>	R <sub>L</sub> ×R <sub>s</sub>	R <sub>g</sub> ×R <sub>s</sub>	R <sub>g</sub> <sup>2</sup>	R <sub>L</sub> <sup>2</sup>	R <sub>s</sub> <sup>2</sup>
2005/06	5.66	7.47	34.94	42.28	197.76	261.00	32.04	55.80	1220.80
2006/07	2.75	8.38	76.81	83.05	211.23	643.67	7.56	70.22	5899.78
2007/08	4.27	8.93	40.86	38.13	174.47	364.88	18.23	79.74	1669.54
200 8/09	7.26	7.91	-22.24	57.43	-161.46	-175.92	52.71	62.57	494.62
2009/10	4.17	10.44	-36.23	43.53	-151.08	-378.24	17.39	108.99	1312.61
2010/11	5.95	11.78	-24.05	70.09	-143.10	-283.31	35.40	138.77	578.40
<b>Total</b>	<b>30.06</b>	<b>54.91</b>	<b>70.09</b>	<b>274.51</b>	<b>127.82</b>	<b>432.08</b>	<b>163.33</b>	<b>516.09</b>	<b>11175.75</b>

Now,

$$r_{gL} = \frac{n \sum R_g R_L - \sum R_g \sum R_L}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_L^2 - (\sum R_L)^2}} = \frac{6 \times 274.51 - 30.06 \times 54.91}{\sqrt{6 \times 163.33 - (30.06)^2} \times \sqrt{6 \times 516.09 - (54.91)^2}} = \frac{3.5346}{78.86364} = -0.07$$

$$r_{gs} = \frac{n \sum R_g R_s - \sum R_g \sum R_s}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 127.82 - 30.06 \times 70.09}{\sqrt{6 \times 163.33 - (30.06)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-1339.9854}{2178.571694} = -0.62$$

$$r_{LS} = \frac{n \sum R_L R_s - \sum R_L \sum R_s}{\sqrt{n \sum R_L^2 - (\sum R_L)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 432.08 - 54.91 \times 70.09}{\sqrt{6 \times 516.09 - (54.91)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-1256.1619}{2249.5175} = -0.56$$

Now,

$$COV_{gL} = r_{gL} \times \sigma_g \times \sigma_L = -0.07 \times 1.596 \times 1.65 = -0.18$$

$$COV_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.62 \times 1.596 \times 45.51 = -45.03$$

$$COV_{LS} = r_{LS} \times \sigma_L \times \sigma_s = -0.56 \times 1.65 \times 45.51 = -42.05$$

**d. Calculation of correlation coefficient and covariance between various investment securities of HBL**

Fiscal Year	Return on govt. Securities(R <sub>g</sub> )	Return on Land & Advances(R <sub>L</sub> )	Return on Shares & Debenture	R <sub>g</sub> ×R <sub>L</sub>	R <sub>L</sub> ×R <sub>S</sub>	R <sub>g</sub> ×R <sub>S</sub>	R <sub>g</sub> <sup>2</sup>	R <sub>L</sub> <sup>2</sup>	R <sub>S</sub> <sup>2</sup>
2005/06	3.35	7.79	34.94	26.10	117.05	272.18	11.22	60.68	1220.80
2006/07	2.97	7.31	76.81	21.71	228.13	561.48	8.82	53.44	5899.78
2007/08	2.69	7.41	40.86	19.93	109.91	302.77	7.24	54.91	1669.54
2008/09	8.43	7.51	-22.24	63.31	-187.48	-167.02	71.06	56.40	494.62
2009/10	4.84	10.14	-36.23	49.08	-175.35	-367.37	23.43	102.82	1312.61
2010/11	6.07	12.18	-24.05	73.93	-145.98	-292.93	36.84	148.35	578.40
Total	28.35	52.34	70.09	254.06	-53.72	309.11	158.61	476.60	11175.75

Now,

$$r_{gL} = \frac{n \sum R_g R_L - \sum R_g \sum R_L}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_L^2 - (\sum R_L)^2}} = \frac{6 \times 254.06 - 28.35 \times 52.34}{\sqrt{6 \times 158.61 - (28.35)^2} \times \sqrt{6 \times 476.60 - (52.34)^2}} = \frac{40.521}{133.307552} = 0.30$$

$$r_{gs} = \frac{n \sum R_g R_s - \sum R_g \sum R_s}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times -53.72 - 28.35 \times 70.09}{\sqrt{6 \times 158.61 - (28.35)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-2309.3715}{3032.01611} = -0.76$$

$$r_{LS} = \frac{n \sum R_L R_s - \sum R_L \sum R_s}{\sqrt{n \sum R_L^2 - (\sum R_L)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 309.11 - 52.34 \times 70.09}{\sqrt{6 \times 476.60 - (52.34)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-1813.8506}{2732.1708} = -0.66$$

Now,

$$COV_{gL} = r_{gL} \times \sigma_g \times \sigma_L = 0.30 \times 2.221 \times 2.00 = 1.33$$

$$COV_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.76 \times 2.221 \times 45.51 = -76.82$$

$$COV_{LS} = r_{LS} \times \sigma_L \times \sigma_s = -0.66 \times 2.00 \times 45.51 = -60.07$$

e. Calculation of correlation coefficient and covariance between various investment securities of NIBL

Fiscal Year	Return on govt. Securities(R <sub>g</sub> )	Return on Land & Advances(R <sub>L</sub> )	Return on Shares & Debenture	R <sub>g</sub> ×R <sub>L</sub>	R <sub>L</sub> ×R <sub>S</sub>	R <sub>g</sub> ×R <sub>S</sub>	R <sub>g</sub> <sup>2</sup>	R <sub>L</sub> <sup>2</sup>	R <sub>S</sub> <sup>2</sup>
2005/06	3.27	7.55	34.94	24.69	114.25	263.80	10.69	57.00	1220.80
2006/07	2.41	7.53	76.81	18.15	185.11	578.38	5.81	56.70	5899.78
2007/08	3.17	7.06	40.86	22.38	129.53	288.47	10.05	49.84	1669.54
2 00 8/09	5.56	8.02	-22.24	44.59	-123.65	-178.36	30.91	64.32	494.62
2009/10	4.04	10.67	-36.23	43.12	-146.37	-386.57	16.32	113.85	1312.61
2010/11	6.02	13.23	-24.05	79.64	-144.78	-318.18	36.24	175.03	578.40
Total	24.47	54.06	70.09	232.57	14.09	247.54	110.02	516.74	11175.75

Now,

$$r_{gL} = \frac{n \sum R_g R_L - \sum R_g \sum R_L}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_L^2 - (\sum R_L)^2}} = \frac{6 \times 232.57 - 24.47 \times 54.06}{\sqrt{6 \times 110.02 - (24.47)^2} \times \sqrt{6 \times 516.74 - (54.06)^2}} = \frac{72.5718}{104.47815} = 0.69$$

$$r_{gs} = \frac{n \sum R_g R_s - \sum R_g \sum R_s}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times -14.09 - 24.47 \times 70.09}{\sqrt{6 \times 110.02 - (24.47)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-1630.5623}{1952.36455} = -0.84$$

$$r_{LS} = \frac{n \sum R_L R_s - \sum R_L \sum R_s}{\sqrt{n \sum R_L^2 - (\sum R_L)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 247.54 - 54.06 \times 70.09}{\sqrt{6 \times 516.74 - (54.06)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-2303.8254}{3325.4394} = -0.69$$

