AN
ANALYSIS OF PORTFOLIO MANAGEMENT
OF
SELECTED COMMERCIAL BANKS
IN NEPAL

A Thesis
Submitted to:
Office of the Dean
Faculty of Management
TRIBHUVAN UNIVERSITY

In Partial Fulfillment of the Requirement for the
Master of Business Studies (MBS)

Submitted by:

YOGESHWARI SHRESTHA
Campus Roll No. 28
T.U. Regd.No: 7-2-424-37-2002
2nd Year Exam Roll No: 395

Birtamode, Nepal
May, 2009

RECOMMENDATION

This is to certify that the thesis

Submitted by

YOGESHWARI SHRESTHA

Entitled

AN

ANALYSIS OF PORTFOLIO MANAGEMENT

OF

SELECTED COMMERCIAL BANKS

IN NEPAL

Has been prepared as approved by this department in the prescribe format of faculty of Management. This thesis is forwarded for examination.

_____	_____	_____
Supervisor	External expert	Campus Chief
Mr. Raju		Mr. Suresh Chapagain

Date:

VIVA-VOCE SHEET

We have conducted the viva-voce examination of the thesis presented by

YOGESHWARI SHRESTHA

Entitled

AN

ANALYSIS OF PORTFOLIO MANAGEMENT

OF

SELECTED COMMERCIAL BANKS

IN NEPAL

and found the thesis to be the original work the student written according to the prescribed
format. We recommended this thesis to be accept as partial fulfillment of the requirements
for Master of Business Studies(M.B.S.)

VIVA VOCE COMMITTEE

Super visor ……..

External expert ……..

Campus chief ……..

Date:

DECLARATION

I hereby declare that the work reported in this thesis entitled " An Analysis of Portfolio management of Selected Commercial Banks in Nepal." submitted to Kankai Adarsha Awasiya Campus, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirements for the Master of Business Studies (M.B.S.) under the supervision and guidance of Mr. Raju Kafle and Mr. Shekhar Sharma, lecturers of Kankai Adarsha Awasiya Campus.

YOGESHWARI SHRESTHA
Researcher
T.U. Regd. No.: - 7-2-424-37-2002
Campus Roll. No= 28

Date:

ACKNOWLEDGEMENT

This project," An Analysis of Portfolio Management of Selected Commercial Bank in Nepal", is prepared for the partial fulfillment of the degree of Master of Business Studies (M.B.S.). While conducting this project work, I've received various inspiration moral support and encouragement from my respected teachers, friends and relatives. I would always like to express my sincere gratitude to all those who have directly or indirectly encouraged me to make this study

My special gratitude to Mr. Raju Kafle and Mr. Shekar Sharma under whose kind supervision I could complete this work. I would like to express my cordial gratitude to Mr. Suresh Chapagain, Campus Chief, Kankai Adarsha and other members of the campus, who have provided ideas, advice and guidance from the very beginning.

I cannot remain without thanking to the authors of published or unpublished materials whose work has been referred in preparing this thesis. I am also thankful to all my colleagues and the talent typer, Mongesh, Ramesh, Bishal who helped me to type and designing of this thesis neat and clear.

The responsibility for any errors of fact or interpretation solely rests on me.

Yogeshwari Shrestha
Birtamode

Table of Contents

Title Page
Recommendation
Viva-voce Sheet
Declaration
Acknowledgement
Table of contents
List of tables
List of figure
Abbreviations

Chapter I
INTRODUCTION

1.1	Background of Study	1
1.1.1	Commercial Banks and Investment	2
1.1.2	Investment Pattern of Nepalese Commercial Banks	3
1.1.3	Evolution of various commercial banks	7
1.1.4	Current situation of commercial Banks based on the First Eight Month data of 2007/08	8
1.1.5	Share Structure of Selected Commercial Banks	10
1.2	Profiles of the banks under study	10
1.3	Focus of the study	11
1.4	Statement of the problem	11
1.5	Objectives of the study	13
1.6	Significance of the study	13
1.7	limitation of the study	14
1.8	Organization of the study	15

Chapter II
REVIEW OF LITERATURE

2.1	Review of Books	17
2.1.1	Single Period Return	18
2.1.2	Portfolio Management	21
2.1.3	Systematic Risk/Undiversifiable Risk	25
2.1.4	Diversifiable Risk	25
2.1.5	Diversification	27
2.1.6	Various cases of correlation and Risk Condition	29
2.1.7	Minimum Risk Portfolio	30
2.1.8	Assets Allocation	31
2.1.9	Portfolio Analysis with Negative weights	31
2.1.10	Convexity of the Efficient Frontier	31
2.1.11	The Characteristics Line	33
2.1.12	Capital Assets Pricing Model	34
2.1.13	Arbitrage Pricing Theory	36

2.1.14	Portfolio Performance Evaluation	38
2.2	Review of Unpublished Thesis	40
2.3	Review of Related Studies	45

Chapter III
RESEARCH METHODOLOGY

3.1	Research Design	47
3.2	Population and Sample	48
3.3	Period of Study	50
3.4	Sources of Data	50
3.5	Data collection Procedure	51
3.6	Method of Analysis	51
3.7	Data Analysis Tools	51

Chapter IV
PRESENTATION AND ANALYSIS OF DATA

4.1	Presentation of Data	61
4.2	Analysis of Market Risk, Return and Coefficient of variation	62
4.3	Individual Assets Analysis	63
4.4	Comparative study of Risk and Return of the Selected Commercial Banks	79
4.5	Partitioning of Total risk into Systematic and unsystematic	80
4.6	The Security Market Live	84
4.7	Analysis of Portfolio Risk and Return	86
4.8	Portfolio Performance Evaluation	97
4.9	Major Findings of Study	99

Chapter V
SUMMARY, CONCLUSION AND RECOMMENDATION

5.1	Summary	102
5.2	Conclusion	103
5.3	Recommendation	105

List of Table

1.1	Evolution of various Commercial Banks	7
1.2	Share Structure of Selected Commercial Banks	10
3.1	Period of the study	50
4.1	Closing price of stock and cash dividend of selected banks from the FY 2002/03 to 2007/08	61
4.2	Calculation of market risk, return and coefficient of variance	62
4.3	MPS and DPS of NABIL BANK LTD.	63
4.4	Calculation of Expected rate of Return, S.D and C.V of NABIL BANK Ltd.	64
4.5	Calculation of Covariance, Beta Coefficient and correlation of NABIL BANK	65
4.6	MPS and DPS of SCBL	67
4.7	Calculation of ERR, S.D and C.V of SCBL	68
4.8	Calculation of Covariance, Beta coefficient and correlation of SCBL	69
4.9	MPS and DPS of NIBL	70
4.10	Calculation of ERR, S.D and C.V of NIBL	71
4.11	Calculation of Covariance of NIBL, Beta coefficient and correlation	72
4.12	MPS and DPS of HBL	73
4.13	Calculation of ERR, S.D and C.V of HBL	74
4.14	Calculation of Covariance, Beta Coefficient and Correlation of HBL	75
4.15	MPS and DPS of BOKL	76
4.16	Calculation of ERR, S.D and C.V of BOKL	77
4.17	Calculation of covariance, Beta coefficient and correlation of BOKL	78
4.18	Inter Bank ERR, S.D and C.V	79
4.19	Beta coefficient of Each Bank	81
4.20	Total Risk and its Partition into systematic and unsystematic risk.	83
4.21	Comparative Analysis of ERR and RRR of selected Commercial Banks	84
4.22	Table showing the optimal Portfolio of the selected Banks with Market and Effective of Diversification	97
4.23	Sharpe Performance Evaluation showing with Ranking of Portfolios	99

.

List of Figures

2.1	Efficient Frontier	32
2.2	The CAPM or Security Market Line	35
4.1	Figure of Multiple Bar Diagram showing stock price of selected Banks	62
4.2	Market Price Movement of NABIL BANK Ltd.	64
4.3	Market Price Movement of SCBL	67
4.4	Market Price Movement of NIBL	70
4.5	Market Price Movement of HBL	73
4.6	Market Price Movement of BOKL	77
4.7	Indication of RRR on Security Market line	86

ABBREVIATIONS

AD	= Anno Domini
BOKL	= Bank of Katmandu Limited
BS	= Bikram Sambat
CAPM	= Capital Asset Pricing Model
Co.	= company
CV	= Coefficient of Variation
DPS	= Dividend per Share
EPS	= Earning per Share
ERR	= Expected Rate of Return
FY	= Fiscal Year
Govt.	= Government
HBL	= Himalayan Bank Limited
Ltd.	= Limited
MBS	= Master of Business Studies
MPS	= Market Price Per Share
NABIL	= Nepal Arab Bank Limited
NBL	= Nepal Bank Limited
NEPSE	= Nepal Stock Exchange
NIBL	= Nepal Investment Bank Limited
No. NRB	= Number Nepal Rastra Bank
RBB	= Rastriya Banijaya Bank
RRR	= Required Rate of Bank
SCBL	= Standard Character Bank Limited
SD	= Standard Deviation
SML	= Security Market Line

Chapter 1

INTRODUCTION

1.1 Background of the study

Commercial banks play a vital role in the economic development of the country. They provide capital for the development of industry, trade, business and other sectors by investing the savings collected as deposits and also provide numerous services to their customers in view of facilitating their economic and social life. The proper mobilization and utilization of domestic resources become indispensable for any developing countries aspiring for a sustainable economic development. Likewise, integrated and speedy development of the country is possible only if competitive banking and financial services reach every nook and corner of the country.

Successful formulation and effective implementation of investment policy is the prime essential for the successful performance of banks and other financial institution. A good investment policy has a positive impact on economic development of the country and vice-versa. A healthy development of any bank depends heavily upon its investment policy. The investment policy of the bank helps the investment operation of the bank to be efficient and profitable by minimizing the interest risk. An investment is the commitment of money that is expected to generate additional money. So expecting the additional return we sacrifice the current resources. Wherever we talk about return, risk must not be avoided.

Portfolio Management activities of Nepalese Commercial Banks are in developing stage the reason behind not using such activities by

commercial banks may be due to unawareness about Portfolio Management and its usefulness, hesitation of taking risk and lack of proper techniques to run such activities in the best and successful manner.

Portfolio is collection of different types of securities in different sectors. Portfolio Management is related to the efficient portfolio investment in financial assets. Portfolio Analysis considers the determination of future risk and return in holding various blend of individual securities. The combination of investment asset is called a portfolio. If investor holds a well diversified portfolio then his concern should be the expected return and risk of portfolio rather than individual assets or securities.

1.1.1 Commercial Banks and Investment Portfolio

Commercial Banks plays an important role in the modern economy as they deal in accepting deposits of persons and institution and giving loans against securities. Commercial bank must mobilize its deposits and other funds to profitable, secured, stable and marketable sector. As a result, it can earn a handsome profit as well as it should be secured and can be converted into cash whenever need. Investment policy provides the bank several inputs through which they can handle their investment operation efficiently ensuring that maximum returns with minimum risk which ultimately leads the banks to the path of success. Thus, investment is the most important function of commercial banks. So, a bank has to be very cautions while investing their funds in various sectors i.e investment portfolio. The success of a bank heavily depends upon the proper management of its investable funds.

Investment Portfolio is the one in which the income or profit of the bank depends upon directly. Hence, the bank should never invest its fund in those securities which are subject to much depreciation and fluctuations because a little difference may cause a great loss. It must not invest its fund into speculative businessman who may be bankrupt at once and who may earn million in a minute, the bank should accept that type of securities which are commercial, durable, marketable, stable, transferable and high market prices. A commercial bank can maximize its volume of wealth through maximization of return on their investment and lending. So they must invest their funds where they gain maximum profit.

Commercial banks must follow the rules and regulations as well as different direction issued by Central Bank, Ministry of Finance, Ministry of Law and other while mobilizing its funds. So, the bank should invest its funds in legal securities only. The commercial banks fully consider the fundamental principles such as length of time, purpose, profitability, safety while making investment portfolio. The investment portfolio should be carefully analyzed so that the investment should ensure minimum risk and maximum return. So, commercial banks should incorporate several elements such as regulatory environment the availability of funds, the selection of risk, investment portfolio balance term structure of the liabilities, etc while making investment decision.

1.1.2 Investment Pattern of Nepalese Commercial Banks.

The evolution of the organized financial system in Nepal has a more recent history than in other countries of the world. Banking history of Nepal is not more than of six decade. The concept of banking system was introduced in Nepal Bank ltd. in 1937 A.D. It was established to help government policy to develop economic and business activities

in the country. After realizing the need of another bank, later in 1956, the first Central Bank names as the “Nepal Rastra Bank” was set up with an objectives of supervising, protection and directing the function of commercial banking activities. After realizing the need of another bank, Rastriya Banijya Bank was set up in 1966 A.D. to spread banking services to both rural and urban areas. As the country moved towards economic liberalization in 1980 A.D. foreign banks were invited to operate in Nepal. The financial scenario has changed with the introduction of joint ventures in 1984, number of commercial banks have been increasing. Since then various financial institutions like JVBS, Domestic commercial Banks, Development Bank, Finance Companies, Co-Operative Banks, Credit Guarantee Corporation, Employee Provident Fund, National Insurance Corporation, Nepal Stock Exchange have come into existence to cater the financial needs of the country there by assisting financial development of the country.

After restoration of democracy in the country in 1990, government highlights the agenda of economic liberalization policies, were announced and emphasized due to invite Foreign Direct Investment (FDI) in the banking sectors in Nepal. There were only two banks prior to 1980s. They are NBL and RBB. All the three commercial banks of 1980s were established as joint venture bank. Similarly six country commercial banks of past 1990s also came into operations as joint venture banks.

The banking sectors in Nepal started with the establishment of Nepal Bank Limited. Today, we have got 23 commercial banks in operation. The commercial banks of Nepal can be categorized into two types – Public sectors and private sectors. Public sector bank includes the two old banks NBL and RBB. Private sectors comprise the other 21 banks.

The NBL was incorporated in 1937 A.D. with an authorized capital shares of Rs 100 lakhs. At first, the majority of shares were owned by the government. Now government owns only 40% shares with the suggestion of World Bank to transfer the ownership to the private sector for better functioning of the financial sectors. But it does not breed results as expected.

In 1956 A.D. the Central Bank of Nepal (Nepal Rastra Bank) was established with the purpose of developing Banking system in the country to promote industry, trade and agriculture as well as to circulate Nepalese Currency all over the country.

Rastriya Banijya Bank, a full government owned bank was established in 1966 A.D. RBB is the largest commercial bank and plays a major role in the economy.

NABIL (earlier known as Nepal Arab Bank ltd) is the first private commercial bank opened in the country. It was established in 1984 A.D. with a paid up equity of Rs 30 million.

Nepal Investment Bank ltd (earlier known as Nepal Indosuez Bank Ltd) is one of the oldest private joint venture bank in the country that started its business in 1986 A.D.

Standard Chartered Bank Nepal (earlier known as Nepal Grindlays Bank Ltd) came into existence in 1987 A.D. as a joint venture between ANZ Grindlays and Nepal Bank ltd. It started its business with Rs 30 million paid up capital. After acquiring of the ANZ operation in the region by the Standard Chartered, it has become a subsidiary of SC Grindlays, which holds 50% of share holding in the bank. Now, from the date July 2001 A.D., it is named as Standard Chartered Bank ltd after takeover by Standard Chartered.

Himalayan Bank Ltd, is a joint venture with Habib Bank of Pakistan, started its operation in early 1993 A.D. with paid up capital of Rs 60 million.

Nepal SBI Bank ltd. Is joint venture between Employees Provident Fund and State Bank of India, where in Indian Bank holds 505 of the equity, the initial paid up capital was Rs 119.95 million in 1993 A.D.

Nepal Bangladesh Bank was also established in 1993 A.D. in technical collaboration with IFIC Bank Ltd of Bangladesh.

Everest Bank Ltd, started its operation in October 1994 A.D. It entered into joint venture with Punjab National Bank of India (PNB) in January 1997 A.D. PNB holds 20% equity stocks in the bank.

Bank of Kathmandu ltd was started in 1995 A.D. as a joint venture with Syam Bank of Thailand. Nepal Credit and Commerce Bank ltd (earlier known as Nepal Bank of Ceylon Ltd) is a joint venture with a leading Bank of SriLanka and was started in 1996 A.D.

Lumbini Bank Ltd was established in the year 1998 A.D. It does not have any joint venture yet it has employed a senior banker from India to head its operation.

Machapuchhre Bank ltd started its operation as a regional bank from Pokhara during the year 2000 A.D.

Kumari Bank ltd started its operation with the issued capital of NPR 500 million during 2001 A.D.

Laxmi Bank ltd has started its operation from April 2002 A.D. as a regional bank with head office in Birgunj. The bank has its issued and paid up capital as NPR 500 million and NPR 275 million respectively.

Siddhartha Bank Ltd is the commercial Bank starts its operation from December, 2002 A.D. with the issued capital of NPR 500 million.

1.1.3 Evolution of Various Commercial Banks

An overview of the historical evolution of the various commercial banks is shown in the table below in a chronological order.

Commercial Banks	Established Date	Head Office
Nepal Bank Ltd	1937/11/15	Ktm
Rastriya Banijya Bank	1966/01/23	Ktm
Nabil Bank	1984/07/16	Ktm
Nepal Investment Bank Ltd	1986/02/27	Ktm
Standard Chartered Bank	1987/01/30	Ktm
Himalayan Bank Ltd	1993/01/18	Ktm
Nepal Bangladesh Bank	1993/06/05	Ktm
Nepal SBI Bank Ltd	1993/07/07	Ktm
Everest Bank Ltd	1994/10/18	Ktm
Bank of Kathmandu Ltd	1995/03/12	Ktm
Nepal Credit and Commercial Bank	1996/10/14	Siddhartha Nagar
Lumbini Bank Ltd	1998/07/17	Narayanghat
Nepal Industrial and commercial Bank Ltd	1998/07/2	Biratnagar
Machhapuchhre Bank Ltd	2000/10/03	Ktm
Kumari Bank Ltd	2001/04/03	Pokhara
Laxmi Bank Ltd	2002/04/03	Ktm
Siddhartha Bank Ltd	2002/12/24	Ktm
Agricultural Development Bank Ltd	1968/01/02	Ktm

Global Bank Ltd	2007/01/02	Birgunj, Parsa
Citizen Bank Ltd	2007/06/21	Ktm
Prime Bank Ltd	2007/09/24	Ktm
Sunrise Bank Ltd	2007/10/12	Ktm
Bank of Asia Nepal Ltd	2007/10/12	Ktm

Table No 1.1 Source:- http://brf.nrb.org.np

1.1.4 Current Situation of Commercial Banks based on the first eight months data of 2007/08.

Commercial banks have Rs 129.25 billion liquid assets as of mid march 2008, including Rs 60.34 billion holding of government securities, Liquidity deposit ratio of commercial banks came down to 34.6% in the previous from 37.6% in the previous year
on account of higher private sector credit off-take. The liquid funds of commercial banks increased by 6.8% amounting Rs 69.61 billion in the review period. Such funds had increased by 6.4% in the previous year. Of the liquid funds, the deposits of commercial banks with NRB increased by 6.7% amounting Rs 24.39 billion in the review period compared to a growth of 5.9% last year for managing liquidity, commercial banks increased the use of Standing Liquidity Facility (SLF) and Inter bank transactions in the review period. Inter bank transactions stood at Rs 190.82 billion in the review period compared to Rs 111.21 billion in the previous year. Moreover, commercial bank borrowed Rs 72.5 billion under SLF in the review period compared to Rs 8.49 billion last year.

