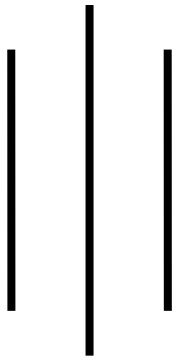
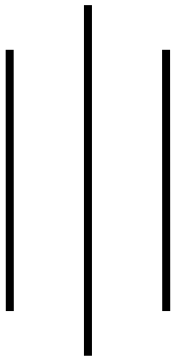
PORTFOLIO ANALYSIS ON INVESTMENT (WITH SPECIAL REFERENCE TO NEPALESE COMMERCIAL BANK)



By
SMRITI JOSHI
Shanker Dev Campus
Roll No : 49/60
TU Registration No : 7-1-271-351-96

A Thesis Submitted to
Office of the Dean
Faculty of Management
Tribhuvan University



In partial fulfillment of the requirements for the degree of
Masters of Business Studies (M.B.S.)

Kathmandu, Nepal
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VIVA VOCE SHEET

We have conducted the viva- voce of the thesis

Submitted by:

Smriti Joshi

Entitled

"Portfolio Analysis on Investment (with Special Reference to Nepalese Commercial Bank)

And found the thesis to be the original work of the student and written in accordance with the prescribed format. The committee recommends the thesis to be accepted as partial fulfillment of the requirement for the degree of

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This is to certify that the thesis
Submitted by:
Smriti Joshi

Entitled

"Portfolio Analysis on Investment (with Special Reference to Nepalese Commercial Bank)

has been prepared as approved by this department in the prescribed format of Faculty of Management, T. U. This thesis is forwarded for examination.

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Achyut Raj Bhattarai	Prof. Bisheshwor Man Shrestha	Prof. Dr Kamal Deep Dhakal
Thesis Supervisor	Head, Research Department	Campus Chief

Shashi Kant Mainali

Thesis Supervisor

Date: ……

DECLARATION

I hereby declare that this thesis entitled *"Portfolio Analysis on Investment (with Special Reference to Nepalese Commercial Bank)"*submitted to the Research Department, Shankar Dev Campus, Putali sadak, Tribhuvan University is my original work for the partial fulfillment of the requirement of the Masters of Business Studies (M.B.S.) this is prepared under supervision of Mr. Shashi Kant Mainali and Mr. Achyut Raj Bhattarai, Shankar Dev Campus, Tribhuvan University

Smriti Joshi

Researcher
Shankar Dev Campus
Roll No : 49/60
TU Registered No: 7-1-271-351-96

Date: ……

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Smriti Joshi
Researcher
Shankar Dev Campus
November, 2009
Kathmandu

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ABBEVIATIONS

A.D	=	Anno Domini
B.S	=	Bikram Sambat
CBs	=	Commercial Banks
CAR	=	Capital Adequacy Ratio
CRR	=	Cash Reserve Ratio
Cov	=	Covariance
CV	=	Coefficient of Variation
EBL	=	Everest Bank Limited
FY	=	Fiscal Year
Govt	=	Government
GDP	=	Gross Domestic Product
HBL	=	Himalayan Bank Limited
i.e	=	That is
IMF	=	International Monetary Fund
LLD	=	Loan Loss Provisioning
Ltd	=	Limited
NABIL	=	NABIL Bank Limited
NEPSE	=	Nepal Stock Exchange
NIBL	=	Nepal Investment Bank Limited
NPAT	=	Net Profit after Tax
NRB	=	Nepal Rastra Bank
PV	=	Present Value
RWA	=	Risk Weighted Assets
Rs	=	Rupees
SCBL	=	Standard Chartered Bank Limited
SD	=	Standard Deviation
SEBO	=	Securities Board
TOI	=	Total outside Investment
TU	=	Tribhuwan University

CHAPTER-1

INTRODUCTION

1.1 Background

Nepal is considered as one of the least developed countries by the international economics standards. The predominance of agriculture and dependence on international trade (import) for basic needs have fostered a chronic and perennial unfavorable balance of payment position. Nepal lags behind in terms of GDP growth and commercial and industrial growth in comparison to its two great neighbors, China and India and many other developed countries. In fact, the commercial sector of Nepal is very fragile.

Nepal has a lot of constraints and opportunities. Unemployment is said to be the biggest problem of the country. Most of the people of the nation are engaged in traditional type of agriculture. The productive activity is the result of the investment venture in productive active enterprises. The process of the economic development depends upon various factors. However economists are now convinced that capital formation and its proper utilization plays a paramount role in rapid economic development. Hence, investment portfolio is one such tool to help proper utilization of resources.

For strengthening the economy of any country both the private and public sector should play a key role. Both private and public sector have been contributing to our nation. Integrated development of the country is possible only when competitive banking service reaches nook and corners of the country. Commercial banks occupy an important place in the framework of every economy because they provide capital for the development of industry, trade, business and other resource deficit sectors by investing the saving collected as deposits. Economic activities of a country are greatly influenced by the commercial banking business of the country.

Banks are an essential part of the business activities which are established to safeguard people's money and thereby using the money in making loans and investments. There are several commercial banks operating inside and outside the valley. Every bank invests its money in some profitable financial sector, which may result in profitable business in the long range. An investment is the commitment of money that is expected to generate additional money. However, every investment entails some degree of risk, which calls for at present certain sacrifice for future uncertain benefits.

The network of a well- organized financial system of the county has great bearing in capital formation. It collects scattered financial resources from the masses and invests them among those engaged in commercial and economic activities of the country. It has been well established that the economic activities of any country can hardly be carried forward without the assistance of financial institutions. Financial institutions have catalytic role in the process of economic development and commercial banks play a key role in the financial system. An

important factor in the development in the country is the mobilization of domestic resources and their investment for productive use to the various sectors. In this connection, commercial banks formulate sound investment policy to maximize quality of investment and contribute to the economic growth of a country.

A portfolio is usually defined as combination of assets. It is a collection of securities. Portfolio provides the highest possible return for any specified degree of risk. The portfolio that provides the highest rate of return with least possible among of risk is the real investment portfolio. Portfolio simply represents the practice among the investors of having their funds in more than one asset. Successful formulation and effective implementation of investment policy is the prime requisite for the successful performance of banks. Good investment policy has a positive impact on economic development of the country and vice versa. A good investment policy attracts both borrower and lenders, which helps the investment operation of the banks to be efficient and profitable by minimizing the inherent risk. A key factor in the development in the country is the mobilization of domestic resources and their investment for productive use to the various sectors by commercial banks. Investment portfolio is one which the income or profit of the bank depends upon directly to minimize risk. A bank must diversify its investment on different sectors, which is known as portfolio investment. Investment portfolio means to reduce risk and distributes the investment in different sectors by means of risk. Portfolio analysis considers the determination of future risk and return in holding various blends of individual securities.

1.2 Statement of the problems

Commercial banks are the backbone of the Nepalese economy. Nepal has been listed among the least developed countries. Nevertheless, the establishment of the commercial bank in this sector has paved the way for the building up of Nepalese economy. Its investment ranges from small-scale cottage industries to large industries in making investment in loans and government securities. One may always wonder which investment is better. It can be hypothesized that bank portfolio variables like loans, investment, cash reserve, deposit and borrowing affects the national income .The government policy affecting these functions, such as, the effect of an interest rate on the bank portfolio variables is of great concern. Hence, during money and credit monitoring process, the central bank has to keep a close eye on bank portfolio behavior. The investment planning of the commercial banks in Nepal is heavily dependent on the rules and regulation provided by the central bank. Thus the composition of asset portfolio of the banks is governed by the central bank policy.

At present, Nepalese commercial banks appear incapable to invest their funds in more profitable sector influenced by risk. They seek more interest in investment in less risky and liquid sector, such as treasury bills or government securities, development bonds, National saving, Shares & Debenture etc. This is due to weak investment policy of commercial banks and absence of portfolio management. Nepalese commercial banks have yet to formulate their investment policy in an organized manner. They pay less attention to portfolio

optimization but just rely upon the instruction and guidelines of Nepal Rastra Bank (NRB). Furthermore, they lack their own clear vision towards investment portfolio and disregard towards proper matching of deposit and investment portfolio. It leads to financial problem enforcing commercial banks to take wrong decisions.

Most of the commercial banks invest their resources in the limited area to achieve the highest amount of profit. Under the prevailing economic situation in the country, the financial investment is insignificant particularly in the agriculture, industrial and other productive sectors, which is quite unsatisfactory to meet the economic growth of the present period. They hesitate to invest in long term projects and intend to adopt conservative loan policy.

Furthermore, there are several problems associated with resources mobilization by commercial banks in Nepal. The most critical problem is poor investment climate prevailing in Nepal due to heavy regulatory procedure, uncertain government policy, and the portfolio analysis between various types of investment made by commercial banks is the most prominent topic, which helps to minimize risk by diversifying total risk to different sectors. But portfolio management activities of Nepalese commercial banks are in an initial stage. The underlying reasons behind the non adoption of such activities by commercial banks are unawareness about portfolio management and its utility, hesitation of taking risk, lack of proper techniques to run such activities in the best manner, less developed capital market, very limited opportunity for exercising the portfolio management. Nepal Rastra Bank (NRB) has also played a key role to make commercial banks as well as financial institutions to invest their funds in good sector, which affect the investment portfolio. NRB has imposed many rules and regulations so that commercial banks can have sufficient liquidity and security. Banking competition is gradually increasing but investment opportunity is insufficiently extended. Now, commercial banks have to compete with each other and many financial institutions too.

With this background, the present study will attempt to analyze investment of commercial banks, portfolio analysis of commercial banks in their investment, return on various types of investment, portfolio risk and return. Thus, this study will concentrate on the following issues.

- How far have commercial banks been able to transfer monetary resources from savers to users?
- What is the trend of investment in different assets by commercial banks?
- How do commercial banks analyze their risk and return through portfolio diversification?
- Whether or not commercial banks effectively utilize portfolio concept in their investment to minimize risk and maximize return?
- Which bank has the largest degree of financial risk under portfolio risk?
- Is investment portfolio oriented toward objectives of profit maximization?

1.3 Focus of the study

Nepal's modern banking history started with the establishment of Nepal Bank Ltd. in 1936. However, Nepal Rastra Bank was set up as the central bank of the country in 1956. The study will focus on portfolio analysis on investment of selected commercial banks in Nepal. This study is oriented to describe the minimized risk and maximized return by portfolio management and the existing situation of portfolio management of commercial banks in Nepal. During the study period 26 commercial banks have been established.

However, the study is concentrated on five commercial banks namely, Nepal Investment Bank Ltd, Nabil Bank Ltd, Standard Chartered Bank Ltd, Everest Bank Ltd and Himalayan Bank Ltd .The study will analyze the financial performance of the banks, their risk, return, trend, and portfolio pattern etc

The study will focus on:

- Prevalent position of portfolio management of Nepalese commercial banks
- Comparative investment portfolio analysis of commercial banks.
- Loans and advance portfolio analysis of commercial banks.
- Risk and return analysis of commercial banks in Nepal.

1.4 Objectives of the study

The general objective of the study is to identify the current situation of investment portfolio of commercial banks in Nepal. The specific objectives are;

- To analyze the current situation of the portfolio management of commercial banks.
- To evaluate the financial performance of commercial bank investment strategies.
- To see the trend of investment in different portfolios.
- To analyze the way commercial bank management of risk and return on investment through portfolio concept.
- To recommend the appropriate measures for adoption

1.5. Importance of the study

The study will equip shareholders to get information for making decision in order to make investment on share of various banks.

- The study will provide existing situation of portfolio analysis on investment of commercial banks in Nepal.
- The study will assist the bank management to dig out the fact for comparative profitability situation with their competitors.

The study will help commercial banks minimize risk on investment and maximize return through portfolio analysis.

The study will furnish information to the bank management to undertake appropriate collective action for improvement.

1.6. Limitation of the study

- This study merely concentrates on factors related to investment portfolio analysis and ignores other financial analysis of these banks.
- Out of the total existing commercial banks, only five commercial banks are selected for study and analysis.
- The study covers data a period of eight fiscal years.

This research is based on secondary source of data .Hence the result is dependent on the reliability of secondary data.

1.7 Organization of the study

The study consists of five chapters. The first chapter begins with introductory background, statement of the problem, focus of the study, and objective of the study, importance and limitations. The chapter two deals with literature review. The chapter three describes research methodology. The chapter four encompasses the presentation, analysis of data, and major findings of the study. The chapter five includes the summary of the study, conclusions and recommendations.

CHAPTER-2

REVIEW OF LITERATURE

This chapter focuses on the review of literature, research studies and other pertinent prepositions in the related field study, textbooks and reference books relevant to the investment portfolio analysis of commercial banks in Nepal particularly different journals, Article, Annual reports and some research paper related with this topic .This chapter is arranged into the following manner;

Conceptual Review.
Review of Legislative provision.
Review of Related study:

- Review of International Journals and Articles.
- Review of Nepalese Journals and Articles.
- Review of Thesis

2.1 Conceptual Review

Conceptual Review provides the fundamental theoretical frame work and foundation to the present study. Hence books, research paper etc. dealing with theoretical aspects of investment and portfolio analysis are taken into consideration.

2.1.1 Definition of Investment

Investment usually means the sacrifice of the current money for future money. The sacrifice takes place in the present and the reward comes later, if at all, and the magnitude is generally uncertain. However, *Shrestha (2002*) describes investment as utilization of saving for something that is expected to produce profit or benefits. Investment is employment of funds to achieve added income or growth in value. It involves the commitment of resources put off from current consumption with hope of capitalizing some benefits in future. It includes both real asset and financial asset .Real asset investment denotes the tangible assets like building, land, machinery, factory and the like. On the other hand, financial asset investment indicates papers representing an indirect claim to real asset held by someone else. .Nevertheless, real asset is less liquid than financial asset.

"Investment is any vehicle into which funds can be placed with the expectation that will preserve or increase in value and generated positive returns." *(Gitman & Joehnk;1990:265)*

"Investment is 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 uncertainty involved in the future flow of the funds*."(Frank & Reilly; 1972:299)*

The above definitions infer that an investment is the allocation and mobilization of funds for a certain time period to acquire some extra benefit or extra attachment with mobilized fund.

2.1.2 Investment Uncertainty Source

Any investment involves uncertainty making future investment risky. Following are the sources of uncertainty contributing to investment risk. (*Elton &Gruber*; 2001:13-17)

Interest rate risk

It is the potential variability of return caused by changes in the market interest rates. Investment's present value varies inversely with changes in the market interest rate. In other words, if market interest raises then the investment's present value (PV) falls.

$$\text{PV of investment} = \frac{1}{\text{Interest rate}}$$

Thus, the investment rate risk affects the prices of securities like stocks, bonds, real estate, gold, and other investments well.

Purchasing power risk (Inflation risk)

It is the variability of return an investor suffers due to inflation. The rate of inflation is measured by consumer price index

$$\text{Rate of inflation} = \frac{CPI_t - CPI_{t-1}}{CP_{t-1}}$$

Where,

CPI_t= consumer price index in period t.

CPI_{t-1}= consumer price in index in period t-1

When inflation takes place, financial assets such as stock, bonds, etc. may lose their ability to command the same amount of real goods and services they did in the past.

Market Risk

It is the risk that arises from the variability in the market return from alternating bull and bear market forces. When a security index rises fairly consistently from low point, this upward trend is called bull market, but when the security index declines from peak point to the next trough it is called bear market. During bearish period the price of the stocks falls but in the bullish market that usually raises enough to compensate for the bear market loses. Thus the alternating bull and bear market forces generate a perennial source of investment risk.

Default Risk

Default risk is that portion of investment's total risk resulting from changes in the financial integrity of the investment. In other words, default risk is the variability of return that experience as a result of changes in the credit worthiness of a firm in which they invested, Investors losses from default risk usually result from the securities prices falling as the financial integrity of a firm weakens. So, by the time bankruptcy occurs, the market prices of the firm's security will already have declined to near zero.

Liquidity Risk

It is variability of return which results from price discounts given or sales commission paid to sell the asset without delay. Perfectly liquid assets are highly marketable and suffer no liquidation costs but liquid assets are not readily marketable. Hence, liquid assets required large price discounts and sales commissions to affect a quick sell.

Call- ability Risk

The portion of a security's total variability of return that derives from the possibility that issue may be called is the call-ability risk. Call-ability risk commands a risk premium that comes in the form of slightly higher average rate of return.

Convertibility Risk

It is that portion of the total risk of return from a convertible bond or a convertible preferred stock that reflects that possibility that investment may be converted into the issuer's common stock.

Political Risk

It is the risk that caused by changing in the political environment that affect the asset's market value. It arises from the exploitation of a politically weak group for the benefit of a politically strong group to improve their relative position increasing the variability of return from the affected asset. Regardless of whether the change causing political risk is sought by economic interest, the variability of return is called political risk.

Industry Risk

Industry risk is the variability of return caused by events affecting the products and firms by up an industry. The stage of the industry's life cycle, international tariffs, quotas, taxes, labor union problem, environmental restrictions, raw material availability and similar factor interact and affect all the firms in an industry simultaneously. As a result of these commonalities the price of the securities issued by competing firms tends to rise and fall together.

Total Risk=Interest rate risk+ purchasing power risk+ Market risk+ Management risk+ Default risk+ Liquidity risk+ Call-ability risk+ Convertibility risk+ Political risk+ industry risk+ Other risk factors.

2.1.3 Investment alternatives

"In the market, a wide range of investment alternatives likes, common stocks, preferred stock and bank as financial assets are available to an individual investor" *(Chene &Moses; 1995:8).* Commercial bankers, investment bankers and brokers provide the financial manager with the detailed information on each of the forms of investment listed. The financial manager maintains these characteristics and follows the principle of making investment selections that maturities yields and risks appropriate to the firm. There are various alternatives for investors and financial institutions as mentioned below.

1. **Equity Security**
    a. Common stock
    b. Preferred stock
2. **Debt Securities**
    a. Short term debt securities.
        i. Negotiable certificate of deposit
        ii. Commercial paper
        iii. Bankers acceptance
        iv. Treasury bills
    b. Intermediate and long term debt securities
        i. Treasury notes
        ii. Treasury bonds
        iii. Saving bonds
        iv. Agency securities
        v. Municipal securities
        vi. Corporate bond
3. **Derivative Securities**
    a. Option
    b. Common future
    c. Financial future
    d. Options on future

e. Rights
f. Warrants

4. **Hybrid Securities**
   a. Convertible preferred
   b. Convertible bonds
5. **Real assets**
   a. Precious metals
   b. Real estate
   c. Collectibles
6. **International Investment**
   a. Multinational corporation
   b. Foreign stocks traded on local exchange
   c. American depository Receipts
7. **Other Investment Alternatives**
   a. Pension funds
   b. Mutual funds
   c. Closed end companies

2.1.4 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."*(Western &Brigham; 1982:245)*.If the investor holds a well diversified portfolio, then his concern should be the expected return and risk of the 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 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 the portfolio exposure to market risk. Financial Portfolio offers three views on risk allowing us to compare our portfolio to market portfolio in terms of Risk-adjusted Return, Value at Risk and Market Risk Exposure. The portfolio of asset usually offers advantages of risk reduction through diversification. A stock or securities held, as a part of a portfolio is less risky than the same stock held in isolation. Thus Portfolio analysis helps develop a portfolio that had the maximum return at whatever level of risk the investor deems appropriate.

2.1.5 Objective of Portfolio Analysis

The objectives of the portfolio analysis are to analyze different individual assets and delineate efficient portfolio. Hence the portfolio manager's task is to select the investment weights resulting in the dominant investments, analyze the risk, return data describing each

investment candidate and determine what the assets to buy what to neglect and what to sell short. The primary objectives of the portfolio management are;

- Minimization of Risk
- Maximization of Profit

The secondary objectives are:

- Regular return
- Stable income
- Appreciation capital
- Liquidity
- Easy marketability
- Safety of investment
- Tax planning:-capital gain tax, income tax, and wealth tax

2.1.6 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 portfolio's expected return and risk."(*Cheney & Mosses; 1992:651)*

2.1.6.1 Portfolio Return

"The portfolio return is the weighted average expected return of the individual stocks in the portfolio. The weights are the proportion of the investor's wealth invested in each stock. The asset and the sum of the weights must be equal to one." *(Cheney Mosses; 1992:652).* The portfolio return is determined by the following equation.

$R_P = W_1K_1 + W_2K_2 + \ldots\ldots\ldots\ldots + W_nK_n$

Where,

R_P= Portfolio expected return.

W_1= weight of investment invested in stock1.

W_2= weight of investment invested in stock2.

K_1= Expected return for stock 1

K_2= Expected return for stock 2

2.1.6.2 Portfolio Risk

"Portfolio risk is measured in terms of standard deviation and variance. It is affected by the variation of the return as well as covariance between the return of the individual assets included in the portfolio and the respective weights."*(Pradhan;2000:295)*

Variance (σ_p^2) of portfolio

$\sigma_p=\sum\sum x_i x_j Cov_{ij}$

Taking the square root of both sides the risk of the portfolio in term of its standard deviation is ;(Francis2003:236)

$\sigma_p^2= \sqrt{\sum\sum x_i x_j Cov_{ij}}$

Where,

Cov_{ij}=Covariance between securities I and j

$Cov_{ij}=\sigma_i \sigma_j \rho_{ij}$

Xi=weight of security i

Xj=weight of security j

Portfolio Risk In case of two assets

The variance of return for two asset portfolio is given by variance $(\sigma_p)^2$

$\rho_p^2=X_A^2 x\ \sigma_A^2+ X_B^2 x\ \sigma_B^2+2X_A X_B Cov_{AB}$

$\sigma_p= \sqrt{X_A^2 x\ \sigma_A^2+ X_B^2 x\ \sigma_B^2+2X_A X_B Cov_{AB}}$

$\sigma_p=\sqrt{X_A^2 x\ \sigma_A^2+ X_B^2 x\ \sigma_B^2+2X_A^2 x X_B x \sigma_A X \sigma_B X \rho_{AB}}$

where ,

A and B are two securities held in a portfolio.

X_A,X_B=weights of securities A and B

$\sigma_{A,,}$ σ_B=Standard deviation of A and B

Cov_{AB}=Covariance between securities A and B

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

$Cov_{AB}= \rho_{AB}\ \sigma_{A,,}\sigma_{B,}$

Where ρ_{AB} =Correlation coefficient between A and B

Cov_{AB} = Correlation coefficient between A and B

2.1.7 Diversification of Risk

Diversification is the one prominent means to control portfolio risk. Investments are made in a wide variety of assets so that exposure to the risk of any particular securities is limited. Diversification of portfolio helps 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 fail to avoid risk altogether, since virtually all securities are affected by the common micro economic factors.

Followings are diversification techniques for reducing a portfolio risk.

2.1.7.1 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 added to a portfolio. Simple diversification reduces a portfolio's total diversifiable risk to zero and only the non- diversifiable risk remains.

2.1.7.2 Superfluous Diversification

Under simple diversification, maximum risk reduction is achieved through inclusion of 10-15 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 asset on his portfolio, because the management of a large number of assets calls for knowledge of liquidity of each investment return, tax liability and thus becomes impossible without specialized knowledge. Superfluous diversification usually results in the following portfolio management problems.

- Impossibility of good portfolio management
- Purchase of lackluster performers
- High search costs
- High transaction costs

Although more money is spent to manage a superfluously diversified portfolio, there will most likely be no concurrent improvement in the portfolio performance. Thus, superfluous diversification may lower the return the net return to the portfolio owners after the portfolio management expenses are deducted.

2.1.7.3 Diversification across industries

Diversification can also be experienced by combining securities from different industries. It is certainly better to follow this advice than select all the securities in a portfolio from one industry. Nevertheless empirical research has demonstrated that diversifying across industries is worst than simply selecting securities randomly.

2.1.7.4 Simple Diversification across Quality rating categories

Diversification of portfolio is also possible across 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 deviation of portfolio of different homogeneous quality rating attained different level of risk. The highest quality portfolio randomly diversified stocks are able to achieve lower level risk than simply diversified portfolio of lower quality stocks. It indicates default risk is a part of total risk. The higher quality portfolios contain assets with less default risk.

Thus portfolio managers can reduce portfolio risk to levels lower than those attainable with simple diversification by not diversifying across lower quality assets.

2.1.7.5 Markowitz Diversification

"Markowitz Diversification may be defined as combining assets which are less than perfectly positively correlated in order to reduce portfolio risk without sacrificing portfolio return." (*Weston & Brigham*; 1987:194) It can sometime reduce below the un-diversifiable level. There is a nature trade- off between risk return in the market but at any given level of expected return. Markowitz diversification can reduce risk more than simple diversification. Applying diversification to a collection of potential investment assets with a computer is Markowitz portfolio analysis. It is a scientific way to manage a portfolio and its results are quite interesting. Since, Markowitz portfolio analysis considers both the risk and return of dozen and hundreds of different securities simultaneously; it is a more powerful method of analyzing a portfolio than using intuition. 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 diversification will be able to reduce the portfolio risk.

2.1.8 Covariance, Correlation Coefficient and Portfolio Risk

"Portfolio Risk can be measured by using covariance of return 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 the negative value indicates that returns of two securities move in opposite side. If the value of covariance is zero, The square root of the coefficient of determination is called Correlation Coefficient (ρ). It is defined as the covariance between dependent there is little or no relationship between the returns for two securities."(*Sharp, Alexander& Bailey*; 2001:180).and independent variables divided by the product of their standard deviation (*Weston & Copeland*; 1992:372).

$$\rho_y = \frac{\mathrm{Cov}(r_i\ r_j)}{\sigma_i, \sigma_j}$$

where ,

ρ_y = Correlation Coefficient between securities i and j

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

σ_i = standard deviation of return for security i

σ_j= standard deviation of return for security j

Correlation Coefficient always lies between -1 and +1

A value of -1 represents perfect negative correlation and a value of +1 represents positive correlation.*(Sharp, Alexander &Bailey;2001:180).* If the correlation is perfectly positive (+1), the portfolio cannot reduce any level of risk. On the contrary, if the correlation is perfectly negative (-1), the proper combination of the two securities can reduce unsystematic risk upto zero. Hence, the positive correlation between securities return is not so beneficial and vice-versa. A zero coefficient means two variables are unrelated to each other. Hence changes in one variable are independent of changes in the other. On the other hand, when securities in a portfolio are perfectly negatively correlated, all risks can be diversified away. When securities are perfectly positively correlated, diversification does not do good whatsoever. In the typical case, correlation among individual stocks is positive but less than +1, some, but not all risk can be eliminated (*Weston&Brigham*; 1992:127).

2.2 Review of Legislative Provisions

This section reviews the legislative framework for the smooth operation of commercial banks. The legal provision poses a significant impact on the establishment of commercial banks, their mobilization and utilization of resources. In Nepal, Nepal Rastra Bank (NRB) as a bank directs the banks and other financial institutions. Plans, policies, directions, rules and regulations from NRB are the major guidelines to operate the commercial banks. To allocate and mobilize the deposits collected by commercial banks in different sectors as well as various areas in the country, NRB formulates fundamental rules, regulations, directions, policies, etc. With this purpose in view Government of Nepal formulated Commercial Bank Act (2031)1974. All the commercial banks have to conform to the legislative provisions specified in the Act and its rules and regulations formulated to facilitate smooth running of the commercial banks. Nevertheless, these directions have direct or indirect impact on making decision to mobilize the bank deposits in various sectors in the nation. Hence, NRB Rules regarding Fund Mobilization of Commercial Bank is briefly described below:

2.2.1 Directive No: 19 Provision for Credit to Priority Sector

NRB requires commercial banks to extend loans and advances amounting at least to 12% of their total outstanding credit to priority sector including the deprived sector. In this connection NRB has included Agriculture sector, Cottage and Small industry sector, Service oriented sector and Cooperative sectors as the priority sector for investment. This provision is totally based on the objective associated with living standard enhancement of people residing in the remote and the rural areas.

2.2.2 Directive No: 19 Provision for Investment in Deprived Sector

Commercial banks are compulsorily required to extend their credit and investment in the deprived sector such as Cooperative institutions and the rural banks that are licensed through NRB. The new provision obligates the commercial banks to invest 0.25% of the total loan and advances to the deprived sector.

2.2.3 Directive No: 19 Provision for Investment in Productive Sector

Nepal, being a developing country needs to develop infrastructure and other primary productive sectors like agriculture, industry etc. For this, NRB has directed commercial banks to extend at least 40% of their credit to the productive sectors like agriculture sector and industrial sectors.

2.2.4 Directive No: 18 Bank Rate and Re-lending

Due to decline in liquidity situation and persistent sluggishness in the economy, NRB revised the bank rate, re-lending rate and the mandatory Cash Reserve Ratio (CRR) to provide further flexibility to the monitory policy in FY2005/06.The bank rate of 6.25% has been continued under the monitory policy for FY2006/07.So does the export credit refinancing rate of 3.5% and sick industry refinancing rate of 1.5%.To facilitate cottage and small scale industries promotion ,refinancing rate for the loans provided to these industries has been fixed at 3.5% Mandatory cash reserve ratio at 5% has also been retained.

Table: 2.1
Bank Rate, Refinancing Rate, and Mandatory Cash Reserve Ratio

(In percent)

Instrument	**2004/05**	**2005/06**	**2006/07**
Bank Rate	5.5	6.25	6.25
Refinancing Rate Export Credit* (in domestic Currency)	3	3.5	3.5
Sick Industries Small and cottage Industries	1.5	1.5	1.5
Small and cottage Industries**			3.5
Mandatory Cash Reserve Ratio	6	5	5

**Such rate also applies to refinancing made available to rural development banks and agriculture loans.*
*** Started since FY2006/07*
Source: Economic Survey 2006/07

2.2.5 Directive No: 1 Provision of Capital Fund

Minimum Capital Requirements:

Unless a higher minimum ratio has been set by Nepal Rastra Bank for an individual bank through a review process, every bank shall maintain at all times, the capital requirement set out below:

a. A Tier 1 (core) capital of not less than 6 per cent of total risk weighted exposure;
b. A total capital fund of not less than 10 per cent of its total risk weighted exposure.

The Capital Adequacy Ratio (CAR) is calculated by dividing eligible regulatory capital by total risk weighted exposure. The total risk weighted exposure shall comprise of risk weights calculated in respect of bank's credit, operational and market risks. The methodologies to calculate RWE for each of these risk categories are described in detail in NRB Capital Adequacy Accord, 2008.

Core Capital:

Paid up capital; Share Premium; Non-redeemable Preference Share; General Reserve; Retained Earning

Supplementary Capital:

General Loan Loss Provision for pass loan only ; Exchange Equalization Reserve ; Asset Revaluation Reserve (not exceeding 25 % of core capital); Hybrid capital instruments (that posses character of both debt and equity **simultaneously; Subordinated Term Debt.**

2.2.6 Directive No: 2 Loan Classification and Loss Provision

To enhance the quality of assets of commercial banks, NRB has directed commercial banks to classify their outstanding loan and advances, investment and other assets into six categories. The classification is done in two ways. The loans exceeding 10 million are classified as debt serve charge ratio, repayment situation, financial condition of the borrower, management efficiency, quality of collateral. However, the loans not exceeding 10 million have been classified as per maturity period.

Furthermore, NRB has directed commercial banks to maintain certain reserve for loans so classified .Credits and purchase of bills by commercial banks have been classified as good, average, substandard, doubtful and poor for the purpose of adequate provisioning. The existing loan loss provisioning is as follows.

Table 2.2
Loan classification and loan loss provision

Loan category	**Loan Loss Provisioning (LLP) (in % of overdue loan)**
Pass	1
Substandard	25
Doubtful	50
Loss	100

Source: NRB Directives Manual, 2007 Edition

Loan loss provisioning has affected banks capability to extend loans and made the risk averse in issuing newer loans, particularly to the private sector and priority sector where loan default is pretty high.

2.2.7 Directive No: 3 Provision for the single Borrower Credit Limit

NRB has issued the following directives to commercial banks for lending.NRB has barred an individual, firm , company or group of companies the single borrower credit limit at 25% of the primary capital in case of fund based credit and 50% of the primary capital in case of non- fund based credit, such as letter of credit, guarantee, commitment etc

In case of consortium financing, NRB have allowed commercial banks to extend an additional 10% credit above the limit. However, Nepal Oil Corporation and Agriculture Input Corporation for import of petrol, diesel, kerosene, fertilizer and food stuffs have been removed from the restriction of single borrower credit limit.

Besides this, following the BASEL II Capital Adequacy Accord, NRB has directed commercial banks to maintain at least 8% Capital Adequacy Ratio (CAR) of their risk weighted assets (RWA) and off balance sheet transaction, for instance letter of credit, letter of acceptance, bonds ,guarantee etc. They are further required to classify their capital requirement into: core capital (Tier 1) and supplementary capital (Tier 2) and maintain at least 4% of their total capital in the form of core capital.

According to the provision, risk weighted assets (RWA) should be calculated by classifying assets and giving different weights as presented below.

Table 2.3
Allocation of Risks Factors

(In Percent)

S.No	Assets	weight
1	Cash balance	0
2	Bank balance with NRB* Other domestic bank** Foreign bank	 0 20 20
3	Call deposit	10
4	Investment: Government papers Share and debenture Other investment	 0 50 50
5	Loan and advances	100
6	Fixed Asset***	100
7	Contingent Liabilities Fully secured three month letter of credit Commitment of more than a year Letter of acceptance, simple commitment and other letter of transactions	 20 50 100

Source: NRB 2008

*

ECA risk score	0-1	2	3	4-6	7
Risk weights	0%	20%	50%	100%	150%

Source: NRB Capital Adequacy Framework 2007, (Updated July 2008)

**

ECA risk score	0-1	2	3-6	7
Risk weights	20%	50%	100%	150%

Source: NRB Capital Adequacy Framework 2007, (Updated July 2008)

*** As per the NRB Capital Adequacy Framework 2007 , (Updated July 2008) if all the criteria mentioned in the product paper approved by Board of Banks are fulfilled then under Claims on Regulatory Retail Portfolio RWE, Claims under Residential Properties RWE and Claims secured by commercial real estate RWE are 75%,60% , and 100% respectively

2.2.8 Directive No: 15 Directives regarding Interest Rate Spread

The interest rate spread , the difference between interest charged on loan and advances and the interest paid to the depositors , has widened significantly in the aftermath of deregulation in interest rates which has caused financial intermediation. Hence, NRB directed commercial banks to limit interest rate spread between deposits and lending rated to a maximum extent of 5%.NRB has also provided commercial banks with a new calculation method of interest rate spread for a certain period recently.

2.2.9 Directive No: 9 Guidelines for Investment in Stocks and Securities

Commercial banks are also required to minimize exposures to risk involved in investing the deposits of the saver 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:

- Nepal Rastra Bank Act
- Commercial Bank Act
- International Accounting System
- Nature and type of their respective transaction
- Directives of the Nepal Rastra Bank
- Monetary and Financial Statistics Manual 2000 of the IMF

2.2.10 Directive No: 21 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 .But the total amount of investment in share and securities of the organized institution is restricted o 30% of the paid up capital of the bank.

