IMPACT OF INTEREST RATE ON DEPOSIT & LENDING OF NEPALESE COMMERCIAL BANKS

(With Reference To Siddhartha Bank & Lumbini Bank Limited)

A Thesis

Submitted By

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RECOMMENDATION

This is to certify that the Thesis

Submitted by:

UMESH DHAKAL

Entitled

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(With Reference To Siddhartha Bank & Lumbini Bank Limited)

Has been prepared as approved by this Department in the prescribed format of the Faculty of Management. This thesis is forwarded for examination.

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(With Reference* To Siddhartha Bank & Lumbini Bank Limited*)

And found the thesis to be the original work of the student and written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirement for the

Degree of Master's in Business studies (M.B.S.)

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Date:- Mar. 2013

DECLARATION

I, hereby, declare that the work reported in this thesis entitled **"IMPACT OF INTEREST RATE ON DEPOSIT & LENDING OF NEPALESE COMMERCIAL BANKS*(With Reference* To Siddhartha Bank & Lumbini Bank Limited*)"*** submitted to office of the Dean, Faculty of Management, Tribhuvan University, is my original work done for the partial fulfillment of the requirement for the Masters of Business Studies (MBS) under the supervision of **Mr. Mahendra Aryal** and **Mr.Om Prakash Yadav** of Nepal Commerce Campus, Minvawan, Kathmandu.

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ABBREVIATIONS

ABBS	Any Branch Banking System
ATM	Automated Teller Machine
B. S.	Bikram Sam bat
C	Credit
CB	Cash and Bank Balance
CD	Credit Deposit
CRR	Cash Reserve Ratio
DA	Deposit Amount
DR	Deposit Ratio
FDIR	Fixed Deposited Interest Rate
FY	Fiscal Year
LA	Loan & Advance
LA	Lending Amount
LC	Letter of Credit
LR	Lending Rate
LBL	Lumbini Bank Limited
LC	Letter of Credit
MBA	Masters' of Business Administration
MBS	Masters' of Business Studies
Misc.	Miscellaneous
NRB	Nepal Rastra Bank
SBL	Siddhartha Bank Limited
SDIR	Saving Deposit Interest Rate
T. U.	Tribhuwan University
TD	Total Deposit

CHAPTER - I

INTRODUCTION

1.1 Background of the Study

Financial institution occupies an important place in a nation's economy. They are indispensable in a modern society. They plays a vital role in the economic development of a country and forms the core of money market in an advance county by collecting funds from unproductive sector with the objective of investments in productive sectors. Nepal Rastra Bank is a central bank of Nepal. It is controlling and monitoring all the financial institutions within the country by formulating various monetary and financial policies.

Interest has a direct relation with economic growth and development. It plays important role in borrowing and lending. Simply, interest rate is define as the price a borrower must pay to secure scare loan able funds from lender for and agreed upon period. In economic term interest is the payment made by borrower to the lender for the use of capital. According to J. L. Hanson (1997), interest is usually paid only on the principal, that it, on the sum of money loaned, and it is called simple interest. In some cases, interest is paid not only on the principal but also on the cumulative total of past interest payment, and the amount so paid is called compound interest. Interest rates targets are also a vital tool of monetary policy and are used to control variables like investment, inflation and unemployment. Interest rate is one of the major tools for sharking economy. It plays important role in borrowing and lending.

An arrangement whereby an individual or organization may place cash for the safekeeping in a bank, discount house or financial institution is known as deposit. Deposit is nothing but it is a type of asset. It is understood that the institution may invest the cash and pay the depositor a specified amount of interest and that the depositor can reclaim the full value of the account

according to the agreed upon procedures governing the account. The account holder retains rights to their deposit, although restrictions placed on access depend upon the terms and conditions of the account and the provider. The deposit account would be shown as a liability owed by the bank to its customer. Deposits as the amount deposited in a current, saving or fixed accounts of a bank or financial institution. The deposits are subject to withdrawals by means of cheque on a short notice by customers. There are several restrictions on these deposits, regarding the amount of deposit, numbers of withdrawal etc. they are used more as investments and hence they earn some interest. The rate of interest varies depending on the nature of the deposits. The bank attracts deposits from customers by offering different rates of interest and different kinds of facilities.

Credit is the provision of resources by one party to another party where that second party does not reimburse the fist party immediately, there by generating a debt and instead arranges either to repay or return those resources at a lateral date. In credit transactions the creditor turns over to the debtor to repay an equivalent amount usually money in future plus an added sum called interest. In other words bank earns profit by lending the amount in terms of loan or credit and in return it gets interests.

Commercial banks are the main source which motivates people to save their earnings. Bank deals in accepting the saving of people in the form of deposit collection and invest it in the productive area. They give the loan to the people against real and financial assets. They transfer monetary sources from savers to users. In other words, they are intermediate between lender and receiver of fund they mobilize the depositor fund.

The commercial bank has been a vital ingredient for economic development. They are intermediaries, which mobilize funds through the prudential combination of investment portfolios in advanced countries. Whereas in Nepal the role of commercial banks are still to be realized as an essentials machine of

mobilizing internal saving through various banking schemes in the economy. Hence, to uplift the backward economic condition of the country, the process of capital accumulation, among other prerequisites should be expedited.

1.2 Statement of the Problem

Interest plays a vital role in the development and the growth of economy. According to economic theory, (other things remain constant), low interest rate is lead for high investment that results into high production, high employment, more income and ultimately growth in economy. Therefore, through this study it is going to explore does decline in interest rate increases the lending activities. Alternatively, what is the actual condition on this regard in Nepalese financial market place? If the condition is not as per theory then -what are the possible causes for such effects? Focusing on the Nepalese context, the investment is low in productive sectors due to unavailability of sufficient finance, security and other factors. Nepal's main export is raw materials. It means that Nepal is exporting raw materials instead of producing goods and services from these. If cheap financing is available, many factories could be established to reap benefits from utilization of resources, which would increase the employment, standard of living and status of country economy.

Theoretically, market interest rate is the sum of real rate plus inflation premium. However, this may or may not occur in real practice. So through this study, the researcher will identify: Is there any positive relation of interest rate and inflation as per theory? Similarly, high interest rate is stimulus for high savings (deposits). However, in the real world people are seen to deposit more even when there is very low interest rate due to various reason such as security, convenience and other. Thus through this study, the researcher will try to discover: what is the relation of deposit and interest rate?

More precisely, this study will inquire about the answer of following questions.

- What is the effect of high interest rate on deposits and lending of Siddhartha Bank Limited & Lumbini Bank Limited?
- What is the relationship between interest rate and borrowing amount of Siddhartha Bank Limited & Lumbini Bank Limited.
- What is the relationship between interest rate and deposit amount of Siddhartha Bank Limited & Lumbini Bank Limited.
- What is the trend of deposit and lending amount of Siddhartha Bank Limited & Lumbini Bank Limited.

1.3 Objectives of the study

The major objective of this study is to find out the relation of interest rate with other two variables Deposit and Lending (credit). To achieve the major objective, the following are the specific objectives of the study.

- To evaluate the rate of interest on deposit and landing of Siddhartha Bank Limited & Lumbini Bank Limited.
- To explore the trend of deposit and landing of Siddhartha Bank Limited & Lumbini Bank Limited.
- To analyze the relation of interest rate with deposit and lending amounts of Siddhartha Bank Limited & Lumbini Bank Limited.

1.4 Significance of the Study

Nepalese interest rate varies time to time, region and sector to sector. The function in interest rate is a regular phenomenon in developing countries. Therefore, it is quite necessary to develop some ideas about the impact of interest rate to the economy. Furthermore, it is important to know the policies of financial institutions regarding rate of interest and its impact on various financial institutions. This study will try to help analyze the interest rate structure of commercial banks in Nepal and try to develop some ideas to know whether it influences deposits and lending. This being an important aspect

for the economic development of the country has not much been emphasized that means very few number of research work has been found in this topic. Hence, it is hoped that the finding of the study to some extent will help the policy makers to make strong policy regarding interest rate charged on deposits and lending in Nepalese context. Similarly, it can be fruitful resource for teachers, students, researchers, academicians, general individuals and others in abstracting some useful information about interest rate, deposits and lending.

1.5 Limitations of the Study

The main limitation likely to be faced for this study could be as given below.

- The sample are taken only from commercial banks, other financial intermediaries are not included in the study.
- The deposit amount and lending amount of the commercial banks are influenced by several factors. However, this study mainly focuses on the interest rate.
- This study covers only 10 fiscal years data from 2002 to 2011.
- This study is based on secondary data.
- Although there are many other commercial banks, samples cover only two because of the unavailability of sufficient and accurate data along with other constraints.

1.6 Organization of Study

The study has been classified into five chapters. The titles of each of these parts are follows:

Chapter - One; Introduction

The first chapter includes various aspects of present study like Background of the Study, Focus of the Study, Statement of Problem, Objective of the Study, Significance of the Study**,** Limitation of Study and Organization of the Study.

Chapter - Two; Review of Literature

The second chapter deals with the study of related books, and research work which are already published and conducted by different experts and researcher in the field of Interest rate, Deposit and Landing.

Chapter - Three; Research Methodology

The third chapter deals research methodology process such as, research design, nature and source of data, population and sampling of the study, methods tools of analysis of data viz. quantitative and qualitative tools.

Chapter - Four; Presentation and Analysis of Data

The forth chapter introduces the main aspect of the study. It deals with data collection procedure and presentation of data with different statistical and financial tools, and findings of the study.

Chapter - Five; Summary, Conclusion and Recommendations

The fifth chapter presents summary, conclusion and recommendations.

Similarly, at the front part of the study table of contents, recommendation sheet, viva voice sheet, acknowledgement, list of table and figure and abbreviation are presented and bibliography and appendices are presented at the end of the study.