Now,

$$COV_{gL} = r_{gL} \times \sigma_g \times \sigma_L = 0.69 \times 1.430 \times 2.44 = 2.41$$

$$COV_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.84 \times 1.430 \times 45.51 = -54.67$$

$$COV_{LS} = r_{LS} \times \sigma_L \times \sigma_S = -0.69 \times 2.44 \times 45.51 = -76.62$$

f. Calculation of correlation coefficient and covariance between various investment securities of Banking Industry

Fiscal Year	Return on govt. Securities(R <sub>g</sub> )	Return on Land & Advances(R <sub>L</sub> )	Return on Shares & Debenture	R <sub>g</sub> ×R <sub>L</sub>	R <sub>L</sub> ×R <sub>S</sub>	R <sub>g</sub> ×R <sub>S</sub>	R <sub>g</sub> <sup>2</sup>	R <sub>L</sub> <sup>2</sup>	R <sub>S</sub> <sup>2</sup>
2005/06	3.01	7.37	34.94	22.18	257.51	105.17	9.06	54.32	1220.80
2006/07	2.86	8.39	76.81	23.99	644.44	219.68	8.18	70.39	5899.78
2007/08	2.85	7.80	40.86	22.23	318.71	116.45	8.12	60.84	1669.54
2 00 8/09	3.83	3.91	-22.24	14.94	-86.96	-84.96	14.59	15.29	494.62
2009/10	4.53	10.56	-36.23	47.84	-382.59	-164.12	20.52	111.51	1312.61
2010/11	5.37	12.53	-24.05	67.29	-301.35	-129.15	28.84	157.00	1758.40
Total	22.44	50.56	70.09	198.47	449.76	63.07	89.31	469.35	11175.75

Now,

$$r_{gL} = \frac{n \sum R_g R_L - \sum R_g \sum R_L}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_L^2 - (\sum R_L)^2}} = \frac{6 \times 198.47 - 22.44 \times 50.56}{\sqrt{6 \times 89.31 - (22.44)^2} \times \sqrt{6 \times 469.35 - (50.56)^2}} = \frac{56.25}{91.6179} = 0.61$$

$$r_{gs} = \frac{n \sum R_g R_s - \sum R_g \sum R_s}{\sqrt{n \sum R_g^2 - (\sum R_g)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times -63.07 - 22.44 \times 70.09}{\sqrt{6 \times 89.31 - (22.44)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-1194.4}{1416.973} = -0.84$$

$$r_{LS} = \frac{n \sum R_L R_s - \sum R_L \sum R_s}{\sqrt{n \sum R_L^2 - (\sum R_L)^2} \times \sqrt{n \sum R_s^2 - (\sum R_s)^2}} = \frac{6 \times 449.76 - 50.56 \times 70.09}{\sqrt{6 \times 469.35 - (50.56)^2} \times \sqrt{6 \times 11175.75 - (70.09)^2}} = \frac{-845.1904}{4017.9386} = -0.21$$

Now,

$$COV_{gL} = r_{gL} \times \sigma_g \times \sigma_L = 0.61 \times 1.038 \times 2.94 = 1.86$$

$$COV_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.84 \times 1.038 \times 45.51 = -39.68$$

$$COV_{LS} = r_{LS} \times \sigma_L \times \sigma_s = -0.21 \times 2.94 \times 45.51 = -28.10$$

## Appendix – 9

### a. Calculation of portfolio risk on investment of BOK

The standard deviation of portfolio investment ( $\sigma_p$ ) can be calculated as follows:

$$\begin{aligned}\sigma_p &= \sqrt{W_g^2 \times \sigma_g^2 + W_L^2 \times \sigma_L^2 + W_S^2 \times \sigma_S^2 + 2COV_{gL} \times W_g \times W_L + 2COV_{LS} \times W_L \times W_S + 2COV_{gS} \times W_g \times W_S} \\ &= \sqrt{(0.1678)^2 \times (1.039)^2 + (0.8268)^2 \times (2.17)^2 + (0.0054)^2 \times (45.51)^2 + 2 \times 0.23 \times 0.1678 \times 0.8268 + 2 \times (-76.04) \times 0.8268 \times 0.0054 + 2 \times (-15.60) \times 0.1678 \times 0.0054} \\ &= \sqrt{2.6663401} = 1.63\%\end{aligned}$$

### b. Calculation of portfolio risk on investment of EBL

$$\begin{aligned}\sigma_p &= \sqrt{W_g^2 \times \sigma_g^2 + W_L^2 \times \sigma_L^2 + W_S^2 \times \sigma_S^2 + 2COV_{gL} \times W_g \times W_L + 2COV_{LS} \times W_L \times W_S + 2COV_{gS} \times W_g \times W_S} \\ &= \sqrt{(0.1924)^2 \times (1.339)^2 + (0.8047)^2 \times (2.13)^2 + (0.0029)^2 \times (45.51)^2 + 2 \times 1.63 \times 0.1924 \times 0.8047 + 2 \times (-67.86) \times 0.8047 \times 0.0029 + 2 \times (-56.67) \times 0.1924 \times 0.0029} \\ &= \sqrt{3.146389} = 1.77\%\end{aligned}$$

### c. Calculation of portfolio risk on investment of NABIL

$$\sigma_p = \sqrt{W_g^2 \times \sigma_g^2 + W_L^2 \times \sigma_L^2 + W_S^2 \times \sigma_S^2 + 2COV_{gL} \times W_g \times W_L + 2COV_{LS} \times W_L \times W_S + 2COV_{gS} \times W_g \times W_S}$$

$$\begin{aligned}
&= \sqrt{(0.1766)^2 \times (1.596)^2 + (0.8105)^2 \times (1.65)^2 + (0.0129)^2 \times (45.51)^2 + 2 \times (-0.18) \times 0.1766 \times 0.8105 + 2} \\
&\quad \times (-42.05) \times 0.8105 \times 0.0129 + 2 \times (-45.03) \times 0.1766 \times 0.0129 \\
&= \sqrt{1.0765407} = 1.77\%
\end{aligned}$$

**d. Calculation of portfolio risk on investment of HBL**

$$\begin{aligned}
\sigma_P &= \sqrt{W_g^2 \times \sigma_g^2 + W_L^2 \times \sigma_L^2 + W_S^2 \times \sigma_S^2 + 2COV_{gL} \times W_g \times W_L + 2COV_{LS} \times W_L \times W_S +} \\
&\quad 2COV_{gS} \times W_g \times W_S \\
&= \sqrt{(0.2008)^2 \times (2.221)^2 + (0.7965)^2 \times (2.00)^2 + (0.0027)^2 \times (45.51)^2 + 2 \times 1.33 \times 0.2008 \times 0.7965 + 2} \\
&\quad \times (-60.07) \times 0.7965 \times 0.0027 + 2 \times (-76.82) \times 0.2008 \times 0.0027 \\
&= \sqrt{2.8354118} = 1.68\%
\end{aligned}$$