Likewise, Commercial banks are not allowed to invest in any shares, securities, and hybrid investment issued by any banks and financial institutions licensed by NRB. Where such investment exists prior to issuance of this directive, such investment brought within the restrictive limitation by the FY2003//04(2060/61). However, investments on rural microfinance development banks' share are free from such restriction.

2.2.11 Directive No: 13 Provision for Minimizing Liquidity Risk

Commercial banks are required to monitor their liquidity risk s. 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 on the basis of maturity period. Maturity periods such as 0-90, 91-180,181-270,271-365 days and above one year are classified for the purpose of checking.

2.3 Review of Related studies

This section is developed to review the major portfolio analysis related literature. For these journals, articles, past thesis and legal provisions are reviewed. Different visions expressed by selected scholars on portfolio analysis are considered.

2.3.1 Review of International Journals and Articles

Markowitz, (1952) in his study on "*Portfolio Selection Module*" 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 effective one. The portfolio manager will need to know the expected returns and risk of these returns for the individual securities.

Markowitz portfolio module is based on the following reasonable assumptions

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

The expected return of the 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 sum of the weights must be equal to one." *(Markowitz; 1952, extract from Chenny and Mosses;1992:651)*

$R_p=R_1X_1+R_2X_2+R_3X_3\ldots\ldots\ldots\ldots\ldots\ldots+R_nX_n$

Where,

R_p=Portfolio expected return

R_1=Expected return for security 1

R_2= Expected return for security 2

X_1=Weight of investment invested in security (stock) 1

X_2=Weight of investment invested in security (stock) 2

According to Markowitz, the portfolio risk is measured by either variance or standard deviation of returns. "The portfolio risk is affected by the variance of return as well as the covariance between return of individual assets included in the portfolio and respective weights" *(Pradhan; 1992:250)*

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

Variance $(\sigma^2_{p)}= X_1^2 x\ \sigma_1^2+ X_2^2 x\ \sigma_2^2+2X_1X_2Cov(r_1r_2)$

$\sigma_p= \pm\sqrt{X_1^2x\sigma_1^2+ X_2^2x\sigma_2^2+2X_1X_2Cov(r_1r_2)}$

where σ_p= standard deviation of portfolio rate of return

$Cov(r_1r_2)$= Covariance of returns between 1 &2

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

$Cov(r_1r_2)=\rho_{12}\sigma_1\sigma_2$

ρ_{12}=Correlation coefficient between the return of 1 and 2

Kane and Buser (1979) in the study, "*Portfolio Diversification of Commercial Banks*" deals 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 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 estimate regression model designed to explain the number of distinct U.S. treasury and federal agency debt held in a time series of cross section of large U.S. commercial bank .They interpret the systematic pattern of the diversification observed for large U.S. commercial banks as evidence that banks stockholders from a relatively uniform diversification clientele. For firm, marginal benefits from diversification takes reduction in the equity funds offered by its specific clientele of stockholders. To maximize the value of the firm, these benefits must be weight against the explicit and implicit marginal cost of diversification.

Followings are their concluding remarks:

Even wealthy investors should be sensitive to administrative costs associated with selecting , evaluating, managing and continually keeping track of a large number of securities.

Either homemade of firm produced diversification reduces the variance of shareholder's portfolio return. If homemade of firm produced diversification bears inordinately high levels of information risk. Some benefits of the firm produce diversification might not be reproducible by individual investors acting on their own.

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.

Berger and Bodie (1985)have presented and proved three propositions regarding "*Optimal Portfolio Selection in the winner-take-all Environments*" as described below

Proposition 1

Any investor seeking to maximize the expected utility of his wealth will select a portfolio which maximizes then probability of his winning the contest i.e. yielding the highest return. This is so regarded of the investor's attribute towards risk.

Proposition 2

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

Proposition 3

If there are more than two securities to choose from, 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 winter-take-all investment contests will tend not to diversify his portfolio, even if he is risk adverse. It is conjecture that is very highly positively correlated so he approximates a single stock as closely as possible.

2.3.2 Review of Nepalese Journals and Articles

In this section it has been attempted to review some related articles published in different economic journals, magazines, newspapers and other related books.

Shrestha, (1995) in her study "*Portfolio Behavior of Commercial Banks in Nepal"* had made remarkable efforts to examine various portfolio behaviors of commercial banks in Nepal particularly investment portfolio, liability portfolio and assets portfolio.

According to her, investment of commercial banks when analyzed individually, were observed that Nepalese domestic banks invest on government securities, national saving bonds, debentures and company shares. On study she found that the supply of bank credit was expected to depend on total deposit, lending rate, lagged variables and dummy variables. Likewise, demand of bank credit was assumed to be affected by national income, lending rate, Treasury bill rate and other variables. The resources of commercial banks were expected to be related with variables like total deposit, cash reserve requirement, bank rate and lending rate.

Followings were her conclusions:

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

Thapa, (2003) published an article "*Managing a Banking Risk* "stating the subsequent issues. Banking and financial service are among the fastest growing industries in the developing world and are also emerging as cornerstone for the other developing and underdeveloped nations as well. According to him, the primary function of a bank is trade risk. Risk cannot be avoided by the bank but can only be managed. There are different types of risk. Among them interest rate risk is one of the common risk the banks facing owing to the volatility of the interest rate in the market.

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

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

Off- bank risk, owing to the creation of contingent liabilities should be managed by a prudent analysis of bank officials 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 the central bank.

He concludes that risk management of the banks is not only crucial for optimum trade- off between risk and probability but is also one of the deciding factors for overall business investment lending to growth of economy. Managing risk not only needs sheer professionalism at the organizational level but appropriate environments also need to develop. Some of the major environmental problems of Nepalese banking sector are under government intervention, relatively weak regulatory fame, if we consider the international standard, meager corporate governance and the biggest of all is the lack of professionalism, The only solution to mitigate the banking risk is to develop the badly needed commitment eradication of corrupt environment particularly in the disbursement of lending, and formulate prudent and conducive regulatory framework.

2.3.3 Review of Thesis

Several thesis works have been conducted by several students in various aspects of commercial banks. Those likely to relevant for this study are presented below.

Shahi, (1999) has conducted a research on "*Investment Policy of Commercial Banks in Nepal*". The primary objective of the study was to compare the investment pattern of Joint Venture Banks. He has mainly compared the investment process of Nepal Bank Ltd, a semi-government bank with more than 221 branches all over the country other Joint Venture Banks concentrated in the urban areas.

He found out that Nepal Bank Ltd is affected by many government interference but Joint Venture Banks are operating efficiently with good investment policy. The growth rate of Joint Venture Banks is relatively more than that of Nepal Bank Ltd but the profitability position of both are the same.

He concluded that commercial banks must mobilize the funds of those sectors yielding optimal returns like purchase of shares, debentures of various institutions. The Joint Venture Banks have to explore new sectors of investment with low level of risks. In case of recovery of loans, the Loan Recovery Act should be efficiently implemented as soon as possible. Hence, his study is basically focused on the investment policy of the commercial banks of Nepal and unconnected with any factors like risk and return.

Pandey (Sijapati),(2000) has conducted a research work on" *Risk and Return Analysis of Common Stock Investment",* which is partially related with this study. The primary objective of her study was to analyze the risk and return and other relevant variables that help in making decisions about the stock and investment in Insurance Companies. The secondary objectives of her study were to understand and identify the problems encountered by

individual investors and Insurance Companies; to calculate risk and return of common stocks and their portfolio and finally to analyze the volatility of different stocks and their companies and other relevant variables that should be considered during deciding investments in stocks.

On the market capitalization based analysis she observed that the size of Nepal Insurance Company (NIC) is the highest one. Expected return on the common stock of National Life and General Insurance Company Ltd (NLGI) is maximum(65.39%) and that of Himalayan General Insurance Company (HGI) is the lowest with the negative value. In overall industry sector, the expected return of Finance and Insurance is the highest. The overall market expected return is over 50%. National Life and General Insurance Company Ltd's expected return is the highest which is ultimate the standard deviation (risk) to be the highest and Everest Insurance Company's risk and return is the lowest one. The stock of National Life and General Insurance Company is highly sensitive with the market owing to its degree of beta coefficient .Furthermore, the stock of United Insurance Company (UIC) moves opposite with the market due to its negative coefficient. She also observed lack of significant difference between the portfolio return of Insurance companies' stock and overall market portfolio.

Hence she concluded that poor education and inadequate information source are the major constraints for developing stock market in Nepal. On comparison of the risk and return of different industries the Finance Companies and Insurance companies are the best owing to their highest expected return with higher degree of risk. However, most of trading industries have minimum return and maximum level of risk. Market sensitivity is calculated by beta coefficient, which cannot be reduced by diversification. Due to lack of specific knowledge of stock market general public invest their funds in different securities on the basis of expectation and assumption rather than proper analysis. Thus, the proper selection of portfolio approach is the suitable way to achieve success in the stock market.

Poudel, (2002) conducted a research on the topic *"Liquidity and Investment Position of Joint Venture 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 Ltd (EBL) and NABIL Bank Ltd . The other objectives of his study were to assess the factors affecting customers' withdrawal and to examine invest- liquidity policy of both banks.

He observed that the liquidity position of EBL is comparatively better than that of NABIL. Nevertheless, EBL has been unsuccessful for fund mobilization on investment, as compared to NABIL. Growth rate of investment of EBL has been recorded significantly higher than NABIL's. However, significant difference in mobilization has not been seen. Likewise, growth rate of liquid funds of EBL is significantly high, while it is negative in case of NABIL. It infers NABIL has accorded higher priority to profitability than liquidity. It has utilized funds to investment in place of holding assets. Cash flow from operating activities of NABIL is sound, since its profitability is higher than EBL. He observed further that the banks lack constant and consistent liquidity on investment policy. There is absence of standard and uniform rate or ratio for maintaining liquid assets by the commercial banks. A commercial bank, at its own judgments may decide to maintain an appropriate level of liquid asset.

Shrestha, (2003) conducted a research work on *"Portfolio Analysis on Investment of Nepalese Commercial Banks"* by using eight year data froom1994/95 to 2001/02. The main objective of his study was to analyze, examine and interpret portfolio technique followed by commercial banks in terms of investment strategies; to analyze the way the commercial banks manage their risk and return on investment using portfolio concept and to find out trend of investment in different sectors.

He found out that most of the commercial banks intended to invest in short term basis where return is fixed. However, they hesitate to invest in long term government securities providing regular constant returns. The total investment to total deposit ratio of selected banks showed that Standard Chartered Bank Ltd (SCBL) is the most successful in utilizing its resources on investment of the other commercial banks. Likewise, on the basis of return on total assets, SCBL utilized its overall resources efficiently than other banks. To some extent, all commercial banks are presumed to be interested in using their deposits for purchasing government securities, although they yield 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 the commercial banks indicates wide fluctuations ranging from 23.78% to104.50%. These fluctuations in returns are manifested primarily by the volatility the capital yield.

Finally he concluded that commercial banks appear incapable of investing their financial resources in more profitable sectors. Nevertheless, most of the commercial banks are interested to invest their funds in liquid and less risky sectors. Commercial banks are found unable to apply a scientific approach for the investment diversification and portfolio management.

Sharma, (2004) conducted a study on"*Portfolio Management of listed Commercial Banks and Insurance Companies in Nepal"* which is also related with this study. The primary objective of his study was to analyze the risk and return of the common stock of the 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 observed that the shares of all commercial banks are attractive for investment compared to those of insurance companies. The conflicting political and economic scenario has the adverse impact on economic activities of the commercial banks. Therefore, insurance companies are unable to manage their portfolio effectively. The researcher realized that risk per unit of return of market is considerably high. Hence, the overall market return can be regarded as attractive in relation to its risk. He thus concluded that the unsystematic risk of all the companies was high in comparison to total risk.

Poudel, (2005) in his research, " *A Comparative Study on Investment Behavior Adopted by NABIL Bank Limited and Himalayan Bank Limited*" had the primary objective to comparatively analyze, examine, interpret and evaluate the total investment behavior of NABIL and HBL. The study is mainly concentrated on whether or not both banks have been successfully operating their collected funds as investment on various sectors, and several alternatives. His secondary objectives were to comparatively present the investment behavior

of sample banks; to examine and interpret SWOT of both banks and to suggest for the best performance in future.

He found out that the investment on share and debenture by both banks are considerably lower as compared to the other alternatives. Likewise, both banks have retained unnecessary cash and balance in comparison with the total investment, which they could invest in the other productive alternatives. Based on current ratio analysis, HBL falls in the safe position since NABIL has maintained more liquidity. Comparatively, NABIL needs to augment deposit. Nevertheless, average total deposit position of NABIL is lower than HBL.

Based on these observations, he came to the conclusion that investment aspects of both banks are quite satisfactory. As the established banks in Nepal, however both should increase their investment in share and debenture in order to motivate other firms. Although HBL has invested enough, its growth in the net profit is quite negligible. Owing to the effective investment management of NABIL, its investment appears high yielding as compared to HBL.

Shrestha, (2005) conducted her thesis on " *Portfolio Analysis of Common stock of Commercial Banks in Nepal"* with the general objective to find out the level of portfolio risk and return on stock of commercial bank investment. The specific 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 commercial banks.

She found out that the expected return of HBL stock was the highest (53.68%) and that of NABIL the lowest (32.72%) among the banks under the study. The risk of NBBL was the highest (93%) and SCBL had the lowest risk (55.42%).The correlation of stock, return and market that all of the banks stocks were highly positive correlated with the market. The correlation values of common stock of all banks with the markets were nearly equal to+1.The stock price of all four listed commercial banks were higher than NEPSE average price of stock. Likewise, the stock prices of these banks were in fluctuating trend than NEPSE index.

She concluded that the investment on common stocks is risky job. It does not guarantee both return and principal, so the investors should be well acquainted with the associated risk and work out their attitude towards the riskiness of various investment strategies.

Shrestha, (2006) performed a research work "*A Study on Investment Portfolio of Commercial Banks in Nepal*" with the general objective of identifying the current situation of investment portfolio of commercial banks in Nepal. The main objectives were to analyze the investment portfolio of commercial banks; to analyze the risk and return of the selected five commercial banks on investment using portfolio concept and to forecast/examine the trend of investment for providing complementary measures.

He observed through the analysis of risk and return that SCBL has more return from investment on government securities. Hence, it effectively mobilized its total deposits on them. However, EBL and SBIN mostly mobilized their depositors' fund in loan and

advances. The return on share and debenture displayed a wide fluctuation particularly due to the volatility of share prices in the market as well as changes in dividends. The portfolio risk on investment in government securities is lower than that in loan and advance or share and debenture.

He concluded that the investment on government securities is quite safe Hence, commercial banks should also mobilize depositors' fund on them.

Research Gap

Portfolio investment refers to an investment that combines several assets. Commercial Banks can't utilize entire fund raised through deposit and borrowing into loan and advances to fulfill the gap between borrowing and lending banks rather prefer investment. On the basis of the review of the previous thesis, it was observed that the previous researchers had focus in other aspects of investment rather than analysis the financial performance of commercial banks in terms of investment strategies

Few research works exists in this topic. In-depth specific researches have yet to continue .All previous researches on portfolio management have focused on the risk and return analysis of investment by commercial banks particularly in common stock. However, there is void (insufficiency/gap) in research program concentrating on investment in the government securities, loan and advances, share and debentures etc. Over the time period, several new options for investment have been introduced. Furthermore, the previous research has been outdated. Hence, the research has endeavored to analyze the present portfolio management situation, risk and return status on investment portfolio of few selected commercial banks, within the frame work of available recent data.

CHAPTER-3

Research Methodology

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

3.1 Research Design

Research design is a plan, structure and strategy of investigations conceived so as to obtain answer to research questions and to control variance (*Wolff*; 1975:51).It is the arrangement of conditions for collection and analysis of data in a manner aiming at combining relevance to the research purpose with economy in procedure. Considering this study objectives, the analysis is based on certain research design. In order to achieve the objectives, descriptive and analytical research design has been adopted .Descriptive research design describes the general pattern of investors, business environment, problem of portfolio management etc. The analytical research design carries out the analysis of information and data. Most of the data and information of the study were related with the past phenomenon. On this background it can be considered as a historical research.

The study covers the data from the FY2000/01 to FY2007/08.It deals with the study of portfolio analysis of commercial banks in Nepal. As the title of the study itself indicates that it is more analytical and empirical and less descriptive.

3.2 Population and Sample

The population of the study is all the commercial banks listed in NEPSE. The total commercial banks currently existing are 26 in number. Hence, these 26 commercial banks are actually the population of the study. For this study, five commercial banks selected for the study. The samples were selected on the basis of rapid growth and gradual growth rate , whose head offices are in Kathmandu and set up as Joint Venture Banks in 1980's and 1990's after the implementation of the economic liberalization policy(1980).

3.3 Sources of Data

The study is mainly based on secondary data. Data are collected from concerned banks Nepal Rastra Bank, NEPSE, SEBO and various libraries .Likewise ,the micro-level data have been derived the different libraries, such as Shanker Dev campus, Nepal commerce campus, TU central library, libraries of NRB,NEPSE,SEBO etc. Furthermore, several data and information were gathered from periodicals, economic journals and the other published and unpublished reports. Informal interview with the authorities of related institutions are also the other sources of data. Briefly, followings are the major sources of data and information:

Economic Survey, Ministry of Finance

Quarterly Economic Bulletin, NRB, 2007/08

Main economic Indicators of Nepal, NRB (Monthly Report2008)

Journal of Finance

Journal of Business

Annual Report of SEBO, Nepal

Annual Reports/websites of the related commercial banks (2000/01-2007/08).

NEPSE website

3.4 Data Collection and Processing Techniques

Although data necessary for research were collected from secondary sources, the concerned authorities' opinions were obtained for additional information and reality about published data, investment policies of the banks, portfolio concept in the investment field etc. Publications like Economic Survey, Annual reports, Banking and Non- banking Financial statistics, Economic Bulletin etc were gathered from the respective offices.

Since, data received from several sources cannot directly be applied in the raw form, they call for verification and simplification in the analysis process. Hence, in this study available data, information, facts and figures were checked, edited and tabulated for computation. These data and information were properly synthesized, arranged, tabulated and calculated for this research study.

3.5 Data Analysis Tools

A host of analytical tools can be applied to perform investment analysis of a firm. Following the nature of the study, a set of appropriate tools, particularly financial and statistical may be used for effective and significant analysis to meet the research objectively.

3.5.1 Financial Tools

On the portfolio investment analysis study financial tools are more applicable. Financial tools are particularly are used for the analysis as well as the interpretation of financial data. These tools can be engaged to procure the precise knowledge of a business, which are fruitful for analyzing the strength and weakness of the investment policies and strategies. Thus, following financial tools are used to achieve the study goal.

3.5.1.1 Risk and Return on Individual Investment Assets and Investment Portfolio

Return on Government Securities

The return on Government Securities is obtained by dividing interest income from government by total investment on government securities expressed as:

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

Return on Share and Debentures

The return on share and debenture considers dividend yield and capital gain yield (change in market price). The dividend yield is merely a partial indication of the return. Hence, the return on share and debenture depends on the change in the share price (*Pandey*;1997:332). It is calculated as:

$$\text{Return on Share and Debenture } (R_s) = P_t - P_{t-1} = \frac{Dt}{\boldsymbol{P_{t-1}}}$$

Where, P_t = Closing price per share as period t
P_{t-1}= Closing price per share as period t-1
D_t= Dividend per share as period t

Return on Loan and Advances

This ratio displays the bank efficiency of employing its resources in various sectors like agriculture, industry and commercial sectors to earn a good return from loan and advances. The return on loan and advances is computed by dividing total interest earned from loan and advances to total amount of loan and advances. Thus,

$$\text{Return on Loan and Advances } (R_l) = \frac{\text{Interest earned from loan and advances}}{\text{Total Loan and Advances.}}$$

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 proportions of the investors' wealth in each asset.

Portfolio return ($R_{P)}$= $\sum W_i R_i$

=$\sum W_A K_A + W_B K_B + \ldots\ldots\ldots\ldots + W_N K_N$

Where,

R_P= Portfolio return.

W_A= Weight of investment invested in stock A.

W_B= Weight of investment invested in stock B.

K_A= Return for stock A

K_B= Return for stock B

Risk on Individual assets

The riskiness of assets is dependent on the variability of rates of return. This variability of rate of return is defined as the extent of the deviation of individual rates of return from the average rate of return. Risk on individual assets is calculated as:

Standard deviation (σ)= $\sqrt{\frac{\sum(R-\bar{R})^2}{n-1}}$

Where

R=Rate of return of individual assets

$\bar{R}$= Average rate of return of individual assets

σ = Standard deviation or risk

n= no. of years

Risk on Portfolio

The portfolio risk is a function of the proportions invested in the components, the riskiness of the components and the correlation of returns on the component securities. It is measured by either variance or standard deviation. $\sigma_p=\sqrt{\sum\sum x_i x_j Cov_{ij}}$

For three assets:

$\sigma_p=\sqrt{W_A^2\sigma_A^2+W_B^2\,\sigma_B^2+W_C^2\,\sigma_C^2+2W_A W_B Cov_{AB}+2W_A W_c Cov_{AC}+2W_B W_c Cov_{BC}}$

Where,

W_A ,W_B ,W_c=Weight of assets A,B and C

σ_A , σ_B , σ_C = Standard deviation of A,B and C

Cov_{AB} = Co-variance between assets A and B

Cov_{BC} = Co-variance between assets B and C

Cov_{AC} = Co-variance 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, two accounting figures expressed mathematically is termed as financial ratio. Ratio analysis is used to compare a firm's financial and status of that of other firms or to itself on time (*Gitman*;1988 :275).Since this study is particularly focused on portfolio analysis of commercial banks, only few ratios related to the investment of commercial banks are adapted in the study.

Total Investment to Total Deposit Ratio

Investment is one of the major credits generated to earn income. It implies the utilization of firms' deposit on investment in government securities. This ratio is obtained by dividing total investment by total deposit as expressed below.

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

Investment on Government Securities to Total outside Investment Ratio

This ratio indicates the banks' investment on government securities among the total outside investment. It is computed by dividing investment on government securities by total outside investment.

$$\text{Investment on Government Securities to Total outside Investment Ratio} = \frac{\text{Investment on Government Securities}}{\text{Total Outside Investment (TOI)}}$$

Investment on Loan andAdvances to Total outside Investment Ratio

This ratio actually depicts the banks' investment status on loan and advances amidst total outside investment, which is obtained dividing investment on loan and advances by total outside investment.

$$\text{Investment on Loan and Advances to Total outside Investment Ratio} = \frac{\text{Investment on Loan and Advances}}{\text{Total Outside Investment}}$$

Investment on Share and Debenture to Total outside Investment Ratio

This ratio portrays the bank investment on share and debentures of the other companies. It is computed by dividing investment on share and debentures by total outside investment.

$$\text{Investment on Share and Debenture to Total Outside Investment Ratio} = \frac{\text{Investment on Share and Debenture}}{\text{Total Outside Investment}}$$

Return (Net Profit) on Total Assets Ratio

This ratio measures the profitability of funds invested in the banks' assets. It is calculated by dividing net profit after tax (NPAT) by total assets, as stated below.

$$\text{Return on Total Assets} = \frac{\text{Net profit after Tax}}{\text{Total Assets}}$$

3.5.2 Statistical Tools

Various statistical tools are available to the researcher to analyze the data. This study adapts the statistical tools particularly holding period return, mean return, standard deviation, coefficient of variation and trend to analyze and evaluate various data, which are stated below.

3.5.2.1 Arithmetic Mean

Arithmetic mean is the most popular as well as commonly used statistical tool. It is the ratio of the sum of all the observations to the number of observations. LetX_1,X_2, X_3,…..,X_n denote n variants values of random variables X, then Arithmetic Mean denoted by $\overline{X}$ is given by the following equation:

$$\overline{X} = \frac{X_1+X_2+X_3\ldots..X_n}{n} = \frac{\sum X}{n}$$

Where, $\overline{X}$= Arithmetic Mean, $\sum X$=sum of observations, and n= number of observations.

The Arithmetic mean is a single value of the selected series which represents the average. Among various central tendencies, a mean is one of the useful tools to find out the average value on the given data.

3.5.2.2 Coefficient of Variation (C.V)

Coefficient of Variation measures risk per unit of expected return. The coefficient of variation is computed through dividing standard deviation of return by the expected return, as shown below.

$$\text{Coefficient of Variation (C.V)} = \frac{\sigma_i}{R_i} \times 100$$

Where, σ_i = Standard Deviation of security i

R_i = Average return of security i

3.5.2.3 Least Square Linear Trend

Things in nature exhibit gradual increase or decrease over the period. Consequently the basic tendency of an enterprise to increase or decrease with the lapse of time is understood as a trend. A widely and commonly used method to describe the trend is the method of least

square. Under this method, a line is fitted to the data and the line thus obtained is the line of the best fit. In this method the trend line between the dependent variable y and the independent variable x is represented by the equation:

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 should determine the value of a and b. Making the calculation easy the deviation of the independent variable is taken from the middle of the time period so that $\sum x=o$, then the values of a and b are calculated by:

$a=\frac{\sum Y}{n}$, and $b=\frac{\sum XY}{x^2}$

If it is not possible, we should solve following two equations:

$\sum Y= n\ a +b\sum x$ (1)

$\sum xY=a\sum x+b\sum X^2$ (2)

Where

N=Number of periods or years covering the data frame

3.5.2.4 Covariance

According to the portfolio theory, not only the risk of the individual assets should be considered, but also the degree to which the return of assets co-vary or move together. Hence, Co-variance is used to find out the portfolio risk which can be measured by the following equation:

$Cov_{AB}= r_{AB}\ \sigma_{A,}\sigma_{B,}$

Where r_{AB} =Correlation coefficient between asset A and asset B

$\sigma_{A,}\sigma_{B,}$ =Standard Deviation of asset A and asset B

3.5.2.5 Karl Pearson's Coefficient of Correlation

Karl Pearson's method, popularly known as Pearson and Coefficient of Correlation is most widely used in practice. The coefficient of correlation between the variables x and y usually denoted by r_{xy} is a numerical measure of linear relationship between them. It is defined by;

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

Where,

r_{xy}=Correlation coefficient between variables x and y, and

n= Number of observations

Pearson and Coefficient of Correlation always lies between -1 and +1.When r = +1, there is perfect positive correlation. Likewise, if r = -1 there is perfect negative correlation between the variables, and it has a zero value (r=0) when there is no correlation between the variables

CHAPTER 4

Data Presentation and Analysis

The chapter is devoted to the presentation, analysis, interpretation and scoring the empirical finding of the study through a defined research methodology. Getting at the study objectives, a set of financial and statistical tools has been applied .Data collected from several sources have been inserted in the tabular form in terms of homogeneity of data. Tables compiled for the analysis have been presented in Annexes Necessary graphs and diagrams have been included to clarify the actual status of the banks. This section analyzes the investment portfolio of commercial banks through the following tools:

Risk and Return analysis of individual assets and investment portfolio
Analysis of ratio
Least square Linear Trend Analysis

4.1 Investment Portfolio Risk and Return Analysis of Commercial Bank

Bank is a vital element in the investment analyzing process hence calls for adequate attention. Investment involving greater risk expects higher return than the investment with lower risk . The relationship between risk and return is perceived by individuals based on their attitude for compensation.

The main aim of risk and return is to appraise investment performance to explore combination of investments maximizing returns and minimizing risk or accomplishing both. Risk, however enjoys a pivotal role in the investment analysis. Commercial banks or investors generally avoid invest their money in one risky asset only. Nevertheless, they tend to hold portfolio of several assets to diversify the investment risk. On the portfolio context, 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 statistical techniques, such as range, semi-inter quartile range, mean deviation, standard deviation and coefficient of variance etc. Among them, standard deviation is commonly used for measuring risk on investment. In this section, standard deviation and coefficient of variation are adapted as the measuring tools for risk and return. Then it has been endeavored 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 the ones among the safest of all investments, as government is quite 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 obtained by dividing interest income from government by total investment on government securities expressed as:

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

$$\text{The average rate of return on Government Securities } (R_g) = \sum_{t=1}^{n} \frac{R_g}{n},$$

Where n=Number of years (periods)

The following tables (4.1-4.6) depict the return on government securities of SCBL, NIBL, NABIL, EBL, HBL and banking industry.

Table 4.1
Return on Government Securities of Standard Chartered Bank Nepal Ltd (SCBL)
(Rs in thousands)

FY	Interest on Government securities	Investment on Government securities	Return on Government securities(R_g)
2000/01	229,454.00	4,811,010.00	4.77%
2001/02	264,953.00	5,784,723.00	4.58%
2002/03	303,543.00	6,722,348.00	4.52%
2003/04	380,441.00	7,948,217.00	4.79%
2004/05	331,633.00	7,203,066.00	4.60%
2005/06	355,291.00	8,644,856.00	4.11%
2006/07	326,550.00	7,107,937.00	4.59%
2007/08	319,606.00	8,137,515.00	3.93%
Total	2,511,471.00	56,359,672.00	35.89%
Average	**313,933.88**	**7,044,959.00**	**4.49%**

Source : *Annual Reports of SCBL, Annexes 1(c)and 1(g)*

The table no 4.1 shows that in an average SCBL generate 4.49% return in the investment made in government securities. It indicates almost consistent trend of SCBL in the return on government securities. During the study period the greatest return is 4.79% in FY2003/04 and the lowest is 3.93% in FY2007/08.

Table 4.2
Return on Government Securities of NIBL

(Rs in thousands)

FY	Interest on Government securities	Investment on Government securities	Return on Government securities(Rg)
2000/01	9,792.00	300,000.00	3.26%
2001/02	11,027.00	224,400.00	4.91%
2002/03	10,227.00	400,000.00	2.56%
2003/04	35,868.00	2,001,100.00	1.79%
2004/05	56,550.00	1,948,500.00	2.90%
2005/06	82,420.00	2,522,300.00	3.27%
2006/07	78,494.00	3,256,400.00	2.41%
2007/08	99,991.00	3,155,000.00	3.17%
Total	384,369.00	13,807,700.00	24.27%
Average	48,046.13	1,725,962.00	3.03%

Source: Annual Reports of NIBL , Annexes 1(c)and 1(g)

The table no 4.2 shows that in an average NIBL generate 3.03% return on the investment made in government securities. However, it demonstrates inconsistent trend of NIBL in the return on government securities. During the study period the greatest return is 4.91% in FY2001/02 and the lowest is 1.79% in FY2003/04.

Table 4.3
Return on Government Securities of NABIL

(Rs in thousands)

FY	Interest on Government securities	Investment on Government securities	Return on Government securities (Rg)
2000/01	107,843.00	2,767,959.00	3.90%
2001/02	175,579.00	4,120,294.00	4.26%
2002/03	174,861.00	3,663,572.00	4.77%
2003/04	192,761.00	3,672,626.00	5.25%
2004/05	151,064.00	2,418,432.00	6.25%
2005/06	130,197.00	2,301,464.00	5.66%
2006/07	132,229.00	4,808348.00	2.75%
2007/08	198,442.00	4,646,883.00	4.27%
Total	1,262,976 .00	28,399,578.00	37.11%
Average	157,872.00	3,549,947.00	4.64%

Source: *Annual Reports of NABIL and Annexes 1(c)and 1(g)*

The table no 4.3 shows that in an average NABIL generate 4.64% return in the investment made in government securities. It indicates highly fluctuating trend of NABIL in the return on government securities. During the study period the greatest return is 6.25% in FY2004/05 and the lowest is 2.75% in FY2006/07.

Table 4.4
Return on Government Securities of EBL

(Rs in thousands)

FY	**Interest on Government securities**	**Investment on Government securities**	**Return on Government securities(Rg)**
2000/01	19,116.00	822,996.00	2.32%
2001/02	39,740.00	1,538,897.00	2.58%
2002/03	48,744.00	1,599,350.00	3.05%
2003/04	92,509.00	2,466,428.00	3.75%
2004/05	77,993.00	2,100,289.00	3.71%
2005/06	97,272.00	3,322,443.00	2.93%
2006/07	128,566.00	4,704,632.00	2.73%
2007/08	180,219.00	4,821,605.00	3.74%
Total	684,159.00	21,376,640.00	24.81%
Average	85,519.88	2,672,080.00	3.10%

Source: *Annual Reports of EBL and Annexes 1(c)and 1(g)*

The table no 4.4 shows that in an average EBL generate 3.10% return on an investment made in government securities. It shows no fixed trend of EBL in the return on government securities. During the study period the greatest return is 3.75% in FY2003/04 and the lowest is 2.32% in FY2001/02.