CHAPTER - TWO

REVIEW OF LITERATURE

Review of literature includes the concepts and ideas about the selected topics by reviewing all the relevant materials regarding the study. In fact, it begins with the search for suitable topics and continues throughout the duration of the research work. It deals with a literature survey of existing volume of similar related subjects. Review of literature means reviewing research studies or other relevant propositions in the related area of the study so that all past studies, their conclusions and deficiencies may be know and further research can be conducted. This chapter is divided into mainly two parts.

1. Conceptual / theoretical review
2. Review of related studies
    - Review of Books
    - Review of Journal and Articles
    - Review of Previous Research Work

2.1 Conceptual / theoretical review

2.1.1 Meaning of Interest

Interest is a fee paid by a borrower of assets to the owner as a form of compensation for the use of the assets. It is most commonly the price paid for the use of borrowed money, or money earned by deposited funds. When money is borrowed, interest is typically paid to the lender as a percentage of the principal, the amount owed to the lender. The percentage of the principal that is paid as a fee over a certain period of time (typically one month or year) is called the interest rate. A bank deposit will earn interest because the bank is paying for the use of the deposited funds. Assets that are sometimes lent with interest include money, shares, consumer goods through hire purchase, major assets such as aircraft, and even entire factories in finance lease arrangements.

The interest is calculated upon the value of the assets in the same manner as upon money.

Interest is compensation to the lender, for a) risk of principal loss, called credit risk; and b) forgoing other investments that could have been made with the loaned asset. These forgone investments are known as the opportunity cost. Instead of the lender using the assets directly, they are advanced to the borrower. The borrower then enjoys the benefit of using the assets ahead of the effort required to pay for them, while the lender enjoys the benefit of the fee paid by the borrower for the privilege. In economics, interest is considered the price of credit.

Interest is often compounded, which means that interest is earned on prior interest in addition to the principal. The total amount of debt grows exponentially, and its mathematical study led to the discovery of the number (Wikipedia, 2009).

In other words, interest is the rewards for the pure yield of capital of saving for forgoing of liquidity and surplus of money. The rate of interest, according to Keynes, is a purely monetary phenomenon and in his theory, he has presented "a proposition that the rate of interest influences the level of economic activity by first influencing the rate of real investment in the economy". According to him, the real investment is in fixed capital or durable machines. Schulz has also expressed his view that, "An important aspect of interest rate policy is the setting of an appropriate margin between the lending and deposit rate. If the margin is too high, bank will make excessive profits and this leads to waste of save resources. However, the neo-classical economist defined the interest as the price for the use of loanable funds. But the modern economist, in their effort to avoid these divergent and controversial views about the nature of interest, have explained it in terms of productivity, saving, liquidity preference and money. If it is too low, it will discourage intermediation and devitalize financial institutions. At the same time, the demand for credit goes on increasing being

affected by the cheap loan rates. Hence, it can be concluded that changes in interest rate structure produce either positive or negative impact upon the growth of a developing economy such as ours" (Rose, 2003: p113).

2.1.2 Interest Rate

An interest rate is the rate at which interest is paid by a borrower for the use of money that they borrow from a lender. Specifically, the interest rate (I/m) is a percent of principal (I) paid at some rate (m). For example, a small company borrows capital from a bank to buy new assets for their business, and in return, the lender receives interest at a predetermined interest rate for deferring the use of funds and instead lending it to the borrower. Interest rates are normally expressed as a percentage of the principal for a period of one year.

Interest rate is one of the crucial indicators of financial as well as economic system of the country. Interest rates send price signals to borrowers, lenders, savers and investors. For example, higher interest rate generally brings forth a greater volume of saving and stimulates the lending of funds. Lower rate of interest, on the other hand tends to dampen the flow of saving and reduce lending activity. Higher interest rate tends to reduce the volume of borrowing and capital investment and lower interest rates stimulate borrowing and investment spending.

Interest rates targets are also a vital tool of monetary policy and are taken into account when dealing with variables like investment, inflation, and unemployment. Although most of the assumptions and expectations made by the Central Banks or Reserve Banks by countries (and economies) that by technically lowering the interest rate would produce the effect of increasing investments and consumptions. However, low interest rate by macro-economic policy is also risky and would also lead to the creation of massive economic bubble. When great amount of investments are poured into the real estate market and stock market, as what Japan experienced in the late 1980's and early

1990's that resulted in the large numbers of accounts of unpaid debts to the Japanese Banks and bankruptcy of these banks and caused stagflation to the local Japanese Economy (Japan being the second largest economy at the time). With exports becoming the last pillar for the growth of Japanese economy throughout the rest of 1990's and early 2000. The same scenario occurs to the United States' lowering of interest rate since late 1990's to present substantially by the decision of Federal Reserve System. Under Margaret Thatcher, United Kingdom's economy was maintaining stable growth by preventing to lower the interest rate by the Bank of England. For developed economies, the pace of the function of the interest rate therefore is inevitably argued either to be protecting the designated range of mild inflation in an economy for the health of economic activities or cap the interest rate concurrently with the economic growth to safeguard the economic momentum.

2.1.3 History of Interest

According to historian Paul Johnson, the lending of "food money" was commonplace in Middle East civilizations as far back as 5000BC. They regarded interest as legitimate since acquired seeds and animals could "reproduce themselves"; whilst the ancient Jewish religious prohibitions against usury were a "different view".

In the Roman Empire interest rates were usually calculated on a monthly basis and set as multiples of 12, apparently for expedient calculation by the wealthy private individuals that did most of the money lending.

The First Council of Nicaea, in 325, forbade clergy from engaging in usury which was defined as lending on interest above 1 percent per month (12.7% APR). Later ecumenical councils applied this regulation to the laity. Catholic Church opposition to interest hardened in the era of scholastics, when even defending it was considered a heresy. St. Thomas Aquinas, the leading theologian of the Catholic Church, argued that the

charging of interest is wrong because it amounts to "double charging", charging for both the thing and the use of the thing.

In the medieval economy, loans were entirely a consequence of necessity (bad harvests, fire in a workplace) and, under those conditions, it was considered morally reproachable to charge interest. It was also considered morally dubious, since no goods were produced through the lending of money, and thus it should not be compensated, unlike other activities with direct physical output such as blacksmithing or farming. For the same reason, interest has often been looked down upon in Islamic civilization, with most scholars agreeing that the Qur'an explicitly forbids charging interest.

In the Renaissance era, greater mobility of people facilitated an increase in commerce and the appearance of appropriate conditions for entrepreneurs to start new, lucrative businesses. Given that borrowed money was no longer strictly for consumption but for production as well, interest was no longer viewed in the same manner. The School of Salamanca elaborated on various reasons that justified the charging of interest: the person who received a loan benefited, and one could consider interest as a premium paid for the risk taken by the loaning party.

There was also the question of opportunity cost, in that the loaning party lost other possibilities of using the loaned money. Finally and perhaps most originally was the consideration of money itself as merchandise, and the use of one's money as something for which one should receive a benefit in the form of interest. Martín de Azpilcueta also considered the effect of time. Other things being equal, one would prefer to receive a given good now rather than in the future. This preference indicates greater value. Interest, under this theory, is the payment for the time the loaning individual is deprived of the money.

Economically, the interest rate is the cost of capital and is subject to the laws of supply and demand of the money supply. The first attempt to control interest

rates through manipulation of the money supply was made by the French Central Bank in 1847.

The first formal studies of interest rates and their impact on society were conducted by Adam Smith, Jeremy Bentham and Mirabeau during the birth of classic economic thought. In the late 19th century leading Swedish economist Knut Wicksell in his 1898 Interest and Prices elaborated a comprehensive theory of economic crises based upon a distinction between natural and nominal interest rates. In the early 20th century, Irving Fisher made a major breakthrough in the economic analysis of interest rates by distinguishing nominal interest from real interest. Several perspectives on the nature and impact of interest rates have arisen since then.

The latter half of the 20th century saw the rise of interest-free Islamic banking and finance, a movement that attempts to apply religious law developed in the medieval period to the modern economy. Some entire countries, including Iran, Sudan, and Pakistan, have taken steps to eradicate interest from their financial systems altogether. Rather than charging interest, the interest-free lender shares the risk by investing as a partner in profit loss sharing scheme, because predetermined loan repayment as interest is prohibited, as well as making money out of money is unacceptable. All financial transactions must be asset-backed and it does not charge any "fee" for the service of lending.

2.1.4 Composition of Interest Rates

In economics, interest is considered the price of credit; therefore, it is also subject to distortions due to inflation. The nominal interest rate, which refers to the price before adjustment to inflation, is the one visible to the consumer (*i.e.*, the interest tagged in a loan contract, credit card statement, etc.). Nominal interest is composed of the real interest rate plus inflation, among other factors. A simple formula for the nominal interest is.

$$i = r + \pi$$

Where,

'i' = the nominal interest,

'*r'* = the real interest and π is inflation.

This formula attempts to measure the value of the interest in units of stable purchasing power. However, if this statement were true, it would imply at least two misconceptions. First, that all interest rates within an area that shares the same inflation (that is, the same country) should be the same. Second, that the lenders know the inflation for the period of time that they are going to lend the money.

One reason behind the difference between the interest that yields a treasury bond and the interest that yields a mortgage loan is the risk that the lender takes from lending money to an economic agent. In this particular case, a government is more likely to pay than a private citizen. Therefore, the interest rate charged to a private citizen is larger than the rate charged to the government.

To take into account the information asymmetry aforementioned, both the value of inflation and the real price of money are changed to their expected values resulting in the following equation.

$$i_t = r_{(t+1)} + \pi_{(t+1)} + \sigma$$

Here,

i_t = the nominal interest at the time of the loan

$r_{(t+1)}$ = the real interest expected over the period of the loan

$\pi_{(t+1)}$ = the inflation expected over the period of the loan and

σ = the representative value for the risk engaged in the operation.

2.1.5 Market Interest Rates

There are markets for investments, which include the money market, bond market, as well as retail financial institutions like banks set interest rates. Each specific debt takes into account the following factors in determining its interest rate.

a. Opportunity cost

Opportunity cost encompasses any other use to which the money could be put, including lending to others, investing elsewhere, holding cash (for safety, for example), and simply spending the funds.

b. Inflation

Since the lender is deferring consumption, they will wish, as a bare minimum, to recover enough to pay the increased cost of goods due to inflation. Because future inflation is unknown, there are three ways this might be achieved.

