

**A STUDY ON  
TREASURY MANAGEMENT OF BANK OF KATHMANDU  
(Bank of the Year 2011)**

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Office of the Dean  
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***In partial fulfillment of the requirement for the degree of  
Master of Business Studies (MBS)***

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July, 2012**

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TREASURY MANAGEMENT  
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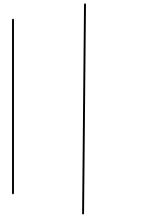
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## Abbreviations

|       |   |                                              |
|-------|---|----------------------------------------------|
| NRB   | = | Nepal Rasta Bank                             |
| BOK   | = | Bank of Kathmandu                            |
| SLR   | = | Statutory Liquidity Ratio                    |
| BFI   | = | Bank and Financial Institutions              |
| CAR   | = | Capital Adequacy Ratio                       |
| CRR   | = | Cash Reserve Ratio                           |
| C/D   | = | Credit Deposit Ration                        |
| NPL   | = | Non-performing Loan                          |
| Lcy   | = | Local Currency                               |
| ROA   | = | Return on Assets                             |
| ROI   | = | Return on Investment                         |
| ROE   | = | Return on Equity                             |
| EPS   | = | Earnings Per Share                           |
| MER   | = | Management Efficiency Ratio                  |
| LLC   | = | Loan Loss Coverage                           |
| TU    | = | Tribhuvan University                         |
| r     | = | Correlation Coefficient                      |
| MBS   | = | Master of Business Studies                   |
| i.e.  | = | That is                                      |
| etc   | = | Et cetera                                    |
| NPAT  | = | Net Profit After Tax                         |
| A.D.  | = | Aanno Domini (after the death of the Christ) |
| B.S.  | = | Bikram Sambat                                |
| S.d.  | = | Standard Deviation                           |
| C.V.  | = | Coefficient of Variance                      |
| P.Er. | = | Probable Error                               |
| FY    | = | Fiscal year                                  |
| ATM   | = | Automatic Teller Machine                     |
| ABBS  | = | Any Branch Banking Service                   |
| Rs    | = | Nepalese Rupees                              |
| No    | = | Number                                       |
| Ltd.  | = | Limited                                      |

# CHAPTER - I

## INTRODUCTION

### 1.1 Meaning of treasury management:

**Treasury management** (or *treasury operations*) includes management of an enterprise's holdings, with the ultimate goal of maximizing the firm's liquidity and mitigating its operational, financial and reputational risk. Treasury Management includes a firm's collections, disbursements, concentration, investment and funding activities. In larger firms, it may also include trading in bonds, currencies, financial derivatives and the associated financial risk management.

Most of the larger banks have whole departments devoted to treasury management and supporting their clients' needs in this area. Until recently, larger banks had the stronghold on the provision of treasury management products and services. However, smaller banks are increasingly launching and/or expanding their treasury management functions and offerings, because of the market opportunity afforded by the recent economic environment (with banks of all sizes focusing on the clients they serve best), availability of (recently displaced) highly-seasoned treasury management professionals, access to industry standard, third-party technology providers' products and services tiered according to the needs of smaller clients, and investment in education and other best practices.

For non-banking entities, the terms *Treasury Management* and *Cash Management* are sometimes used interchangeably, while, in fact, the scope of treasury management is larger (and includes funding and investment activities mentioned above). In general, a company's treasury operation

comes under the control of the CFO, Vice-President / Director of Finance or Treasurer, and is handled on a day to day basis by the organization's treasury staff, controller, or comptroller.

Bank Treasuries may have the following departments:

- J A Fixed Income or Money Market desk that is devoted to buying and selling interest bearing securities
- J A Foreign exchange or "FX" desk that buys and sells currencies
- J A Capital Markets or Equities desk that deals in shares listed on the stock market.

In addition the Treasury function may also have a Proprietary Trading desk that conducts trading activities for the bank's own account and capital, an Asset liability management or ALM desk that manages the risk of interest rate mismatch and liquidity; and a Transfer pricing or Pooling function that prices liquidity for business lines (the liability and asset sales teams) within the bank.

Banks may or may not disclose the prices they charge for Treasury Management products, however the Phoenix Hecht Blue Book of Pricing may be a useful source of regional pricing information

## **1.2 General background of the study:**

In this era of globalization and economic liberalization, the economic activities are soaring up in the international market. Nepal doesn't have its own long history of the economic activities. About two century ago the barter system was prevailing everywhere in the country, even now in the remote areas the system is still in practice. Until the period of unification of modern Nepal by Prithvi Narayan Shah there were only two trading partners namely India and Tibet. After the reunification, political instable was prevailing which was somehow controlled by the Rnanas, their

regime begun in 1903 (B.S). During the beginning period of their regime, office like Tejarath Adda and Mulukhi Khana was established in order to attract deposits and grant loans. But it was not sufficient for the economic development due to lacking of experienced manpower and new technology. As the time passed by their some increasing economic activities was seemed in the country which led to the establishment of first commercial bank of Nepal viz. Nepal Bank Limited.

Another revolution on banking of Nepal was establishment of Nepal Rastra Bank as Central bank in 1956. Since then the development of banking raised to present boiling point. In 1995, it established under Nepal Rastra Bank Act, 1995. It has been playing the vital role in the aspects of insuring proper management to issue of Nepalese currency notes to make proper arrangement for the circulation of Nepalese currency throughout the kingdom and to stabilize the exchange rates of the Nepalese currency in order to ensure the convenience and economic interests of the general public.

Firstly, commercial banks were operated under 'Commercial Bank Act' introduced in 1974. This Act helped to emerge numbers of commercial banks. Now, commercial banks are operated under the directive of NRB Act 2058. There is also bank and financial Act to operate commercial bank and financial institutions. In the decade of 2040 different joint venture banks started to operate in Nepalese money market, gradually the number is increased in the decade of 2050 and now the number is increasing enormously.

Financial sector has evolved as the biggest sector in the economy. There are altogether 198 financial institutions (Commercial banks, development banks and Finance Companies only) in the country and currently more than 25,000 people employed in these BFIs. This GDP of Nepal was around 1346 crore in 2011 according to preliminary estimated; out of these around

50% contribution was service sectors. One of the major sector are taken banking and financial sector, which helps to grow other sectors too or the success of other sectors also connection with Banking and financial sector.

In this regards this research will concentrate into the treasury management of some highly rated, highly performing and have huge profit banks and tends to identify treasury operation practices of Bank of Kathmandu. It is said that the banking sector mirrors the larger economy. It's linkage to all sectors make it a proxy for what is happening in the economy as a whole. Indeed, the Nepal banking sector today is at boiling point or doing the best in these circumstances. Further, it can't be said that all the banks and financial institutions are doing well. The objective of this study is to analyze and distinguish some of the best performing commercial banks' performance through their financial statement specially cash flow of last five fiscal years. Again, this means that, this research is concentrate in the cash position and the flow of cash of high performing commercial banks in different time, fiscal years and situation, so that the actual cash position of the economy could be identified.

Thus, the history of the development of financial institutions in Nepal is not very long. Nepal bank Ltd is the first commercial bank of Nepal, which was established in 1994 B.S. in non- government sector. The second commercial bank is Rastrya Baniija Bank Ltd., which was established in 2022 B.S. in 100% government ownership. But after studying to the origin of modern banking, we come to know that "Bank DE RIALTO" which was established in 1587 A.D. is the first bank of the world in Venice, Italy.

### **1.3 Development of banking sector in Nepal**

The banking sector in Nepal started with the establishment of Nepal bank limited on 30<sup>th</sup> Kartik 1994 (1938). It is the oldest bank of Nepal. Its initial authorised capital was Rs 10 million and issued capital was Rs 25 lakhs,

paid up capital was Rs 8 lakhs 42 thousand but now it has increased its capital in many fields.

Under the Nepal Rastra bank act 2012 (1956) Nepal Rastra bank was established in 14th Baisakh 2013 (1957) in Nepal. But this act has been repealed and the Nepal Rastra bank act 2058 (2002) has been enacted by parliament. It is known as the central bank of Nepal. After the establishment of Nepal Rastra bank, the first 5 years plan was introduced in the country to fulfil the need of the financial institution for achieving industrialization and development of the country. Nepal Industrial Development Corporation 2016, Agricultural Development Bank, 2024 were established under the special legal provision on corporate act and Agricultural Development Bank, Rastriya Banijya Bank was established in the government sector in 2022 under Banijya Bank act 2021 as per the recommendation of Nepal Rastra bank.

#### **1.4 Introduction of Concern bank (BOK)**

Bank of Kathmandu (BOK) limited has a prominent name in the Nepalese banking sector. We would like to express our sincere gratitude to our customers, shareholders, employees and other stakeholders for their support and co-operation for leading the bank to the present height of achievements. We wish to reiterate here that whatever activity we undertake, we put in conscious efforts to glorify our corporate slogan, "we make your life easier".

We would also like to elucidate that Bank of Kathmandu is committed to delivering quality service to customers, generating good return to shareholders, providing alternatives incentives to employees and serving the community through stronger corporate social responsibility endeavor.

Bank of Kathmandu limited has today become a landmark in the Nepalese banking sector by being among the few commercial banks which is entirely managed by Nepalese professionals and owned by the general public.

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

The bank has focused on the following mentioned areas:

- a. Contribution towards sustainable development of nation by mobilization domestic saving and channeling them into productive sectors.
- b. Use of latest banking technology to provide better, reliable and efficient services at a reasonable cost.
- c. Facilitate trade by making financial transactions easier, faster and more reliable through relationship with foreign banks and transfer agency.
- d. Contribute to the overall socio-economic development of Nepal.

Products and services by Bank of Kathmandu under deposit are current Account, Saving Account, BOK chetanshil yuva Bachat, Premium Saving Scheme, My Choice Bachat Khata, Ladder Deposit, General Saving, Sajilo Bachat Yojana, Jestha Lagani Kosh, Griha Laxmi Bachat, Call Account, Fixed Deposits and Recurring Deposit.

Under corporate banking Bank of Kathmandu is providing the facilities like project financing, trade financing, working capital finance, Syndicated loan agreement, consortium lending, business banking, small scale project finance, trade finance, other business credit retail banking, housing loans,

vehicle loans, education loans, foreign employment loans, festivity loans etc.

***Vision of the bank:*** To become a significant contributor to the economic development of Nepal by distinguishing the bank as an efficient, competitive, safe and to-quality financial institution.

***Mission:*** To offer financial services and become the “bank of choice” by dedicating the progress and growth of the institution to the community, customers, employees and stockholders by:

- ) Promoting economic growth and becoming a caring corporate citizen.
- ) Providing excellent customer services by offering personalized quality service and product.
- ) Including modern technologies of banking that add value to customer services.
- ) Following strict risk control mechanism.
- ) Enhancing shareholders value.
- ) Providing challenging career and learning opportunities for our employees.

**Share holding pattern (In percent)**

| <b><u>Parties</u></b> | <b><u>Percentage</u></b> |
|-----------------------|--------------------------|
| Promoters             | 42%                      |
| <u>General Public</u> | <u>58 %</u>              |
| <b>Total</b>          | <b>100%</b>              |

**Note: Total paid up Capital NPR. 160.41 crore.**

### **1.5 Statement of the problems:**

The commercial banks have been operating well from their establishment. Their experience on international banking prompt and computerized services, professional attitude is factors for their rapid progress. There have been growing from weakness and inefficiency of domestic commercial banks. These banks have succeeded to capture remarkable market share of Nepalese banking sectors of financial services industry in a relatively short period of time.

According to unpublished research, inefficiency and weakness can be traced with the financial statement analysis in same aspects of this bank's financial performance. Banks provide only short-term credit while demand for long and medium term credit has meet in the process of development. The margin ration for providing loans is too high, which makes deposits unutilized. Though all the commercial banks are increasing their profit (Shrestha, p.7).However, Nepal is facing lots of national as well as international problems such as: instability of politics, difficulty in collecting resources, declining of tourism industry, falling of manufacturing companies and garments etc. These areas are mainly affected by recent unfavorable international economic conditions. Therefore, these areas and recent unfavorable economic conditions are adversely affecting the investment of the banks. Against these problems this research deals with the following issues:

- How far commercial banks as well as joint venture banks have been able to convert the mobilized deposits into investment?
- How efficiently joint venture banks are managing their assets and liquidity ratio?
- What is the relationship of investment with deposits and net profit?
- To what extent these banks have been able to raise their profitability?

- To evaluate the trend of deposits and credit banks.

### **1.6 Objectives of the Study:**

This research work is concerned with studying the treasury management of BOK. The main objective is to study and analyze the treasury operation of Bank of Kathmandu. Following subsidiary objectives have been framed to assist the basic objectives.

- To highlight the treasury operation of bank.
- To evaluate and analyze the liquidity, profitability, capital adequacy, market risk and Foreign exchange risk for its management of concern bank.
- To evaluate the trend of deposits and credit of concern bank.
- To analyze the trend of net profit, investment of concern bank.

### **1.7 Significance of the Study:**

Since the study unites the different financial and risk aspect of the bank. It would be useful to the concerned organization, institutions and general public to formulate strategies to utilize the opportunities and face the increasing threats. The stockholders that are concerned to the bank include shareholders, management, outsiders (general public, government, central bank etc.) and policy makers. Thus the main importances of the study are:

- The study focuses on treasury management of concern bank, NRB act and directives for the commercial banks.
- This study will be valuable for the shareholders, management of the banks and board of directors of the respective banks, as they hold the position where they stand in the market.

- It will give a clear picture on how the banks performing their important functions of treasury operation.

It will provide information to the general public regarding success of bank on the investments they have made.

### **1.8 Scope of the study**

This study will attempt to cover the major component of treasury operation. It aims to find out the liquidity position, capital adequacy, various long-term or short-term banks' risk. However, the major areas of this study are as follows:

- i. Liquidity, profitability, capital adequacy, market risk and foreign exchange risk for its management of concern bank.
- ii. Treasury operation practices of concern bank in respect to risk management motives.
- iii. Existing system of treasury management of bank.

### **1.9 Focused of the study**

This study focused the treasury management; it involves the management of sources and uses of funds for any type of organization in the broadest sense. However in the context of banks, the term treasury management is construct liquidity, Investment portfolio, market risk and Foreign exchange risk management terms. It is necessary to know about the treasury of bank. This study based on the sources and uses of funds which are important part of Bank. Treasury operation management is a very important tool can be used in profit planning contributes to the managerial efficiency by assisting management to identify the possible future funds problem in advance and decide on policies and procedures to solve them if and when they arises every Bank and financial institution need to use funds projection to maintain optimum liquidity. Both excess and shortage

of funds make a liquidity crisis to the Bank which reduces the profit to be earned as well as financial crisis.

This study mainly focuses on the uses and sources of fund planning technique to maximize the profit and minimize the liquidity risk of the BOK. The study is based on the date of fiscal year from 2063/64 to F Y 2067/68.

### **1.10 Limitations of the Study:**

This study has basically been carried out for the requirement of the Masters of Business Studies (MBS) degree. So, it has different limitation and constraints which are presented as below:

- This study will upon the management of treasury management of BOK.
- This study will be mainly conducted on the basis of secondary data such as annual reports of BOK, NRB directives, BFI act, other related journals, magazines and books etc.
- The study will cover only the period of five years.
- In some case due to the unavailability of data, some analysis will not be done.
- Due to the management policies of various banks and confidential in nature some analysis for such banks will not be conducted.
- The research will be done as per the objectives. Therefore, it may not be sufficient to draw conclusions beyond the objectives.
- Finally not being a professional researcher the study may not be as good as professional do.

### **1.11 Organization of the Study:**

The study has been organized into five chapters each denoted to some aspects of the management of assets and liabilities.

The title of each of these chapters is as follows:

### **Chapter One: Introduction**

This chapter contains the introduction of the study where it includes, introduction, bank, Treasury management, statement of the problems, objectives of the study, significance of the study, limitation of the study and organization of the study.

### **Chapter Two: Review of Literature**

It states the theoretical review of the study, collected from the different books, research paper, websites, discussion papers etc.

### **Chapter Three: Research Methodology**

This chapter explains the methodology used in this research to find the result for meeting objectives set.

### **Chapter Four: Presentation and Analysis of Data**

This chapter deals with the analysis of primary as well as secondary data. First part of the chapter includes the analysis of Treasury, second part includes analysis of ration, third part includes economical analysis and fourth part includes statistical analysis.

### **Chapter Five: Summary, Conclusion and Recommendation**

It states about the summary, findings, recommendations and conclusion of the study.

At the end of the study bibliography and appendices have also been incorporated.

## **CHAPTER - II**

### **REVIEW OF LITERATURE**

This chapter deals with the literature, relevant to this study, this part of thesis will essential to know about the findings of other research which are appropriate to the study. The first part will consist conceptual framework and the remaining parts will consist the review of reports, articles, journals and dissertation.

#### **2.1 Conceptual Review:**

Treasury management approach is important to goal achievement because of the increasing scope and complexity of banking. Treasury management incorporates features of other approaches to market risk, liquidity, Investment portfolio and Foreign exchange risk management. It also incorporates management experience and judgment into the decision process. Successful treasury management requires managers to take an overall rather than narrow functional view of the bank, provides the means to break down complex problems for decision making allows for changes in the banking environment and provides decisions perceived consistent with wealth maximization.

"Banking is the business of collecting and safeguarding money as deposits and lending of same. The banker's business is than to take the debt of other people to offer his own in exchange and thereby to create money. He may be a dealer in debts, but in distress is only observe of wealth and it would be equally permissible to describe the baker as liquefies if wealth (Geoffrey: 1945, p.81)."

Interactive nature of bank decisions is to break down this system of interrelationship into key variable, which affects the attainment of wealth maximization. While each decisions making should focus on the key variables attesting wealth maximization. (1) Spread management (2) Liquidity management (3) Overhead cost control, and (4) Capital management. Of these variables, the first two are probably most appropriate to me relatively short decisions horizon of asset/liability management. They key variables assist management in establishing and carrying out policy in the major banking management, to obtain funds and maintain adequate liability, investment and capital (Olson: 1979, p.89).

Mr. Bradley and Crane express the views, "Potentially the most important use of management science is in banking system oriented approaches to balance sheet management (Bradley & Crone: 1975, p.51)." Balance sheet management is concerned with the coordinated management of the entire balance sheet and its inter-relationship. It incorporates the concept of asset/liability management approaches. Balance sheet management facilitates improved overall profit planning and performance, while maintaining liquidity solvency and deposit safety in an uncertain world consistent with management policy and bank regulations.

Finally the management achievement index for all the banks was computed to analyze their performance against the target set. Next findings on investment operation of commercial banks on the securities and the loans are the main assets portfolio to be stressed. The allocation of funds among the assets has been an objective of the management by maximizing profits and minimizing loss (cost). Returned from the investments and the risk involved in the loan made by the commercial banks in Nepal for investment in various sectors, priority sectors and secured loans the "loan loss ratio" and the "default" has been computed.

The investment planning of commercial banks in Nepal is highly regulated by the central bank (Shrestha: 1995, p.18).

### **2.1.1 Concept of Treasury Management**

Treasury management involves the management of sources and uses of funds for any organization in the broad sense. The scope of treasury management is very wide and it covers every types of organization be it charitable, government or corporate.

However in the context of banks, the term treasury management is construed in terms of following four dimensions.

- A. Market risk management.
- B. Liquidity management.
- C. Investment portfolio management.
- D. Foreign exchange risk management.

#### **A. Market risk management:**

There are four dimensions of market risks:

**Interest rate risk:** Global money and currency markets are liberalized. Neither the exchange rates nor the interest rates are administered, but they move freely depending upon their demand and supply. This creates a lot of volatility in the interest rates of various currencies. This is Called interest rate risk.

**Price risk:** As ware, we are those prices in the market move both ways (UP/down). Due to the continuous movement of prices of commodities/currencies, “price risk” arises.

**Credit risk:** Credit risk arises due to possibility of payment default from the counter parties.

**Event risk:** Major political events/natural calamities create the event risks.

## **B. Liquidity risk (Fund) management:**

The term 'Fund' denotes as the liquid assets of the bank. This includes cash, Bank balance, money at call or short notice and investment. Thus fund management is concerned with planning and managing of the liquid assets of the bank.

### **There are four aspects of fund management:**

1. Liquidity : Ability to meet immediate maturing liabilities
2. Profitability: Related with return of the liquid assets.
3. Safety: Risk associated with Liquidity
4. Nostro management

➤ ***Liquidity Management:*** Liquidity refers to the ability to meet immediately maturing liabilities. In the context of banking liquidity means the capacity of paying out cheques, loans and demand draft on demand.

Liquidity is maintained for the following four purposes:

- i. Transaction purpose: Deposit withdrawal, loan disbursement, personnel/ administrative expenses.
- ii. Speculative purpose: Foreign exchange position holding, investment.
- iii. Precautionary purpose: For meeting contingencies.
- iv. Statutory purpose: For maintaining statutory reserves (CCR, SLR)

**Types of liquid assets:** For effective and efficient fund management banks keep its liquid assets in there forms:

- a. Cash and balance with other banks.
- b. Placement/money at call or short notice.
- c. Investment in government and readily marketable securities.

- ***Profitability:*** If the banks chose to hold all of their assets as liquid assets, their profits will be very low. Hence banks will try to minimize the volume of liquid assets to the extent possible.
- ***Risk Management:*** In order to avoid the loss of assets, various risk limits are set up. It helps avoid the risk of loss in liquid assets investment.
- ***Nostro Management:*** Banks have to open accounts with other banks both at home and abroad. Such accounts with other banks are called Nostro accounts. Funds are needed in these accounts for payment of demand draft, reimbursement of trade and other outgoing remittances. Overdraft may draw a very high penal interest.

### **Managing liquidity risk in bank**

Managing the liquidity risk has been an integral part of the banking business. Risk can be defined as the degree of uncertainty of future return as well as transactions. This uncertainty has varied dimensions and therefore can be defined in different ways, presently on account of the severe competition, deregulation of interest rates both on lending as well as on deposits and other developments in various financial markets; banks have been increasingly exposed to various types of risks. These are liquidity risks, interest rate risks, market risks, settlement risks etc. Since these risks are inevitable elements of banking business, banks are required to design and use different strategies to take and manage various risks. One of the effective strategies which is recognized world-wide is introduction and implantation of effective assets liability management (ALM) policy.

Banks are required to measure and manage their liquidity risks as many of their liabilities are payable on demand or at very short notice. Further, they must visualize and evaluate liquidity needs (based on certain assumption) under different business scenarios. Liquidity represents the

ability to deal with shortage of funds (i.e. to raise cash on short notice without paying high cost) and surplus of fund (i.e. to deploy funds in assets). Irrespective of the size of a bank, adequate liquidity is essential to meet commitments when due and to undertake new transactions when desirable. Considering the managing of liquidity risk each bank is required to have a suitable policy in this regard which must cover inter alia, objectives of liquidity management, framework for assessing and managing liquidity, funding strategies and internal norm including delegation of authority etc. The most vital aspects of managing liquidity risk viz. assessing and managing liquidity is discussed below.