Table 4.5
Return on Government Securities of HBL

(Rs in thousands)

FY	Interest on Government securities	Investment on Government securities	Return on Government securities(Rg)
2000/01	64,960.00	2,025,252.00	3.21%
2001/02	79,894.00	2,588,562.00	3.09%
2002/03	121,543.00	3,347,102.00	3.63%
2003/04	170,332.00	3,431,728.00	4.96%
2004/05	149,131.00	5,469,729.00	2.73%
2005/06	172,242.00	5,144,313.00	3.35%
2006/07	191,559.00	6,454,873.00	2.97%
2007/08	201,310.00	7,471,668.00	2.69%
Total	1,150,971.00	35,933,227.00	26.63%
Average	143,871.38	4,491,653.00	3.33%

Source: *Annual Reports of HBL and Annexes 1(c)and 1(g)*

The table no 4.5 shows that in an average HBL generate 3.33% return on an investment made in government securities. It shows no fixed trend of EBL in the return on government securities. During the study period the greatest return is 4.96% in FY2003/04 and the lowest is 2.69% in FY2007/08

Table 4.6
Return on Government Securities of Banking Industry

(Rs in thousands)

FY	Interest on Government securities	Investment on Government securities	Return on Government securities(Rg)
2000/01	431,165.00	10,727,217.00	4.02%
2001/02	571,193.00	14,256,876.00	4.01%
2002/03	658,918.00	15,732,372.00	4.19%
2003/04	871,911.00	19,520,099.00	4.47%
2004/05	766,371.00	19,140,016.00	4.00%
2005/06	837,422.00	21,935,376.00	3.82%
2006/07	857,398.00	26,332,190.00	3.26%
2007/08	999,568.00	28,232,671.00	3.54%
Total	5,993,946.00	155,876,817.00	31.31%
Average	749,243.25	3,896,920.43	3.91%

Source: *Banking and Financial Statistics NRB and Annexes 1(c)and 1(g)*

The table no 4.6 shows that in an average, Bank industry generates 3.16% return on an investment made in government securities. It demonstrates a fair decreasing trend of Bank industry in the return on government securities. During the study period the greatest return is 4.47% in FY2003/04 and the lowest is 1.60% in FY2007/08

The following table 4.7 displays the return on government securities of sample banks and banking industry

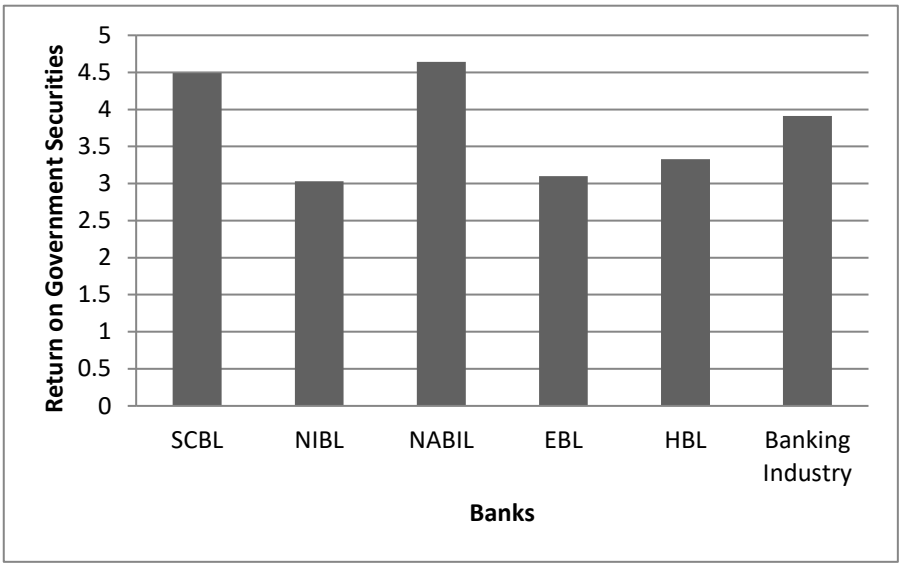
Table 4.7
Return on Government Securities of Sample Banks and Banking Industry

(In percentage)

Fiscal Year	SCBL	NIBL	NABIL	EBL	HBL	Banking Industry
2000/01	4.77	3.26	3.90	2.32	3.21	4.02
2001/02	4.58	4.91	4.26	2.58	3.09	4.01
2002/03	4.52	2.56	4.77	3.05	3.63	4.19
2003/04	4.79	1.79	5.25	3.75	4.96	4.47
2004/05	4.60	2.90	6.25	3.71	2.73	4.00
2005/06	4.11	3.27	5.66	2.93	3.35	3.82
2006/07	4.59	2.41	2.75	2.73	2.97	3.26
2007/08	3.93	3.17	4.27	3.74	2.69	3.54
Total	**35.89**	**24.27**	**37.11**	**24.81**	**26.63**	**31.31**
Mean	**4.49**	**3.03**	**4.64**	**3.10**	**3.33**	**3.91**

Source: *Annual Reports of CBS and Tables: 4.1-4.6*

Figure 4.1
Return on Government Securities of Sample Banks & Banking Industry



From the above analysis, the average return on government securities of SCBL, NIBL NABIL, EBL, HBL and Bank industry is 4.49%, 3.03%, 4.64%, 3.10%, 3.33% and 3.91% respectively. It can be observed that SCBL the highest mean return on government securities of the five sample banks. Likewise, NABIL has the moderate mean return on government securities, while EBL has the lowest mean return on government securities

From the above table, it is evident that SCBL and NABIL only have higher mean return on government securities than mean return on government securities of bank industry while the rest have lower mean return in comparison to bank industry.

4.1.1.2 Return on Loan and Advances

Loan and advances are the major source income for commercial banks. The facility of granting loan and advances is one of the important services which customers of commercial banks can enjoy. Hence to realize their objectives, the commercial banks invest in several sectors like agriculture, industry and commercial sectors to earn a good return from loan and advances. The return on loan and advances is computed by dividing total interest earned from loan and advances to total amount of loan and advances. Thus,

$$\text{Return on Loan and Advances } (R_l) = \frac{\text{Interest earned from loan and advances}}{\text{Total Loan and Advances}}$$

$$\text{Average return on Loan and Advances } (R_l) = \frac{\sum R_l}{n}, \text{ where n= Number of years}$$

The following tables (4.8-4.13) depict the return on loan and advances of SCBL, NIBL, NABIL, EBL, HBL and banking industry

Table 4.8
Return on Loan and Advances of Standard Chartered Bank Nepal Ltd (SCBL)
(Rs in thousands)

FY	Interest on Loan and Advances	Investment on Loan and Advances	Return on Loan and Advances (R_L)
2000/01	558,102.00	5,660,803.00	9.86%
2001/02	540,851.00	5,248,362.00	10.31%
2002/03	563,505.00	5,574,061.00	10.11%
2003/04	558,006.00	6,410,242.00	8.70%
2004/05	581,664.00	8,143,208.00	7.14%
2005/06	596,622.00	8,935,418.00	6.68%
2006/07	728,589.00	10,502,637.00	6.94%
2007/08	872,690.00	13,718,597.00	6.36%
Total	**5,000,029.00**	**64,193,328.00**	**66.10%**
Average	**625,003.63**	**8,024,166.00**	**8.26%**

Source: *Annual Reports of SCBL and Annexes 1(e) and 1(h)*

The table no 4.8 shows that in an average SCBL generate 48.26% return in the investment made in loan and advances. It indicates a gradual decreasing trend of SCBL in the return on loan and advances. During the study period the greatest return is 10.31% in FY2001/02 and the lowest is 6.36% in FY2007/08.

Table 4.9
Return on Loan and Advances of NIBL
(Rs in thousands)

FY	Interest on Loan and Advances	Investment on Loan and Advances	Return on Loan and Advances (R_L)
2000/01	229,042.00	2,318,907.00	9.88%
2001/02	258,583.00	2,518,057.00	10.27%
2002/03	421,847.00	5,648,032.00	7.47%
2003/04	663,016.00	6,917,796.00	9.58%
2004/05	769,195.00	10,453,164.00	7.36%
2005/06	964,689.00	13,178,152.00	7.32%
2006/07	1,302,199.00	17,769,100.00	7.33%
2007/08	1,907,261.00	27,529,305.00	6.93%
Total	**6,515,832.00**	**86,332,513.00**	**66.13%**
Average	**814,479.00**	**10,791,564.13**	**8.27%**

Source: *Annual Reports of NIBL and Annexes 1(e) and 1(h)*

The table no 4.9 shows that in an average NIBL generate 8.27% return on the investment made in loan and advances. However, it demonstrates inconsistent trend of NIBL in the return on loan and advances. During the study period the greatest return is 10.27% in FY2001/02 and the lowest is 6.93% in FY2007/08.

Table 4.10
Return on Loan and Advances of NABIL

(Rs in thousands)

FY	**Interest on Loan and Advances**	**Investment on Loan and Advances**	**Return on Loan and Advances (R_L)**
2000/01	846,764.00	7,993,282.00	10.59%
2001/02	801,046.00	7,135,536.00	11.23%
2002/03	776,300.00	7,454,262.00	10.41%
2003/04	761,616.00	7,953,759.00	9.58%
2004/05	831,830.00	10,946,737.00	7.60%
2005/06	988,417.00	13,278,782.00	7.44%
2006/07	1,167,255.00	15,903,024.00	7.34%
2007/08	1,496,244.00	21,759,460.00	6.88%
Total	**7,669,472.00**	**92,424,842.00**	**71.07%**
Average	**958,684.00**	**11,553,105.25**	**8.88%**

Source: *Annual Reports of NABIL and Annexes 1(e) and 1(h)*

The table no 4.10 shows that in an average NABIL generate 8.88% return in the investment made in loan and advances. It indicates a gradual decline trend of NABIL in the return on government securities. During the study period the greatest return is 11.23% in FY2001/02 and the lowest is 6.88% in FY2007/08.

Table 4.11
Return on Loan and Advances of EBL

(Rs in thousands)

FY	Interest on Loan and Advances	Investment on Loan and Advances	Return on Loan and Advances (R_L)
2000/01	348,618.00	2,959,446.00	11.78%
2001/02	395,098.00	3,923,601.00	10.07%
2002/03	464,763.00	4,882,788.00	9.52%
2003/04	563,137.00	6,075,841.00	9.27%
2004/05	633,625.00	7,900,015.00	8.02%
2005/06	770,826.00	10,136,254.00	7.60%
2006/07	967,178.00	14,082,686.00	6.87%
2007/08	1,329,695.00	18,836,432.00	7.06%
Total	**5,472,940.00**	**68,797,063.00**	**70.19%**
Average	**684,117.50**	**8,599,632.88**	**8.77%**

Source: *Annual Reports of EBL and Annexes 1(e) and 1(h)*

The table no 4.11 shows that in an average EBL generate 8.77% return on an investment made in loan and advances. It shows a general decreasing trend of EBL in the return on loan and advances. During the study period the greatest return is 11.78% in FY2000/01 and the lowest is 6.87% in FY2006/07.

Table 4.12
Return on Loan and Advances of HBL

(Rs in thousands)

FY	Interest on Loan and Advances	Investment on Loan and Advances	Return on Loan and Advances (R_L)
2000/01	850,359.00	9,015,347.00	9.43%
2001/02	853,429.00	9,557,137.00	8.93%
2002/03	903,838.00	10,844,599.00	8.33%
2003/04	970,166.00	12,919,631.00	7.51%
2004/05	1,122,392.00	13,451,168.00	8.34%
2005/06	1,140,687.00	15,761,977.00	7.24%
2006/07	1,242,850.00	17,793,724.00	6.98%
2007/08	1,444,245.00	20,179,995.00	7.16%
Total	**8,527,966.00**	**109,523,578.00**	**63.93%**
Average	**1,065,995.75**	**13,690,447.25**	**7.99%**

Source: *Annual Reports of HBL and Annexes 1(e) and 1(h)*

The table no 4.12 shows that in an average HBL generate 7.99% return on an investment made in loan and advances. It shows no fixed trend of EBL in the return on loan and advances. During the study period the greatest return is 9.43% in FY2000/01 and the lowest is 6.98% in FY2006/07

Table 4.13
Return on Loan and Advances of Banking Industry

(Rs in thousands)

FY	**Interest on Loan and Advances**	**Investment on Loan and Advances**	**Return on Loan and Advances (R_L)**
2000/01	4,922,750.00	27,947,785.00	17.61%
2001/02	5,108,481.00	28,382,693.00	18.00%
2002/03	8,356,438.00	34,403,742.00	24.29%
2003/04	9,770,721.00	40,277,269.00	24.26%
2004/05	13,622,675.00	50,894,292.00	26.77%
2005/06	16,674,704.00	61,290,583.00	27.21%
2006/07	21,874,972.00	76,051,171.00	28.76%
2007/08	32,672,179.00	102,023,789.00	32.02%
Total	**113,002,920.00**	**421,271,324.00**	**198.92%**
Average	**14125365.00**	**52658915.50**	**24.87%**

Source: *Banking and Financial Statistics NRB and Annexes 1(e) and 1(h)*

The table no 4.13 shows that in an average the bank industry generates 26.82% return on an investment made in loan and advances. It demonstrates an inconsistent trend of Bank industry in the return on loan and advances. During the study period the greatest return is 32.02% in FY2007/08 and the lowest is 17.61% in FY2001/02

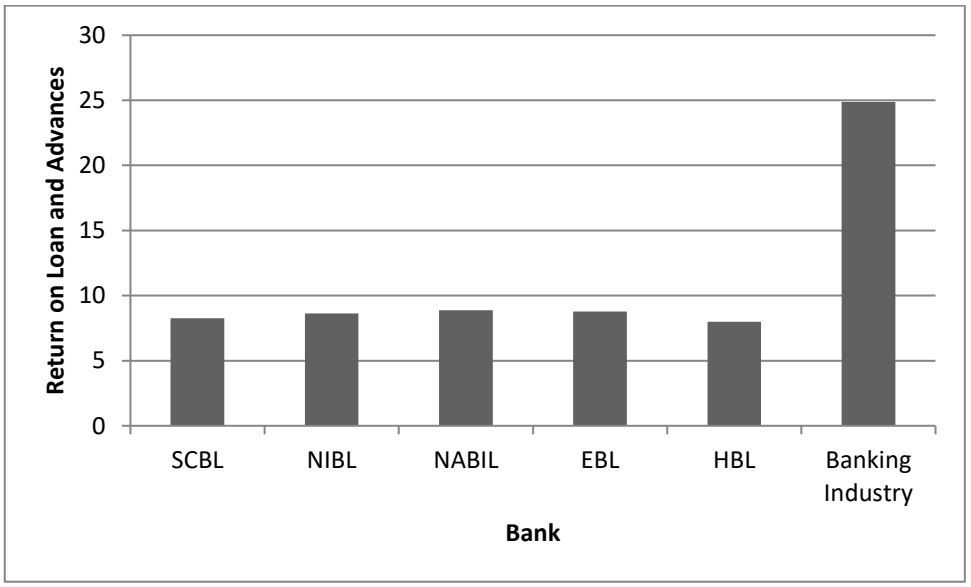
The following table 4.14 displays the return on loan and advances of sample banks and banking industry

Table 4.14
Return on Loan and Advances of Sample Banks and Banking Industry
(in percentage)

Fiscal Year	SCBL	NIBL	NABIL	EBL	HBL	Banking Industry
2000/01	9.86	9.88	10.59	11.78	9.43	17.61
2001/02	10.31	10.27	11.23	10.07	8.93	18.00
2002/03	10.11	7.47	10.41	9.52	8.33	24.29
2003/04	8.70	9.58	9.58	9.27	7.51	24.26
2004/05	7.14	7.36	7.60	8.02	8.34	26.77
2005/06	6.68	7.32	7.44	7.60	7.24	27.21
2006/07	6.94	7.33	7.34	6.87	6.98	28.76
2007/08	6.36	9.88	6.88	7.06	7.16	32.02
Total	**66.10**	**69.09**	**71.07**	**70.19**	**63.92**	**198.92**
Mean	**8.26**	**8.64**	**8.88**	**8.77**	**7.99**	**24.87**

Source: *Annual Reports of CBS Tables: 4.8- 4.13*

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



From the above analysis, the average return on loan and advances of SCBL, NIBL NABIL, EBL, HBL and Bank industry is 8.26%, 8.64%, 8.88%, 8.77%, 7.99% and 24.87% respectively. It can be observed that NABIL the highest mean return on loan and advances of the five sample banks. Likewise, EBL has the moderate mean return on loan and advances, while HBL has the lowest mean return on loan and advance.

From the above table, it is evident that all sample banks have lower mean return in comparison to bank industry.

4.1.1.3 Return on Share and Debenture

The return on share and debenture comprise dividend yield and capital gain yield (change in market price. In other words, return is the combination of capital gain yield and dividend yield. Capital gain yield (loss) can be calculated by the difference the current year price and the last year price with respect to the last year price. However, dividend yield is calculated by dividend per share divided by market price per share. Market price is the mean return on the selected companies which is represented by market return of the study.

The information about the dividend received and the dividend by the commercial banks are insufficiently available. In absence of such information calculation on return on share and debenture is generally infeasible. Hence, it has been assumed to calculate the necessary return on share and debenture by using market return. The average market return on share and debenture is the average return of bank from the investment on share and debenture.

Market return can be calculated by taking difference between the market indexes divided by the closing market index in time (n-1). Here, the dividend is ignored.

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, and P_{t-1}= NEPSE index at time t-1

Average Return on Share and Debenture $(R_s)= \frac{\sum R_s}{n}$, where n = number of years

Table 4.15
Market Return on Share and Debenture of Banking Industry

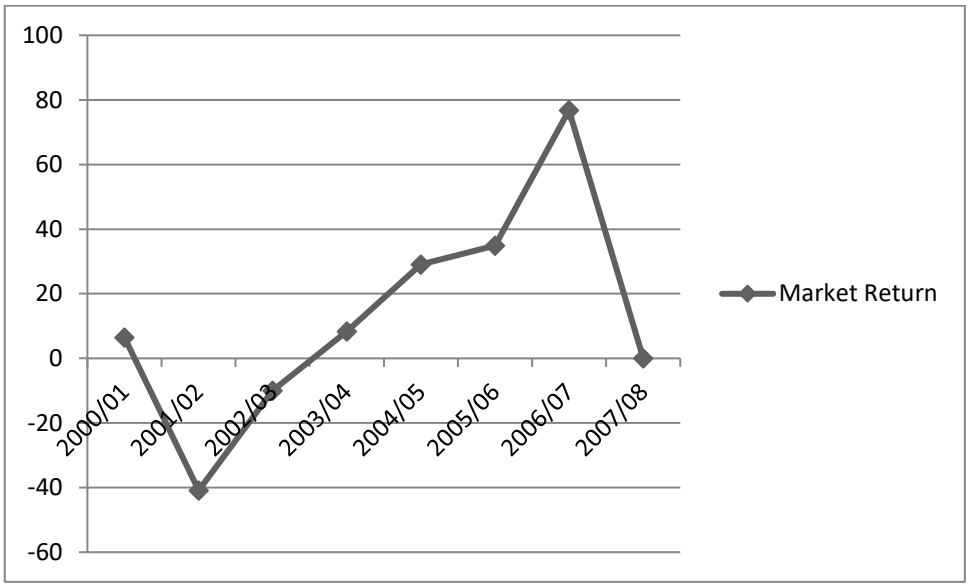
(in Percentage)

Fiscal year	**NEPSE Index**	**Market Return**
2000/01	383.90	6.43
2001/02	227.54	-40.87
2002/03	204.86	-9.96
2003/04	222.04	8.38
2004/05	286.87	29.11
2005/06	386.83	34.91
2006/07	683.95	76.81
2007/08	683.90	-0.01
Average		**14.97**

Source: *SEBO and Annex 6 (a)*

Figure 4.3

Return on Share and Debenture of Banking Industry



The table 4.15 above depicts the return on share and debenture of Banking Industry is highly fluctuating -40.87 in FY2001/02 to76.81 in FY2006/07. These fluctuations in returns are mainly contributed by the volatility of the share prices in the market. The changes in dividends also lead to the variability of return on share to some extent.

The average market return on share and debenture of Banking Industry is 14.97 during the review period. It is higher than the rate of return on other assets like government securities ,and loan and advances i.e 6.40,2.87;7

4.1.2 Risk on Individual Investment

4.1.2.1 Risk on Government Securities

The risk on government security is computed as follows:

Risk on Government Securities (σ_g)=$\sqrt{\frac{\sum(R_g-\overline{R}_g)^2}{n-1}}$

Where R_g=Return on government securities; $\overline{R}_g$=Average rate of return on government securities; σ_g = Standard Deviation on government securities; n=No of years.

The following tables 4.16-4.21 present the risk (Standard Deviation of return) on government securities of SCBL. NIBL, NABIL, EBL, HBL and banking industry

Table 4.16
Risk on Government Securities of SCBL

(in percentage)

FY	Return on Government Securities(R_g)	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2000/01	4.77	0.28	0.0784
2001/02	4.58	0.09	0.0081
2002/03	4.52	0.03	0.0009
2003/04	4.79	0.3	0.0900
2004/05	4.60	0.11	0.0121
2005/06	4.11	-0.38	0.1444
2006/07	4.59	0.1	0.0100
2007/08	3.93	-0.56	0.3136
Total	**35.89**		**0.6575**
Mean	**4.49**		
SD (σ_g)	**0.3064**		

Source: *Annual Reports of SCBL and Annex 4*

The table shows that the average return on government securities of SCBL is 4.49% and the standard deviation which represents risk is 0.3064. It reveals that the risk on investment on government securities of SCBL is 0.3064 which indicates the riskiness on government securities. The standard deviation clearly indicates that there is some minimal risk associated with government securities despite general assumption of no-risk on such type of securities.

Table 4.17
Risk on Government Securities of NIBL

(in percentage)

Fiscal Year	Return on Government securities(R_g)	$(R_g - \bar{R}_g)$	$(R_g - \bar{R}_g)^2$
2000/01	3.26	0.23	0.0529
2001/02	4.91	1.88	3.5344
2002/03	2.56	-0.47	0.2209
2003/04	1.79	-1.24	1.5376
2004/05	2.9	-0.13	0.0169
2005/06	3.27	0.24	0.0576
2006/07	2.41	-0.62	0.3844
2007/08	3.17	0.14	0.0196
Total	**24.28**		**5.8243**
Mean	**3.03**		
SD (σ_g)	**0.9122**		

Source: *Annual Reports of NIBL and Annex 4*

The table shows that the average return on government securities of NIBL is 3.03% and the standard deviation which represents risk is 0.9122. It reveals that the risk on investment on government securities of NIBL is 0.9122 which indicates the riskiness on government securities. Comparing with SCBL, NIBL exhibits higher riskiness on government securities (0.9122>0.3064)

Table 4.18
Risk on Government Securities of NABIL

(in percentage)

Fiscal Year	**Return on Government securities(R_g)**	**($R_g - \overline{R}_g$)**	**($R_g - \overline{R}_g$)^2**
2000/01	3.90	-0.74	0.5476
2001/02	4.26	-0.38	0.1444
2002/03	4.77	0.13	0.0169
2003/04	5.25	0.61	0.3721
2004/05	6.25	1.61	2.5921
2005/06	5.66	1.02	1.0404
2006/07	2.75	-1.89	3.5721
2007/08	4.27	-0.37	0.1369
Total	**37.11**	**0.00**	**8.4225**
Mean	**4.64**		
SD (σ_g)	**1.0969**		

Source: *Annual Reports of NABIL and Annex 4*

The table shows that the average return on government securities of NABIL is 4.64% and the standard deviation which represents risk is 1.0969. It reveals that the risk on investment on government securities of NABIL is 1.0969 which indicates the riskiness on government securities. On observation, NABIL experiences greater riskiness on government securities as compared to NIBL and SCBL (1.0969>0.9122>0.3064).

Table 4.19
Risk on Government Securities of EBL

(in percentage)

Fiscal Year	**Return on Government securities(R_g)**	**($R_g - \overline{R}_g$)**	**($R_g - \overline{R}_g$)^2**
2000/01	2.32	-0.78	0.6084
2001/02	2.58	-0.52	0.2704
2002/03	3.05	-0.05	0.0025
2003/04	3.75	0.65	0.4225
2004/05	3.71	0.61	0.3721
2005/06	2.93	-0.17	0.0289
2006/07	2.73	-0.37	0.1369
2007/08	3.74	0.64	0.4096
Total	**24.81**	**0.01**	**2.2513**
Mean	**3.1**		
SD (σ_g)	**0.5671**		

Source: *Annual Reports of EBL and Annex 4*

The table shows that the average return on government securities of EBL is 3.1% and the standard deviation which represents risk is 0.5671. It reveals that the risk on investment on government securities of EBL is 0.5671which indicates the riskiness on government securities. It is visible that EBL displays lower riskiness on government securities than NABIL and NIBL (0.5671<1.0969<0.9122).

Table 4.20
Risk on Government Securities of HBL

(in percentage)

Fiscal Year	**Return on Government securities(R_g)**	**($R_g - \overline{R}_{g..}$)**	**($R_g - \overline{R}_{g..}$)^2**
2000/01	3.21	-0.12	0.0144
2001/02	3.09	-0.24	0.0576
2002/03	3.63	0.30	0.0900
2003/04	4.96	1.65	2.2848
2004/05	2.73	-0.60	0.360
2005/06	3.35	0.02	0.0004
2006/07	2.97	-0.36	0.1296
2007/08	2.69	-0.64	0.4096
Total	**26.63**	**0.01**	**3.3464**
Mean	**3.33**		
SD (σ_g)	**0.6914**		

Source: *Annual Reports of HBL and Annex 4*

The table shows that the average return on government securities of HBL is 3.33% and the standard deviation which represents risk is 0.6914. It reveals that the risk on investment on government securities of HBL is 0.6914which indicates the riskiness on government

securities. It is evident that HBL also displays lower riskiness on government securities than NABIL and NIBL (0.6914<1.0969<0.9122).

Table 4.21
Risk on Government Securities of Banking Industry

(in percentage)

Fiscal Year	**Return on Government securities(R_g)**	**($R_g - \overline{R}_g$)**	**($R_g - \overline{R}_g$)^2**
2000/01	4.02	0.11	0.0113
2001/02	4.01	0.10	0.0093
2002/03	4.19	0.28	0.0763
2003/04	4.47	0.56	0.3094
2004/05	4.00	0.09	0.0074
2005/06	3.82	-0.09	0.0088
2006/07	3.26	-0.65	0.4274
2007/08	3.54	-0.37	0.1397
Total	**31.31**	**0.00**	**0.9896**
Mean	**3.91**		
SD (σ_g)	**0.376**		

Source: *Banking and Financial Statistics NRB and Annex 4*

The table shows that the average return on government securities of Banking Industry is 3.91%, where as the standard deviation which represents risk is 0.376. It reveals that the risk on investment on government securities of Bank industry is 0.376 which indicates the riskiness on government securities.

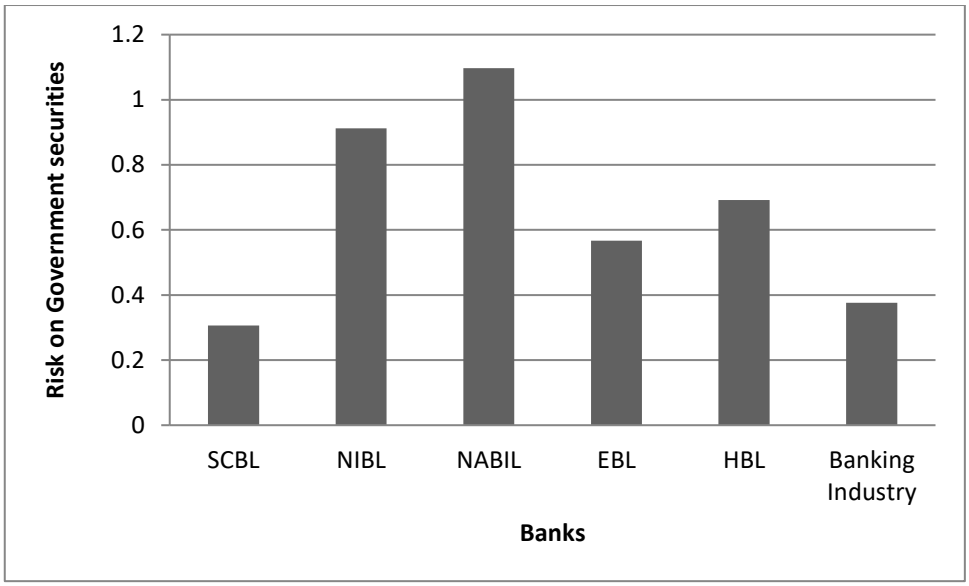
Table 4.22
Risk on Government Securities of Sample Banks and Banking Industry

*(*in percentage)

Fiscal Year	**SCBL**	**NIBL**	**NABIL**	**EBL**	**HBL**	**Banking Industry**
2000/01	4.77	3.26	3.90	2.32	3.21	4.02
2001/02	4.58	4.91	4.26	2.58	3.09	4.01
2002/03	4.52	2.56	4.77	3.05	3.63	4.19
2003/04	4.79	1.79	5.25	3.75	4.96	4.47
2004/05	4.60	2.9	6.25	3.71	2.73	4.00
2005/06	4.11	3.27	5.66	2.93	3.35	3.82
2006/07	4.59	2.41	2.75	2.73	2.97	3.26
2007/08	3.93	3.17	4.27	3.74	2.69	3.54
Total	**35.89**	**24.28**	**37.11**	**24.81**	**26.63**	**31.31**
Mean	**4.49**	**3.03**	**4.64**	**3.10**	**3.33**	**3.91**
SD (σ_g)	**0.3064**	**0.9122**	**1.0969**	**0.5671**	**0.6914**	**0.376**

Source: *Annual Reports of CBs and Annex 4*

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



The above table 4.22 shows the risk (Standard deviation of return) on government securities of banking industry is 0.376.Similarly the risk on government securities of SCBL, NIBL NABIL, EBL, and HBL are 0.3064, 0.9122, 1.0969, 0.5671, and 0.6914 respectively. From the above analysis, it is evident that NABIL has the highest risk on government securities among five commercial banks. NIBL, HBL and EBL have moderate risk and SCBL has the lowest risk on government securities.

From the above table it is evident that four sample banks particularly NIBL, NABIL, EBL and HBL demonstrate higher risk on government securities than that of the banking industry.

4.1.2.2 Risk on Loan and Advances

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

Standard Deviation on Loan and Advances (σ_l)= $\sqrt{\frac{\sum(R_l-\overline{R}_l)^2}{n-1}}$

Where, R_l =Return on Loan and Advances

$\overline{R_l}$ = Average Return on Loan and Advances

σ_l = Standard Deviation on Loan and Advances

N= Number of year

The following tables 4.23-4.28 present the risk (Standard Deviation of return) on Loan and Advances of SCBL. NIBL, NABIL, EBL, HBL and banking industry

Table 4.23
Risk on Loan and Advances of SCBL

(in percentage)

Fiscal Year	**Return on Loan and Advances(R_l)**	**($R_l - \bar{R}_l$)**	**($R_l - \bar{R}_l)^2$**
2000/01	9.86	1.60	2.5600
2001/02	10.31	2.05	4.2025
2002/03	10.11	1.85	3.4225
2003/04	8.7	0.44	0.1936
2004/05	7.14	-1.12	1.2544
2005/06	6.68	-1.58	2.4964
2006/07	6.94	-1.32	1.7424
2007/08	6.36	-1.90	3.6100
Total	**66.1**	**0.02**	**19.4818**
Mean	**8.26**		
SD (σ_l)	**1.6683**		

Source: *Annual Reports of SCBL and Annex 5*

The table shows that the average return on loan and advances of SCBL is 8.26% and the standard deviation which represents risk is 1.6683. It reveals that the risk in investment on loan and advances of SCBL is 1.6683which indicates the riskiness on loan and advances.

Table 4.24

Risk on Loan and Advances of NIBL

(In percentage)

Fiscal Year	**Return on Loan and Advances(R_l)**	**($R_l - \bar{R}_l$)**	**($R_l - \bar{R}_l)^2$**
2000/01	9.88	1.61	2.5921
2001/02	10.27	2.00	4.0000
2002/03	7.47	-0.80	0.6400
2003/04	9.58	1.31	1.7161
2004/05	7.36	-0.91	0.8281
2005/06	7.32	-0.95	0.9025
2006/07	7.33	-0.94	0.8836
2007/08	6.93	-1.34	1.7956
Total	**66.13**	**-0.02**	**13.3580**
Mean	**8.27**		
SD (σ_l)	**1.3814**		

Source: *Annual Reports of NIBL and Annex 5*

The table shows that the average return on loan and advances of NIBL is 8.27% and the standard deviation which represents risk is 1.3814. It reveals that the risk on investment on loan and advances of NIBL is 1.3814 which indicates the riskiness on loan and advances. On comparison, NIBL exhibits lower riskiness on loan and advances than SCBL (1.3814<1.6683)

Table 4.25
Risk on Loan and Advances of NABIL

(in percentage)

Fiscal Year	**Return on Loan and Advances(R_l)**	**($R_l - R_l$)**	**($R_g - R_l)^2$**
2000/01	10.59	1.71	2.9241
2001/02	11.23	2.35	5.5225
2002/03	10.41	1.53	2.3409
2003/04	9.58	0.70	0.4900
2004/05	7.6	-1.28	1.6384
2005/06	7.44	-1.44	2.0736
2006/07	7.34	-1.54	2.3716
2007/08	6.88	-2.00	4.0000
Total	**71.07**	**0.03**	**21.3611**
Mean	**8.88**		
SD (σ_l)	**1.7469**		

Source: *Annual Reports of NABIL and Annex 5*

The table shows that the average return on loan and advances of NABIL is 8.88% and the standard deviation which represents risk is 1.7469. It reveals that the risk on investment on Loan and Advances of NABIL is 1.7469 which indicates the riskiness on loan and advances Observing the status of riskiness on loan and advances, NABIL displays higher step than NIBL and SCBL (1.7469>1.6683>1.3814).

Table 4.26
Risk on Loan and Advances of EBL

(in percentage)

Fiscal Year	**Return on Loan and Advances(R_l)**	**($R_l - \bar{R}_l$)**	**($R_l - \bar{R}_l$)^2**
2000/01	11.78	3.01	9.0601
2001/02	10.07	1.30	1.6900
2002/03	9.52	0.75	0.5625
2003/04	9.27	0.50	0.2500
2004/05	8.02	-0.75	0.5625
2005/06	7.6	-1.17	1.3689
2006/07	6.87	-1.90	3.6100
2007/08	7.06	-1.71	2.9241
Total	**70.19**	**0.03**	**20.0281**
Mean	**8.77**		
SD (σ_l)	**1.6915**		

Source: *Annual Reports of EBL and Annex 5*

The table shows that the average return on loan and advances of EBL is 8.77% and the standard deviation which represents risk is 1.6915. It reveals that the risk on investment on Loan and Advances of EBL is 1.6915which indicates the riskiness on loan and advances. Nevertheless, EBL has lower riskiness on loan and advances than NABIL(1.6915<1.7469).

Table 4.27
Risk on Loan and Advances of HBL

(in percentage)

Fiscal Year	**Return on Loan and Advances(R_l)**	**($R_l - \bar{R}_l$)**	**($R_l - \bar{R}_l$)^2**
2000/01	9.43	1.44	2.0736
2001/02	8.93	0.94	0.8836
2002/03	8.33	0.34	0.1156
2003/04	7.51	-0.48	0.2304
2004/05	8.34	0.35	0.1225
2005/06	7.24	-0.75	0.5625
2006/07	6.98	-1.01	1.0201
2007/08	7.16	-0.83	0.6889
Total	**63.93**	**0.00**	**5.6972**
Mean	**7.99**		
SD (σ_l)	**0.9022**		

Source: *Annual Reports of HBL and Annex 5*

The table shows that the average return on loan and advances of HBL is 7.99% and the standard deviation which represents risk is 0.9022. It reveals that the risk on investment on Loan and Advances of HBL is 0.9022 which indicates the riskiness on loan and advances. It

is evident that HBL has even lower riskiness on loan and advances than NIBL (0.9022<1.3814).

Table 4.28
Risk on Loan and Advances of Banking Industry

(in percentage)

Fiscal Year	**Return on Loan and Advances(R_l)**	**($R_l - \bar{R}_l$)**	**($R_l - \bar{R}_l$)^2**
2000/01	17.61	-7.26	52.6350
2001/02	18.00	-6.87	47.1282
2002/03	24.29	-0.57	0.3306
2003/04	24.26	-0.60	0.3660
2004/05	26.77	1.91	3.6290
2005/06	27.21	2.35	5.4990
2006/07	28.76	3.90	15.1710
2007/08	32.02	7.16	51.1940
Total	**198.92**	**0.00**	**175.9530**
Mean	**24.865**		
SD (σ_l)	**5.0136**		

Source: *Reports of Banking and Annex 5*

The table shows that the average return on loan and advances of Banking Industry is 24.865% and the standard deviation which represents risk is 5.0136. It reveals that the risk on investment on loan and advances of Banking industry is 5.0136 which indicate the riskiness on loan and advances.