- Charge X percentage interest 'plus inflation' many governments issue 'real-return' or 'inflation indexed' bonds. The principal amount or the interest payments are continually increased by the rate of inflation. See the discussion at real interest rate.
- Decide on the 'expected' inflation rate. This still leaves the lender exposed to the risk of 'unexpected' inflation.
- Allow the interest rate to be periodically changed. While a 'fixed interest rate' remains the same throughout the life of the debt, 'variable' or 'floating' rates can be reset. There are derivative products that allow for hedging and swap between the two.

However, the market and it set interest rates happens frequently that they are insufficient to compensate for inflation: for example at times of high inflation during e.g. the oil crisis; and currently (2011) when real yields on many inflation-linked government stocks are negative.

c. Default

There is always the risk the borrower will become bankrupt, abscond or otherwise default on the loan. The risk premium attempts to measure the integrity of the borrower, the risk of his enterprise succeeding and the security of any collateral pledged. For example, loans to developing countries have higher risk premiums than those to the US government due to the difference in creditworthiness. An operating line of credit to a business will have a higher rate than a mortgage loan.

The creditworthiness of businesses is measured by bond rating services and individual's credit scores by credit bureaus. The risks of an individual debt may have a large standard deviation of possibilities. The lender may want to cover his maximum risk, but lenders with portfolios of debt can lower the risk premium to cover just the most probable outcome.

d. Default Interest

Default interest is the interest that a borrower would pay if the borrower will not fulfill the loan covenants. The default interest is usually much higher than the original interest since it is reflecting the aggravation in the financial risk of the borrower. The default interest compensates the lender for the added risk. Banks tend to add default interest to the loan agreements in order to separate between different scenarios.

e. Deferred Consumption

Charging interest equal only to inflation will leave the lender with the same purchasing power, but they would prefer their own consumption sooner rather than later. There will be an interest premium of the delay. They may not want to consume, but instead would invest in another product. The possible return they could realize in competing investments will determine what interest they charge.

f. Length of time

Shorter terms often have less risk of default and exposure to inflation because the near future is easier to predict. In these circumstances, short term interest rates are lower than longer term interest rates (an upward sloping yield curve).

g. Government Intervention

Interest rates are generally determined by the market, but government intervention - usually by a central bank - may strongly influence short-term interest rates, and is one of the main tools of monetary policy. The central bank offers to borrow (or lend) large quantities of money at a rate which they determine (sometimes this is money that they have created ex nihilo, i.e. printed) which has a major influence on supply and demand and hence on market interest rates (Wikipedia, Market Interest Rate: 2009)

2.1.6 Reasons for Interest Rate Change

a. Political Short-term Gain

Lowering interest rates can give the economy a short-run boost. Under normal conditions, most economists think a cut in interest rates will only give a short-term gain in economic activity that will soon be offset by inflation. The quick boost can influence elections. Most economists advocate independent central banks to limit the influence of politics on interest rates.

b. Deferred Consumption

When money is loaned the lender delays spending the money on consumption goods. Since according to time preference theory people prefer goods now to goods later, in a free market there will be a positive interest rate.

c. Inflationary Expectations

Most economies generally exhibit inflation, meaning a given amount of money buys fewer goods in the future than it will now. The borrower needs to compensate the lender for this.

d. Alternative Investments

The lender has a choice between using his money in different investments. If he chooses one, he forgoes the returns from all the others. Different investments effectively compete for funds.

e. Risks of Investment

There is always a risk that the borrower will go bankrupt, abscond, die, or otherwise default on the loan. This means that a lender generally charges a risk premium to ensure that, across his investments, he is compensated for those that fail.

f. Liquidity Preference

People prefer to have their resources available in a form that can immediately be exchanged, rather than a form that takes time or money to realize.

g. Taxes

Because some of the gains from interest may be subject to taxes, the lender may insist on a higher rate to make up for this loss. (Wikipedia, Reason for Interest Rate Change: 2009).

2.1.7 Interest Rate Risk

Interest rate risk is the risk (variability in value) borne by an interest-bearing asset, such as a loan or a bond, due to variability of interest rates. In general, as rates rise, the price of a fixed rate bond will fall, and vice versa. Interest rate risk is commonly measured by the bond's duration.

Interest rate risk analysis is almost always based on simulating movements in one or more yield curves using the Heath-Jarrow-Morton framework to ensure that the yield curve movements are both consistent with current market yield curves and such that no riskless arbitrage is possible. The Heath-Jarrow-Morton framework was developed in the early 1990s by David Heath of Cornell University, Andrew Morton of Lehman Brothers, and Robert A. Jarrow of Kamakura Corporation and Cornell University.

There are a number of standard calculations for measuring the impact of changing interest rates on a portfolio consisting of various assets and liabilities. The most common techniques include.

- Marking to market, calculating the net market value of the assets and liabilities, sometimes called the "market value of portfolio equity"
- Stress testing this market value by shifting the yield curve in a specific way. Duration is a stress test where the yield curve shift is parallel
- Calculating the Value at Risk of the portfolio
- Calculating the multi period cash flow or financial accrual income and expense for N periods forward in a deterministic set of future yield curves
- Doing step 4 with random yield curve movements and measuring the probability distribution of cash flows and financial accrual income over time.
- Measuring the mismatch of the interest sensitivity gap of assets and liabilities, by classifying each asset and liability by the timing of interest rate reset or maturity, whichever comes first.

2.1.8 Banks and Interest Rate Risk

Banks face many types of interest rate risk, which are as follows.

a. Basis risk

The risk presented when yields on assets and costs on liabilities are based on different bases, such as the London Interbank Offered Rate (LIBOR) versus the U.S. prime rate. In some circumstances, different bases will move at different rates or in different directions, which can cause erratic changes in revenues and expenses.

b. Yield Curve Risk

The risk presented by differences between short-term and long-term interest rates. Short-term rates are normally lower than long-term rates, and banks earn profits by borrowing short-term money (at lower rates) and investing in long-term assets (at higher rates). However, the relationship between short-term and long-term rates can shift quickly and dramatically, which can cause erratic changes in revenues and expenses.

c. Reprising Risk

The risk presented by assets and liabilities that reprise at different times and rates. For instance, a loan with a variable rate will generate more interest income when rates rise and less interest income when rates fall. If the loan is funded with fixed rated deposits, the bank's interest margin will fluctuate.

d. Option risk

The risk presented by optional ties embedded in some assets and liabilities. For instance, mortgage loans present significant option risk due to prepayment speeds that change dramatically when interest rates rise and fall. Falling interest rates will cause many borrowers to refinance and repay their loans, leaving the bank with uninvited cash when interest rates have declined. Alternately, rising interest rates cause mortgage borrowers to repay slower, leaving the bank with more loans based on prior, lower interest rates. Option risk is difficult to measure and control.

e. Model risk

The risk presented by mathematical models used to price asset and liabilities not directly quoted on the market. Interest rate pricing models are based on reasonable assumptions about the behavior of interest rates that may fail in particular market conditions.

Most banks are asset sensitive, meaning interest rate changes impact asset yields more than they affect liability costs. This is because substantial amounts of bank funding are not affected, or are just minimally affected, by changes in interest rates. The average checking account pays no interest, or very little interest, so changes in interest rates do not produce notable changes in interest expense. However, banks have large concentrations of short-term and/or variable rate loans, so changes in interest rates significantly affect interest income. In general, banks earn more money when interest rates are high, and they earn less money when interest rates are low. This relationship often breaks down in very large banks that rely significantly on funding sources other than traditional bank deposits. Large banks are often liability sensitive because they depend on large concentrations of funding that are highly interest rate sensitive. Large banks also tend to maintain large concentrations of fixed rate loans, which further increase liability sensitivity. Therefore, large banks will often earn more net interest income when interest rates are low.

2.1.9 Interest Rate Movements and Its Relevance

Interest rate movements affect the values of securities, and therefore affect the performance of all types of financial institutions. It is critical for managers of financial institutions (including portfolio managers) to understand why interest rates change, how their movements affect performance, and how to manage according to anticipated movements (Panday 1990: p-234).

Interest rate movements can affect the values of virtually all securities. They have a direct influence on the market values of debt securities such as money

market securities, bond and mortgages. Interest rate has an indirect effect on values of stocks and exchange rates. Since the price movements in derivatives are partially influenced by the price of the underlying instruments, interest rate movements affect the prices of derivatives representing debt securities or stock or currencies. Thus, all participants in financial markets closely monitor interest rate movements. So they can restructure their positions in securities to benefit from any expected movements in interest rate .interest rate movement also effect the value of most financial institutions. Interest rate movements affect both the cost of funds to depository institutions and the interest received on same loans. In addition, the market value of securities (such as bonds) held by depository institutions or not-depository institutions are affected as well. Thus, managers of financial institutions closely monitor interest rate movements so they can capitalize on favorable movements or reduce their institutions exposure to unfavorable movements (Shrestha 1889: p-230).

2.1.10 Factors Affecting Interest Rates

Although it is assumed that deposit increase as interest increases but interest rate is affected by numerous factors. In real world, different financial institutions quote different interest rate. It means that the same type of instrument carries different interest rate at the same time, so there is presence of interest spread (Kohn, 1993: p169). For this, there are various factors affecting the difference in interest rate.

1. Credit or Default Risk

The credit risk is the most commonly associated risk. It determines the different amount individuals or firms pay based on their credit worthiness. Different parties will be offered different rates on debt obligations (such as loans). The measure of credit worthiness of an individual is called a credit rating or credit score. Other entities (such as governments and companies) will acquire a bond rating if they are active in bond markets. Credit risk requires

making estimates of the possibility of loss due to this reason. This probability is then converted into an interest rate premium, the credit or default risk premium and added to the saver‟s required nominal yield. The credit spread between an instrument and its risk free equivalent is called the risk premium.