### **Measuring and managing liquidity risk:**

The bank is required measure and manages its own- liquidity position on continuous basis. One of the approaches in this regard is to use stock approach viz. measuring liquidity position at any point of time. For this various ratios can be used viz.

1. Credit to deposit ratio.
2. Short term liabilities to short term assets ratio.
3. Liquid assets to total assets.
4. Loans to total assets ratio.
5. Loans to Core deposits ratio
6. Purchased funds to total funds.

As the scope of stock approach is very much limited it just gives only a snapshot at point of item and doesn't reveal a real moving picture. For this we need to use maturity ladder or profile statement method.

***Maturity ladder approach:*** Maturity profile statement is prepared with a view to compare banks' future cash inflows to its' future cash outflows and to find out cash flow miss-matches over a series of specified time periods or buckets. Though miss-match is considered as an inherent

feature of banking business, steps will have to be taken to avoid mismatch, which will expose the bank to the liquidity risk. A bank is free to decide about various time periods for which maturity profile statements can be prepared. However the following time buckets are commonly used by the banks in Nepal. (KFA banking book)

- I. 0-30 days
- II. 30-90 days
- III. 90-180 days
- IV. 180-270 days
- V. 270-365 days
- VI. 360 days and above

Based on the past data and information, ALCO or liquidity management committee must bring desired changes in the composition of assets and liabilities. The bank must look into the profile of customers. It must maintain continuous customer relationship with large borrowers, depositors and other liability holders. This will help the bank to secure required funds during liquidity crisis.

The bank should prepare contingency plan for line of credit with large banks and suppliers of credit to face adverse liquidity position arising out of specific or general market crisis. The internal limitation/norms may be fixed for certain type of transactions which will have an adverse impact on liquidity position. Such as:

- 1) Cap on borrowing from call money market.
- 2) Desires ratio for short term liabilities to short term assets.

- 3) Cumulative miss-match across all time buckets.
- 4) Time buckets negative liquidity Gap.
- 5) Duration of liabilities and assets.

### **C. Investment Portfolio Management.**

Banks have both home currency and foreign currency liabilities (deposit). Most of their deposits are invested in the form of loans, advances and bills discounting. This is the assets class with highest risk and return. However for the purpose of liquidity/safety, banks also need to invest a part of their funds into government bonds, treasury bills and sometimes corporate bonds.

While making such investments banks have to match the maturity of their liabilities and assets so that they can meet their obligation on time without suffering a liquidity crunch.

### **Introduction to foreign exchange markets and risk management:**

Banks buy and sell foreign exchange to the public. To carry out this function, banks have to keep sufficient stocks of foreign exchange. These are kept in the form of bank account abroad.

Subjected to the rules and regulations of Nepal Rastra Bank and foreign exchange and money market dealers association of Nepal (FEDAN), banks have to quote rates for foreign exchange to be purchased and sold to their customers. Subjected to these regulation rates quoted would depend upon the rates prevailing in the international/inter-bank market.

This section of the department is headed by a “Dealer”, It is the duty of the dealer to see that bank maintains just adequate balance of each foreign currency and that the rates quoted to the customer is competitive and at the time profitable to the bank.

#### **D. Foreign exchange transactions:**

Foreign exchange dealing is a business in which foreign currency is the commodity. As foreign currency is not a legal tender, it can't be used for settlements of debts in home currency, nevertheless it has value. The value of US Dollar in Nepalese markets is like the value of any other exchange dealings.

Purchase and sales transaction:

Any trading has two aspects. i.e.

Purchase and sale: A trader has to purchase goods from his suppliers which he sells to his customers. Likewise the bank purchases as well as sells its commodity i.e. the foreign currency. Two points need to be kept in mind while talking of a foreign exchange transaction.

- a. The transaction is always talked from the bank's point of view and
- b. The item referred to is the foreign currency.

Therefore when we say a purchase, we imply that the bank purchased foreign currency and when we say sale, the bank has sold the foreign currency.

**Foreign exchange risk:** There are four types of risk exposures in foreign exchange market:

*Transaction exposure:* Every entry and exit from a foreign exchange deal comes at a cost. This is due to continuously changing market rates. Suppose if you buy Euro 100,000.00 in the morning at the rate 1.2200 against USD, you have to pay USD 122,000.00 for this. Now after one hour if you want to sell back the euro market rates will not be same. It may have gone up or down or it may be same. If it has gone up to say 1.2300, now you will get back USD 123,000.00, so you made a profit of USD 1000.00. If

it goes down to 1.2100, you will lose USD 1000.00 this is how the transaction risk arises. In order to come the transaction risk, dealers try to square their position as soon as possible.

***Translation exposure:*** This comes into effect for the MNC (Multination Corporation) whose subsidiaries overseas maintain their books in foreign currencies, thus posing a transaction risk to the parents.

***Accounting exposure:*** This related to the value of assets/liabilities in terms of foreign currency.

***Economic exposure:*** This related to economic value of assets in one country with respect to that of another country.

### **2.1.2 Definition of Bank**

Generally, an institution established by law that deals with money and credit is called bank. It is obvious that in common sense an institution involved in monetary transaction is called a bank. A bank simply carries out the work of exchanging money providing loans accepting and transferring the money.

According to U.S. Law "any institution offering deposits subject to withdrawal on demand and making loans of a commercial or business nature is a Bank".

While going through the banking history of Nepal, Nepal bank ltd was the first bank of Nepal established in 1994 B.S. After establishments of this bank other banks were also established like Nepal Rastra Bank, Rastray Banijya Bank, Agricultural Development Bank, Nepal Industrial Development Bank. The process of the development of banking system in Nepal was not satisfactory up to 2040. No bank was opened during this period except extending the branches and sub branches of the banks, which were established up to this period. Nepal was observing the events

that were taking place in the world also. Nepal was deeply studying and researching what sorts of programs, policies, law and regulation should be brought into practice. The country can't change its status by using only its own capital in the country without importing the new technology from foreign country and accordingly, law and policy have been developed by the state to encourage the foreign investment on banking sector. From this the real mode of development of banking system started in Nepal. The competitions began to grow. Thus some banks are opened on the joint investment basis like: Nabil Bank Limited, Nepal Investment Bank Limited, Standard Chartered Bank Ltd. Himalayan Bank Ltd. Nepal Bangladesh Bank Ltd etc.

### **2.1.3 Concept of Commercial Bank**

Simply, commercial bank is a largest financial institution whose primary business is providing financial services to the people. Commercial banks are one of the major financial institutions, which help to mobilize the funds in the economy. It does not produce anything but transaction of money. It simply acts as a mediator between people who want to save their surplus money and those who need some money to operate their business or projects. It deal with money and attracts deposits. It acts as a mediator between the businessmen and helps transfer of funds from one location to another that might be national or international.

As per commercial bank act 1974,"A commercial bank means bank which deals in exchanging currency, accepting deposits, giving loans and doing commercial transaction."

According to Ministry of Law HMG/N Commercial Bank Act 2031 B.S. "A commercial bank is one which exchanges money, deposits money, accepts deposits, grant loan and advances and performs commercials banking

functions and which is not a bank meant for co-operation, agriculture industries or for such specification."

Thus commercial bank is an institution that deals with money. It attracts deposits and it leads the same into various productive sectors analyzing the feasibility of the project. It also acts as a mediator between the businessmen and also helps to transfer of funds from one location to another that might be national or international.

"Principally speaking, a commercial bank accepts deposits and provides loans primarily to business firms thereby facilitating the transfer of funds in the economy (Abrol & Gupta: 1987, p.101)."

Although in the past, banks were considered to be acceptors of deposits and providers of loans, modern commercial banks work for the overall development of industries, trade and commerce, services as well as agriculture. There are four functions of the commercial bank which have been laid down by the American Institute of Banking. There are:

1. Receiving and handling deposits,
2. handling payments for its clients,
3. granting loans and investment and
4. Creating money by extension of credit.

A commercial bank is a dealer which deals with money as well as the substitutes for money such as cheques and bills of exchange. It also provides a variety of financial services.

#### **2.1.4 Factors Affecting the Treasury Operation:**

**There are three major factors responsible for this:**

- a. Lack of infrastructure to support treasury transactions.
- b. Unavailability of global market treasury products.
- c. Lack of expertise among the market players.

Above three weaknesses are dealt in following sections in relation to various areas of treasury management:

- ) Assets & Liability Management (ALM)
- ) Foreign Exchange Management
- ) Money Market Operations
- ) Government Securities Operations

### **2.1.5 Role of Treasury Management to handle Financial Crisis.**

Until before sometimes, The Financial sector had been facing liquidity crunch. A problem related to the Liquidity crunch is basically known as financial crisis in banking sector. Banks borrow large amount of short-term deposit and reserve from individual, business and from other lending institution and then turn around and make long term credit available to their borrowing customers. In this situation, most banks faces imbalance between the maturity dates on their assets and the maturity dates attached to their liabilities. Rarely incoming cash flow from assets will exactly balance the cash flowing out to over liabilities.

A problem related to the maturity mismatch is that banks hold an unusually high proportion of liabilities subject to immediate payment, such as demand deposit, call account, inter-bank borrowing and money market borrowing. In this situation, banks must always stand ready to meet immediate cash demand that can be substantial at times, especially near to end of a week, at the first of certain season of the year.

Treasury management (or treasury operations) includes management of an enterprise's holdings, with the ultimate goal of maximizing the firm's liquidity and mitigating its operational, financial and reputational risk. Treasury Management includes a firm's collections, disbursements, concentration, investment and funding activities. In larger firms, it may also include trading in bonds, currencies, financial derivatives and the associated financial risk management.

Most of the larger banks have whole departments devoted to treasury management and supporting their clients' needs in this area. Until recently, larger banks had the stronghold on the provision of treasury management products and services. However, smaller banks are increasingly launching and/or expanding their treasury management functions and offerings, because of the market opportunity afforded by the recent economic environment (with banks of all sizes focusing on the clients they serve best), availability of (recently displaced) highly-seasoned treasury management professionals, access to industry standard, third-party technology providers' products and services tiered according to the needs of smaller clients, and investment in education and other best practices.

For non-banking entities, the terms *Treasury Management* and *Cash Management* are sometimes used interchangeably, while, in fact, the scope of treasury management is larger (and includes funding and investment activities mentioned above). In general, a company's treasury operation comes under the control of the CFO, Vice-President / Director of Finance or Treasurer, and is handled on a day to day basis by the organization's treasury staff, controller, or comptroller.

Bank Treasuries may have the following departments:

- J) A Fixed Income or Money Market desk that is devoted to buying and selling interest bearing securities
- J) A Foreign exchange or "FX" desk that buys and sells currencies
- J) A Capital Markets or Equities desk that deals in shares listed on the stock market.

In addition the Treasury function may also have a proprietary Trading desk that conducts trading activities for the bank's own account and capital, an Asset liability management or AML desk that manages the risk of interest rate mismatch and liquidity; and a Transfer pricing or Polling function that prices liquidity for business lines (the liability and asset sales teams) within the bank.

### **2.3 Review of Articles and Journals:**

Under this headings effort has been made to examine and review of some related articles published in different economic journals, magazines, newspapers and related books. Modern commercial banks have various kinds of sets in their possession. Generally the size & volume of the asset depend on the scientific and rational management of asset.

**Mats clarhall and Robert Lillerud**, (spring, 2001) *The case of CGE & Y on treasury management*, Sometimes treasury management is used as synonymous to cash management, but there are differences. Compared to cash management, treasury management focus more on the process of short-term investment, or lending and borrowing s and the process of assuring that decisions are in accordance with the company's policy, the three last stated points of the cash management components. Treasury management can be defined as follows: " The management of monetary assets and liabilities, financial risk and banking relationship in such a way as to maximize yields, minimize costs and control risk subject to the

agreed corporate policy”(International treasury management, p.1). Furthermore one can state: “The treasury function in most corporations will vary, depending on its size, complexities, geography and organization” (International treasury management, p.1). One has to consider the different flows in the company as follows: “These flows have four aspects: amount, currency, time and place. Of course each aspect must be managed. One of the most important of these is maintaining liquidity to ensure that the right amounts of funds in the right currency are in the right place at the right time. We want to point out that this definition is viewed from a company perspective. The definition would have embraced more and different factors if it had been out of a banking perspective.”(International treasury management, P 6-11)

**Robert Pederson**, (July, 2006), *Transmittal letter on treasury management*; the four areas of treasury management discussed in this transmittal letter; corporate cash management, relationship banking, electronic payment and risk management. This overview provides a basis for understanding the policies and procedures for day-to-day cash management, bank selection and certain elements of corporate financial risk management.

**Alberto Alvarez and Thomas Poppensiker**, (2007), *Article on New frontiers in treasury management at banks*. Treasuries in the developed world have a philosophy very different from the guiding their counterparts in developing markets, but the two models may be converging. In recent years, a number of organization and governance models for banks treasuries have evolved in response to the growing sophistication of financial markets. The research shows that institutions in the emerging world typically regard the function as a profit center, whereas those in developed countries tend to focus its activities on liquidity and balance sheet management.

Evidence suggests that these models are converging some developed market banks are now undertaking an integrated approach that more closely links assets liability management needs and capital market activity.

**Leire san Jose, Txomin Iturralde and Amaia Maseda, (2008),** treasury management versus cash management Major changes of corporate treasury management policies have been in the past few decades. Treasury management has gradually taken up more and more responsibilities. In the 1960s treasury related tasks entailed purely routine work in what was no more than as ancillary function as centralizing cash management unit linked to administrative tasks. In the 1970s the first significant changes began to take place as the economic environment was hit by recession, which favored the emergence of new short-term monetary policy instruments and the first hinds of deregulation of financial markets, but treasury management was still restricted to the first hinds of deregulation of financial markets, but treasury collections and the maintenance of bank balance positions. It was not until the 1980s that it become integrated into general corporate management and finally outgrew its purely administrative function linked to the accounting or liquidity management perspective. More recent advances have favored the development of new treasury management functions, and increased the importance of treasury departments within companies. In this way, now the techniques and instruments required for optimum development are available.

## **2.4 Review of Previous Thesis**

Under this section an attempt has been made to examine and review of some related previous thesis as follows:

**Shrestha (2007)** has conducted a research on the topic of *“A case study of Liquidity Management of NABIL Bank”*. He highlighted the aggregate performance and condition of Nabil banks. In the aspect of liquidity

position, cash and bank balance shows the more liquidity position. On his study, try to give clear picture of the liquidity management policies of concern banks by taking 5 years study period.

His major objectives were as under:

- ) To analyzes financial ratio and benefit of liquidity management.
- ) To highlight the financial ratio and liquidity trend of Nabil Bank Ltd.
- ) To provide suggestions for the future betterment.

**Limbu (2008)**, in his thesis, *“Credit management of NABIL Bank Limited”* highlighted that aggregate performance and condition of Nabil bank. In the aspect of liquidity position. Cash and bank balance to total deposit has fluctuating trend in 5 years study period. Cash and bank balance to current deposit is also fluctuating. The average mean of cash and bank balance to interest sensitive ratio is able to maintain good financial condition. The main objectives of research are as follows:

- ) To evaluate various financial ration of Nabil bank.
- ) To analyze the portfolio of lending of selected sector of banks.
- ) To determine the impact of deposit in liquidity and its effect on lending practices.
- ) To offer suitable suggestions based on finding of his study.

**Khatrri (2009)** in his study on *“Cash flow management of commercial Banks”* describes that cash flow and liquidity management efficiency of listed high performing commercial banks of Nepal. It is also aimed to find out the relationship between cash flow management and liquidity crisis a raised in the financial market.

His major objectives were as under:

- ) To analysis the cash flow position of commercial banks of Nepal.
- ) To conduct comparative study of the annual cash flow statements of the banks.
- ) To examine the cash flows periodically due to changes in net assets, financial structure and different activities like operating, financing, investing and marketing.
- ) To analyze liquidity crisis in financial market
- ) To recommend the findings of the study to concern bodies and authorities, after analyzing cash flow position and liquidity problem of the banks.

**Gautam (2011)** has conducted thesis entitled “*A case study of Liquidity Management of Commercial Banks*” with special reference to Standard Chartered Bank, Himalayan Bank, Everest Bank & NABIL Bank. He highlighted the aggregate performance and condition of concern banks. In the aspect of liquidity position, cash and bank balance shows the more liquidity position. On his study, try to give clear picture of the liquidity management policies of concern banks by taking 5 years study period.

His major objectives were as under:

- ) To examine liquidity position of commercial banks of Nepal.
- ) To analyze the credit deposit ratio (CDR) and its impact on liquidity.
- ) To examine the different ratio regarding the liquidity risk management.

**Pokharel (2011)** in his study on “*Management of Deposit & Liquidity & Its’ Impact on Profitability of Joint Venture Bank*” describes that deposit mobilization, liquidity management and its impact in profitability.

His major objectives were as under:

- ) To assist the liabilities and assets structure of joint venture banks.
- ) To analyze the composition of assets and liabilities of joint venture bank in Nepal.
- ) To examine the utilization of assets.
- ) To evaluate the trend of deposits and loans of joint venture banks in Nepal.
- ) To evaluate liquidity, profitability, capital structure activity and capital adequacy position of joint venture banks in Nepal.
- ) To provide suggestions and recommendation on the basis of finding and analyses to improve the commercial banks.

**Adhikari (2011)** has conducted thesis entitled, *“Liquidity management of commercial banks in Nepal”* with reference to Everest Bank and Standard Chartered Bank Ltd. The main objective of the study is to analyze the liquidity position and the profitability of these two Banks.

His major objectives were as under:

- ) To analyze the liquidity management, deposit and investment position of the banks.
- ) To find out the relationship between deposit, investment, loans and advances and net profit.
- ) To find out the trend analysis of deposit, investment, loans and advances and net profit.
- ) To recommend for the improvement based on findings.

### **The Major findings from the study were:**

There is no standard and uniform rate or ratio for maintaining liquid assets by the concern banks. The management may decide to maintain an appropriate level asset on own judgment and considering NRB circulars. Treasury management decision should be made based on the relation to the source offends, practices and statutory obligation. Nepalese commercial banks are in over liquidity position and nearly average banks are able to manage it properly. Due to lack of favorable investment opportunity the liquidity position of commercial bank is increasing trend. Worldwide depression has not change liquidity positions of commercial banks in Nepal. Due to the political instability, nearly average banks have to face liquidity problem. NRB supervision and monitoring for liquidity management is at surface level and less effective. Most of the Nepalese commercial banks have not assessed the adequacy of both a bank's liquidity risk management framework and its liquidity position.

### **2.5 Research Gap**

There are most of the researchers are concerned with liquidity management, cash management and fund mobilization of various banks as well as lending practice, financial performance, profitability analysis and others but there is not found research about the treasury management of a Bank. In the context of Nepal, The treasury management is the one of the current and urgent issue in banking industry, which helps to solve the liquidity crisis by minimizing the risks and maximizing the profit.

Actually, a treasury management strategy is determined by various factors. In this research various ratio are systematically analyzed and generated as well as NRB's rules and directives are produced while analyzing. Past researchers are not analyzed about the treasury management and its impact on the profitability and overall operation of

business and also ratios are not categorized according to nature. Here in this research all ratios are categorized according to their nature and area. This study emphasis the effect of treasury management of BOK, on the other hand, no any research attempt has been made after BOK become “Bank of Year 2011”. So, this research work is very much centered to identify the responsible causes to analyze them and recommended practical suggestions for the betterment of BOK.

## **CHAPTER - III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction:**

This chapter encompasses the process followed during the period of study to meet the target. Hence, the target refers to the Treasury management of BOK almost with the help of financial accounts and notes of accounts. The study also deals with the necessary suggestions for its reform for the betterment of its financial performance in the future. So research methodology describes the methods and process applied in the entire aspect of the study. Therefore, this chapter includes the following with regards to the methodology.

#### **3.2 Types of research:**

This study included three types of research. They are descriptive, analytical as well as empirical.

- i. Descriptive research included surveys and facts for finding inquires of various kinds.
- ii. Analytical research has to used fact or information already available and analyzed these to make a critical evaluation of the material.
- iii. Empirical research is data based research coming up with conclusion, which is capable of being verified by observation.

### **3.3 Research Design:**

Research refers to a search of knowledge. A research design is the arrangement of conditions for collecting and analysis of data in a manner that aims to combine relevance of the research purpose with economy in procedure. This research has been used as a descriptive as well as a analytical. The study is based on the wide range of variables and factors influencing treasury management of concern bank and data relating to financial analysis are presented in such manner that the research becomes more informative.

### **3.4 Population and Sample:**

“The term ‘population’ or ‘universe’ means all the members of any well defined class of events of objective.” (Pant, 2002:75). The population refers to the organization of the same nature and its services and product in general. So, the total numbers of commercial banks in Nepal are population. There are 32 commercial banks in Nepal at the beginning of June, 2012.

“A sample portion chosen from the population for studying its properties is called sample and the number of units in the known as sample size. The method of selecting for study a small portion of the population to draw conclusion about the characteristics of the population (universe) is known as sampling.’ (Chaudhary, AK. 2058:171).

The study of whole population is not possible due to lack of time, money, capacity and other resources. Thus, among 32 commercial banks, Bok has been chosen as sample bank. Likewise, financial statements of five years (FY 2063/64 to 2067/68 are selected as samples for the purpose of it.

### **3.5 Nature of data:**

To fulfill the research objective of this study mainly secondary data have been used, which is collected from the audited annual report of the concern bank's websites ([www.bok.com.np](http://www.bok.com.np)) and authentic data published by NRB regarding with BFIs from the NRB as well as primary data is also collected to get result where necessary.

### **3.6 Sources of data:**

In this research, data have been collected from both primary & secondary sources. Primary data is gathered from interview and questionnaire with staff of different level and also from other related persons.

Secondary data wear collect from different sources like balance sheet, profit and loss account, official report, different budget and other related published or unpublished report of Bank of Kathmandu.

### **3.7 Data Gathering Procedure:**

To meet the objective of the study primary as well as secondary sources of data have been used. Including Acts and Bylaws most of the data are based on secondary sources. Since the entire research is based on the variables and factor influencing treasury management of BOK, the secondary data have been used. Secondary data are taken from the company's annual reports of the company containing its balance sheet, income statement, cash flows statement and others, direct information from respective bank, economic journals, NRB's reports and other sources. Economic survey of different years published by Ministry of Finance NG,

Banking and Financial Statistics published by NRB, previous dissertation, publication and reports relating to commercial banks are collected.

### **3.8 Methods of Data Analysis:**

The gathered data, especially the income statement and Balance sheet of the banks will have been analyzed to get the desired objectives with the help of various financials as well as statistical tools. Besides these, some graph charts and tables will also have presented to analyze and interpret the findings of the study. The objectives of the study and availability of the data limit selection of the tools. To light out about the treasury management of BOK, it will be mainly used tabular and graphical, financial and statistical tools for the conclusion and recommendation.