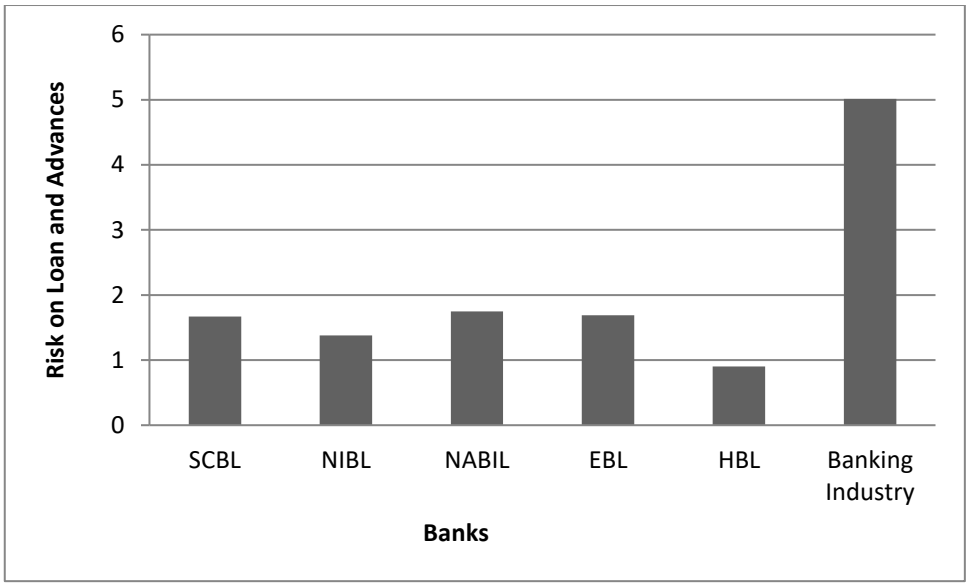
Table 4.29
Risk on Loan and Advances of Sample Banks and Banking Industry

(in percentage)

Fiscal Year	**SCBL**	**NIBL**	**NABIL**	**EBL**	**HBL**	**Banking Industry**
2000/01	9.86	9.88	10.59	11.78	9.43	17.61
2001/02	10.31	10.27	11.23	10.07	8.93	18.00
2002/03	10.11	7.47	10.41	9.52	8.33	24.29
2003/04	8.70	9.58	9.58	9.27	7.51	24.26
2004/05	7.14	7.36	7.60	8.02	8.34	26.77
2005/06	6.68	7.32	7.44	7.60	7.24	27.21
2006/07	6.94	7.33	7.34	6.87	6.98	28.76
2007/08	6.36	6.93	71.07	7.06	7.16	32.02
Total	**66.10**	**66.13**	**6.88**	**70.19**	**63.93**	**198.92**
Mean	**8.26**	**8.27**	**10.59**	**8.77**	**7.99**	**24.865**
SD (σ_l)	**1.6683**	**1.3814**	**1.7469**	**1.6915**	**0.9022**	**5.0136**

Source: *Annual Reports of CBs and Tables: 4.23-4.28*

Figure 4.5
Risk on Loan and Advances of Sample Banks and Banking Industry



The above table 4.29 shows the risk (Standard deviation of return) on loan and advances of Bank industry is 5.0136.Similarly the risk on loan and advances of SCBL, NIBL NABIL, EBL, and HBL are 1.6683, 1.3814, 1.7469, 1.6915, 0.9022 respectively. From the above analysis, it is evident that NABIL has the highest risk on loan and advances among five commercial banks. EBL and SCBL have moderate risk and HBL has the lowest risk on loan and advances.

4.1.2.3 Risk on Share and Debenture

Market Risk can be calculated as follows.

Risk on Share and Debenture (σ_s) = $\sqrt{\frac{\sum(R_s-\overline{R}_s)^2}{n-1}}$

Where R_s=Return on share and debenture

$\overline{R}_s$ = Average Rate of return on share and debenture

σ_s= Standard Deviation on return on share and debenture

n=Number of years

Table 4.30
Risk on Share and Debenture of Banking Industry

(in Percentage)

Fiscal year	**NEPSE Index**	**Market Return**	**($R_s - \bar{R}_s$)**	**$(R_s - \bar{R}_s)^2$**
2000/01	383.90	6.43	-8.54	72.93
2001/02	227.54	-40.87	-55.84	3118.11
2002/03	204.86	-9.96	-24.93	621.50
2003/04	222.04	8.38	-6.59	43.43
2004/05	286.87	29.11	14.14	199.94
2005/06	386.83	34.91	19.94	397.60
2006/07	683.95	76.81	61.84	3824.19
2007/08	683.90	-0.01	-14.98	224.40
Total		**104.8**		**8502.1**
SD (σ_s)				**34.85**

Source: *Annex 6 (b)*

The table 4.30 listed above reveals the risk (Standard Deviation) of return on Share and Debenture of Banking Industry. The Standard deviation of return on Share and Debenture of Banking Industry is 34.85 The Standard deviation portrays more risk than investment on loan and advances and government securities i.e 5.0136 >1.0587 respectively. Thus it is clear that investment on share and debenture is more risky

4.1.3 Return on Investment Portfolio

The return on portfolio is the weighted average of the expected returns of the individual stock in the portfolio, with the weights being the proportion of the investment on each security in the portfolio equation. Commercial banks invest their funds in government securities, share and debenture and loan and advances. The weight of investment on various assets and their portfolio of returns can be calculated as below;

Calculation of Portfolio Return ($R_{P)}$

Portfolio return ($R_{P)} = \sum W \times R$

$= \sum W_1R_1 + W_2R_2 + W_3R_3$

$$\text{Proportion Weight (W)} = \frac{\text{Investment in each asset}}{\text{Total outside Investment}}$$

Where,
R_P= Portfolio return.
W_1= Proportion of investment on government securities.
W2= Proportion of investment on loan and advances.
W3= Proportion of investment on share and debenture.

R_1, R_2, and R_3 = Return on government securities, loan and advances, share and debenture respectively

Table 4.31
Portfolio Return on Investment of SCBL

(in percentage)

S.NO	Assets	Average Rate of Return (R)	Proportion Weight (W)
1	Return on Government securities(R_g)	4.49	0.4666
2	Return on Loan and advances(R_l)	8.26	0.5315
3	Return on Share and debenture(R_s)	14.97	0.0019
Portfolio Return(R_p)		6.42	1.0000

Source: Annual Reports of SCBL, Annexes 7 and16

From the above table 4.31 the expected return on portfolio of SCBL is 6.42 which is more than that of mean rate of return on investment on government securities i.e 6.42>4.49,but less than that of mean rate of return on investment on loan and advances i.e 6.42<8.26 and share and debenture i.e 6.42<14.05

Table 4.32
Portfolio Return on Investment of NIBL

(in percentage)

S.No	Assets	Average Rate of Return (R)	Proportion Weight (W)
1	Return on Government securities(R_g)	3.03	0.1376
2	Return on Loan and advances(R_l)	8.27	0.8605
3	Return on Share and debenture(R_s)	14.97	0.0018
Portfolio Return(R_p)		7.56	1.0000

Source: *Annual Reports of NIBL, Annexes 7 and16*

From the above table 4.32 the expected return on portfolio of NIBL is 7.56which is more than that of mean rate of return on investment on government securities i.e 7.56>3.03, but less than that of mean rate of return on investment on loan and advances i.e 7.76<8.27 and share and debenture i.e7.56< 14.05

Table 4.33
Portfolio Return on Investment of NABIL

(in percentage)

S.No	Assets	Average Rate of Return (R)	Proportion Weight (W)
1	Return on Government securities(R_g)	4.64	0.2327
2	Return on Loan and advances(R_l)	10.59	0.7573
3	Return on Share and debenture(R_s)	14.97	0.0100
Portfolio Return(R_p)		9.25	1.0000

Source: *Annual Reports of NABIL, Annexes 7 and16*

From the above table 4.33 the expected return on portfolio of NABIL is 9.25 which is more than that of mean rate of return on investment on government securities i.e 9.25>4.64 ,but less than that of mean rate of return on investment on loan and advances i.e 9.25<10.59 and share and debenture i.e9.25<14.97

Table 4.34
Portfolio Return on Investment of EBL

(in percentage)

S.No	Assets	Average Rate of Return (R)	Proportion Weight (W)
1	Return on Government securities(R_g)	3.10	0.2365
2	Return on Loan and advances(R_l)	8.77	0.7611
3	Return on Share and debenture(R_s)	14.97	0.0024
Portfolio Return(R_p)		7.44	1.0000

Source: Annua*l Reports of EBL, Annexes 7 and16*

From the above table 4.34 the expected return on portfolio of EBL is 7.44 which is more than that of mean rate of return on investment on government securities i.e 7.44 >3.10, but less than that of mean rate of return on investment on loan and advances i.e 7.44<8.77 and share and debenture i.e7.44 <14.05

Table 4.35
Portfolio Return on Investment of HBL

(in percentage)

S.No	Assets	Average Rate of Return (R)	Proportion Weight (W)
1	Return on Government securities(R_g)	3.33	0.2464
2	Return on Loan and advances(R_l)	7.99	0.7511
3	Return on Share and debenture(R_s)	14.97	0.0024
	Portfolio Return(R_p)	6.86	1.0000

Source: *Annual Reports of HBL, Annexes 7 and16*

From the above table 4.35 the expected return on portfolio of HBL is 6.86 which is more than that of mean rate of return on investment on government securities i.e 6.86 >3.33, but less than that of mean rate of return on investment on loan and advances i.e 6.86<7.99 and share and debenture i.e6.86<14.05

Table 4.36
Portfolio Return on Investment of Banking Industry

(in percentage)

S.No	Assets	Average Rate of Return (R)	Proportion Weight (W)
1	Return on Government securities(R_g)	3.91	0.2691
2	Return on Loan and advances(R_l)	24.87	0.7271
3	Return on Share and debenture(R_s)	14.97	0.0038
	Portfolio Return(R_p)	19.19	1.0000

Source: *Banking and Financial Statistics of NRB, Annexes 7 and16*

From the above table 4.36 the expected return on portfolio of Banking industry is 19.19 which is more than that of mean rate of return on investment on government securities and share and debenture i.e 19.19 >3.91 >14.97 ,but less than that of mean rate of return on investment on loan and advances i.e 19.19 <24.87

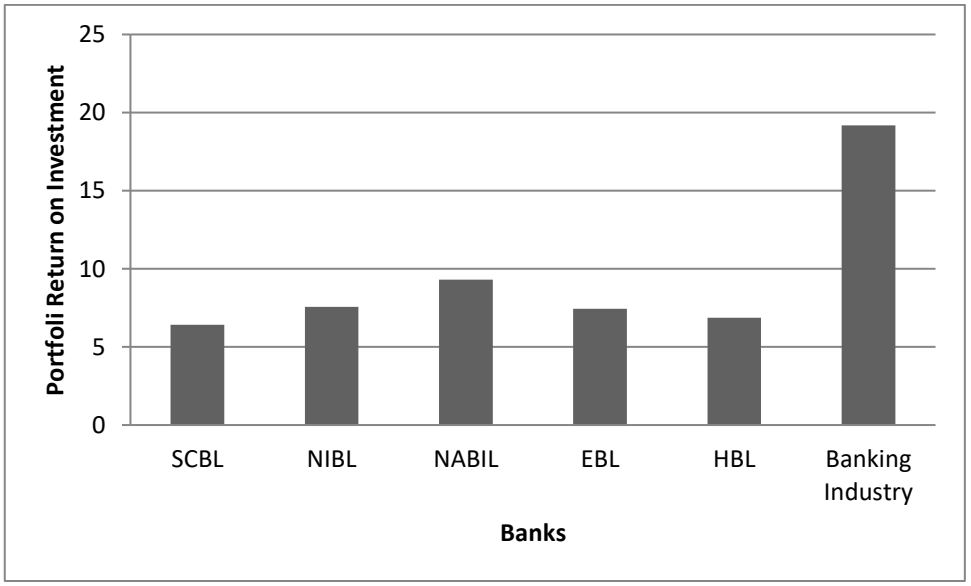
Table 4.37
Portfolio Return on Investment of Sample Banks and Banking Industry

(in percentage)

S.No	Assets	SCBL	NIBL	NABIL	EBL	HBL	Banking Industry
1	Return on Government securities(R_g)	4.49	3.03	4.64	3.10	3.33	3.91
2	Return on Loan and advances(R_l)	8.26	8.27	10.59	8.77	7.99	24.87
3	Return on Share and debenture(R_s)	14.97	14.97	14.97	14.97	14.97	14.97
Portfolio Return(R_p)		6.42	7.56	9.25	7.44	6.86	19.19

Source: *Banking and Financial Statistics of NRB, Tables4.31-4.36*

Figure 4.6
Portfolio Return on Investment of Sample Banks and Banking Industry



The above table 4.37 displays that the portfolio returns of SCBL,NIBL,NABIL,EBL,HBL and Banking industry are 6.42%,7.56%, 9.25%, 7.44%, 6.86% and19.19% respectively. From the above analysis, it is seen that NABIL has the highest portfolio return on various assets among five commercial banks, because NABIL is investing 59.26% of its total outside investment in loan and advances and 0.78% of its total outside investment on share and debenture which generate higher return and only 39.96% of its total outside investment in government securities which yields lower return.

Likewise, SCBL has the lowest portfolio return (6.42%) on various assets among five commercial banks SCBL has invested 53.15% of its total outside investment in loan and advances and 0.19% of its total outside investment on share and debenture which generate higher return and only 44.66% of its total outside investment in government securities which yields lower return.

Similarly, NIBL, EBL and HBL have moderate portfolio return on various assets. The portfolio returns on various assets of all sample banks are less than that of banking industry.

From the above calculation, NABIL has utilized the optimum combination of the portfolio return, which is the highest among four selected banks except banking industry.

4.1.4 Risk on Investment Portfolio

Expected risk on a portfolio is the 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 portfolio risk is affected by the association of movement of returns of two securities. The degree to which the assets return move together is measured by the covariance. Hence, by combining the measures of individual assets risk, relative asset weights and the co-movement of asset returns (covariance) the risk of the portfolio can be estimated. Thus prior to the calculation of portfolio risk on investment, covariance between two assets return should be calculated.

Calculation of Correlation Coefficient

Correlation Coefficient between government securities and loan and advances

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

Correlation Coefficient between government securities and share and debenture

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

Correlation Coefficient between loan and advances and share and debenture

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

Calculation of Covariance

Covariance between government securities and loan and advances

$Cov_{gl} = r_{gl} x\sigma_g x\sigma_l$

Covariance between loan and advances and share and debenture

$Cov_{ls} = r_{ls} x\sigma_s x\sigma_l$

Covariance between government securities and share and debenture

$Cov_{ls} = r_{gs} x\sigma_g x\sigma_s$

Where, R_g=Return on government securities

R_l=Return on loan and advances

R_s=Return on share and debenture

σ_g=Standard deviation of return on government securities

σ_l= Standard deviation of return on loan and advances

σ_s= Standard deviation of return on share and debenture

Calculation of Standard Deviation of Portfolio Investment

The Standard Deviation of portfolio investment (σ_p) can be calculated as follows

$$\sigma_p = \sqrt{W_g^2\sigma_g^2 + W_l^2\sigma_l^2 + W_s^2\sigma_s^2 + 2W_gW_lCov_{gl} + 2W_gW_sCov_{gs} + 2W_lW_sCov_{ls}}$$

Where,

W_g,W_l and W_s=Weight of government securities , loan and advances and shares and debentures respectively

σ_g, σ_l , σ_s=Standard deviation of government securities , loan and advances and shares and debentures respectively

Cov_{gl} = Co-variance between government securities and loan and advances

Cov_{ls}= Co-variance between loan and advances and shares and debentures

Cov_{gs}= Co-variance between government securities and shares and debentures

Table 4.38
Portfolio Risk on Investment of SCBL

(in percentage)

S.No	Assets	Risk(Standard deviation)	Correlation Coefficient
1	Risk on Government Security(σ_g)	0.3064	r_{gl}=0.62
2	Risk on Loan and Advances(σ_l,)	1.6683	r_{gs}= -0.022
3	Risk on Share and Debenture(σ_s)	34.85	r_{ls}= -0.068
Portfolio Risk (σ_p)		1.043	

Source: *Annual reports of SCBL, Annexes 8 and 9*

From the above table 4.38, the expected risk of portfolio (standard deviation) of SCBL is 1.043% which is considerably less than the expected risk on investment on share and debenture 1.043%< 34,85% and loan and advances 1.043% < 1.6683% but more than the expected risk of investment on government securities i.e. 1.043% >0.3064%. The risk of investment portfolio of SCBL has considerably reduced owing to the negative correlation between returns of investment on government securities and share and debenture (r_{gs}= -0.022) and returns of investment on loan and advances and share and debenture (r_{ls}=-0.068). Hence it is clear from the above analysis that the lower the correlation coefficient, the lower the risk of the portfolio. In other words, combining assets with negative correlation(r<0) will significantly reduce the risk of the portfolio.

Table 4.39
Portfolio Risk on Investment of NIBL

(in percentage)

S.No	Assets	Risk(Standard deviation)	Correlation Coefficient
1	Risk on Government Security(σ_g)	0.9122	r_{gl}=0.47
2	Risk on Loan and Advances(σ_l,)	1.3814	r_{gs}= -0.57
3	Risk on Share and Debenture(σ_s)	34.85	r_{ls}= -0.67
Portfolio Risk (σ_p)		1.28	

Source: *Annual reports of SCBL, Annexes 8 and 9*

From the above table 4.39, the expected risk of portfolio (standard deviation) of NIBL is 1.28% which is considerably less than the expected risk on investment on share and debenture 1.28% < 34.85% and loan and advances 1.28% < 1.3814% but more than the expected risk of investment on government securities i.e 1.28% > 0.9122%. The risk of investment portfolio of NIBL has considerably reduced owing to the negative correlation between returns of investment on government securities and share and debenture (r gs=-0.57) and returns of investment on loan and advances and share and debenture (r_{ls}=-0.67).

Table 4.40
Portfolio Risk on Investment of NABIL

(in percentage)

S.No	Assets	Risk(Standard deviation)	Correlation Coefficient
1	Risk on Government Security(σ_g)	1.0969	r_{gl}=-0.06
2	Risk on Loan and Advances(σ_l,)	1.7469	r_{gs}=0.17
3	Risk on Share and Debenture(σ_s)	34.85	r_{ls}= -0.69
Portfolio Risk (σ_p)		1.153	

Source: *Annual reports of NABIL, Annexes 8 and 9*

From the above table 4.40, the expected risk of portfolio (standard deviation) of NABIL is 1.183%which is considerably less than the expected risk on investment on share and debenture 1.153%<34.85% and loan and advances 1.153%< 1.7469% and the expected risk of investment on government securities i.e1.153%>1.0969%. The risk of investment portfolio of NABIL has considerably reduced owing to the negative correlation between and returns of investment on loan and advances and share and debenture (r_{ls}= -0.69).). Hence it is clear from the above analysis that the lower the correlation coefficient, the lower the risk of the portfolio. In other words, combining assets with negative correlation(r<0) will significantly reduce the risk of the portfolio.

Table 4.41
Portfolio Risk on Investment of EBL

(in percentage)

S.No	Assets	Risk(Standard deviation)	Correlation Coefficient
1	Risk on Government Security(σ_g)	0.5674	r_{gl}= -0.50
2	Risk on Loan and Advances(σ_l,)	1.6915	r_{gs}=0.04
3	Risk on Share and Debenture(σ_s)	34.85	r_{ls}= -0.60
Portfolio Risk (σ_p)		0.852	

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

From the above table 4.41, the expected risk of portfolio (standard deviation) of EBL is 0.852% which is considerably less than the expected risk on investment on share and debenture 0.852% < 34.85% and loan and advances 0.852% < 1.6915 but more than the expected risk of investment on government securities i.e. 0.852% >0.5674 %. The risk of investment portfolio of EBL has considerably reduced owing to the negative correlation between returns of investment on loan and advances, and share and debenture (r ls= -0.6).

Table 4.42
Portfolio Risk on Investment of HBL

(in percentage)

S.No	Assets	Risk(Standard deviation)	Correlation Coefficient
1	Risk on Government Security(σ_g)	0.6914	r_{gl}= -0.09
2	Risk on Loan and Advances(σ_l,)	0.9022	r_{gs}= -0.14
3	Risk on Share and Debenture(σ_s)	34.85	r_{ls}= -0.59
Portfolio Risk (σ_p)		-0.567	

Source: *Annual reports of HBL, Annexes 8 and 9*

From the above table 4.42, the expected risk of portfolio (standard deviation) of HBL is -0.567% which is considerably less than the expected risk on investment on share and debenture -0.567% < 34.85% and loan and advances -0.567% < 0.9022 and the expected risk of investment on government securities -0.567% <0.6914 %. The risk of investment portfolio of HBL has considerably reduced owing to the negative correlation between returns of investment on government securities and share and debenture (r_{gs}= -0.14), and returns of investment on loan and advances and share and debenture (r_{ls}= -0.59)

Table 4.43
Portfolio Risk on Investment of Banking Industry

(in percentage)

S.No	Assets	Risk(Standard deviation)	Correlation Coefficient
1	Risk on Government Security(σ_g)	0.376	r_{gl}=-0.55
2	Risk on Loan and Advances(σ_l,)	5.0136	r_{gs}=-0.18
3	Risk on Share and Debenture(σ_s)	34.85	r_{ls}=0.55
Portfolio Risk (σ_p)		3.62	

Source: *Annual reports of CBs, Annexes 8 and 9*

From the above table 4.43, the expected risk of portfolio (standard deviation) of banking industry is 3.62% which is considerably less than the expected risk on investment on share and debenture 3.62% < 34.85% and loan and advances 3.62% < 5.0136 and the expected risk of investment on government securities 3.62% >0.376%. The risk of investment portfolio of banking industry has reduced owing to the lower correlation between returns of investment on government securities and share and debenture (r_{gs}=-0.18), and returns of investment on government securities and loan and advances (r_{gl}=-0.55)

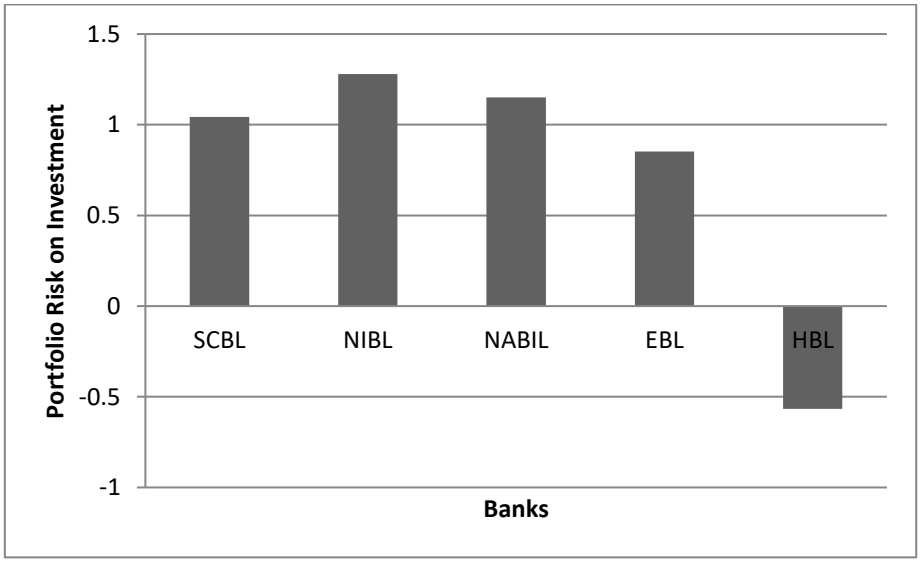
Table 4.44
Portfolio Risk on Investment of Sample Banks

(in percentage)

Asset	SCBL	NIBL	NABIL	EBL	HBL
Risk on Government securities	0.3064	0.9122	1.0969	0.5674	0.6914
Risk on Loan and Advances	1.6683	1.3814	1.7469	1.6915	0.9022
Risk on Share and Debenture	34.85	34.85	34.85	34.85	34.85
Portfolio Risk	1.043	1.28	1.15	0.852	-0.567

Source: *Annual Reports of CBs and Annex 9*

Figure 4.7
Portfolio Risk on Investment of Sample Banks



The above table presents the portfolio risk on investment of SCBL, NIBL, NABIL, EBL, and HBL as 1.043%, 1.28%, 1.15%,0.852%,and -0.567% respectively From the above analysis, it is found that NABIL has the highest portfolio risk on investment on various assets, while HBL has the lowest portfolio risk on investment on various assets.

From the above calculation, it is evident that investing the total funds on loan and advances and share and debenture is more risky than that of investment on government securities. However, average return on investment on loan and advances and share and debenture is more than that of average return on investment on government securities. Thus, investing wealth in more than one security helps minimize the 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 the financial position of a firm. As a tool of financial analysis, ratio can be expressed in percentage. With the help of ratio analysis, the quantitative judgment can be obtained very easily and timely with respect to financial performance of the firm. In this section, major ratios related to the investment mechanism of commercial banks are calculated and analyzed.

4.2.1Total Investment to Total Deposit Ratio

The ratio is used to measure the ability of banks to successfully mobilize the total deposits of investment. This ratio is obtained by dividing total investment by total deposit as expressed below.

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

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

The following table (4.45) shows the ratios of total investment to total deposit of sample commercial banks.

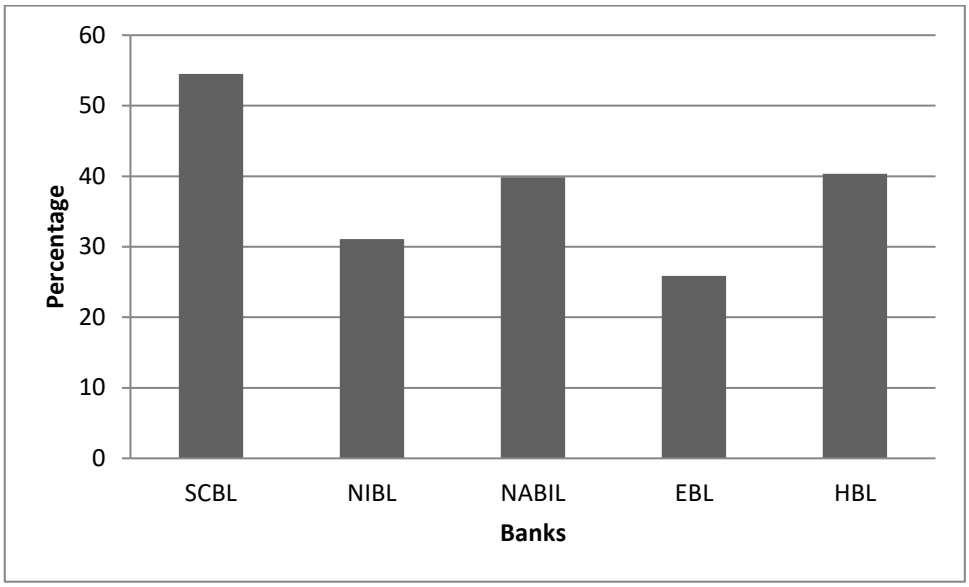
Table 4.45
Total Investment to Total Deposit Ratio (%)

FY	SCBL	NIBL	NABIL	EBL	HBL
2000/01	61.95	46.29	48.64	19.71	23.29
2001/02	58.58	43.65	52.88	30.97	49.18
2002/03	54.47	21.52	44.85	24.70	48.44
2003/04	53.68	33.51	41.33	31.44	32.36
2004/05	50.11	27.60	29.27	21.08	47.13
2005/06	55.67	29.60	31.94	30.44	41.10
2006/07	54.99	26.56	38.36	27.41	39.35
2007/08	46.74	19.97	31.23	21.11	41.89
Mean	**54.52**	**31.09**	**39.84**	**25.86**	**40.34**
SD (σ_l)	**4.39**	**8.98**	**8.1**	**4.57**	**8.28**
C.V	**8.05**	**28.88**	**20.33**	**17.67**	**20.53**

Source: *Annual Reports of related banks from FY2000/01-2007/08and Annexes1 (a), 1(b) &10*

Bank Industry Average Mean $= \frac{(54.52+31.09+39.84+25.86+40.51)}{5} = \frac{191.82}{5} = 38.36\%$

Figure 4.8
Total Investment to Total Deposit Ratio



The comparative table 4.45 and figure 4.8 reveal that the ratio of total investment to total deposit of sample commercial banks has quite fluctuating trend during the study period of FY 2000/01-2007/08. The mean investment to total deposit of SCBL is the highest at the 54.39 %. Likewise HBL has the second highest of investment to total deposit with 40.34%. NABIL stood at the third position (39.84%) Gauging at the average ratio it can be inferred that SCBL, HBL, and NABIL capacity of mobilizing deposit on investment is more than others, since their mean ratio are higher than the average ratio on CBS 38.3 %. However, the mobilization of deposit on investment by NIBL and EBL is comparatively lower than overall CBs.

Nevertheless, the coefficient of variation (C.V) in the ratio of SCBL is the lowest (8.13%).Likewise, the C.V in the ratio of NIBL is the highest (28.88 %) indicating more consistency among the others. Thus it is evident that SCBL is the most successful in utilizing its resources on investment among the banks. Next stands HBL in utilizing its resources on investment. However, other banks are poor in utilizing their deposits on investment.

4.2.2 Investment on Government Securities to Total outside Investment Ratio

This ratio is very useful for understanding to what extent the CBs are successful to mobilize their total outside investment on different types of government securities to maximize the

income. The ratio is computed by dividing investment on government securities by total outside investment.

$$\text{Investment on Government Securities to Total outside Investment Ratio} = \frac{\text{Investment on Government Securities}}{\text{Total outside Investment (TOI)}}$$

A high ratio indicates the efficiency of firms in overall investment on government securities and vice –versa.

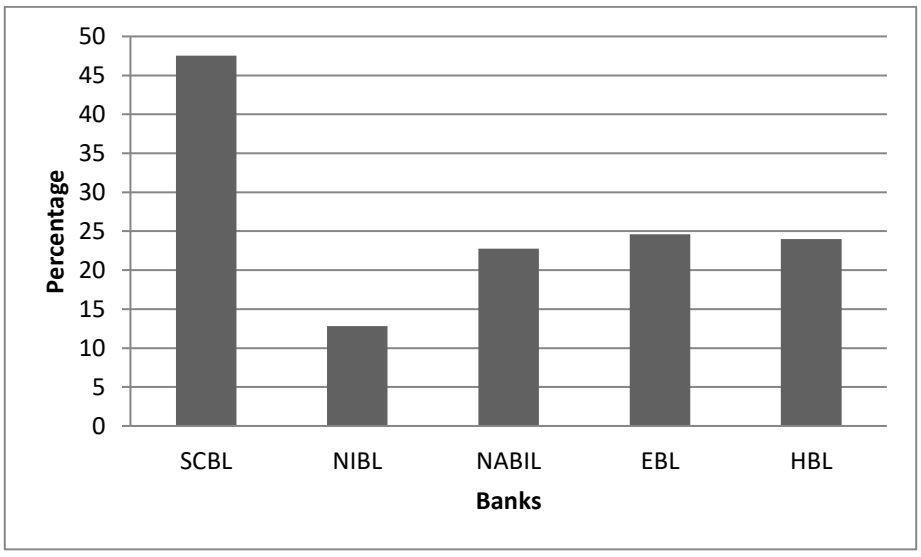
The table 4.46 shows Investment on Government Securities to Total outside Investment Ratio.

Table 4.46
Investment on Government Securities to Total outside Investment Ratio (%)

FY	SCBL	NIBL	NABIL	EBL	HBL
2000/01	45.89	11.40	25.68	21.74	18.33
2001/02	51.83	5.12	26.35	27.28	22.28
2002/03	54.09	5.35	26.03	24.37	23.53
2003/04	55.31	21.88	30.90	29.47	20.94
2004/05	46.90	16.11	17.96	21.56	28.85
2005/06	49.12	16.47	15.01	26.54	24.56
2006/07	40.25	15.82	22.90	25.58	26.54
2007/08	37.04	10.26	17.26	20.29	26.93
Mean	**47.55**	**12.80**	**22.76**	**24.60**	**24.00**
SD (σ_I)	**6.03**	**4.17**	**5.14**	**2.99**	**3.23**
C.V	**12.68**	**32.58**	**22.58**	**12.04**	**13.46**

Source: *Annual Reports of related banks from FY2000/01-2007/08, Annexes1(c), 1(f) &11*

Figure 4.9
Investment on Government Securities to Total outside Investment Ratio (%)



Among the five selected banks, SCBL has the highest investment (47.55%) on Government Securities to total outside investment. It means SCBL utilizes the highest percentage of total outside investment into government securities amounting to 47.55 %. Similarly, NIBL invests the lowest fraction (12.80%) of total outside investment into government securities.

The Coefficient of Variation of NIBL is the highest (32.58 %), which indicates that the ratios of NIBL are the least consistent.EBL has the lowest C.V (12.04%). It depicts the given ratios of EBL is the most consistent among five banks.

From the above analysis, it can be concluded that the mobilization of total outside investment into government securities of SCBL is the highest among other CBs that is proved by the highest ratios and lower C.V. Likewise, EBL and HBL have moderate position. However NIBL falls on the weakest position for the 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 for understanding the capacity of banks to mobilize 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.

$$\text{Investment on Loan and Advances to Total outside Investment Ratio} = \frac{\text{Investment on Loan and Advances}}{\text{Total outside Investment}}$$

A high ratio of loan and advances to total outside investment indicates better mobilization of depositors' fund on loan and advances and vice-versa. Nevertheless, it should be noted that too high ratio might be better from its liquidity point of view

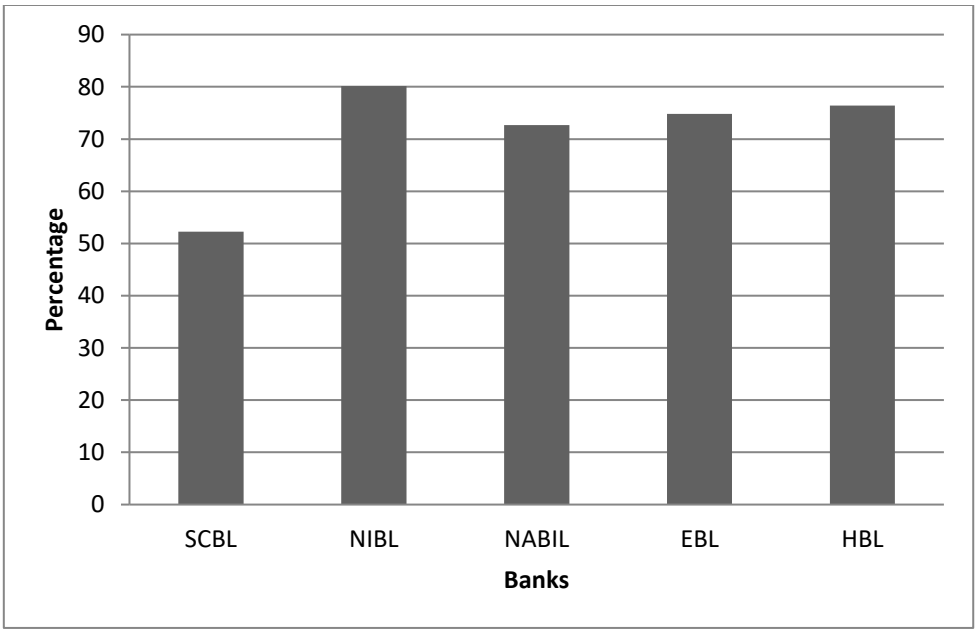
The table 4.47 shows that the ratio of investment on loan and advances to total outside investment.