Commercial banks mobilized additional deposits of Rs 41.14 billion in the first eight months of 2007/08 compared to Rs 38.80 billion in the same period of the previous year. Out of the total deposits mobilized, saving deposits stood at the top with Rs 21.23 billion (51.6%) followed by fixed deposits of Rs 16.53 billion (40.2%). Out of total resource mobilized of Rs

64.07 billion in the review period, private sector credit remained at Rs 48.89 billion (78.5%). Commercial banks claims to the private sector actually increased by 18.9% in the review period compared to an increase of 10.3% in the previous year. As a result, the credit deposit ratio increased to 87.0% in the review period from 82.1% last year, commercial banks provided credit of Rs 10.99 billion (22.5%) to production sector, Rs 7.35 billion (15%) to construction, Rs 6.51 billion (13.3%) to wholesale and retail business, Rs 4.84 billion (9.9%) to real state, Rs 2.24 billion (4.6%) to tourism, education and health services and Rs 10.29 billion (21%) to miscellaneous sectors including margin lending.

The weighted average monthly inter bank rate remained at 5.07% as in Mid March 2008 compared to 1.39% in Mid March 2006. A decline in excess liquidity of commercial banks pushed up short term interest rates. In spite of marginal hike in interest rates on deposits of more than a year by some commercial banks, there have been no noticeable changes in interest rates on the other deposits and lending in the review period. Interest rates on saving deposits still remained at 2 to 5.5%. Interest on fixed deposits ranged between 1.75 and 5.75% for more than one year, and between 2.75 and 3.75% for more than two years. Interest rates on industrial loan also vary among commercial banks from minimum of 7% to maximum of 13%, whereas interest rates for the commercial loans ranged from 8% to 13.5%.

1.1.5 Share Structure of Selected Commercial Banks.

	NABIL	NIBL
Authorized capital	Rs 500,000,000	Rs 590,000,000
Issued Capital	Rs 491,654,400	295,293,000
Paid up Capital	Rs 491,654,400	295,293,000
Par value of Share	Rs 100	Rs 100
NO. of Share holders	5076	2780
No. of Branches	17	13
Incorporation year	2041B.S. (1984 A.D.)	2042 B.S. (1985 A.D.)
Listing Date in NEPSE	2042-09-08(1986 A.D.)	2044-08-05(1987 A.D.)

SCBL	HBL	BOKL
Rs 1,000,000,000	Rs 1,000,000,000	Rs 1,000,000,000
500,000,000	650,000,000	500,000,000
374,640,400	536,250,000	463,580,900
Rs 100	Rs 100	Rs 100
5037	7210	23316
7	17	10
2042 B.S. (1985 A.D.)	2048 B.S. (1992 A.D.)	2050 B.S. (1994 A.D.)
2045-03-21(1988 A.D.)	2050-03-21(1993 A.D.)	2054-04-02(1997 A.D.)

Table No 1.2

1.2 Profiles of Study

This research study is concerned with the portfolio management and analysis of selected commercial banks – NABIL, NIBL, SCBL, HBL and BOKL. This study is based on secondary data obtained from securities board and NEPSE. The five above sample banks have been chosen on the random basis for the study. In the chapter-4 Analysis and Presentation of data, the general introduction of the selected commercial banks under study will be explained.

1.3 Focus of the Study

Economic development of a country largely depends upon the effective mobilization of its internal resources. Bank and other financial institutions play vital role in financial and other services primarily to commercial services occasionally to industrial and agricultural sectors. Their main objectives are to collect the idle scattered resources of the economy and to mobilize them in productive sectors. In this context, investment portfolio becomes much more important. Investment decision is very difficult for general people. Where there is investment, there exists risk. The investor should calculate return and risk while taking any investment decision.

This study is focused on the analysis of risk and return and how and investor take investment decision in shares of commercial banks in Nepal. Among the several commercial banks operating in Nepal, investment Portfolio of NABIL, SCBL, NIBL, HBL and BOKL are the focus of the study. The study is focused in analyzing the various aspects of investment Portfolio of NABIL, SCBL, NIBL, HBL and BOKL also the risk return attributes of the investment of the selected commercial banks.

1.4 Statement of the Problem

Nowadays people are attracted to invest in shares for the purpose of getting greater returns. They have different expectations about the risk, return and future value in terms of dividend interest and capital gain. And they are also independent to invest their funds in either individual stock or portfolio. Investors' attitudes and perception plays a vital role in rational decision, which is influenced by the knowledge and access to the data required for analysis. Potential investors feel more risk to invest in

common stock than it really has the risk. Some investors are risk seeker and some are risk avoider since share price, return, dividend and risk are always uncertain. So, in this study, I will try to construct the portfolio's in which the investor would earn maximum expected return at the same risk class or minimum risk at its same level of return. Accurate information and unbiased analysis are essential for their confidence towards the stock investment.

Nepalese Commercial banks are aiming to contribute to the nation. Lack of information and knowledge is a great problem faced by individual investor who are being manipulated and exploited by the financial institution and other market intermediaries; Nepalese investors and financial institutions lack knowledge about the functions of stock exchange, corporate funds to investments, knowledge and practice of portfolio to diversify the risk and return. Nepal Stock Exchange has been providing institutional support to capital market with the establishment of Security Exchange Center in 1977.

The above facts inspire to study what are the factors that affect the investment portfolio of the commercial banks. Following are the major problems that have been identified for the purpose of this study.

- What is the risk and risk position of selected commercial banks?
- What is the proportion of systematic risk in comparison to total risk?
- What is the portfolio management situation of selected commercial banks?
- Would portfolio constructed from within be helpful for the evaluation of investment and advances?

1.5 Objectives of the Study

Nepalese investors are facing above mentioned problems in the field of setting their investment policy, analyzing financial assets, selection and evaluation of portfolios. The specific objectives of the study are subject to find the risk minimizing assets to certain constraints. Taking the subject matter in consideration, the following objectives are derived from the study.

- To analyze the risk and return ratios of the selected commercial banks.
- To examine the proportion of systematic risk on the stock of commercial banks.
- To survey the existing situation of portfolio management of Nepalese Commercial Banks.
- To evaluate the effects of correlation in the construction of portfolio and stock is overpriced or under priced compared to require rate of return.
- To measure the systematic, unsystematic risk and analyze them in portfolio construction process.

1.6 Significance of the study

Corporate sector is expanding but there is an information gap between the management of Nepalese banks and Nepalese investors who eager to invest in the shares of these banks. Some investors are still reluctant to invest in shares and invest in the shares on the trial and error methods. So, the present study is devoted to analyze the prevailing portfolio management adopted by the Nepalese commercial banks and tries to throw some light in the Nepalese context. Thus, it provides important guidelines to the management in taking investment decisions.

As this study is for the partial fulfillment of the requirement for the MBS programme, it will be of multi dimensional significance to investors, students, banks and general public.

- This study will be helpful to investors for committing their funds expecting the return by assuming the risk.
- This analysis will create awareness to utilize the scarce resources.
- This comparative analysis will help the banks to know about their financial performance.
- It will be helpful to know about the investment portfolio of Nepalese investors.

1.7 Limitations of the study

This study can't cover all the aspects of the selected banks due to certain time period. So, this study will be limited by the followings:

- This study has been focused on only 5 commercial banks. They are NABIL, SCBL, NIBL, HBL and BOKL.
- There are many factors that affect decision and valuation of the firm. However, only those factors related to investment portfolio have been considered in this study.
- Only 6 years period will be taken for the study i.e. from fiscal year 2002/03 to fiscal year 2007/08.
- Only in few cases, the study is based on secondary data and will be analyzed to interpret the result emerging from decision. So, the result depends on the reliability and accuracy of secondary data.
- This study is for partial fulfillment of MBS programme and it cannot be considered as a masterpiece.
- This study is bounded with time and resources constraints which limits the study.

1.8 Organization of the Study.

This study has been organized into five chapters. Each of them has been devoted to some aspects of the study of investment policy. The titles of each chapter are as follows:

Chapter I: - Introduction

Chapter II: - Literature Review

Chapter III: - Research Methodology

Chapter IV: - Presentation and Analysis of Data

Chapter V: - Summary, Conclusion and Recommendation

Chapter I – Introduction → It deals with

- Background of the study
- Focus of the study
- Statement of the study
- Objectives of the study
- Significance of the study
- Organization of the study

Chapter II – Literature Review →

It deals with review of literature including conceptual frame work, review of major books, journal, articles, previous thesis, etc. The conceptual framework about the investment portfolio showing the risk return analysis is done in this chapter.

Chapter III – Research Methodology →

It describes the research methodology employed in the study. It includes methodology used to achieve the objective of the study, sources of data, population and sample, financial (portfolio return and expected return, minimum risk portfolio and portfolio management) and statistical tools (expected return, standard deviation, coefficient of variance and beta coefficient.)

Chapter IV – Presentation and analysis of Data →

It deals with the presentation, analysis and interpretation of relevant data using financial and statistical tools as described in chapter III.

Chapter V – Summary, Conclusion and Recommendation →

This is the last chapter containing the summary of the whole study. It deals with the issues and gaps, conclusion and recommendation and pragmatic suggestion of the study.

The appendix and bibliography are incorporated at the end of the study.

Chapter II

REVIEW OF LITERATURE

This chapter provides some glimpses on the literature that is available in the topic “Analysis of Portfolio Management of Selected Nepalese Commercial Banks”. This study mainly focused on the analysis of the Portfolio that exists in most of the commercial banks. The main objective of this study is to find out the portfolio risk and return. This chapter especially covers a comprehensive review of the published and unpublished work by academician and scholars. The purpose of the literature review is to ensure that no important variable is ignored has past been found repeatedly to have had an impact on the problem review of literature is conducted in this study into three sections or categories.

2.1 Review of Books

Nepal’s Banking history had begun with the establishment of Nepal Bank Limited in 1937 A.D. Later on, other than commercial banks like Rastriya Banijya Bank (1996 A.D.), Agricultural Development Bank (1968 A.D.) was established to continue the banking sector’s development. In 1980 A.D., the government introduced ‘Financial Sector Reform’. Nepal allowed the entry of foreign banks as Joint Venture Bank with upto maximum of 50% equity participation. Now there are 23 Commercial Banks operating in Nepal aiming to contribute in trade and commercial sector of the nation (Rastriya Bank Samachar, 2061)

In Nepalese context, institutional set up of securities market begun along with the establishment of Security Exchange Center in 1977. Rational investors must be motivated providing investment related information and good knowledge to analyze risk and return behavior of stock and portfolio

to develop stock market in Nepal. All these activities ultimately help them to be confidence and to improve stock investment and efficiency.

Commercial banks are the backbone of developing as well as growing industries. Commercial bank collects the saving and investment of the economy and reinvests them in productive sectors. So, banks are essential sector of the business activity, which are established to promote the whole industry in the economy. Commercial banks refer to such type of banks other than specified banks related to cooperative, agriculture, industrial and which deal in money exchange accepting deposits and advancing loans, etc. (commercial banks act, 2031)

Investment positions are undertaken with the goal of earning some expected rate of return. Investors seek to minimize inefficient deviations from this expected rate of return. Diversification is essential to the creation of an efficient investment because it can reduce the variability of returns around the expected return. So, the portfolio manager seeking efficient investment works with two kinds of statistics expected return statistics and risk statistics. The objective of portfolio analysis is to develop a portfolio that has the maximum return at whatever level of risk the investor deems appropriate.

2.1.1 (i) The single Period Rate of Return

The single period rate of return is the basic random variable in investments analysis. The rate of return concept is important because it measures the speed at which the investor's wealth increases or decreases. An investment's single period rate of return, denoted 'r', is simply the total return an investment would receive during the investment period or holding period stated as a percent of the investment's price at the start of the holding period.

$$\text{Single period rate} = \frac{\textbf{Ending wealth - Begining Wealth of return}}{\textbf{Begining Wealth (Purchase Price)}}$$

An investor can obtain two kinds of income from an investment in a share of stock or a bond:

1. Income from price appreciation (or losses from price depreciation), sometimes called capital gains (or losses). This quantity is denoted P_t-P_{t-1}.
2. Cash flow income from cash dividend or coupon interest payments, represented by the convention Ct.

The sum of these two sources of income (or loss) equals the change in the invested wealth during any given holding period. The rate of return formula can be restated in a form appropriate for almost any investment.

$$r_t = \frac{\text{Price Change + Cash flow (if any)}}{\text{Price at the beginning of the period}} = \frac{(P_t - P_{t-1}) + C_t}{P_{t-1}}$$

Where,

P_t = Market price at end of period t

P_{t-1} = Price at end of period t-1

C_t = Cash flow income received during the t^{th} period.

2.1.1 (ii) The Expected Rate of Return

Investment decisions are based on expectation about the future. The expected rate of return for any asset is the weighted average rate of return, using the probability of each rate of return as the weight. The expected rate of return is calculated by summing the products of the rates of return and their respective probabilities.

$$\text{Expected Rate of Return, } E(r) = \sum_{T=1}^{r} P_t r_t$$

Where,

R_t = Rate of return at time t

P_t = Probability of occurring return at period t

R^{th} is the t^{th} single period rate of return from an asset; P_t denotes the probability that the t^{th} rate of return will take place, and therefore % possible rate of return.

2.1.1 (iii) Statistical Risk Analysis

When analyzing investments, analysts define risk as variability of return. Thus, the wider the probability distribution of returns, the riskier the investment. Risks refers to the chance that unfavorable event will occur.

Investors can quantify the risk (uncertainty) by using statistical measures. Two possible measures of risk have received support in theoretical work on portfolio theory. Variance and the standard deviation of the estimated distribution of expected returns. The larger the variance for expected rate of return, the greater the dispersion of expected return and greater the uncertainty, or risk, of the investment.

$$\text{Var}(r) \text{ or } \sigma^2 = \sum_{T=1}^{T} P_t [r_t - E(r)]^2$$

$$\sigma^2 = P_l [r_l - E(r)]^2 + P_2 [r_2 - E(r)]^2 + \ldots\ldots\ldots\ldots P_T [r_t - E(r)]^2$$

Where,

r_t = Realized rate of return on asset at the time period ‘t’

E(r) = Expected rate of return on asset at the time period ‘t’

P_t = Probability of period ‘t’

The standard deviation and the variance are equally acceptable and conceptually equivalent quantitative measure of an asset's total risk the standard deviation is defined as the positive square root of average sum of square of deviation from the arithmetic mean of distribution. Simply, the standard deviation is the square root of the variance.

$$\text{Standard Deviation, } \sigma = \sqrt{\text{var}(r)}$$

$$\text{Or, } \quad \sigma = \sum_{t=1}^{T} \sqrt{P_t [r_t - E(r)]^2}$$

2.1.1 (iv) A relative measure of Risk (Coefficient of Variation)

In some case, an unadjusted variance or standard deviation can be misleading. If condition for two or more investment alternatives is not similar i.e. if there are major difference in the expected rates of return. It is necessary to use a measure of relative variability to indicate risk per unit of expected return.

$$\text{Coefficient of variation (C.V)} = \frac{\text{Standard deviation Return}}{\text{Expected Rate of Return}} = \frac{\sigma_i}{E(r_i)}$$

This measure of relative variability and risk is used by financial analyst to compare alternative investments.

2.1.2 Portfolio Management

Most securities available for investment have uncertain outcome are thus risky. The basic problem facing each investor is to determine which particular risky securities to own. Portfolio is a collection of

securities; this problem is equivalent to the investors selecting the optimal portfolio from a set of possible portfolios. In other words, the creation of an optimum investment portfolio is not simply a matter of combining a lot of unique individual securities that have desirable risk return characteristics. Hence, a good portfolio is not simply a collection of individually good investments. The recognition of what is important is creating a portfolio was demonstrated in the derivation of portfolio theory.

Portfolio management is the art of handling a pool of funds so that it not only presences its original worth but also overtime appreciates involve and yields an adequate return consistent with the level of risk assumed. The optimal portfolio for an investor is defined as the tendency point between the efficient set of portfolio and the investor highest indifference curve.

2.1.2 (i) Expected Rate of Return Portfolio

The expected rate of return for a portfolio of investment is simply the weighted average of the expected rate of return for the individual investment in the portfolio. The weights are the proportion of total values for the investment.

$$E(R_p) = Wi\ E(R_i) + W_j\ E(R_j)$$

Where,

$E(R_p)$ = Expected return on portfolio of stock I & J

W_i = Weight of wealth invested on a asset i.

W_j = Weight of wealth invested on asset j.

R_i = Return on asset i

R_j = Return on asset j

2.1.2 (ii) Portfolio Standard Deviation / Portfolio risk

The standard deviation of return for a portfolio of assets is the measure of risk for a portfolio. Harry Markowitz derived the formula for computing the standard deviation of a portfolio of assets. The formula indicates that the standard deviation for portfolio assets is the function of the weighted average of the individual variance (where the weight is squared, plus the weighted covariance between all the assets in the portfolio.) The standard deviation for a portfolio of assets encompasses not only the variance of the individual assets but also includes the covariance between pairs of individual assets in the portfolio. Thus, portfolio is the combination of various assets where the investor could earn maximum expected return as its same risk class or minimum risk at its same level of return.

$$\sigma p = \sqrt{(W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + 2\,Cov_{AB}W_AW_B)}$$

Or $$\sigma p = \sqrt{W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + 2\,\rho_{AB} \times \sigma_A \times \sigma_B \times W_A \times W_B}$$

Where,

σp = Standard deviation of portfolio

W_A = Weight of asset A

W_B = Weight of asset B

σ_A = Standard deviation of asset A

σ_B = Standard deviation of asset B

Cov_{AB} = Covariance between the rate of return for asset A and B

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

Variance of Portfolio $(\sigma p^2) = W_A^2\sigma^2_A + W_B^2\sigma^2_B + 2\,Cov_{AB}W_AW_B$

Or $\sigma^2 p = W_A^2\sigma^2_A + W_B^2\sigma^2_B + 2\,\rho_{AB} \times \sigma_A \times \sigma_B \times W_A \times W_B$

2.1.2 (iii) Covariance of Return

Covariance of return is the degree to which tow variables more together relative to their individual for two mean values over time. A positive covariance means that the rate of return for two investments tend to more in the same direction relative to their individual means during the same time period. In contrast, a negative covariance indicates that the rates of return for two investments tend to move in different directions relative to their means during specified time intervals overtime.

$$Cov_{AB} = \sum[\{R_A - E(R_A)\}\ \{R_B - E(R_B)\}$$

2.1.2 (iv) Correlation Coefficient of Return

Correlation analysis refers to the techniques used in measuring the relationship between two variables. Standardizing the covariance by the individual standard deviation yields correlation coefficient, which can vary only -1 to +1 indicates the return of the stock move together incompletely linear manner. A value of -1 indicates a perfect negative relationship between the two return series. The formula of correlation for efficient is

$$\rho_{AB} = \frac{Cov_{AB}}{\sigma_A \sigma_B}$$

Where,

ρ_{AB} = Correlation coefficient of return of stock A & B

Cov_{AB} = Covariance of the rate of return of stock A & B

σ_A = Standard deviation of the return of stock A

σ_B = Standard deviation of the return of stock B

2.1.3 Systematic Risk / Undiversifiable Risk

Systematic risk of a security represents that portion of its total risk which is attributable to general economic wide factors like growth rate of GNP, Interest rates, the level of government spending, money supply and inflation rate. Since these factors affect all firm to a greater or lesser degree, investors cannot avoid the risk arising from them, however, diversified their portfolio may be. It is also called market risk or unavoidable risk or beta risk as it affects all securities.