**e. Calculation of portfolio risk on investment of NIBL**

$$\begin{aligned}
\sigma_P &= \sqrt{W_g^2 \times \sigma_g^2 + W_L^2 \times \sigma_L^2 + W_S^2 \times \sigma_S^2 + 2COV_{gL} \times W_g \times W_L + 2COV_{LS} \times W_L \times W_S +} \\
&\quad 2COV_{gS} \times W_g \times W_S \\
&= \sqrt{(0.1024)^2 \times (1.430)^2 + (0.8960)^2 \times (2.44)^2 + (0.0016)^2 \times (45.51)^2 + 2 \times 2.41 \times 0.1024 \times 0.8960 + 2} \\
&\quad \times (-76.62) \times 0.8960 \times 0.0016 + 2 \times (-54.67) \times 0.1024 \times 0.0016 \\
&= \sqrt{5.01102697} = 2.24\%
\end{aligned}$$



f. **Calculation of portfolio risk on investment of Banking Industry**

$$\begin{aligned}\sigma_P &= \sqrt{W_g^2 \times \sigma_g^2 + W_L^2 \times \sigma_L^2 + W_S^2 \times \sigma_S^2 + 2COV_{gL} \times W_g \times W_L + 2COV_{LS} \times W_L \times W_S +} \\ &\quad 2COV_{gS} \times W_g \times W_S} \\ &= \sqrt{(0.1585)^2 \times (1.038)^2 + (0.7510)^2 \times (2.94)^2 + (0.0905)^2 \times (45.51)^2 + 2 \times 1.86 \times 0.1585 \times 0.7510 + 2} \\ &\quad \times (-39.68) \times 0.1585 \times 0.0905 + 2 \times (-28.10) \times 0.7510 \times 0.0905} \\ &= \sqrt{17.3501699} = 4.16\%\end{aligned}$$

## Appendix – 10

Calculation of mean, Standard deviation and coefficient of variation of total investment to total deposit ratio

### a. Total investment to total deposit ratio of BOK

Fiscal Year	Ratio (x)	$(x - \bar{x})$	$(x - \bar{x})^2$
2005/06	32.18	10.77	115.9929
2006/07	24.15	2.74	7.5076
2007/08	20.24	-1.17	1.3689
2008/09	15.39	-6.02	36.2404
2009/10	16.09	-5.32	28.3024
2010/11	20.39	-1.02	1.0404
<b>Total</b>	<b>128.44</b>		<b>190.4526</b>

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{128.44}{6} = 21.41\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{190.4526}{6}} = 5.63\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{5.63}{21.41} \times 100 = 26.30\%$$

### b. Total investment to total deposit ratio of EBL

Fiscal Year	Ratio (x)	$(x - \bar{x})$	$(x - \bar{x})^2$
2005/06	30.43	8.9	79.21
2006/07	27.41	5.88	34.5744
2007/08	21.10	-0.43	0.1849
2008/09	17.85	-3.68	13.5424
2009/10	13.56	-7.97	63.5209
2010/11	18.81	-2.72	7.3984
<b>Total</b>	<b>129.16</b>		<b>198.431</b>

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{129.16}{6} = 21.53\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{198.431}{6}} = 5.75\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{5.75}{21.53} \times 100 = 26.71\%$$

**c. Total investment to total deposit ratio of NABIL**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	31.93	0.89	0.7921
2006/07	38.32	7.28	52.9984
2007/08	31.14	0.10	0.01
2008/09	28.99	-2.05	4.2025
2009/10	29.53	-1.51	2.2801
2010/11	26.32	-4.72	22.2784
Total	186.23		82.5615

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{186.23}{6} = 31.04\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{82.5615}{6}} = 3.71\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{3.71}{31.04} \times 100 = 11.95\%$$

**d. Total investment to total deposit ratio of HBL**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	41.10	9.21	84.8241
2006/07	39.35	7.46	55.6516
2007/08	41.89	10	100
2008/09	25.12	-6.77	45.8329
2009/10	22.45	-9.44	89.1136
2010/11	21.43	-10.46	109.4116
Total	191.34		484.8338

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{191.34}{6} = 31.89\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{484.8338}{6}} = 8.99 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{8.99}{31.89} \times 100 = 28.19\%$$

**e. Total investment to total deposit ratio of NIBL**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	29.60	8.93	79.7449
2006/07	26.57	5.90	34.81
2007/08	19.95	-0.72	0.5184
2 00 8/09	15.85	-4.82	23.2324
2009/10	17.24	-3.43	11.7649
2010/11	14.81	-5.86	34.3396
Total	124.02		184.4102

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{124.02}{6} = 20.67\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{184.4102}{6}} = 5.54 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{5.54}{20.67} \times 100 = \mathbf{26.80\%}$$

**f. Total investment to total deposit ratio of Banking Industry**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	28.21	3.59	12.8881
2006/07	27.71	3.09	9.5481
2007/08	25.57	0.95	0.9025
2 00 8/09	23.22	-1.4	1.96
2009/10	21.25	-3.37	11.3569
2010/11	21.75	-2.87	8.2369
Total	147.71		44.8925

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{147.71}{6} = 24.62\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{44.8925}{6}} = 2.74 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{2.74}{24.62} \times 100 = \mathbf{11.13\%}$$

Source : Annual Report (Balance Sheet) of CBS

## Appendix – 11

Calculation of mean, Standard deviation and coefficient of variation of investment on Government securities to total outside investment ratio of CBS

### a. Investment on Government securities to total outside investment ratio of BOK (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	26.54	9.06	82.0836
2006/07	19.73	2.25	5.0625
2007/08	14.39	-3.09	9.581
2008/09	10.57	-6.91	47.7481
2009/10	15.03	-2.45	6.0025
2010/11	18.61	1.13	1.2769
Total	104.87		151.7217

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{104.87}{6} = 17.48\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{151.217}{6}} = 5.03 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{5.03}{17.48} \times 100 = 28.78\%$$

### b. Investment on Government securities to total outside investment ratio of EBL (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	26.54	6.08	36.9664
2006/07	25.58	5.12	26.2144
2007/08	20.73	0.27	0.0729
2008/09	17.66	-2.8	7.84
2009/10	13.60	-6.86	47.0596
2010/11	18.65	-1.81	3.2761
Total	122.76		121.4294

Source : Annual Report (Balance Sheet) of CBS

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{122.76}{6} = 20.46\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{121.4294}{6}} = 4.50 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{4.50}{20.46} \times 100 = 21.99\%$$

### c. Investment on Government securities to total outside investment ratio of NABIL (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	15.01	-2.60	6.76
2006/07	23.30	5.69	32.3761
2007/08	17.65	0.04	0.0016
2008/09	11.71	-5.90	34.81
2009/10	19.64	2.03	4.1209
2010/11	18.33	0.72	0.5184
Total	105.64		78.587

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{105.64}{6} = 17.61\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{78.587}{6}} = 3.62\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{3.62}{17.61} \times 100 = 20.56\%$$

**d. Investment on Government securities to total outside investment ratio of HBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	25.95	4.94	24.4036
2006/07	27.44	6.43	41.3449
2007/08	27.61	6.60	43.56
2008/09	14.48	-6.53	42.6409
2009/10	13.73	-7.28	52.9984
2010/11	16.83	-4.18	17.4724
Total	126.04		222.4202