Table 4.47
Investment on Loan and Advances to Total outside Investment Ratio (%)

FY	SCBL	NIBL	NABIL	EBL	HBL
2000/01	54.00	88.11	74.15	78.16	81.58
2001/02	48.06	57.40	61.62	69.98	82.27
2002/03	45.82	77.19	56.25	74.79	76.23
2003/04	44.60	77.96	68.91	70.32	78.88
2004/05	53.01	83.73	78.76	78.23	70.94
2005/06	50.77	83.41	84.30	73.30	75.25
2006/07	59.48	84.00	75.73	74.30	73.16
2007/08	62.44	89.54	81.53	79.28	72.74
Mean	**52.27**	**80.17**	**72.66**	**74.80**	**76.38**
SD (σ_I)	**5.91**	**9.49**	**9.14**	**3.14**	**3.91**
C.V	**11.31**	**11.84**	**12.58**	**4.20**	**5.12**

Source: *Annual Reports of related banks from FY2000/01-2007/08, Annexes 1(e),1(f)&12*

Figure 4.10
Investment on Loan and Advances to Total outside Investment Ratio (%)



The above table shows that the ratio of investment on loan and advances to total outside investment is not fixed. Among the five selected banks, the mean loan and advances to total outside investment of NIBL is the highest (80.17%). Similarly HBL stood at the second position taking 76.38 % and EBL stood at the third position (74.80%). Based on the average

rate, it can be inferred that NIBL, HBL and EBL possess better capacity to mobilize total outside investment into loan and advances.

The C.V of EBL is the lowest (4.20%). It indicates that EBL is consistent investing its total outside investment in loan and advances. However, NABIL is less consistent (12.58 %), because its C.V is the highest among five banks.

4.2.4 Investment on Share and Debenture to Total outside Investment Ratio

This ratio reflects the extent to which banks are successful to mobilize their total outside investment on purchase of share and debentures.

It is computed by dividing investment on share and debentures by total outside investment.

$$\text{Investment on Share and Debenture to Total Outside Investment Ratio} = \frac{\text{Investment on Share and Debenture}}{\text{Total Outside Investment}}$$

A higher ratio indicates more portions of share and debenture out of total outside investment and vice –versa.

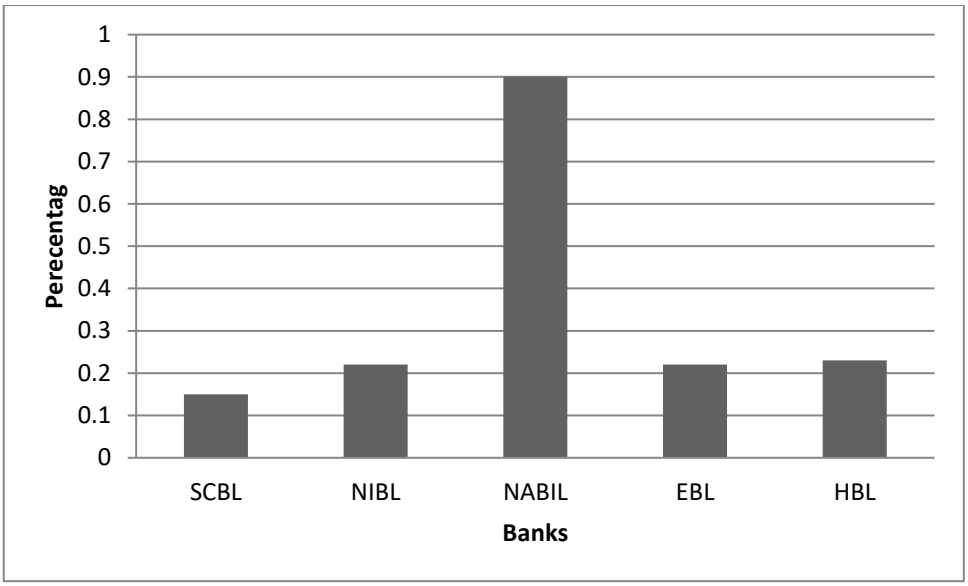
The table 4.48presents Investment on Share and Debenture to Total outside Investment Ratio

Table 4.48
Investment on Share and Debenture to Total outside Investment Ratio (%)

FY	SCBL	NIBL	NABIL	EBL	HBL
2000/01	0.11	0.48	0.17	0.10	0.10
2001/02	0.10	0.32	0.14	0.31	0.29
2002/03	0.09	0.19	0.16	0.26	0.24
2003/04	0.07	0.15	0.18	0.20	0.21
2004/05	0.09	0.14	3.27	0.20	0.21
2005/06	0.09	0.11	0.68	0.15	0.19
2006/07	0.25	0.17	1.37	0.10	0.30
2007/08	0.52	0.19	1.21	0.43	0.32
Mean	**0.15**	**0.22**	**0.90**	**0.22**	**0.23**
SD (σ_l)	**0.15**	**0.11**	**1.01**	**0.10**	**0.07**
C.V	**100**	**50**	**112.22**	**47.14**	**29.13**

Source: *Annual Reports of related banks from FY2000/01-2007/08, Annexes 1(d), 1(f) &13*

Figure 4.11
Investment on Share and Debenture to Total outside Investment Ratio (%)



The comparative table listed above reveals that investment on share and debenture to total outside investment has a fluctuating trend. It shows that banks invest a minor portion of its total outside investment on share and debenture of other companies. Among five commercial banks, NABIL has the highest ratio (0.90%) on share and debenture to total outside investment. This means among five banks NABIL utilized highest percentage of total outside investment on share and debenture. Similarly, SCBL has the lowest ratio (0.15 %) on share and debenture to total outside investment. This means SCBL invests lowest portion of total outside investment.

Likewise, the C.V of NABIL is the highest (112.22%). This shows that the ratio of the bank is less consistent and more variable. The lowest C.V (29.13%) of HBL shows that it has the least variability in the investment on share and debenture to total outside investment.

From the above analysis, it can be concluded that the CBs are less successful to mobilize their resources in the field of share and debentures of the other companies. They invested very nominal part of total outside investment on share and debentures of the other companies.

Lastly it can also be concluded that the investment on share and debenture to total outside investment ratio of the selected five CBs is pretty low.

Return to Total Assets Ratio

This ratio measures the profitability of banks in terms of total assets. The ratio is vital for measuring financial performance of the firms or the effective utilization of resources in

different sectors and yields a higher return for banks. This ratio is calculated by dividing net profit after tax (NPAT) by total assets, as stated below.

$$\text{Return to Total Assets Ratio} = \frac{\text{Net Profit After Tax (NPAT)}}{\text{Total Assets}}$$

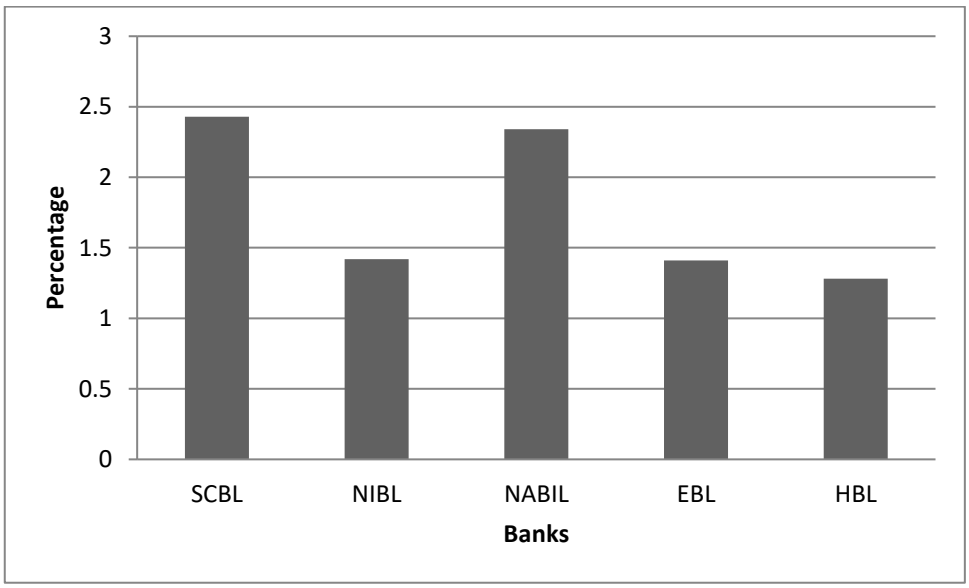
The returns on total assets of different CBs are presented below.

Table 4.49
Return to Total Assets (%)

Fiscal Year	SCBL	NIBL	NABIL	EBL	HBL
2000/01	2.23	1.10	1.59	1.34	1.42
2001/02	2.60	1.15	1.54	1.29	1.10
2002/03	2.41	1.30	2.51	1.17	0.91
2003/04	2.27	1.15	2.71	1.49	1.06
2004/05	2.46	1.42	3.02	1.44	1.07
2005/06	2.55	1.64	2.84	1.49	1.50
2006/07	2.42	1.82	2.47	1.38	1.43
2007/08	2.46	1.77	2.01	1.66	1.73
Mean	**2.43**	**1.42**	**2.34**	**1.41**	**1.28**
SD (σ_l)	**0.33**	**0.27**	**0.53**	**0.14**	**0.26**
C.V	**13.58**	**19.01**	**22.65**	**9.93**	**20.31**

Source: *Annual Reports of related banks from FY2000/01-2007/08, Annexes 1(i), 1(j) &14*

Figure 4.12
Return to Total Assets (%)



During the study period, NABIL earned the highest ratio (3.02%) in FY 2004/05. While examining the mean ratio, SCBL has the highest ratio (2.43%) and HBL has the lowest (1.28%) among five CBs.

The lowest C.V of EBL (9.93%) shows that the return on total assets of EBL is the most consistent among five banks. Similarly, the highest C.V in the ratios of NABIL (22.65 %) shows that the return on total assets is highly variable among five banks.

Finally, it can be concluded that SCBL is the best bank in relation to return on total assets ratio. This means SCBL utilized its resource more efficiently than other banks. Likewise the ratio of NABIL also reflects that it is also successful in utilization of its overall resources. The profitability position of HBL is the weakest in relation to the return on total assets among five CBs during the study period.

4.3 Trend analysis

Trend analysis is a statistical tool to highlight the previous trend and forecast the future. The purpose of the trend analysis in this section is to analyze the trend of investment on various assets particularly government securities loan and advances, share and debentures of the sample banks and forecast for next four years.

Here, the method of least square is used to calculate the trend value. In this method the trend line between the dependent variable y and the independent variable x (time) is 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 should determine the value of a and b.

To make the calculation easy the deviation of the independent variable is taken from the middle of the time period so that $\sum x=o$, then the values of a and b are calculated by:

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

4.3.1 Trend Analysis of Investment on Government Securities

In this section it has been endeavored to calculate the trend values of investment on government securities of sample banks. Efforts are directed towards analyzing the total investment on government securities of commercial banks for 8 years from 2001 to2008 and predicting it for the next four years till 2012.

The trend values of investment on government securities of commercial banks are presented in the following table.

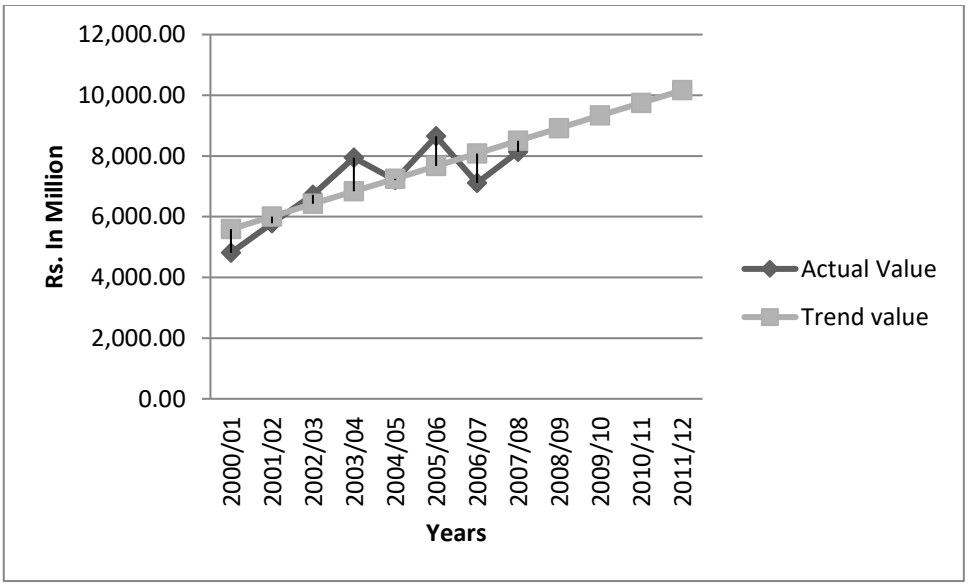
Table 4.50
Trend Analysis of Investment on Government Securities of SCBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Y_g=7044.96+415.76x
2001	-3.5	4,811.01	5589.80
2002	-2.5	5,784.72	6005.56
2003	-1.5	6,722.35	6421.32
2004	-0.5	7,948.22	6837.08
2005	0.5	7,203.07	7252.84
2006	1.5	8,644.86	7668.60
2007	2.5	7,107.94	8084.36
2008	3.5	8,137.52	8500.12
2009	4.5	-	8915.88
2010	5.5	-	9331.64
2011	6.5	-	9747.4
2012	7.5	-	10163.16

Source: *Annual reports of SCBL and Annex 15(a)*

Figure 4.13
Trend and Actual Value Investment on Government Securities of SCBL



The above table shows that ‘a’ (y intercept) and ‘b’ (slope of trend line) of investment on government securities of SCBL are Rs7044.96and Rs 415.76 m respectively. Hence the slope of trend line is positive; it shows that investment on government securities of SCBL is increasing by Rs415.76 m each year .From the above equation the predicted investment on government securities for the next 4 years would be Rs 8915.88,Rs9331.64, Rs9747.40 and Rs10163.16 million respectively. It has increased 1.82 times (10163/5589)

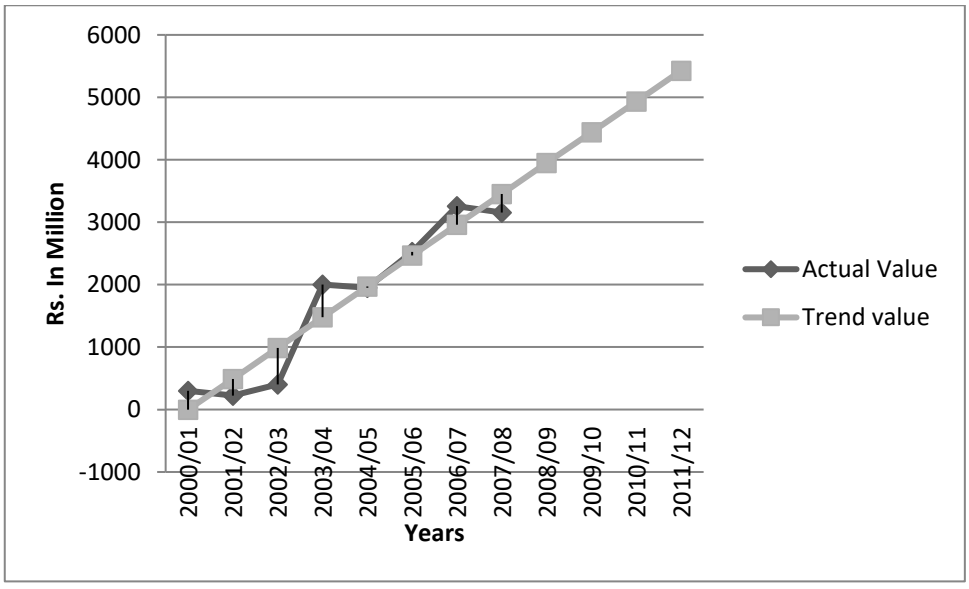
Table 4.51
Trend Analysis of Investment on Government Securities of NIBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Y_g=1725.96+493.56x
2001	-3.5	300.00	-1.5
2002	-2.5	224.40	492.06
2003	-1.5	400.00	985.62
2004	-0.5	2,001.10	1479.18
2005	0.5	1,948.50	1972.74
2006	1.5	2,522.30	2466.3
2007	2.5	3,256.40	2959.86
2008	3.5	3,155.00	3453.42
2009	4.5		3946.98
2010	5.5		4440.54
2011	6.5		4934.1
2012	7.5		5427.66

Source: *Annual reports of NIBL and Annex 15(b)*

Figure 4.14
Trend and Actual Value Investment on Government Securities of NIBL



From the above table, the positive slope of the trend line shows the investment trend of NIBL on government securities is increasing by Rs493.56m each year and expected to reach Rs5427.66m at the end of 2012. Therefore it is clear that investment on government securities of NIBL has increased 11.03 times (5427.66/492.06)

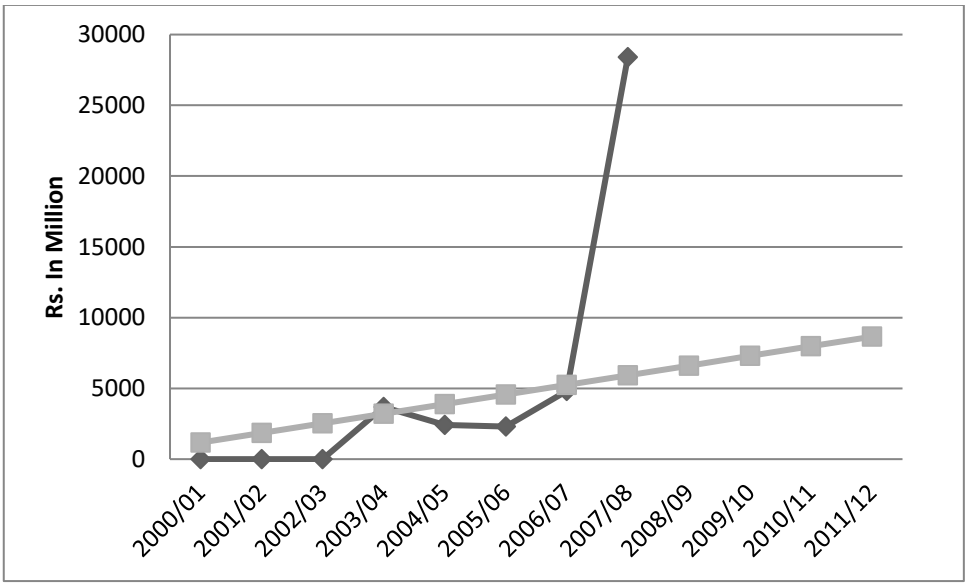
Table 4.52
Trend Analysis of Investment on Government Securities of NABIL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Y_g=3,549.9+680x
2001	-3.5	2,76.80	1169.9
2002	-2.5	4,12.29	1849.9
2003	-1.5	3,66.57	2529.9
2004	-0.5	3,672.63	3209.9
2005	0.5	2,418.43	3889.9
2006	1.5	2,301.46	4569.9
2007	2.5	4,808.35	5249.9
2008	3.5	28,399.58	5929.9
2009	4.5		6606.9
2010	5.5		7289.9
2011	6.5		7969.9
2012	7.5		8649.9

Source: *Annual reports of NABIL and Annex 15(c)*

Figure 4.15
Trend and Actual Value Investment on Government Securities of NABIL



From the above table, the positive slope of the trend line shows the investment trend of NABIL on government securities is increasing by Rs3549.9 m each year and expected to reach Rs 8649.9 m at the end of 2012. Therefore it is clear that investment on government securities of NABIL has increased 7.39 times (8649.9/1169.9)

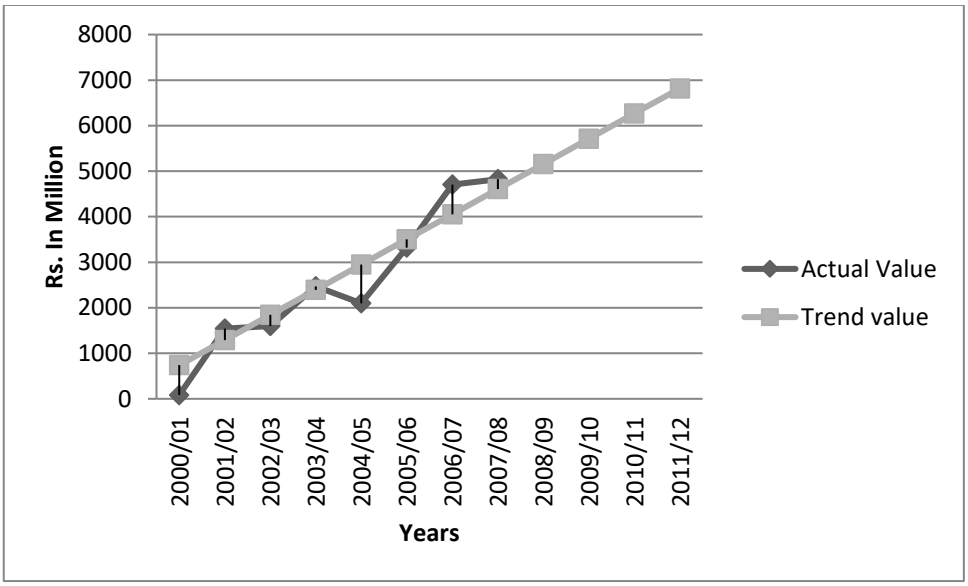
Table 4.53
Trend Analysis of Investment on Government Securities of EBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Y_g=2672.08+552.41x
2001	-3.5	83.00	738.65
2002	-2.5	1,538.90	1291.06
2003	-1.5	1,599.35	1843.47
2004	-0.5	2,466.43	2395.88
2005	0.5	2,100.29	2948.29
2006	1.5	3,322.44	3500.70
2007	2.5	4,704.63	4053.11
2008	3.5	4,821.61	4605.52
2009	4.5		5157.93
2010	5.5		5710.34
2011	6.5		6262.75
2012	7.5		6815.16

Source: *Annual reports of EBL and Annex 15(d)*

Figure 4.16
Trend and Actual Value Investment on Government Securities of EBL



From the above table, the positive slope of the trend line shows the investment trend of EBL on government securities is increasing by Rs552.41m each year and expected to reach Rs 6815.16 m at the end of 2012. Therefore it is clear that investment on government securities of EBL has increased 9.23 times (6815.16/738.65)

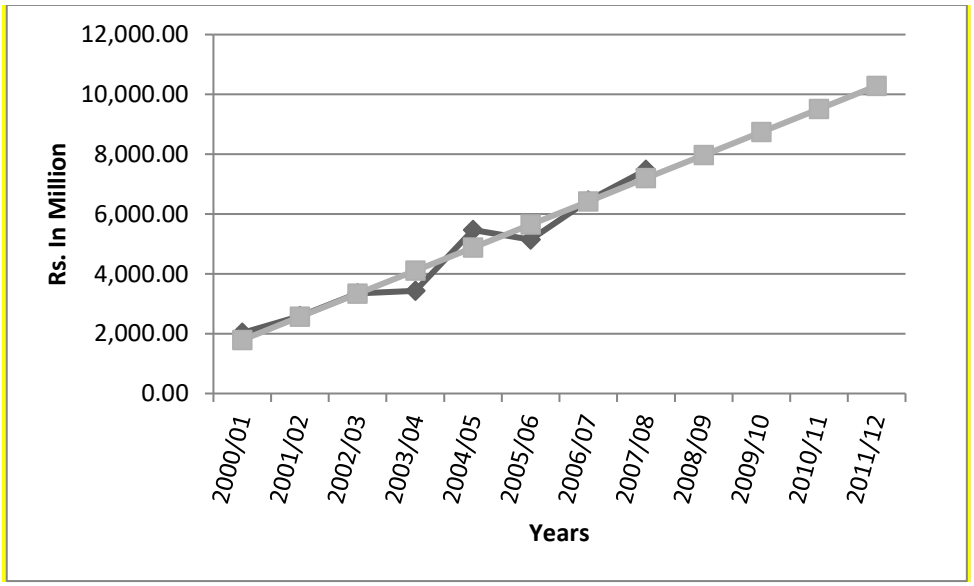
Table 4.54
Trend Analysis of Investment on Government Securities of HBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Y_g=4491.63+772.45x
2001	-3.5	2,025.25	1788.06
2002	-2.5	2,588.56	2560.51
2003	-1.5	3,347.10	3332.96
2004	-0.5	3,431.73	4105.41
2005	0.5	5,469.73	4877.86
2006	1.5	5,144.31	5650.31
2007	2.5	6,454.87	6422.76
2008	3.5	7,471. 67	7195.21
2009	4.5		7967.66
2010	5.5		8740.11
2011	6.5		9512.56
2012	7.5		10285.01

Source: *Annual reports of HBL and Annex 15(e)*

Figure 4.17
Trend and Actual Value Investment on Government Securities of HBL



From the above table, the positive slope of the trend line shows the investment trend of HBL government securities is increasing by Rs772.45m each year and expected to reach Rs 10285.01 m at the end of 2012. Therefore it is clear that investment on government securities of HBL has increased 5.75 times (10285.01/1788.06)

From the above trend analysis, finally it can be concluded that investment on government securities of all commercial banks: SCBL, NIBL, NABIL EBL, and HBL is increasing. In

comparison, increasing ratio on government securities of NIBL is the highest among sample banks 11.03 times of its investment on government securities during the period.

4.3.2Trend Analysis of Investment on Loan and Advances

In this section it has been endeavored to calculate the trend values of investment on loan and advances of sample banks. Efforts are directed towards analyzing the total investment on loan and advances of commercial banks for 8 years from 2001 to2008 and predicting it for the next four years till 2012.

The trend values of investment on loan and advances of commercial banks are presented in the following tables.

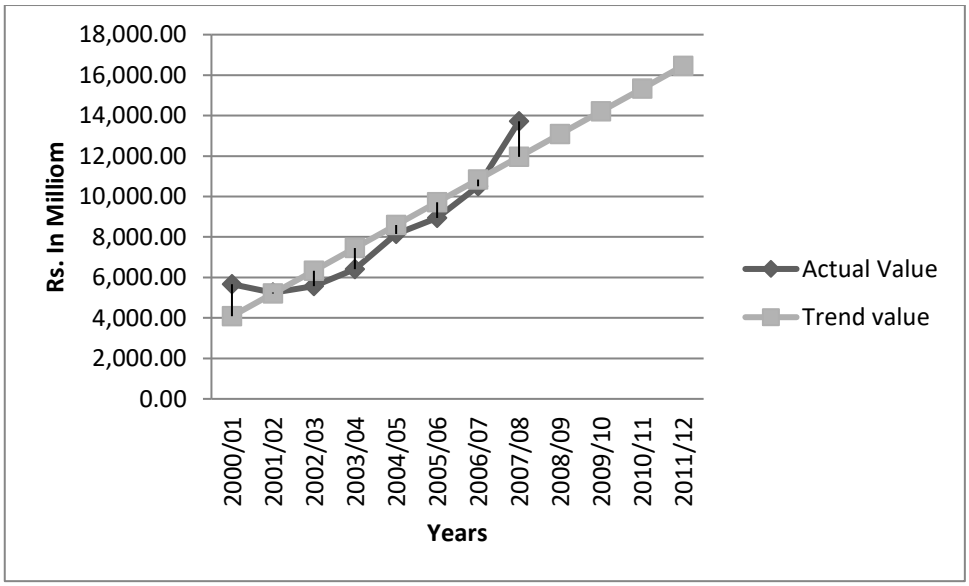
Table 4.55
Trend Analysis of Investment on Loan and Advances of SCBL

(Rs in millions)

Year	**X=(t-2004.5)**	**Actual Value**	**Trend value Y_I=8024.17+1124.9x**
2001	-3.5	5,660.80	4087.02
2002	-2.5	5,248.36	5211.92
2003	-1.5	5,574.06	6336.82
2004	-0.5	6,410.24	7461.72
2005	0.5	8,143.21	8586.62
2006	1.5	8,935.42	9711.52
2007	2.5	10,502.64	10836.42
2008	3.5	13,718.60	11961.32
2009	4.5		13086.22
2010	5.5		14211.12
2011	6.5		15336.02
2012	7.5		16460.92

Source: *Annual reports of SCBL and Annex 15(f)*

Figure 4.18
Trend and Actual Value Investment on Loan and Advances of SCBL



The above table shows that 'a' (y intercept) and 'b' (slope of trend line) of investment on loan and advances of SCBL are Rs 8024.17 m and Rs1124.9 m respectively. Hence the slope of trend line is positive; it shows that investment on loan and advances of SCBL is increasing by Rs4087.02 m each year .From the above equation the predicted investment on loan and advances for the next 4 years would be Rs13086.22, Rs14211.12 Rs15336.0, and Rs16460.92 respectively. It has increased 4.03 times (16460.92/4087.02)

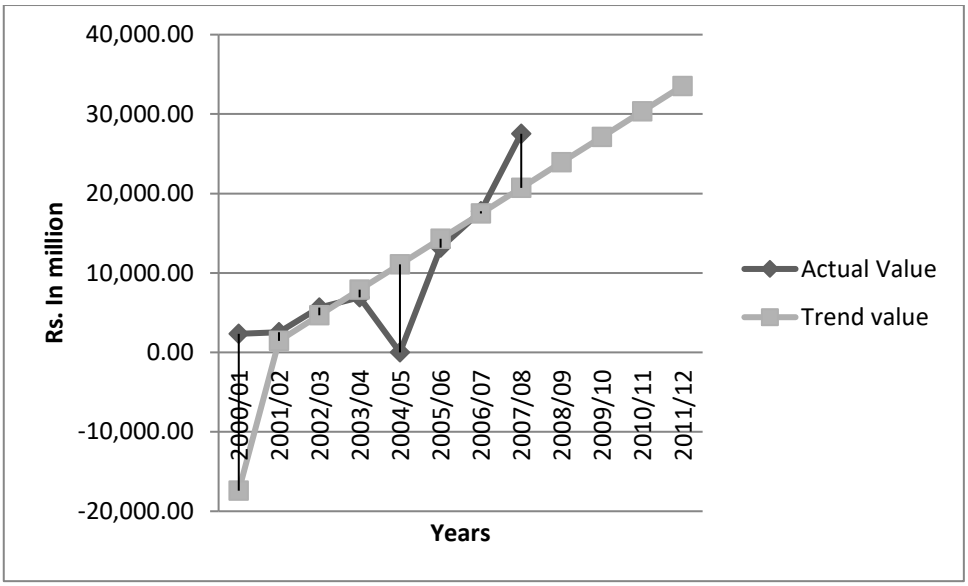
Table 4.56
Trend Analysis of Investment on Loan and Advances of NIBL

(Rs in millions)

Year	**X=(t-2004.5)**	**Actual Value**	**Trend value Y_t=9484.92+3207.69x**
2001	-3.5	2,318.91	-17412.00
2002	-2.5	2,518.06	1465.70
2003	-1.5	5,648.03	4673.39
2004	-0.5	6,917.80	7881.08
2005	0.5	10,45.16	11088.77
2006	1.5	13,178.15	14296.46
2007	2.5	17,769.10	17504.15
2008	3.5	27,529.31	20711.84
2009	4.5		23919.53
2010	5.5		27127.22
2011	6.5		30334.91
2012	7.5		33542.60

Source: *Annual reports of NIBL and Annex 15(g)*

Figure 4.19
Trend and Actual Value Investment on loan and advances of NIBL



From the above table, the positive slope of the trend line shows the investment trend of NIBL on loan and advances is increasing by Rs3207.69 m each year and expected to reach Rs33542.6 m at the end of 2012. Therefore it is clear that investment on loan and advances of NIBL has increased 19.26 times (33542.60/1742).

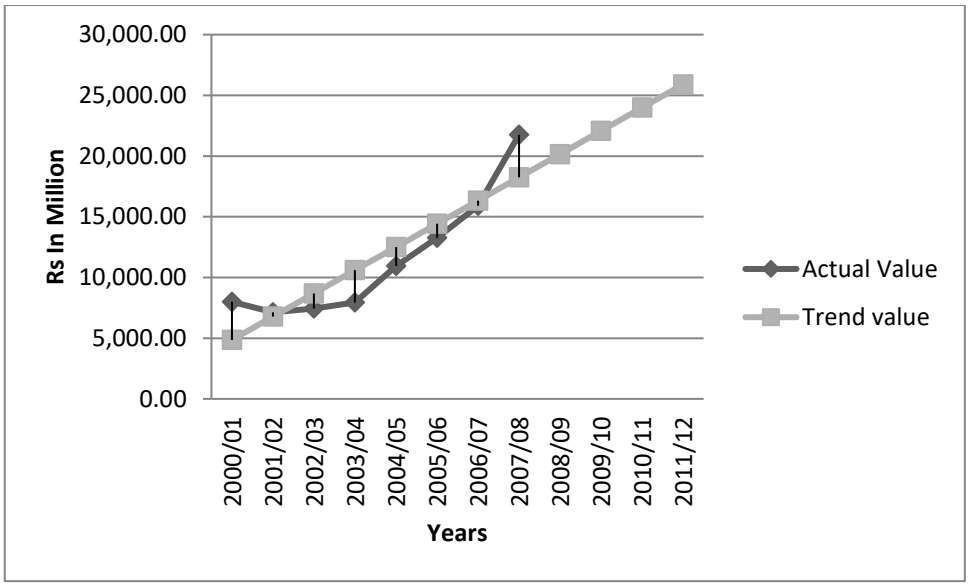
Table 4.57
Trend Analysis of Investment on Loan and Advances of NABIL

(Rs in millions)

Year	**X=(t-2004.5)**	**Actual Value**	**Trend value Y_I=11553.11+1912.70x**
2001	-3.5	7,993.28	4858.66
2002	-2.5	7,135.54	6771.36
2003	-1.5	7,454.26	8684.06
2004	-0.5	7,953.76	10596.76
2005	0.5	10,946.74	12509.46
2006	1.5	13,278.78	14422.16
2007	2.5	15,903.02	16334.86
2008	3.5	21,759.46	18247.56
2009	4.5		20160.26
2010	5.5		22072.96
2011	6.5		23985.66
2012	7.5		25898.36

*Source***:** *Annual reports of NABIL and Annex 15(h)*

Figure 4.20
Trend and Actual Value Investment on Loan and Advances of NABIL



From the above table, the positive slope of the trend line shows the investment trend of NABIL on loan and advances is increasing Rs1912.70 m each year and expected to reach Rs 25898.36 m at the end of 2012. Therefore it is clear that investment on loan and advances of NABIL has increased 5.53 times (25898.36/4858.66).