#### **3.8.1 Financial Analysis:**

Financial Analysis is the process of identifying the financial strength and weakness of the firm by properly establishing relationship between the items of balance sheet,, which represents snapshot of the firm's financial position at a moment in time and next, income statement, that depicts a summary of the firm's profitability overtime (Van Horne and Wachowicz, 2003:120)

In financial analysis, ratio is used as a benchmark for evaluating the financial position and performance of a firm. Financial analysis is a technique of answering various questions regarding the performance of a firm in the past, present and future. As financial Analytical tools, following ratios will be used.

##### **3.8.1.1 Cash Reserve Ratio (CRR):**

Cash Reserve Ratio is a bank regulation that sets the minimum reserves each bank must hold to customer deposit and notes. These reserves are designed to satisfy withdrawal demands and would normally be in the form of fiat currency stored in a bank vault, or with a central bank. The

reserve ratio is sometimes used as a tool in monetary policy, influencing the country's economy, borrowing and interest rates.

NRB has kept CRR of 5% for commercial banks for this fiscal year. NRB uses this method to drain out the excessive money from the banks or provide more liquidity. CRR is used as a tool in monetary policy, influencing the country's economy, borrowing and interest rates that work like brakes on the economy's money supply.

$$\text{CRR} = \frac{\text{NRB Balance (Lcy only)}}{\text{Deposit (Lcy) - Margin Deposit}}$$

#### **3.8.1.2 Cash and Bank Balance Ratio (C & B):**

We know that liquidity is capacity to meet the short term cash obligation by banks. In this regard banks are used to be maintaining some additional amount in their bank account or with themselves. This amount is used to be fulfilling day to day payments to their customers. This ratio is the relation between the deposit and cash with the bank. So, it can be analyzed that how much amount is getting used in day to day payments in relation to the deposit. It is better to maintain 5% of cash and bank balance to fulfill the daily cash requirements. This toll also supports managers to boost the cash management capacity of commercial banks.

$$\text{C \& B} = \frac{\text{Total Cash \& Bank Balance}}{\text{Total Deposit}}$$

#### **3.8.1.3 Statutory Liquidity Ratio (SLR):**

SLR refers to the amount that all banks require to maintain in cash or in the form of Gold or approved government securities. SLR is determined as percentage of total demand and percentage of time deposit liabilities. It is the amount which a bank has to maintain in the form: Cash, Gold valued

at price not exceeding the current market price, approved Government securities.

The objectives of SLR are, to restrict the expansion of bank credit, to augment the investment of the banks in government securities and to ensure solvency of banks. The commercial banks should maintain 6.5% SLR ratio for this fiscal year in quarterly basis.

$$\text{SLR} = \frac{\text{Total Investment in govt. Securities}}{\text{Total deposit}}$$

#### **3.8.1.4 Capital Adequacy Ratio (CAR):**

As per the directive issued by NRB, the bank capital has categorized into two parts, core capital and supplementary capital. The total of these two capitals considers for calculating capital adequacy ratio. The capital adequacy ratio is based on total risk weighted assets. The sum of core capital and supplementary capital is measured to be total capital fund. For the purpose of calculation of capital fund, the risk weighted assets have been classified in two parts as on balance sheet items and off balance sheet items. The capital adequacy ratio would measure the total capital fund on the basis of total risk weighted assets. As per the rule of NRB commercial banks should maintain 15% capital adequacy and is mandatory.

$$\text{CAR} = \frac{\text{Total Capital Fund}}{\text{Total Risk Weighted Assets}}$$

#### **3.8.1.5 Core Capital Ratio (CCR):**

As mentioned above topic, the bank capital has categorized into two parts, core capital and supplementary capital. Out of these two capital core capital is to be considered for calculating core capital ratio. Core capital is

that sort of capital which is provision for general purpose and is basic capital. It is known as name of TIRE-I according to Basel-I & II. It is based on total risk weighted assets. The core capital ratio would measure the core capital fund on the basis of total risk weighted assets. As per the rule of NRB commercial banks should maintain 6% capital Core capital. It can be calculated as under:

$$\text{CCR} = \frac{\text{Core Capital Fund}}{\text{Total Risk Weighted Assets}}$$

#### **3.8.1.6 Non-Performing Loan Ratio (NPL):**

According to directive published by NRB, the Loan and Advance has divided in two parts- Performing loan and Non-performing loan. Performing loan consist good or pass loan. Good or pass loan mean that sort of loan which time of payment made is not passed more than 3 months. Another hand, Non-performing loan includes the restructured or (Rescheduled) loan, Sub-standard loan, Doubtful loan and bad loan. Under Non-performing loan the time of payment is passed above than 3 months. Non-performing loan ratio shows the relationship or ratio of sum of Non-performing loan and total credit. Higher the NPL ratio denotes higher the non performing loan and it indicates not satisfied performance of lending and recovering credit. According to NRB directive, the banks should maintain NPL ratio less than 5%.

$$\text{NPL} = \frac{\text{Total Non-Performing Loan}}{\text{Total Loan \& Advance}}$$

### **3.8.1.7 Loan Loss Coverage Ratio:**

Loan loss coverage ratio measures the capacity of cover of Non-performing loan from the loan loss provision. Every Bank and financial institutions should make provision for future loan loss according to loan category for their safeguard. As per provision BFIs should make provision in the every quarter end. From that provision loss should be cover if loss is occurred in the future. So, BFIs use to make sufficient provision according to loan's category and it can be allowed to adjust in profit and loss account. Higher ratio is better.

$$\text{Loan Loss Coverage ratio} = \frac{\text{Total Loan Loss Provision}}{\text{Total Non-performing Loan}}$$

### **3.8.1.8 Loan Loss Provision (LLP) Ratio:**

Every bank and financial institutions should make loan loss provision according to loan classification. For the purpose of making provision loan is divided into five categories; Pass loan, Restructured loan, sub-standard loan, doubtful loan and bad loan. Loan loss provision is made with objectives of meeting the future losses which reduces the future risks.

Loan loss provision (LLP) ratio shows the ratio of total loan loss provision on total loan and advance. It is the one of tools to analyze the credit risk and assets quality which helps to make plan to the stakeholders, investors etc.

$$\text{LLP} = \frac{\text{Total Loan Loss Provision}}{\text{Total Loan \& Advance}}$$

### 3.8.1.9 Total Credit to Deposit Ratio (C/D):

C/D ratio is a tool which shows relation between deposit accepted and credit granted to the lenders by a bank. It is the proportion of loan –assets created by banks from the deposits received. The higher the ratio, the higher the loan-assets created from deposits. A high credited-deposit ratio could lead to a rise in interest rates. It determines the amount of total lending from the total deposit from the customers. This ratio directly shows the credit performance of commercial banks. Credit is major source of generation of out-cash flow. Commercial banks used to grant credit charging high cost to risky areas to generate maximum cash flow. Management of cash from deposit and cash out flow to credit to generate more profit is strategic tactical job of commercial banks. Most of the effort of commercial banks is use to be concentrated to the credit deposit activity. Banks are generating about 60% to 70% income from credit. As per NRB, the commercial banks should maintain 80% C/D ratio for this fiscal year.

$$\text{C/D Ratio} = \frac{\text{Total Credit}}{\text{Total Deposit}}$$

### 3.8.1.10 Earning Per Share (EPS):

The main objective of every business organization is maximization or earning or profit. The Earning per share (EPS) after income taxes is one of the most important determinants of share's value because it measures the earnings power under each share. The income of per share is known as earning per share. It can be calculated by the following formula.

$$\text{EPS} = \frac{\text{NPAT - Preference dividend (If any)}}{\text{Total No. of equity Shares}}$$

Where,

NPAT = Net profit after tax.

#### **3.8.1.11 Return on Equity (ROE):**

Return on equity is the ratio of net income to equity capital. It measures the rate of return of equity shareholders' investment. Objective of management is to generate the maximum return on shareholder's investment in the organization. Return on equity is therefore the best single measure of the company's success in fulfilling its goal. Increasing ratio of ROE is favorable for a company which shows that the net profit is increasing.

$$\text{ROE} = \frac{\text{NPAT}}{\text{Total Shareholder's Fund}}$$

#### **3.8.1.12 Return on Total Assets (ROA):**

Return on Total assets is the ratio of net income after tax to total assets. It measures the return on all the company's assets after interest and taxes. Assets are hold to earn income for their holding. Assets include all types of assets that might be banking or non-banking assets. In the BFIs have huge amount cover the loan and advance as assets by which employed for maximization earnings.

$$\text{ROA} = \frac{\text{NPAT}}{\text{Total Assets}}$$

#### **3.8.1.13 Return on Investment:**

The objective of the investment is to earn higher income to run business successfully. Return means earnings which is main motto of the every business organization. It is one of the barometers of success.

Return on investment is the ratio of the net profit after tax to investment. It measures the strength of the investment to earn as well as denotes the whether the productive investment or not. Investment is holding assets with intention to earning income. Higher the ratio is favorable for company which indicates the higher capacity of investment and also increasing the return.

$$\text{ROI} = \frac{\text{NPAT}}{\text{Total Investment}}$$

#### **3.8.1.14 Return on Loan & Advance:**

Return on loan and advance is the ratio of the net profit after tax to loan and advance which shows the strength of loan and advance to earn profit. Bank and financial institutions have got huge amount of loan and advance as assets which is provided from public deposits because the main function of BFIs are earn profit through lending credit by collecting deposits. RLA measures what times the loan and advance's contribution to the profit. It can be calculated as under:

$$\text{Return on Loan \& Advance} = \frac{\text{NPAT}}{\text{Total Loan \& Advance}}$$

#### **3.8.1.15 Management Efficiency Ratio (MER):**

Management Efficiency Ratio is tool to indentify the contribution in net profit by per staff. It ratio is the ratio of net profit after tax to no. of staffs employed. It measures the efficiency of management to earn income. Due to management decision, capacity, ability, skills and other factors will determine the level of earnings. That's why; it is one of the tools to exam the efficiency of the management to run business effectively and

efficiently. It depends upon overall management skills. Every employee or staff has vital role to success.

$$\text{MER} = \frac{\text{NPAT}}{\text{Total No. of Staffs}}$$

### **3.8.2 Statistical Analysis:**

Statistics is a body of methods of obtaining and analyzing data in order to base decision on them. It is a branch of scientific method used in dealing with phenomena that can be described numerically either by counts or by measurements. Thus, the word statistical data are analyzed is called statistical methods. Such methods are applicable to a very larger number of fields.

Statistical methods of analysis are the mathematical techniques used to facilitate the analysis and interpretation of numerical data secured from groups of individual or groups of observation from a single individual. The various statistical tools can be used to analyze out of them following tools will be used as:

#### **3.8.2.1 Arithmetic Mean:**

Arithmetic mean or simply a 'mean' of a set of observation is the sum of all the observation divided by the number of observations. It is also known as the arithmetic average. It is one of the tools of measures of central tendency.

The most popular and widely used measures of representation from the entire data by one value are what most laymen call an 'average' and what the statisticians call the arithmetic mean. Its value is obtained adding together all the times and by dividing this total by the number of items. The formula to calculated mean is given by.

$$\text{Mean } (\bar{x}) = \frac{\sum X}{N}$$

Where,  $\bar{x}$  = Mean of the Values

$\sum x$  = Summation of the Values

N = No. of observation

### 3.8.2.2 Standard Deviation (S.D.):

The standard deviation is the absolute measure of dispersion in which the drawbacks present in other measures of dispersion are removed. It is said to be the best measure of dispersion as it satisfies most of the requisites of a good measure of dispersion.

Standard deviation (s.d.) is defined as the positive square root of the mean of the square of the deviations taken from the arithmetic mean. It is denoted by  $\delta$ .

$$\text{Standard Deviation } (\delta) = \sqrt{\frac{1}{N} \sum (X - \bar{X})^2}$$

### 3.8.2.3 Coefficient of Variation (C.V.):

Standard deviation is the absolute measure of dispersion. The relative measure of dispersion based on the standard deviation is known as the coefficient of standard deviation.

The coefficient of dispersion based on standard deviation multiplied by 100 is known as the coefficient of variance (C.V.). If  $\bar{X}$  be the arithmetic mean and  $\delta$ , the standard deviation of the distribution, then the C.V. is defined by:

$$\text{Coefficient of variance (C.V.)} = \frac{S}{\bar{X}} \times 100$$

### 3.8.2.4 Measures of Correlation:

Correlation analysis is the statistical tool that we can use to describe the degree to which one variable is linearly related to other variables. Two or more variables are said to be correlated if change in the other of one variable appears to be related or linked with the change in the other variables.

“Correlation is defined as the relationship (association) between (among) the one dependent variable or factor and one (or more than one) independent variable(s) or factor(s). Correlation analysis deals with the association between two or more variables” (Simpson & Kalka, 1997)

“Correlation analysis is the statistical tools generally used to describe the degree to which one variable is related to another. On the basis theory of correlation one can study the comparative changes occurring in two related phenomena and their cause effect relation can be examined” (Kotheri, 1981).

**The degree of relationship is measured by using following formula**

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{N}\right) \left(\sum Y^2 - \frac{(\sum Y)^2}{N}\right)}}$$

Where, r = correlation coefficient

$\sum X$  = Sum of the variable X

$\sum Y$  = Sum of variable Y

$\sum XY$  = Sum of products of X and Y

N = Number of pairs of X and Y

### 3.8.3 Trends Analysis:

Trend analysis implies straight line irrespective of the seasonal and cyclical swing and function trend analysis is used to measure the line of best fit or straight line is obtained or not. Trend analysis is also used to compare the overall performance of different study period. The term best fit is interpreted in accordance with the principle of least square which consists of minimizing the sum of the square of the deviation between the given observed value of the variables and their corresponding estimated values as given by the line of best fit. Absolute amount per unit of time can change by increasing or decreasing the trend value.

The analysis is also denoted by least squares liners trends analysis. Trend analysis describes the average relationship between two serious where the one serious related to time and other serious to the value of available. Among the various methods of determining trend of time series, the most popular and mathematical method is the least square method. Using this least square method, it has been estimated the future trend values of different variables. For the estimation of linear trends lines following formula can be used:

$$Y = a + bx$$

Where,

y= Depended variable

x = Independent variable

a = Y-intercept

b= Slope of the trend line

### **3.9 Research Procedure:**

This research procedure includes the following steps for the study.

- i. Collection of various books and other publication relevant for the study.
- ii. Assimilation of useful secondary data.
- iii. Description and analysis of collect data in lights of theoretical basis.
- iv. Tabulation of data by using approved financial and statistical tools.
- v. Extraction of valuable conclusion and recommendation.

## CHAPTER - IV

### PRESENTATION AND ANALYSIS OF DATA

This chapter deals with the presentation, analysis and interpretation of data in order to fulfill the objectives of this study. This chapter includes analysis of ratios and statistical analysis which is connection with treasury operation of BOK as well as management efficiency and foreign exchange management analysis. The motto of this chapter is to study, evaluate and analysis those major factors which are related to treasury management of Bank of Kathmandu.

#### 4.1 Treasury Operation of Bank

Basically, Treasury Management includes a firm's collections, disbursements, concentration, investment and funding activities. In BFIs, it is also included trading in bonds, currencies, financial derivatives and money market operation. In broad sense, it is the management of sources and uses of funds for any organization. The scope of treasury management is very wide and it covers every types of organization be it charitable, government or corporate. It has basically following aspects or tools which are described.

##### I. Management of market risk

**Interest rate risk:** Global money and currency markets are liberalized. Neither the exchange rates nor the interest rates are administered, but they move freely depending upon their demand and supply. This creates a lot of instability in the interest rates of various currencies. This is Called interest rate risk.

**Price risk:** As ware, we are those prices in the market move both ways (UP/down). Due to the continuous movement of prices of commodities/currencies, “price risk” arises.

**Credit risk:** Credit risk arises due to possibility of payment default from the counter parties.

**Event risk:** Major political events/natural calamities create the event risks.

## **II. Management of liquidity.**

**Cash management:** Cash management is important activity in bank and financial institutions as their major job is to generate earning by cash business or money business. BFIs take money from people and again lend to the people in higher cost and generate excess cash flow to meet the competitive profitability. Having analyzed the market situation and cash position, BFIs have to keep their liquidity to meet their future demand.

**Nestro management:** Banks have tom open accounts with other banks both at home and abroad. Such accounts with other banks are called Nostro accounts. Funds are needed in these accounts for payment of demand draft, reimbursement of trade and other outing remittances. Overdraft may draw a very high penal interest.

**Safely mobilization of funds:** Safety mobilization of funds is essential and challenging job in this fraud era because we people are feel very hardship to return the amount taken and clever to deceive others. Therefore, a bank should analyze the Customer’s Capacity, Creditability, Collateral, purpose, income resources, intention and other related factors to provide credit facility for safety lending funds. Otherwise, investment will be converted into bad or non-performing loan.

**Profitability through appropriate management of liquidity:** If the banks chose to hold all of their assets as liquid assets, their profits will be very low. Hence banks will try to minimize the volume of liquid assets to the extent possible.

### **III. Management of investment portfolio**

**Sector based:** There are different sectors for lending, so the BFIs must choose the appropriate sectors according to their safety, profitability and easier to liquidity management. But the bank should maintain sector wise investment which is prescribed by NRB. For example, deprive sector investment, agriculture loan, real estate loan, housing loan, hire purchase loan and so on. There is also maintaining limit of loan in different sectors.

**Long term and short term investment:** Before investing, the BFIs should decide the whether the investment is long term or short term and how it is recovered that should be clear to maintain liquidity or to safe from liquidity crisis. Time or period of lending is basically depending upon the deposit structure or composition of deposits nature and tenure. If bank has more short term or current and saving deposit rather than fixed and recurring deposit; it is better to lend fewer amounts in long term. If bank has higher danger deposit (a person hold huge amount, huge amount current and call account), bank should invest for short run. This is important job to analyze for investment decision of treasury managers.

### **IV. Management of foreign exchange risk.**

**Transaction exposure:** Every entry and exit from a foreign exchange deal comes at a cost. In order to come the transaction risk, dealers try to square their position as soon as possible.

**Translation exposure:** This comes into effect for the MNC (Multination Corporation) whose subsidiaries overseas maintain their books in foreign currencies, thus posing a transaction risk to the parents.

**Accounting exposure:** This related to the value of assets/liabilities in terms of foreign currency.

**Economic exposure:** This related to economic value of assets in one country with respect to that of another country.

## **V. Assets & Liability Management (ALM)**

In banking, *asset and liability management* is the practice of managing risks that arise due to mismatches between the assets and liabilities (debts and assets) of the bank. Banks face several risks such as the liquidity risk, interest rate risk, credit risk and operation risk. Asset liability management (ALM) is a strategic management tool to manage interest rate risk and liquidity risk faced by banks, other financial services companies and corporations. Banks manage the risks of assets liability mismatch by matching the assets and liabilities according to the maturity pattern or the matching the duration, by hedging and by securitization.

## **VI. Money Market Operations**

The money market is guided by monetary policy of NRB can be considered as one positive development in Nepal's. When the central bank's primary goal is to mop up excess liquidity from the market, keeping a conservative cap can be considered as a positive move. It includes the short term or less than one year negotiable instruments which provides liquidity or working capital for the banks. For example, interbank transaction (lending and borrowing), cheque, draft, bills of exchange, letter of credit, treasury bills etc. are considered its instruments. Despite the problems, the Nepali treasury market along with its market players need to be positive and must welcome positive changes in the market.

## **VII. Government Securities Operations**

Government securities operations refer to the amount compulsory investment in government securities that is required to maintain for liquidity management. The objectives of investment in government securities are, to restrict the expansion of bank credit, to augment the investment of the banks in government securities and to ensure solvency of banks. The commercial banks should invest 15% on deposit for this fiscal year in quarterly basis.

### **4.2 Financial Analysis:**

Ratio analysis is one of the most commonly used techniques and most powerful tools of financial analysis. In financial analysis, a ratio is a benchmark for evaluating the financial position and performance of a firm. It is a simple and meaningful technique of measuring operating performance and evaluating managerial performance of a firm. The ratio analysis provides a basic tool which reflects the norms of business operation to examine different accounting parameters. Ratios are calculated and compared with relevant firm or competitors in order to see whether the operating results are at a satisfactory level or not. Ratios help to summarize large quantities of financial data and to make qualitative judgment about the firm's performance.

The ratio analysis includes a wide range of examination from a specific aspect of a division or unit of the overall firm. The main objective of ratio analysis is to examine various aspects of business and make sure that the operating results have not deviated from the state norms. Specifically, the objectives of ratio analysis are to examine (a) liquidity position (b) profitability (c) financial leverage (d) management efficiency and (e) capital adequacy. Different ratios can be calculated to examine each of these aspects; however ratios are classified in the following five sets.

|                                |                                                                           |
|--------------------------------|---------------------------------------------------------------------------|
| A. Liquidity Ratios            | to examine liquidity position,                                            |
| B. Profitability Ratios        | to examine earning power                                                  |
| C. Assets Quality Test Ratio   | to examine quality of assets,                                             |
| D. Capital Adequacy Ratios     | to examine the strength of the capital adequacy of the available capital. |
| E. Management efficiency Ratio | to examine contribution of management for earning.                        |

#### **4.2.1 Liquidity analysis:**

Liquidity of any business organization is directly related with the working capital or liquid assets and liquid liabilities of that organization. In other words, one of the main objectives of working capital management is keeping sound liquidity position. Bank is different organization which is engaged in mobilization of fund. Therefore, without sound liquidity position, bank is not able to operate its function. To measure the bank's solvency position or ability to meet its short-term obligation, various liquidity ratios are calculated and to know the trend of liquidity, trend analysis of major liquidity ratios have been calculated.

##### **4.2.1.1 Cash Reserve Ratio (CRR):**

Cash Reserve Ratio is a bank regulation that sets the minimum reserves each bank must hold to customer deposit and notes. These reserves are designed to satisfy withdrawal demands and would normally be in the form of fiat currency stored in a bank vault, or with a central bank. The reserve ratio is sometimes used as a tool in monetary policy, influencing the country's economy, borrowing and interest rates.

NRB has kept CRR of 5 % for commercial banks. NRB uses this method to drain out the excessive money from the banks or provide more liquidity. CRR is used as a tool in monetary policy, influencing the country's

economy, borrowing and interest rates that work like brakes on the economy's money supply.