2. Liquidity Risk

A desirable quality of assets that are to be part of a precautionary reserve is liquidity. An asset is liquid if it can be turned into cash quickly without loss. But the risk that the lender might not be able to get cash on short notice is called the liquidity risk. The difference in interest rate due to liquidity risk is called liquidity spread. Instruments such as bonds have an active secondary market. The saving bond will obviously offer a higher return. Other instruments such as savings deposits are easily transferable to cash. Another interesting phenomenon observed from liquidity spread is that on-the-run securities (primary market) have lower interest rates compare to the off-the-run securities (secondary market). This implies that there is a higher demand for on-the-run securities.

3. Marketability risk

Marketability is the capacity of being sold quickly at low transaction cost. Marketability risk deals with the degree of difficulty in being able to convert a financial into cash at its most recent transaction price or very close to it. Savers who purchase poorly marketable investments expect to be compensated for the lack of marketability. This represents an additional interest spread and is referred to as the marketability risk premium.

4. Call or Prepayment risk

Some financial claims offer the borrower the right to repay the principal debt prior to maturity. On financial claims like bond, these provisions are referred to

as call provision and on some financial claims such as home mortgage and installment auto loan, they are called prepayment provisions. These provisions are options. The borrower has the option to call or repay the debt before the maturity date. The investor in such callable financial claim must accept repayment risk. The repayment risk is that if interest rates fall, the borrower will call the bond or prepay the mortgage. The investor receiving cash cannot reinvest it at an interest rate as high as risk. The compensation that investors demand to accept this risk is an additional interest spread offered as the call premium.

5. Servicing Cost

Some financial claims are difficult to service. This means that the process of collecting interest and principal payment providing accurate records or monitoring the ongoing credit position of the borrowing involves considerable operating costs. This cost is included in the interest rate charged and is referred to as the servicing cost.

6. Exchange Rate Risk

As our financial market has become more global, there has been a significant growth in the borrowing and investment in foreign currency denominated financial claims. A U.S. company establishing manufacturing facility in Nepal might be inclined to issue shares and or bonds denominated in Nepalese rupees rather than U.S. dollars. Investors also have available to them many investments involving exchange rate risk. This risk refers to the potentiality that the rate of exchange between the domestic currency and foreign denominated currency will change as a result of any factors. The primary risk for the borrower is the devaluation of the domestic currency. This results in an unexpected cost on the international loans, since the loan would have to be repaid in the foreign currency that has risen in value relative to the domestic

currency. This potential change in currency values must be reflected in computing the cost of borrowing.

7. Taxability

The final factor influencing the change in interest rate is taxability. Financial claim income is typically subject to taxation. Since the value of the financial claim is based on its anticipate cash flow, taxation acts to reduce those cash flows. Not all incomes are taxable equally. Thus, higher the tax, lower will be the cash flow and higher the interest rate and vice versa.

2.1.11 Concept of Deposit

An arrangement whereby an individual or organization may place cash for the safekeeping in a bank, discount house or financial institution is known as deposit. Deposit is nothing but it is a type of asset. It is understood that the institution may invest the cash and pay the depositor a specified amount of interest and that the depositor can reclaim the full value of the account according to the agreed upon procedures governing the account. The account holder retains rights to their deposit, although restrictions placed on access depend upon the terms and conditions of the account and the provider. The deposit account would be shown as a liability owed by the bank to its customer. Commercial Bank Act 2031 defines "deposits" as the amount deposited in a current, saving or fixed accounts of a bank or financial institution. The deposits are subject to withdrawals by means of cheque on a short notice by customers. There are several restrictions on these deposits, regarding the amount of deposit, numbers of withdrawal etc. they are used more as investments and hence they earn some interest. The rate of interest varies depending on the nature of the deposits. The bank attracts deposits from customers by offering different rates of interest and different kinds of facilities.

Though the banks pay an important role in influencing the customer to save and open deposit account with it, it is ultimately the customer who decides

where s/he should deposit his surplus funds in current deposit account, saving deposit or fixed/time deposit account. Bank deposits arise in two ways. When the banker receives cash, it credits the customer's account, it is known as a primary or a simple deposit. People deposit cash in the banking system and thereby convert one form of money, cash into another form, bank money. They prefer to keep their money in deposit account and issue cheques against them to their creditors. Deposits also arise when customers are granted accommodation in the form of loans. Of course, there is nothing that prevents the borrower from withdrawing the entire amount of borrowing in cash but quite often s/he retains the amount with the bank as deposit (Bhandari, 2003: p73).

2.1.11.1 Types of Deposit

Banks and financial institutions offer various types of deposit a/c to attract the saving from the customers. Under this study only three types of deposit are taken which are mentions below.

1. Current Deposit

A current deposit is a running account with amounts being paid into the drawn out of the account continuously. These accounts are also called demand deposits or demand liabilities since the bank is under an obligation to pay money in such deposits on demand. The account never becomes time barred because the limitation does not run until a demand is made by the customer on the bank for the payment of deposit. These accounts are generally opened by business houses, public institutions, corporate bodies and other organization whose banking transactions are numerous and frequent. This type of account is just a facility offered by bank to its customer. So then bank doesn't give interest on this account. Under this study this type of deposit is not considered.

2. Saving Deposit

According to Commercial Bank Act 2031 (1974) saving account means "An account of amounts deposited in a bank for saving purpose." The saving deposit bears the features of both of the current and fixed period's deposits. Saving accounts are mainly meant for non-trading customer who have some potential for saving and who don't have numerous transactions entering their account. While operating the account the minimum compensating balance differ according to the bank rule. The bank fixes the minimum and maximum amount of withdraw able from this deposit. If the bank goes into liquidity priority is given to the saving deposit than current and fixed deposits while repaying the liabilities.

3. Fixed Deposit

Fixed deposits constitute a very important resource for banks and financial institutions as they need not to keep greater reserve in respect of such deposits. Under the commercial bank act 2031, "Fixed account means as account of amounts deposited in a bank for certain period of time." The customers opening such account deposit their money in the account for a fixed period. Usually, only the person or institution who wants to gain more interest opens such type of account. Bank paid higher interest rate on this account compared with saving deposit. The bank invests this money on the productive sector and gains profit and the customer too can be made his financial transaction stronger by getting more interest from this deposit. The principal amount with interest must be returned to the customer after expiry of fixed time. Bank generally gives loans up to 90% of the amount deposited under fixed deposit account against the security of the deposit. For this bank charges higher interest rate than the interest given on the fixed deposit.

2.1.12 Concept of Lending (Credit)

The word ‘credit’ means trusting. In credit transaction, the lender (or banks) must have confidence in the borrower that s/he will be able to repay the money. In credit transactions, the creditor turns over to the debtor to repay an equivalent amount usually money in future plus an added sum called interest. In other words, the commercial bank earns profit by lending the amount in terms of loan or credit and in return it gets interests.

Banks loan are classified as (a) Loan advances (b) Overdraft (c) Cash credit (d) Discounting of bills and so on. But besides this, the other forms of credit are: Bills Exchange, Cheques, Drafts, Promissory Note, Traveler’s Cheque, Treasury Bills (TBills), Letter of Credit (LC), Book Credit etc. (Shrestha & Bhandari, 2004: p255). If credit is made to the government the credit is known as public credit and transacted by the private for his own purposes the credit becomes private. There are certain distinctions between public and private credit. Bank is the major sources of credit to both private and public debtors. Sometimes banks also take credit. There is another type of credit known as investment credit and commercial credit which can be divided according to the purposes of using credit. The former refers to the credit which is used for investment and the latter for trade purposes. Similarly, another classification is consumer’s credit and producer‟s credit. The latter type of credit is the advances made to individuals firms, companies and governments, which are used to facilitate the production of goods and services.

2.1.12.1 Factors Affecting the Volume of Lending

The value of credit within a country depends upon different factors. For this study only the effect of interest rate is taken into consideration. Some other factors affecting the volume of credit are mention below:

1. Credit (lending) Rate

If the bank credit rate is very high then, the volume of credit expansion is less and vice versa. It means that there is inverse relation between credit and interest rate of credit.

2. Rate of Return

If the rate of return is high, the people inclined to invest more. People earn more profit and they become able to afford higher rate of interest along with timely repayment of loan.

3. Investment Opportunity

If the investment opportunity within the country is high, the volume of credit becomes high. More investment opportunity will be available when the interest rate is low and vice versa.

4. Pace of Financial Development

If there is enough banking facilities to provide loan in easy terms, the volume of credit may be high. If the banking facilities in the country expanded the volume of credit rises automatically.

5. Basic Infrastructure

The development of basic infrastructure in the country automatically increases the financial activities and leads to increase in the volume of credit.

6. Political Condition

The political condition of the country, especially political in-stability, is also one of the major causes of low volume of credit. In this situation, no one would like to take risk on his new capital.

2.2 Review of Journal and Articles

Pradhan (2000) in his articles, *"Deposit Mobilization, Its Problem and Prospects"* He has presented the following problems in the context of Nepal:

- People do not have knowledge and proper education for saving in institutional manner. They so now know financial organizational process, withdrawal system, depositing system etc.
- Financial institutions do not want to operate and provide their services in rural areas.
- He has also recommended about how to mobilize the deposit collection by the financial institutions by rendering their services in rural areas, by adding various services.
- By operating rural banking programmers and unit
- Nepal Rastra Bank must organize training programmers to develop the skilled human resources.
- By spreading a numbers of co-operative societies to develop mini banking services and improves the habits of public on deposit collection to the rural areas.