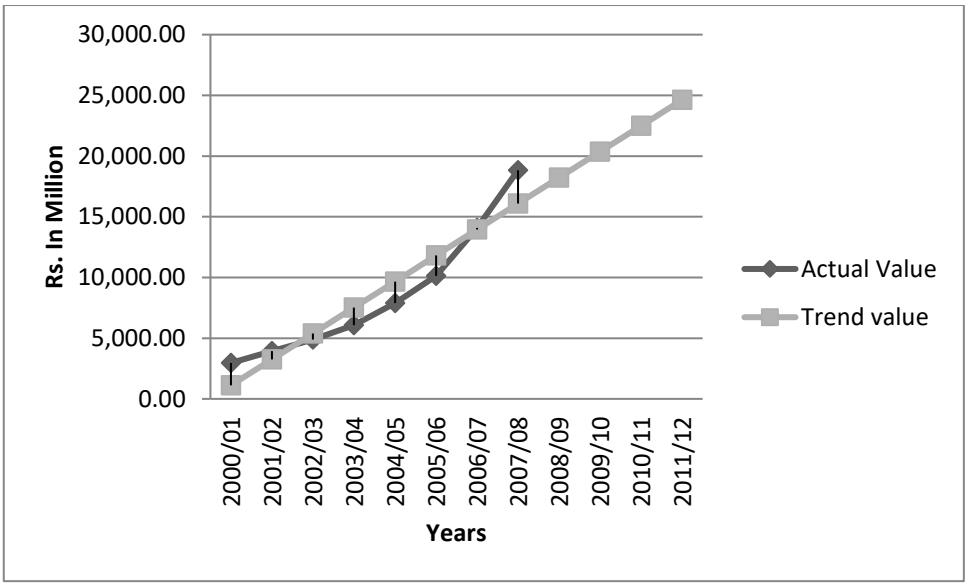
Table 4.58
Trend Analysis of Investment on Loan and Advances of EBL

(Rs in millions)

Year	**X=(t-2004.5)**	**Actual Value**	**Trend value Y_I=8599.63 +2137.13 x**
2001	-3.5	2,959.45	1119.68
2002	-2.5	3,923.60	3256.81
2003	-1.5	4,882.79	5393.94
2004	-0.5	6,075.84	7531.07
2005	0.5	7,900.02	9668.20
2006	1.5	10,136.25	11805.33
2007	2.5	14,082.69	13942.46
2008	3.5	18,836.43	16079.59
2009	4.5		18216.72
2010	5.5		20353.85
2011	6.5		22490.98
2012	7.5		24628.11

Source: *Annual reports of EBL and Annex 15(i)*

Figure 4.21
Trend and Actual Value Investment on loan and advances of EBL



From the above table, the positive slope of the trend line shows the investment trend of EBL on loan and advances is increasing by Rs2137.13 m each year and expected to reach Rs 24628.11 m at the end of 2012. Therefore it is clear that investment on loan and advances of EBL has increased 22 times (24628.11/1119.68)

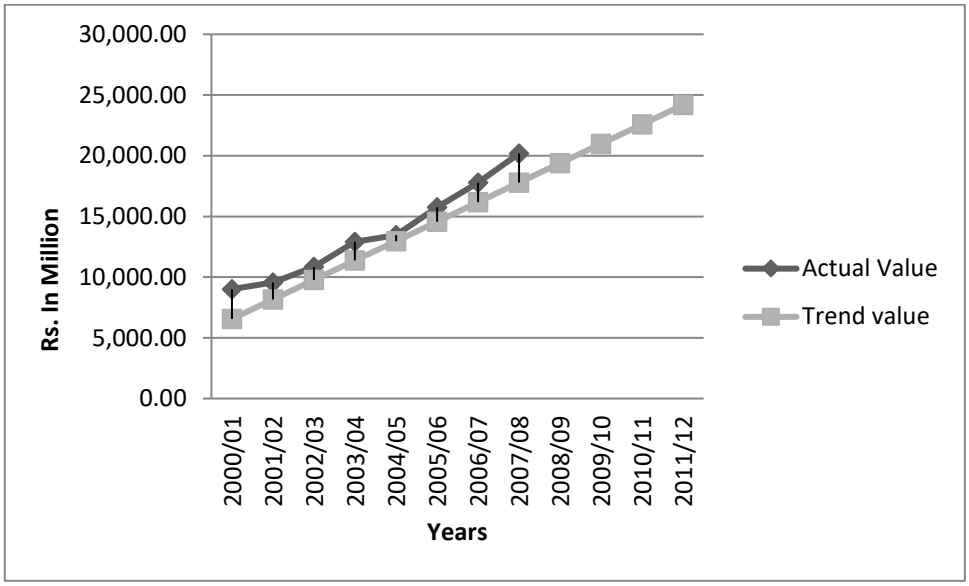
Table 4.59
Trend Analysis of Investment on Loan and Advances of HBL

(Rs in millions)

Year	**X=(t-2004.5)**	**Actual Value**	**Trend value Y_t=12169.27 + 1602.61 x**
2001	-3.5	9,015.35	6560.14
2002	-2.5	9,557.14	8162.75
2003	-1.5	10,844.60	9765.36
2004	-0.5	12,919.63	11367.97
2005	0.5	13,451.17	12970.58
2006	1.5	15,761.98	14573.19
2007	2.5	17,793.72	16175.80
2008	3.5	20,180.00	17778.41
2009	4.5		19381.02
2010	5.5		20983.63
2011	6.5		22586.24
2012	7.5		24188.86

Source: *Annual reports of HBL and Annex 15(j)*

Figure 4.22
Trend and Actual Value Investment on Loan and Advances of HBL



From the above table, the positive slope of the trend line shows the investment trend of HBL loan and advances is increasing by Rs 1602.61 m each year and expected to reach Rs 24188.86 m at the end of 2012. Therefore it is clear that investment on loan and advances of HBL has increased 3.69 times (24188.86/6560.14)

From the above trend analysis, finally it can be concluded that investment on loan and advances of all the sample banks: SCBL, NIBL, NABIL, EBL, HBL is increasing. In comparison, increasing ratio on loan and advances of NIBL is the highest among sample banks 19.26 times of its investment on loan and advances during the period.EBL occupied the second position in the investment on loan and advances during the period, while HBL has occupied the lowest position in the investment on loan and advances. In other words, it has increased only 3.69 times of its investment on loan and advances during the period. It conveys that HBL has invested a low portion of its total investment on loan and advances.

4.3.3Trend Analysis of Investment on Share and Debenture

In this section it has been endeavored to calculate the trend values of investment on share and debenture of sample banks. Efforts are directed towards analyzing the total investment on share and debenture of commercial banks for 8 years from 2001 to2008 and predicting it for the next four years till 2012.

The trend values of investment on share and debenture of commercial banks are presented in the following tables.

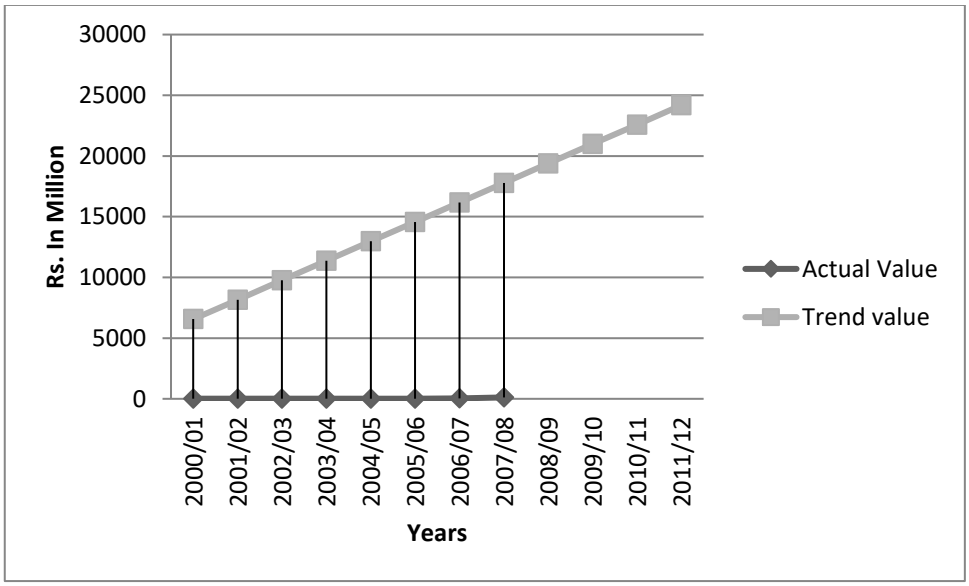
Table 4.60
Trend Analysis of Investment on Share and Debenture of SCBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Ys=12169.27 + 1602.61 x
2001	-3.5	11.20	6560.12
2002	-2.5	11.20	8162.75
2003	-1.5	11.20	9765.36
2004	-0.5	11.20	11367.97
2005	0.5	13.35	12970.58
2006	1.5	15.43	14573.19
2007	2.5	44.94	16175.80
2008	3.5	114.54	17778.41
2009	4.5		19381.02
2010	5.5		20983.63
2011	6.5		22586.24
2012	7.5		24188.85

Source: *Annual reports of SCBL and Annex 15(k)*

Figure 4.23
Trend and Actual Value Investment on Share and Debenture of SCBL



The above table shows that 'a' (y intercept) and 'b' (slope of trend line) of investment on share and debenture of SCBL are Rs 12169.27 m and Rs 1602.61 m respectively. Hence the slope of trend line is positive; it shows that investment on share and debenture of SCBL is increasing by Rs 1602.61 m each year .From the above equation the predicted investment on share and debenture for the next 4 years would be Rs19381.02, Rs20983.63, Rs22586.24, and Rs respectively. It has increased 3.18 times (24188.85/6560.14)

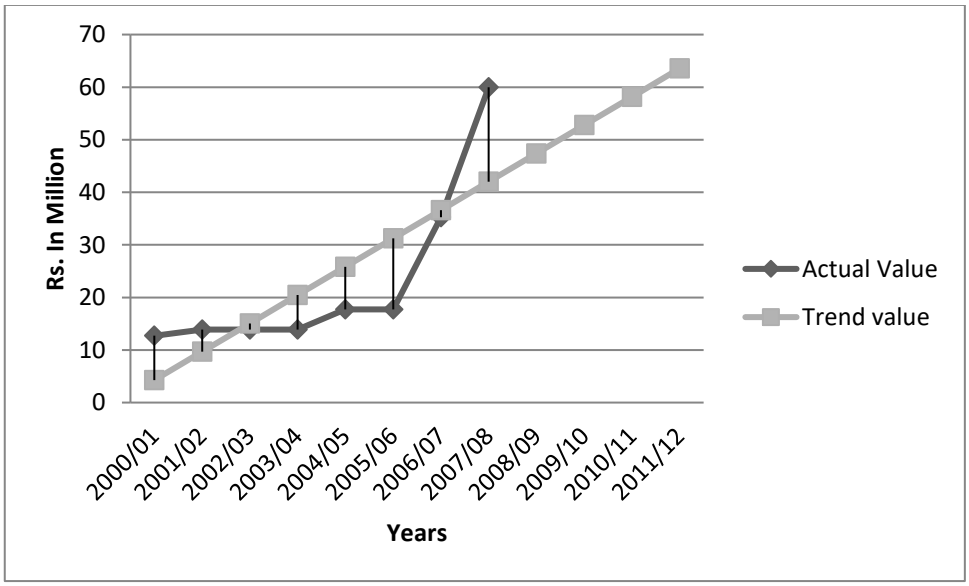
Table 4.61
Trend Analysis of Investment on Share and Debenture of NIBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Ys=23.13+5.39x
2001	-3.5	12.70	4.27
2002	-2.5	13.90	9.66
2003	-1.5	13.90	15.05
2004	-0.5	13.90	20.44
2005	0.5	17.74	25.83
2006	1.5	17.74	31.22
2007	2.5	35.25	36.61
2008	3.5	59.95	42.00
2009	4.5		47.39
2010	5.5		52.78
2011	6.5		58.17
2012	7.5		63.56

Source: *Annual reports of SCBL and Annex 15(l)*

Figure 4.24
Trend and Actual Value Investment on Share and Debenture of NIBL



From the above table, the positive slope of trend line shows that investment on share and debenture of NIBL is increasing by Rs 5.39 m each year .From the above equation the predicted investment on share and debenture for the next 4 years would be Rs47.36, Rs52.78, Rs58.17 and Rs63.56 respectively. It has increased 14.89 times (63.56/4.27)

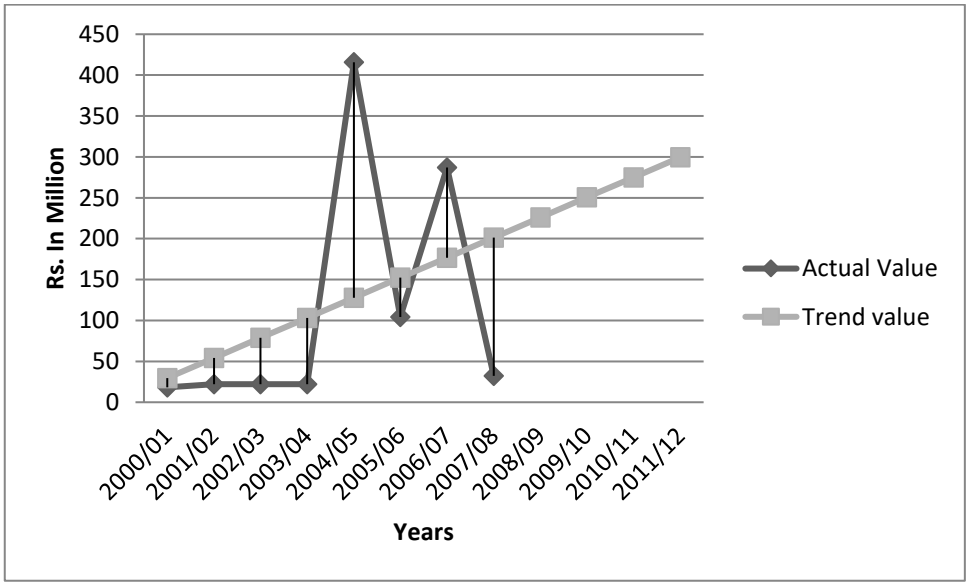
Table 4.62
Trend Analysis of Investment on Share and Debenture of NABIL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Ys=115.5+24.54x
2001	-3.5	18.22	29.61
2002	-2.5	22.22	54.15
2003	-1.5	22.22	78.69
2004	-0.5	22.22	103.23
2005	0.5	415.72	127.77
2006	1.5	104.19	152.31
2007	2.5	286.96	176.85
2008	3.5	32.24	201.39
2009	4.5		225.93
2010	5.5		250.47
2011	6.5		275.01
2012	7.5		299.55

Source: *Annual reports of NABIL and Annex 15(m)*

Figure 4.25
Trend and Actual Value Investment on Share and Debenture of NABIL



From the above table, the positive slope of trend line shows that investment on share and debenture of NABIL is increasing by Rs 24.54m each year .From the above equation the predicted investment on share and debenture for the next 4 years would be Rs225.93, Rs250.47, Rs275.01 and Rs299.55 respectively. It has increased 10.17 times (299.55/29.61)

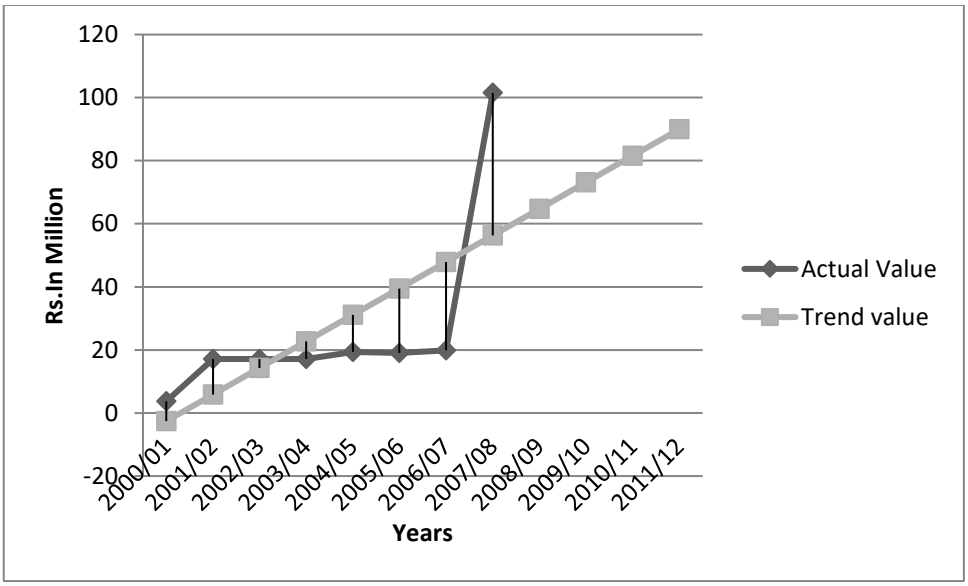
Table 4.63
Trend Analysis of Investment on Share and Debenture of EBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Ys=26.86+8.41x
2001	-3.5	3.70	-2.58
2002	-2.5	17.11	5.84
2003	-1.5	17.11	14.25
2004	-0.5	17.11	22.66
2005	0.5	19.39	31.07
2006	1.5	19.08	39.48
2007	2.5	19.89	47.89
2008	3.5	101.51	56.30
2009	4.5		64.71
2010	5.5		73.12
2011	6.5		81.53
2012	7.5		89.94

Source: *Annual reports of EBL and Annex 15(n)*

Figure 4.26
Trend and Actual Value Investment on Share and Debenture of EBL



From the above table, the positive slope of trend line shows that investment on share and debenture of EBL is increasing by Rs 8.41m each year. From the above equation the predicted investment on share and debenture for the next 4 years would be Rs 64.71, Rs 73.12, Rs81.53, and Rs89.94 respectively. It has increased 34.86 times (89.94/2.58)

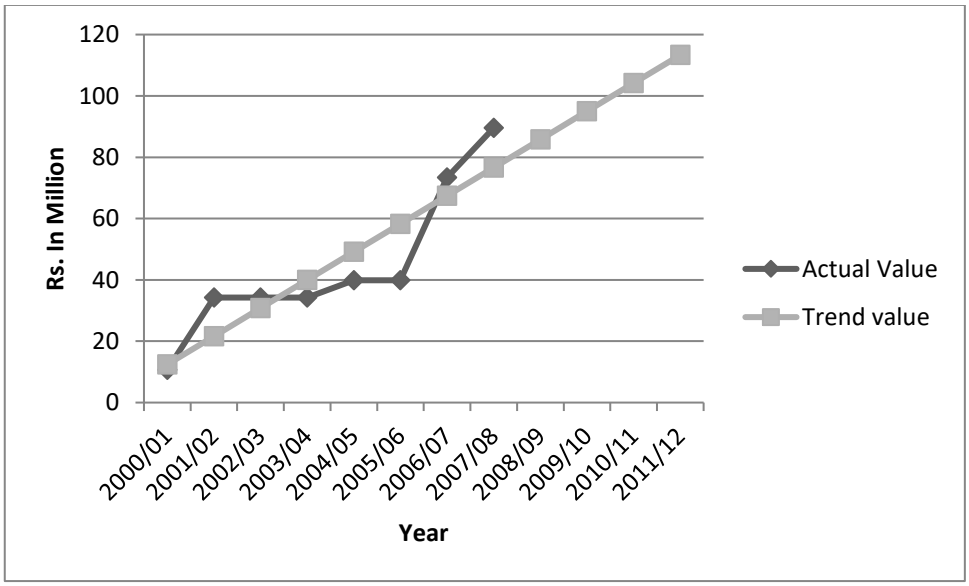
Table 4.64
Trend Analysis of Investment on Share and Debenture of HBL

(Rs in millions)

Year	X=(t-2004.5)	Actual Value	Trend value Ys=44.54+9.17x
2001	-3.5	10.69	12.445
2002	-2.5	34.27	21.615
2003	-1.5	34.27	30.785
2004	-0.5	34.27	39.955
2005	0.5	39.91	49.125
2006	1.5	39.91	58.295
2007	2.5	73.42	67.465
2008	3.5	89.56	76.635
2009	4.5		85.805
2010	5.5		94.975
2011	6.5		104.145
2012	7.5		113.315

Source: *Annual reports of HBL and Annex 15(o)*

Figure 4.27
Trend and Actual Value Investment on Share and Debenture of HBL



From the above table and the figure, the positive slope of trend line shows that investment on share and debenture of HBL is increasing by Rs 9.17 m each year .From the above equation the predicted investment on share and debenture for the next 4 years would be Rs85.81, Rs94.98, Rs104.15 and Rs113.32 respectively. It has increased 9.1 times (113.32/12.45)

From the above trend analysis, finally it can be concluded that the investment on share and debenture of all five sample banks is increasing. In comparison, increasing ratio in share and debenture of EBL is the highest among the sample banks, which means it has increased 34.86 times of its investment on share and debenture during the period. NIBL occupied second position in share and debenture, while SCBL has occupied the lowest position in share and debenture. In other words, it has increased only 3.18 times of its investment on share and debenture during the period.

On analyzing sample banks, the investment of SCBL on share and debenture is slight increasing trend (3.18 times).But its increasing ratio on share and debenture is lower (3.18 times) than that of loan and advances (4.03 times),but higher than that of government securities (1.82 times). It indicates that investment on share and debenture of SCBL is increasing less rapidly than that on loan and advances, but more rapidly than government securities.

Similarly, on analyzing NIBL the increasing ratio in loan and advances (19.26 times) is the highest among sample banks and also in terms of government securities (11.03 times) and but its share and debenture is 14.89 times. It portrays that investment on loan and advances of NIBL is increasing more rapidly than that on government securities or share and debenture.

On analyzing NABIL the investment on share and debenture is slightly increasing (10.17 times) but more than that on government securities (7.59 times) or loan and advances (5.53). It depicts that the investment on share and debenture of NABIL is increasing more rapidly than that on loan and advances or government securities.

In the similar way, on analyzing EBL, the increasing ratio in share and debenture (34.86 times) is the highest among the sample banks It is also higher than loan and advances (22 times) or government securities (9.23 times).It spells out that the investment on share and debenture of EBL is increasing more rapidly than that on loan and advances or government securities.

Likewise, on analyzing HBL the increasing ratio on share and debenture (9.1 times) is higher than that on government securities (6.36 times) or loan and advances (3.69 times).It indicates that the investment on share and debenture is increasing more rapidly than that on government securities or loan and advances.

4.4 Major Findings of the Study

Based on the analysis of various data remarkable findings are gathered. The major findings are presented below:

4.4.1 Findings from Risk and Return Analysis

Major findings from risk and return on various investment assets in which commercial banks invest their funds and portfolio made from such assets can be summarized as follow:

Table 4.65

Major Findings from Risk and Return Analysis of Different Commercial Banks

(in percentage)

S.No	Assets		SCBL	NIBL	NABIL	EBL	HBL
1	Government Securities	Return (R_g)	4.49	3.03	4.64	3.10	3.33
		Risk (σ_g)	0.3064	0.9122	1.0969	0.5671	0.6914
2	Loan and Advances	Return (R_l)	8.26	8.27	10.59	8.77	7.99
		Risk (σ_l)	1.6683	1.3814	1.7469	1.6915	0.9022
3	Share and Debenture	Return (R_s)	14.97	14.97	14.97	14.97	14.97
		Risk (σ_s)	34.85	34.85	34.85	34.85	34.85
4	Investment Portfolio	Return (R_p)	6.42	7.56	9.25	7.44	6.86
		Risk (σ_p)	1.043	1.28	1.153	0.852	-0.567

4.4.2 Findings from Analysis of Ratios

From the analysis of ratios of different commercial banks, major findings can be summarized as follows:

Table 4.66

Major Findings from Analysis of Ratios of Different Commercial Banks

(in percentage)

S.No	Ratios		SCBL	NIBL	NABIL	EBL	HBL
1	Total Investment to Total Deposit	Mean	54.52	31.09	39.84	25.86	40.34
		SD	4.39	8.98	8.1	4.57	8.28
		CV	8.05	28.88	20.33	17.67	20.53
2	Government securities to Total outside Investment	Mean	47.55	12.80	22.76	24.60	24.00
		SD	6.03	4.17	5.14	2.99	3.23
		CV	12.68	32.58	22.58	12.04	13.46
3	Loan and Advances to Total outside Investment	Mean	52.27	80.17	72.66	74.80	76.38
		SD	5.91	9.49	9.14	3.14	3.91
		CV	11.31	11.84	12.58	4.20	5.12
4	Share and debenture to Total outside Investment	Mean	0.15	0.22	0.90	0.22	0.23
		SD	0.15	0.11	1.01	0.10	0.07
		CV	100	50	112.22	47.14	29.13
5	Return on Total Asset	Mean	2.43	1.42	2.34	1.41	1.28
		SD	0.33	0.27	0.53	0.14	0.26
		CV	13.58	19.01	22.65	9.93	20.31

4.4.3 Findings from Analysis of Trend

According to the objective of the study, the trend analysis of various assets related with the investment has been calculated. The slope trend (increasing or decreasing value of the trend) has been presented below.

Table 4.67
Major Findings from Trend Analysis of Ratios of Different Commercial Banks

S.No	Assets		SCBL	NIBL	NABIL	EBL	HBL
1	Investment on government securities	Increasing / Decreasing per year	415.76	493.56	3549.9	552.41	772.45
		Increasing / Decreasing Ratio	1.82	11.03	7.39	9.23	5.75
2	Investment on Loan and Advances	Increasing /Decreasing per year	1124.9	3207.69	1912.7	2137.13	1602.61
		Increasing / Decreasing Ratio	4.03	19.26	5.53	22	3.69
3	Investment on Share and Debenture	Increasing / Decreasing per year	1602.61	5.39	24.54	8.41	9.17
		Increasing / Decreasing Ratio	3.18	14.89	10.17	34.86	3.18

CHAPTER -5

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter summarizes the entire study, draws the conclusions from the study and presents the recommendation for further improvement. Summary incorporates a brief description of the whole study. Conclusions are drawn on the analysis of relevant data using various financial and statistical tools that presents strength, weakness, opportunities and threats of the commercial banks. Recommendations are presented in terms of suggestions prepared based on findings and conclusion.

5.1 Summary

Commercial banks are the major financial institutions which occupy very important place in the framework of every economy. They play a vital role in the capital formation, proper utilization of the collected resources and provide a host of banking services. Commercial banks collect money from the public providing sound interest and subsequently gain profit through lending it in business organization, industry, agriculture sectors etc. Hence it can be stated the main task of commercial banks is to mobilize idle resources in productive areas by collecting it from scattered sources for generation of the profit. Bank plays the intermediary role between saving and investment caters the credit needs of the customers and the investment requirements of the savers. Thus it is evident that the efficient and stable banking systems are essential for an orderly economic growth.

Successful formulation and effective implementation of the investment policy is the prime requisite for refined performance of the commercial banks. In the similar manner, a good investment policy has a positive impact on the economic development of the country and vice-versa. Bank should attract its customers through implementing the best or competitive investment policy. It helps increase the quality of the banking service as well as quality deposit and investment in various sectors. Investment management of a bank is guided by the investment policy adopted by the bank. The bank investment policy fosters the investment operation of the bank to be efficient and profitable by minimizing the interest risk. Thus the commercial bank should mobilize its deposits and the other funds to profitable, secured, stable and marketable sectors to earn a good profit.

Investment portfolio is the collection of securities. It simply represents the practice among investors having their funds on more than one asset. Portfolio theory deals with the selection of optimal portfolio. In other words, portfolio provides the highest possible return for any specified return. The income or profit of the bank entirely depends upon the investment decision. Considering the fact, the bank should never invest its funds in individual security alone, which is subject to massive depreciation and fluctuations. Banks should accept those types of securities which are commercial, marketable, stable, liquid and profitable. A bank

should not lay all its eggs in one basket, which means, to minimize risk a bank must diversify its investment on different sectors and different securities.

To achieve 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 launched. Five commercial banks are taken as reference for analysis. During the research work, a brief review of literature has been conducted. In this connection various textbooks and published journals have been reviewed. The required data for the study were collected from the concerned banks, NRB, NEPSE and SEBO. To meet the need and the objectives, the secondary data were complied, processed, and tabulated for the better presentation.

With respect to risk and return analysis, return on the government securities is low but it has lower risk .In the similar manner, the loan and advances give more return than the government securities, but it has also higher risk than government securities .Likewise, share and debentures are also high risky securities which provide higher return.

Regarding ratio analysis, different ratios related with investment portfolio have been used. The total investment to total deposit ratio of SCBL is found to be the highest in comparison to the other four sample commercial banks. It absorbed a major portion of its investment on government securities. Hence its profitability position is lower than NABIL. The analysis indicates that commercial banks invested very nominal percentage of total outside investment on share and debenture of the other companies.

With regards to trend analysis, investment on various assets, like government securities, loan and advances and share and debenture are in increasing trend. The table 4.67 displays that the investment on government securities of five sample banks increased by 1.82 to 11.03 times, while the investment on loan and advances of those banks augmented by 3.69 to 19.26 times. Likewise, the investment on share and debenture increased by3.18 to 34.86 times.

Nevertheless, increasing ratio of share and debenture is greater than increasing ratio of loan and advances. Furthermore, increasing ratio of loan and advances is more than the increasing ratio of government securities.

5.2 Conclusion

Regarding the 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 government securities. It is proved from the above conducted analysis. The standard deviation of the government securities is the lower than standard deviation of other securities.

The risk and return and the standard deviation both are higher than other assets. Hence it is clear from the analysis that the investment on share and debenture is highly risky than the other assets.

Portfolio return is slightly lower than the average return from loan and advances, and share and debenture, but higher than that of government securities. Likewise, the risk on investment portfolio is less than that of risk on share and debenture and loan and advances, but is higher than that of risk on government securities.

5.2.2 Ratio Analysis

All sample banks accorded first priority for investing their resources on loan and advances. Likewise, the sample banks offered second priority to government securities and the least priority to share and debenture.

The sample banks are hesitant to mobilize their resources on share and debenture of the other companies. They invest quite a nominal percentage of totals outside investment on share and debenture.

The return on total asset ratio indicates NABIL has utilized its resources efficiently among the selected banks. The profitability status of SCBL, NIBL, and EBL is moderate, while HBL is the weakest in profitability position during the study period.

5.2.3 Trend Analysis

Investment on Share and debenture is increasing rapidly than the investment on loan and advances Likewise the investment on loan and advances is rapidly increasing than government securities. The investment plan is the challenging subject on the commercial banks. The success of the commercial banks heavily depends on planning of investment. The successful formulation and effective implementation of investment policy should be developed by adopting portfolio concept. Commercial banks should mobilize their resources on secured, stable, profitable, liquid, and marketable securities for achieving their goal. However, it is not feasible to achieve such goal in absence of the portfolio concept. Investment portfolio is the risk mitigating mechanism, which helps minimize risk and maximize return through diversification.

Based on the analysis and findings of the Study, commercial banks are weak to invest their resources in more liquid assets and less risky sectors. Furthermore, the commercial banks are unable to capitalize the opportunities by making suitable combination of investment portfolio.

From risk and return analysis and individual investment assets, it can be inferred that investment on loan and advances is better than investment on share and debenture or investment on government securities, because loan and advances provides fixed interest income. Hence commercial banks are interested to invest their greater chunk of resources on

loan and advances in various economic sectors, since return from loan and advances are less volatile than other assets. On the other hand, the return from share and debenture displays wide fluctuation. Owing to the high fluctuation of return from share and debenture, commercial banks invested a very nominal percentage of the total investments into share and debenture. This shows that commercial banks are more interested to invest their funds in the less risky sectors.

From the resource utilization point of view, commercial banks mostly mobilize their resources on loan and advances. They provide low priority to mobilize their funds on government securities

The trend analysis of commercial banks depicts that investment on government securities, that on loan and advances, and investment on share and debenture are gradually increasing. In comparison, increasing ratio on share and debenture is the highest among loan and advances and government securities .In the similar manner, investment on loan and advances is more rapidly increasing than government securities during the period of years 2000 to 2012 A.D.

5.3 Recommendation

Based on the analysis, findings and conclusions of the study following recommendations are put forth to counteract the feeble situation.

During the study period, all selected sample banks invested a very low proportion of their total outside investment on share and debenture of the other companies. Therefore all selected sample banks are suggested to accord more priority to investment on share and debenture.

All sample banks have ineffectively utilized portfolio management concept. The investment of these banks is strongly dominated by loan and advances. They generate inadequate return for the banks. Hence they should have a compendium of optimum portfolios of different securities.

The sample commercial banks are inefficiently utilizing resources particularly in the productive sectors. Hence, they should identify new investment sectors through efficient investment programs in retail banking such as education loan, housing loan, automobile loan, small-medium enterprise loan, youth self-employment loan, green energy sector oriented consortium loan etc.

The total investment fund with respect to total deposit of EBL is pretty low. Hence, it calls for identifying the new investment sectors, and efficient as well as effective investment in those sectors.

The profitability position of NABIL is near to satisfaction. However, its investment on various assets is less stable. Hence the bank should upgrade its stability status and decrease the variability of investment.

SCBL has utilized its total deposits more efficiently than other sample banks. Hence, it should keep up its current investment position and endeavor to diversify its investment on various assets.

The portfolio return of SCBL should augment its investment on share and debentures to increase its portfolio return.

The profitability position of EBL is the weakest in relation to return on total assets. Hence, the bank should effectively utilize its overall resources to achieve the highest profit margins.