**Table 4.1**  
**Position of Cash Reserve Ratio**

(In millions)

| <b>FY</b>   | <b>NRB Balance</b> | <b>Total deposit</b> | <b>Actual CRR</b> | <b>St. CRR</b> |
|-------------|--------------------|----------------------|-------------------|----------------|
| 2063/64     | 883.50             | 12219.85             | 7.23 %            | 5%             |
| 2064/65     | 606.05             | 15681.59             | 3.86 %            | 5.5%           |
| 2065/66     | 1,324.11           | 14,469.97            | 9.15%             | 5.5%           |
| 2066/67     | 687.58             | 20,017.15            | 3.43%             | 5.5%           |
| 2067/68     | 641.69             | 20,804.71            | 3.08%             | 5%             |
| <b>Mean</b> | <b>828.59</b>      | <b>16,638.65</b>     | <b>5.35%</b>      | -              |
| <b>S.D.</b> | <b>265.67</b>      | <b>3283.76</b>       | <b>2.41</b>       | -              |
| <b>C.V.</b> | <b>30.06%</b>      | <b>19.74%</b>        | <b>44.98%</b>     | -              |

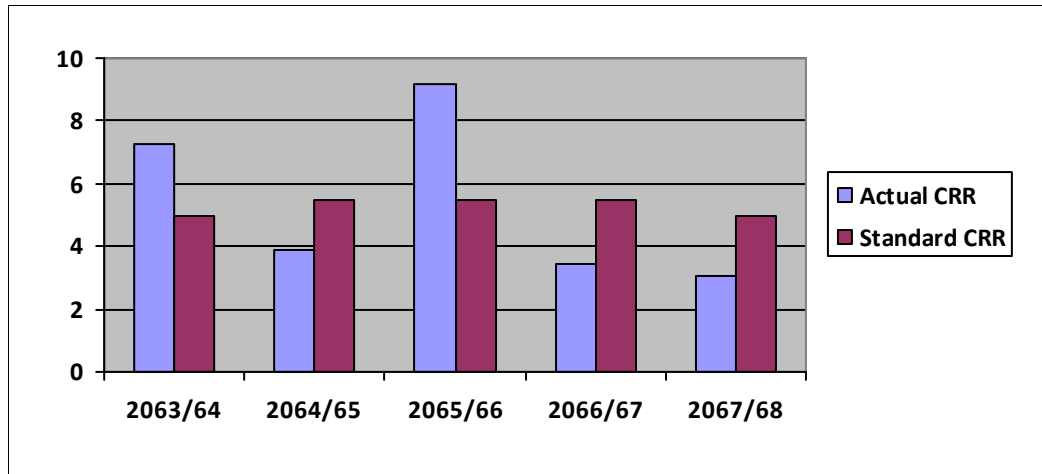
(Sources: Appendix-I)

Table No.4.1 shows that the balance with Nepal Rastra Bank, Total deposit excluding margin deposit, actual cash reserve ratio and standard cash reserve ratio of BOK for five fiscal years. The highest balance with NRB is 1324.11 in year 2065/66 and lowest Balance with NRB is 606.05 in year 2064/65 with average balance 828.59, which is fluctuating trend. The S.D. of NRB balance is 265.67 and coefficient of variance is 30.06%. Likewise, the trend of deposit is increasing, which average deposit, S.D. and coefficient of variance (C.V.) are 16638.65, 3283.76 and 19.74 considering five year respectively.

BOK is able to maintain standard level of CRR in year 2063/64 and 2065/66. But in other years BOK is not able to maintain standard rate of CRR. According to calculation, the average CRR, S.D. and CV are 5.35, 2.41 and 44.98 respectively. For the kind consideration, the above NRB balance

uses to consider closing date of fiscal year but in practice CRR is calculated in weekly balance basis.

**Figure 4.1**  
**Comparative analysis of Actual CRR and Standard CRR**



The figure No. 4.1 shows that the comparative analysis of Actual CRR and standard CRR is required to keep for maintaining liquidity of BOK. BOK is able to maintain standard level of CRR in year 2063/64 and 2065/66. But in other years BOK is not able to maintain standard rate of CRR. According to calculation, the average CRR, S.D. and CV are 5.35, 2.41 and 44.98 respectively.

#### **4.2.1.2 Cash and Bank Balance Ratio (C & B):**

We know that liquidity is capacity to meet the short term cash obligation by banks. In this regard banks are used to be maintaining some additional amount in their bank account or with themselves. This amount is used to be fulfilling day to day payments to their customers. This ratio is the relation between the deposit and cash with the bank. So, it can be analyzed that how much amount is getting used in day to day payments in relation to the deposit. It is better to maintain 5% of cash and bank balance to fulfill

the daily cash requirements. This toll also supports managers to boost the cash management capacity of commercial banks.

**Table 4.2**  
**Analysis of cash & bank balance to total deposit ratio**

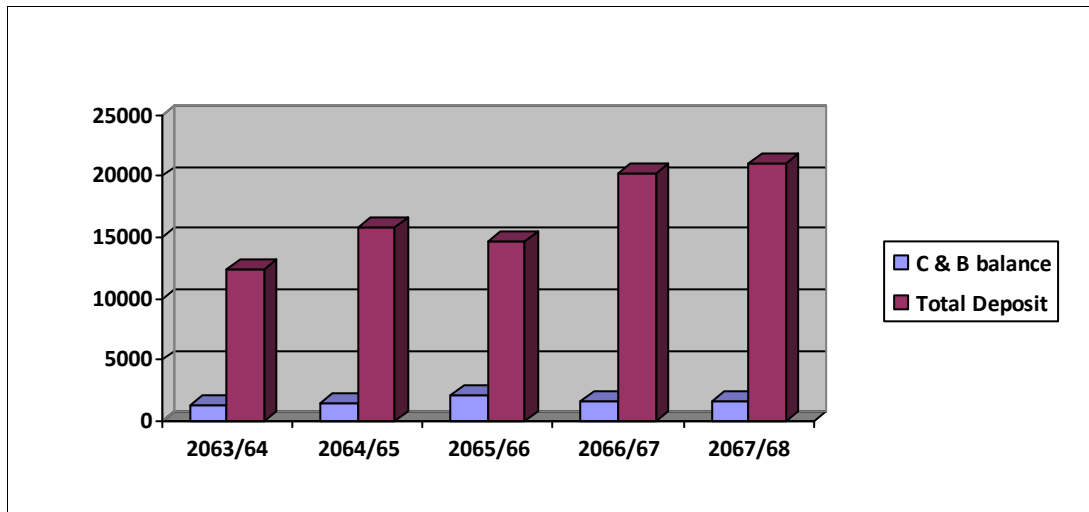
(Rs. in millions)

| <b>FY</b>   | <b>Cash &amp; Bank Balance</b> | <b>Total deposit</b> | <b>C &amp; B Ratio</b> |
|-------------|--------------------------------|----------------------|------------------------|
| 2063/64     | 1315.90                        | 12,388.90            | 10.62%                 |
| 2064/65     | 1440.47                        | 15,833.74            | 9.10%                  |
| 2065/66     | 2182.12                        | 14,642.98            | 14.90%                 |
| 2066/67     | 1798.37                        | 20,315.83            | 8.85%                  |
| 2067/68     | 1678.93                        | 21,018.42            | 7.99%                  |
| <b>Mean</b> | <b>1683.16</b>                 | <b>16839.97</b>      | <b>10.29%</b>          |
| <b>S.D.</b> | <b>253.43</b>                  | <b>3322.42</b>       | <b>2.46</b>            |
| <b>C.V.</b> | <b>15.06%</b>                  | <b>19.73%</b>        | <b>23.87%</b>          |

(Sources: Appendix-II)

The table 4.2 shows that the actual cash and bank balances to total deposit ratio of BOK. The BOK has its highest ratio 14.90% in year 2065/66 and lowest ratio 7.99 in year 2067/68. In the other year during the study period in 2063/64 ,2064/65 and 2066/67 the level of cash and bank in relation to total deposit is 10.62%, 9.10% and 8.85% respectively. From the above analysis, it can be concluded that the average ratio of BOK is 10.29 that shows that its liquidity position for five in average maintained by BOK. Likewise S.D. of c & B ratio is 2.46 and coefficient of variation is 23.87%. It deals average cash and bank balance is not efficiently consistent. Higher the S.D. shows the higher fluctuation and vice versa. It is crucial importance for the company to keep careful watch over the cash movements to determine new cash flow because of variable and also to investigate the opportunities for the use of cash. The bar diagrams below shows the cash and bank balance position comparison with total deposits.

**Figure 4.2**  
**Comparative analysis of cash & bank balance to total deposit**



The figure 4.2 shows the analysis of cash and bank balance to total deposit the maximum cash and bank balance is required to keep for maintaining liquidity of BOK. Generally cash and bank balance uses to increase with increase in total deposit but deposit is not only factors that influence in cash and bank balance. Here, maximum cash and bank balance is in the year 2065/66 and minimum cash and bank balance is in year 2063/64 with average Rs.1683.16 millions.

#### **4.2.1.3 Statutory Liquidity Ratio (SLR)**

SLR refers to the amount that all banks require maintaining in cash or in the form of Gold or approved government securities. SLR is determined as percentage of total demand and percentage of time deposit liabilities. It is the amount which a bank has to maintain in the form: Cash, Gold valued at price not exceeding the current market price, approved Government securities.

The objectives of SLR are, to restrict the expansion of bank credit, to augment the investment of the banks in government securities and to

ensure solvency of banks. The commercial banks should maintain 15% SLR ratio for this fiscal year in quarterly basis.

**Table4.3**  
**Position of Statutory Liquidity Ratio (SLR)**

(Rs in millions)

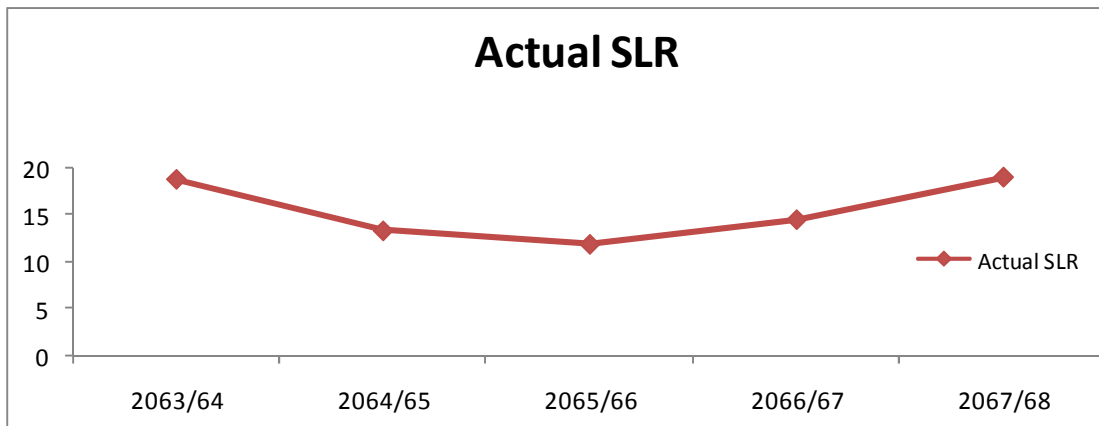
| FY          | Investment in Govt. Securities | Total deposit   | Actual SLR    | Standard SLR |
|-------------|--------------------------------|-----------------|---------------|--------------|
| 2063/64     | 2332.04                        | 12,388.90       | 18.82%        | -            |
| 2064/65     | 2113.22                        | 15,833.74       | 13.35%        | -            |
| 2065/66     | 1744.98                        | 14,642.98       | 11.92%        | -            |
| 2066/67     | 2954.93                        | 20,315.83       | 14.54%        | 8%           |
| 2067/68     | 4002.14                        | 21,018.42       | 19.04%        | 15%          |
| <i>Mean</i> | <b>2629.46</b>                 | <b>16839.97</b> | <b>15.53%</b> | -            |
| <i>S.D.</i> | <b>790.88</b>                  | <b>3322.42</b>  | <b>2.90</b>   | -            |
| <i>C.V.</i> | <b>30.08%</b>                  | <b>19.73%</b>   | <b>18.65%</b> | -            |

(Source: Appendix-III)

Table No. 4.3 shows the investment in government securities and total deposit of BOK from fiscal year 2063/64 to 2067/68 with its ratio i.e. SLR. During the study period the highest investment is 4002.14 in year 2067/68 and lowest is 1744.98 in year 2065/66. The mean or average, S.D. and CV of investment in government securities are 2629.46, 790.88 and 30.08% respectively.

The NRB started the provision of SLR from the fiscal year 20696/67 by announcing the 6% rate of SLR and according to provision commercial banks should maintain 8% in end of ashadh 2067. BOK is able to meet the standard SLR from the year to till date.

**Figure 4.3**  
**Trend analysis of actual SLR**



The figure 4.3 shows the trend of actual SLR of BOK. Here, actual CAR is fluctuating trend. It has trend of gradually decreasing but again from the fiscal year 2065/66 it is gradually increasing. And actual CAR is more than standard CAR in last past two years.

#### **4.2.2 Capital Adequacy Analysis**

As per the directive issued by NRB, the bank capital has categorized into two parts, core capital and supplementary capital. The total of these two capitals considers for calculating capital adequacy ratio

##### **4.2.2.1 Capital Adequacy Ratio (CAR):**

The capital adequacy ratio is based on total risk weighted assets. The sum of core capital and supplementary capital is measured to be total capital fund. For the purpose of calculation of capital fund, the risk weighted assets have been classified in two parts as on balance sheet items and off balance sheet items. The capital adequacy ratio would measure the total capital fund on the basis of total risk weighted assets. As per the rule of NRB commercial banks should maintain 15% capital adequacy and is mandatory.

**Table 4.4**  
**Position of Capital Adequacy Ratio**

(Rs in millions)

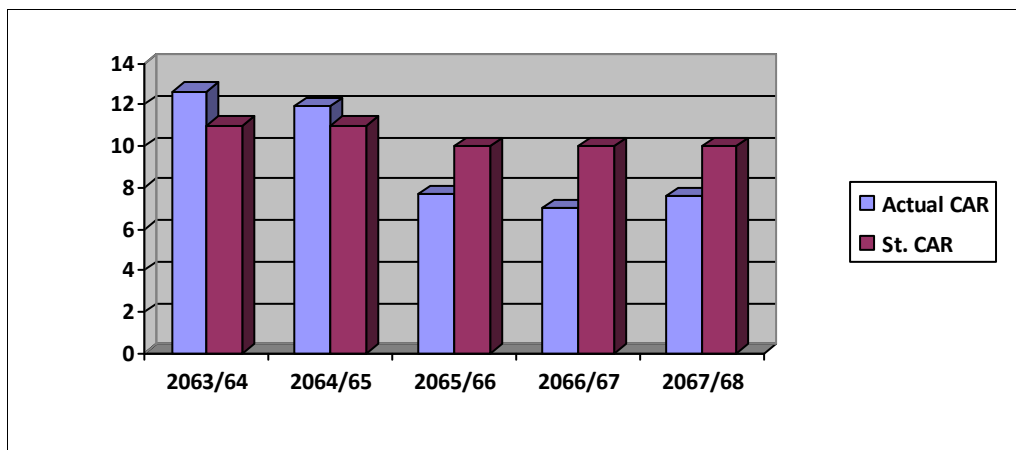
| FY          | Total Capital Fund | TRWA            | Actual CAR    | NRB Standard |
|-------------|--------------------|-----------------|---------------|--------------|
| 2063/64     | 1,290.12           | 10,226.19       | 12.62%        | 11%          |
| 2064/65     | 1,635.24           | 13,702.37       | 11.93%        | 11%          |
| 2065/66     | 2,005.70           | 26,101.47       | 7.68%         | 10%          |
| 2066/67     | 2,330.07           | 33,352.28       | 6.99%         | 10%          |
| 2067/68     | 2,662.07           | 35,078.96       | 7.59%         | 10%          |
| <i>Mean</i> | <b>1984.64</b>     | <b>23692.26</b> | <b>9.36%</b>  | -            |
| <i>S.D.</i> | <b>486.44</b>      | <b>10098.62</b> | <b>2.40</b>   | -            |
| <i>C.V.</i> | <b>24.51%</b>      | <b>42.62%</b>   | <b>25.64%</b> | -            |

(Source: Appendix-IV)

Table No. 4.4 shows the total capital fund and total risk weighted assets (TRWA) of BOK from fiscal year 2063/64 to 2067/68 with its ratio i.e. CAR. The trend of both total capital fund and total risk weighted assets are increasing. The mean or average, S.D. and CV of total capital fund are 1984.64, 486.44 and 24.51 respectively. Similarly, the mean or average, S.D. and CV of total risk weighted assets are 1984.64, 217.54 and 1.96 respectively.

The BFIs should be maintained CAR prescribed by NRB and which is mandatory. BOK is able to maintain in year 2064/64 and 2064/65 but other years are not or i.e. less the standard. The average CAR is 9.36%, which also less than standard.

**Figure 4.4**  
**Comparative analysis of actual CAR and standard CAR**



The figure 4.4 shows the trend of actual CAR of BK and standard CAR. Here, both actual CAR and standard CAR are fluctuating trend. And actual CAR is less than standard CAR in last past three years with decreasing rate and standard CAR last past three year is constant after decreasing from 11% to 10%.

#### **4.2.2.2 Core Capital Ratio (CCR)**

As mentioned above topic, the bank capital has categorized into two parts, core capital and supplementary capital. Out of these two capital core capital is to be considered for calculating core capital ratio. Core capital is that sort of capital which is provision for general purpose and is basic capital. It is known as name of Tire-I according to Basel-I &II. It is based on total risk weighted assets. The core capital ratio would measure the core capital fund on the basis of total risk weighted assets. As per the rule of NRB commercial banks should maintain 5.5% capital Core capital. It can be calculated as under:

**Table 4.5**  
**Position of Core Capital Ratio**

(Rs in millions)

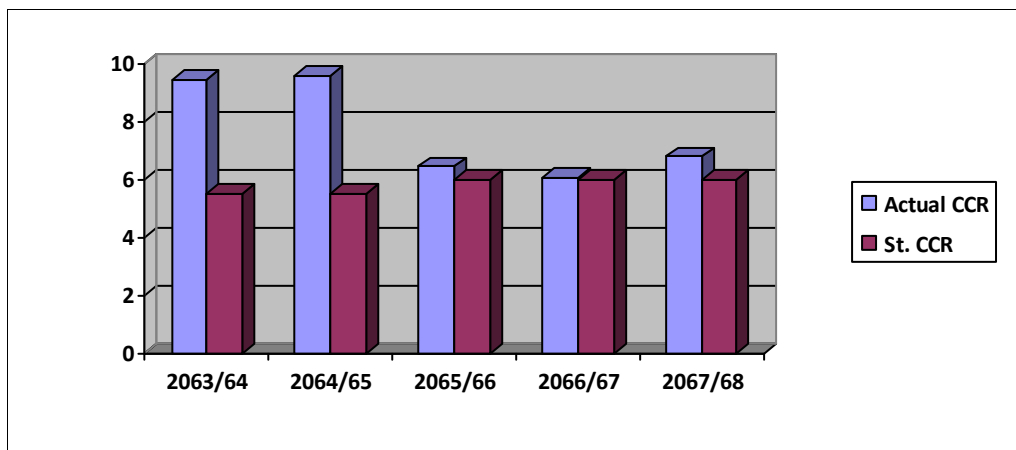
| FY          | Core Capital Fund | Total Risk Weighted Assets | Actual CCR    | St. CCR  |
|-------------|-------------------|----------------------------|---------------|----------|
| 2063/64     | 964.56            | 10,226.19                  | 9.43%         | 5.5%     |
| 2064/65     | 1,310.85          | 13,702.37                  | 9.57%         | 5.5%     |
| 2065/66     | 1,683.59          | 26,101.47                  | 6.45%         | 6%       |
| 2066/67     | 2,021.09          | 33,352.28                  | 6.06%         | 6%       |
| 2067/68     | 2,377.73          | 35,078.96                  | 6.78%         | 6%       |
| <i>Mean</i> | <i>1671.56</i>    | <i>23692.26</i>            | <i>7.66%</i>  | <i>-</i> |
| <i>S.D.</i> | <i>500.19</i>     | <i>10098.62</i>            | <i>1.52</i>   | <i>-</i> |
| <i>C.V.</i> | <i>29.92%</i>     | <i>42.62%</i>              | <i>19.87%</i> | <i>-</i> |

(Source: Appendix-V)

Table No. 4.5 shows the Core capital fund and total risk weighted assets (TRWA) of BOK from fiscal year 2063/64 to 2067/68 with its ratio i.e. CAR. The trend of both core capital fund and total risk weighted assets are increasing. The mean or average, S.D. and CV of core capital fund are 1671.56, 500.19 and 29.92 respectively. Similarly, the mean or average, S.D. and CV of total risk weighted assets are 1984.64, 217.54 and 1.96 respectively.

The BFIs should be maintained CCR prescribed by NRB and which is mandatory. BOK is able to maintain whole during study periods or which is higher than standard CCR by NRB. The average or mean, S.D. and CV of CAR are 7.66, 1.52 and 19.87 respectively.

**Figure 4.5**  
**Comparative analysis of actual CCR and standard CCR**



The figure 4.5 shows the trend of actual CCR and standard CCR of BOK. Here, both actual CCR and standard CCR are fluctuating trend. During the study periods actual CCR is higher than standard CCR.

#### **4.2.3 Assets Quality Analysis:**

Every bank and financial institutions have huge amount of loan and advance as assets. Loan and advance lends from deposit received from the depositors. The different between loan interest and deposit interest is called interest spread, which generates the profit for banks. It covers the around 70 to 80% income from interest income. The purpose of lending loan is get back loan amount with interest in prescribed schedule. If any loan client is unable to pay on timely. The bank should bear loss. Therefore, Bank should analyze and credit appraisal before providing credit facility to clients.

Assets quality analysis is related to quality of credit provided by bank, which study the quality of assets according to their performance, recoverable, provision for possible losses, payment trends, coverage from the provision, collateral etc. To know position of bank it should necessary

to analyze and study about quality of assets specially credit quality in terms of banks. For this following ratios will be calculated as:

#### 4.2.3.1 Non-Performing Loan Ratio (NPL)

According to directive published by NRB, the Loan and Advance has divided in two parts- Performing loan and Non-performing loan. Performing loan consist good or pass loan. Good or pass loan mean that sort of loan which time of payment made is not passed more than 3 months. Another hand, Non-performing loan includes the restructured or (Rescheduled) loan, Sub-standard loan, Doubtful loan and bad loan. Under Non-performing loan the time of payment is passed above than 3 months. Non-performing loan ratio shows the relationship or ratio of sum of Non-performing loan and total credit. Higher the NPL ratio denotes higher the non performing loan and it indicates not satisfied performance of lending and recovering credit. According to NRB directive, the banks should maintain NPL ratio less than 5%.