Mathematically the systematic risk (beta) is measured as the covariance of the stock returns with the market returns expressed per unit of market variance as follows:

$$\text{Beta Coefficient } (\beta i) = \frac{\text{Cov}(r_A r_m)}{\sigma_m^2} = \frac{\rho_{Am}\sigma_A\sigma_B}{\sigma_m^2}$$

Where,

$\text{Cov}(r_A r_m)$ = Covariance between the returns of security A and market

σ_m^2 = Variance of market return

ρ_{Am} = correlation between the return of security A and market

2.1.4 Diversifiable Risk

The diversifiable risk of a security represents that portion of the total risk which stems from firm specific factors like the development of new product or labour strike, or the emergence of a new competitor. Event of this nature primarily affect the specific firm and not all firms in general. Hence, diversifiable risk of a stock can be washed by combining it with other stocks. In a diversified portfolio, diversifiable risk of different stocks tends to cancel each other. It is also referred to as unique risk or unsystematic risk.

I. Partitioning the total Risk

Total risk can be measured by the variance of returns, denoted Var(r). This measure of total risk is partitioned into its systematic and unsystematic components.

Var(ri) = Total risk of the asset

= $Var(ai+bir_m+e)$ [substituting $(ai+bir_m+e)$ for r_1]

= $var(bir_m)+var(e)$ [since $var(ai)=0$]

= $\beta i^2 var(rm)+var(e)$ [since $var(\beta ir_m) = \beta i^2 var(r_m)$]

Systematic risk + unsystematic risk

The unsystematic risk measure, var(e) is called the residual variance (standard error squared) in regression terms.

II. Proportion of systematic risk / Undiversifiable risk

The percentage of total risk that is systematic can be measured by the coefficient of determination ρ^2 (that is the characteristic line's squared correlation coefficient)

$$\text{Proportion of systematic risk} = \frac{\text{Systematic risk x 100}}{\text{Total risk}} = \frac{\beta i^2 var(rm)}{Var(ri)}$$

$= \rho^2$ i.e coefficient of correlation

III. Proportion of unsystematic risk / diversifiable risk

The percentage of unsystematic risk equals $(1.0 - \rho^2)$

$$\text{Proportion of systematic risk} = \frac{\text{Unsystematic risk}}{\text{Total risk}} = \frac{var(re)}{Var(ri)} = 1- \rho^2$$

2.1.5 Diversification

Investment positions are undertaken with the goal of earning some expected rate of return. Investors seek to minimize inefficient deviation from this expected rate of return. Diversification is essential to the creation of an investment because it can reduce the variability of returns around the expected return. An investor's objective is to make maximum return from his/her fund at the lower risk. By investing in a single asset, investor cannot achieve his/her objective. But it is only possible through portfolio. A portfolio is a combination of securities. By the help of portfolio, risk can be diversified.

Forms of Diversification

There are some different diversification techniques for reducing a portfolio's risk. The portfolio approaches usually assume one of the following forms of diversification.

I. Simple Diversification

Simple diversification can be defined as "not putting all the eggs in one basket" or "spreading the risks". Simple diversification reduces a portfolio's total diversifiable risk to zero and only the undiversifiable risk remains. Simple diversification is the random selection of securities that are to be added to a portfolio.

II. Diversification Across Industries

Under diversification across industries, securities are taken from many different industries to form portfolio. Some investment counselors advocate selecting securities from different industries to achieve better diversification. It is certainty better to follow this advice than to select all the securities in a portfolio from one

industry. But, empirical research has shown that diversifying across industries is not much better than simply selecting securities randomly.

III. Superfluous Diversification (over Diversification)

If 10 to 15 different assets are selected for a portfolio, the maximum risk reduction benefits from simple diversification have most likely been attained. Further spreading of the portfolio's assets is superfluous diversification and should be avoided. In the simple diversification, 10-15 securities are selected for a portfolio while superfluous diversification include more than that of simple diversification. Superfluous diversification will usually result in the following portfolio management problems – impossibility of good portfolio management, high search costs and high transaction costs.

IV. Simply diversification Across Quality Rating Categories

The securities available in the market are rated on the default risk by rating agencies. Under this technique the portfolio is formed from same quality rating assets. From the various analyses, it is found that the highest quality portfolio of randomly diversified stock was able to achieve lower levels of risk than the simply diversified portfolios of lower quality stocks.

V. 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 returns. Markowitz diversification is more analytical than simple

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

It is a logical error to draw general conclusions from specific cases. Therefore, we will consider a more general analysis of Markowitz diversification which focuses on the correlation between assets.

Markowitz "Portfolio Selection", Journal of Finance, March 1952, p-89. There is a natural trade off between risk and return in the market. But at any given level of expected return, Markowitz diversification can reduce risk more than simple diversification.

Thus, Markowitz diversification is the combining of assets, which are less than perfectly positively correlated in order to reduce portfolio risk. Portfolio risk reduction depends on the numbers of securities in the portfolio, correlation between the securities and weight of the individual securities in the portfolio (Francis 7th edition, P-234)

2.1.6 Various cases of Correlation and Risk Condition

Case – 1: Perfect Positive correlation ($\rho_{ij} = +1$)

Returns on two perfectly positively correlated stocks would move up and down together and a portfolio consisting of two such stocks would be exactly as risky as individual stocks. Thus, diversification does nothing to reduce risk if the portfolio consists of perfectly positive correlated stock.

Case – 2: Perfect Negative Correlation ($\rho_{ij} = -1$)

Returns on two perfectly negatively correlates stocks would move perfectly together but in exactly opposite directions. In this condition, risk can be completely eliminated. Perfect negative correlation is almost never found in the real world.

Case – 3: No relationship between returns ($\rho_{ij} = 0$)

When the correlation between two stocks is exactly zero, there is no relationship between the returns; they are independent of each other. In this condition, some risk can be reduced.

Case – 4: Intermediate risk ($\rho_{ij} = +0.5$)

Most stock are positively correlated, but not perfectly. On average the returns on two stock would lie on the range of +0.4 and +0.75 under this condition combining stocks into portfolio's reduces risk but does not eliminate it completely.

2.1.7 Minimum Risk Portfolio

It is the portfolio with the lowest level of risk in the efficient frontier. It is also called risk minimizing weight or optimal weight. In two stock portfolios, the optimal weight to invest in stock A and B are calculated as follows:

$$W_A = \frac{\sigma_B^2 - \rho_{AB} \times \sigma_A \times \sigma_B}{\sigma_A^2 + \sigma_B^2 - 2\,\rho_{AB} \times \sigma_A \times \sigma_B}$$

$$W_B = 1 - W_A$$

Where,

W_A = Optimal weight to invest in stock A

W_B = Optimal weight to invest in stock B

2.1.8 Asset Allocation

Asset allocation decisions deals with attaining the optimal proportions of investments from different assets categories. Portfolio manager's focus primarily on the stock bond mix, the decision often boils down trying to determine the best long run stock bond distribution. Individual securities are not analyzed when solving asset allocation problems. Risk and return statistics that are supposedly representative of different asset categories are analyzed.

2.1.9 Portfolio Analysis with Negative Weights

If an asset has a negative weight, two economic representations are possible. First, negative weight can be used to represent a short sale. Second, a negative weight may indicate that the investor created a leveraged (or borrowed, or margined) portfolio by selling (or issuing) a security that has the same risk and return statistics as the asset with the negative weight.

2.1.10 Convexity of the Efficient Frontier

The risk and return of all individual assets (such as stocks, bonds, options, old paintings, commodity, future contracts, gold etc) can be plotted in risk return space. They are represented by the dots in the figure 1.1, which represents the set of all investment

opportunities available in the world. If we consider the infinite number of portfolio's that could be formed from two or more securities and plotted portfolios' expected return and risk, we would create the figure that is drawn below

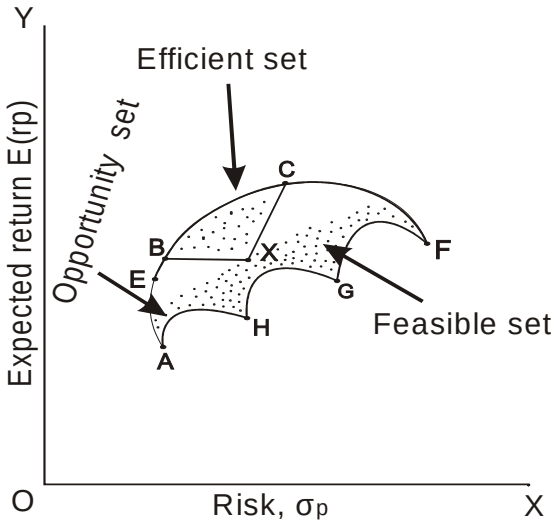


Fig. 2.1 > The efficient Frontier

The efficient frontier is represented by the line form by EBCF. Portfolio along curve EBCF dominates all other investment possibilities. An efficient frontier or portfolio is a portfolio that

→ Offers maximum expected return for varying levels of risk and

→ Offers minimum risk for varying levels of expected return.

The opportunity set is constructed from curves that are all convex toward the E(rp) axis. This is because all assets have correlation coefficients between positive unity and negative unity. Such correlations result in a locus of portfolios that trace a curve which is convex to the E(rp) axis in [σp, E(rp)] space. Only perfectly positively correlated (i.e. ρ = +1) assets will generate linear combinations of risk and return, and under no circumstances will a portfolio possibility locus ever curve away from the E(rp) axis in [σp,E(r)] space.

Portfolios to the left of the efficient frontier are not possible, because they lie outside the attainable set. Portfolios to the right of the efficient frontier are inefficient because some other portfolio could provide either a higher return with same degree of risk or a lower risk for the same rate of return. In the figure above, C is the portfolio that provides higher return than portfolio x with same level of risk. Another portfolio B is the portfolio that provides the same return as portfolio x with less risk because of both portfolios C and B lie in efficient frontier.

2.1.11 The Characteristic Line

Portfolio theory was developed mathematically without reference to the "Characteristic Line". The characteristic line is the line of best fit through a scatter part of rate of return for individual risky asset and for the market portfolio of risky asset over some designated past period. It is also known as Regression Line. Total risk of an asset consists of systematic risk and unsystematic risk. The characteristic line is used to measure statistically the diversifiable risk and undiversifiable risk of individual assets and portfolios. The characteristic line shows the relation between the return on an asset and the return on market portfolio. Apart from this, it expresses systematic risk of assets in terms of market forces which simultaneously affect the prices of all securities. The equation for the characteristic line is as follows:

$$r_{it} = ai + \beta_i r_{mt} + e_{it}$$

Where,

R_{it} = rate of return for asset I during period t.

r_{mt} = rate of return for the market portfolio during period t

ai = constant term or intercept of the regression.

bi = slope coefficient for the regression, a measure of undiversifiable risk.

eit = the random error around the regression line for security i during the period.

The characteristic line is sometimes called a single factor model because it contains only one source of systematic risk $r_{mt.}$ The characteristic line can be decomposed into a multifactor model that includes interest rate risk, default risk, and other risk factors.

$$r_{it} = ai + \beta_i r_{mt} + eit$$

$$r_{it} = ai + \beta_{i1} F_{1,t} + \beta_{i2} F_{2,t} + \beta_{i3} F_{1,3} + \ldots\ldots\ldots\ldots + \beta_{ik} F_{1,k} + e_{it}$$

This equation is called a k-factor return generating function. The equation contains k different risk factors to explain the i^{th} asset's return. The random variables denoted F_{kt} represented k different risk factors, fkt for k=1 ,2------ T .The k regression co-efficient ,b_{ik} measure the sensitivity of the i^{th} assets returns to the k^{th} risk factor,bi1 might be the beta for the interest rate risk factor and bi2 might be the default risk beta.

2.1.12. Capital Assets Pricing Model (CAPM)

The CAPM is the relationship in which the expected rate of return of the ith asset is a linear function of that asset's systematic as represented by bi. The relevant risk for an individual asset is systematic risk (or market-related risk) because non-market risk can be eliminated by diversification. The relationship between an assets return and its systematic risk can be expressed by the CAPM, which is also called the Security Market Line (SML).The equation for the CAPM is

$$E(ri) = r_f + [\, E(r_m) - r_f \,]\, \beta i$$

Where,

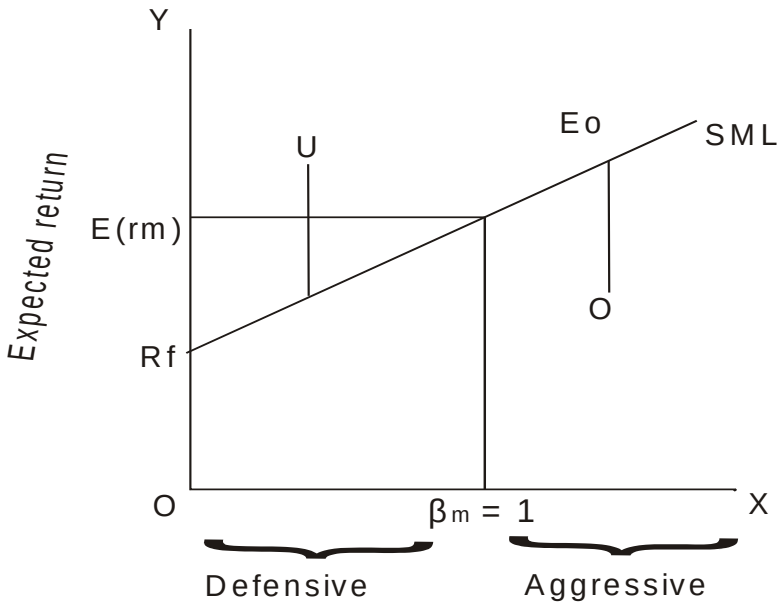
E(ri) = Expected return for an asset

r_f = risk free rate (usually assumed to be a short term T-bill rate)

$E(r_m)$ = Expected market return (usually assumed to be the S & P 500)

Bi = the asset's beta

The CAPM is an equilibrium model for measuring the risk-return trade off for all assets including both inefficient and efficient portfolios. A graph of the CAPM is given in the figure.



β_i = Beta

Fig 2.2 The CAPM or Security Market Line

This figure depicts two assets, U and O, that are not in equilibrium on the CAPM. Asset U is under-valued and therefore a very desirable asset to own U's price will rise in the market as more investors purchase it. However, as U's return falls to the return consistent with the beta on SML,

equilibrium is attained. With O, just opposite takes place. Investors will attempts to sell O, since it is overvalued, and therefore put downward pressure on O's price. When the return on asset O increases to the rate is consistent with the beta risk level given by the SML, equilibrium will be achieved and downward price pressure will cease.

2.1.13 Arbitrage Pricing Theory

Stephen Ross proposed the Arbitrage Pricing Theory (APT), an investment theory that both competes with Markowitz portfolio theory and complements it. The APT is based on the law of one price, which says that the same goods cannot sell for two different prices. If the same goods does sell for different price, arbitrages will buy the goods where it is cheap, thereby bidding up the low price, and simultaneously sell the goods where its price is higher, thereby driving down the high price. Arbitragers will continue this activity under all prices for the goods are equal.

There are four essential conditions for Arbitrages opportunity.

1. Assets should be overpriced and under priced.
2. The arbitrage requires no investment of funds.
3. .The weighted average beta of the portfolio.
4. The arbitrage portfolio must have positive return.

Arbitrage Pricing Theory (APT) model

Like capital market theory, APT is an equilibrium theory of expected return. CAPM assumes that these risk factor (beta) for determining required rate of return, while APT suggest that multiple factors affects the securities return. So these multiple factor should be considered while determining the required rate of return of securities. The multiple factor APT model is expressed as follows:

$$E(r_i) = \lambda_0 + \lambda_1 b_{i1} + \ldots\ldots\ldots + \lambda_n b_{in}$$

Where,

$E(r_i)$ = Expected rate of return on asset i or equilibrium rate of return

λ_0 = risk free rate of return

λ_1 = constant variable

b_{i1} = systematic risk factor or independent variable

1. <u>One factor model</u>

The one factor model is equilibrium to the capital assets pricing model. It suggests that there is only one factor to affect the expected rate of return of securities. One factor APT model is expressed as follows:

$$E(r_i) = \lambda_0 + \lambda_1 b_{i1}$$

Where,

$E(r_i)$ = required rate of return or equilibrium rate of return

λ_0 = risk free rate of return

λ_1 = constant variable

b_{i1} = systematic risk factor

2. <u>Two factor model</u>

Under this model, there are two systematic risk factors that are used affect the required rate of returns of securities. The two factors APT model describes the return as follows:

$$E(r_i) = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2}$$

2.1.14 Portfolio Performance Evaluation

For the purpose of portfolio ranking averages return of portfolio can be complicated. But calculation of average portfolio return and comparison with others is not the end of evaluation of portfolio performance. Returns must be adjusted for risk before they can be compared meaningfully. The comparison of performance with other similar investment is a useful first step in evaluating performance.

Methods of risk adjusted performance evaluation using mean-variance criteria came on stage simultaneously with Capital Asset Pricing Model (CAPM). Three great scholars namely William Sharpe, Jack Treynor and Michael Jenson recognized immediately the application of the CAPM for rating the performance of investment portfolio. Hence some risk adjusted performance measures can be listed as:

I. Sharpe's Measure (SI)
II. Treynor's Measure (TI)
III. Jensen's Measure (αp)

A. Sharpe's Portfolio Performance Measure

In assessing the performance of a portfolio, it is necessary to consider both risk and return. The real need is for an index of portfolio performance that is determined by both the return and the risk of a portfolio. Sharpe's measure defines a single parameter portfolio performance index that is calculated from both the risk and return statistics. William F Sharpe devised an index of portfolio performance denoted Si stated as:

$$Si = \overline{r_i} - \overline{r_f}$$

Wherer,

Si = Sharpe's index of portfolio performance

$\overline{r_i}$ = average return on portfolio 'I' during a specified time period.

$\overline{r_f}$ = average risk free rate during the same time period.

σI = standard deviation of portfolio 'I'

Sharpe's measure divides average portfolio excess return over the same period by the standard deviation of return over that period.

The numerator $\overline{r_i}$ - $\overline{R_{f,}}$ is called the risk premium for portfolio i. the risk premium is the additional return over and above the risk less rate that is paid to induce investor to assume risk. The denominator is the total risk of this portfolio. Hence, it is the risk premium return earned per unit of total risk. So, the rate is appropriately called reward-to-variability ratio. A higher value of Si means a better performing portfolio as this indicates higher risk premium per unit of total risk.