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ANNEX 1

a) Total Investment

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	9,559,175.00	1,970,277.00	7,704,304.00	901,721.00	4,083,160.00	24,218,637.00
2001/02	9,275,884.00	1,822,162.00	8,199,514.00	1,693,036.00	9,157,107.00	30,147,703.00
2002/03	10,216,199.00	1,705,240.00	6,031,175.00	1,653,977.00	10,175,435.00	29,782,026.00
2003/04	11,360,328.00	3,862,483.00	5,836,068.00	2,535,657.00	9,292,103.00	32,886,639.00
2004/05	9,702,553.00	3,934,189.00	4,277,953.00	2,128,932.00	11,692,342.00	31,735,969.00
2005/06	12,838,555.00	5,602,869.00	6,180,658.00	4,201,324.00	10,889,031.00	39,712,437.00
2006/07	13,553,233.00	6,505,680.00	8,956,309.00	4,985,119.00	11,822,985.00	45,823,326.00
2007/08	13,902,819.00	6,879,424.00	9,966,562.00	5,061,158.00	13,340,177.00	49,150,140.00
Total	**90,408,746.00**	**32,282,324.00**	**57,152,543.00**	**23,160,924.00**	**80,452,340.00**	**283,456,877.00**
Average	**11,301,093.25**	**4,035,290.50**	**7,144,067.88**	**2,895,115.50**	**10,056,542.50**	**7,086,421.93**

Source: *Annual Reports of CBs*

b) Total Deposit

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	15430051	4256210	15839007	4574508	17532404	43,745,180.00
2001/02	15835747	4174762	15506428	5466609	18619375	59,602,921.00
2002/03	18755634	7922766	13447661	6694963	21007379	67,828,403.00
2003/04	21161442	11524680	14119032	8063902	22010333	57,879,389.00
2004/05	19363470	14254474	14586609	10097693	24810012	83,112,258.00
2005/06	23061032	18927306	19347399	13802446	26490852	101,629,035.00
2006/07	24647021	24488056	23342285	18186254	30048418	120,712,034.00
2007/08	29743999	34451726	31915047	23976299	31842789	151,929,860.00
Total	**167,998,396.00**	**119,999,980.00**	**148,103,468.00**	**90,862,674.00**	**192,361,562.00**	**686,439,080.00**
Average	**20,999,800.00**	**14,999,997.50**	**18,512,933.50**	**11,357,834.25**	**24,045,195.25**	**17,160,977.00**

Source: *Annual Reports of CBs*

c) Investment on Government securities

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	4,811,010.00	300,000.00	2,767,959.00	822,996.00	2,025,252.00	10,727,217.00
2001/02	5,784,723.00	224,400.00	4,120,294.00	1,538,897.00	2,588,562.00	14,256,876.00
2002/03	6,722,348.00	400,000.00	3,663,572.00	1,599,350.00	3,347,102.00	15,732,372.00
2003/04	7,948,217.00	2,001,100.00	3,672,626.00	2,466,428.00	3,431,728.00	19,520,099.00
2004/05	7,203,066.00	1,948,500.00	2,418,432.00	2,100,289.00	5,469,729.00	19,140,016.00
2005/06	8,644,856.00	2,522,300.00	2,301,464.00	3,322,443.00	5,144,313.00	21,935,376.00
2006/07	7,107,937.00	3,256,400.00	4,808,348.00	4,704,632.00	6,454,873.00	26,332,190.00
2007/08	8,137,515.00	3,155,000.00	4,646,883.00	4,821,605.00	7,471,668.00	28,232,671.00
Total	**56,359,672.00**	**13,807,700.00**	**28,399,578.00**	**21,376,640.00**	**35,933,227.00**	**155,876,817.00**
Average	**7,044,959.00**	**1,725,962.50**	**3,549,947.25**	**2,672,080.00**	**4,491,653.38**	**19,484,602.13**

Source: *Annual Reports of CBs*

d) Investment on Share and Debenture

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	11195	12695	18820	3700	10691	57,101.00
2001/02	11195	13895	22220	17114	34265	98,689.00
2002/03	11195	13895	22220	17114	34265	98,689.00
2003/04	11195	13895	22220	17114	34265	98,689.00
2004/05	13348	17738	415724	19387	39909	506,106.00
2005/06	15343	17738	104192	19082	39909	196,264.00
2006/07	44943	35253	286958	19887	73424	460,465.00
2007/08	114536	59945	323236	101152	89558	688,427.00
Total	**232,950.00**	**185,054.00**	**1,215,590.00**	**214,550.00**	**356,286.00**	**2,204,430.00**
Average	**29,118.75**	**23,131.75**	**151,948.75**	**26,818.75**	**44,535.75**	**55,110.75**

Source: *Annual Reports of CBs*

e) Investment on Loan and Advances

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	5,660,803.00	2,318,907.00	7,993,282.00	2,959,446.00	9,015,347.00	27,947,785.00
2001/02	5,248,362.00	2,518,057.00	7,135,536.00	3,923,601.00	9,557,137.00	28,382,693.00
2002/03	5,574,061.00	5,648,032.00	7,454,262.00	4,882,788.00	10,844,599.00	34,403,742.00
2003/04	6,410,242.00	6,917,796.00	7,953,759.00	6,075,841.00	12,919,631.00	40,277,269.00
2004/05	8,143,208.00	10,453,164.00	10,946,737.00	7,900,015.00	13,451,168.00	50,894,292.00
2005/06	8,935,418.00	13,178,152.00	13,278,782.00	10,136,254.00	15,761,977.00	61,290,583.00
2006/07	10,502,637.00	17,769,100.00	15,903,024.00	14,082,686.00	17,793,724.00	76,051,171.00
2007/08	13,718,597.00	27,529,305.00	21,759,460.00	18,836,432.00	20,179,995.00	102,023,789.00
Total	**64,193,328.00**	**86,332,513.00**	**92,424,842.00**	**68,797,063.00**	**109,523,578.00**	**421,271,324.00**
Average	**8,024,166.00**	**10,791,564.13**	**11,553,105.25**	**8,599,632.88**	**13,690,447.25**	**10531783.1**

Source: *Annual Reports of CBs*

f) Total outside Investment

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	10,483,008	2,631,602	10,780,061	3,786,142	11,051,290	38,732,103
2001/02	11,159,924	4,386,584	11,580,410	5,641,515	11,616,654	44,385,087
2002/03	12,429,847	7,477,382	11,366,942	6,562,439	14,225,966	52,062,576
2003/04	14,369,654	9,145,121	11,884,838	8,367,664	16,385,624	60,152,901
2004/05	15,359,622	12,092,294	13,440391	9,738,348	18,960,806	69,591,461
2005/06	17,596,617	15,316,246	15,328,198	13,369,812	20,946,199	82,557,072
2006/07	17,655,517	20,578,080	20,998,330	18,388,601	24,322,021	101,942,549
2007/08	21,970,648	30,744,250	26,689,979	23,759,189	27,741,221	130,905,287
Total	**120,785,950**	**100,325,267**	**122,069,149**	**90,388,253**	**145,813,091**	**580,329,036**
Average	**15,098,243.75**	**12,540,658.38**	**15,258,643.63**	**11,298,531.63**	**18,226,636.38**	**14,508,225.9**

Source: *Annual Reports of CBs*

Here, total outside investment includes the investments on government securities, loan and advances and share and debentures

g) Interest on Government securities

(InRS'000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	229,454.00	9,792.00	107,843.00	19,116.00	64,960.00	431,165.00
2001/02	264,953.00	11,027.00	175,579.00	39,740.00	79,894.00	571,193.00
2002/03	303,543.00	10,227.00	174,861.00	48,744.00	121,543.00	658,918.00
2003/04	380,441.00	35,868.00	192,761.00	92,509.00	170,332.00	871,911.00
2004/05	331,633.00	56,550.00	151,064.00	77,993.00	149,131.00	766,371.00
2005/06	355,291.00	82,420.00	130,197.00	97,272.00	172,242.00	837,422.00
2006/07	326,550.00	78,494.00	132,229.00	128,566.00	191,559.00	857,398.00
2007/08	319,606.00	99,991.00	198,442.00	180,219.00	201,310.00	999,568.00
Total	**2,511,471.00**	**384,369.00**	**1,262,976.00**	**684,159.00**	**1,150,971.00**	**5,993,946.00**
Average	**313,933.88**	**48,046.13**	**157,872.00**	**85,519.88**	**143,871.38**	**149,848.65**

Source: *Annual Reports of CBs*

h) Interest on Loan and advances

(In Rs '000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	558,102.00	2,318,907.00	846,764.00	348,618.00	850,359.00	4,922,750.00
2001/02	540,851.00	2,518,057.00	801,046.00	395,098.00	853,429.00	5,108,481.00
2002/03	563,505.00	5,648,032.00	776,300.00	464,763.00	903,838.00	8,356,438.00
2003/04	558,006.00	6,917,796.00	761,616.00	563,137.00	970,166.00	9,770,721.00
2004/05	581,664.00	10,453,164.00	831,830.00	633,625.00	1,122,392.00	13,622,675.00
2005/06	596,622.00	13,178,152.00	988,417.00	770,826.00	1,140,687.00	16,674,704.00
2006/07	728,589.00	17,769,100.00	1,167,255.00	967,178.00	1,242,850.00	21,874,972.00
2007/08	872,690.00	27,529,305.00	1,496,244.00	1,329,695.00	1,444,245.00	32,672,179.00
Total	**5,000,029.00**	**86,332,513.00**	**7,669,472.00**	**5,472,940.00**	**8,527,966.00**	**113,002,920.00**
Average	**625,003.63**	**10,791,564.13**	**958,684.00**	**684,117.50**	**1,065,995.75**	**2,825,073.00**

Source: *Annual Reports of CBs*

i) Total Asset

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	19357198	5127362	18367148	5202576	19500572	67,554,856.00
2001/02	18443102	4973888	17629252	6616898	21315848	68,978,988.00
2002/03	20910970	9014249	16562524	8052209	24197974	78,737,926.00
2003/04	23642060	13463937	167454886	9608570	25729787	239,899,240.00
2004/05	21781679	16390652	17064082	11792126	28871343	95,899,882.00
2005/06	25767352	21732081	22329971	15959285	30579808	116,368,497.00
2006/07	28596689	18073517	27253393	21432574	34314868	129,671,041.00
2007/08	33335788	39405959	37132759	27149343	36858006	173,881,855.00
Total	**191,834,838.00**	**128,181,645.00**	**323,794,015.00**	**105,813,581.00**	**221,368,206.00**	**970,992,285.00**
Average	**23,979,354.75**	**16,022,705.63**	**40,474,251.88**	**13,226,697.63**	**27,671,025.75**	**24,274,807.13**

Source: *Annual Reports of CBs*

j) Net Profit

(In Rs ’000)

FY	SCBL	NIBL	NABIL	EBL	HBL	All Banks
2000/01	430831	56408	291376	69705	277039	1,125,359.00
2001/02	479206	57105	271638	84347	235023	1,127,319.00
2002/03	506932	116817	416235	94180	212132	1,346,296.00
2003/04	437800	152671	455311	143566	263052	1,452,400.00
2004/05	536245	232147	520114	170810	308277	1,767,593.00
2005/06	658748	350536	639262	237280	457458	2,343,284.00
2006/07	691668	501399	673960	296409	491823	2,655,259.00
2007/08	818921	698673	746468	451219	635869	3,351,150.00
Total	**4,560,351.00**	**2,165,756.00**	**4,014,364.00**	**1,547,516.00**	**2,880,673.00**	**15,168,660.00**
Average	**570,043.88**	**270,719.50**	**501,795.50**	**193,439.50**	**360,084.13**	**379,216.50**

Source: *Annual Reports of CBs*

ANNEX 2

Calculation of Return on Government Securities of SCBL

Here $\sum R_g = 35.89$

$\overline{R_g} = \frac{\sum Rg}{n} = \frac{35.89}{8} = 4.49\%$

Calculation of Return on Government Securities of NIBL

Here $\sum R_g = 24.28$

$\overline{R_g} = \frac{\sum Rg}{n} = \frac{24.28}{8} = 3.03\%$

Calculation of Return on Government Securities of NABIL

Here $\sum R_g = 37.11$

$\overline{R_g} = \frac{\sum Rg}{n} = \frac{37.11}{8} = 4.64\%$

Calculation of Return on Government Securities of EBL

Here $\sum R_g = 24.81$

$\overline{R_g} = \frac{\sum Rg}{n} = \frac{24.81}{8} = 3.10\%$

Calculation of Return on Government Securities of HBL

Here $\sum R_g = 26.63$

$\overline{R_g} = \frac{\sum Rg}{n} = \frac{26.63}{8} = 3.33\%$

Calculation of Return on Government Securities of Banking Industry

Here $\sum R_g = 31.31$

$\overline{R_g} = \frac{\sum Rg}{n} = \frac{\mathbf{31.31}}{8} = 0.376\%$

ANNEX 3

Calculation of Return on Loan and Advances of SCBL

Here $\sum R_l = 66.1$

$$\overline{R_l} = \frac{\sum R_l}{n} = \frac{66.1}{8} = 8.26\%$$

Calculation of Return on Loan and Advances of NIBL

Here $\sum R_l = 66.13$

$$\overline{R_l} = \frac{\sum R_l}{n} = \frac{66.13}{8} = 8.27\%$$

Calculation of Return on Loan and Advances of NABIL

Here $\sum R_l = 71.07$

$$\overline{R_l} = \frac{\sum R_l}{n} = \frac{77.07}{8} = 8.88\%$$

Calculation of Return on Loan and Advances of EBL

Here $\sum R_l = 70.19$

$$\overline{R_l} = \frac{\sum R_l}{n} = \frac{70.19}{8} = 8.77\%$$

Calculation of Return on Loan and Advances of HBL

Here $\sum R_l = 63.93$

$$\overline{R_l} = \frac{\sum R_l}{n} = \frac{66.93}{8} = 7.99\%$$

Calculation of Return on Loan and Advances of Banking Industry

Here $\sum R_l = 198.92$

$$\overline{R_l} = \frac{\sum R_l}{n} = \frac{198.92}{8} = 24.87\%$$

ANNEX 4

Calculation of Risk on Government Securities of SCBL

Here $\sum(R_g-\overline{R}_g)^2=0.6575$, $\overline{R}_g=4.49$

Now $\sigma_g=\frac{\sqrt{\sum(R_g-\overline{R}_g)^2}}{n-1}$

$\sqrt{\frac{\sum(R_g-\overline{R}_g)^2}{n-1}}=\sqrt{\frac{0.6575}{8-1}}=0.3064$

Calculation of Risk on Government Securities of NIBL

Here $\sum(R_g-\overline{R}_g)^2=5.8243$, $\overline{R}_g=3.03$

Now $\sigma_g=\sqrt{\frac{\sum(R_g-\overline{R}_g)^2}{n-1}}=\sqrt{\frac{5.8243}{8-1}}=0.9122$

Calculation of Risk on Government Securities of NABIL

Here $\sum(R_g-\overline{R}_g)^2=8.4225$, $\overline{R}_g=4.64$

Now $\sigma_g=\sqrt{\frac{\sum(R_g-\overline{R}_g)^2}{n-1}}=\sqrt{\frac{8.4224}{8-1}}=1.0969$

Calculation of Risk on Government Securities of EBL

Here $\sum(R_g-R_g)^2=2.2513$, $\overline{R}_g=3.1$

Now $\sigma_g=\sqrt{\frac{\sum(R_g-\overline{R}_g)^2}{n-1}}=\sqrt{\frac{2.2513}{8-1}}=0.5671$

Calculation of Risk on Government Securities of HBL

Here $\sum(R_g-\overline{R}_g)^2=3.3464$, $\overline{R}_g=3.33$

Now $\sigma_g=\sqrt{\frac{\sum(R_g-\overline{R}_g)^2}{n-1}}=\sqrt{\frac{3.3464}{8-1}}=0.6914$

Calculation of Risk on Government Securities of Banking Industry

Here $\sum(R_g-\overline{R}_g)^2=0.9896$, $\overline{R}_g=3.91$

Now $\sigma_g=\sqrt{\frac{\sum(R_g-\overline{R}_g)^2}{n-1}}=\sqrt{\frac{0.9896}{8-1}}=0.376$

ANNEX 5

Calculation of Risk on Loan and Advances of SCBL

Here $\sum(R_l - \overline{R_l})^2 = 19.4818$, $\overline{R_l} = 8.26$

Now $\sigma_l = \sqrt{\frac{\sum(R_l - \overline{R_l})^2}{n-1}} = \sqrt{\frac{19.4818}{8-1}} = 1.6683$

Calculation of Risk on Loan and Advances of NIBL

Here $\sum(R_l - \overline{R_l})^2 = 13.358$, $\overline{R_l} = 8.27$

Now $\sigma_l = \sqrt{\frac{\sum(R_l - \overline{R_l})^2}{n-1}} = \sqrt{\frac{13.358}{8-1}} = 1.3814$

Calculation of Risk on Loan and Advances of NABIL

Here $\sum(R_l - \overline{R_l})^2 = 21.3611$, $\overline{R_l} = 8.88$

Now $\sigma_l = \sqrt{\frac{\sum(R_l - \overline{R_l})^2}{n-1}} = \sqrt{\frac{21.3611}{8-1}} = 1.7469$

Calculation of Risk on Loan and Advances of EBL

Here $\sum(R_l - \overline{R_l})^2 = 20.0281$, $\overline{R_l} = 8.77$

Now $\sigma_l = \sqrt{\frac{\sum(R_l - \overline{R_l})^2}{n-1}} = \sqrt{\frac{20.0281}{8-1}} = 1.6915$

Calculation of Risk on Loan and Advances of HBL

Here $\sum(R_l - \overline{R_l})^2 = 5.6972$, $\overline{R_l} = 7.99$

Now $\sigma_l = \sqrt{\frac{\sum(R_l - \overline{R_l})^2}{n-1}} = \sqrt{\frac{5.6972}{8-1}} = 0.9022$

Calculation of Risk on Loan and Advances of Banking Industry

Here $\sum(R_l - \overline{R_l})^2 = 175.953$, $\overline{R_l} = 24.865$

Now $\sigma_l = \sqrt{\frac{\sum(R_l - \overline{R_l})^2}{n-1}} = \sqrt{\frac{175.953}{8-1}} = 5.0136$

ANNEX 6

(a) Calculation of Market Return on Share and Debenture

(in Percentage)

Fiscal year	NEPSE Index	Market Return
2000/01	383.90	6.43
2001/02	227.54	-40.87
2002/03	204.86	-9.96
2003/04	222.04	8.38
2004/05	286.87	29.11
2005/06	386.83	34.91
2006/07	683.95	76.81
2007/08	683.90	-0.01
Total		**104.8**

Source: *SEBO*

NEPSE index in FY 1999/2000=360.70

Here $\sum R_s$=104.8

Now $\overline{R_s} = \frac{\sum R_s}{n} = \frac{104.8}{8}$ =13.1

(b) Calculation of Market Risk on Share and Debenture

(in Percentage)

Fiscal year	NEPSE Index	Market Return	$(R_s - \overline{R}_s)$	$(R_s - \overline{R}_s)^2$
2000/01	383.90	6.43	-8.54	72.93
2001/02	227.54	-40.87	-55.84	3118.11
2002/03	204.86	-9.96	-24.93	621.50
2003/04	222.04	8.38	-6.59	43.43
2004/05	286.87	29.11	14.14	199.94
2005/06	386.83	34.91	19.94	397.60
2006/07	683.95	76.81	61.84	3824.19
2007/08	683.90	-0.01	-14.98	224.40
Total		**104.8**		**8502.1**

Source: *SEBO*

Here $\sum(R_s + R_s)^2$=8502.1

$\sigma = \sqrt{\frac{\sum(R_s - \overline{R}_s)^2}{n-1}} = \sqrt{\frac{8502.1}{8-1}} =$ 34.85

ANNEX 7

Calculation of Portfolio return on Investment of SCBL

Portfolio return ($R_{P)}$= $\sum W \times R = \sum W_1R_1+W_2R_2+W_3R_3$

=4.49x0.4466+8.26x0.5315+14.97x 0.0019= 6.42

Calculation of Portfolio return on Investment of NIBL

Portfolio return ($R_{P)}$= $\sum W \times R = \sum W_1R_1+W_2R_2+W_3R_3$

=3.03 x 0.1376+8.27 x0.8605+14.97x0.0018 = 7.56

Calculation of Portfolio return on Investment of NABIL

Portfolio return ($R_{P)}$= $\sum W \times R = \sum W_1R_1+W_2R_2+W_3R_3$

=4.64x0.2327+10.59 x0.7573+14.97 x0.01 = 9.25

Calculation of Portfolio return on Investment of EBL

Portfolio return ($R_{P)}$= $\sum W \times R = \sum W_1R_1+W_2R_2+W_3R_3$

=3.10 x0.2365+8.77 x0.7611+14.97x0.0024 = 7.44

Calculation of Portfolio return on Investment of HBL

Portfolio return ($R_{P)}$= $\sum W \times R = \sum W_1R_1+W_2R_2+W_3R_3$

=3.33 x0.2464+7.99 x0.7511+14.97x0.0024 = 6.86

Calculation of Portfolio return on Investment of Banking industry

Portfolio return ($R_{P)}$= $\sum W \times R = \sum W_1R_1+W_2R_2+W_3R_3$

=3.91 x0.2691+24.87 x0.7271+14.97x0.0038 = 19.19

ANNEX 8

(a) Calculation of Correlation Coefficient and Covariance between various Investment Securities of SCBL

Fiscal Year	Return on Gov. Securities(Rg)	Return on Loan and Advances(Rl)	Return on Share and Debenture (Rs)	$R_g \times R_l$	$R_g \times R_S$	$R_l \times R_S$	$(R_g)^2$	$(R_l)^2$	$(R_s)^2$
2000/01	4.77	9.86	6.43	47.0322	30.6711	63.3998	22.7529	97.2196	41.345
2001/02	4.58	10.31	-40.87	47.2198	-187.1846	-421.37	20.9764	106.296	1670.4
2002/03	4.52	10.11	-9.96	45.6972	-45.0192	-100.696	20.4304	102.212	99.202
2003/04	4.79	8.7	8.38	41.673	40.1402	72.906	22.9441	75.69	70.224
2004/05	4.6	7.14	29.11	32.844	133.906	207.845	21.16	50.9796	847.39
2005/06	4.11	6.68	34.91	27.4548	143.4801	233.199	16.8921	44.6224	1218.7
2006/07	4.59	6.94	76.81	31.8546	352.5579	533.061	21.0681	48.1636	5899.8
2007/08	3.93	6.36	-0.01	24.9948	-0.0393	-0.0636	15.4449	40.4496	0.0001
Total	**35.89**	**66.1**	**104.8**	**298.77**	**468.51**	**588.28**	**161.67**	**565.63**	**9847**

Now,

Correlation Coefficient between R_g&R_l

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

$$r_{gl} = \frac{8\times 298.77 - 35.89\times 66.1}{\sqrt{8\times 161.67 - (35.89)^2} \times \sqrt{8\times 565.63 - (66.1)^2}} = 0.62$$

Correlation Coefficient between R_g & R_s

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

$$= \frac{8\times 468.51 - 35.89\times 104.8}{\sqrt{8\times 9847 - (35.89)^2} \times \sqrt{8\times 9847 - (104.8)^2}}$$

$$= \frac{3748.08 - 3761.27}{2.3\times 260.37} = -0.02$$

Correlation Coefficient between R_l & R_s

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

$$= \frac{8\times 588.25 - 66.1\times 104.8}{\sqrt{8\times 565.63 - (66.1)^2} \times \sqrt{8\times 9847 - (104.8)^2}}$$

$$= \frac{4706\text{-}6927.28}{12.48 \times 260.37}$$

$= -0.68$

$Cov_{gl} = r_{gl} \times \sigma_g \times \sigma_l = 0.62 \times 0.3064 \times 1.6683 = 0.32$

$Cov_{ls} = r_{ls} \times \sigma_s \times \sigma_l = -0.68 \times 34.85 \times 1.668.3 = -39.54$

$Cov_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.02 \times 0.3064 \times 34.85 = -0.21$

(b) Calculation of Correlation Coefficient and Covariance between various Investment Securities of NIBL

Fiscal Year	**Return on Gov. Securities(R_g)**	**Return on Loan and Advances(R_l)**	**Return on Share and Debenture(R_s)**	**$R_g \times R_l$**	**$R_g \times R_s$**	**$R_l \times R_s$**	**$(R_g)^2$**	**$(R_l)^2$**	**$(R_s)^2$**
2000/01	3.26	9.88	6.43	32.2088	20.9618	63.5284	10.6276	97.6144	41.345
2001/02	4.91	10.27	-40.87	50.4257	-200.6717	-419.735	24.1081	105.473	1670.4
2002/03	2.56	7.47	-9.96	19.1232	-25.4976	-74.4012	6.5536	55.8009	99.202
2003/04	1.79	9.58	8.38	17.1482	15.0002	80.2804	3.2041	91.7764	70.224
2004/05	2.9	7.36	29.11	21.344	84.419	214.25	8.41	54.1696	847.39
2005/06	3.27	7.32	34.91	23.9364	114.1557	255.541	10.6929	53.5824	1218.7
2006/07	2.41	7.33	76.81	17.6653	185.1121	563.017	5.8081	53.7289	5899.8
2007/08	3.17	9.88	-0.01	31.3196	-0.0317	-0.0988	10.0489	97.6144	0.0001
Total	**24.28**	**69.09**	**104.8**	**213.17**	**193.45**	**682.38**	**79.45**	**609.76**	**9847**

Correlation Coefficient between R_g&R_l

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

$$r_{gl} = \frac{8X213.7 - 24.28x69.09}{\sqrt{8x79.24 - (24.28^)^2} \times \sqrt{8x609.72 - (69.09)^2}} = 0.47$$

Correlation Coefficient between R_g&R_s

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

$$= \frac{8x193.45 - 24.28x104.8}{\sqrt{8x79.24 - (24.28\ )^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{1537.6 - 1544.54}{0.66x260.37}$$

= - 0.57

Correlation Coefficient between R_l&R_s

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

$$= \frac{8x682.38 - 69.09x104.8}{\sqrt{8x609.72 - (69.09)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{5459.04 - 7240.63}{10.21 \text{ x} 260.37}$$

= -0.67

$Cov_{gl}=r_{gl} \times \sigma_g \times \sigma_l = 0.47$ x0.9122 x1.3814=0.59

$Cov_{ls}=r_{ls} \times \sigma_s \times \sigma_l =$ -0.67 x34.85 x1.3814= -32.25

$Cov_{gs}=r_{gs} \times \sigma_g \times \sigma_s =$ -0.57 x0.9122 x34.85= -18.12

(c) Calculation of Correlation Coefficient and Covariance between various Investment Securities of NABIL

Fiscal Year	Return on Gov. Securities(R_g)	Return on Loan and Advances(R_l)	Return on Share and Debenture(R_s)	$R_g \times R_l$	$R_g \times R_s$	$R_l \times R_s$	$(R_g)^2$	$(R_l)^2$	$(R_s)^2$
2000/01	3.9	10.59	6.43	41.301	25.077	68.0937	15.21	112.148	41.345
2001/02	4.26	11.23	-40.87	47.8398	-174.1062	-458.97	18.1476	126.113	1670.4
2002/03	4.77	10.41	-9.96	49.6557	-47.5092	-103.684	22.7529	108.368	99.202
2003/04	5.25	9.58	8.38	50.295	43.995	80.2804	27.5625	91.7764	70.224
2004/05	6.25	7.6	29.11	47.5	181.9375	221.236	39.0625	57.76	847.39
2005/06	5.66	7.44	34.91	42.1104	197.5906	259.73	32.0356	55.3536	1218.7
2006/07	2.75	7.34	76.81	20.185	211.2275	563.785	7.5625	53.8756	5899.8
2007/08	4.27	6.88	-0.01	29.3776	-0.0427	-0.0688	18.2329	47.3344	0.0001
Total	37.11	71.07	104.8	328.26	438.25	630.40	180.57	652.73	9847

Correlation Coefficient between R_g & R_l

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

$$r_{gl} = \frac{8X328.26 - 37.11x71.07}{\sqrt{8x163.15 - (37.11)^2} \times \sqrt{8x652 - (71.02)^2}}$$

$$= \frac{\mathbf{2626.08 - 2637.41}}{13.64x12.85} = -0.06$$

Correlation Coefficient between R_g&R_s

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

$$= \frac{8x438.25 - 37.11x104.8}{\sqrt{8x163.15 - (37.11)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{3567.12 - 3505.56}{18.48x260.37}$$

$$= 0.17$$

Correlation Coefficient between Rl&Rs

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

$$= \frac{8x630.4 - 71.07x104.8}{\sqrt{8x652.73 - (71.01)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{5043.2 - 7448.14}{13.39\ x260.37}$$

$$= -0.69$$

$Cov_{gl} = r_{gl} \times \sigma_g \times \sigma_l = -0.06\ x1.0969x1.7469 = -0.11$

$Cov_{ls} = r_{ls} \times \sigma_s \times \sigma_l = -0.69\ x34.85\ x1.7469 = -42.01$

$Cov_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.17\ x1.10969x34.85 = 6.50$

(d) Calculation of Correlation Coefficient and Covariance between various Investment Securities of EBL

Fiscal Year	Return on Gov. Securities(R_g)	Return on Loan and Advances(R_l)	Return on Share and Debenture(R_s)	$R_g \times R_l$	$R_g \times R_s$	$R_l \times R_s$	$(R_g)^2$	$(R_l)^2$	$(R_s)^2$
2000/01	2.32	11.78	6.43	27.3296	14.9176	75.7454	5.3824	138.768	41.345
2001/02	2.58	10.07	-40.87	25.9806	-105.4446	-411.561	6.6564	101.405	1670.4
2002/03	3.05	9.52	-9.96	29.036	-30.378	-94.8192	9.3025	90.6304	99.202
2003/04	3.75	9.27	8.38	34.7625	31.425	77.6826	14.0625	85.9329	70.224
2004/05	3.71	8.02	29.11	29.7542	107.9981	233.462	13.7641	64.3204	847.39
2005/06	2.93	7.6	34.91	22.268	102.2863	265.316	8.5849	57.76	1218.7
2006/07	2.73	6.87	76.81	18.7551	209.6913	527.685	7.4529	47.1969	5899.8
2007/08	3.74	7.06	-0.01	26.4044	-0.0374	-0.0706	13.9876	49.8436	0.0001
Total	24.81	70.19	104.8	214.29	330.46	673.44	79.19	635.86	9847

Correlation Coefficient between R_g&R_l

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

$$r_{gl} = \frac{8X214.29 - 24.81x70.19}{\sqrt{8x79.19 - (24.81)^2} \times \sqrt{8x635.86 - (70.19)^2}}$$

$$= \frac{1714.32 - 1741.41}{4.24x12.66}$$

$$= -50$$

Correlation Coefficient between R_g &R_s

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

$$= \frac{8x330.46 - 24.81x104.8}{\sqrt{8x79.19 - (24.81)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{2643.68 - 2600.09}{4.24x260.37}$$

$$= 0.04$$

Correlation Coefficient between R_l&R_s

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

$$= \frac{8x673.44 - 70.19x104.8}{\sqrt{8x653.86 - (70.19)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$=\frac{45387.52-7359.91}{12.66x260.37}$$

$$= -0.60$$

$Cov_{gl}=r_{gl} \times \sigma_g \times\sigma_l= -0.50 \text{ x}0.5671 \text{ x}1.6915= 0-0.48$

$Cov_{ls}=r_{ls} \times \sigma_s \times\sigma_l= -0.60 \text{ x}34.85 \text{ x}1.6915= -35.37$

$Cov_{gs}=r_{gs} \times \sigma_g \times\sigma_s= 0.04 \text{ x}0.5671\text{x}34.85= 0.79$

(e) Calculation of Correlation Coefficient and Covariance between various Investment Securities of HBL

Fiscal Year	**Return on Gov. Securities(R_g)**	**Return on Loan and Advances(R_l)**	**Return on Share and Debenture(R_s)**	**$R_g \times R_l$**	**$R_g \times R_s$**	**$R_l \times R_s$**	**$(R_g)^2$**	**$(R_l)^2$**	**$(R_s)^2$**
2000/01	3.21	9.43	6.43	30.2703	20.6403	60.6349	10.3041	88.9249	41.345
2001/02	3.09	8.93	-40.87	27.5937	-126.2883	-364.969	9.5481	79.7449	1670.4
2002/03	3.63	8.33	-9.96	30.2379	-36.1548	-82.9668	13.1769	69.3889	99.202
2003/04	4.96	7.51	8.38	37.2496	41.5648	62.9338	24.6016	56.4001	70.224
2004/05	2.73	8.34	29.11	22.7682	79.4703	242.777	7.4529	69.5556	847.39
2005/06	3.35	7.24	34.91	24.254	116.9485	252.748	11.2225	52.4176	1218.7
2006/07	2.97	6.98	76.81	20.7306	228.1257	536.134	8.8209	48.7204	5899.8
2007/08	2.69	7.16	-0.01	19.2604	-0.0269	-0.0716	7.2361	51.2656	0.0001
Total	**26.63**	**63.92**	**104.8**	**212.36**	**324.28**	**707.22**	**92.36**	**516.41**	**9847**

Correlation Coefficient between R_g&R_l

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

$$r_{gl} = \frac{8X212.36-26.63x63.92}{\sqrt{8x92.36-(26.63)^2}\times\sqrt{8x516.41-(63.92)^2}}$$

$$= \frac{169.88-1702.19}{5.45x6.75}$$

$$= -0.09$$

Correlation Coefficient between R_g&R_s

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

$$= \frac{8x324.28 - 26.63x104.8}{\sqrt{8x92.36 - (26.63)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{2594.24 - 2790.82}{5.45x260.37}$$

$$= -0.14$$

Correlation Coefficient between Rl&Rs

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

$$= \frac{8x707.22 - 63.92x104.8}{\sqrt{8x516.41 - (63.92)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{5657 - 6698.82}{6.75\ x260.37}$$

$$= -0.59$$

$Cov_{gl} = r_{gl} \times \sigma_g \times \sigma_l = -0.09\ x0.6914\ x0.9022 = -0.056$

$Cov_{ls} = r_{ls} \times \sigma_s \times \sigma_l = -0.59\ x34.85\ x0.9022 = -18.55$

$Cov_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.14\ x0.6914\ x34.85 = -3.37$

(f) Calculation of Correlation Coefficient and Covariance between various Investment Securities of Banking Industry

Fiscal Year	**Return on Gov. Securities (R_g)**	**Return on Loan and Advances (R_l)**	**Return on Share and Debenture (R_s)**	**$R_g \times R_l$**	**$R_g \times R_s$**	**$R_l \times R_s$**	**$(R_g)^2$**	**$(R_l)^2$**	**$(R_s)^2$**
2000/01	4.02	17.61	6.43	70.7922	25.8486	113.2323	16.1604	310.1121	41.3449
2001/02	4.01	18	-40.87	72.18	-163.887	-735.66	16.0801	324	1670.3569
2002/03	4.19	24.29	-9.96	101.7751	-41.7324	-241.9284	17.5561	590.0041	99.2016
2003/04	4.47	24.26	8.38	108.4422	37.4586	203.2988	19.9809	588.5476	70.2244
2004/05	4	26.77	29.11	107.08	116.44	779.2747	16	716.6329	847.3921
2005/06	3.82	27.21	34.91	13.9422	133.3562	949.9011	14.5924	740.3841	1218.7081
2006/07	3.26	28.76	76.81	93.7576	250.4006	2209.0556	10.6276	827.1376	5899.7761
2007/08	3.54	32.02	-0.01	113.3508	-0.0354	-0.3202	12.5316	1025.2804	0.0001
Total	**31.31**	**198.92**	**104.8**	**771.3201**	**357.8475**	**3276.8539**	**123.5291**	**5122.0988**	**9847.0042**

Correlation Coefficient between R_g&R_l

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

$$r_{gl} = \frac{8X771.32 - 31.31x198.92}{\sqrt{8x123.53 - (31.31)^2} \times \sqrt{8x5122.1 - (198.92)^2}}$$

$$= \frac{6170.56 - 6228.19}{2.81x37.52}$$

$$= -0.55$$

Correlation Coefficient between R_g&R_s

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

$$= \frac{8x357.85 - 31.31x104.8}{\sqrt{8x123.5 - (31.31)2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{2862.8 - 3281.29}{8.93x260.4}$$

$$= -0.18$$

Correlation Coefficient between R_l&R_s

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

$$= \frac{8x3276.85 - 198.92x104.8}{\sqrt{8x5122.1 - (198.92)^2} \times \sqrt{8x9847 - (104.8)^2}}$$

$$= \frac{26214.8 - 20846.82}{37.52 \text{ x} 260.37}$$

$$= 0.55$$

$Cov_{gl} = r_{gl} \times \sigma_g \times \sigma_l = -0.55x0.376 \text{ x} 5.0136 = -1.04$