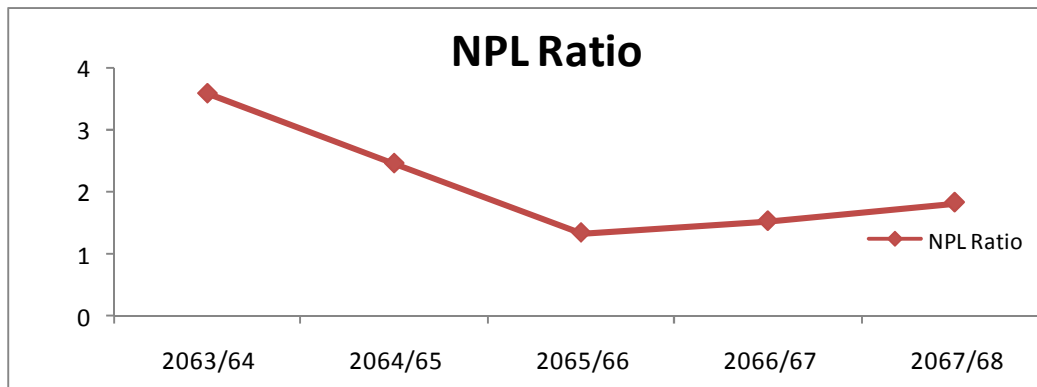
**Table 4.6**  
**Position of Non-Performing Loan Ratio**

| (Rs in millions) |                  |                                 |                  |
|------------------|------------------|---------------------------------|------------------|
| <b>FY</b>        | <b>Total NPL</b> | <b>Total Loan &amp; Advance</b> | <b>NPL Ratio</b> |
| 2063/64          | 347.29           | 9,694.10                        | 3.58%            |
| 2064/65          | 312.50           | 12,747.72                       | 2.45%            |
| 2065/66          | 198.89           | 14,945.72                       | 1.33%            |
| 2066/67          | 259.52           | 17,044.30                       | 1.52%            |
| 2067/68          | 326.33           | 17,956.95                       | 1.82%            |
| <b>Mean</b>      | <b>288.91</b>    | <b>14477.76</b>                 | <b>2.14%</b>     |
| <b>S.D.</b>      | <b>53.54</b>     | <b>2992.90</b>                  | <b>0.81</b>      |
| <b>C.V.</b>      | <b>18.53%</b>    | <b>20.67%</b>                   | <b>38.05%</b>    |

(Source: Appendix-VI)

The above table shows that actual percentage of non-performing loan to total loan and advances in every study year is less than 5%, which indicates the good credit and recover policy of BOK. During the study period maximum NPL is 3.58 in year 2063/64 and minimum NPL in year 2065/66 with average 2.14%. And S.D. of NPL is 0.81 and coefficient of variance 38.05%, which shows the level of consistent, is less and satisfied level of NPL because NPL is less then prescribed NPL by NRB.

**Figure 4.6**  
**Trend Analysis of NPL Ratio**



Above figure shows the trend of actual non-performing loan to total loan and advance ratio every study year. The trend of NPL ratio is fluctuating but it is in decreasing way in overall, which is favorable for BOK.

#### **4.2.3.2 Loan Loss Coverage Ratio**

Loan loss coverage ratio measures the capacity of cover of Non-performing loan from the loan loss provision. Every Bank and financial institutions should make provision for future loan loss according to loan category for their safeguard. As per provision BFIs should make provision in the every quarter end. From that provision loss should be cover if loss is occurred in the future. So, BFIs use to make sufficient provision according to loan's

category and it can be allowed to adjust in profit and loss account. Higher ratio is better.

**Table 4.7**  
**Position of total loan loss provision and total NPL**

| (Rs in millions) |                           |               |                |
|------------------|---------------------------|---------------|----------------|
| FY               | Total Loan Loss Provision | Total NPL     | LLC Ratio      |
| 2063/64          | 294.77                    | 347.29        | 84.88%         |
| 2064/65          | 285.08                    | 312.50        | 91.23%         |
| 2065/66          | 298.42                    | 198.89        | 150.04%        |
| 2066/67          | 379.37                    | 259.52        | 146.18%        |
| 2067/68          | 488.76                    | 326.33        | 149.77%        |
| <b>Mean</b>      | <b>349.28</b>             | <b>288.91</b> | <b>124.42%</b> |
| <b>S.D.</b>      | <b>77.51</b>              | <b>53.54</b>  | <b>29.79</b>   |
| <b>C.V.</b>      | <b>22.19%</b>             | <b>37.42%</b> | <b>23.95%</b>  |

(Source: Appendix-VII)

The above table shows the total loan loss provision and total non-performing loan in every study year with Loan loss coverage ratio. The LLR analysis whether total non-performing loan is covered from total loan loss provision or not. Here, maximum LLC ratio is 150.04% in year 2065/66 and minimum ratio is 84.88% in year 2063/64. To cover the NPL from provision, the ratio must be 100%. In last past three years BOK has been able to maintain and other are not. But, the average of last five fiscal years is 124.42, which is satisfied to meet future credit risk. The S.D. of LLC ratio is 29.79 and CV is 23.95%.

**Figure 4.7**  
**Comparative analysis of total loan loss provision and total NPL**

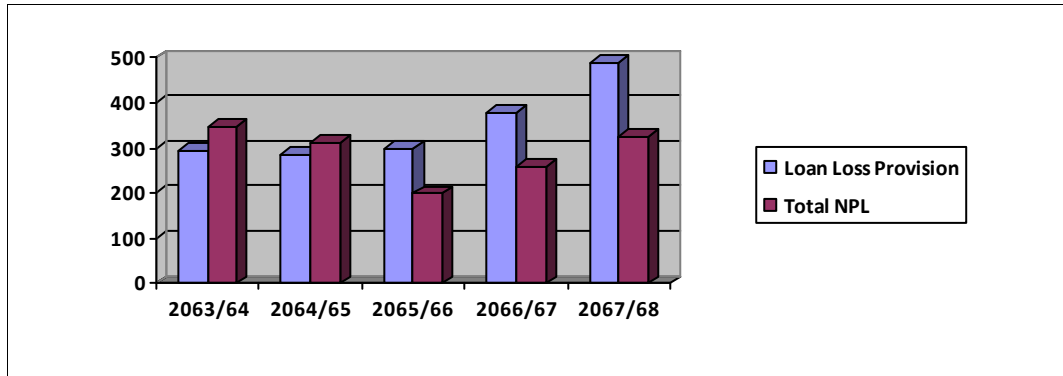


Figure No.4.7 shows the level of total non-performing loan with total loan loss provision is shown in every study year. Both on total non-performing loan with total loan loss provision are fluctuating. Though there is favorable for BOK to cover future loss because last past three year are able to maintain higher provision than NPL or i.e. LLC ratio > 100%.

#### **4.2.3.3 Loan Loss Provision Ratio**

Every bank and financial institutions should make loan loss provision according to loan classification. For the purpose of making provision loan is divided into five categories; Pass loan, Restructured loan, sub-standard loan, doubtful loan and bad loan. Loan loss provision is made with objectives of meeting the future losses which reduces the future risks.

Loan loss provision (LLP) ratio shows the ratio of total loan loss provision on total loan and advance. It is the one of tools to analyze the credit risk and assets quality which helps to make plan to the stakeholders, investors etc.

#### **4.2.3.4 Total Credit to Deposit Ratio (C/D)**

C/D ratio is a tool which shows relation between deposit accepted and credit granted to the lenders by a bank. It is the proportion of loan -assets created by banks from the deposits received. The higher the ratio, the

higher the loan-assets created from deposits. A high credited-deposit ratio could lead to a rise in interest rates. It determines the amount of total lending from the total deposit from the customers. This ratio directly shows the credit performance of commercial banks. Credit is major source of generation of out-cash flow. Commercial banks used to grant credit charging high cost to risky areas to generate maximum cash flow. Management of cash from deposit and cash out flow to credit to generate more profit is strategic tactical job of commercial banks. Most of the effort of commercial banks is use to be concentrated to the credit deposit activity. Banks are generating about 60% to 70% income from credit. As per NRB, the commercial banks should maintain 80% C/D ratio for this fiscal year.

**Table 4.8**  
**Position of total credit and total deposit**

(Rs in millions)

| FY          | Total Credit    | Total Deposit   | C/D Ratio     |
|-------------|-----------------|-----------------|---------------|
| 2063/64     | 9,694.10        | 12,388.90       | 78.25%        |
| 2064/65     | 12,747.72       | 15,833.74       | 80.51%        |
| 2065/66     | 14,945.72       | 14,642.98       | 102.07%       |
| 2066/67     | 17,044.30       | 20,315.83       | 83.90%        |
| 2067/68     | 17,956.95       | 21,018.42       | 85.43%        |
| <i>Mean</i> | <i>14477.76</i> | <i>16839.97</i> | <i>86.03%</i> |
| <i>S.D.</i> | <i>2992.67</i>  | <i>3322.42</i>  | <i>8.40</i>   |
| <i>C.V.</i> | <i>20.67%</i>   | <i>19.73%</i>   | <i>9.77%</i>  |

(Source: Appendix-VIII)

Table No. 4.8 shows the total credit and total deposit of BOK form fiscal year 2063/64 to 2067/68 with its ratio i.e. C/D ratio. The trend of total credit is increasing and trend of total deposit is fluctuating. The mean or average, S.D. and CV of total credit are 14477.76, 2992.67 and 20.67

respectively. Similarly, the mean or average, S.D. and CV of total deposit are 16839.97, 3322.42 and 9.73 respectively.

As per NRB BFIs should maintain less than 80% C/D ratio, which is mandatory. BOK is not able to maintain whole during study periods. BOK is able to maintain C/D ratio's standard of NRB in year 2063/64. The average or mean, S.D. and CV of CAR are 86.03% 8.40% and 9.77% respectively.

**Figure 4.8**  
**Comparative analysis of credit and deposit**

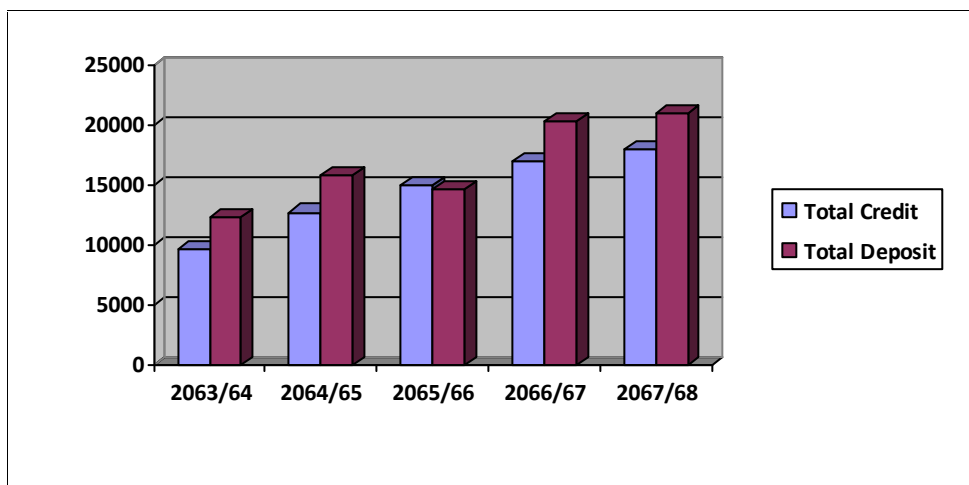


Figure No. 4.8 shows the comparative position of total credit with total deposit is shown in every study year. The trend of total credit is increasing and trend of total deposit is fluctuating. Despite of financial crisis and highly competitive market, we can say that the BOK is doing in both credit and deposit because it is increasing trend in overall year.

#### **4.2.4 Profitability Analysis**

Profitability analysis is the analysis of the overall efficiency of banks in terms of profit and financial performance. The higher profitability ratios indicate the better performance. It is one of the important tools to analyze

the profitability of any types of business firms. Under this, the following profitability ratio will be calculated:

#### 4.2.4.1 Earning Per Share (EPS)

The main objective of every business organization is maximization or earning or profit. The Earning per share (EPS) after income taxes is one of the most important determinants of share's value because it measures the earnings power under each share. The income of per share is known as earning per share. It can be calculated by the following formula.

**Table 4.9**  
**Position of earning per share**

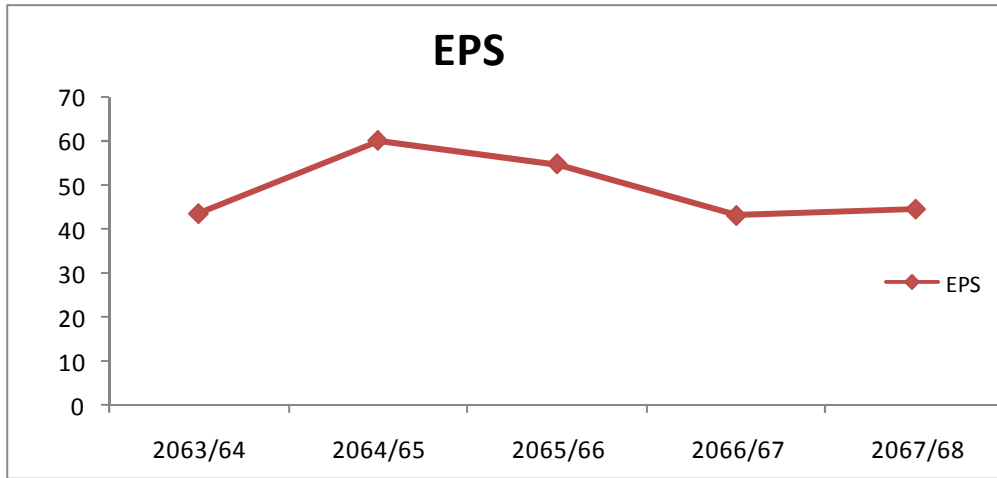
(Rs in millions)

| FY          | NPAT   | No. of Equity Share | EPS           |
|-------------|--------|---------------------|---------------|
| 2063/64     | 262.39 | 6031413             | 43.50         |
| 2064/65     | 361.50 | 6031413             | 59.94         |
| 2065/66     | 46.17  | 8443979             | 54.68         |
| 2066/67     | 509.26 | 11821571            | 43.08         |
| 2067/68     | 605.15 | 13594807            | 44.51         |
| <i>Mean</i> |        |                     | <b>49.14</b>  |
| <i>S.D.</i> |        |                     | <b>6.89</b>   |
| <i>C.V.</i> |        |                     | <b>14.01%</b> |

(Source: Appendix-IX)

Table No. 4.9 shows that the earning per share in yearly basis is found fluctuating trend. The highest EPS is 59.94 in year 2064/65 and lowest is 43.08 in year 2066/67 with average EPS 49.14. The S.D. of EPS is 6.89 and C.V. of EPS is 14.01%.

**Figure 4.9**  
**Trend Analysis of EPS**



The above diagram shows that the BOK's net profit after tax is increasing trend and average NPAT , S.D. and coefficient of variance is 440.10, 53.01 and 12.05 respectively. It shows the NPAT is higher consistent. Likewise, EPS trend is fluctuating.

#### **4.2.4.2 Return on Equity (ROE)**

Return on equity is the ratio of net income to equity capital. It measures the rate of return of equity shareholders' investment. Objective of management is to generate the maximum return on shareholder's investment in the organization. Return on equity is therefore the best single measure of the company's success in fulfilling its goal. Increasing ratio of ROE is favorable for a company which shows that the net profit is increasing.

**Table 4.10**  
**Position of NPAT and shareholder's fund**

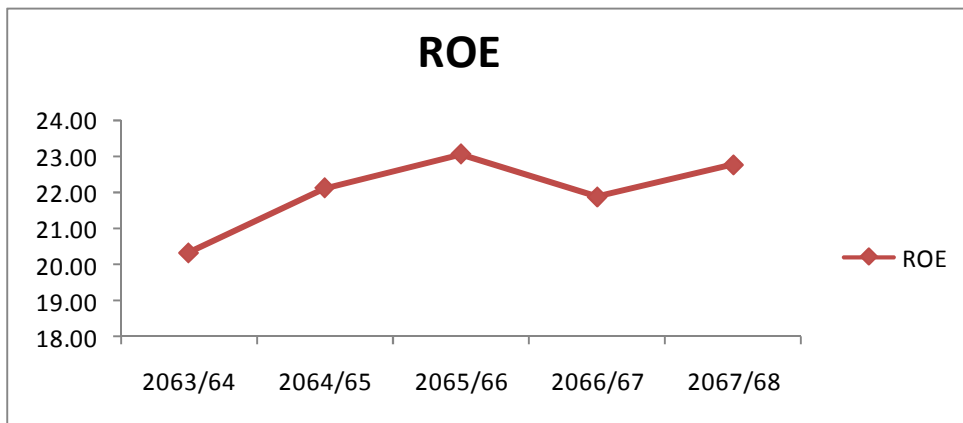
(Rs in millions)

| FY          | NPAT          | Shareholder's Fund | ROE            |
|-------------|---------------|--------------------|----------------|
| 2063/64     | 262.39        | 1,290.12           | 20.34%         |
| 2064/65     | 361.50        | 1,635.24           | 22.11%         |
| 2065/66     | 461.73        | 2,005.70           | 23.03%         |
| 2066/67     | 509.26        | 2,330.07           | 21.86%         |
| 2067/68     | 605.15        | 2,662.07           | 22.73%         |
| <b>Mean</b> | <b>440.01</b> | <b>1984.51</b>     | <b>22.01%</b>  |
| <b>S.D.</b> | <b>118.53</b> | <b>486.43</b>      | <b>0.94</b>    |
| <b>C.V.</b> | <b>26.94%</b> | <b>24.51</b>       | <b>4.25%/%</b> |

(Source: Appendix-X)

The return on equity is around 22.01% for BOK. The table shows the return on equity varies from 20.34%, 22.11%, 23.03%, 21.86% and 22.73% from the fiscal year 2063/64 to 2067/68 with average return 22.01%. Likewise, S.D. is 0.94 and coefficient of variance is 4.25%. Return on equity is fluctuating trend. The following bar diagram shows the position of net profit after tax and equity of BOK.

**Figure 4.10**  
**Trend Analysis of ROE**



The above diagram shows that the BOK's net profit after tax is increasing trend and average NPEAT , S.D. and coefficient of variance is 440.10, 53.01 and 12.05 respectively. It shows the NPAT is higher consistent. Likewise, shareholder's fund of BOK is increasing trend. And ROE is fluctuating trend, where the highest ROE is in year 2067/66 and lowest ROE is in year 2063/64 and average considering five year is 22.01, S.D. is 0.94 and C.V. is 4.25%.

#### 4.2.4.3 Return on Total Assets (ROA)

Return on Total assets is the ratio of net income after tax to total assets. It measures the return on all the company's assets after interest and taxes. Assets are hold to earn income for their holding. Assets include all types of assets that might be banking or non-banking assets. In the BFIs have huge amount cover the loan and advance as assets by which employed for maximization earnings.

**Table 4.11**  
**Position of Return on Total Assets**

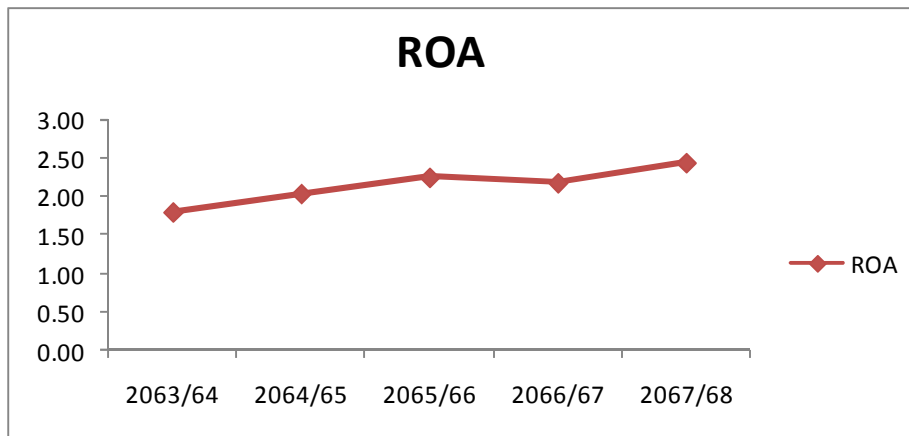
(Rs in millions)

| FY          | NPAT          | Total Assets    | ROA           |
|-------------|---------------|-----------------|---------------|
| 2063/64     | 262.39        | 14,581.39       | 1.80%         |
| 2064/65     | 361.50        | 17,721.93       | 2.04%         |
| 2065/66     | 461.73        | 20,496.01       | 2.25%         |
| 2066/67     | 509.26        | 23,396.19       | 2.18%         |
| 2067/68     | 605.15        | 24,757.75       | 2.44%         |
| <i>Mean</i> | <i>440.1</i>  | <i>20190.65</i> | <i>2.14%</i>  |
| <i>S.D.</i> | <i>118.53</i> | <i>3709.06</i>  | <i>0.22</i>   |
| <i>C.V.</i> | <i>26.94%</i> | <i>18.37%</i>   | <i>10.07%</i> |

(Source: Appendix-XI)

The return on total assets is around 2.14% for BOK. The table shows the return on position of net profit after tax and total assets with its ratio i.e. return on total assets (ROA). Both return net profit after tax and total assets are increasing trend. The following bar diagram shows the position of net profit after tax and investment of BOK.

**Figure 4.11**  
**Trend Analysis of Return on Total Assets**



The above diagram shows that the BOK's both net profits after tax and total assets are increasing trend and average or mean, S.D. and coefficient of variance of NPAT are 440.10, 53.01 and 12.05 respectively. Likewise, average or mean, S.D. and coefficient of variance of total assets are 20190.65, 3709.06 and 18.37 respectively. The trend of ROA is fluctuating but increasing in overall. The average or mean, S.D. and coefficient of variance of ROA are 2.14, 0.22 and 10.07 respectively.

#### **4.2.4.4 Return on Investment (ROI)**

The objective of the investment is to earn higher income to run business successfully. Return means earnings which is main motto of the every business organization. It is one of the barometers of success.

Return on investment is the ratio of the net profit after tax to investment. It measures the strength of the investment to earn as well as denotes the whether the productive investment or not. Investment is holding assets with intention to earning income. Higher the ratio is favorable for company which indicates the higher capacity of investment and also increasing the return.

**Table 4.12**  
**Position of Return on Investment (ROI)**

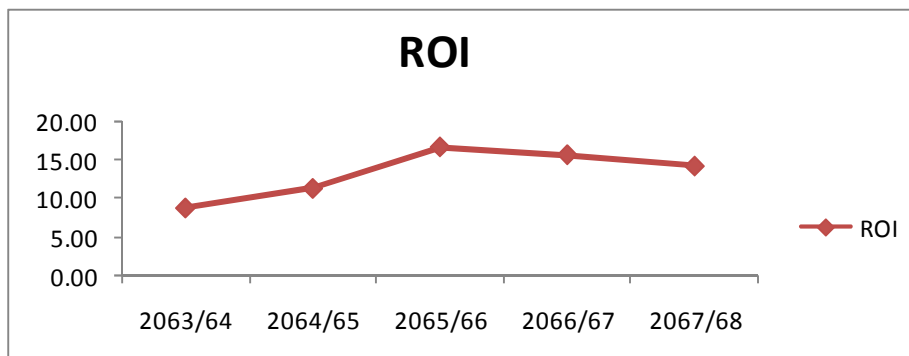
(Rs in millions)

| <b>FY</b>   | <b>NPAT</b>   | <b>Investment</b> | <b>ROI</b>    |
|-------------|---------------|-------------------|---------------|
| 2063/64     | 262.39        | 2,995.19          | 8.76%         |
| 2064/65     | 361.50        | 3,206.83          | 11.27%        |
| 2065/66     | 461.73        | 2,786.36          | 16.57%        |
| 2066/67     | 509.26        | 3,269.20          | 15.58%        |
| 2067/68     | 605.15        | 4,286.60          | 14.12%        |
| <b>Mean</b> | <b>440.1</b>  | <b>3308.84</b>    | <b>13.26%</b> |
| <b>S.D.</b> | <b>118.53</b> | <b>517.56</b>     | <b>2.87</b>   |
| <b>C.V.</b> | <b>26.94%</b> | <b>15.64%</b>     | <b>21.67%</b> |

(Source: Appendix-XII)

The return on investment is around 13.26% for BOK. The table shows the return on investment varies from 8.76%, 11.27%, 16.57%, 15.58% and 14.12% from the fiscal year 2063/64 to 2067/68 with average return 13.26%. Likewise, S.D. is 2.87 and coefficient of variance is 21.67%. Return on investment is fluctuating trend. The following bar diagram shows the position of net profit after tax and investment of BOK.