B. <u>Treynor's Portfolio Performance Measures</u>

Jack Treynor conceived an index of portfolio performance that is based on systematic risk, as measured by portfolio's beta coefficients. He introduced a risk free asset that could be combined with different portfolio, to form a straight portfolio possibility line. The slope of this possibility line (designed Ti) is the Treynor's portfolio performance measure and is given by

$$Ti = \frac{\overline{r_i} - \overline{R_f}}{\beta i}$$

Where,

$\overline{ri}$ = The average rate of return for portfolio 'I'

$\overline{Rf}$ = The average rate of return on a risk free investment d

βi = The slope of the fund's characteristic line during that time Period (i.e. Portfolio's beta coefficients)

Thus, Treynor's measure gives excess return per unit of risk, but it uses systematic risk instead of total risk.

C. Jensen's Portfolio Performance Measure

Michael C Jensen has modified the characteristic regression line to make it useful as a one parameter investment performance measure. The version of CAPM which is used to compute securities or portfolio's expected rate of return is given by

$$E(ri) = R_f + \beta i[\overline{r_m} - R_f]$$

Where,

E(ri) = The expected return on security or portfolio 'i'

R_f = One period risk free rate of return

βi = The systematic risk coefficient (beta) for security or portfolio 'i'

$\overline{r_m}$ = The expected return on market portfolio

Jensen's measure is the average realized return on the portfolio over the return predicted by the CAPM, given the portfolios

$$\text{Jensen's measure } (\alpha p) = \overline{r_p} - [R_f + \beta p(\overline{r_m} - R_f)]$$

Hence, Jensen's measure (αp) represents how much of the rate of return on the portfolio is greater than the average returns adjusted for risk (or average return assigned by CAPM)

2.2 Review of Unpublished Thesis

Prior to this thesis, there is some thesis written by Master Level students regarding Portfolio Management. Some relevant thesis on this topic of commercial banks and joint venture has been conducted by

various researchers for the partial fulfillment of MBS Programme. They are reviewed as follows.

Raju Kafle (2005), entitled “Analysis of Portfolio Management on Common Stock of Joint Venture Banks in Nepal”. He has focused his thesis on the portfolio management of selected joint venture banks taking NABIL, HBL, SCBL and NBB listed is NEPSE as samples.

The major objectives of his study are:

- To evaluate each company’s stock in terms of their risk and return. To analyze comparative risk and return characteristics of the commercial banks and study.
- To construct portfolio selecting the stocks from within these sectors and to identify the risk reduction effect of portfolio.
- To evaluate the effects of correlation in the construction of portfolio and stock is over priced or under priced compared to required rate of return.
- To know about systematic, unsystematic risk and analyze them in portfolio construction process.

Major Findings of the study are

- Expected rate of return of all joint venture banks which are taken as sample, has higher than market expected rate of return.
- NABIL Bank has the highest expected rate of return and NBL has the lowest rate of return.
- Coefficient of variation of HBL and NBB are highest and thus regarded as the most riskier asset.
- It is found that the stock of NABIL and NBB are aggressive type of assets and SCBL and HBL are defensive type of assets.
- NABIL and NBB have nearly 1 coefficient of determination and it is concluded that there is low proportion of undiversification risk

compare to HBL and NBB has higher proportion of diversification risk with low coefficient of determination.

- All commercial banks have less required rate of return than the expected return and concluded as undervalued and investor will be beneficial by investing their stocks.
- According to sample study of portfolio analysis the diversification between SCBL and market is most preferable whereas portfolio between market with HBL and NBB is better. But NABIL with market is the worst.
- According to Sharpe Portfolio Performance evaluation, portfolio between SCBL and market is ranked as best performance.

Shobha Lamichhane (2008), entitled "Portfolio Analysis of commercial Banks" has found out and analyzes the major problem of investor regarding selection of the portfolio among the securities of selected commercial banks such as NABIL, HBL and NBL in NEPSE. The various objectives of this study are:

- To analyze the return and risk of the common stock of sample commercial banks.
- To calculate the proportion of diversifiable and undiversifiable risk over total return on common stocks of the sample commercial banks.
- To analyze the portfolio return and risk of the sample commercial banks with respect to random weights,
- To highlight the concept of investments and loans and advances portfolio.

Major findings of this study are: -

- NABIL has the highest average return over the study period as compared to the other banks likewise the average of HBL is found to be the least of all the three banks.

- NABIL has the highest standard deviation (risk) of returns and HBL has the lowest risk on return.
- EBL has the highest variation of return per unit given by coefficient of variation.
- EBL has the highest beta coefficient and HBL has the lowest beta coefficient. The beta coefficients reveal that the stocks of NABIL and HBL are aggressive and are more sensitive than the market returns whereas the stocks of HBL are defensive.
- HBL has the highest proportion of systematic risk. EBL also has higher component of systematic risk in its total risk, composure. However, the portfolio combining stocks of NABIL can reduce the risk components as it comprises of large amount of avoidable risk.
- NABIL, EBL and HBL have invested its highest fund (i.e. 99.34%, 99.55%, and 99.52% respectively) on risk free assets. None of the bank invested in NRB bond.

Sailendra Giri (2005), entitled "Investment Portfolio Analysis of Joint Venture Banks in Nepal" has also prepared thesis based on five listed joint venture banks – NABIL, NIBL, SCBL, NSBI and BOKL. His thesis presents the situation of investment portfolio of joint venture banks in Nepal. The various objectives of his study are.

- To analyze how joint venture banks manage their risk and return ratio on investment using portfolio concept.
- To evaluate the financial performance of joint venture banks.
- To find out trend of investment in different sectors.
- To provide suggestion based on the analysis of data.

Major findings of this study are:

- The average return on government securities is 6.54% and its coefficient of variation (CV) is 37% which is quite opposite result than general assumption.

- The higher average returns and lower CV of loan and advances than government securities shows that the investment on loan and advances has more fixed trend than government securities.
- The total investment to total deposits ratio of selected JVBs shows that Standard Chartered Bank (SCB) is the most successful in utilizing its resources on investment than other JVBs.
- SBI is the bank that mobilizes its total deposit more effectively on loan and advances but mobilization on investment on government securities is poor.
- NABIL is the best bank among the five JVBs on the basis of utilization of resources in the field of loan advances. Bokl takes the last position.
- There is low negative correlation coefficient between return on investment made by JVBs in shares and debenture. This shows low degree of negative relationship between assets.

Kalpana Khaniya 2003, prepared her thesis on Investment Portfolio Analysis Of Joint Ventures Banks'' taken five listed JVBs – NABIL, SCBL, HBL, NBBL, and EBL as sample. The main objective of the study is to portfolio structure of NABIL bank Ltd as compared to other JVBs and to analyze the risk and return of JVBs and the financial performance analysis.

Major finding of the study is that the SCBL and HBL have better position.

- NBBL and NABIL have a low position in the industry.
- EBL has a very low position in the industry because of having mean return on shareholder's fund resulting from the negative return.
- The investment portfolio structure of NABIL bank's almost similar to other JVBs investment portfolio.

- The financial performance of NABIL bank is at moderate position to other JVBs, some of the banks earn high and some banks earn low than NABIL bank.

.

2.3 Review of Related Studies

The article in the web page www.investopedia.com. "Are you over diversified'' mentioned that many individual investors could not tolerate the short term fluctuation in the stock market. Diversifying your portfolio is the best way to smooth out the ride. Diversification is the risk management techniques that mix a wide variety of investment within a portfolio in order to minimize the impact that only one security will have on the overall performance of the portfolio. Diversification laws the risk of your portfolio. Academics have complex formulas to demonstrate how this works.

The article "Selection Of Portfolio" in web page www.indiainfoline.com by Dr. Prof. Vijay Pal Chatarjee mentions some guidelines to select optimal portfolio. He mentioned that investor like high- expected return for given level of risk is efficient portfolios. If investors want to know the marginal impact of the stock on risk of the portfolios then he\she must not look at the risk of that stock in isolation but rather as its contribution to portfolio risk. That is dependent on the stocks sensitivity to changes in the value of the portfolios. If the investor can borrow and lend at the risk free rate of interest, they should always hold a mixture of the risk free investment and one particular common stock portfolio. The composition of this portfolio depends on when the investment liquidated. Risk is lower in the short term. Diversification of the portfolio can reduce the unique risk. If such diversification results an expected portfolio return or risk level that is below or above the desired level. Portfolio strategy should mould according to the need of each individual investor. Since each portfolio provides an expected return based on particular level of risk, while

constructing portfolios, care should take to ensure that portfolio does not exceed the risk bearing capacity of investor. It is constructed in such a way that it provides the highest return for a given acceptable level of risk. In an efficient portfolio, there is a straight-line relationship between the expected return and the marginal contribution to portfolio risk. This is a true because investor would include a security, which contributes to increasing the risk of the portfolio as a whole only when it offers higher return and increase the expected return of the portfolios.

Chapter III

RESEARCH METHODOLOGY

Research methodology is a way to systematically solve the research problem. It is also understood as a science of studying how research is done appropriately.

This chapter highlights about the methodology adopt in the process of current study. It also focuses about sources and limitations of data, which are used on current study. In other words, research methodology is a systematic and scientific process, method, step and guideline for presenting the collected data for meaningful analysis.

Research methodology describes the methods and process applied in the aspects of the designs and has been included in the present study. This research study is based on scientific methods and most of the data are quantitative. Financial indicators and statistically tools are used for the analysis of various aspects and different variables of portfolios management on the basis of secondary data. The collected data are presented in simple way using tables, diagrams, etc. In this study, research methodology has been paid due attention to achieve the objectives of the study, which is to be compared among the various commercial banks practiced in Nepal (with reference to five commercial banks) and is to find out the factors that affect it. The following are the major content of research methodology.

3.1 Research Design

Research Design is a conceptual structure within which a research is conducted. In simple words, planning for research is a research design. A

research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine reference to the research purpose with economy in procedure. Research design is a plan, structure and strategy of investigations conceived so as to obtain answers to research questions and to control variance.

A well research design can fulfill the objectives of this study. So, this study is mainly based on two types of research design i.e. descriptive and analytical employing the various historical secondary data to analyze the using variable which are related to the various aspects of portfolio management practicing in Nepalese Commercial Banks. For the analytical purpose, the annual reports, financial statement and other relevant materials of the companies were collected under study. So, the analytical as well as descriptive research designs have been followed in this research study.

3.2 Population and Sample

Population refers to the large group about which generalization is made for the study. It means the large group from which the sample is drawn. Population may be finite or infinite based on the subject matter of the study. A small portion chosen from the population for studying its properties is called the sample. Sample is the representative of entire population.

There are many banks whose shares are traded actively in stock market. Hence, it is not possible to study all of them regarding the research topic. Therefore, sampling will be done selecting from population. The following are the population of this study.

Licensed Commercial Banks

1. Nepal Bank Limited
2. Rastriya Banijya Bank
3. Nabil Bank Ltd
4. Nepal Investment Bank Ltd
5. Standard Chartered Bank Nepal Ltd
6. Himalayan Bank Ltd
7. Nepal SBI Bank Ltd
8. Nepal Bangladesh Bank Ltd
9. Everest Bank Ltd
10. Bank Of Kathmandu Ltd
11. Nepal Credit And Commercial Bank Ltd
12. Lumbini Bank Ltd
13. Nepal Industrial And Commercial Bank Ltd
14. Machhapuchhre Bank Ltd
15. Kumari Bank Ltd
16. Laxmi Bank Ltd
17. Siddhartha Bank Ltd
18. Agriculture Development Bank Ltd
19. Global Bank Ltd
20. Citizens Bank International Ltd
21. Prime Commercial Bank Ltd
22. Bank Of Asia Nepal Ltd
23. Sunrise Bank Ltd
24. Development Credit Bank Ltd
25. NMB Bank Ltd

The samples selected for research are as follows: -

1. NABIL Bank Ltd
2. Nepal Investment Bank Ltd
3. Standard Chartered Bank Ltd Nepal
4. Himalayan Bank Ltd
5. Bank of Kathmandu Ltd.

Out of the 25 commercial banks only five banks are sampled under this study. The selected companies represent only one area of business i.e. banking sector. For the purpose of this study, the companies listed in the Stock Exchange have been chosen keeping in the view of availability of data. The financial statement of five year's period from fiscal year 2002/03 to 2006/07 is being used for the purpose of the study.

3.3 Period of the Study

The financial statement of five year's period from fiscal year 2002/03 to 2006/07 is being used for the purpose of the study.

This study is based on the five years financial data, which can be indicated as follows: -

S.N	Name of the banks	Observation Years	No. of Observation
1	Nepal Arab bank Ltd (NABIL)	2002/03 to 2006/07	6
2	Nepal Investment Bank(NIBL)	2002/03 to 2006/07	6
3	Standared Character Bank Ltd(SCBL)	2002/03 to 2006/07	6
4	Himalayan Bank Ltd(HBL)	2002/03 to 2006/07	6
5	Bank of Kathmandu Ltd(BOKL)	2002/03 to 2006/07	6

Table 3.1 Period of the study

3.4 Sources of data

In this study, most of the data are collected from secondary sources, which are available at websites and financial statement of selected banks. Further more Economic Reports published by NRB, Report of Security Board of Nepal, financial and the relevant data published in various newspapers, books magazines and journal are also used as per needed.

3.5 Data Collection Procedures

Required information for this study is collected through published statistical reports, available books journals, and newspapers and web pages. Similarly required information has been acquired from the Library of Kankai Adarsha Awasiya Campus, Birtamode. Apart from this relevant data and information have been collected visiting the concerned banks through indirect or informal interview to generate primary data as required for this study.

3.6 Method of Analysis

The analysis of data has been done according to the pattern of data available. Various financial and statistical tools have been applied according to reliability and consisting of data. Before using the analytical tools; the data containing in the financial statement have been grouped and rearranged so as to make the analysis easy. Then only various financial and statistical tools have been applied to interpret the result and drawn up the sound conclusion. Mainly, the analysis has been performed using the under mentioned tools.

3.7 Data Analysis Tools

The analysis of this study is based on financial indicators and statistical tools. A brief explanation of the data analysis indicators and tools in the study are as follows:

A. Statistical Tools:

Various statistical tools have been used to draw a meaningful conclusion from the study. The following statistical tools have been used during the study.

i) Expected rate of return [E(r)]

Investment decisions are based on expectations about the future. The expected rate of return for any asset is the weighted average rate of return, using the probability of each rate of return as the weight. The expected rate of return is calculated by summing the products of the rates of return and their respective probabilities.

$$\text{Expected Value, } E(r) = \sum_{t=1}^{n} r_t P_t = r_1 P_1 + r_2 P_2 + \ldots\ldots\ldots + r_n P_n$$

r_t = rate of return on t^{th} outcome or event

p_t = Probability of occurrence of t^{th} outcome or event

When historical returns are used, the following formula is used to calculate an average return.

$$E(r) = \frac{\sum_{t=1}^{n} r_t}{n}$$

Where E(r) is the average or mean return and n is the number of observed return.

ii) Standard Deviation (σ)

The standard deviation is the square root of the average of the square deviation of the observation from the mean, standard deviation measures the absolute dispersion or variability of the distribution; the greater the amount of dispersion or variability

the greater the standard deviations, for the greater will be the magnitude of the deviation of values from their mean. Standard deviation measures the risk of possible return and denoted by sigma (σ)

The equation for the standard deviation is

$$(\sigma) = \sqrt{\frac{\sum_{t=1}^{n} [r_t - E(r_t)]^2}{n}}$$

$$= \sqrt{\frac{\sum [r_t - E(r_t)]^2}{n}}$$

Where,

E(r) = Expected rate of return

r = Single period rate of return

n = No. of Observation

$$\text{Variance } (\sigma) = \frac{\sum [r - E(r)]^2}{n}$$

iii) Coefficient of Variance(C.V)

The standard deviation as stated above is an absolute measure of dispersion. The corresponding relative measure is known as the coefficient of variation. It is used to compare the variability of two or more than two series. The series for which the coefficient of variation is greater is said to be more variable or conversely less consistent, less stable and less homogeneous and the smaller the value of coefficient of variation, the more will be

the uniformity or less will be the variability. C.V is defined as the ratio of the standard deviation to the mean expressed in percent. Symbolically,

$$CV = \frac{\sigma}{E(r)}$$

Where,

CV = Coefficient of variance

σ = Standard Deviation

E(r) = Expected rate of return

iv) Covariance [$cov(r_t r_m)$] or Cov_{AB}

Covariance is a measure of the degree in which two variables move together overtime. A co-variance between the rate of return for the assets that is positive indicates that the rate of return tend to move in the same direction at the same time. If the covariance is negative the rate of return of the assets tend to move in opposite direction and zero value of covariance means there is no relationship between two assets at all. The covariance between assets return can be calculated by using the following equations.

a) If the probability is given :

$$Cov_{AB} = \sum_{j=1}^{n} [r_A - E(r_A)] [r_B - E(r_B)] pj$$

b) If the probability is not given

$$Cov_{AB} = \frac{1}{n} \sum_{t=1}^{n} [\bar{r}_A - (r_A)] [\bar{r}_B - (r_B)]$$

Where,

Cov_{AB} = Covariance between return on assets A and B

n = no. of observation

p = Probability

E(r) = Expected rate of return

$\bar{r}$ = Mean return

v) Correlation (ρ)

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

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

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

Where,

ρ_{ij} = Correlation Coefficient between stock i and j

Cov_{ij} = Covariance between stock i and j

$\sigma_i \sigma_j$ = Standard Deviation of stock i and j

vi) Beta Coefficient (β)

Beta is the index of systematic risk. The risk contribute to a portfolio of an individual stock can be measured by the stocks beta coefficient. The market index will have beta coefficient of +1. An asset with b>1 is an aggressive asset and b<1 is defensive type of asset. Mathematically, the systematic risk beta is measured as the covariance of the stock returns with the market returns expressed per unit of market variance as follows

$$\beta_i = \frac{Cov(r_i r_j)}{\sigma_m^2} = \frac{\rho_{ij}\,\sigma_i\,\sigma_j}{\sigma_m^2}$$

Where,

ρ_{ij} = Correlation Coefficient

β_i = Beta Coefficient

σ_m^2 = Market Variance

B. Financial Tools

The Various financial tools used for analyzing the data are as follows:

i) Portfolio Expected Return E(rp)

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

$$E(rp) = \sum_{i=1}^{n} w_i E(r_i)$$

$$= w_1 E(r_1) + w_2 E(r_2) + \ldots\ldots\ldots\ldots + w_n E(r_n)$$

Where,

E(rp) = Expected rate of return of portfolio

Wi = The fraction of the total value of the portfolio invested in the i^{th} asset or stock.

E(ri) = The expected return from the i^{th} asset or stock.

ii) Portfolio Risk

Portfolio risk is measured by a statistical tool standard deviation and variance. It is a function of the proportions invested in the components. The riskiness of the components and correlation of returns on the components securities. The risk is computed by using the following equations.

$$Var(r_p) \text{ or } \sigma p^2 = \sum_{i=1}^{n} \sum_{j=1}^{n} W_i \; W_j \; Cov_{ij} \quad \text{or} \sum_{i=1}^{n} \sum_{j=1}^{n} W_i \; W_j \; \rho_{ij} \sigma_i \sigma_j$$

$$\sigma p = \sqrt{\sum_{i=1}^{n} \sum_{j=1}^{n} W_i \; W_j \; \rho_{ij} \sigma_i \sigma_j}$$

Where,

σp = Standard deviation of portfolio's return

Wi = Proportion of investment in asset i.

Wj = Proportion of investment in asset j.