Manandhar (2004) conduct a study on the topic *"NRB Directives and Interest Rate in Nepal"* Nepal Rastra Bank as a central bank of Nepal control and regulate all the financial activities as well as formulate and implement necessary financial rules and regulation in the country. As a central bank of the country it is the sole controller for regulating interest rate in the country. Taking the reference of history of interest rates, we observe different changes in interest rate. In the beginning, the interest rate charged and offered by banks and financial institutions was mentioned at a lower level with a view to stimulate real income and employment. Regulation of interest rate by NRB is made in the early stage of financial market development taking the period from 1955 to 1965. But NRB gradually began to liberalize the determinations of interest rate on phase wise basis according to compatibility of the banks and the financial institutions that have developed in the country. In the early 1980's

Nepal has adopted liberal economic policy. Number of finance companies and commercial banks begin to develop and government made the liberal policy in maintaining the interest rate were encouraged for commercial banks, established under joint venture in association with foreign banks in private sector. Similarly, deregulated of interest rate was applied to under finance companies established finance company acts. As a sole institution authorized to determine interest rate NRB has full discretions on determining interest rates structure from 1960 to 1975.

On 16th November 1984 government had provided autonomy in offering the interest rate on saving and fixed deposit to the extent of 1.5% and 1% respectively above the prevailing rates. In 1986 financial institutions got freedom in fixing their interest rates in their deposits and loans. In addition, there was also limitation on the interest rate on different loans provided for the productive and priority sector. However there was limitation imposed on certain sectors of lending such as the rate of maximum of 15% on the priority sectors loan. And for other kinds of loans financial institutions were given freedom to maintain the interest rate structure. In this way government has provided freedom as well as maintains certain limitation on the determination of interest rate.

Shrestha (2006) has given a short foretaste on the *"Leanding Management in Commercial Bank, Theory and Practice".* The lending management becomes very important for both individuals as well as institutional investors. Investors would like to select a best mix of investment assets subject to the following aspects.

- Higher return which is comparable with alternative opportunities available according to the risk class of investors.
- Good liquidity with adequate safety of investment.
- Certain capital gain.
- Maximum tax concession.

- Flexible investment.
- Economic, efficient and effective investment mix

NRB (2012) *"Provisions Relating to Interest Rates"* the following Directives have been issued, having exercised the powers conferred by Section 79 of the Nepal Rastra Bank Act, 2002, with regard to the interest to be paid for the deposits and interest to be charged for loans and advances by the licensed institutions.

a. **Provisions Relating to Interest Rates:-** The "A", "B" and "C" Class licensed institutions shall be free to fix interest rates for both deposits and lending, including fixation of types of interest and procedures on their own.
b. **Prohibition for Fixing Flat Rate of Interest:-** The licensed institutions other than "D" Class institutions shall not be allowed to fix flat interest rates on the loan and advances.
c. **Interest Rate to be approved:-** Licensed institutions shall implement the interest rates for deposits and lending, procedures for calculation of interest, penal interest, commission and service charges only after approval. The institutions may increase the interest rate for deposits up to a point of 0.5 percent over the published rates, but in case of interest rate on lending it should not be higher than published rate. Provided that;
    1. Interest rate may be fixed on the agreement between bank or financial institution and customer in the case of perpetual fund or in case of deposit having the maturity period of more than five years.
    2. No provision of published interest rate shall be applicable in case of the institutional deposit to be collected on the basis of bidding.
d. **Submission of Return on Interest Rate:-** The licensed institutions shall compulsorily furnish the statements of interest rates on deposits and lending to Banks and Financial Institutions Regulation Department and the concerned Supervision Department of this Bank within seven

days of the end of each quarter. Moreover, the licensed institutions shall submit all provisions and procedures relating to interest rates according to Clause 3 above at the time of beginning of the implementation and changes made thereto within seven days.

e. **Interest Rates to be published:-** The national level "A", "B", and "C" Class licensed institutions shall publish the particulars according to Clause 4 above at the time of each amendment made in the interest rates on deposit and lending in national daily newspapers. The regional/ district level institutions shall publish the particulars of changes in the requirement of about the minimum level of balance to be maintained in the regional/district level newspapers. Provided that the "D" Class institutions may publish the rates putting the information on its notice board.

f. **Provisions of recording interest income:-** The interest accruals on loan and advances shall be recognized as income on cash basis only. The interest accrued but not realized in cash shall be recognized in the year of cash realization and the account shall be reconciled accordingly. Interest receivable for a period shall be debited to "interest receivable account" and credit to "interest suspense account".

g. **Provisions relating to providing interest:-** In situation where interest on credit/lending by banks and financial institutions on aquarterly basis, interest shall be credited to the savings account of depositors at least on every 3/3 months basis. Interest to be provided to depositors shall be provided at least on average deposit balance of week, month, quarter or other duration on the basis of which the interest has to be calculated according to the policy of the concerned bank and financial institution to provide interest on deposit liability.

(Note:"Average deposit balance" means the average of daily closing balance to be maintained after the end of daily transaction. (For example, the procedures according to which licensed banks and financial institutions use to have

calculated interest on the remaining amount of credit and lending, the same procedures shall be applied in the calculation of the interest.)

On August 22, 1992, Nepal Rastra Bank issued some directives to commercial banks and financial institutions to clearly spell out the interest rate on deposits. NRB also instructed the bank and financial institutions to limit their interest rate spread on deposit and credit at 6% within mid-December 1993. A further instruction to banks and financial institutions was issued in 2002, and now the interest rate spread required to be maintained by commercial banks and financial institutions has also been removed. The interest rate regime in Nepalese perspective changed from rigid control and monopoly of NRB to liberalization from 1960. At present there is complete freedom to have competitive system as an important part of government's liberalization policy. In this way interest rate became a market determined phenomena rather than a regulated phenomena. The process of interest rate deregulation becomes a major indicative factor of the financial system reform in the country.

2.3 Review of Previous Thesis

Bhatta (2007) conducted a study entitled *"Interest Rate and its effect on Deposit and Lending"* with the following objectives.

- To examine the relationship between interest rate and deposits
- To examine the relationship between interest rate and loans
- To present and analyze interest rate structure of various commercial banks in different time period
- To show the relationship between inflation and interest rate on deposit and lending.

The major findings of his study are as follows.

- Deposit rates of all the sample banks under study are in decreasing trend; means that every year deposit rates of sample banks under study have decreased.

- Lending rates of all the sample banks under study are also in decreasing trend; means that every year lending rates of sample banks under study have decreased.
- Analysis shows that interest rates on lending are far higher than deposit rates of sample banks. The correlation coefficient between these two variables (deposit rate and lending rate) of sample banks comes highly positive.
- The correlation analysis between lending rate and lending amount of all sample banks under study comes highly negative. This relation between two variables (lending rate and lending amount) of sample banks matches with the theory which says with the increase in lending rate, lending amount decreases and vice-versa. This thesis concluded that lending rate is the most important determinant of loan and advances of all commercial banks. This makes clear that borrower's seem more interest conscious.

Parajuli (2008), carried out a study entitled *"Interest rate and its relation with Deposit, Lending and Inflation in Nepal"*. The major objective of this study is to find out the relation of interest rate with deposit and lending amount (i.e. existence of substitution effect).

The findings drawn by Parajuli were as follows.

- The interest rate on both deposit and lending of all the sample banks are found to be in decreasing trend. Theoretically, there is positive relationship between saving amount and saving interest rate but here negative relationship is found. It states that there is no substitution effect in Nepalese financial market.
- Analysis of fixed deposit amount and fixed interest rate shows negative relationship except RBB and NBL. Theoretically, there is negative relationship between lending interest rate and lending amount. In this study for the 5 sample banks except NBL have negative correlation between these two variables.

- The relationship between interest rate on deposit and inflation rate is positive. Similarly, the correlation between interest rate on lending and inflation rate is found to be moderately positive.
- This thesis concluded that the spread between deposit interest rate and lending interest rate is in decreasing trend.

Shrestha, (2009) conduct a study on the topic *"A study of Interest Rate & its impact on Resource Mobilization and Utilization".* The main objectives of the study were;

- How far the interest rate impact on the mobilization in order to meet the lack of capital for the implementation of various project.
- To see the deposit credit margin ratio throughout the changed incurred in the interest rate by which one can see that how far the deposits have been effectively utilized.

With the above mention objective his major findings were;

- The structure of interest rate has greater influence over the resource mobilization and utilization in the productive sector.
- The commercial banks of Nepal are not fully succeeded in this regards.
- The commercial banks are not fully been able to motivate and facilitate to their customer except the change in interest rate as instructed by central bank.
- It can be solved by attracting saving into maximum and mobilization these savings into the sector where money is needed. For this branches should be extended even to the remote area of the country and mobilized those idle deposits and diversified their money according to needs.

Joshi (2011), has conducted a study on *" Deposit and Lending of Commercial Bank of Nepal"* a comparative study of SCBNL with NABIL Bank and BOK.

Her Main Objectives

- To examine the liquidity assets management and profitability position and investment policy of SCBNL in comparison to NABIL and BOKL.
- To analyze the relationship between loan and advance and total investment with other financial variable of SCBNL and compare with NABIL and BOKL.
- To study the various risks in investment of SCBNL in comparison to NABIL and BOKL.

Her Majors Findings

- SCBNL has higher idle cash and bank balance. It may decrease profit of bank. It is good to invest more on share & debentures as it encourage financial and economic development of the country.
- A commercial bank must mobilize its fund in different sector such as to purchase share & debentures of other financial and non financial companies out of total working fund.
- SCBNL has invested its more of the funds i.e. total investment on total deposit ratio, in comparison to other commercial banks but percentage of investment on share and debenture in very nominal.
- Portfolio condition of a bank should be regularly revised from the time to time. It should always try to maintain the equilibrium in the portfolio condition of the bank. So it can be said "all eggs should not be kept in the same basket".
- On the basis of above facts, it is seen that SCBNL has invested much of its fund in total outside assets but it has not achieved the desired result.
- The risk taken by SCBNL, from the angle of credit and capital are in an average whereas the consistencies of the same are highly volatile which may result higher loss. The bank should not test those risks on an experiment basis as seen from the consistency angle.

2.4 Research Gap

Research gap refers to the gap between previous research and this research. The different students, experts and researcher about deposit mobilization, lending and interest rate have conducted many research studies. There have been fund numerous research studies on financial companies and public enterprises regarding deposit mobilization, lending and interest rate. But impact of interest rate on deposit & lending of Nepalese commercial banks can be hardly fund from the review of related studies no one study have been found on impact of interest rate on deposit & lending of Nepalese commercial banks with reference to SBL and LBL.