**Figure 4.12**  
**Trend Analysis of Return on Investment (ROI)**



The above diagram shows that the BOK's net profit after tax is increasing trend and average NPAT , S.D. and coefficient of variance is 440.10, 118.53 and 26.94 respectively. It shows the NPAT is higher consistent. Likewise, investment of BOK is fluctuating where, the highest investment is in year 2067/68 and lowest investment is in year 2063/64 and average investment considering five year is 3308.84, S.D. is 517.56 and C.V. is 15.64%. There is increasing trend in investment.

#### **4.2.4.5 Return on Loan & Advance**

Return on loan and advance is the ratio of the net profit after tax to loan and advance which shows the strength of loan and advance to earn profit. Bank and financial institutions have got huge amount of loan and advance as assets which is provided from public deposits because the main function of BFIs are earn profit through lending credit by collecting deposits. RLA measures what times the loan and advance's contribution to the profit. It can be calculated as under:

**Table 4.13**  
**Position of return on loan and advance**

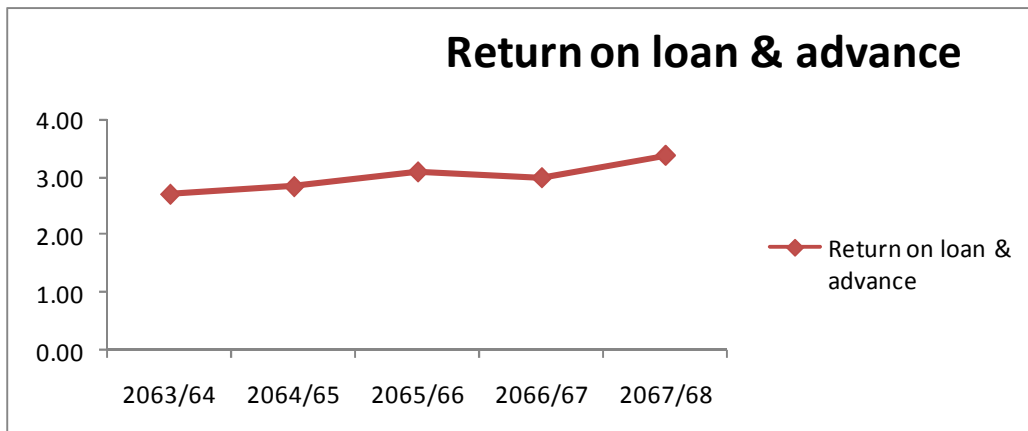
(Rs in millions)

| FY          | NPAT          | Total Loan & Advance | Return on Loan & Advance Ratio |
|-------------|---------------|----------------------|--------------------------------|
| 2063/64     | 262.39        | 9,694.10             | 2.71%                          |
| 2064/65     | 361.50        | 12,747.72            | 2.84%                          |
| 2065/66     | 461.73        | 14,945.72            | 3.09%                          |
| 2066/67     | 509.26        | 17,044.30            | 2.99%                          |
| 2067/68     | 605.15        | 17,956.95            | 3.37%                          |
| <b>Mean</b> | <b>440.01</b> | <b>14477.76</b>      | <b>3.00%</b>                   |
| <b>S.D.</b> | <b>118.53</b> | <b>2992.90</b>       | <b>0.23</b>                    |
| <b>C.V.</b> | <b>26.94%</b> | <b>20.67%</b>        | <b>7.58%</b>                   |

(Source: Appendix-XIII)

Table No. 4.13 shows the net profit after tax and total loan and advance with its ratio. The trend of both the net profit after tax and total loan and advance are increasing and trend of return on total loan and advance ratio is fluctuating. The following bar diagram shows the trend of return on total loan and advance of BOK.

**Figure 4.13**  
**Trend Analysis of Return on loan and advance**



The above diagram shows that the BOK's return on loan and advance is fluctuating trend but increasing in overall, which is favorable aspect for BOK. And average NPAT, S.D. and coefficient of variance is 3.00, 0.23 and 7.58% respectively.

#### **4.2.5 Management Efficiency Analysis:**

Efficiency denotes capacity, ability, management skills, earning power etc are covered. Management efficiency analysis is the analysis of management capacity and ability to earn income and to run business effectively in competitive today's market. Management efficiency is reflects in their market share, profit, financial position, market goodwill and others. Contribution of management will be analysis under this topic, which is following.

##### **4.2.5.1 Management Efficiency Ratio (MER)**

Management Efficiency Ratio is tool to indentify the contribution in net profit by per staff. It is the ratio of net profit after tax to no. of staffs employed. It measures the efficiency of management to earn income. Due to management decision, capacity, ability, skills and other factors will determine the level of earnings. That's why; it is one of the tools to exam the efficiency of the management to run business effectively and efficiently. It depends upon overall management skills. Every employee or staff has vital role to success.

##### **4.2.5.2 Market Risk Management Analysis**

There are four dimensions of market risks:

**Interest rate risk:** Global money and currency markets are liberalized. Neither the exchange rates nor the interest rates are administered, but they move freely depending upon their demand and supply. This creates a lot

of volatility in the interest rates of various currencies. This is Called interest rate risk.

**Price risk:** As ware, we are those prices in the market move both ways (UP/down). Due to the continuous movement of prices of commodities/currencies, “price risk “arises.

**Credit risk:** Credit risk arises due to possibility of payment default from the counter parties.

**Event risk:** Major political events/natural calamities create the event risks.

#### **4.2.5.3 Investment Portfolio Management Analysis**

Banks have both home currency and foreign currency liabilities (deposit). Most of their deposits are invested in the form of loans, advances and bills discounting. This is the assets class with highest risk and return. However for the purpose of liquidity/safety, banks also need to invest a part of their funds into government bonds, treasury bills and sometimes corporate bonds.

While making such investments banks have to match the maturity of their liabilities and assets so that they can meet their obligation on time without suffering a liquidity crunch.

#### **4.2.5.4 Foreign Exchange Risk Management Analysis**

Banks buy and sell foreign exchange to the public. To carry out this function, banks have to keep sufficient stocks of foreign exchange. These are kept in the form of bank account abroad.

Subjected to the rules and regulations of Nepal Rastra Bank and foreign exchange and money market dealers association of Nepal (FEDAN), banks have to quote rates for foreign exchange to be purchased and sold to their

customers. Subjected to these regulation rates quoted would depend upon the rates prevailing in the international/inter-bank market.

This section of the department is headed by a “Dealer”, It is the duty of the dealer to see that bank maintains just adequate balance of each foreign currency and that the rates quoted to the customer is competitive and at the time profitable to the bank.

**Foreign exchange risk:** There are four types of risk exposures in foreign exchange market:

*Transaction exposure:* Every entry and exit from a foreign exchange deal comes at a cost. This is due to continuously changing market rates. Suppose if you buy Euro 100,000.00 in the morning at the rate 1.2200 against USD, you have to pay USD 122,000.00 for this. Now after one hour if you want to sell back the euro market rates will not be same. It may have gone up or down or it may be same. If it has gone up to say 1.2300, now you will get back USD 123,000.00, so you made a profit of USD 1000.00. If it goes down to 1.2100, you will lose USD 1000.00 this is how the transaction risk arises. In order to come the transaction risk, dealers try to square their position as soon as possible.

*Translation exposure:* This comes into effect for the MNC (Multination Corporation) whose subsidiaries overseas maintain their books in foreign currencies, thus posing a transaction risk to the parents.

*Accounting exposure:* This related to the value of assets/liabilities in terms of foreign currency.

*Economic exposure:* This related to economic value of assets in one country with respect to that of another country.

### **Tools to manage foreign exchange risks:**

**Forward contract:** In forward contract buyer/sellers agree to buy/sell a currency/commodity at a fixed rate on future date.

**Swaps:** Swaps are used to hedge both exchange rate risk and interest risks. In a swap transaction currencies are bought and sold back at a rate is predetermined based on the interest differentials of the currencies involved.

**Options/futures:** In case of option/futures they are traded through an exchange and are traded in standard lots. Options and futures provide an excellent hedging opportunity without having to payback a heavy cancellation charge like in forward contract (KFA Banking Course).

### **4.3 Statistical Analysis**

Statistics is a body of methods of obtaining and analyzing data in order to base decision on them. It is a branch of scientific method used in dealing with phenomena that can be described numerically either by counts or by measurements. Thus, the word statistical data are analyzed is called statistical methods. Such methods are applicable to a very larger number of fields.

Statistical methods of analysis are the mathematical techniques used to facilitate the analysis and interpretation of numerical data secured from groups of individual or groups of observation from a single individual. The various statistical tools can be used to analyze out of them following tools will be used as:

#### 4.3.1 Coefficient of Correlation Analysis:

Correlation analysis is the statistical tool that we can use to describe the degree to which one variable is linearly related to other variables. Two or more variables are said to be correlated if change in the one of one variable appears to be related or linked with the change in the other variables. The relationship between age, height and weight are studied by correlation. Correlation is an analysis of the covariance between two or more variables and correlation analysis deals to determine the degree of relationship between two or more variables. It refers the closeness of the relationship between two or more variables. Correlation says just degree of the relationship between two or more variables. It does not tell us anything about cause and which is the effect.

Correlation is defined as the relationship (association) between (among) the one dependent variable or factor and on or more than one independent variable(s) or factor(s). "Correlation analysis deals with the association between two or more variables". (Simpson & Kafka, 1997)

"Correlation analysis is the statistical tools the generally used to describe the degree to which one variable is related to another. On the basis theory of correlation one can study the comparative changes occurring in two related phenomena and their cause effect relation can be examined" (Kothari, 1981)

"Correlation is an analysis of the co variation between two or more variables". AM Title (Gupta, 1984)

Correlation analysis attempts to determine the degree of relationship between variables". (Ya Lun Chou, 1998)

Karl pearson's measure, known as pearsonian correlation coefficient between two variables (series) X and Y, Usually denoted by  $r(X, Y)$  or  $r_{xy}$

or simply  $r$  is a numerical measure of linear relationship between them. Of the several mathematical methods measuring correlation, the Karl Pearson's method popularly known as personian coefficient of correlation is mostly widely used in practice. The personian coefficient of correlation is denoted by the symbol  $r$ .

**The degree of relationship is measured by using following formula.**

**Co-efficient of correlation** 
$$r = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\sqrt{\sum X^2 - \frac{(\sum X)^2}{N}} \sqrt{\sum Y^2 - \frac{(\sum Y)^2}{N}}}$$

Where,

$r$  = correlation coefficient

$\sum X$  = Sum of the variable  $X$

$\sum Y$  = Sum of variable  $Y$

$\sum XY$  = Sum of products of  $X$  and  $Y$

$N$  = Number of pairs of  $X$  and  $Y$

The Karl Pearson coefficient of correlation ( $r$ ) always fall between -1 to +1. The value of correlation in minus signifies the negative correlation and in plus signifies the positive correlation. As the value of correlation reaches near to the value of zero, it is said that there is no relationship between the variables.

#### 4.3.1.1 Correlation Coefficient between Deposit and Credit

Deposit have played very vital role in performance of a banks and similarly credit or loan and advances are played very important to mobilize the collected deposit. Coefficient of correlation between deposit and credit measures the degree of relationship these two variables. In this analysis, deposit is independent variable (X) and credit is dependent variable (Y). The main objectives of calculation coefficient of correlation (r) between these two variables is to justify whether deposit are significantly used as credit in proper way or not. The following table shows the coefficient of correlation, coefficient of determination, probable error and six times of probable error during the fiscal year 2063/64 to 2067/68.

**Table 4.14**  
**Coefficient of correlation between total deposit and credit**

| <b>Particulars</b> | <b>r</b>    | <b>R<sup>2</sup></b> | <b>P.Er</b>  | <b>6P.Er</b> | <b>Remarks</b>     |
|--------------------|-------------|----------------------|--------------|--------------|--------------------|
| <b>BOK</b>         | <b>0.91</b> | <b>0.83</b>          | <b>0.051</b> | <b>0.31</b>  | <b>Significant</b> |

(Source: Appendix-XIV)

From the above table, we found that coefficient of correlation between deposit and credit of BOK is 0.91. It shows that the high degree of positive relationship between these two variables. The correlation coefficient of both banks is significant because the correlation coefficient is greater than the relative value of 6P.Er. In other words there is significant relationship between deposits and credit.

#### 4.3.1.2 Correlation Coefficient between Total Deposit and Total investment.

The coefficient of correlation between deposit and investment measures the degree of relationship between these two variables or deposit is significantly utilized or not. In this correlation analysis, deposit is independent variable (X) and investment is dependent variable (Y). The

main objectives of calculation coefficient of correlation ( $r$ ) between these two variables is to justify whether deposit are significantly used as credit in proper way or not.

**Table 4.15**  
**Coefficient of correlation between total deposit and total investment**

| Particulars | $r$  | $R^2$ | P.Er | 6P.Er | Remarks     |
|-------------|------|-------|------|-------|-------------|
| BOK         | 0.77 | 0.59  | 0.12 | 0.72  | Significant |

(Source: Appendix-XV)

From the above table, it is found that coefficient of correlation between total deposit and total investment of BOK is 0.77. It denotes the high degree of positive correlation, in addition Coefficient of determination of Bok is 0.59, which implies only 59 % of total investment, is covered by total deposit's sources. The correlation coefficient is higher than 6 P.Er, so the correlation coefficient is significant. It refers that there is significant relationship between total deposit and total investment of BOK. From the above analysis, the conclusion can be drawn in the case of BOK that has high degree of positive correlation between total deposit and total investment.

#### 4.3.1.3 Correlation Coefficient between Investment and Net Profit

The coefficient of correlation between total investment and net profit measures the degree of their relationship. In the correlation analysis, investment is independent variable (X) and net profit (Y) is dependent variable.

**Table 4.16**  
**Correlation Coefficient between Investment and Net Profit**

| Particulars | $r$  | $R^2$ | P.Er | 6P.Er | Remarks     |
|-------------|------|-------|------|-------|-------------|
| BOK         | 0.67 | 0.45  | 0.17 | 1.02  | Significant |

(Source: Appendix-XVI)

From the above calculation table shows that the correlation coefficient between total investment and net profit of BOK is 0.67, which means there is positive correlation between total investment and net profit. In addition, coefficient of determination of BOK is 0.45, which implies only 0.45 % is contribute by total investment to earn profit. This correlation is significant at all due to coefficient of determination is higher than Probable error.

#### 4.3.1.4 Correlation Coefficient between Credit and NPL

The coefficient of correlation between credit and NPL measures the degree of relationship between these two variables. In this correlation analysis, Credit is independent variable (X) and NPL is dependent variable (Y).

**Table 4.17**  
**Correlation Coefficient between Credit and NPL**

| Particulars | r     | R <sup>2</sup> | P.Er | 6P.Er | Remarks       |
|-------------|-------|----------------|------|-------|---------------|
| BOK         | -0.39 | 0.15           | 0.26 | 1.56  | Insignificant |

(Source: Appendix-XVII)

From the above table, it is found that coefficient of correlation between Credit and NPL of BOK is -0.39. It denotes the negative correlation between Credit and NPL; in addition Coefficient of determination of Bok is 0.15, which implies only 15 % of NPL is covered by credit. The correlation coefficient is less than 6 P.Er, so the correlation coefficient is insignificant. It refers that there is insignificant relationship credit NPL of BOK. From the above analysis, the conclusion can be drawn in the case of BOK that has positive correlation between credit and NPL.

#### 4.4 Trend Analysis:

Trend analysis plays a vital role in the analysis and interpretation of financial statement. Trend in general terms, signifies a tendency. It helps in

furcating and planning future operation. Trend analysis is a statistical tool, which shows the previous trend of the financial performance and forecasts the financial results of the firms.

The analysis is also denoted by least squares liners trends analysis. Trend analysis describes the average relationship between two serious where the one serious related to time and other serious to the value of available. Among the various methods of determining trend of time series, the most popular and mathematical method is the least square method. Using this least square method, it has been estimated the future trend values of different variables.

#### **4.4.1 Trend Analysis of Deposit**

Deposits are the important factors for mobilizing other factors by lending credit facility to earn profit in banking sector. It is consider as a barometer of success some extant because without deposit banks will not be able to lend its customer for earning profit. It is important sources of the lending for generating its profit. Here, with the objectives of analysis deposit trend five years deposits of BOK are shown with its trends as follows

**TableNo.4.18**

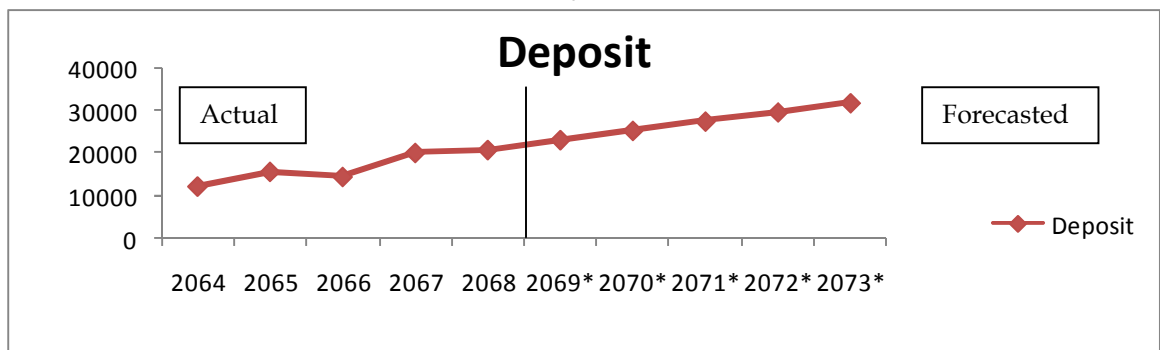
**Trend Value of Deposit of BOK 2064 to 2073**

(Rs in millions)

| Years | Deposit   |
|-------|-----------|
| 2064  | 12,388.90 |
| 2065  | 15,833.74 |
| 2066  | 14,642.98 |
| 2067  | 20,315.83 |
| 2068  | 21,018.42 |
| 2069* | 23362.30  |
| 2070* | 25536.36  |
| 2071* | 27710.52  |
| 2072* | 29884.58  |
| 2073* | 32058.69  |

(Source: Appendix -XVIII), \* Forecasted value

**Figure 4.14**  
**Trend Value Analysis of Deposit of BOK**



According to above table, we can conclude the total deposit of Bok has increasing trend in totality which has shown in figure. But in year 2066, deposit of bank seems to decrease by around Rs 1.2 millions. Except than year 2066, bank has able to increase its deposits. From taking the 5 previous years data we can forecast the total deposit trend value will be increasing or it has increasing trend of deposits and will same. Here, we

forecast for next 5 years or 2069 to 2073. So, we can say that the BOK is being able to expanse its services despite of the financial crisis and increasing trend of banks' number. It is one of the successes of BOK in the deposit point of view.

#### **4.4.2 Trend Analysis of Credit.**

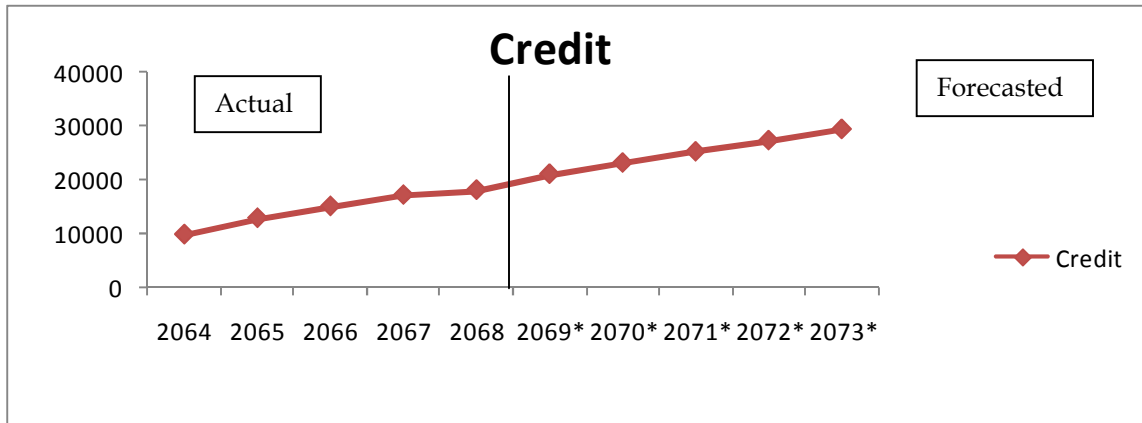
Lending is one of the major functions of bank as well as very sensitive too. Before providing credit facility, bank should prepare credit appraisal, evaluate and analyze the related other documents by the clients. In the analysis banks found the genuine customer then credit facility will be provided. Credit trend is basically depends upon deposit and capital. If the trend of deposit and capital are increased the credit will also increase and vice versa. Here, the trend of credit of BOK will be presented as under for analysis for five fiscal years.

**Table 4.19**  
**Trend Value of Credit 2064 to 2073**  
(Rs in millions)

| <b>Years</b> | <b>Credit</b> |
|--------------|---------------|
| 2064         | 9,694.10      |
| 2065         | 12,747.72     |
| 2066         | 14,945.72     |
| 2067         | 17,044.30     |
| 2068         | 17,956.95     |
| 2069*        | 20912.55      |
| 2070*        | 22994.78      |
| 2071*        | 25077.01      |
| 2072*        | 27159.24      |
| 2073*        | 29241.47      |

(Source: Appendix -XIX), \* Forecasted value)

**Figure 4.15**  
**Trend Value Analysis of Credit**



The above table and figure show that the credit of BOK is increasing trend. From the analysis of trend of credit of BOK by considering the last five years actual trend value of credit we can say that the trend value analysis of credit BOK is increasing rapidly and it seems bank has aggressive strategies in respect of credit. Or BOK is able mobilize its fund in effective way.