Cov_{ij} = Covariance of the return between asset i and j

Alternatively,

The above equation can be simplified as follows:

a) If portfolio is formed by two securities A and B

$\sigma p^2 = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 \, Cov_{AB} W_A W_B$

Or $\sigma p^2 = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 \, W_A \times W_B \times \rho_{AB} \times \sigma_A \times \sigma_B$

$$\sigma p = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 \, Cov_{AB} W_A W_B}$$

b) If portfolio is formed by three assets A, B and C

$$\sigma p^2 = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + W_C^2 \sigma_C^2 + 2 W_A W_B \rho_{AB} \sigma_A \sigma_B + 2 W_A W_C \rho_{AC} \sigma_A \sigma_C + 2 W_B W_C \rho_{BC} \sigma_B \sigma_C$$

$$\sigma p = \sqrt{W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + W_C^2\sigma_C^2 + 2W_AW_B\rho_{AB}\sigma_A\sigma_B + 2W_AW_C\rho_{AC}\sigma_A\sigma_C + 2W_BW_C\rho_{BC}\sigma_B\sigma_C}$$

Where,

W_A = Weight of investment in asset A

W_B = Weight of investment in asset B

iii) Minimum Risk Portfolio

It is the portfolio with the lowest level of risk in the efficient frontier. It is also called risk minimizing weight or optimal weigh. In two stock portfolios, the optimal weight to invest in stock i and j are calculated as follows.

$$Wi = \frac{\sigma_j^2 - \rho_{ij} \times \sigma_i \times \sigma_j}{\sigma_i^2 + \sigma_j^2 - 2\rho_{ij} \times \sigma_i \times \sigma_j}$$

$$Wj = 1 - Wi$$

Where,

Wi = Optimal weight to invest in stock i

Wj = Optimal weight to invest in stock j

iv) Portfolio Performance Measure

While considering a portfolio's performance, it is important to consider both risk and return. Here, in the study Sharpe's Performance Measure is used to rank the portfolio evaluation.

The Sharpe's measure of portfolio performance is stated as

$$S_i = \frac{\bar{r}_i - \bar{R}_j}{\sigma_i}$$

Where,

S_i = Sharpe's index of Portfolio performance

$\bar{r}_i$ = Average return on portfolio 'i' during a specified time period

$\bar{R}_j$ = Average risk free rate during the same time period

σ_i = Standard deviation of portfolio 'i'.

CHAPTER IV

PRESENTATION AND ANAYSIS OF DATA

This chapter is the crucial and important part of the research. It deals with the presentation and analysis of the Portfolio Management of the selected commercial banks namely NABIL, SCBL, NIBL, HBL and BOKL. The study attempts to analyze the relevant secondary data regarding the Portfolio Management of the Nepalese Commercial Banks. The main purpose of this study is to construct and analyze the various portfolios taking the optimal weight of each stock assuming the minimum portfolio risk. The stock price and dividend of the selected commercial banks are collected from the fiscal year 2002/03 to 2007/08. The various aspects of data available are analyzed and interpreted using several statistical and financial tools as well as the management attitude towards the portfolio management to determine the meaningful financial data. The data constitute the financial information extracted from the financial statement of concerned banks are summarized and presented in a tabular diagram or graphical forms.

Return and risk characteristics of the assets portfolio have been formed from and also been analyzed with the viewpoint of the individual investors. Thereafter, they are analyzed in terms of risks, return, coefficient of variation, beta coefficient, correlation and covariance. Furthermore, the portfolio performance has also been evaluated using Sharpe's index of Portfolio Performance measure.

4.1 Presentation of Data

Table 4.1

Closing Price of Stock and Cash Dividend of Selected Banks from the Fiscal year 2002/03 to 2007/08

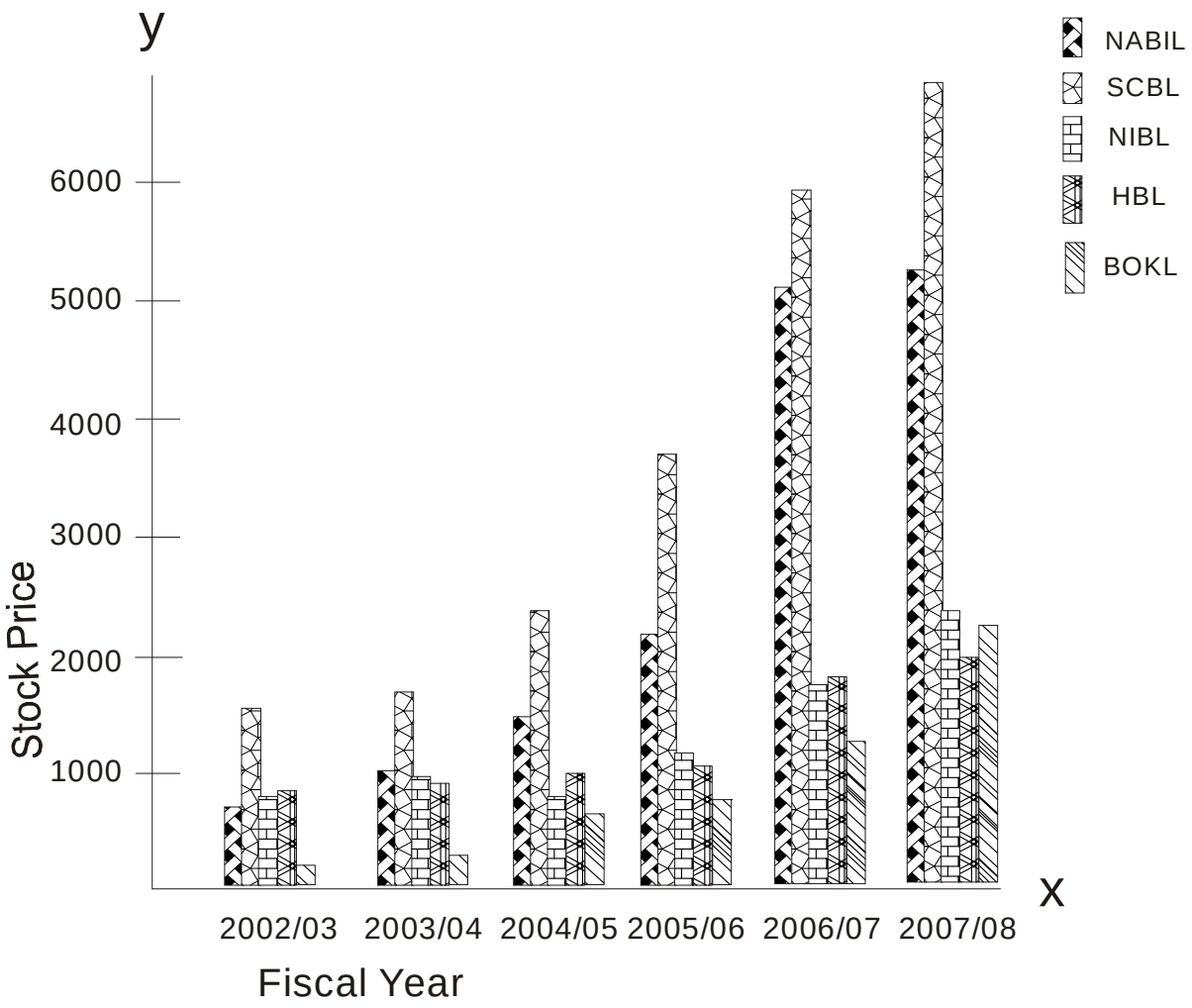
FY	NEPSE	NABIL		SCBL		NIBL		HBL		BOKL	
		Stock Price	Cash Dividend	Stock Price	Cash Dividend	Stock Price	Cash Dividend	Stock Price	Cash Dividend	Stock Price	Cash Dividend
2002/03	204.86	735	50	1670	110	790	20	815	1.31	210	5
2003/04	222.04	1000	6	1745	110	940	15	840	0	295	10
2004/05	286.67	1505	65	2345	110	800	15	920	0	430	10
2005/06	386.83	2240	5	3775	120	1260	20	1100	30	850	18
2006/07	683.95	5050	12.59	5900	80	1729	5	1760	15	1375	20
2007/08	963.36	5275	0	6830	0	2450	0	1980	0	2350	0

Table No 4.1 Source: - http\www.nepalstock.com

The above table shows that stock prices of the selected banks are fluctuating within the various years. All the banks have the highest stock price in the FY 2007/08 and have got the increasing trend of stock price since 2002/03. NBIL has highest stock price of Rs 5275, SCBL has highest stock price of Rs 6830, NIBL has highest of Rs 2450, HBL has the highest of Rs 1980 and BOKS has also highest of Rs 2350. All the banks have the highest stock price during same year 2007/08. It is found that SCBL is exceeding faster than that of the remaining banks.

Figure No. 4.1

Figure of Multiple Bar Diagram Showing Stock Price of Selected Banks at FY 2002/03 to 2007/08



4.2 Analysis of Market Risk, Return and Coefficient of Variation

Table No. 4.2

Calculation of Market Risk, Return and Coefficient of Variation

FY	NEPSE Index	$r_m = \frac{NEPSE_t - NEPSE_{t-1}}{NEPSE_{t-1}}$	$r_m = E(r_m)$	$[r_m = E(r_m)]^2$
2002/03	204.86	-0.0997	-0.3999	0.15992
2003/04	222.04	0.0839	-0.2163	0.04679
2004/05	286.67	0.2911	-0.0091	0.00008

2005/06	386.83	0.3494	0.0492	0.00242
2006/07	683.95	0.7681	0.4679	0.21893
2007/08	963.36	0.4085	0.1083	0.01173

$E(r_M) = 1.8013$ $[r_M=E(r_M)]^2 = 0.43987$

i) Expected Return $E(r_M) = \frac{\sum r_M}{N} = \frac{1.8013}{6} = 0.3002 = 30.02\%$

ii) S.D $(\sigma_M) = \sqrt{\frac{[r_M=E(r_M)]^2}{N-1}} = \sqrt{\frac{0.43987}{6-1}}$

$= \sqrt{0.087974} = 0.2966 = 29.66\%$

iii) C.V $= \frac{\sigma_M}{E(r_M)} = \frac{29.66\%}{30.02\%} = 0.9880$

Here in the above, the market return is highest in the fiscal year 2006/07 with 76.81% but before that there was negative return in the FY 2002/3 and there after there were positive returns regularly. The standard deviation of the market is 29.66% and C.V is resulted as 0.9880.

4.3 Individual Asset Analysis

1. Nabil Bank Ltd

Table No 4.3

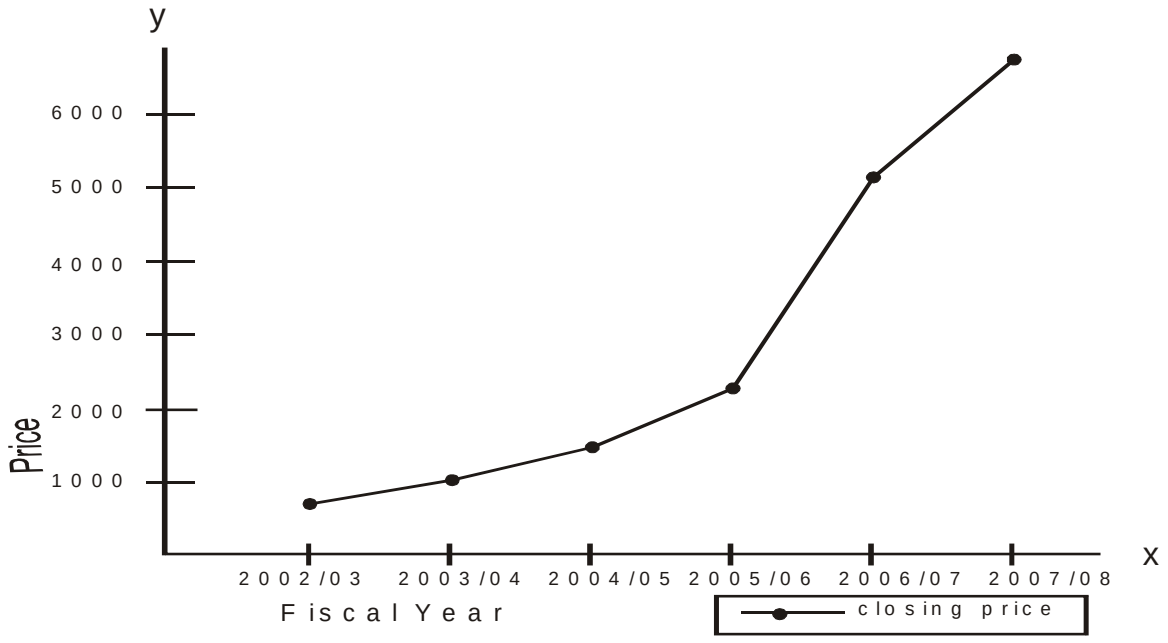
MPS and DPS of NABIL

FY	Stock Price			Cash Dividend
	High	Low	Closing	
2002/03	875	700	735	50
2003/04	1005	705	1000	60

2004/05	1515	1000	1505	65
2005/06	2300	1500	2240	5
2006/07	5050	2025	5050	12.59
2007/08	6700	3410	5275	0

Figure 4.2

Market Price Movement of NABIL Bank Ltd



The above table and figure show that there is an increasing trend in the market price of NABIL Bank Ltd. The market price per share is highest in the FY 2007/08 with Rs 6700. The lowest MPs of Rs 6700 is found to be in the FY 2002/03 as compared with other fiscal years. In the FY 2007/08 there is no declaration of dividend.

Table No 4.4

Calculation of Expected Rate of

Return, S.D and C.V of Nabil Bank Ltd.

FY	Stock Price(p_t)	Cash Dividend(Ct)	$r_{NABIL}=\frac{p_t-p_{t-1}+c_t}{p_{t-1}}$	$r_{NABIL}=E(r_{NABIL})$	$[r_{NABIL}=E(r_{NABIL})]^2$
2002/03	735	50	0.1135	-0.3735	0.13950
2003/04	1000	60	0.4422	-0.0448	0.00201

2004/05	1505	65	0.5700	0.0830	0.00689
2005/06	2240	5	0.4917	0.0047	0.00002
2006/07	5050	12.59	1.2601	0.7731	0.59768
2007/08	5275	0	0.0445	-0.4425	0.19580

$E(r_{NABIL}) = 2.9220$ $[r_{NABIL}=E(r_{NABIL})]^2 = 0.9419$

i) ERR of NABIL Bank $E(r_{NABIL}) = \frac{\sum r_{NABIL}}{N} = \frac{2.9220}{6} = 0.4870 = 48.70\%$

ii) S.D of NABIL Bank$(\sigma_{NABIL}) = \sqrt{\frac{[r_{NABIL} - E(r_{NABIL})]^2}{N-1}} = \sqrt{\frac{0.9419}{6-1}}$

$= \sqrt{0.18838} = 0.4340 = 43.40\%$

iii) C.V $= \frac{\sigma_{NABIL}}{E(r_{NABIL})} = \frac{43.40\%}{48.70\%} = 0.8912$

From the above calculation, the expected rate of return of NABIL is 48.70% which is the sum of single rate of return dividend by no. of observation. Its standard deviation is 43.40% which is due to the variation in the single period rate of return where as the coefficient of variation of NABIL is 0.8912.

Table No. 4.5

Calculation of Covariance, Beta Coefficient and Correlation of NABIL Bank Ltd.

FY	$[r_m-E(r_m)]$	$r_{NABIL}=E(r_{NABIL})$	$[r_m-E(r_m)] \times r_{NABIL}=E(r_{NABIL})$
2002/03	-0.3999	-0.3735	0.1494

2003/04	-0.2163	-0.0448	0.0097
2004/05	-0.0091	0.0830	-0.0008
2005/06	0.0492	0.0047	0.0002
2006/07	0.4679	0.7731	0.3617
2007/08	0.1083	-0.4425	-0.0479

$$\sum\{[r_m - E(r_m)] \times r_{NABIL} = E(r_{NABIL})\} = 0.4723$$

i) $Cov(r_{NABIL}, r_m) = \frac{\sum\{[r_m - E(r_m)] \times r_{NABIL} = E(r_{NABIL})\}}{N-1}$

$$= \frac{0.4723}{6-1} = 0.09446$$

ii) Beta Coefficient (β_{NABIL}) $= \frac{Cov(r_{NABIL}, r_m)}{\sigma m^2} = \frac{0.09446}{0.2966^2}$

$$= \frac{0.09446}{0.08797} = 1.0738$$

iii) Correlation Coefficient ($\int_{NABIL}, m$) $= \frac{Cov(r_{NABIL}, r_m)}{\sigma_{NABIL} \times \sigma m}$

$$= \frac{0.9446}{0.4340 \times 0.2966} = \frac{0.9446}{0.12872} = 0.7338$$

From the above calculations, the covariance between the NABIL and market is 0.09446. The Beta coefficient of NABIL is 1.0738 which is greater than 1 which shows that the stock of NABIL is more volatile than the market or the stock seems to be an aggressive type. The correlation coefficient of NABIL is seems to be 0.7338.

2. Standard Chartered Bank Ltd

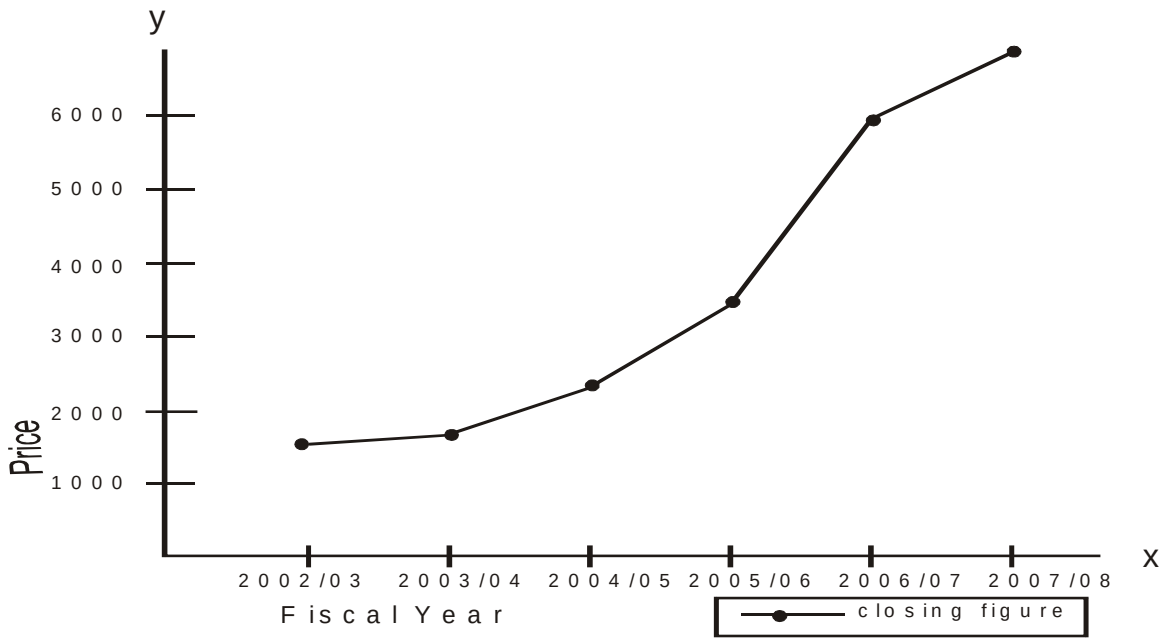
Table No 4.6

MPS and DPS of SCBL

FY	Stock Price			Cash Dividend
	High	Low	Closing	
2002/03	1760	1380	1670	110
2003/04	1800	1520	1745	110
2004/05	2350	1553	1245	110
2005/06	3375	2200	3775	120
2006/07	5900	3058	5900	80
2007/08	9025	4505	9830	0

Figure 4.3

Market Price Movement of SCBL



The above table and figure show that there is an increasing trend in the market price of SCBL Ltd. The lowest MPs of Rs 1670 is found to be in the

FY 2002/03 and then after started to rise up and the MPS is highest in the FY 2007/08 with Rs 6830 as compared with other fiscal years. In the FY 2007/08 there is no declaration of dividend.