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{126.04}{6} = 21.01\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{222.4202}{6}} = 6.09\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{6.09}{21.01} \times 100 = 28.99\%$$

**e. Investment on Government securities to total outside investment ratio of NIBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	16.47	5.12	26.2144
2006/07	15.82	4.47	19.9809
2007/08	10.44	-0.91	0.8281
2008/09	6.52	-4.83	23.3289
2009/10	9.42	-1.93	3.7249
2010/11	9.45	-1.9	3.61
Total	68.12		77.6872

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{68.12}{6} = 11.35\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{77.6872}{6}} = 3.60\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{3.60}{11.35} \times 100 = 31.72\%$$

**f. Investment on Government securities to total outside investment ratio of Banking Industry (in Percentage)**

<b>Fiscal Year</b>	<b>Ratio (x)</b>	<b>(x - <math>\bar{x}</math>)</b>	<b>(x - <math>\bar{x}</math>)<sup>2</sup></b>
2005/06	22.52	5.68	32.2624
2006/07	19.98	3.14	9.8596
2007/08	17.36	0.52	0.2704
2008/09	13.03	-3.81	14.5161
2009/10	13.20	-3.64	13.2496
2010/11	14.96	-1.88	3.5344
<b>Total</b>	<b>101.05</b>		<b>73.6925</b>

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{101.05}{6} = 16.84\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{73.6925}{6}} = 3.50 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{3.50}{16.84} \times 100 = 20.78\%$$

Source : Annual Report (Balance Sheet) of CBS

## Appendix -12

Calculation of mean, standard deviation and coefficient of variation of investment on Loan and advance to total outside investment ratio of CBS

### a. Loan and advance to total outside investment ratio of BOK (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	72.49	-9.43	88.9249
2006/07	79.51	-2.41	5.8081
2007/08	84.84	2.92	8.5264
2 00 8/09	88.69	6.77	45.8329
2009/10	84.77	2.85	8.1225
2010/11	81.21	-0.71	0.5041
Total	491.51		157.7189

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{491.51}{6} = 81.92\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{157.7189}{6}} = 5.13 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{5.13}{81.92} \times 100 = 6.26\%$$

### b. Loan and advance to total outside investment ratio of EBL (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	73.31	-5.96	35.5216
2006/07	74.31	-4.96	24.6016
2007/08	78.84	-0.43	0.1849
2 00 8/09	81.99	2.72	7.3984
2009/10	86.08	6.81	46.3761
2010/11	81.06	1.79	3.2041
Total	475.59		117.2867

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{475.59}{6} = 79.27\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{117.2867}{6}} = 4.42 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{4.42}{79.27} \times 100 = 5.58\%$$

### c. Loan and advance to total outside investment ratio of NABIL (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	84.31	3.12	9.7344
2006/07	75.31	-5.88	34.5744
2007/08	81.13	-0.06	0.0036
2 00 8/09	87.17	5.98	35.7604
2009/10	79.50	-1.69	2.8561
2010/11	79.71	-1.48	2.1904
Total	487.13		85.1193



$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{487.13}{6} = 81.19\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{85.1193}{6}} = 3.77 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{3.77}{81.19} \times 100 = 4.64\%$$

**d. Loan and advance to total outside investment ratio of HBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	73.85	-4.87	23.7169
2006/07	72.25	-6.47	41.8609
2007/08	72.06	-6.66	44.3556
2008/09	85.20	6.48	41.9904
2009/10	86.03	7.31	53.4361
2010/11	82.93	4.21	17.7241
	472.32		223.084

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{472.32}{6} = 78.72\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{223.084}{6}} = 6.10 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{6.10}{78.72} \times 100 = 7.75\%$$

**e. Loan and advance to total outside investment ratio of NIBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	83.42	-5.07	25.7049
2006/07	84	-4.49	20.1601
2007/08	89.36	0.87	0.7569
2008/09	93.32	4.83	23.3289
2009/10	90.43	1.94	3.7636
2010/11	90.39	1.9	3.61
Total	530.92		77.3244

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{530.92}{6} = 88.49\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{77.3244}{6}} = 3.59 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{3.59}{88.49} \times 100 = 4.06\%$$

**f. Loan and advance to total outside investment ratio of Banking industry (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	67.84	-5.82	33.8724
2006/07	70.10	-3.56	12.6736
2007/08	73.55	-0.11	0.0121
2008/09	75.31	1.65	2.7225
2009/10	77.10	3.44	11.8336
2010/11	78.03	4.37	19.0969
Total	441.93		80.2111

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{441.93}{6} = 73.66\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{80.2111}{6}} = 3.66\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{3.66}{73.66} \times 100 = 4.97\%$$

Source : Annual Report (Balance Sheet) of CBS

### Appendix -13

Calculation of mean, Standard deviation and coefficient of variation of investment on share and debenture to total outside investment ratio of CBS

#### a. Share and debenture to total outside investment ratio of BOK (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	0.97	0.36	0.1296
2006/07	0.76	0.15	0.0225
2007/08	0.78	0.17	0.0289
2 00 8/09	0.75	0.14	0.0196
2009/10	0.20	-0.41	0.1681
2010/11	0.19	-0.42	0.1764
Total	3.65		0.5451

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{3.65}{6} = 0.61\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.5451}{6}} = 0.30 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.30}{0.61} \times 100 = 49.18\%$$

#### b. Share and debenture to total outside investment ratio of EBL (in Percentage)

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	0.15	-0.13	0.0169
2006/07	0.11	-0.17	0.0289
2007/08	0.43	0.15	0.0049
2 00 8/09	0.35	0.07	0.0049
2009/10	0.32	0.04	0.0016
2010/11	0.29	0.01	0.0001
Total	1.65		0.0749

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{1.65}{6} = 0.28\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.0749}{6}} = 0.11 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.11}{0.28} \times 100 = 39.29\%$$

**c. Share and debenture to total outside investment ratio of NABIL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	0.68	-0.53	0.2809
2006//07	1.39	0.18	0.0324
2007/08	1.23	0.02	0.0004
2008/09	1.12	-0.09	0.0081
2009/10	0.85	-0.36	0.1296
2010/11	1.96	0.75	0.5625
Total	7.23		1.0139

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{7.23}{6} = 1.21\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{1.0139}{6}} = 0.41 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.41}{1.21} \times 100 = 33.88\%$$

**d. Share and debenture to total outside investment ratio of HBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	0.20	-0.07	0.0049
2006/07	0.31	0.04	0.0016
2007/08	0.33	0.06	0.0036
2 00 8/09	0.32	0.05	0.0025
2009/10	0.24	-0.03	0.0009
2010/11	0.23	-0.04	0.0016
Total	1.63		0.0151

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{1.63}{6} = 0.27\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.0151}{6}} = 0.05 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.05}{0.27} \times 100 = 18.52\%$$

**e. Share and debenture to total outside investment ratio of NIBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	0.12	-0.04	0.0016
2006/07	0.17	0.01	0.0001
2007/08	0.20	0.04	0.0016
2 00 8/09	0.17	0.01	0.0001
2009/10	0.15	-0.01	0.0001
2010/11	0.16	0	0
	0.97		0.0035

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{0.97}{6} = 0.16\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.0035}{6}} = 0.02\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.02}{0.16} \times 100 = 12.5\%$$