$Cov_{ls} = r_{ls} \times \sigma_s \times \sigma_l = 0.55 \text{ x} 34.85 \text{ x} 5.0136 = 98.45$

$Cov_{gs} = r_{gs} \times \sigma_g \times \sigma_s = -0.18 \text{ x} 0.376 x 34.85 = -2.36$

ANNEX 9

Calculation of Standard Deviation of Portfolio Investment of SCBL

$\sigma_p=\sqrt{W_g^2\sigma_g^2+W_l^2\,\sigma_l^2+W_s^2\,\sigma_s^2+2W_gW_lCov_{gl}+2W_gW_sCov_{gs}+2W_lW_sCov_{ls}}$

$=\sqrt{(0.4466)^2(0.3064)^2+(0.5315)^2(1.6683)^2+(0.0019)^2(34.85)^2+2(0.32)(0.4466)(0.5315)+2(-39.54)(0.5315)(.0019)+2(-0.21)(0.4466)(.0019)}=\sqrt{1.0888}=1.04$

Calculation of Standard Deviation of Portfolio Investment of NIBL

$\sigma_p=\sqrt{W_g^2\sigma_g^2+W_l^2\,\sigma_l^2+W_s^2\,\sigma_s^2+2W_gW_lCov_{gl}+2W_gW_sCov_{gs}+2W_lW_sCov_{ls}}$

$=\sqrt{(0.1376)^2(.0.9122)^2+(0.8605)2(1.3814)^2+(0.0018)^2(34.85)^2+2(0.59)(0.4466)(0.5315)+2(-32.25)(0.8605)(.0018)+2(-18.12)(0.1376)(.0018)}=\sqrt{1.6391}=1.28$

Calculation of Standard Deviation of Portfolio Investment of NABIL

$\sigma_p=\sqrt{W_g^2\sigma_g^2+W_l^2\,\sigma_l^2+W_s^2\,\sigma_s^2+2W_gW_lCov_{gl}+2W_gW_sCov_{gs}+2W_lW_sCov_{ls}}$

$=\sqrt{(0.2327)^2(1.0969)^2+(0.7573)^2(1.7469)^2+(0.001)^2(34.85)^2+2(-0.11)(0.2327)(0.01)+2(-42.01)(0.7573)(.001)+2(6.5)(0.2327)(.001)}=\sqrt{1.3303}=1.15$

Calculation of Standard Deviation of Portfolio Investment of EBL

$\sigma_p=\sqrt{W_g^2\sigma_g^2+W_l^2\,\sigma_l^2+W_s^2\,\sigma_s^2+2W_gW_lCov_{gl}+2W_gW_sCov_{gs}+2W_lW_sCov_{ls}}$

$=\sqrt{(0.2365)^2(0.5671)^2+(0.7611)^2(1.6915)^2+(0.0024)^2(34.85)^2+2(-0.48)(0.2365)(0.7611)+2(-35.37)(0.7611)(.0024)+2(0.79)(0.2365)(.0024)}=\sqrt{0.7261}=0.85$

Calculation of Standard Deviation of Portfolio Investment of HBL

$\sigma_p=\sqrt{W_g^2\sigma_g^2+W_l^2\,\sigma_l^2+W_s^2\,\sigma_s^2+2W_gW_lCov_{gl}+2W_gW_sCov_{gs}+2W_lW_sCov_{ls}}$

$=\sqrt{(0.2464)^2(0.6914)^2+(0.7511)^2(0.9022)^2+(0.0024)^2(34.85)^2+2(-0.56)(0.2464)(0.7511)+2(-18.55)(0.7511)(0.0024)+2(-3.37)(.0.2464)(.0024)}=\sqrt{-0.3219}=-0.57$

Calculation of Standard Deviation of Portfolio Investment of Banking industry

$\sigma_p=\sqrt{W_g^2\sigma_g^2+W_l^2\,\sigma_l^2+W_s^2\,\sigma_s^2+2W_gW_lCov_{gl}+2W_gW_sCov_{gs}+2W_lW_sCov_{ls}}$

$=\sqrt{(0.2691)^2(0.376)^2+(0.7271)^2(5.0136)^2+(0.0038)^2(34.85)^2+2(-0.55)(0.2691)(0.7271)+2(-0.18)(0.2691)(.0038)+2(0.55)(0.7271)(.0038)}=\sqrt{13.1018}=3.62$

ANNEX 10

Calculation of Mean, S. D, C.V of Total Investment to Total Deposit Ratio

Total Investment to Total Deposit Ratio of SCBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	61.95	7.43	55.2049
2001/02	58.58	4.06	16.4836
2002/03	54.47	-0.05	0.0025
2003/04	53.68	-0.84	0.7056
2004/05	50.11	-4.41	19.4481
2005/06	55.67	1.15	1.3225
2006/07	54.99	0.47	0.2209
2007/08	46.74	-7.78	60.5284
Total	436.19		153.9165
Mean	54.52		

Source: *Annual Reports of SCBL*

Standard Deviation $(\sigma)=\sqrt{\frac{\sum(x-\bar{x})^2}{n}}=4.42$

Coefficient of Variance (C.V)= $\frac{\sigma}{x}\times 100=\frac{4.39}{54.52}$ x100=8.05

Total Investment to Total Deposit Ratio of NIBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	46.29	15.2	231.04
2001/02	43.65	12.56	157.7536
2002/03	21.52	-9.57	91.5849
2003/04	33.51	2.42	5.8564
2004/05	27.60	-3.49	12.1801
2005/06	29.60	-1.49	2.2201
2006/07	26.56	-4.53	20.5209
2007/08	19.97	-11.12	123.6544
Total	**248.7**		**644.8104**
Mean	**31.09**		

Source: *Annual Reports of NIBL*

Standard Deviation (σ)=$\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$=8.98

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}}$×100= $\frac{8.98}{31.09}$ x100=28.88

Total Investment to Total Deposit Ratio of NABIL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	48.64	8.8	77.44
2001/02	52.88	13.04	170.0416
2002/03	44.85	5.01	25.1001
2003/04	41.33	1.49	2.2201
2004/05	29.27	-10.57	111.7249
2005/06	31.94	-7.9	62.41
2006/07	38.36	-1.48	2.1904
2007/08	31.23	-8.61	74.1321
Total	**318.7**		**525.2592**
Mean	**39.84**		

Source: *Annual Reports of NABIL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =8.10

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}}$×100=$\frac{8.10}{39.84}$ ×100=20.33

Total Investment to Total Deposit Ratio of EBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	19.71	-6.15	39.975
2001/02	30.97	5.11	26.1121
2002/03	24.70	-1.16	1.3456
2003/04	31.44	5.58	31.1364
2004/05	21.08	-4.78	22.8484
2005/06	30.44	4.58	20.9764
2006/07	27.41	1.55	2.4025
2007/08	21.11	-4.75	22.5625
Total	**206.86**		**167.3589**
Mean	**25.86**		

Source: *Annual Reports of EBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =4.57

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{4.57}{25.86}$ x100=17.67

Total Investment to Total Deposit Ratio of HBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	23.29	-17.05	290.7025
2001/02	49.18	8.84	78.1456
2002/03	48.44	8.1	65.61
2003/04	32.36	-7.98	63.6804
2004/05	47.13	6.79	46.1041
2005/06	41.10	0.76	0.5776
2006/07	39.35	-0.99	0.9801
2007/08	41.89	1.55	2.4025
Total	**322.74**		**548.2028**
Mean	**40.34**		

Source: *Annual Reports of HBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =8.28

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{8.28}{40.34} \times 100 = 20.53$

ANNEX 11

Calculation of Mean, S. D, C.V of Investment on Government Security to Total outside Investment Ratio

Investment on Government Securities to Total outside Investment Ratio of SCBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	45.89	-1.66	2.7556
2001/02	51.83	4.28	18.3184
2002/03	54.09	6.54	42.7716
2003/04	55.31	7.76	60.2176
2004/05	46.90	-0.65	0.4225
2005/06	49.12	1.57	2.4649
2006/07	40.25	-7.3	53.29
2007/08	37.04	-10.51	110.4601
Total	**380.43**		**290.7007**
Mean	**47.55**		

Source: *Annual Reports of SCBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =6.03

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{6.03}{47.55} \times 100 = 12.68$

Investment on Government Security to Total outside Investment Ratio of NIBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	11.40	-1.4	1.96
2001/02	5.12	-7.68	58.9824
2002/03	5.35	-7.45	55.5025
2003/04	21.88	9.08	82.4464
2004/05	16.11	3.31	10.9561
2005/06	16.47	3.67	13.4689
2006/07	15.82	3.02	9.1204
2007/08	10.26	-2.54	6.4516
Total	**102.41**		**238.89**
Mean	**12.80**		

Source: *Annual Reports of NIBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ = 4.17

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{11.62}{54.1} \times 100 = 32.58$

Investment on Government Securities to Total outside Investment Ratio of NABIL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	25.68	2.92	8.5264
2001/02	26.35	3.95	12.8881
2002/03	26.03	3.27	10.6929
2003/04	30.90	8.14	66,2596
2004/05	17.96	-4.8	23.04
2005/06	15.01	-7.75	60.0625
2006/07	22.90	0.14	0.0196
2007/08	17.26	-5.5	130.25
Total	**182.09**		**211.7391**
Mean	**22.76**		

Source: *Annual Reports of NABIL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =5.14

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{5.14}{22.76}$ x100=22.58

Investment on Government Securities to Total outside Investment Ratio of EBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	21.74	-2.86	8.1796
2001/02	27.28	2.68	7.1824
2002/03	24.37	0.23	0.0529
2003/04	29.47	4.87	23.7169
2004/05	21.56	-3.04	9.2416
2005/06	26.54	1.94	3.7636
2006/07	25.58	0.98	0.9604
2007/08	20.29	-4.31	18.5761
Total	**196.83**		**71.6734**
Mean	**24.60**		

Source: *Annual Reports of EBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =2.99

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{2.99}{24.6}$ x100=12.04

Investment on Government Securities to Total outside Investment Ratio of HBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	18.33	-5.67	32.1489
2001/02	22.28	-1.72	2.9584
2002/03	23.53	-0.47	0.2209
2003/04	20.94	-3.06	9.3636
2004/05	28.85	4.85	23.5225
2005/06	24.56	0.56	0.3136
2006/07	26.54	2.54	6.4516
2007/08	26.93	2.93	8.5849
Total	**191.96**		**83.5644**
Mean	**24.00**		

Source: *Annual Reports of HBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =3.23

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{3.23}{24.0}$ x100=13.46

ANNEX 12

Calculation of Mean, S. D, C.V of Investment on Loan and Advances to Total outside Investment Ratio

Investment on Loan and Advances to Total outside Investment Ratio of SCBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	54.00	1.73	2.9929
2001/02	48.06	-4.21	17.7241
2002/03	45.82	-6.45	41.6025
2003/04	44.60	-7.67	58.8289
2004/05	53.01	0.74	0.5476
2005/06	50.77	-1.50	2.25
2006/07	59.48	7.21	51.9841
2007/08	62.44	10.17	103.4289
Total	418.18		279.359
Mean	52.27		

Source: *Annual Reports of SCBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =5.91

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{5.91}{52.27}$ x100=11.31

Investment on Loan and Advances to Total outside Investment Ratio of NIBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	88.11	7.94	63.0436
2001/02	57.40	-22.77	518.4729
2002/03	77.19	-2.98	8.8804
2003/04	77.96	-2.21	4.8841
2004/05	83.73	3.56	12.6736
2005/06	83.41	3.24	10.4976
2006/07	84.00	3.83	14.6689
2007/08	89.54	9.37	87.7969
Total	641.34		720.918
Mean	80.17		

Source: *Annual Reports of NIBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =9.49

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}}\times 100 = \frac{9.49}{80.17}$ x100=11.84

Investment on Loan and Advances to Total outside Investment Ratio of NABIL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	74.15	1.49	2.2201
2001/02	61.62	-11.04	121.8816
2002/03	56.25	-16.41	169.2881
2003/04	68.91	-3.75	14.0625
2004/05	78.76	6.1	37.21
2005/06	84.30	11.64	135.4896
2006/07	75.73	3.07	9.4249
2007/08	81.53	8.87	78.6769
Total	**581.25**		**668.2537**
Mean	**72.66**		

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =9.14

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}}\times 100 = \frac{9.14}{72.66}$ x100=12.58

Investment on Loan and Advances to Total outside Investment Ratio of EBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	78.16	3.36	11.2896
2001/02	69.98	-4.82	23.2324
2002/03	74.79	-0.01	0.0001
2003/04	70.32	-4.48	20.0704
2004/05	78.23	3.43	11.7649
2005/06	73.30	-1.5	2.25
2006/07	74.30	-0.5	0.25
2007/08	79.28	4.48	20.0704
Total	**598.36**		**78.9278**
Mean	**74.80**		

Source: *Annual Reports of EBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =3.14

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{3.14}{73.80}$ x100=4.20

Investment on Loan and Advances to Total outside Investment Ratio of HBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	81.58	5.20	27.04
2001/02	82.27	5.89	34.6921
2002/03	76.23	-0.15	0.0225
2003/04	78.88	2.50	6.25
2004/05	70.94	-5.44	29.5936
2005/06	75.25	-1.13	1.2769
2006/07	73.16	3.22	10.3684
2007/08	72.74	-3.64	13.2496
Total	**611.05**		**122.4931**
Mean	**76.38**		

Source: *Annual Reports of HBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =3.91

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{3.91}{76.38}$ x100=5.12

ANNEX 13

Calculation of Mean, S. D, C.V of Investment on Share and Debenture to Total outside Investment Ratio

Investment on Share and Debenture to Total outside Investment Ratio of SCBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	0.11	-0.04	0.0016
2001/02	0.10	-0.05	0.0025
2002/03	0.09	-0.06	0.0036
2003/04	0.07	-0.08	0.0064
2004/05	0.09	-0.06	0.0036
2005/06	0.09	-0.06	0.0036
2006/07	0.25	0.10	0.0100
2007/08	0.52	0.37	0.1369
Total	**1.23**		**0.1682**
Mean	**0.15**		

Source: *Annual Reports of SCBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ = 0.15

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.15}{0.15} \times 100 = 100$

Investment on Share and Debenture to Total outside Investment Ratio of NIBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	0.48	0.26	0.0676
2001/02	0.32	0.10	0.01
2002/03	0.19	-0.03	0.0009
2003/04	0.15	-0.07	0.0049
2004/05	0.14	-0.08	0.0064
2005/06	0.11	-0.11	0.0121
2006/07	0.17	-0.05	0.0025
2007/08	0.19	-0.03	0.0009
Total	**1.75**		**0.1053**
Mean	**0.22**		

Source: *Annual Reports of NIBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =0.11

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.11}{0.22} \times 100 = 50$

Investment on Share and Debenture to Total outside Investment Ratio of NABIL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	0.17	-0.73	0.5329
2001/02	0.14	-0.76	0.5776
2002/03	0.16	-0.74	0.5476
2003/04	0.18	-0.72	0.5184
2004/05	3.27	2.37	5.6169
2005/06	0.68	-0.22	0.0150
2006/07	1.37	0.47	0.2209
2007/08	1.21	0.31	0.0961
Total	**7.18**		**8.1254**
Mean	**0.90**		

Source: *Annual Reports of NABIL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =1.01

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{1.01}{0.9} \times 100 = 112.22$

Investment on Share and Debenture to Total outside Investment Ratio of EBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	0.10	-0.11	0.0121
2001/02	0.31	0.09	0.0081
2002/03	0.26	0.04	0.0016
2003/04	0.20	-0.02	0.0004
2004/05	0.20	-0.02	0.0004
2005/06	0.15	-0.07	0.0049
2006/07	0.10	-0.12	0.0144
2007/08	0.43	0.21	0.0441
Total	**1.75**		**0.0860**
Mean	**0.22**		

Source: *Annual Reports of EBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =0.10

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.1037}{0.22} \times 100 = 47.14$

Investment on Share and Debenture to Total outside Investment Ratio of HBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	0.10	-0.13	0.0169
2001/02	0.29	0.06	0.0036
2002/03	0.24	0.01	0.0001
2003/04	0.21	-0.02	0.0004
2004/05	0.21	-0.02	0.0004
2005/06	0.19	-0.04	0.0016
2006/07	0.30	0.07	0.0049
2007/08	0.32	0.09	0.0081
Total	**1.86**		**0.036**
Mean	**0.23**		

Source: *Annual Reports of HBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ = 0.067

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.067}{0.23}$ x100=29.13

ANNEX 14

Calculation of Mean, S. D, C.V of Return on Total Asset

Return on Total Asset of SCBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	2.23	-0.2	0.04
2001/02	2.60	0.17	0.0289
2002/03	2.41	-0.02	0.0004
2003/04	2.27	-0.16	0.0256
2004/05	2.46	0.03	0.0009
2005/06	2.55	0.12	0.0144
2006/07	2.42	-0.01	0.0001
2007/08	2.46	0.03	0.0009
Total	**19.4**		**0.1112**
Mean	**2.43**		

Source: *Annual Reports of SCBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ = 0.33

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.33}{2.43} \times 100 = 13.58$

Return on Total Asset of NIBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	1.10	-0.32	0.1024
2001/02	1.15	-0.27	0.0729
2002/03	1.30	-0.12	0.0144
2003/04	1.15	-0.27	0.0729
2004/05	1.42	0	0
2005/06	1.64	0.22	0.0484
2006/07	1.82	0.40	0.16
2007/08	1.77	0.35	0.1225
Total	**11.35**		**0.5935**
Mean	**1.42**		

Source: *Annual Reports of NIBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =0.27

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.27}{1.42} \times 100 = 19.01$

Return on Total Asset of NABIL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	1.59	-0.75	0.5625
2001/02	1.54	-0.8	0.64
2002/03	2.51	0.17	0.0289
2003/04	2.71	0.37	0.1369
2004/05	3.02	0.68	0.4624
2005/06	2.84	0.5	0.25
2006/07	2.47	0.13	0.0169
2007/08	2.01	-0.33	0.1089
Total	**18.69**		**2.21**
Mean	**2.34**		

Source: *Annual Reports of NABIL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =0.53

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.53}{2.34} \times 100 = 22.65$

Return on Total Asset of EBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	1.34	-0.07	0.0049
2001/02	1.29	-0.12	0.0144
2002/03	1.17	-0.24	0.0576
2003/04	1.49	0.08	0.0064
2004/05	1.44	0.03	0.0009
2005/06	1.49	0.08	0.0064
2006/07	1.38	-0.03	0.0009
2007/08	1.66	0.25	0.0625
Total	**11.26**		**0.154**
Mean	**1.41**		

Source: *Annual Reports of EBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =0.14

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.14}{1.41}$ x100=9.93

Return on Total Asset of HBL

In percentage

Fiscal Year	**Ratio**	**$(x-\bar{x})$**	**$(x-\bar{x})^2$**
2000/01	1.42	0.14	0.0196
2001/02	1.10	-0.18	0.0324
2002/03	0.91	-0.37	0.1369
2003/04	1.06	-0.22	0.0484
2004/05	1.07	-0.21	0.0441
2005/06	1.50	0.22	0.0484
2006/07	1.43	0.15	0.0225
2007/08	1.73	0.45	0.2025
Total	**10.22**		**0.5548**
Mean	**1.28**		

Source: *Annual Reports of HBL*

Standard Deviation (σ)= $\sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ =0.26

Coefficient of Variance (C.V)= $\frac{\sigma}{\bar{x}} \times 100 = \frac{0.26}{1.28}$ x100=20.31

ANNEX 15

Sample calculation of "Straight Line Trend"

Let the straight line trend between the dependent variable(total investment) y and the independent variable x (time) is be

$y=a+ b x$

Thus to find the value of a and b

$a=\frac{\sum y}{n}$, and $b=\frac{\sum xy}{\sum x^2}$ it is only when $\sum x=o$

Let FY 2000/01 be equal to2001, FY 2001/2002 to2002 and so on. Here deviations are considered from the middle of the years.

(a) Trend Analysis of Investment on Government Securities of SCBL

(Rs in millions)

Year	**Investment on government securities (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	4,811.01	-3.5	-16838.54	12.25
2002	5,784.72	-2.5	-14461.8	6.25
2003	6,722.35	-1.5	-10083.53	2.25
2004	7,948.22	-0.5	-3974.11	0.25
2005	7,203.07	0.5	3601.535	0.25
2006	8,644.86	1.5	12967.29	2.25
2007	7,107.94	2.5	17769.85	6.25
2008	8,137.52	3.5	28481.32	12.25
Total	**56,359.69**	**0**	**17,462.03**	**42**

Since $\sum x=o$,

$$a=\frac{\sum y}{n} = \frac{56,359.69}{8} = 7044.96$$

$$b=\frac{\sum xy}{\sum x^2} = \frac{17,462.03}{42.00} =415.76$$

The straight line trend of government securities of SCBL is

$$Y_g=a+bx$$
$$=7044.96+415.76x$$

(b) Trend Analysis of Investment on Government Securities of NIBL

(Rs in millions)

Year	**Investment on government securities (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	300.00	-3.5	-1050	12.25
2002	224.40	-2.5	-561	6.25
2003	400.00	-1.5	-600	2.25
2004	2,001.10	-0.5	-1000.55	0.25
2005	1,948.50	0.5	974.25	0.25
2006	2,522.30	1.5	3783.45	2.25
2007	3,256.40	2.5	8141	6.25
2008	3,155.00	3.5	11042.5	12.25
Total	**13,807.70**	**$\sum x=0$**	**$\sum x\,y=20729.65$**	**42**

Since $\sum x=0$, $a=\frac{\sum y}{n}=\frac{13807.7}{8}=1725.96$ $b=\frac{\sum xy}{\sum x^2}=\frac{20729.65}{42}=493.56$

The straight line trend of government securities of NIBL is

$Y_g=1725.96+493.56x$

(c) Trend Analysis of Investment on Government Securities of NABIL

(Rs in millions)

Year	**Investment on government securities (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	2,76.80	-3.5	-968.8	12.25
2002	4,12.29	-2.5	-1030.73	6.25
2003	3,66.57	-1.5	-549.85	2.25
2004	3,672.63	-0.5	-1836.32	0.25
2005	2,418.43	0.5	1209.22	0.25
2006	2,301.46	1.5	3452.19	2.25
2007	4,808.35	2.5	12,020.9	6.25
2008	4,646.88	3.5	16,264.08	12.25
Total	**28,399.58**	**0**	**28,561.41**	**42**

Since $\sum x=o$, $a=\frac{\sum y}{n}=\frac{28,399.58}{8}=3,549.9$ $b=\frac{\sum xy}{\sum x^2}=\frac{28,561.41}{42}=680$

The straight line trend of government securities of NABIL is

$Y_g=3,549.9+680x$

(d) Trend Analysis of Investment on Government Securities of EBL

(Rs in millions)

Year	**Investment on government securities (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	83.00	-3.5	-290.5	12.25
2002	1,538.90	-2.5	-3847.25	6.25
2003	1,599.35	-1.5	-2399.03	2.25
2004	2,466.43	-0.5	-4932.86	0.25
2005	2,100.29	0.5	1050.15	0.25
2006	3,322.44	1.5	4983.66	2.25
2007	4,704.63	2.5	11761.58	6.25
2008	4,821.61	3.5	16875.64	12.25
Total	**21,376.64**	**∑x=0**	**∑x y=**	**42**

Since $\sum x=o$, $a=\frac{\sum y}{n}=\frac{21376.64}{8}=2672.08$ $b=\frac{\sum xy}{\sum x^2}=\frac{23201.39}{42}=552.41$

The straight line trend of government securities of EBL is

$Y_g=2672.08+552.41x$

(e) Trend Analysis of Investment on Government Securities of HBL

(Rs in millions)

Year	**Investment on government securities (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	2,025.25	-3.5	-7088.38	12.25
2002	2,588.56	-2.5	-6471.4	6.25
2003	3,347.10	-1.5	-5020.65	2.25
2004	3,431.73	-0.5	-1715.87	0.25
2005	5,469.73	0.5	2734.87	0.25
2006	5,144.31	1.5	7716.47	2.25
2007	6,454.87	2.5	16137.18	6.25
2008	7,471. 67	3.5	26150.85	12.25
Total	**35,933.23**	**∑x=0**	**∑x y=32443.08**	**42**

Since $\sum x=o$, $a=\frac{\sum y}{n}=\frac{35933.23}{8}=4491.63$ $b=\frac{\sum xy}{\sum x^2}=\frac{32443.08}{42}=772.45$

The straight line trend of government securities of HBL is

$Y_g=4491.63+772.45x$

(f) Trend Analysis of Investment on Loan and Advances of SCBL

(Rs in millions)

Year	**Investment on loan and advances (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	5,660.80	-3.5	-19812.8	12.25
2002	5,248.36	-2.5	-13120.9	6.25
2003	5,574.06	-1.5	-8361.09	2.25
2004	6,410.24	-0.5	-3205.12	0.25
2005	8,143.21	0.5	4071.61	0.25
2006	8,935.42	1.5	13403.13	2.25
2007	10,502.64	2.5	26256.6	6.25
2008	13,718.60	3.5	48015.1	12.25
Total	**64,193.33**	**$\sum x=0$**	**$\sum x\,y=47246.53$**	**42**

Since $\sum x=0$, $a=\frac{\sum y}{n}=\frac{64,193.33}{8}=8024.17$, $b=\frac{\sum x\,y}{\sum x^2}=\frac{47246.53}{42}=1124.92$

The straight line trend of loan and advances of SCBL is

$$Y_l=8024.17+1124.9x$$

(g) Trend Analysis of Investment on Loan and Advances of NIBL

(Rs in millions)

Year	**Investment on loan and advances (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	2,318.91	-3.5	-8116.19	12.25
2002	2,518.06	-2.5	-6295.15	6.25
2003	5,648.03	-1.5	-8472.05	2.25
2004	6,917.80	-0.5	-3458.90	0.25
2005	10,45.16	0.5	522.58	0.25
2006	13,178.15	1.5	19767.23	2.25
2007	17,769.10	2.5	44422.75	6.25
2008	27,529.31	3.5	96352.59	12.25
Total	75,879.36	$\sum x=0$	134722.86	42

Since $\sum x=0$, $a=\frac{\sum y}{n}=\frac{75,879.36}{8}=9484.92$

$$b=\frac{\sum x\,y}{\sum x^2}=\frac{34722.86}{42}=3207.69$$

The straight line trend of loan and advances of NIBL is

Y_L=a+bx

Y_L =9484.92+3207.69x

(h) Trend Analysis of Investment on Loan and Advances of NABIL

(Rs in millions)

Year	**Investment on loan and advances (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	7,993.28	-3.5	-27976.48	12.25
2002	7,135.54	-2.5	-17838.85	6.25
2003	7,454.26	-1.5	-11181.39	2.25
2004	7,953.76	-0.5	-3976.88	0.25
2005	10,946.74	0.5	5473.37	0.25
2006	13,278.78	1.5	19918.17	2.25
2007	15,903.02	2.5	39757.55	6.25
2008	21,759.46	3.5	76158.11	12.25
Total	**92,424.84**	**0**	**80333.60**	**42**

Since $\sum x=0$,

$$a=\frac{\sum y}{n}=\frac{92,424.84}{8}=11553.11$$

$$b=\frac{\sum x\,y}{\sum x^2}=\frac{80333.60}{42}=1912.70$$

The straight line trend of loan and advances of NABIL is

Y_L=a+bx

=11553.11+1912.70x

(i) Trend Analysis of Investment on Loan and Advances of EBL

(Rs in millions)

Year	**Investment on loan and advances (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	2,959.45	-3.5	-10358.08	12.25
2002	3,923.60	-2.5	-9809.0	6.25
2003	4,882.79	-1.5	-7324.19	2.25
2004	6,075.84	-0.5	-3037.92	0.25
2005	7,900.02	0.5	3950.01	0.25
2006	10,136.25	1.5	15204.38	2.25
2007	14,082.69	2.5	35206.73	6.25
2008	18,836.43	3.5	65927.51	12.25
Total	**68,797.06**	**∑x=0**	**89759.44**	**42**

Since $\sum x=o$, $a=\frac{\sum y}{n}, = \frac{68,797.06}{8}=8599.63$ $b=\frac{\sum x\,y}{\sum x^2} = \frac{89759.44}{42} =2137.13$

The straight line trend of loan and advances of EBL is

$Y_l=8599.63 +2137.13\ x$

(j) Trend Analysis of Investment on Loan and Advances of HBL

(Rs in millions)

Year	**Investment on loan and advances (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	9,015.35	-3.5	-31553.73	12.25
2002	9,557.14	-2.5	-23892.85	6.25
2003	10,844.60	-1.5	-16266.9	2.25
2004	12,919.63	-0.5	-6459.82	0.25
2005	13,451.17	0.5	6725.59	0.25
2006	15,761.98	1.5	23642.97	2.25
2007	17,793.72	2.5	44484.3	6.25
2008	20,180.00	3.5	70630.0	12.25
Total	**109,523.58**	**∑x=0**	**∑x y=67309.56**	**42**

Since $\sum x=0$, $a=\frac{\sum y}{n} = \frac{109523.58/8}{8}=12169.27$ $b=\frac{\sum x\,y}{\sum x^2} = \frac{67309.56}{42}=1602.61$

The straight line trend of loan and advances of HBL is

$Y_l=12169.27 + 1602.61\ x$

(k) Trend Analysis of Investment on Share and Debenture of SCBL

(Rs in millions)

Year	**Investment on share and debenture (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	11.20	-3.5	-39.2	12.25
2002	11.20	-2.5	-28.0	6.25
2003	11.20	-1.5	-16.8	2.25
2004	11.20	-0.5	-5.6	0.25
2005	13.35	0.5	5.68	0.25
2006	15.43	1.5	23.15	2.25
2007	44.94	2.5	112.35	6.25
2008	114.54	3.5	400.89	12.25
Total	**232.95**	**$\sum x=0$**	**$\sum x\,y=352.47$**	**42**

Since $\sum x=0$, $a=\frac{\sum y}{n}=232.95/8=29.12$ $b=\frac{\sum x\,y}{\sum x^2}=352.47/42=8.39$

The straight line trend of share and debenture of SCBL is

$Y_s=29.12+8.39x$

(l) Trend Analysis of Investment on Share and Debenture of NIBL

(Rs in millions)

Year	**Investment on share and debenture (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	12.70	-3.5	-44.45	12.25
2002	13.90	-2.5	-34.75	6.25
2003	13.90	-1.5	-20.85	2.25
2004	13.90	-0.5	-6.95	0.25
2005	17.74	0.5	8.87	0.25
2006	17.74	1.5	26.61	2.25
2007	35.25	2.5	88.13	6.25
2008	59.95	3.5	209.83	12.25
Total	**185.05**	**$\sum x=0$**	**$\sum xy=226.44$**	**42**

Since $\sum x=0$, $a=\frac{\sum y}{n}=\frac{185.05}{8}=23.13$ $b=\frac{\sum x\,y}{\sum x^2}=\frac{226.44}{42}=5.39$

The straight line trend of share and debenture of NIBL is

$Y_s=23.13+5.39x$

(m) Trend Analysis of Investment on Share and Debenture of NABIL

(Rs in millions)

Year	**Investment on share and debenture (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	18.22	-3.5	-63.77	12.25
2002	22.22	-2.5	-55.55	6.25
2003	22.22	-1.5	-33.33	2.25
2004	22.22	-0.5	-11.11	0.25
2005	415.72	0.5	207.86	0.25
2006	104.19	1.5	156.29	2.25
2007	286.96	2.5	717.4	6.25
2008	32.24	3.5	112.84	12.25
Total	**923.99**	**0**	**1030.63**	**42**

Since $\sum x=0$, $a=\frac{\sum y}{n}=\frac{923.99}{8}=115.50$ $b=\frac{\sum x\,y}{\sum x^2}=\frac{1030.63}{42}=24.54$

The straight line trend of share and debenture of NABIL is

$Y_s = a+bx = 115.50+24.54x$

(n) Trend Analysis of Investment on Share and Debenture of EBL

(Rs in millions)

Year	**Investment on share and debenture (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	3.70	-3.5	-12.95	12.25
2002	17.11	-2.5	-42.78	6.25
2003	17.11	-1.5	-25.67	2.25
2004	17.11	-0.5	-8.56	0.25
2005	19.39	0.5	9.70	0.25
2006	19.08	1.5	28.62	2.25
2007	19.89	2.5	49.73	6.25
2008	101.51	3.5	355.29	12.25
Total	**214.9**	**$\sum x=0$**	**$\sum x\,y=353.38$**	**42**

Since $\sum x=o$, $a=\frac{\sum y}{n}=\frac{214.9}{8}=26.86$ $b=\frac{\sum x\,y}{\sum x^2}=\frac{353.38}{42}=8.41$

The straight line trend of share and debenture of EBL is

$Y_s = 26.86+8.41x$

(o) Trend Analysis of Investment on Share and Debenture of HBL

(Rs in millions)

Year	**Investment on share and debenture (y)**	**x=(t-2004.5)**	**x y**	**x^2**
2001	10.69	-3.5	-37.415	12.25
2002	34.27	-2.5	-85.675	6.25
2003	34.27	-1.5	-51.405	2.25
2004	34.27	-0.5	-17.135	0.25
2005	39.91	0.5	19.955	0.25
2006	39.91	1.5	59.865	2.25
2007	73.42	2.5	183.55	6.25
2008	89.56	3.5	313.46	12.25
Total	**356.3**	**0**	**385.2**	**42**

Since $\sum x=0$, $a=\frac{\sum y}{n}=\frac{356.3}{8}=44.54$ $b=\frac{\sum x\,y}{\sum x^2}=\frac{385.2}{42}=9.17$

The straight line trend of share and debenture of HBL is

$Y_s=a+bx=44.54+9.17x$

ANNEX 16

Proportion Weight of Government Securities, Loan and Advances, Share and Debenture

(In Rs' 000)

Total Investment on	**SCBL**	**NIBL**	**NABIL**	**EBL**	**HBL**	**All Banks**
Government Securities (g)	56,359,672	13,807,700	28,399,578	21,376,640	35,933,227	155,876,817
Loan and Advances (l)	64,193,328	86,332,513	92,424,842	68,797,063	109,523,578	421,271,324.
Share and Debenture (s)	232,950	185,054	1,215,590	214,550	356,286	2,204,430.
Total	**120,785,950**	**100,325,267**	**122,040,010**	**90,388,253**	**145,813,091**	**579,352,571**
Proportion Weight of g	0.4666	0.1376	0.2327	0.2365	0.2464	0.2691
Proportion Weight of l	0.5315	0.8605	0.7573	0.7611	0.7511	0.7271
Proportion Weight of Rs	0.0019	0.0018	0.0100	0.0024	0.0024	0.0038
Total	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**

Sources: Annual Reports of CBs and Annexes1(c)-1(f)