Table No 4.7

Calculation of ERR, S.D and CV of SCBL

FY	Stock Price(p_t)	Cash Dividend(Ct)	$r_{SCBL}=\frac{p_t-p_{t-1}+c_t}{p_{t-1}}$	$r_{SCBL}=E(r_{SCBL})$	$[r_{SCBL}=E(r_{SCBL})]^2$
2002/03	1670	110	0.0821	-0.2516	0.0633
2003/04	1745	110	0.1108	-0.2229	0.0497
2004/05	2345	110	0.4069	0.0732	0.0054
2005/06	3775	120	0.6609	0.3272	0.1071
2006/07	5900	80	0.5841	0.2504	0.0627
2007/08	6830	0	0.1576	-0.1761	0.0310

$E(r_{SCBL})$ = 2.0024 $[r_{SCBL}=E(r_{SCBL})]^2$ = 0.3192

i) ERR of SCBL Bank $E(r_{SCBL}) = \frac{\sum r_{SCBL}}{N} = \frac{2.0024}{6} = 0.3337 = 33.37\%$

ii) S.D of SCBL Bank$(\sigma_{SCBL}) = \sqrt{\frac{[r_{SCBL} - E(r_{SCBL})]^2}{N-1}} = \sqrt{\frac{0.3192}{6-1}}$

$= \sqrt{0.06384} = 0.2527 = 25.27\%$

iii) C.V $= \frac{\sigma_{SCBL}}{E(r_{SCBL})} = \frac{35.27\%}{48.70\%} = 0.7573$

The expected rate of return of SCBL is 33.37% that has been calculated by summing up the single period rate of return of different years dividend by no. of observation. The standard deviation is measured of dispersion

around the expected return is 25.27% and the coefficient of variation is 0.7573.

Table no 4.8

Calculation of Covariance, Beta Coefficient and Correlation of SCBL Bank Ltd.

FY	$[r_m-E(r_m)]$	$r_{SCBL}=E(r_{SCBL})$	$[r_m-E(r_m)] \times r_{SCBL}=E(r_{SCBL})$
2002/03	-0.3999	-0.2516	0.10061
2003/04	-0.2163	-0.2229	0.04821
2004/05	-0.0091	0.0732	-0.00067
2005/06	0.0492	0.3272	0.01609
2006/07	0.4679	0.2504	0.11716
2007/08	0.1083	-0.1761	-0.01907

$$\sum\{[r_m-E(r_m)] \times r_{SCBL}=E(r_{SCBL})\} = 0.30181$$

i) $Cov(r_{SCBL},r_m) = \frac{\sum\{[r_m-E(r_m)] \times r_{SCBL}=E(r_{SCBL})\}}{N-1}$

$$= \frac{0.30181}{6-1} = 0.06036$$

ii) Beta Coefficient $(\beta_{SCBL}) = \frac{Cov(r_{SCBL},r_m)}{\sigma m^2} = \frac{0.06036}{0.2966^2}$

$$= \frac{0.06036}{0.08797} = 1.6861$$

iii) Correlation Coefficient $(\int_{SCBL},m) = \frac{Cov(r_{SCBL},r_m)}{\sigma_{SCBL} \times \sigma m}$

$$= \frac{0.06036}{0.2527 \times 0.2966} = \frac{0.06036}{0.07495} = 0.8053$$

The beta coefficient of SCBL is 0.6861 which indicates that it is a defensive type of asset which seems to be less volatile than market. Covariance is 0.06036 which indicates lower than perfectly positively correlation of SCBL with the market and it is also less risky asset.

3. Nepal Investment Bank Limited

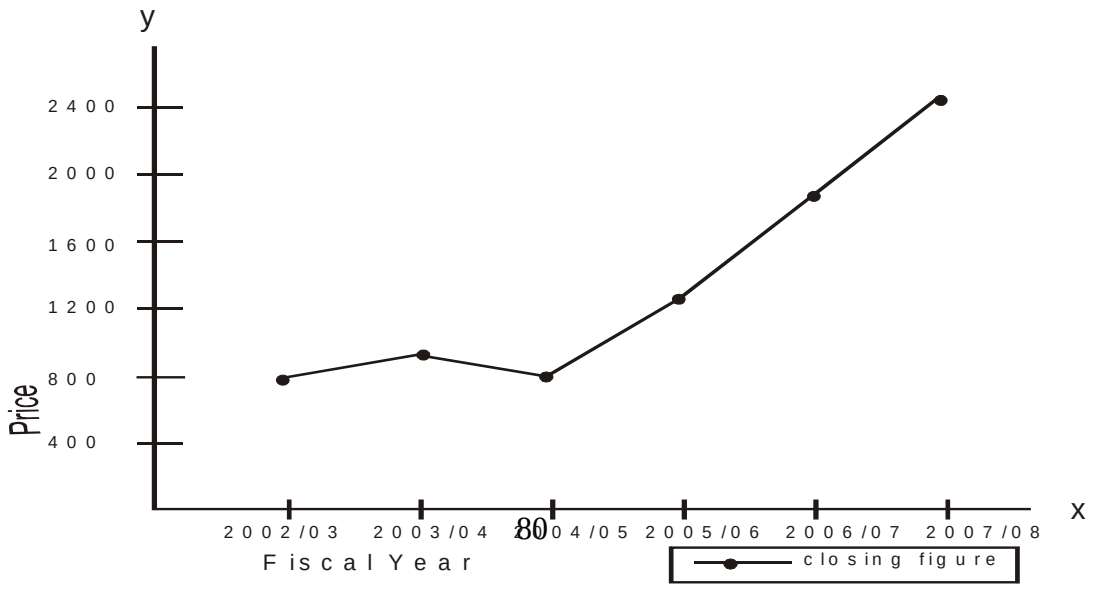
Table No 4.9

MPS and DPS of NIBL

FY	Stock Price			Cash Dividend
	High	Low	Closing	
2002/03	795	710	790	20
2003/04	942	745	940	15
2004/05	1430	760	800	15
2005/06	1265	762	1260	20
2006/07	1729	1000	1729	5
2007/08	3101	1305	2450	0

Figure 4.4

Market Price Movement of NIBL



From the above table and figure shows that the MPS of NIBL has increased for the FY 2003/04 but it decreases in the next year i.e. 2004/05. However, from the FY 2005/06 it has been increasing and NIBL is having an increasing trend of MPS and also found highest in the FY 2007/08 with Rs 2450 and there is no declaration of dividend.

Table No. 4.10

Calculation of ERR, SD and CV

FY	Stock Price(p_t)	Cash Dividend(Ct)	$r_{NIBL}=\frac{p_t-p_{t-1}+c_t}{p_{t-1}}$	$r_{NIBL}=E(r_{NIBL})$	$[r_{NIBL}=E(r_{NIBL})]^2$
2002/03	790	20	0.0385	-0.2128	0.0453
2003/04	940	15	0.2089	-0.0424	0.0018
2004/05	800	15	-0.1329	-0.3842	0.1476
2005/06	1260	20	0.6000	0.3487	0.1216
2006/07	1729	5	0.3762	0.1249	0.0156
2007/08	2450	0	0.4170	0.1657	0.0275

$E(r_{NIBL}) = 1.5077$ $[r_{NIBL}=E(r_{NIBL})]^2 = 0.3594$

i) ERR of NIBL Bank $E(r_{NIBL}) = \frac{\sum r_{NIBL}}{N} = \frac{1.5077}{6} = 0.2513 = 25.13\%$

ii) S.D of NIBL Bank$(\sigma_{NIBL}) = \sqrt{\frac{[r_{NIBL} - E(r_{NIBL})]^2}{N-1}} = \sqrt{\frac{0.3594}{6-1}}$

$= \sqrt{0.07188} = 0.2681 = 26.81\%$

iii) C.V $= \frac{\sigma_{NIBL}}{E(r_{NIBL})} = \frac{26.81\%}{25.13\%} = 1.0669$

The expected rate of return of NIBL is 25.13%. The standard deviation is 26.81% due to the variation in the single period rate of return. The coefficient of variation is 1.0669.

Table NO. 4.11

Calculation of Covariance of NIBL with market

Its beta coefficient and correlation

FY	$[r_m-E(r_m)]$	$r_{NIBL}=E(r_{NIBL})$	$[r_m-E(r_m)] \times r_{NIBL}=E(r_{NIBL})$
2002/03	-0.3999	-0.2128	0.08509
2003/04	-0.2163	-0.0424	0.00917
2004/05	-0.0091	-0.3842	0.00349
2005/06	0.0492	0.3487	0.01716
2006/07	0.4679	0.1249	0.05844
2007/08	0.1083	0.1657	0.01795

$$\sum\{[r_m-E(r_m)] \times r_{NIBL}=E(r_{NIBL})\} = 0.1913$$

i) $Cov(r_{NIBL},r_m) = \frac{\sum\{[r_m-E(r_m)]\,[r_{NIBL}-E(r_{NIBL})]\}}{N-1}$

$= \frac{0.1913}{6-1} = 0.03826$

ii) Beta Coefficient $(\beta_{NIBL}) = \frac{Cov(r_{NIBL},r_m)}{\sigma m^2} = \frac{0.03826}{(0.2966)^2}$

$= \frac{0.03826}{0.08797} = 0.4349$

iii) Correlation Coefficient $(\int_{NIBL},m) = Cov(r_{NIBL},r_m)$

$$= \frac{0.03826}{0.2681 \times 0.2966} = \frac{0.03826}{\overline{\sigma_{NIBL} \times \sigma m}} = \frac{0.03826}{0.07951} = 0.4812$$

The covariance between NIBL and the market is 0.03826 which is less volatile than the market. The beta coefficient is found to be 0.4349 i.e $\beta<1$ that indicates a defensive type of asset. Beta is an index of systematic risk that is found to be minimum. So, this is a defensive type of asset and found to be less risky.

4. Himalayan Bank Limited

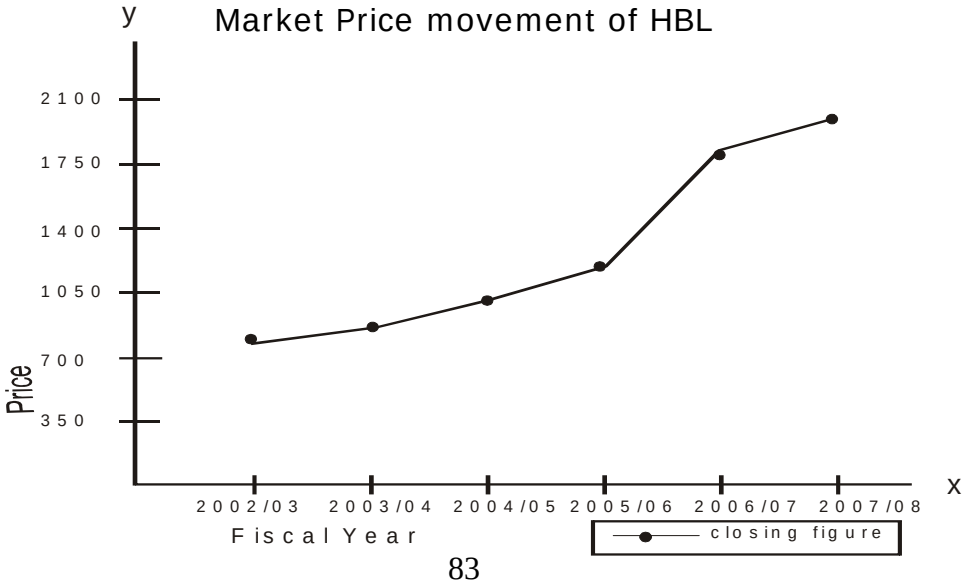
Table No. 4.12

MPS and DPS of HBL

FY	Stock Price			Cash Dividend
	High	Low	Closing	
2002/03	950	750	815	1.31
2003/04	1010	600	840	0
2004/05	1181	855	920	0
2005/06	1200	900	1100	30
2006/07	1760	950	1760	15
2007/08	2856	1340	1980	0

Figure 4.5

Market Price movement of HBL



The above table and figure shows the increasing trend of market price. The MPS is found to be lowest in the FY 2002/03 and then after it keeps on increasing and found highest of Rs 1980 in the FY 2007/08. There is no declaration of dividend during the same year.

Table No. 4.13

Calculation of ERR, SD and CV of HBL

FY	Stock Price(p_t)	Cash Dividend(Ct)	$r_{HBL}=\frac{p_t-p_{t-1}+c_t}{p_{t-1}}$	$r_{HBL}=E(r_{HBL})$	$[r_{HBL}=E(r_{HBL})]^2$
2002/03	815	1.31	0.0016	-0.1808	0.0327
2003/04	840	0	0.0307	-0.1517	0.0230
2004/05	920	0	0.0952	-0.0872	0.0076
2005/06	1100	30	0.2283	0.0459	0.0021
2006/07	1760	15	0.6136	0.4312	0.1859
2007/08	1980	0	0.1250	-0.0574	0.0033

$E(r_{HBL}) = 1.0944$ $[r_{HBL}=E(r_{HBL})]^2 = 0.2546$

i) ERR of HBL Bank $E(r_{HBL}) = \frac{\sum r_{HBL}}{N} = \frac{1.0944}{6} = 0.1824 = 18.24\%$

ii) S.D of HBL Bank$(\sigma_{HBL}) = \sqrt{\frac{[r_{HBL]} - E(r_{HBL})]^2}{N-1}} = \sqrt{\frac{0.2546}{6-1}}$

$= \sqrt{0.05092} = 0.2257 = 22.57\%$

iii) C.V $= \frac{\sigma_{HBL}}{E(r_{HBL})} = \frac{22.57\%}{18.24\%} = 1.2374$

Above calculation shows that the return on HBL increasing from 0.16% to 61.36% and got decreased to 12.50% in the FY 2007/08. The weighted average rate of return of HBL is 18.24% which is the sum total of single return dividend by no. of observation. The variation of return i.e standard deviation of HBL is 22.57% and consequently the C.V is 1.2374.

Table NO. 4.14

Calculation of Covariance of HBL with market

Its beta coefficient and correlation

FY	$[r_m-E(r_m)]$	$r_{HBL}=E(r_{HBL})$	$[r_m-E(r_m)] \times r_{HBL}=E(r_{HBL})$
2002/03	-0.3999	-0.1808	0.0723
2003/04	-0.2163	-0.1517	0.0328
2004/05	-0.0091	-0.0872	0.0008
2005/06	0.0492	0.0459	0.0023
2006/07	0.4679	0.4312	0.2018
2007/08	0.1083	0.0574	0.0062

$$\sum\{[r_m-E(r_m)] \times r_{HBL}=E(r_{HBL})\} = 0.3162$$

i) $Cov(r_{HBL},r_m) = \dfrac{\sum\{[r_m-E(r_m)]\ [r_{HBL}=E(r_{HBL})]\}}{N-1}$

$$= \frac{0.3162}{6-1} = 0.06324$$

ii) Beta Coefficient $(\beta_{HBL}) = \dfrac{Cov(r_{HBL},r_m)}{\sigma m^2} = \dfrac{0.06324}{0.2966^2}$

$$= \frac{0.06324}{0.08797} = 0.7189$$

iii) Correlation Coefficient $(\int_{HBL},m) = Cov(r_{HBL},r_m)$

$$= \frac{0.06324}{0.2257 \times 0.2966} = \frac{0.06324}{\sigma_{HBL} \times \sigma m} = \frac{0.06324}{0.06694} = 0.9447$$

Here from the above calculations, the beta coefficient of HBL is found 0.7189 i.e $\beta<1$. So, this is a defensive type of asset and is found to be less risky. The covariance between HBL and market is 0.06324. The correlation coefficient is 0.9534.

5. Bank of Kathmandu Limited

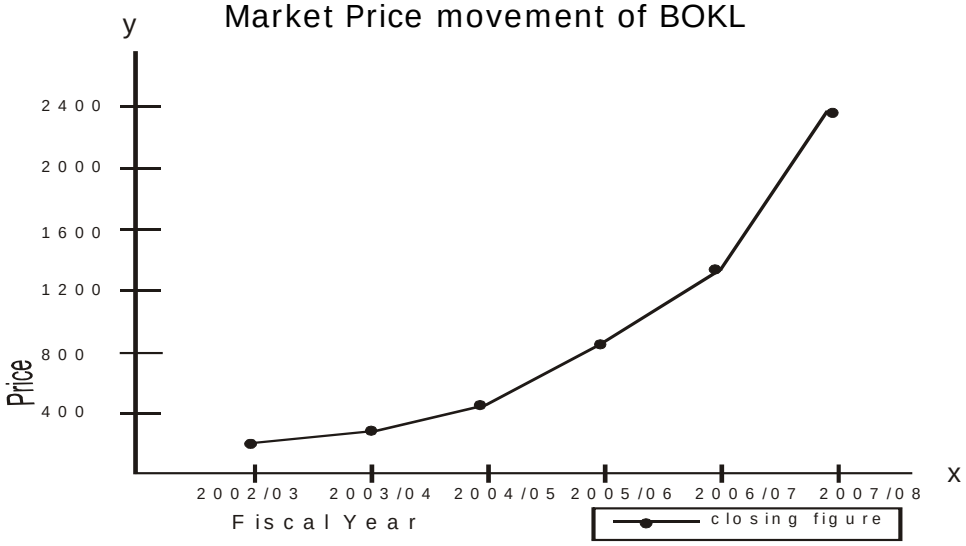
Table No. 4.15

MPS and DPS of BOKL

FY	Stock Price			Cash Dividend
	High	Low	Closing	
2002/03	230	190	210	5
2003/04	310	175	295	10
2004/05	472	280	430	10
2005/06	881	422	850	18
2006/07	1375	691	1375	20
2007/08	2361	1200	2350	0

Figure 4.6

Market Price movement of BOKL



The above table and figure shows that the MPS of BOKL has increasing from FY 2002/03 to 2007/08. The lowest MPS of BOKL is found in the FY 2002/03 and the highest in FY 2007/08. There is no declaration of dividend during the same year.