#### **4.4.3 Trend Analysis of Net Profit.**

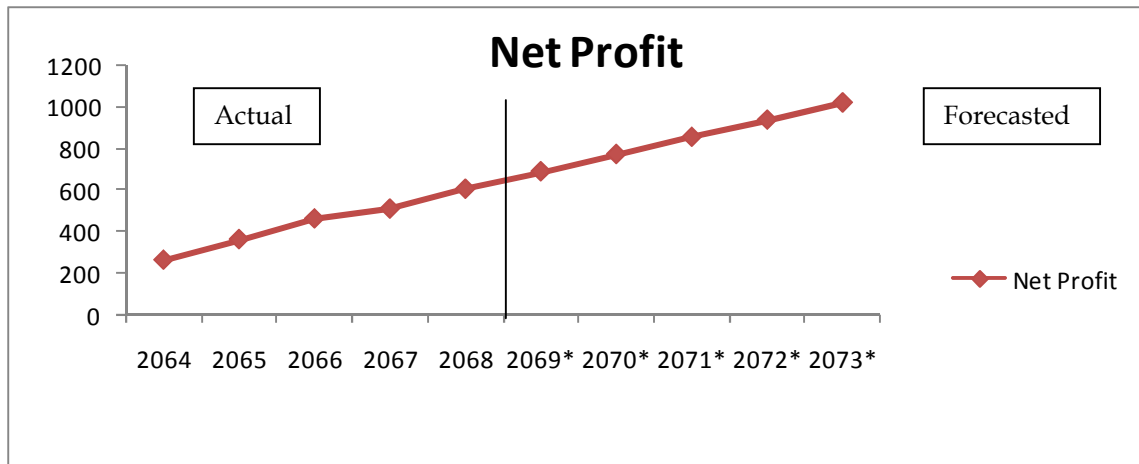
Profit maximization is main aim of the every business firm and it is connection with success of business firm. Banking is also one of the services oriented business sector, which requires earning profit to existence in the competitive market situation. The trend values of net profit have been calculated for five fiscal years of BOK as follows

**Table 4.20**  
**Trend Value of Net Profit 2064 to 2073**  
(Rs in millions)

| Years | Net profit |
|-------|------------|
| 2064  | 262.39     |
| 2065  | 361.50     |
| 2066  | 461.73     |
| 2067  | 509.26     |
| 2068  | 605.15     |
| 2069* | 689.70     |
| 2070* | 772.93     |
| 2071* | 856.16     |
| 2072* | 939.39     |
| 2073* | 1022.62    |

(Source: Appendix -XX), \* Forecasted value)

**Figure 4.16**  
**Trend Value Analysis of Net Profit**



The table 4.20 and figure 4.16 show that the profit of BOK has increasing trend. Its increasing trend is moderate. Above statistics, shows that BOK has able to maintain its increasing trend and can forecast it will be

increasing trend in upcoming days too. Here, we have forecasted for next 5 years net profit of BOK is increasing trend. So, we can say that net profit trend of BOK indicate that the future of BOK is bright.

#### **4.4.4 Trend Analysis of Investment.**

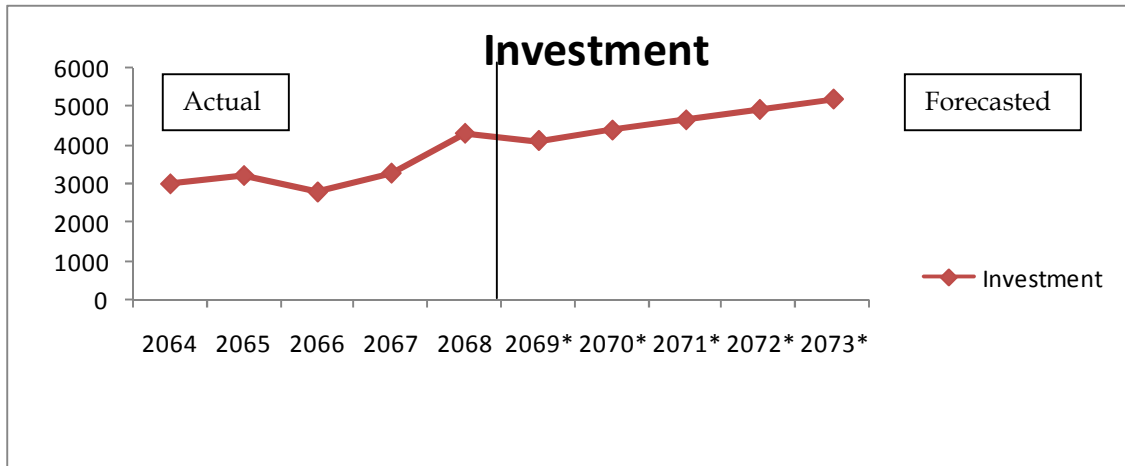
The objective of investment is getting future return. The trend values of investment of BOK have been calculated for five years as under.

**Table 4.21**  
**Trend Value of Investment 2064 to 2073**  
(Rs in millions)

| <b>Years</b> | <b>Investment</b> |
|--------------|-------------------|
| 2064         | 2,995.19          |
| 2065         | 3,206.83          |
| 2066         | 2,786.36          |
| 2067         | 3,269.20          |
| 2068         | 4,286.60          |
| 2069*        | 4102.4            |
| 2070*        | 4366.92           |
| 2071*        | 4631.44           |
| 2072*        | 4895.96           |
| 2073*        | 5160.48           |

(Source: Appendix -XXI), \* Forecasted value

**Figure 4.17**  
**Trend Value Analysis of Investment**



From the analysis of above table and figure the investment of BOK has fluctuation trend but in overall trend of investment is increasing. Huge amount of funds are mobilized as credit lending by the banking industry and small amount of funds are mobilized as an investment especially for the purpose of SLR and liquidity. So, the BOK has least of funds are employed as investment and its trend is not also rapidly increasing trend, which is shown by above table and trend of investment.

## **CHAPTER - V**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5.1 Summary**

As per commercial bank act 2031 “A Class commercial bank means bank which deals in exchanging currency, accepting deposits, lending loans and doing commercial transaction”. Commercial bank came into existence mainly with the objectives of collecting the idle funds, mobilizing then into productive sector and causing an overall economic development. The commercial banking in Nepal started from 1937AD (30<sup>th</sup> Baishak 1994 BS) with the establishment of Nepal Bank limited.

This thesis analyses the responsibilities taken on by financial departments in treasury management, seeking to corroborate empirically the existence of a broader concept of treasury management that brings together not only liquidity management but also more strategic tasks, such as management of treasury surpluses, deficit management and financial risk management. Or it includes management of an enterprise's holdings, with the ultimate goal of maximizing the firm's liquidity and mitigating its operational, financial and reputational risk. Treasury Management includes a firm's collections, disbursements, concentration, investment and funding activities. In larger firms, it may also include trading in bonds, currencies, financial derivatives and the associated financial risk management.

As far as described in the research treasury management of some highly rated, highly performing and have huge profit banks and tends to identify treasury operation practices of Bank of Kathmandu. It is said that the banking sector mirrors the larger economy. It's linkage to all sectors make it a proxy for what is happening in the economy as a whole. Indeed, the

Nepal banking sector today is at boiling point or doing the best in these circumstances. Further, it can't be said that all the banks and financial institutions are doing well. The objective of this study is to analyze and evaluate performance of BOK's through their treasury operation specially considering the last five fiscal years. Again, this means that, this research is concentrate in the treasury management of BOK in different time, fiscal years and situation, so that the actual position and performance of the BOK could be identified.

Some Statistical and financial tools have been applied to examine the facts and descriptive techniques have been adopted to evaluate the treasury management of concern bank. After completion of the basic analysis required for the study, the final and most important task of the researcher is to enlist findings issue and gaps of the study and give suggestions for further improvement. The main objectives of this research are not only point out faults and errors but also to provide sound directions for further improvement

## **5.2 Conclusions**

Commercial banks have proved as resources for achieving rapid economic development of any country. Being a soul of the economic development, Nepalese commercial banks face several problems related to maintain efficient treasury management. They are still working under traditional approach. They need to achieve innovative approach of banking thereby, bringing professionalism in their business. Nepali banking sector has witnessed some innovative products in loans and deposits following various reforms started some years ago, but unfortunately, Treasury Management continues to be elementary. Treasury departments of most of the banks in Nepal are limited to fund management and foreign exchange

management rather than operating as independent profit centers. This does not allow the banks to explore into more innovative and sophisticated global treasury products, which is hindering the revenue maximization avenues of the banks. There are three major factors responsible for this: a. Lack of infrastructure to support treasury transactions b. Unavailability of global market treasury products c. Lack of expertise among the market players. It is better for commercial banks to follow below suggestions. They can certainly have better achievement to the modern innovative and competitive banking scenario.

### **5.3 Recommendations**

On the basis of overall analysis and findings of the study we have made the following recommendation for the further improvement and/or development of banking business of Bank of Kathmandu.

1. The Bank should increase its annual income by efficient operation of treasury management.
2. The bank has better to focus small but large scale deposit customers.
3. The BOK has to provide free fund transfer facility and ABBS facility.
4. According to study, actual CRR is less than in year 2064/65, 2066/67 and 2067/68 of BOK. So, BOK is suggested to keep sufficient CRR for their liquidity maintain to be safe from future liquidity crisis.
5. BOK has been maintaining higher SLR than require to maintain since last two years, But impact of higher SLR will be in lending and profitability. So, BOK should better to maintain SLR is equal to standard SLR.

6. Since last three years, BOK is not being able to meet standard CAR. So, BOK should better to maintain standard CAR by issuing or increasing its capital.
7. NRB strictly notify to BFIs to maintain C/D ratio is equal to or less than 80%. But BOK is not able to maintain this ratio because of this the liquidity problem may face in upcoming days as well as penalty will be paid to NRB. So, it's necessary to reduce its C/D ratio up to 80%.
8. The deposit trend of BOK is fluctuating though it is increasing in overall. It is favorable for BOK but last year's deposit increasing percentage is not better than year 2066/67 in comparatively. Therefore, it's suggestion for BOK to do deposit marketing and expand services by using and innovating different sort of marketing schemes, services, facility, and product to large scale by covering all types of customers and markets segments.
9. The bank has better flow of credit so it should attract more saving from the depositors and deploy the cash to generate more cash inflow.
10. The bank should extend its branches and more savings and should previous services to more people to generate surplus cash inflow.
11. BOK has better interest paying capacity so it should increase internet rates to reduce the liquidity crisis. Accounting to the bankers of BOK the bank is not success to provide remittance service widely and increases in interest rates can strengthen liquidity position and can attract remittance to the bank account.

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## Appendix-I

### Calculation of CRR, mean, standard deviation and coefficient of variance

(In millions)

| Years       | NRB Balance(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | Deposit-Margin(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | CRR(X)      | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|----------------|---------------|-------------------|-------------------|---------------|-------------------|-------------|---------------|-------------------|
| 2063/64     | 883.50         | 54.91         | 3,014.65          | 12,219.86         | (4,418.79)    | 19,525,735.63     | 7.23        | 1.88          | 3.53              |
| 2064/65     | 606.05         | (222.54)      | 49,524.46         | 15,681.59         | (957.06)      | 915,971.74        | 3.86        | (1.49)        | 2.21              |
| 2065/66     | 1,324.11       | 495.52        | 245,538.43        | 14,469.97         | (2,168.68)    | 4,703,193.32      | 9.15        | 3.80          | 14.45             |
| 2066/67     | 687.58         | (141.01)      | 19,883.30         | 20,017.15         | 3,378.50      | 11,414,289.66     | 3.43        | (1.92)        | 3.67              |
| 52067/68    | 641.69         | (186.90)      | 34,929.98         | 20,804.71         | 4,166.06      | 17,356,048.65     | 3.08        | (2.27)        | 5.13              |
|             | 4142.93        | Total         | 352,890.82        | 83193.27          | Total         | 53,915,239.00     | 26.75       | Total         | 28.99             |
| <b>Mean</b> | <b>828.59</b>  |               |                   | <b>16,638.65</b>  |               |                   | <b>5.35</b> |               |                   |
| <b>S.D.</b> |                |               | <b>265.67</b>     | <b>S.D.</b>       |               | <b>3,283.76</b>   | <b>S.D.</b> |               | <b>2.41</b>       |
| <b>C.V.</b> |                |               | <b>32.06</b>      | <b>C.V.</b>       |               | <b>19.74</b>      | <b>C.V.</b> |               | <b>44.98</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

*Calculation of mean, standard deviation ( $\delta$ ) and Coefficient of variance (C.V.) can be calculated by using following formula.*

For, Cash Reserve Ratio (CRR)

$$\begin{aligned} \text{Mean } (\bar{x}) &= \frac{\sum X}{N} \\ &= \frac{26.75}{5} = 5.35 \end{aligned}$$

$$\text{Standard Deviation } (\delta) = \sqrt{\frac{1}{N} \sum (X - \bar{X})^2}$$

$$= \sqrt{\frac{1}{5} \times 28.99} = 2.4079$$

$$\text{Coefficient of variance (C.V.)} = \frac{S}{\bar{X}} \times 100$$

$$= \frac{2.4079}{5.35} \times 100 = 45\%$$

Similarly, mean, standard deviation ( $\delta$ ) and Coefficient of variance (C.V.) can be calculated by using above formula for others too.

## Appendix-II

### Calculation of C&B, mean, standard deviation and coefficient of variance

(In millions)

| Years       | Cash & Bank(X)  | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total Deposit(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | C&B(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|-----------------|---------------|-------------------|------------------|---------------|-------------------|--------------|---------------|-------------------|
| 2063/64     | 1,315.90        | (367.26)      | 134,877.01        | 12,388.90        | (4,451.07)    | 19,812,024.14     | 10.62        | 0.33          | 0.11              |
| 2064/65     | 1,440.47        | (242.69)      | 58,899.92         | 15,833.74        | (1,006.23)    | 1,012,498.81      | 9.10         | (1.19)        | 1.42              |
| 2065/66     | 2,182.11        | 498.95        | 248,952.93        | 14,642.98        | (2,196.99)    | 4,826,765.06      | 14.90        | 4.61          | 21.27             |
| 2066/67     | 1,798.37        | 115.21        | 13,272.74         | 20,315.83        | 3,475.86      | 12,081,602.74     | 8.85         | (1.44)        | 2.07              |
| 52067/68    | 1,678.93        | (4.23)        | 17.88             | 21,018.42        | 4,178.45      | 17,459,444.40     | 7.99         | (2.30)        | 5.30              |
|             | 8415.78         | Total         | 321,143.48        | 84199.87         | Total         | 55,192,335.16     | 51.46        | Total         | 30.17             |
| <b>Mean</b> | <b>1,683.16</b> |               |                   | <b>16,839.97</b> |               |                   | <b>10.29</b> |               |                   |
|             | <b>S.D.</b>     |               | <b>253.43</b>     | <b>S.D.</b>      |               | <b>3,322.42</b>   | <b>S.D.</b>  |               | <b>2.46</b>       |
|             | <b>C.V.</b>     |               | <b>15.06</b>      | <b>C.V.</b>      |               | <b>19.73</b>      | <b>C.V.</b>  |               | <b>23.87</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

### Appendix-III

#### Calculation of SLR, mean, standard deviation and coefficient of variance

(In millions)

| Years       | Investment in Govt. securities(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total Deposit(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | SLR(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|-----------------------------------|---------------|-------------------|------------------|---------------|-------------------|--------------|---------------|-------------------|
| 2063/64     | 2,332.04                          | (297.42)      | 88,457.91         | 12,388.90        | (4,451.07)    | 19,812,024.14     | 18.82        | 3.29          | 10.85             |
| 2064/65     | 2,113.22                          | (516.24)      | 266,500.52        | 15,833.74        | (1,006.23)    | 1,012,498.81      | 13.35        | (2.18)        | 4.77              |
| 2065/66     | 1,744.98                          | (884.48)      | 782,310.94        | 14,642.98        | (2,196.99)    | 4,826,765.06      | 11.92        | (3.61)        | 13.06             |
| 2066/67     | 2,954.93                          | 325.47        | 105,932.59        | 20,315.83        | 3,475.86      | 12,081,602.74     | 14.54        | (0.99)        | 0.97              |
| 2067/68     | 4,002.14                          | 1,372.68      | 1,884,244.79      | 21,018.42        | 4,178.45      | 17,459,444.40     | 19.04        | 3.51          | 12.33             |
|             | 13147.31                          | Total         | 3,127,446.75      | 84199.87         | Total         | 55,192,335.16     | 77.67        | Total         | 41.97             |
| <b>Mean</b> | <b>2,629.46</b>                   |               |                   | <b>16,839.97</b> |               |                   | <b>15.53</b> |               |                   |
| <b>S.D.</b> |                                   |               | <b>790.88</b>     | <b>S.D.</b>      |               | <b>3,322.42</b>   | <b>S.D.</b>  |               | <b>2.90</b>       |
| <b>C.V.</b> |                                   |               | <b>30.08</b>      | <b>C.V.</b>      |               | <b>19.73</b>      | <b>C.V.</b>  |               | <b>18.65</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-IV

### Calculation of CAR, mean, standard deviation and coefficient of variance

(In millions)

| Years       | T. Capital Fund(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total RWA(X)     | $x - \bar{x}$ | $(x - \bar{x})^2$ | CAR(X)      | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|--------------------|---------------|-------------------|------------------|---------------|-------------------|-------------|---------------|-------------------|
| 2063/64     | 1,290.12           | (694.52)      | 482,352.33        | 10,226.19        | (13,466.06)   | 181,334,809.24    | 12.62       | 3.26          | 10.60             |
| 2064/65     | 1,635.24           | (349.40)      | 122,083.70        | 13,702.37        | (9,989.89)    | 99,797,816.21     | 11.93       | 2.57          | 6.63              |
| 2065/66     | 2,005.70           | 21.06         | 443.34            | 26,101.47        | 2,409.21      | 5,804,300.44      | 7.68        | (1.68)        | 2.81              |
| 2066/67     | 2,330.07           | 345.43        | 119,324.21        | 33,352.28        | 9,660.03      | 93,316,133.61     | 6.99        | (2.37)        | 5.63              |
| 2067/68     | 2,662.07           | 677.43        | 458,910.14        | 35,078.96        | 11,386.71     | 129,657,116.38    | 7.59        | (1.77)        | 3.14              |
|             | 9923.20            | Total         | 1,183,113.72      | 118461.28        | Total         | 509,910,175.87    | 46.81       | Total         | 28.81             |
| <b>Mean</b> | <b>1,984.64</b>    |               |                   | <b>23,692.26</b> |               |                   | <b>9.36</b> |               |                   |
| <b>S.D.</b> |                    |               | <b>486.44</b>     | <b>S.D.</b>      |               | <b>10,098.62</b>  | <b>S.D.</b> |               | <b>2.40</b>       |
| <b>C.V.</b> |                    |               | <b>24.51</b>      | <b>C.V.</b>      |               | <b>42.62</b>      | <b>C.V.</b> |               | <b>25.64</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-V

### Calculation of CCR, mean, standard deviation and coefficient of variance

(In millions)

| Years       | Core capital(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total RWA(X)     | $x - \bar{x}$ | $(x - \bar{x})^2$ | CCR(X)      | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|-----------------|---------------|-------------------|------------------|---------------|-------------------|-------------|---------------|-------------------|
| 2063/64     | 964.56          | (707.00)      | 499,855.81        | 10,226.19        | (13,466.06)   | 181,334,809.24    | 9.43        | 1.77          | 3.15              |
| 2064/65     | 1,310.85        | (360.71)      | 130,113.56        | 13,702.37        | (9,989.89)    | 99,797,816.21     | 9.57        | 1.91          | 3.65              |
| 2065/66     | 1,683.59        | 12.02         | 144.58            | 26,101.47        | 2,409.21      | 5,804,300.44      | 6.45        | (1.21)        | 1.46              |
| 2066/67     | 2,021.09        | 349.53        | 122,170.17        | 33,352.28        | 9,660.03      | 93,316,133.61     | 6.06        | (1.60)        | 2.55              |
| 2067/68     | 2,377.73        | 706.16        | 498,668.87        | 35,078.96        | 11,386.71     | 129,657,116.38    | 6.78        | (0.88)        | 0.77              |
|             | 8357.82         | Total         | 1,250,952.99      | 118461.28        | Total         | 509,910,175.87    | 38.29       | Total         | 11.58             |
| <b>Mean</b> | <b>1,671.56</b> |               |                   | <b>23,692.26</b> |               |                   | <b>7.66</b> |               |                   |
| <b>S.D.</b> |                 |               | <b>500.19</b>     | <b>S.D.</b>      |               | <b>10,098.62</b>  | <b>S.D.</b> |               | <b>1.52</b>       |
| <b>C.V.</b> |                 |               | <b>29.92</b>      | <b>C.V.</b>      |               | <b>42.62</b>      | <b>C.V.</b> |               | <b>19.87</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-VI

### Calculation of NPL ratio, mean, standard deviation and coefficient of variance

(In millions)

| Years       | Total NPL(X)  | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total Loan(X)    | $x - \bar{x}$ | $(x - \bar{x})^2$ | NPL Ratio(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|---------------|---------------|-------------------|------------------|---------------|-------------------|--------------|---------------|-------------------|
| 2063/64     | 347.29        | 58.38         | 3,408.22          | 9,694.10         | (4,783.66)    | 22,883,403.00     | 3.58         | 1.44          | 2.08              |
| 2064/65     | 312.50        | 23.59         | 556.49            | 12,747.72        | (1,730.04)    | 2,993,038.40      | 2.45         | 0.31          | 0.10              |
| 2065/66     | 198.89        | (90.02)       | 8,103.60          | 14,945.72        | 467.96        | 218,986.56        | 1.33         | (0.81)        | 0.65              |
| 2066/67     | 259.52        | (29.39)       | 863.77            | 17,044.30        | 2,566.54      | 6,587,127.57      | 1.52         | (0.62)        | 0.38              |
| 52067/68    | 326.33        | 37.42         | 1,400.26          | 17,956.95        | 3,479.19      | 12,104,763.06     | 1.82         | (0.32)        | 0.10              |
|             | 1444.53       | Total         | 14,332.34         | 72388.79         | Total         | 44,787,318.59     | 10.70        | Total         | 3.32              |
| <b>Mean</b> | <b>288.91</b> |               |                   | <b>14,477.76</b> |               |                   | <b>2.14</b>  |               |                   |
| <b>S.D.</b> |               |               | <b>53.54</b>      | <b>S.D.</b>      |               | <b>2,992.90</b>   | <b>S.D.</b>  |               | <b>0.81</b>       |
| <b>C.V.</b> |               |               | <b>18.53</b>      | <b>C.V.</b>      |               | <b>20.67</b>      | <b>C.V.</b>  |               | <b>38.05</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-VII

### Calculation of LLCR, mean, standard deviation and coefficient of variance

(In millions)

| Years       | LLP(X)        | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total NPL(X)  | $x - \bar{x}$ | $(x - \bar{x})^2$ | LLCR(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|---------------|---------------|-------------------|---------------|---------------|-------------------|---------------|---------------|-------------------|
| 2063/64     | 294.77        | (54.51)       | 2,971.34          | 347.29        | 58.38         | 3,408.22          | 84.88         | (39.54)       | 1,563.63          |
| 2064/65     | 285.08        | (64.20)       | 4,121.64          | 312.50        | 23.59         | 556.49            | 91.23         | (33.19)       | 1,101.87          |
| 2065/66     | 298.42        | (50.86)       | 2,586.74          | 198.89        | (90.02)       | 8,103.60          | 150.04        | 25.62         | 656.52            |
| 2066/67     | 379.37        | 30.09         | 905.41            | 259.52        | (29.39)       | 863.77            | 146.18        | 21.76         | 473.56            |
| 2067/68     | 488.76        | 139.48        | 19,454.67         | 326.33        | 37.42         | 1,400.26          | 149.77        | 25.35         | 642.86            |
|             | 1746.40       | Total         | 30,039.80         | 1444.53       | Total         | 14,332.34         | 622.10        | Total         | 4,438.45          |
| <b>Mean</b> | <b>349.28</b> |               |                   | <b>288.91</b> |               |                   | <b>124.42</b> |               |                   |
|             | <b>S.D.</b>   |               | <b>77.51</b>      | <b>S.D.</b>   |               | <b>53.54</b>      | <b>S.D.</b>   |               | <b>29.79</b>      |
|             | <b>C.V.</b>   |               | <b>22.19</b>      | <b>C.V.</b>   |               | <b>18.53</b>      | <b>C.V.</b>   |               | <b>23.95</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-VIII