**f. Share and debenture to total outside investment ratio of Banking Industry (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	9.64	0.44	0.1936
2006/07	9.02	-0.18	0.0324
2007/08	9.09	-0.11	0.0121
2 00 8/09	11.65	2.45	6.0025
2009/10	8.80	-0.4	0.16
2010/11	7.00	-2.2	4.84
	55.2		11.2406

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{55.2}{6} = 9.2\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{11.2406}{6}} = 1.37 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{1.37}{9.2} \times 100 = 14.89\%$$

Source : Annual Report (Balance Sheet) of CBS

### Appendix -14

Calculation of mean, Standard deviation and coefficient of variation of Return on Total Assets ratio of CBS

#### a. Return on Total Assets ratio of BOK (in Percentage)

Fiscal Year	Ratio (x)	$(x - \bar{x})$	$(x - \bar{x})^2$
2005/06	1.65	-0.41	0.1681
2006/07	1.80	-0.26	0.0676
2007/08	2.04	-0.02	0.0004
2008/09	2.25	0.19	0.0361
2009/10	2.18	0.12	0.0144
2010/11	2.44	0.38	0.1444
	12.36		0.431

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{12.36}{6} = 2.06\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.531}{6}} = 0.27\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.27}{2.06} \times 100 = 13.11\%$$

#### b. Return on Total Assets ratio of EBL (in Percentage)

Fiscal Year	Ratio (x)	$(x - \bar{x})$	$(x - \bar{x})^2$
2005/06	1.49	-0.22	0.0484
2006/07	1.38	-0.33	0.1089
2007/08	1.66	-0.05	0.0025
2008/09	1.73	0.02	0.0004
2009/10	2.01	0.3	0.09
2010/11	2.01	0.3	0.09
	10.28		0.3402

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{10.28}{6} = 1.71\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.3402}{6}} = 0.24\%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.24}{1.71} \times 100 = 14.04\%$$

#### c. Return on Total Assets ratio of NABIL (in Percentage)

Fiscal Year	Ratio (x)	$(x - \bar{x})$	$(x - \bar{x})^2$
2005/06	1.57	-0.45	0.2025
2006/07	1.84	-0.18	0.0324
2007/08	1.88	-0.14	0.0196
2008/09	2.35	0.33	0.1089
2009/10	2.19	0.17	0.0289
2010/11	2.30	0.28	0.0784
	12.13		0.4707

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{12.13}{6} = 2.02\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.4707}{6}} = 0.28 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.28}{2.02} \times 100 = 13.86\%$$

**d. Return on Total Assets ratio of HBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	1.55	-0.08	0.0064
2006/07	1.47	-0.16	0.0256
2007/08	1.76	0.13	0.0169
2008/09	1.91	0.28	0.0784
2009/10	1.19	-0.44	0.1936
2010/11	1.91	0.28	0.0784
	9.79		0.3993

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{9.79}{6} = 1.63\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.3993}{6}} = 0.26 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.26}{1.63} \times 100 = 15.95\%$$

**e. Return on Total Assets ratio of NIBL (in Percentage)**

Fiscal Year	Ratio (x)	(x - $\bar{x}$ )	(x - $\bar{x}$ ) <sup>2</sup>
2005/06	1.64	-0.22	0.0484
2006/07	1.82	-0.04	0.0016
2007/08	1.79	-0.07	0.0049
2008/09	1.70	-0.16	0.0256
2009/10	2.21	0.35	0.1225
2010/11	2.02	0.16	0.0256
	11.18		0.2286

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{11.18}{6} = 1.86\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.2286}{6}} = 0.20 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.20}{1.86} \times 100 = 10.75\%$$

**f. Return on Total Assets ratio of Banking Industry (in Percentage)**

<b>Fiscal Year</b>	<b>Ratio (x)</b>	<b>(x - <math>\bar{x}</math>)</b>	<b>(x - <math>\bar{x}</math>)<sup>2</sup></b>
005/06	2.05	0.14	0.0196
2006/07	1.82	-0.09	0.0081
2007/08	2.11	0.2	0.04
2008/09	1.76	-0.15	0.0225
2009/10	1.95	0.04	0.0016
2010/11	1.78	-0.13	0.0169
	11.47		0.1087

$$\text{Mean } (\bar{x}) = \frac{\sum x}{n} = \frac{11.47}{6} = 1.91\%$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{n}} = \sqrt{\frac{0.1087}{6}} = 0.13 \%$$

$$\text{Coefficient of variation (CV)} = \frac{\sigma}{\bar{x}} \times 100 = \frac{0.13}{1.91} \times 100 = 6.81\%$$

Source : Annual Report (Balance Sheet) of CBS



## Appendix -15

### Sample Calculation of "Straight Line Trend"

Let straight-line trend between dependent variable ( Total Investment)  $y_c$  and the independent variable (time)  $x$  be,

$$Y_c = a + bx$$

Then , to find the value of  $a$  and  $b$

$$a = \frac{\sum y}{n} \text{ and } b = \frac{\sum xy}{\sum x^2}$$

#### a. A trend analysis of investment on Government Securities of BOK

Fiscal Year	investment on Government Securities (Y)	$x = t - 2008$	$xy$	$x^2$
2005/06	2658.369	-2	-5316.738	4
22006/07	2332.041	-1	-2332.041	1
22007/08	2113.223	0	0	0
22008/09	1744.977	1	1744.977	1
22009/10	2954.932	2	5909.864	4
22010/011	4002.138	3	12006.414	9
	$\sum y = 15805.68$		12012.476	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{15805.68}{6} = 2634.28$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{12012.476}{19} = 632.24$$

The straight line trend for investment for Government securities of BOK

$$y_c = 2634.28 + 632.24x$$

#### b. A trend analysis of investment on Government Securities of EBL

Fiscal Year	investment on Government Securities (Y)	$x = t - 2008$	$xy$	$x^2$
2005/06	3548.617	-2	-7097.234	4
2006/07	4704.632	-1	-4704.6320	1
2007/08	4821.605	0	0	0
22008/09	5146.046	1	5146.046	1
2009/10	4354.353	2	8708.706	4
2010/011	7145.017	3	21435.051	9
	$\sum y = 29720.017$		12012.476	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{29720.27}{6} = 4953.378$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{23487.937}{19} = 1236.21$$

The straight line trend for investment for Government securities of EBL

$$y_c = 4953.378 + 1236.21x$$

**c. A Trend analysis of investment on Government Securities of NABIL**

Fiscal Year	investment on Government Securities (Y)	$x = t - 2008$	$xy$	$x^2$
2005/06	2301.463	-2	-4602.926	4
22006/07	4808.348	-1	-4808.348	1
22007/08	4646.883	0	0	0
22008/09	3706.102	1	3706.102	1
22009/10	7973.664	2	15947.328	4
22010/011	8745.231	3	26235.693	9
	$\sum y = 32181.691$		12012.476	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{32181.691}{6} = 5363.62$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{36477.849}{19} = 1919.89$$