The financial and statistical tools used by most of the researchers were ratio analysis, test of hypothesis and regression analysis. This study includes different tools like ratio analysis, correlation analysis and co-efficient of variation, trend analysis, t-test as specific tools. Thus the research study made on " impact of interest rate on deposit & lending of Nepalese commercial banks with reference to SBL and LBL " will be an effort to analyze on detail about the interest rate, deposit and lending of the SBL & LBL in present situation with the help of various related financial as well as statistical tools and techniques. The study can be beneficial to all the concerned parties and people as well.

CHAPTER – III

RESEARCH METHODOLOGY

Research in common parlance refers to a search for knowledge is composed by means repeatedly or again and again and "search" means to investigate or find. Research methodology is a way to systematically solve the research problem. Research methodology may be defined as "a systematic process that is adopted by the researcher in studying problem with certain objective and view". In other word, research methodology describes the methods and process applied in the entire aspect of the study focus of data, data gathering instrument and procedure, data tabulating and processing and methods of analysis. It is really a method of critical thinking by defined and redefining the problems, formulating hypothesis or suggested solution and collecting and organizing and evaluating data, making deduction and making conclusions. Research methodology is a path from which we can solve research dilemma systematically to accomplish the basic objective of the study. It consists of a brief explanation of research design, nature and sources of data, method of data collection and methods of tools used for analyzing data.

3.1 Research Design

A research design is the arrangement of conditions for collection and analysis of data that aim to combine relevance to the research purpose with economy in procedure. Research design in the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to objective of this study. To achieve the objective of this study, descriptive and analytical research design has been used. A descriptive study is one in which information is collected without changing; the environment (i.e., nothing is manipulated). A descriptive research design refers to the process of describing what current conditions or attitudes exist at the moment and the analytical surveys describe and explain why certain situations exist.

It is the process, which gives us an appropriate way to reach research goal. It includes definite procedures and techniques, which guide in sufficient way for analyzing and evaluating the study. This study is carried out by using quantitative analysis method. Mostly, secondary data has been used for analysis; hence, research design of this study is based on descriptive and analytical method.

3.2 Sources of Data

Mainly the study is conducted on the basis of secondary data. The data relating to the interest rate, deposit and lending are obtained from the annual reports of the concern banks and the other data relating to the topic is obtain from the economic bulletin of Nepal Rastra Bank and the different government publications. The supplementary data and information are obtained from the sample banks.

3.3 Population and Sample

All the commercial banks of Nepal as a population of the study and among them two commercial banks are selected as sample. There are 32 commercial

banks are operating in Nepal; hence it is not possible to study all of them regarding the study topic. Therefore sample will be done selecting from population. The Sample to be selected are as follows.

1. Siddhartha Bank Limited
2. Lumbini Bank Limited.

3.4 Research Variables

The basic research variables of this study are mainly related with the " Impact of Interest Rate on Deposit & Lending of joint venture Banks.". Such variables are interest rate, deposit and lending.

3.5 Data Processing and Presentation

The information or data obtained from the different sources are in raw form. From that information, direct presentation is not possible. So it is necessary to process data and converts it into required form. After then only, the data are presented for this study. This process is called data processing. For this study, only required data are taken from the secondary source (bank's publication) and presented in this study. For presentation, different tables are used. Similarly, in some case graphical presentation is also made. For reference, the photocopies of raw data are attached in the last portion of this thesis. So far as the computation is concerned, it has been done with the help of scientific calculator and computer software program.

3.6 Data Analysis Tools

In order to get the concrete results from this research, data are analyzed by using different types of tools. As per topic requirements, emphasis is given on statistical tools rather than financial tools.

3.6.1 Financial Tools

a. Credit Deposit Ratio

The total credit is the loan and advance and investment. Loan is the sum of the money that will be repay by the borrower. Investment is defined simply to be the sacrifice of current consumption for future consumption whose future objective is to increase future wealth.

Credit deposit ratio (CD Ratio) = $\frac{\text{Total Credit}}{\text{Total Deposit}}$

b. Growth Ratio

Growth Ratio is calculated to find out how would the bank is maintaining economic and financial condition. The following formula has been used to calculate growth ratio.

$$D_n = D_0 (1+g)^{n-1}$$

Where,

D_n = Total amount in nth year.

D_0 = Total amount in beginning year

G = Growth rate of amount

N = Total no. of years during the study period.

To examine and analysis following growth ratio are calculated in this study.

- Growth ratio of Deposit.
- Growth ratio of total Lending.

c. Percentage Change

To find out the changing positions of different amount this ratio is used. This ratio is calculated to measure the acceleration or retardation of any variables to the company is to take the suitable direction. It is calculated in following way.

$$\text{Annual percentage change} = \frac{Amount\ of\ This\ Year - Amount\ of\ Last\ Year}{Amount\ of\ Last\ Yeat}$$

d. Cash and Bank Balance to Total Deposit Ratio

Cash and bank balance are the most liquid current assets of a firm, cash and bank balance to total deposit ratio measures the percentage of most liquid assets to pay depositors immediately. This ratio is computed dividing the amount of cash and bank balance by the total deposits. It can be presented as,

$$\text{Cash and Bank Balance} = \frac{Cash\ and\ Bank\ Balance}{Total\ Deposit}$$

3.6.2 Statistical Tools

Statistical tools are used to analyze the relationship between two variables and to find how these variables are related. In this study, following statistical tools are used.

a. Summary Measures

The summary measures such as mean ± standard deviation for summering the data related to deposit, lending and interest rate etc. has been applied Mena and standard deviation computed as follows.

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

Where,

$\overline{X}$ = Arithmetic Mean

$\sum X$ = Sum of values of all items, and,

N = Number of items

$$\text{Standard deviation}(\sigma) = \sqrt{\frac{\sum(X-\bar{x})^2}{n-1}}$$

Where,

$\boldsymbol{\sigma}$ = Standard deviation

$\sum(\mathbf{X} - \bar{\mathbf{x}})^2$ = Sum of squares of the deviations measured from arithmetic average.

n = Number of items

b. Coefficient of Variation (CV)

The coefficient of variation is the ratio of standard deviation to the mean for a given sample used to measure spread. It can also be thought of as the measure of relative risk. The larger the coefficient of variation, the greater the risk relative to the average. Mathematically,

$$CV = \frac{\sigma}{\bar{X}} \times 100$$

Where,

CV = Coefficient of Variation

$\boldsymbol{\sigma}$ = Standard Deviation

$\bar{X}$ = Arithmetic Mean

c. Coefficient of Correlation

Correlation is a statistical tool design to measure the degree of association between two or more variables. In other word if the changes in one variable affects the changes in other variable, then the variable are said to be co-related when it is used to measure the relationship between two variables, then it is called simple correlation. The coefficient of correlation measures the degree of relationship between two sets of figures. Among the various methods of finding out coefficient of correlation, Karl Pearson's method is applied in the study because of the simplicity and suitable for the nature of data. The result of coefficient of correlation is always lying between +1 and -1.The formula for the calculation of coefficient of correlation between X and Y is given below.

$$r = \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2 \sum x_2^2}}$$

Where,

r = Correlation coefficient

$\sum x_1 = X_1 - \overline{X}_1$

$\sum x_2 = X_2 - \overline{X}_2$

d. Least Square Linear Trend Analysis

Trend analysis has been a very useful and commonly applied statistical tool to forecast the future events in quantitative terms. On the basis of tendencies in the dependent variables in the past periods, the future trend is predicted. This analysis takes the historical data as the basis of forecasting. This method of forecasting the future trend is based on the assumptions that the past tendencies of the variable are repeated in the future or the past events affect the future events significantly The future trend is forecasted by using the following formula.

$$Y = a + bx$$

where,

Y = the dependent variable

a = Y intercept

b = the slope or the rate of change of Y per unit change in x

x = the independent variable

e. Assessment of the Sample Correlation Coefficient

For this study, t-test for significance of an observed and sample correlation coefficient is used.

Set up Hypothesis

Null hypothesis (H_0); $\rho = 0$ i.e. There is no correlation between the considered variables.

Alternative Hypothesis (H_1); $\rho \neq 0$ i.e. There is significant correlation between the considered variables.

Test statistic under H_0;

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

Where,

r	=	Sample correlation between two variables
r^2	=	Sample correlation Coefficient
n	=	No of Pair of observations

Level of significance: Level of significance $\propto = 5\%$

Critical Value: Tabulated or critical value of t at $\propto$ % level of significance for (n - 2) degree of freedom obtain from 't' tables.

Decision: If calculated 't' is less than or equal to tabulated value of 't' it falls in the accepted region and the null hypothesis is accepted and if calculated 't' is greater than tabulated 't' null hypothesis is rejected.

CHAPTER - IV

PRESENTATION AND ANALYSIS OF DATA

This chapter of data presentation and analysis related to impact of interest rate on deposit and lending of commercial banks begins with analysis different financial ratios. These financial indicators of concerned banks are compared with the help of statistical tools viz. Mean standard deviation and coefficient of variables which are calculated and interpreted. At last, correlation and trend analysis of some specific component has been made. The data are also presented in graph.

4.1 Analysis of Deposit and Interest Rate

Deposit is the sum of money lodged with a bank, discount house or other financial institution. Deposit is nothing more than the assets of an individual which is given to the bank for safe-keeping with an obligation to get something (interest) from it. To a bank these deposits are liabilities. In this section, detail

study is made about deposit amount and interest rate of sample banks. For this study, only saving and fixed deposits (One & More than One Year) are considered because current deposit doesn't earn any interest.

4.1.1 Siddhartha Bank Limited (SBL)

Prior to entering into the main topics, it is preferable to take a glance on the interest rate structure on different types of deposits. This is essential because the interest rates are generally different in magnitude every sample banks. These differences are due to the numerous factors like maturity period, policy of bank, goodwill of organization and so on.