Table No. 4.16

Calculation of ERR, SD and CV of BOKL

FY	Stock Price(p_t)	Cash Dividend(Ct)	$r_{BOKL}=\frac{p_t-p_{t-1}+c_t}{p_{t-1}}$	$r_{BOKL}=E(r_{BOKL})$	$[r_{BOKL}=E(r_{BOKL})]^2$
2002/03	210	5	-0.0487	-0.5927	0.3513
2003/04	295	10	0.4524	-0.0916	0.0084
2004/05	430	10	0.4915	-0.0525	0.0028
2005/06	850	18	1.0186	0.4746	0.2252
2006/07	1375	20	0.6412	0.0972	0.0094
2007/08	2350	0	0.7091	0.1651	0.0273

$E(r_{BOKL}) = 3.2641$ $[r_{BOKL}=E(r_{BOKL})]^2 = 0.6244$

i) ERR of BOKL Bank $E(r_{BOKL}) = \frac{\sum r_{BOKL}}{N} = \frac{3.2641}{6} = 0.5440 = 54.40\%$

ii) S.D of BOKL Bank$(\sigma_{BOKL}) = \sqrt{\frac{\sum[r_{BOKL}-E(r_{BOKL})]^2}{N-1}} = \sqrt{\frac{0.6244}{6-1}}$

$= \sqrt{0.12488} = 0.3534 = 35.34\%$

iii) C.V $= \frac{\sigma_{BOKL}}{E(r_{BOKL})} = \frac{35.34\%}{54.40\%} = 0.6496$

The weighted average rate of return of BOKL is 54.40% which is the sum total of single return dividend by no. of observation. The variation of return i.e standard deviation of BOKL is 35.34% and consequently C.V is 0.6496.

Table NO. 4.17

Calculation of Covariance of BOKL with market

Its beta coefficient and correlation

FY	$[r_m-E(r_m)]$	$r_{BOKL}=E(r_{BOKL})$	$[r_m-E(r_m)] \times r_{BOKL}=E(r_{BOKL})$
2002/03	-0.3999	-0.5927	0.2370
2003/04	-0.2163	-0.0916	0.0198
2004/05	-0.0091	-0.0525	0.0005
2005/06	0.0492	0.4746	0.0234
2006/07	0.4679	0.0972	0.0455
2007/08	0.1083	0.1651	0.0179

$$\sum\{[r_m-E(r_m)] \times r_{BOKL}=E(r_{BOKL})\} = 0.3441$$

i) $Cov(r_{BOKL},r_m) = \dfrac{\sum\{[r_m-E(r_m)] \times r_{BOKL}=E(r_{BOKL})\}}{N-1}$

$$= \frac{0.3441}{6-1} = 0.06882$$

ii) Beta Coefficient $(\beta_{BOKL}) = \dfrac{Cov(r_{BOKL},r_m)}{\sigma m^2} = \dfrac{0.06882}{0.2966^2}$

$$= 0.06882 = \frac{0.7823}{0.08797}$$

iii) Correlation Coefficient $(\int_{BOKL},m) = \dfrac{Cov(r_{BOKL},r_m)}{\sigma_{BOKL} \times \sigma m}$

$$= \frac{0.06882}{0.3534 \times 0.2966} = \frac{0.06882}{0.1048} = 0.6567$$

The above calculation shows that the covariance of BOKL with the market is positive. BOKL has beta of 0.7823 which indicates that it is a defensive type of asset. It is less risky type of asset.

4.4 Comparative study of Risk and Return of the selected commercial Banks.

From the above table and calculation i.e. from table1 to 17, the expected rate of return, standard deviation and c.v. of the selected commercial banks with the market are summarized below:

Table No 4.18

Inter Bank expected Rate of Return, standard Deviation and coefficient of variance.

Banks	ERR	SD	CV
NABIL Bank Ltd.	48.70%	43.40%	0.8912
Standard chartered Bank Ltd.	33.37%	25.27%	0.7573
Nepal Investment Bank Ltd.	25.13%	26.81%	1.0669
Himalayan Bank Ltd.	18.24%	22.57%	1.2374
Bank of Kathmandu Ltd.	54.40%	35.34%	0.6496
NEPSE (MARKET)	30.02%	29.66%	0.9880

We can observe from the table that the investor will prefer highest expected return and will get it from BOKL. However, the investors must pay attention to the standard deviation of the assets. Further researcher knows that the expected return and standard deviation from any investor is the objects of choice for any investor. Most investors are risk averter, they prefer highest with low risk. Therefore, investor should concentrate

on both the risk and return but it is difficult to say that which security is best for investment point of view. For this purpose the C.V. gives clear ideas about the risk per unit of return for any security. Now , investor can clearly know the assets are less risky if they have low C.V. it is found in the above table that NIBL and HBL have highest C.V. and are most risky assets. BOKL has the lowest C.V. among the sample study, and is more secure assets or risk less assets. With the investment point of view, it is found that BOLK is appropriate where in to invest.

4.5 Partition of total risk into systematic and unsystematic risk.

Total risk is measured by the variance of return. Total risk can be partition into systematic risk and unsystematic risk. Systematic risk cannot be eliminated through diversification. Beta coefficient is the index of systematic risk. In other words, market sensitively of stock can be defined by termed as 'beta coefficient '.

Beta coefficient of different banks is summarized below:

Table No. 4.19

Beta Coefficient of Each Bank

Banks	Beta	Result
NABIL Bank Ltd.	1.0738	Aggressive
Standard chartered Bank Ltd.	0.6861	Defensive
Nepal Investment Bank Ltd.	0.4349	Defensive
Himalayan Bank Ltd.	0.7189	Defensive
Bank of Kathmandu Ltd	0.7823	Defensive

Summary of Beta calculation.

The above table shows that the beta of NABIL Bank Ltd. Is greater than one i.e. $\beta>1$. so, NABIL has aggressive type of asset which indicates more volatile then the market. If the market goes up by 10 percent, the assets NABIL will increase by 10.73%. in other hand the other banks SCBL, NIBL, HBL, and BOKL have Beta less than one i.e. $\beta>1$ which indicates the defensive type of assets and these assets are less volatile than the market.

Partition of Total Risk into Systematic and Unsystematic risk.

Nabil Bank Limited.

Total risk= systematic risk + unsystematic risk

$Var(r_{NABIL}) = (\beta_{NABIL})^2 Var(r_m) + var(e)$

$0.1884 = (1.0738)^2 x 0.0879 + var(e)$

$0.1884 = 1.1530 x 0.0879 + var(e)$

$0.1884 = 0.1013 + var(e)$

$Var(e) = 0.1884 - 0.1013 = 0.0871$

Therefore, unsystematic risk, var(e) = 0.0871

Where, systematic risk = 0.1013

Standard character Bank Limited.

Total risk = systematic risk + unsystematic risk

$Var(r_{SCBL}) = (\beta_{SCBL})^2 x VAR(r_m) + var(e)$

$0.0639 = (0.6861)^2 x 0.0879 + var(e)$

$0.0639\ 0.4707x\ 0.0879 + var(e)$

$0.0639 = 0.0414 + var(e)$

$Var(e) = 0.0639 - 0.0414 = 0.0225$

Therefore, unsystematic risk, var(e) = 0.0225

Where, systematic risk = 0.0414

Nepal investment Bank Limited.

Total risk = systematic risk +unsystematic risk

$Var(r_{NBIL}) = (\beta_{NABIL})^2 \times var(r_m) + var(e)$

$0.0719 = (0.4349)^2 \times 0.0879 + var(e)$

$0.0719 = 0.1891 \times 0.0879 + var(e)$

$0.719 = 0.0719 - 0.0166$

$= 0.0553$

Therefore, unsystematic risk =0.0553

Systematic risk = 0.0166

Himalayan Bank Limited.

Total risk = unsystematic risk +unsystematic risk

$Var(r_{HBL}) = (\beta_{HBL})^2 var(r_m) + var(e)$

$0.0509 = (0.7189)^2 \times 0.0879 + var(e)$

$0.0509 = 0.5168 \times 0.0879 + var(e)$

$0.0509 = 0.0454 + var(e)$

$Var(e) = 0.0509 - 0.0454$

$= 0.0055$

Therefore, unsystematic risk = 0.0055

Systematic risk = 0.0454

Bank of Kathmandu Limited.

Total risk = systematic risk +unsystematic risk

$Var(r_{BOKL}) = (\beta_{BOKL})^2 var(r_m) + var(e)$

$0.1249 = (0.7823)^2 \times 0.0879 + var(e)$

0.0249 = 0.6119 x 0.0879 +var(e)

0.0249 =0.0538 + var(e)

Var(e) = 0.1249 – 0.0538

=0.0711

Therefore, unsystematic risk = 0.0711

Systematic risk = 0.0538

Table No. 4.20

Total risk and its partition into systematic and unsystematic risk.

Bank	Total Risk	Systematic Risk	Unsystematic Risk	Coefficient of Determination
NABIL	0.1884	0.1013	0.0871	0.5385
SCBL	0.0639	0.0414	0.0225	0.6485
NIBL	0.0719	0.0166	0.0553	0.2316
HBL	0.0509	0.0454	0.0055	0.8925
BOKL	0.1249	0.0538	0.0711	0.4313

The above table 4.20 indicates that the total risk of NABIL is highest i.e. 0.1884 and total risk of HBL is lowest i.e. 0.0509 among the five selected commercial banks. Systematic risk is the market risk and that can't eliminate through diversification. Here, HBL has the highest coefficient of determination which indicates that the total risk of them has consist with systematic risk that can't be eliminated. Unsystematic risk of HBL, SCBL, and NIBL can be diversified to some extend. NABIL has highest total risk and lower coefficient of determination which shows that there is huge part of unsystematic risk on total risk. So, risk of SCBL and HBL can b eliminated through diversification.

4.6 The Security market Line.

The Security Market Line (SML) is an equilibrium theory of how to price and measure risk. The logic of the security market line equation is that the required return on any investment is the risks free return plus a risk adjusted factor. The risk adjusted factor is obtained by multiplying the risk premium required for the market rate of return by the riskyness of the individual investment.

$$E(r_i) = r_f + [E(r_m) - r_f]\beta$$

Thus, the required rate of return for bank could be calculated by SML equation. Risk free rate of return is taken as weighted average return of treasury bill rate published by NRB where risk free rate of return (R_f) = 5.3%

(β_i) = Beta coefficient of different banks

Market rate of return $E(r_m)$ = 30.02%

Beta coefficient and comparison of ERR and RRR is shown in the table below:

Table no. 4.21

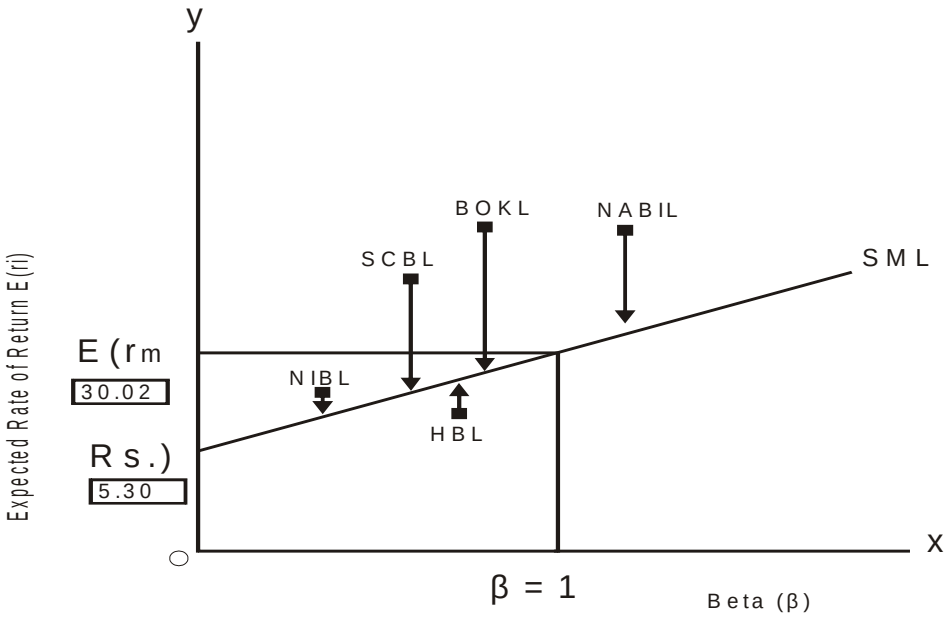
Comparative Analysis of ERR and RRR of
Selected Commercial Banks.

Banks	R_f	$E(r_m)$	β	$RRR = R_f + [E(r_m) - r_f]\beta$	ERR	Evaluation	Remarks
NABIL	5.30%	30.02%	1.0738	31.84%	48.70%	Under priced	Required rate of return < Expected rate of return.
SCBL	5.30%	30.02%	0.6861	22.26%	33.37%	Under priced	Required rate of

							return < Expected rate of return.
NIBL	5.30%	30.02%	0.4349	16.05%	25.13%	Under priced	Required rate of return < Expected rate of return.
HBL	5.30%	30.02%	0.7189	23.07%	18.24%	Under priced	Required rate of return > Expected rate of return.
BOKL	5.30%	30.02%	0.7823	24.64%	54.40%	Under priced	Required rate of return < Expected rate of return.

Figure no. 4.7

Indication of RRR on Security Market Line



The stock that line lies above the security market line is said to be under priced and stock that lies below the security market line is said to be overpriced.

Above table and figure shows that the stocks of the selected commercial banks are not in equilibrium on the CAMP. Assets are under priced of undervalued and therefore a very desirable assets to own. NABIL, SCBL, NIBL, and BOKL are under priced and the price will rise in the market as more investors purchase them. However, as assets price goes up, its return falls. HBL is found to be overpriced, it would be better to sell stock of HBL.

4.7 Analysis of portfolio risk and return.

From the above calculation and analysis, we can see that there are some risk factors In various assets. Risk can be reflected by standard deviation of different assets. Constructing portfolio can diversify some of the risk, which is unsystematic.
In two stock portfolios, the optimal weight of assets can be found out by the help of minimum risk portfolio weight. Risk portfolio is the portfolio with the lowest level of risk in the efficient frontier. It is also called risk minimizing weight or optimal weight.

Table no.4.20 shows that every commercial bank which are taken as simple has some unsystematic risk and that can be reduced by diversifying with construction of two assets.

Optimal weight of each stock can be found out by using the equation.

$$W_A = \frac{\sigma_B^2 - cov_{AB}}{}$$

$$\sigma_A^2+\sigma_B^2-2cov_{AB}$$

$W_B = 1-W_A.$

1. NABIL BANK LTD.

The portfolio of the common stock of NABIL Bank Ltd. (Lets support stock A) and common stock of any security in market i.e. NEPSE (suppose stock B) is constructed.

Where,

$E(r_{NABIL}) = 0.4870$ $\sigma_{NABIL} = 0.4340$

$E(r_m) = 0.3002$ $\sigma_m = 0.2966$

$Cov(r_{NABIL,m}) = 0.09446$

Optimal weight of NABIL$(W_{NABIL}) = \dfrac{\sigma_M^2-COV(r_{NABIL,m})}{\sigma_{NABIL}^2\ \sigma M^2-2cov(r_{NABIL,m})}$

$$= \frac{(0.2966)^2-0.9446}{(0.4340)^2+ (0.2966)^2-2 \times 0.09446}$$

$$= \frac{0.08797-0.09446}{0.18836+0.08797-0.18892}$$

$$= \frac{-0.00649}{0.08741}$$

$$= -0.0742$$

Therefore, the optimal weight of NABIL $(W_{NABIL}) = -0.0742$

Therefore, weight of market $(W_m) = 1- W_{NABIL}$

$= 1-(-0.0742)$

$= 1.0742$

Portfolio Return $E(R_p) = W_{NABIL} \times E(r_{NABIL}) + W_m \times E(r_m)$

$= (-0.0742) \times 0.4870 + 1.0742 \times 0.3002$

$= -0.0361 + 0.3225$

$= 0.2864$

$= 28.64\%$

Portfolio Risk (σ_p).

$$= \sqrt{(\sigma_{NABIL})^2 x (W_{NABIL})^2 + (\sigma_M)^2 x (W_M)^2 + 2cov(R_{NABIL,m}) x\ W_{NABIL} \times W_m}$$

$$= \sqrt{0.4340)^2 x (-0.0742)^2 + (02966)^2 x (1.0742)^2 + 2x0.09466x(-0.0742)x0.2966}$$

$$= \sqrt{0.1883x0.00550 + 0.08797x1.15390 - 0.00416}$$

$$= \sqrt{0.00104 + 0.10151 - 0.00416}$$

$$= \sqrt{0.09839}$$

$= 0.3137$

$= 31.37\%$

Above calculation of portfolio return and risk shows that unsystematic risk is reduced by constructing portfolio consisting stock of NABIL and market i.e. NEPSE. It will be quite beneficial for those investors who prefer high return with risk because there is positive return from the portfolio.

2. Standard chartered Bank Ltd.

Again, the portfolio of the common stock of SCBL and common stock of any security in market is constructed.

Where,

$E(r_{SCBL}) = 0.3337$ $\sigma_{SCBL}=0.2527$

$E(r_M) 0.3002$ $\sigma_m=0.2966$

$Cov\ (r_{SCBL,M}) = 0.06036$

$$\text{Optimal weight of SCBL}(W_{SCBL}) = \frac{\sigma_m^2 - cov(r_{SCBL,M})}{\sigma_{SCBL}^2+\sigma_m^2-2cov\ (r_{SCBL,M})}$$

$$= \frac{(0.2966)^2 - 0.06036}{(0.2527)^2+(0.2966)^2-2x0.06036}$$

$$= \frac{0.08797-0.06036}{0.06386+0.08797-0.12072}$$

$$= \frac{0.02761}{0.03111}$$

$$= 0.8875$$

The optimal weight of SCBL =0.8875

$$= 1 - 0.8875$$

$$= 0.1125$$

$$\text{Portfolio Return } E(R_p) = W_{SCBL} \times E(r_{SCBL}) + W_m \times E(r_m)$$

$=0.8875x0.3337+0.1125x0.3002$

$=0.2962+0.0338$

$=0.33$

$=33\%.$

Portfolio Risk(σ_p)

$$= \sqrt{(\sigma_{SCBL})^2 x (W_{SCBL})^2 + (\sigma_M)^2 x (W_M)^2 + 2cov(R_{SCBL,m}) x\ W_{SCBL} x\ W_m}$$

$$= \sqrt{(0.2527)^2 \text{ x } (0.8875)^2 + (0.2966)^2 x (0.1125)^2 + 2 \text{ x } 0.06036 \text{ x } 0.8875x0.1125}$$

$$= \sqrt{0.06386x0.78766 + 0.08797x0.01266 - 0.01205}$$

$$= \sqrt{0.05029 + 0.00111 - 0.01205}$$

$$= \sqrt{0.06345}$$

$$= 0.2519$$

$$= 25.19\%$$

Using the diversification, we can reduce the unsystematic risk. There is 25.27% and 29.66% risk respectively in individual assets, after diversification, portfolio risk is reduced to 25.19% where the portfolio return is 33%.

3. Nepal Investment Bank Ltd.

Again, the portfolio of NIBL and any asset from the market is constructed and analyzed.

Where,

$E(r_{NIBL})$ $=0.2513$ $\sigma_{NIBL}=0.2618$

$E(r_M)$ = 0.3002 σ_m =0.2966

Cov (r_{NIBL}) = 0.03826

$$(W_{SCBL}) = \frac{\sigma_m^2 - cov(r_{NIBL,M})}{(\sigma_{NIBL})^2 + (\sigma_m)^2 - 2cov\ (r_{NIBL,M})}$$

$$= \frac{(0.2966)^2 - 0.03826}{(0.2681)^2 + (0.2966)^2 - 2x0.03826}$$

$$= \frac{0.08797 - 0.03826}{0.07188 + 0.08797 - 0.07652}$$

$$= \frac{0.04971}{0.833} = 0.5965$$

The optimal weight of NIBL

Weight of market (W_m)= 1-W_{NIBL}

= 1 - 0.5965

= 0.4035

Portfolio Return $E(R_p)$ = W_{NIBL} x $E(r_{NIBL})$ + W_m x $E(r_m)$

=0.5965x0.2513+0.4035x0.3002

=0.1499+0.1200

=0.271

=27.10%.