The straight line trend for investment for Government securities of NABIL

$$y_c = 5363.62 + 1919.89x$$

**d. A trend analysis of investment on Government Securities of HBL**

Fiscal Year	investment on Government Securities (Y)	$x = t - 2008$	$xy$	$x^2$
2005/06	5144.313	-2	-10288.626	4
22006/07	6454.873	-1	-6454.873	1
22007/08	7471.668	0	0	0
22008/09	4212.300	1	4212.300	1
22009/10	4465.372	2	8930.744	4
22010/011	6407.363	3	19222.089	9
	$\sum y = 64155.889$		15621.634	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{34155.889}{6} = 5692.648$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{15621.634}{19} = 822.19$$

The straight line trend for investment for Government securities of HBL

$$y_c = 5692.65 + 822.19x$$

**e. A trend analysis of investment on Government Securities of NIBL**

Fiscal Year	investment on Government Securities (Y)	$x = t - 2008$	$xy$	$x^2$
2005/06	2522.300	-2	-5044.600	4
2006/07	3256.400	-1	-3256.400	1
2007/08	3155.000	0	0	0
2008/09	2531.300	1	2351.300	1
2009/10	4201.850	2	8403.700	4
2010/011	4294.600	3	12883.800	9
	$\sum y = 19961.450$		15517.800	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{19961.450}{6} = 3326.908$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{15517.800}{19} = 816.73$$

The straight line trend for investment for Government securities of NIBL

$$y_c = 3326.91 + 816.73x$$

**f. A trend analysis of investment on Government Securities of Banking Industry**

Fiscal Year	investment on Government Securities (Y)	$x = t - 2008$	$xy$	$x^2$
2005/06	57539.1	-2	-115078.2	4
2006/07	64443.0	-1	-64443.0	1
2007/08	71495.5	0	0	0
2008/09	68902.0	1	68902.0	1
2009/10	79079.6	2	158159.2	4
2010/011	100267.3	3	300801.9	9
	$\sum y = 441726.5$		348341.9	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{441726.5}{6} = 73621.083$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{348341.9}{19} = 18333.78$$

The straight line trend for investment for Government securities of NIBL

$$y_c = 73621.083 + 18333.78x$$

**g. A trend analysis of investment on Loan and Advance of BOK**

<b>Fiscal Year</b>	<b>investment on Loan and advance(y)</b>	<b><math>x = t - 2008</math></b>	<b><math>xy</math></b>	<b><math>x^2</math></b>
2005/06	7259.083	-2	-14518.166	4
2006/07	9399.328	-1	-9399.328	1
2007/08	12462.637	0	0	0
2008/09	14647.297	1	14647.297	1
2009/10	16664.931	2	33329.862	4
2010/011	17468.192	3	52404.576	9
	$\sum y = 77901.468$		76464.241	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{77901.468}{6} = 12983.58$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{76464.241}{19} = 4024.43$$

The straight line trend for investment for Loan and Advance of BOK

$$y_c = 12983.58 + 4024.43x$$

**h. A Trend analysis of investment on Loan and Advance of EBL**

<b>Fiscal Year</b>	<b>investment on Loan and advance(y)</b>	<b><math>x = t - 2008</math></b>	<b><math>xy</math></b>	<b><math>x^2</math></b>
2005/06	9801.308	-2	-19602.616	4
2006/07	13664.081	-1	-13664.081	1
2007/08	18339.086	0	0	0
2008/09	23884.674	1	23884.674	1
2009/10	27556.356	2	55112.712	4
2010/011	31057.691	3	93173.073	9
	$\sum y = 124303.196$		138903.762	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{124303.196}{6} = 20717.20$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{138903.762}{19} = 7310.72$$

The straight line trend for investment for Loan and Advantage of EBL

$$y_c = 20717.20 + 7310.72x$$

**i. A Trend analysis of investment on Loan and Advance of NABIL**

<i>Fiscal Year</i>	<b>investment on Loan and advance(y)</b>	<b><math>x = t - 2008</math></b>	<b><math>xy</math></b>	<b><math>x^2</math></b>
2005/06	12922.543	-2	-25845.086	4
2006/07	15545.778	-1	-15545.778	1
2007/08	21365.053	0	0	0
2008/09	27589.933	1	27589.933	1
2009/10	32268.873	2	64537.746	4
2010/011	38034.098	3	114102.294	9
	<b><math>\sum y = 147726.278</math></b>		164839.109	<b><math>\sum x^2 = 19</math></b>

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{147726.278}{6} = 24621.046$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{164839.109}{19} = 8675.74$$

The straight line trend for investment for Loan and Advantage of NABIL

$$y_c = 24621.046 + 8675.74x$$

**j. A Trend analysis of investment on Loan and Advance of HBL**

<i>Fiscal Year</i>	<b>investment on Loan and advance(y)</b>	<b><math>x = t - 2008</math></b>	<b><math>xy</math></b>	<b><math>x^2</math></b>
2005/06	14642.560	-2	-29285.12	4
2006/07	16997.997	-1	-16997.997	1
2007/08	19497.520	0	0	0
2008/09	24793.155	1	24793.155	1
2009/10	27980.629	2	55961.258	4
2010/011	31566.977	3	94700.931	9
	<b><math>\sum y = 135478.838</math></b>		129172.27	<b><math>\sum x^2 = 19</math></b>

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{135478.838}{6} = 22579.806$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{129172.227}{19} = 6798.54$$

The straight line trend for investment for Loan and Advantage of HBL

$$y_c = 22579.806 + 6798.54x$$

**k. A Trend analysis of investment on Loan and Advance of NIBL**

<i>Fiscal Year</i>	<b>investment on Loan and advance(y)</b>	$x = t - 2008$	$xy$	$gx^2$
2005/06	12776.208	-2	-25552.416	4
2006/07	17286.427	-1	-17286.427	1
2007/08	26996.652	0	0	0
2008/09	36241.207	1	36241.207	1
2009/10	40318.308	2	80636.616	4
2010/011	41095.515	3	123286.545	9
	$\sum y$ = 174714.317		197325.525	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{174714.317}{6} = 29119.053$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{197325.525}{19} = 10385.55$$

The straight line trend for investment for Loan and Advantage of NIBL

$$y_c = 29119.053 + 10385.55x$$

**l. A Trend analysis of investment on Loan and Advance of Banking industry**

<i>Fiscal Year</i>	<b>investment on Loan and advance(y)</b>	$x = t - 2008$	$xy$	$x^2$
2005/06	173383.4	-2	-346766.8	4
2006/07	228951.9	-1	-228951.9	1
2007/08	302913.4	0	0	0
2008/09	398143.0	1	398143.0	1
2009/10	467107.2	2	934214.4	4
2010/011	522853.3	3	1568559.9	9
	$\sum y = 2093352.2$		$\sum xy$ = 2325198.6	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{2093352.2}{6} = 348892.03$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{2325198.6}{19} = 122378.87$$

The straight line trend for investment for Loan and Advantage of Banking industry

$$y_c = 348892.03 + 122378.87x$$

**m. A Trend analysis of investment on Shares and Debenture of BOK**

<i>Fiscal Year</i>	<i>investment on Shares and Debenture(y)</i>	$x = t - 2008$	$xy$	$x^2$
2005/06	96.868	-2	-193.736	4
2006/07	90.169	-1	-90.169	1
2007/08	114.059	0	0	0
2008/09	123.751	1	123.751	1
2009/10	40.140	2	80.28	4
2010/011	40.140	3	120.42	9
	$\sum y = 505.127$		$\sum xy = 40.546$	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{505.127}{6} = 84.188$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{40.546}{19} = 2.134$$