### Calculation of C/D ratio, mean, standard deviation and coefficient of variance

(In millions)

| Years       | Total Credit(X)  | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total deposit(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | C/D(X)          | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|------------------|---------------|-------------------|------------------|---------------|-------------------|-----------------|---------------|-------------------|
| 2063/64     | 9,694.10         | (4,783.66)    | 22,883,403.00     | 12,388.90        | (4,451.07)    | 19,812,024.14     | 78.25           | (7.78)        | 60.56             |
| 2064/65     | 12,747.72        | (1,730.04)    | 2,993,038.40      | 15,833.74        | (1,006.23)    | 1,012,498.81      | 80.51           | (5.52)        | 30.47             |
| 2065/66     | 14,945.72        | 467.96        | 218,986.56        | 14,642.98        | (2,196.99)    | 4,826,765.06      | 102.07          | 16.04         | 257.20            |
| 2066/67     | 17,044.30        | 2,566.54      | 6,587,127.57      | 20,315.83        | 3,475.86      | 12,081,602.74     | 83.90           | (2.13)        | 4.55              |
| 2067/68     | 17,956.95        | 3,479.19      | 12,104,763.06     | 21,018.42        | 4,178.45      | 17,459,444.40     | 85.43           | (0.60)        | 0.35              |
|             | 72388.79         | Total         | 44,787,318.59     | 84199.87         | Total         | 55,192,335.16     | 430.16          | Total         | 353.13            |
| <b>Mean</b> | <b>14,477.76</b> |               |                   | <b>16,839.97</b> |               |                   | <b>86.03</b>    |               |                   |
| <b>S.D.</b> |                  |               | <b>2,992.90</b>   | <b>S.D.</b>      |               |                   | <b>3,322.42</b> | <b>S.D.</b>   | <b>8.40</b>       |
| <b>C.V.</b> |                  |               | <b>20.67</b>      | <b>C.V.</b>      |               |                   | <b>19.73</b>    | <b>C.V.</b>   | <b>9.77</b>       |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XI

### Calculation of EPS, mean, standard deviation and coefficient of variance

(In millions)

| Years   | NPAT(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | No of Shares  | EPS(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|---------|---------|---------------|-------------------|---------------|--------|---------------|-------------------|
| 2063/64 | 262.39  | (177.62)      | 31,548.82         | 6,031,413.00  | 43.50  | (5.64)        | 31.77             |
| 2064/65 | 361.50  | 157.70        | 24,870.73         | 6,031,413.00  | 59.94  | 10.80         | 116.55            |
| 2065/66 | 461.73  | 415.42        | 172,573.11        | 8,443,979.00  | 54.68  | 5.54          | 30.72             |
| 2066/67 | 509.26  | 509.26        | 259,348.95        | 11,821,571.00 | 43.08  | (6.06)        | 36.73             |
| 2067/68 | 605.15  | 605.15        | 366,209.46        | 13,594,807.00 | 44.51  | (4.63)        | 21.40             |
|         | 2200.03 | Total         | 854,551.07        |               | 245.71 | Total         | 237.17            |
| Mean    | 440.01  |               |                   |               | 49.14  |               |                   |
| S.D.    |         |               | 413.41            | S.D.          |        |               | 6.89              |
| C.V.    |         |               | 93.96             | C.V.          |        |               | 14.01             |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-X

### Calculation of ROE, mean, standard deviation and coefficient of variance

(In millions)

| Years       | NPAT(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ | Shareholder's Fund(X) | $x - \bar{x}$ | $(x - \bar{x})^2$ | ROE(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|---------------|---------------|-------------------|-----------------------|---------------|-------------------|--------------|---------------|-------------------|
| 2063/64     | 262.39        | (177.62)      | 31,548.86         | 1,290.12              | (694.39)      | 482,177.47        | 20.34        | (1.67)        | 2.79              |
| 2064/65     | 361.50        | (78.51)       | 6,163.82          | 1,635.24              | (349.27)      | 121,989.53        | 22.11        | 0.10          | 0.01              |
| 2065/66     | 461.73        | 21.72         | 471.76            | 2,005.07              | 20.56         | 422.71            | 23.03        | 1.02          | 1.04              |
| 2066/67     | 509.26        | 69.25         | 4,795.56          | 2,330.07              | 345.56        | 119,411.71        | 21.86        | (0.15)        | 0.02              |
| 2067/68     | 605.15        | 165.14        | 27,271.22         | 2,662.07              | 677.56        | 459,087.55        | 22.73        | 0.72          | 0.52              |
|             | 2200.03       | Total         | 70,251.23         | 9922.57               | Total         | 1,183,088.99      | 110.06       | Total         | 4.39              |
| <i>Mean</i> | <b>440.01</b> |               |                   | <b>1,984.51</b>       |               |                   | <b>22.01</b> |               |                   |
| <i>S.D.</i> |               |               | <b>118.53</b>     | <i>S.D.</i>           |               | <b>486.43</b>     | <i>S.D.</i>  |               | <b>0.94</b>       |
| <i>C.V.</i> |               |               | <b>26.94</b>      | <i>C.V.</i>           |               | <b>24.51</b>      | <i>C.V.</i>  |               | <b>4.25</b>       |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XI

### Calculation of ROA, mean, standard deviation and coefficient of variance

(In millions)

| Years       | NPAT(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ | Total Assets(X)  | $x - \bar{x}$ | $(x - \bar{x})^2$ | ROA(X)      | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|---------------|---------------|-------------------|------------------|---------------|-------------------|-------------|---------------|-------------------|
| 2063/64     | 262.39        | (177.62)      | 31,548.86         | 14,581.39        | (5,609.26)    | 31,463,797.75     | 1.80        | (0.34)        | 0.12              |
| 2064/65     | 361.50        | (78.51)       | 6,163.82          | 17,721.93        | (2,468.72)    | 6,094,578.44      | 2.04        | (0.10)        | 0.01              |
| 2065/66     | 461.73        | 21.72         | 471.76            | 20,496.01        | 305.36        | 93,244.73         | 2.25        | 0.11          | 0.01              |
| 2066/67     | 509.26        | 69.25         | 4,795.56          | 23,396.19        | 3,205.54      | 10,275,486.69     | 2.18        | 0.04          | 0.00              |
| 2067/68     | 605.15        | 165.14        | 27,271.22         | 24,757.75        | 4,567.10      | 20,858,402.41     | 2.44        | 0.30          | 0.09              |
|             | 2200.03       | Total         | 70,251.23         | 100953.27        | Total         | 68,785,510.02     | 10.71       | Total         | 0.23              |
| <b>Mean</b> | <b>440.01</b> |               |                   | <b>20,190.65</b> |               |                   | <b>2.14</b> |               |                   |
| <b>S.D.</b> |               |               | <b>118.53</b>     | <b>S.D.</b>      |               | <b>3,709.06</b>   | <b>S.D.</b> |               | <b>0.22</b>       |
| <b>C.V.</b> |               |               | <b>26.94</b>      | <b>C.V.</b>      |               | <b>18.37</b>      | <b>C.V.</b> |               | <b>10.07</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XII

### Calculation of ROI, mean, standard deviation and coefficient of variance

(In millions)

| Years       | NPAT(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ | Investment(X)   | $x - \bar{x}$ | $(x - \bar{x})^2$ | ROI(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|---------------|---------------|-------------------|-----------------|---------------|-------------------|--------------|---------------|-------------------|
| 2063/64     | 262.39        | (177.62)      | 31,548.86         | 2,995.19        | (313.65)      | 98,376.32         | 8.76         | (4.50)        | 20.25             |
| 2064/65     | 361.50        | (78.51)       | 6,163.82          | 3,206.83        | (102.01)      | 10,406.04         | 11.27        | (1.99)        | 3.95              |
| 2065/66     | 461.73        | 21.72         | 471.76            | 2,786.36        | (522.48)      | 272,985.35        | 16.57        | 3.31          | 10.96             |
| 2066/67     | 509.26        | 69.25         | 4,795.56          | 3,269.20        | (39.64)       | 1,571.33          | 15.58        | 2.32          | 5.37              |
| 2067/68     | 605.15        | 165.14        | 27,271.22         | 4,286.60        | 977.76        | 956,014.62        | 14.12        | 0.86          | 0.73              |
|             | 2200.03       | Total         | 70,251.23         | 16544.18        | Total         | 1,339,353.66      | 66.30        | Total         | 41.26             |
| <b>Mean</b> | <b>440.01</b> |               |                   | <b>3,308.84</b> |               |                   | <b>13.26</b> |               |                   |
| <b>S.D.</b> |               |               | <b>118.53</b>     | <b>S.D.</b>     |               | <b>517.56</b>     | <b>S.D.</b>  |               | <b>2.87</b>       |
| <b>C.V.</b> |               |               | <b>26.94</b>      | <b>C.V.</b>     |               | <b>15.64</b>      | <b>C.V.</b>  |               | <b>21.67</b>      |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XIII

### Calculation of ROLA, mean, standard deviation and coefficient of variance

(In millions)

| Years       | NPAT(X)       | $x - \bar{x}$ | $(x - \bar{x})^2$ | T Loan(X)        | $x - \bar{x}$ | $(x - \bar{x})^2$ | ROLA(X)     | $x - \bar{x}$ | $(x - \bar{x})^2$ |
|-------------|---------------|---------------|-------------------|------------------|---------------|-------------------|-------------|---------------|-------------------|
| 2063/64     | 262.39        | (177.62)      | 31,548.86         | 9,694.10         | (4,783.66)    | 22,883,403.00     | 2.71        | (0.29)        | 0.09              |
| 2064/65     | 361.50        | (78.51)       | 6,163.82          | 12,747.72        | (1,730.04)    | 2,993,038.40      | 2.84        | (0.16)        | 0.03              |
| 2065/66     | 461.73        | 21.72         | 471.76            | 14,945.72        | 467.96        | 218,986.56        | 3.09        | 0.09          | 0.01              |
| 2066/67     | 509.26        | 69.25         | 4,795.56          | 17,044.30        | 2,566.54      | 6,587,127.57      | 2.99        | (0.01)        | 0.00              |
| 52067/68    | 605.15        | 165.14        | 27,271.22         | 17,956.95        | 3,479.19      | 12,104,763.06     | 3.37        | 0.37          | 0.14              |
|             | 2200.03       | Total         | 70,251.23         | 72388.79         | Total         | 44,787,318.59     | 14.99       | Total         | 0.26              |
| <b>Mean</b> | <b>440.01</b> |               |                   | <b>14,477.76</b> |               |                   | <b>3.00</b> |               |                   |
| <b>S.D.</b> |               |               | <b>118.53</b>     | <b>S.D.</b>      |               | <b>2,992.90</b>   | <b>S.D.</b> |               | <b>0.23</b>       |
| <b>C.V.</b> |               |               | <b>26.94</b>      | <b>C.V.</b>      |               | <b>20.67</b>      | <b>C.V.</b> |               | <b>7.58</b>       |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XIV

### Calculation of correlation coefficient between Total deposit and total credit of BOK

(In millions)

| Year     | Total Deposit(X) | Total Credit(Y) | XY                   | X <sup>2</sup>                    | Y <sup>2</sup>                    |
|----------|------------------|-----------------|----------------------|-----------------------------------|-----------------------------------|
| 2063/64  | 12,388.90        | 9,694.10        | 120,099,235.49       | 153,484,843.21                    | 93,975,574.81                     |
| 2064/65  | 15,833.74        | 12,747.72       | 201,844,084.07       | 250,707,322.39                    | 162,504,365.20                    |
| 32065/66 | 14,642.98        | 14,945.72       | 218,849,879.05       | 214,416,863.28                    | 223,374,546.32                    |
| 2066/67  | 20,315.83        | 17,044.30       | 346,269,101.27       | 412,732,948.59                    | 290,508,162.49                    |
| 2067/68  | 21,018.42        | 17,956.95       | 377,426,717.02       | 441,773,979.30                    | 322,452,053.30                    |
|          | ΣX=84,199.87     | ΣY=72,388.79    | ΣXY=1,264,489,016.90 | ΣX <sup>2</sup> =1,473,115,956.76 | ΣY <sup>2</sup> =1,092,814,702.12 |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

*Correlation coefficient can be calculated by using following formula,*

$$\begin{aligned}
 r &= \frac{N \sum XY - \sum X \sum Y}{\sqrt{N \sum X^2 - (\sum X)^2} \sqrt{N \sum Y^2 - (\sum Y)^2}} \\
 &= \frac{5 \times 1264489016.90 - 84199.87 \times 72388.79}{\sqrt{5 \times 1473115956.76 - (84199.87)^2} \times \sqrt{5 \times 1092814702.12 - (72388.79)^2}} \\
 &= \frac{227318372.5}{248591849.8} \\
 &= 0.91
 \end{aligned}$$

The value of Correlation coefficient 'r' shows that there is high degree positive correlation between total deposit and total credit. Computation of probable error as follows.

$$\begin{aligned}
 P.Er . &= 0.6745 \times \frac{1 - (0.91)^2}{\sqrt{5}} \\
 &= 0.6745 \times \frac{1 - 0.83}{2.2360} \\
 &= 0.6745 \times 0.4148 \\
 &= 0.051
 \end{aligned}$$

*Similarly, correlation coefficient can be calculated by adopting above formula and procedure.*

## Appendix-XV

### Calculation of correlation coefficient between total deposit and total investment of BOK

(In millions)

| Year     | Deposit(X)   | Investment(Y) | XY                 | X <sup>2</sup>                    | Y <sup>2</sup>                 |
|----------|--------------|---------------|--------------------|-----------------------------------|--------------------------------|
| 2063/64  | 12,388.90    | 2,995.19      | 37,107,109.39      | 153,484,843.21                    | 8,971,163.14                   |
| 2064/65  | 15,833.74    | 3,206.83      | 50,776,112.44      | 250,707,322.39                    | 10,283,758.65                  |
| 32065/66 | 14,642.98    | 2,786.36      | 40,800,613.75      | 214,416,863.28                    | 7,763,802.05                   |
| 2066/67  | 20,315.83    | 3,269.20      | 66,416,511.44      | 412,732,948.59                    | 10,687,668.64                  |
| 2067/68  | 21,018.42    | 4,286.60      | 90,097,559.17      | 441,773,979.30                    | 18,374,939.56                  |
|          | ΣX=84,199.87 | ΣY=16,544.18  | ΣXY=285,197,906.20 | ΣX <sup>2</sup> =1,473,115,956.76 | ΣY <sup>2</sup> =56,081,332.03 |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XVI

### Calculation of correlation coefficient between investment and net profit of BOK

(In millions)

| Year     | Investment(X)      | Net Profit(Y)     | XY                     | X <sup>2</sup>           | Y <sup>2</sup>          |
|----------|--------------------|-------------------|------------------------|--------------------------|-------------------------|
| 2063/64  | 2,995.19           | 262.39            | 785,907.90             | 8,971,163.14             | 68,848.51               |
| 2064/65  | 3,206.83           | 361.50            | 1,159,269.05           | 10,283,758.65            | 130,682.25              |
| 32065/66 | 2,786.36           | 461.73            | 1,286,546.00           | 7,763,802.05             | 213,194.59              |
| 2066/67  | 3,269.20           | 509.26            | 1,664,872.79           | 10,687,668.64            | 259,345.75              |
| 2067/68  | 4,286.60           | 605.15            | 2,594,035.99           | 18,374,939.56            | 366,206.52              |
|          | $\sum X=16,544.18$ | $\sum Y=2,200.03$ | $\sum XY=7,490,631.73$ | $\sum X^2=56,081,332.03$ | $\sum Y^2=1,038,277.63$ |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XVII

### Calculation of correlation coefficient between total loan and non-performing loan of BOK

(In millions)

| Year     | Loan(X)            | NPL(Y)            | XY                      | X <sup>2</sup>              | Y <sup>2</sup>        |
|----------|--------------------|-------------------|-------------------------|-----------------------------|-----------------------|
| 2063/64  | 9,694.10           | 347.29            | 3,366,663.99            | 93,975,574.81               | 120,610.34            |
| 2064/65  | 12,747.72          | 312.50            | 3,983,662.50            | 162,504,365.20              | 97,656.25             |
| 32065/66 | 14,945.72          | 198.89            | 2,972,554.25            | 223,374,546.32              | 39,557.23             |
| 2066/67  | 17,044.30          | 259.52            | 4,423,336.74            | 290,508,162.49              | 67,350.63             |
| 2067/68  | 17,956.95          | 326.33            | 5,859,891.49            | 322,452,053.30              | 106,491.27            |
|          | $\sum X=72,388.79$ | $\sum Y=1,444.53$ | $\sum XY=20,606,108.97$ | $\sum X^2=1,092,814,702.12$ | $\sum Y^2=431,665.73$ |

(Source: Annual report of BOK from the fiscal year 2063/64 to 2067/68)

## Appendix-XVII

### Calculation of trend value of total deposit for the period ending 2012 to 2016 of BOK

(In millions)

| Year | Deposit(y)           | X (t-x) | X <sup>2</sup>     | XY                    | Year  | X(t-2066) | Y = a + bx |
|------|----------------------|---------|--------------------|-----------------------|-------|-----------|------------|
| 2064 | 12,388.90            | (2.00)  | 4.00               | (24,777.80)           | 2012* | 3         | 23362.30   |
| 2065 | 15,833.74            | (1.00)  | 1.00               | (15,833.74)           | 2013* | 4         | 25536.36   |
| 2066 | 14,642.98            | -       | -                  | -                     | 2014* | 5         | 27710.52   |
| 2067 | 20,315.83            | 1.00    | 1.00               | 20,315.83             | 2015* | 6         | 29884.58   |
| 2068 | 21,018.42            | 2.00    | 4.00               | 42,036.84             | 2016* | 7         | 32058.69   |
|      | $\sum Y = 84,199.87$ |         | $\sum X^2 = 10.00$ | $\sum XY = 21,741.13$ |       |           |            |

(Source: Annual report of BOK from the year 2007 to 2011), \* Forecasted value

The equation of straight line trend is,

$$Y = a + bx \text{----- eq (i)}$$

By sloving following equations, we can get the value of a and b:

$$\sum Y = na + b\sum x \text{----- eq (ii)}$$

$$\sum XY = a\sum x + b\sum x^2 \text{----- eq (iii)}$$

Putting the value of  $\sum X$ ,  $\sum Y$ ,  $\sum X^2$  and  $\sum XY$  in the equation (ii) and (iii), it will get the value of a and b,

Since,  $\sum X = 0$

$$\text{Therefore, } a = \sum Y/n = 84199.87/5 = 16839.97$$

$$b = \sum XY/\sum X^2 = 21741.13/10 = 2174.11$$

Now, Substituting the value of **a** and **b** in equation of straight line trend or equation (i).

**For up-coming year 2064,**

$$Y = a + bx \text{----- eq (i)}$$

$$Y_{2012} = 16839.97 + 2174.11 \times 3$$

$$= \mathbf{23362.30}$$

Similarly, we can forecast the deposit for the period ending 2064 to 2068 of BOK as well as credit, net profit and investment by adopting above formula and procedure too.

## Appendix-XIX

### Calculation of trend value of total credit for the period ending 2012 to 2016 of BOK

(In millions)

| Year | Credit (y)           | X (t-x) | X <sup>2</sup>     | XY                    | Year  | t-2066 | Y = a + bx |
|------|----------------------|---------|--------------------|-----------------------|-------|--------|------------|
| 2064 | 9,694.10             | (2.00)  | 4.00               | (19,388.20)           | 2012* | 3      | 201912.55  |
| 2065 | 12,747.72            | (1.00)  | 1.00               | (12,747.72)           | 2013* | 4      | 22994.78   |
| 2066 | 14,945.72            | -       | -                  | -                     | 2014* | 5      | 25077.01   |
| 2067 | 17,044.30            | 1.00    | 1.00               | 17,044.30             | 2015* | 6      | 27159.24   |
| 2068 | 17,956.95            | 2.00    | 4.00               | 35,913.90             | 2016* | 7      | 29241.47   |
|      | $\sum Y = 72,388.79$ |         | $\sum X^2 = 10.00$ | $\sum XY = 20,822.28$ |       |        |            |

(Source: Annual report of BOK from the year 2007 to 2011), \* Forecasted value

## Appendix-XX

### Calculation of trend value of net profit for the period ending 2012 to 2016 of BOK

(In millions)

| Year | Net Profit (y)      | X (t-x) | X <sup>2</sup>     | XY                 | Year  | t-2066 | Y = a + bx |
|------|---------------------|---------|--------------------|--------------------|-------|--------|------------|
| 2007 | 262.39              | (2.00)  | 4.00               | (524.78)           | 2012* | 3      | 689.70     |
| 2008 | 361.50              | (1.00)  | 1.00               | (361.50)           | 2013* | 4      | 772.93     |
| 2009 | 461.73              | -       | -                  | -                  | 2014* | 5      | 856.16     |
| 2010 | 509.26              | 1.00    | 1.00               | 509.26             | 2015* | 6      | 939.39     |
| 2011 | 605.15              | 2.00    | 4.00               | 1,210.30           | 2016* | 7      | 1022.62    |
|      | $\sum Y = 2,200.03$ |         | $\sum X^2 = 10.00$ | $\sum XY = 833.28$ |       |        |            |

(Source: Annual report of BOK from the year 2007 to 2011), \* Forecasted value

## Appendix-XXI

### Calculation of trend value of investment for the period ending 2012 to 2016 of BOK

(In millions)

| Year | Investment(Y)        | X (t-x) | X <sup>2</sup>     | XY                   | Year  | t-2066 | Y = a + bx |
|------|----------------------|---------|--------------------|----------------------|-------|--------|------------|
| 2064 | 2,995.19             | (2.00)  | 4.00               | (5,990.38)           | 2012* | 3      | 4102.4     |
| 2065 | 3,206.83             | (1.00)  | 1.00               | (3,206.83)           | 2013* | 4      | 4366.92    |
| 2066 | 2,786.36             | -       | -                  | -                    | 2014* | 5      | 4631.44    |
| 2067 | 3,269.20             | 1.00    | 1.00               | 3,269.20             | 2015* | 6      | 4895.96    |
| 2068 | 4,286.60             | 2.00    | 4.00               | 8,573.20             | 2016* | 7      | 5160.48    |
|      | $\sum Y = 16,544.18$ |         | $\sum X^2 = 10.00$ | $\sum XY = 2,645.19$ |       |        |            |

(Source: Annual report of BOK from the year 2007 to 2011), \* Forecasted value