Table: 4.1

Interest Rate on Deposit of SBL

Deposit	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Saving	4.00	4.00	2.75	2.50	3.00	2.00	2.00	2.00	2.00	3.00
Fixed										
1 Year	5.50	5.50	4.50	3.50	4.00	4.00	3.50	5.00	7.00	9.50
2Years Above	-	-	-	4.00	4.00	4.25	4.25	5.75	8.00	10.00
Mean of FDIR	5.50	5.50	4.50	3.75	4.00	4.13	3.88	5.38	7.50	9.75
Average Rate	4.75	4.75	3.63	3.13	3.50	3.07	2.94	3.69	4.75	6.38

Source: Banking and financial statistics NRB (2002 to 2011)

The table 4.1, portrays the interest rate of SBL on saving deposit and fixed deposits. The interest rate on deposits are fluctuated, means both on increasing

and decreasing trend. In the 10 years fiscal periods, the saving deposit interest rates are fluctuate. The average interest rate on fixed deposit is 5.50% in 2002 and 2003 but it was 4.50%, 3.75%, 4%, 4.13%, 3.88%, 5.38%, 7.50% and 9.75% in FY 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2011 respectively. It shows that the average interest rate is in decreasing trend during FY 2002 to 2005, it increase at 2006 to 2007 and decreased at 2008 after that increasing up to 2011. Similarly the saving deposit interest rate is 4%, 4%, 2.75% and 2.50% and 3% in FY 2002, 2003, 2004, 2005 and 2006 respectively after that the rate of interest remain constant up to the FY 2010 at the rate of 2% and increase in 2011.

Figure: 4.1

Trend of Interest Rate on Deposit of SBL

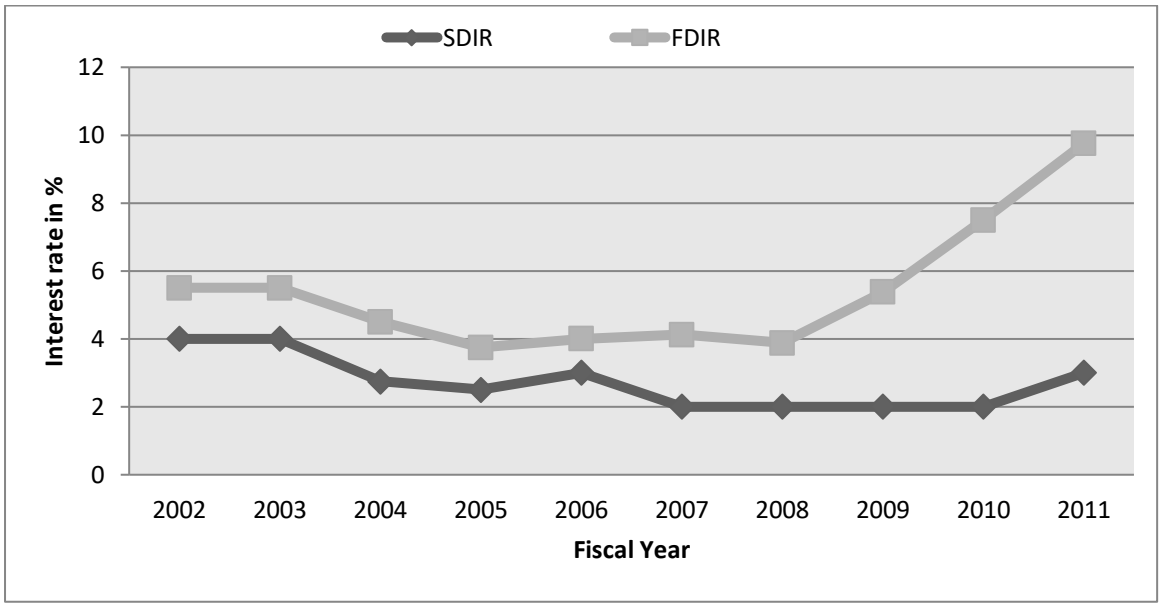


Table: 4.2

Deposit Position of SBL

Year	SDIR %	SD	FDIR %	FD

		(Rs. In Millions)		(Rs. In Millions)
2002	4	4917.1	5.5	3719.2
2003	4	4889	5.5	2446.8
2004	2.75	5237.4	4.5	2252.6
2005	2.5	5994.1	3.75	2310.6
2006	3	7026.4	4	2078.6
2007	2	8770.8	4.13	3450.2
2008	2	10187.4	3.88	5435.2
2009	2	12160	5.38	8464.1
2010	2	14620.4	7.5	8310.7
2011	3	13783.6	9.75	14711.1
Mean ± SD	2.73 ± 0.79	-	5.39 ± 1.91	-
CV	28.83%	-	35.41%	-

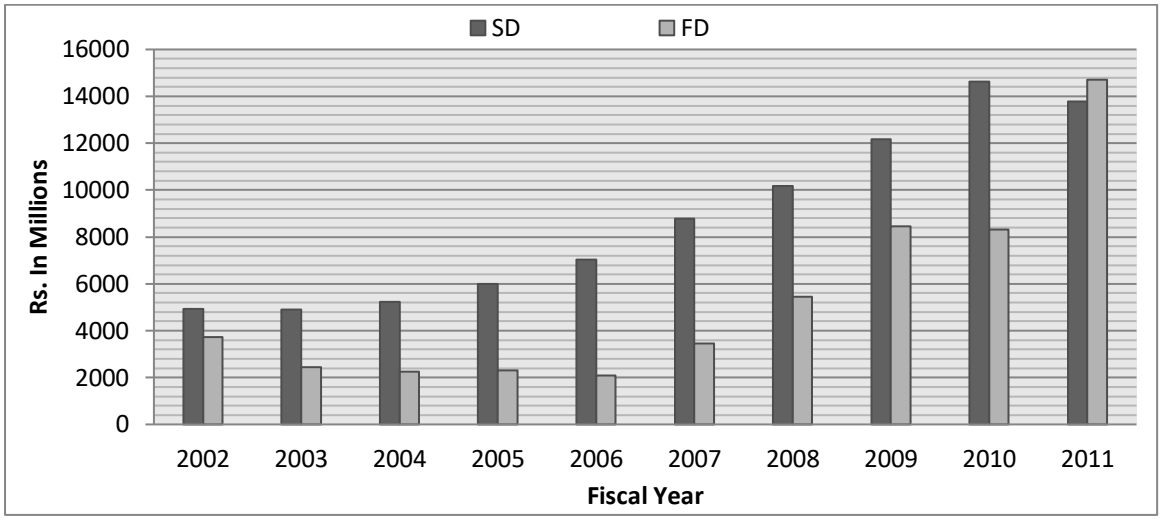
Source: Banking and financial statistics NRB (2002 to 2011)

The table 4.2, shows the amount of saving deposit and its interest rate as well as amount of fixed deposit and its interest rate for 10 fiscal year. The table indicates that, saving deposit rates are declining except the year 2006 and 2011 and deposit amount is increasing in each fiscal year except the year 2003. This suggests that saving deposit interest rate and saving deposit amount may have negative relationship, i.e. when SDIR is found to be decreased, amount of Saving deposit increase. However, the fixed deposit amount has been fluctuated over the study period except.

The average value of SDIR is 2.73% and the FDIR is 5.39%. The Standard Deviations of SDIR, and FDIR are 0.79% and 1.91% respectively, it means SDIR is less variability in compare to FDIR. The CV of SDIR and FDIR ratio of SBL is 28.83% and 35.41% respectively which indicate that FDIR is more variable than SDIR.

Figure: 4.2

Deposit Position of SBL



4.1.2 Lumbini Bank Limited (LBL)

Table: 4.3

Interest Rate on Deposit of LBL

Deposit	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Saving	5.25	5.25	5.25	5.00	3.25	3.25	3.00	3.00	3.00	3.00
Fixed										
1 Year	6.25	6.25	6.00	5.50	3.50	4.00	4.00	5.00	5.00	5.00
2 Years Above	6.75	6.75	6.25	6.00	4.00	4.50	4.50	5.25	5.25	5.25
Mean of FDIR	6.50	6.50	6.13	5.75	3.75	4.25	4.25	5.13	5.13	5.13
Average	5.88	5.88	5.69	5.38	3.50	3.75	3.63	4.07	4.07	4.07

Rate										

Source: Banking and financial statistics NRB (2002 to 2011)

Table 4.3, portrays the interest rate of LBL on saving deposit and fixed deposits. The interest rate on saving deposit is fluctuated, means both on increasing and decreasing trend. The interest rate on saving deposit is 5.25% in the 2002 to 2004 but it was 5% in 2005, 3.25% in 2006 & 2007 after that the rate is constant at the rate of 3%. It shows that the interest rate is in constant during FY 2002 to 2004, it decrease at 2005 to 2007 after that constant up to 2011. Similarly the average fixed deposit interest rate is 6.50%, 6.50%, 6.13%, 5.75%, 3.75%, 4.25% and 4.25% in FY 2002, 2003, 2004, 2005, 2006, 2007 and 2008 respectively after that the rate of interest remain constant up to the FY 2011 at the rate of 5.13%.