The straight line trend for investment for Shares and debenture of BOK

$$y_c = 84.188 + 2.134x$$

**n. A Trend analysis of investment on Shares and Debenture of EBL**

<i>Fiscal Year</i>	<i>investment on Shares and Debenture(y)</i>	$x = t - 2008$	$xy$	$x^2$
2005/06	19.887	-2	-39.774	4
2006/07	19.887	-1	-19.887	1
2007/08	101.152	0	0	0
2008/09	102.035	1	102.035	1
2009/10	102.035	2	204.07	4
2010/011	109.576	3	328.728	9
	$\sum y = 454.572$		$\sum xy = 575.172$	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{454.572}{6} = 75.762$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{575.472}{19} = 30.27$$

The straight line trend for investment for Shares and debenture of EBL

$$y_c = 75.762 + 30.27x$$

**o. A Trend analysis of investment on Shares and Debenture of NABIL**

<i>Fiscal Year</i>	<i>investment on Shares and Debenture(y)</i>	$x = t - 2008$	$xy$	$x^2$
2005/06	104.192	-2	-208.384	4
2006/07	286.958	-1	-286.958	1
2007/08	323.236	0	0	0
2008/09	354.931	1	354.931	1
2009/10	346.856	2	693.712	4
2010/011	936.386	3	2809.158	9
	$\sum y = 2352.559$		$\sum xy = 3362.459$	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{2352.559}{6} = 392.093$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{3362.459}{19} = 176.97$$

The straight line trend for investment for Shares and debenture of NABIL

$$y_c = 392.093 + 176.97x$$

**p. A Trend analysis of investment on Shares and Debenture of HBL**

<i>Fiscal Year</i>	<i>investment on Shares and Debenture(y)</i>	$x = t - 2008$	$xy$	$x^2$
2005/06	39.909	-2	-79.818	4
2006/07	73.424	-1	-73.424	1
2007/08	89.558	0	0	0
2008/09	93.883	1	93.883	1
2009/10	78.882	2	157.764	4
2010/011	88.787	3	266.361	9
	$\sum y = 464.443$		$\sum xy = 364.766$	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{464.443}{6} = 77.407$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{364.766}{19} = 19.20$$

The straight line trend for investment for Shares and debenture of HBL

$$y_c = 77.407 + 19.20x$$



**q. A Trend analysis of investment on Shares and Debenture of NIBL**

<i>Fiscal Year</i>	<i>investment on Shares and Debenture(y)</i>	$x = t - 2008$	$xy$	$x^2$
2005/06	17.738	-2	-35.476	4
2006/07	35.253	-1	-35.253	1
2007/08	59.946	0	0	0
2008/09	64.271	1	64.271	1
2009/10	66.646	2	133.292	4
2010/011	72.912	3	218.736	9
	$\sum y = 316.766$		$\sum xy = 345.570$	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{316.766}{6} = 52.794$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{345.570}{19} = 18.19$$

The straight line trend for investment for Shares and debenture of NIBL

$$y_c = 52.794 + 18.19x$$

**r. A Trend analysis of investment on Shares and Debenture of Banking industry**

<i>Fiscal Year</i>	<i>investment on Shares and Debenture(y)</i>	$x = t - 2008$	$xy$	$x^2$
2005/06	24634.7	-2	-49269.4	4
2006/070	29087.8	-1	-29087.8	1
2007/08	37459.3	0	0	0
2008/09	61595.5	1	61595.5	1
2009/10	52697.3	2	105394.6	4
2010/011	46901.4	3	140704.2	9
	$\sum y = 252376.0$		$\sum xy = 229337.1$	$\sum x^2 = 19$

Since,  $\sum x = 0$

$$a = \frac{\sum y}{n} = \frac{252376.0}{6} = 42062.67$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{229337.1}{19} = 12070.374$$

The straight line trend for investment for Shares and debenture of Banking and industry

$$y_c = 42062.67 + 12070.374x$$

**Appendix -16**  
**Bank of Kathmandu Ltd.**  
**Consolidate Balance sheet**  
**As on Mid. July**

<b>Capital and Liabilities</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
Capital Share	463.581	603.141	603.141	1182.157	1359.481	1604.187
Reserve and Surplus	376.157	378.837	738.932	559.433	714.049	831.002
Debenture and Bond	200.000	200.000	200.000	200.000	200.000	200.000
Loan and Borrowing	553.180	730.000	100.000	100.000	300.000	464.900
Deposit Liabilities	10485.359	12388.927	15833.738	18083.980	20315.834	21018.417
Bills Payable	11.622	25.777	51.576	51.125	35.702	19.051
Proposed & unpaid Dividend	98.712	135.575	32.804	62.219	177.324	227.713
Income Tax Liability	-	-	-	-	-	-
Other Liabilities	89.723	107.841	161.733	257.092	293.802	392.481
<b>Total Capitals Liabilities</b>	<b>12278.330</b>	<b>14570.099</b>	<b>17721.925</b>	<b>20496.005</b>	<b>23396.192</b>	<b>24757.750</b>
<b>Assets</b>						
Cash in Hand	184.020	219.043	563.747	565.066	455.181	542.371
Balance with NRP	349.296	883.496	606.049	1324.108	687.582	641.694
Balance with other Bank	195.382	213.366	297.670	292.938	655.604	494.866
Money at call & Short Notice	594.047	259.279	72.680	243.352	931.989	479.920
Investment	3374.712	2992.434	3204.068	2783.599	3269.205	4286.599
Loan and Advance	7259.083	9399.328	12462.637	14647.297	16664.931	17468.192
Fixed Assets	110.745	320.846	387.274	417.041	491.295	501.995
Non-Banking Assets	7.356	3.626	0.453	-	-	-
Other Asset	203.689	278.683	154.346	222.606	240.405	342.111
<b>Total Assets</b>	<b>12278.330</b>	<b>14570.099</b>	<b>17721.925</b>	<b>20496.005</b>	<b>23396.192</b>	<b>24757.750</b>

**Everest Bank Ltd.**  
**Consolidate Balance sheet**  
**As on Mid. July**

<b>Capital &amp; Liabilities</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
Share Capital	518.000	518.000	831.400	838.821	1279.607	1391.570
Reserve Funds	444.808	683.515	1089.838	1364.804	1479.530	1721.976
Debenture & Bonds	300.000	300,000	300.000	300.000	300.000	300.000
Loan & Borrowing	-	-	-	312.000	404.600	482.000
Deposit Liabilities	13802.445	18186.253	23976.299	33322.946	36932.310	41127.914
Bills Payable	15.806	26.776	49.430	148.656	145.515	49.717
Proposed & unpaid dividend	114.667	68.146	140.790	230.525	276.253	576.897
Income Tax Liabilities	-	15.278	41.143	20.522	(1.136)	26.900
Other Liabilities	763.559	1634.604	720.444	378.575	566.082	559.237
<b>Total Capital &amp; liabilities</b>	<b>15959.285</b>	<b>21432.574</b>	<b>27149.343</b>	<b>36916.849</b>	<b>41382.761</b>	<b>46236.212</b>
<b>Assets</b>						
Cash in hand	259.348	534.996	822.989	944.696	1091.500	1048.999
Balance with NRB	1139.515	1178.198	1080.915	4787.164	5628.114	4706.320
Balance with other Bank	154.105	678.225	764.068	432.512	1102.201	367.544
Money at call & short Notice	66.960	-	346.000	-	-	-
Investment	4200.515	4984.314	5059.558	5948.480	5008.308	7743.928
Loan and Advance	9801.308	13664.081	18339.086	23884.674	27556.356	31057.391
Fixed Assets	152.090	170.097	360.512	427.157	463.094	460.259
Non-Banking Assets	7.496	-	-	-	-	-
Other Assets	178.008	222.660	376.215	492.166	536.188	851.471
<b>Total Assets</b>	<b>15959.285</b>	<b>21432.574</b>	<b>27149.343</b>	<b>36916.849</b>	<b>41382.761</b>	<b>46236.212</b>