Portfolio Risk (σ_p)

$$= \sqrt{(W_{NIBL})^2 x (\sigma_{NIBL})^2 + (W_M)^2 x (\sigma_M)^2 + 2cov(r_{NIBL,m}) x\ W_{NIBL} x\ W_m}$$

$$= \sqrt{(0.5965)^2 \text{ x } (0.2681)^2 + (0.4035)^2 x (0.2966)^2 + 2 \text{ x } 0.03826 \text{ x } 0.5965 \text{ x } 0.4035}$$

$$= \sqrt{0.35581 x 0.07188 + 0.16281 \text{ x } 0.08797 - 0.01842}$$

$$= \sqrt{0.02558 + 0.01432 - 0.01842}$$

$$= \sqrt{0.05832}$$

$$= 0.2415$$

$$= 24.15$$

The portfolio seems to be beneficial for those investor who prefer higher return because the return is positive.

4. Himalayan Bank Ltd.

The portfolio of common stock of HBL and any stock from market i.e. NEPSE will be constructed in this part.

Where,

$E(r_{HBL}) = 0.1824$ $\sigma_{HBL} = 0.2577$

$E(r_M) 0.3002$ $\sigma_m = 0.2966$

Cov $(r_{HBL,M}) = 0.06324$

$$(W_{HBL}) = \frac{\sigma_m^2 - cov(r_{HBL,M})}{(\sigma_{HBL})^2 + (\sigma_m)^2 - 2cov\ (r_{HBL,M})}$$

$$= \frac{(0.2966)^2 - 0.06324}{(0.2257)^2 + (0.2966)^2 - 2 \text{ x } 0.06324}$$

$$= \frac{0.08797-0.06324}{0.05094+0.08797-0.12642}$$

$$= \frac{0.02473}{0.01243}$$

$$= 1.9895$$

Therefore, The optimal weight of HBL =1.9895

Weight of market (W_m) = 1-W_{HBL}

= 1 -1.9895

= -0.9895

Portfolio Return $E(R_p)$ = W_{HBL} x $E(r_{HBL})+W_m$ x $E(r_m)$

=1.9895x0.1824+(-0.9895)x0.3002

=0.3629+0.2970

=0.0659

=6.59%.

Portfolio Risk (σ_p)

$$= \sqrt{(W_{HBL})^2 x(\sigma_{HBL})^2+(W_M)^2 x(\sigma_M)^2+2cov(r_{HBL,m})x\ W_{HBL}\ x\ W_m}$$

$$= \sqrt{(1.9895)^2 \text{ x } (0.2257)^2+(-0.9895)^2 x(0.2966)^2+2 \text{ x } 0.06324 \text{ x } 1.9895 \text{ x}(-0.9895)}$$

$$= \sqrt{3.95811x0.05094+0.97911 \text{ x } 0.08797 -0.24899}$$

$$= \sqrt{0.20163+0.08613-0.24899}$$

$$= \sqrt{0.03877}$$

= 0.1969

= 19.69%

Above calculation shows that if investors invest their funds with diversification between HBL and market he/she could reduce the risk sufficiently. Before the diversification individual stock has 22.57% and 29.66% risk and 18.24% and return respectively. After diversification, risk is minimized to 19.69% and expected return is 6.59%. This portfolio consists of HBL and market is beneficial for risk averter investor.

5. Bank of Katmandu Ltd.

The portfolio of common stock of BOKL and any stock from market is constructed. We know that BOKL stock is an asset which is less riskier than that of NABIL. And it is beneficial to reduce the unsystematic risk. Portfolio is constructed.

Where,

$E(r_{BOKL}) = 0.5440$ $\sigma_{BOKL} = 0.3534$

$E(r_M) = 0.3002$ $\sigma_m = 0.2966$

$Cov\ (r_{BOKL,M}) = 0.06882$

$$(W_{BOKL}) = \frac{\sigma_m^2 - cov(r_{BOKL,M})}{(\sigma_{BOKL})^2 + (\sigma_m)^2 - 2cov\ (r_{BOKL,M})}$$

$$= \frac{(0.2966)^2 - 0.06882}{(0.3534)^2 + (0.2966)^2 - 2 \times 0.06882}$$

$$= \frac{0.08797 - 0.06882}{0.12489 + 0.08797 - 0.13764}$$

$$= \frac{0.01915}{0.07522}$$

$$= 0.2546$$

Therefore, The optimal weight of BOKL =0.2546

Weight of market (W_m) $= 1-W_{BOKL}$

$= 1 -0.2546$

$= -0.7454$

Portfolio Return $E(R_p) = W_{BOKL} \times E(r_{BOKL}) + W_m \times E(r_m)$

$=0.2546x0.5440+0.7454x0.3002$

$=0.1385+0.2238$

$=0.3623$

$=36.23\%.$

Portfolio Risk (σ_p)

$$= \sqrt{(W_{BOKL})^2 x(\sigma_{BOKL})^2 + (W_M)^2 x(\sigma_M)^2 + 2cov(r_{BOKL,m}) x\ W_{BOKL} \times W_m}$$

$$= \sqrt{(0.2546)^2 \times (0.3534)^2 + (-0.7454)^2 x(0.2966)^2 + 2 \times 0.06882 \times 0.2546 \times 0.7454}$$

$$= \sqrt{0.06482 \times 0.12489 + 0.55562 \times 0.08797 - 0.02612}$$

$$= \sqrt{0.00809+0.04888-0.02612}$$

$$= \sqrt{0.08309}$$

$$= 0.2883$$

= 28.83%

Using the diversification, we can reduce the unsystematic risk. This is 35.34% and 29.66% risk respectively in individual's assets. After the diversification, portfolio risk is reduced to 28.83% where portfolio return is 36.23%.

Table No. 4.22

Table showing optimal portfolio of different banks with market and effectiveness of Diversification.

Portfolio	Assets	Weights	Individual Risk (σ_i)	Individuals Returns $E(r_i)$	Portfolio risk σ_p	Portfolio return r_p
A	NABIL	-0.0742	0.4340	0.4870		
	MARKET	1.0742	0.2966	0.3002	0.3137	0.2864
B	SCBL	0.8875	0.2527	0.3337		
	MARKET	0.1125	0.2966	0.3002	0.2519	0.33
C	NIBL	0.5965	0.2681	0.2513		
	MARKET	0.4035	0.2966	0.3002	0.2415	0.2710
D	HBL	1.9895	0.2257	0.1824		
	MARKET	-0.9895	0.2966	0.3002	0.1969	0.0659
E	BOKL	0.2546	0.3534	0.5440		
	MARKET	0.7454	0.2966	0.3002	0.2883	0.3623

Above table shows that the optional weight of individual asset of commercial bank and market portfolio that gives minimum risk.

- First portfolio consists of NABIL and market having the risk of 0.2966 respectively and the diversification, it is reduced to0.2864 which dominates the portfolio D.

- In the second portfolio, it consists of SEBL and market with optional weight of 0.8875 and 0.1125 respectively and is more preferable than portfolio A because portfolio B dominates the portfolio A, B, C and D where portfolio return is sufficient to compensate the risk.
- Portfolio C consists of NIBL and market considering risk of 0.2681 and 0.2996 respectively. This portfolio can reduce the risk which provides return of 0.2710 from the portfolio. After the diversification, the risk is reduced to 0.2415 which is more preferable by the investor.
- The portfolio D consists of 198.95%in HBL with short selling of assets from market 95.95%which includes the individual risk of 0.2257and 0.2966 respectively. After diversification the portfolio minimizes the risk to0.1969 and portfolio return is 0.0659. All the portfolios – A, B, C, and E dominate portfolio D since the return from the portfolio is the lowest.
- The portfolio E consist of individuals risks of 0.3534 and 0.2966 respectively of BOKL and market which minimize the risk to 0.2883 the portfolio is model portfolio of best performance in risk reduction among all the portfolio i.e. A, B, C and D. After diversification, the portfolio returns is found to be 0.3623 portfolio E is said to be dominate portfolio to portfolio A ,B ,C, and D.

4.8 Portfolio Performance Evaluation

When considering a portfolio performance, it is important to consider both risk and return. Here, in this study, portfolio performance is evaluated by the Sharpe Performance Evaluation Method.

Sharpe Performance Evaluation $$\frac{\overline{Sp}}{\sigma_p} = r_p - r_f$$

Where,

$\overline{r_p}$ = Expected Return of Portfolio

r_f = Risk Free Rate of Return

σ_p = Standard Deviation of Portfolio

Table No 4.23

Sharpe Performance Evaluation

showing with Ranking of Portfolio

Portfolios	$Sp = \frac{\bar{r}_p - r_f}{\sigma_p}$	Result	Ranking
A	$= \frac{0.2864 - 0.0530}{0.3137}$	0.7440	Fourth
B	$= \frac{0.33 - 0.0530}{0.2519}$	1.0996	First
C	$= \frac{0.2710 - 0.0530}{0.2415}$	0.9027	Third
D	$= \frac{0.0659 - 0.0530}{0.1969}$	0.0655	Fifth
E	$= \frac{0.3623 - 0.0530}{0.2883}$	1.0728	Second

Above table shows that the performance of portfolio B i.e. portfolio between SCBL and assets from market has best performance among the fire portfolios constructed. Portfolio B has higher return and lower risk i.e. the C.V is 0.7633 and hence performed as best portfolio. Similarly, portfolio E has second ranking of portfolio performance evaluation i.e. portfolio between BOKL and NEPSE.

Portfolio C is ranked as third performer portfolio where the return is 27.10% and relatively risk is 24.15% resulted third performance. Portfolio A has less return of 28.64% as compared to the risk given of 31.37% and ranked as fourth in the performance evaluation. Finally, portfolio D which

is resulted as worst performance because it has very low return with least risk. However, this type of portfolio may be preferred by risk seeker investors with bothering about the risk. But risk averter investor may not prefer such type of asset having high risk compared to the return.

4.9 Major Findings of Study

Expected return of BOKL is highest i.e. 54.40% and HBL has lowest expected rate of return of 18.24%. NABIL has ranked second in terms of expected rate of return of 48.70% with the maximum standard deviation of 43.40%. SCBL has 33.37% of expected rate return with 25.27% of standard deviation. The expected rate of return of NIBL is 25.13% with 26.81% of risk.

- The expected rate of return and standard deviation cannot draw an appropriate comparison and conclusion. So, we have to consider C.V for this. The C.V of HBL is 1.2374 and found to be the highest and regarded as the most risky asset. Similarly, NIBL has also C.V of 1.0669 and resulted as risky asset.
- Standard deviation is the surrogate of total risk and here NIBL has variance of 0.1884 where 0.1013 is systematic risk and 0.0874 is the unsystematic risk. BOKL has second large portion of unsystematic risk on total risk. NIBL and SCBL have low unsystematic risk. HBL has the unsystematic risk. As we know that unsystematic risk is diversifiable risk and could be eliminated through diversification. Here, NABIL's risk can be eliminated by diversifying into the asset from the market.
- Beta is the index of systematic risk where we found NAIL has the highest beta of 1.0738 i.e. $\beta>1$. So, this is an aggressive type of asset. BOKL has the second highest beta but beta is found less than 1 i.e. $\beta_{BOKL}=0.7828$ which is regarded as the defensive type of asset. Likewise beta of SCBL, NIBL and HBL also found to be less than 1 having beta of 0.6861, 0.4349 and 0.7189 respectively. They are also considered to be defensive type of assets.

- Coefficient of determination is proportion of systematic risk to the total risk where we find HBL having highest coefficient of determination of 0.8925, SCBL has next highest of 0.6485 coefficient of determination. The rest NABIL, BOKL and NIBL have the lowest coefficient of determination.
- As Government Treasury Bill have average of 5.3% rate of return, which is risk free assets, the risk free rate of return is 5.3%. Likewise, the risk free rate of return is taken as average of 5.3% for the study.
- The correlation coefficient of different banks to the market (NEPSE) indicates that they are dependent to each other. As we know that for the perfectly positively correlated stock, we cannot eliminate risk. Here, HBL has nearly perfectly positive correlation with market, which reveals that the diversification cannot eliminate the risk i.e. 0.9447 of correlation coefficient. Likewise, NABIL, SCBL, NIBL and BOKL have 0.7388, 0.8053, 0.4812 and 0.6567 correlations with the market which reveals that diversification can reduce the unsystematic risk.
- CAPM describes the required rate of return of single asset. From all the above calculations, it is found that all the banks except HBL are undervalued and none of them are in the SML equilibrium line. Required Rate of Return is the cost of capital to meet the investor's expectation and they are found 31.84%, 22.26%, 16.05%, 23.07% and 24.64% respectively for NABIL, SCBL, NIBL, HBL and BOKL where HBL is overpriced and rest under priced.
- Portfolio returns I highest i.e. 36.23%, if investors invest their fund with diversify between BOKL and market, where risk is reduced to 28.83%. Portfolio return is lowest i.e. 6.59% with risk 19.69% if investors diversify their funds in HBL and market. Similarly, the expected portfolio return are 33%, 28.64% and 27.10% if investors diversify their funds in SCBL, NABIL and NIBL where portfolio risk are 25.19%, 31.37% and 24.15%.
- Portfolio performance evaluation method of Sharpe shows that the portfolio between SCBL and market is ranked as first. BOKL and

market has second ranking of portfolio performance. Likewise, NIBL, NABIL and HBL rank third, fourth and fifth respectively in the portfolio performance.

Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter focuses on summarizing the study held with the researcher's conclusion. The next attempt in this chapter will be made for the recommendation on the basis of findings. For this whole purpose the chapter is sub-divided into summary, conclusion and recommendation as following:

5.1 Summary

Nepal is an underdeveloped country having very low per capital income and corporate growth rate. The traditional concept of business and commerce is deep rooted in the people and most of them are aware of modern form of commerce. But after the restoration of democracy in 1990, a Universal echo of economic liberalization, Nepal has implemented liberal economic policy. As a result, there comes a drastic change in the different sectors such as industrial, tourism, transportation, trade and mostly in the financial sectors whose contribution in economy has great significance. These commercial joint venture banks mainly concentration their business in foreign trade and in financing agriculture and service sectors.

In Nepalese context, institutional set up of securities market began along with the establishment of Security Exchange Centre in 1977. The primary objective of investors investing in stock is to earn dividend gain and capital gain. Rational investors must be motivated providing investment related and good knowledge to analyze risk and return behavior of stock and portfolio to develop stock market in Nepal. All these activities ultimately help them to be confidence and to improve stock investment and efficiency.

Investor deems capital gain and dividend from the investment but they are not always able to fulfill their expectation because risk is there. So, for any individual investor, risk and return is the objects of choice. However, investor is not able to determine the risk return trade off in investment. They invest their funds randomly on the sis of their personal preferences. Some investor invest their fund in only one security bet some of them invest in more than two assets without having the knowledge about portfolio selection or diversification. Investors are also unknown about the correlated stocks.

The main objective of this study is to analyze the risk and return ratios and find out the level of portfolio risk and return on the stock of the commercial banks. The study focuses on the analysis of the portfolio of the five selected commercial banks. The data used in this study are mainly secondary in nature. For the analysis, financial tools such as portfolio risk, portfolio return, portfolio performance and statistical tools such as mean/average, standard deviation coefficient of variation, covariance, correlation and coefficient of determination are used. The data and results are tabulated and presented in figures as per the requirements of the study.

5.2 Conclusions

From the study held by this researcher on the basis of the calculations, tables and figures, it can be concluded in the following points. But the conclusion and recommendation are drawn completely based on the sample study.

- The expected rate of return of NABIL, SCBL and BOKL are higher than the market expected rate of return. Whereas the excepted rate

of return of NABIL and HBL are lower than the excepted rate of return.

- BOKL has the highest excepted rate of the return and HBL has the lowest excepted rate of return. So, investor can get the highest excepted rate of return in BOKL. But only the excepted rate of the return cannot gives appropriate comparisons between the assets. For this, investor has to consider both risk and return as well as C.V.
- Coefficient of variations is the ratio of risk to per unit expected return. So, investor should decide to invest by observing the coefficient of variation. Here, NIBL and HBL have the highest C.V. and concluded as most riskier asset.
- Correlation coefficient measures the degree of relationship between two stocks. Correlation coefficient always lies between -1 to +1. A value of +1 represents the perfectly positively correlation and -1 represents the perfectly negatively correlated with the market and it is beneficial to diversify the risk. HBL nearly perfectly positively correlated stock and rest sample banks NABIL,SCBL, NIBL and BOKL are less perfectly positively correlated.
- The beta itself measure the index of systematic risk of stock and it is found that NABIL has highest beta and is an aggressive type of asset. BOKL, SCBL, NIBL and HBL have defensive type of asset.
- Coefficient of determination reveals the proportion of systematic risk to the total risk. HBL hashes highest coefficient of determination and it is concluded that there is low proportion of diversification risk.
- HBL has more required rate of return than the expected return and concluded as overpriced. NABIL, SCBL, NIBL, BOKL have less required rate of return than the excepted return and concluded as under priced or undervalued and investors will be beneficial by investigating in these stocks.

- According to the sample study of Portfolio analysis, the diversification between BOKL and market is most preferable. Portfolios between market with NABIL, SCBL and NIBL respectively are better. But Portfolio HBL and market is Found to be the lowest.
- According to Sharpe Portfolio Performance evaluation, Portfolio between SCBL and market is ranked as best performance.

5.3 Recommendations

Although, this study was concern with the analysis of portfolio management on stock price of selected commercial banks, it may be appreciate to provide a package of suggestion in the light of findings. However, these recommendations may also some repercussion and there is no doubt of these measures to improve the existing conditions. Based on the all above study and conclusion, the researcher prescribed the following recommendation and subjection:

- Expected rate of return from BOKL is highest among the sample study. So, it is suggested to invest in BOKL stock.
- Expected rate of return from NABIL, SCBL, NIML and BOKL are greater than the required rate of return. So, it is suggest to purchase the stock of these banks that will be beneficial in future.
- HBL may have some internal risk factor such as management errors, investigation, advertising campaigns, shift in consumer taste, etc. So, HBL has too improve the management to increase the stock price to reduce the unsystematic risk.
- Though the electronic system has been developed, the investors are facing difficulty in transaction electronically from different parts of the nation. It is because some of the investors do have the proper knowledge of the system. It can be done if NEPSE modernizes the trading system and effective information channel to enhance to investor attraction towards the investment.

- To expand the growth of capital market there should be proper and effective consumer awareness programs towards, the investment and its opportunities.
- Stock exchange facilities should be expand in each development region based on feasibility to participate and attract the unproductive funds of the country.
- Investors should concentrate the risk and return characteristics of individual security before investment. Without proper analysis of individuals security and overall market, investment on stock of bank will not be beneficial.
- It is beneficial to develop the capital market to attract to increaser the liquidity of the market.
- Investment on stock has both risk and return. So, investors should be acquitted with the associated risk and should work out their attitude towards the riskiness of various investment strategies.