**Nabil Bank Ltd.**  
**Consolidate Balance sheet**  
**As on Mid. July**

<b>Capital and Liabilities</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
Share Capital	1383.340	491.654	689.216	1448.621	2028.774	2029.769
Reserve and Surplus	-	1565.395	1747.983	1681.620	1807.933	2536.748
Debenture and Bonds	173.202	-	240.000	300.000	300.000	300.000
Loan & Borrowings	19347.399	882.572	1360.000	1681.30	74.900	1650.599
Deposit Liabilities	112.607	23342.285	31915.047	37348.256	46410.701	49696.113
Bills Payable	435.084	83.514	238.422	463.139	425.444	415.768
Proposed & unpaid dividend	34.605	509.417	437.373	338.011	434.737	608.931
Income Tax Liabilities	352.080	-	38.777	80.232	24.904	44.104
Other Liabilities	378.552	465.941	526.214	644.291	859.406	
<b>Total Capital &amp; Liabilities</b>	<b>22329.971</b>	<b>27253.393</b>	<b>37132.759</b>	<b>43867.398</b>	<b>52151.684</b>	<b>58141.437</b>
<b>Assets</b>						
Cash in hand	237.819	270.406	511.427	674.395	635.987	744.592
Balance with NRB	318.359	1113.415	1829.471	2648.596	549.455	1473.986
Balance with other Bank	74.061	16.003	330.244	49.521	214.657	217.971
Money at call & short Notice	1734.902	563.532	1952.361	552.888	3118.144	2452.512
Investment	6178.533	8945.310	9939.771	10826.379	13703.024	13081.206
Loan & Advance	12922.543	15545.778	21365.053	27589.933	32268.873	38034.098
Fixed Assets	319.086	286.895	598.039	660.989	779.540	935.087
Non-Banking Asset	-	-	-	-	-	-
Other Assets	544.668	512.050	606.394	864.696	882.005	1201.984
<b>Total Assets</b>	<b>22329.971</b>	<b>27253.323</b>	<b>37132.759</b>	<b>43867.398</b>	<b>52151.684</b>	<b>58141.437</b>

**Himalayan Bank Ltd.**  
**Consolidate Balance sheet**  
**As on Mid. July**

<b>Capital &amp; Liabilities</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
Share Capital	772.200	772.200	772.200	772.200	772.200	772.200
Reserve & surplus	993.976	993.976	993.976	993.976	993.976	993.976
Debenture & Bonds	360.000	360.000	360.000	360.000	360.000	360.000
Loans & Borrowings	144.625	144.625	144.625	144.625	144.625	144.625
Deposit Liabilities	26490.852	26490.852	26490.852	26490.852	26490.852	26490.852
Bills Payable	73.578	73.578	73.578	73.578	73.578	73.578
Proposed & unpaid dividend	238.409	238.409	238.409	238.409	238.409	238.409
Income Tax Liability	-	-	-	-	-	-
Other Liabilities	386.751	386.751	386.751	386.751	386.751	386.751
<b>Total Capital &amp; Liabilities</b>	<b>29460.390</b>	<b>29460.390</b>	<b>29460.390</b>	<b>29460.390</b>	<b>29460.390</b>	<b>29460.390</b>
<b>Assets</b>						
Cash Balance	305.428	305.428	305.428	305.428	305.428	305.428
Balance with NRB	1096.253	1096.253	1096.253	1096.253	1096.253	1096.253
Balance with other Banks	315.671	315.671	315.671	315.671	315.671	315.671
Money at call & Short Notice	1005.280	1005.280	1005.280	1005.280	1005.280	1005.280
Investment	10889.031	10889.031	10889.031	10889.031	10889.031	10889.031
Loan & Advance	14642.560	14642.560	14642.560	14642.560	14642.560	14642.560
Fixed Assets	540.284	540.284	540.284	540.284	540.284	540.284
Non-Banking Assets	21.733	21.733	21.733	21.733	21.733	21.733
Other Assets	643.610	643.610	643.610	643.610	643.610	643.610
<b>Total Assets</b>	<b>29460.610</b>	<b>29460.610</b>	<b>29460.610</b>	<b>29460.610</b>	<b>29460.610</b>	<b>29460.610</b>

**Nepal Investment Bank Ltd.**  
**Consolidate Balance sheet**  
**As on Mid. July**

<b>Capital &amp; liabilities</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
Share Capital	590.586	801.352	1203.915	2407.069	2409.098	3011.372
Reserve & Surplus	824.854	1076.770	1482.871	1500.771	2176.295	2148.388
Debenture & Bonds	550.000	800.000	1050.000	1050.000	1050.000	1050.000
Borrowings	-	-	-	38.800	37.315	280.764
Deposits	18927.306	24488.855	34451.726	46698.100	50094.725	50138.122
Bills Payable	18.820	32.401	78.839	82.338	38.144	8.250
Proposed Dividend	121.627	43.650	93.468	485.454	602.274	602.274
Income Tax Liabilities	9.319	0.295	24.083	38.297	37.195	-
Other Liabilities	287.626	347.518	488.404	709.975	860.367	1117.657
<b>Total Liabilities &amp; Capital</b>	<b>21330.138</b>	<b>27590.845</b>	<b>38873.306</b>	<b>53010.803</b>	<b>57305.413</b>	<b>58356.828</b>
<b>Assets</b>						
Cash Balance	562.560	763.984	1464.482	1833.462	1525.442	1718.666
Balance with Nepal RB	1526.067	1381.351	1820.006	4411.133	3237.217	4009.460
Balance with Banks/Financial institution	247.894	296.178	470.453	1673.403	2053.231	2412.245
Money at call & Short Notice	70.000	362.970	-	-	-	150.000
Investment	5602.869	6505.679	6874.024	7399.812	8635.530	7423.107
Loan , Advance, Bill Purchased	12776.208	17286.427	26996.652	36241.207	40318.308	41095.515
Fixed Assets	343.450	759.456	970.092	1060.752	1136.247	1108.448
Non-Banking Assets	-	1.125	0.750	0.375	-	-
Other Assets	201.090	233.671	276.847	390.653	399.438	439.388
<b>Total Assets</b>	<b>21330.138</b>	<b>27590.845</b>	<b>38873.306</b>	<b>53010.803</b>	<b>57305.413</b>	<b>58356.828</b>