Figure: 4.3

Trend of Interest Rate on Deposit of LBL

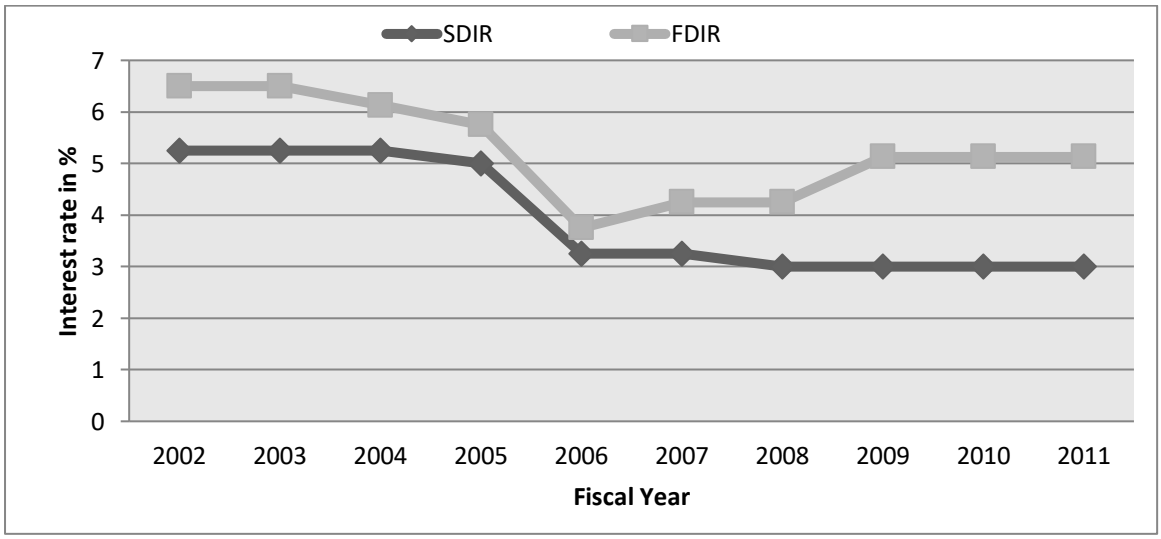


Table: 4.4

Deposit Position of LBL

Year	Saving Deposit Interest Rate (SDIR %)	Saving Deposit (Rs. In Millions)	Fixed Deposit Interest Rate (FDIR %)	Fixed Deposit (Rs. In Millions)
2002	5.25	1384.1	6.5	2470.2
2003	5.25	1733.3	6.5	2694.6
2004	5.25	2758	6.13	2803.4
2005	5	3730.7	5.75	29131.1
2006	3.25	4806.9	3.75	3444.5
2007	3.25	6929.2	4.25	3298.2
2008	3	9018	4.25	5658.7
2009	3	11883.9	5.13	6558
2010	3	14782.3	5.13	7094.7
2011	3	13360	5.13	10440.3
Mean ± SD	3.93 ± 1.09	-	5.25 ± 0.97	-
CV	27.85%	-	18.44%	-

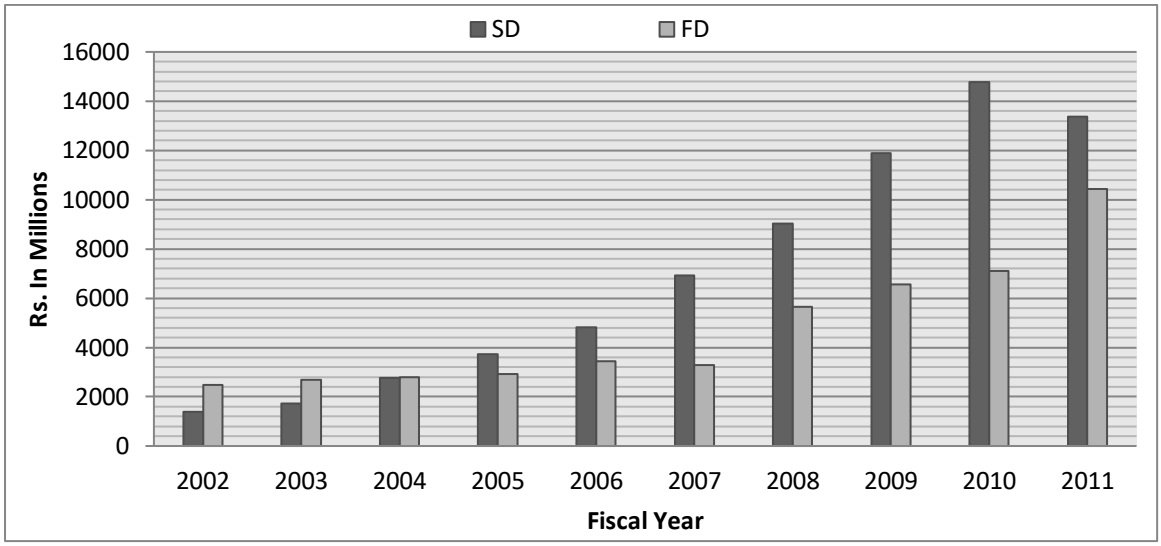
Source: Financial Statement of Sample Banks from 2002 to 2011

Table 4.4, shows the amount of saving deposit and its interest rate as well as amount of fixed deposit and its interest rate for 10 fiscal year. The table indicates that, in one hand deposits rates are declining where as in other hand deposits amount is increasing in each fiscal year, except the year 2011. This suggests that deposit interest rate and deposit amount may have negative relationship, i.e. when DIR is decreased, amount of deposits increase.

The average value of SDIR is 3.93% and the FDIR is 5.25. The Standard Deviations of SDIR, and FDIR are 1.09% and 0.97% respectively, it means FDIR is less variability in compare to SDIR. The CV of SDIR and FDIR ratio of LBL is 27.85% and 18.44% respectively which indicate that SDIR is more variable than FDIR.

Figure: 4.4

Deposit Position of LBL



4.2 Analysis of Lending and Interest Rate

This is second area of the analysis where mainly the relationship between lending interest rate and its effect upon lending amount is measured.

4.2.1 Interest Rate on Lending

Generally, when there is higher interest rate (esp. lending or credit rate) in the economy, people normally borrow lesser amount than the period when lending interest rate is low. According to theory, when there is low lending rate, then there should be higher amount of borrowing.

Table: 4.5

Interest Rate on Lending

Year	**Banks (Interest Rates in %)**	
	SBL	**LBL**
2002	11.93	11.46

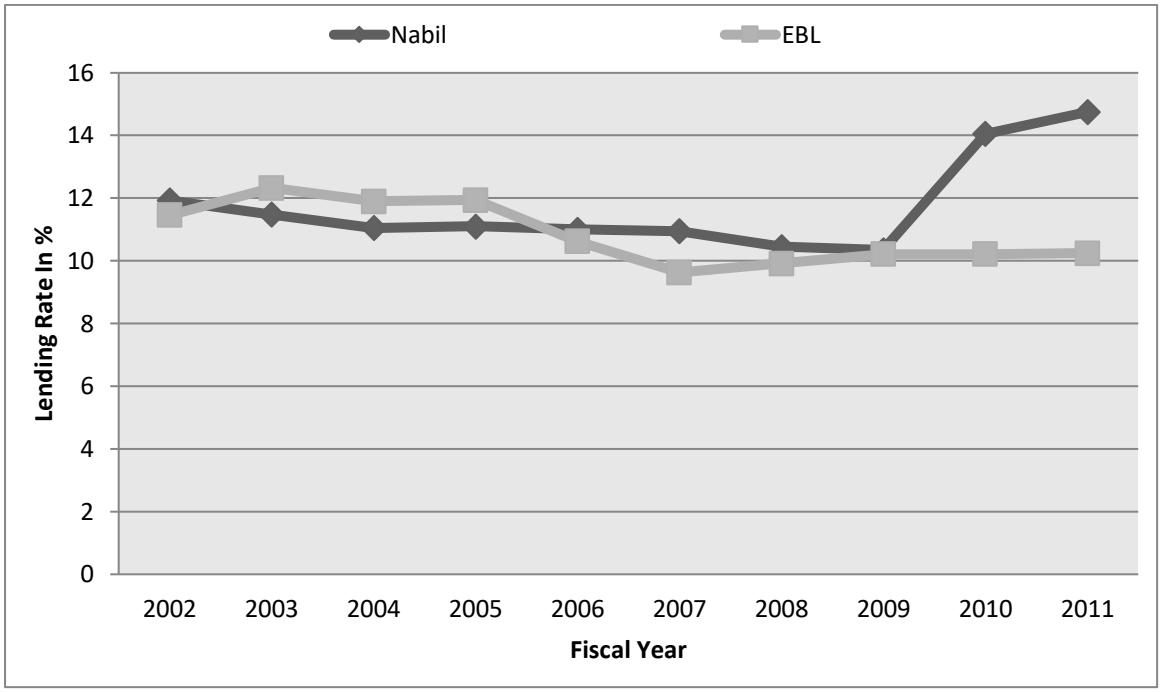
2003	11.48	12.33
2004	11.05	11.90
2005	11.10	11.94
2006	11	10.62
2007	10.95	9.63
2008	10.45	9.92
2009	10.35	10.21
2010	14.06	10.21
2011	14.75	10.25
Mean ± SD	11.71 ± 1.50	10.85 ± 0.97
CV	12.79%	8.93%

Source: Banking and financial statistics NRB (2002 to 2011)

Lending activity of commercial banks can be diversified into different sectors. But according to the publication of Nepal Rastra Bank- Banking & Financial statistics- the loan of commercial banks are classified in different sub-sectors like overdraft, export credit, Import LC, commercial loan and so on. Besides this there are other section (area) when bank provides loan and these areas are placed in the topic of "others". For this study, lending area are categorized as classified by NRB. According to table 4.5, it shows that average interest rate on lending of different area. The average interest rate in lending of SBL is in decreasing trend except the year 2010 and 2011 and the average interest rate in lending of LBL is in fluctuating trend over the study period. Over the study period, the average lending rate of SBL is high than LBL. The average lending rates are 11.71 and 10.85% of SBL and LBL respectively. The standard deviation of lending rate of SBL is the high than LBL, it means in the lending rate SBL has high variability than LBL and the CV also shows the same result. It is also observed that, there is least variability found in interest rate on lending of LBL than the SBL bank.

Figure: 4.5

Trend of Interest Rate on Lending of Sample Banks



4.2.2 Lending Amount (Credit)

The total credit is the loan and advance and investment. Loan is the sum of the money that will be repay by the borrower. Investment is defined simply to be the sacrifice of current consumption for future consumption whose future objective is to increase future wealth. The general public gets attracted to take loan and advances from the bank if the interest rate is lower. The bank provides loan to the general public for different purposes like industry, trade, commerce etc.

Table: 4.6

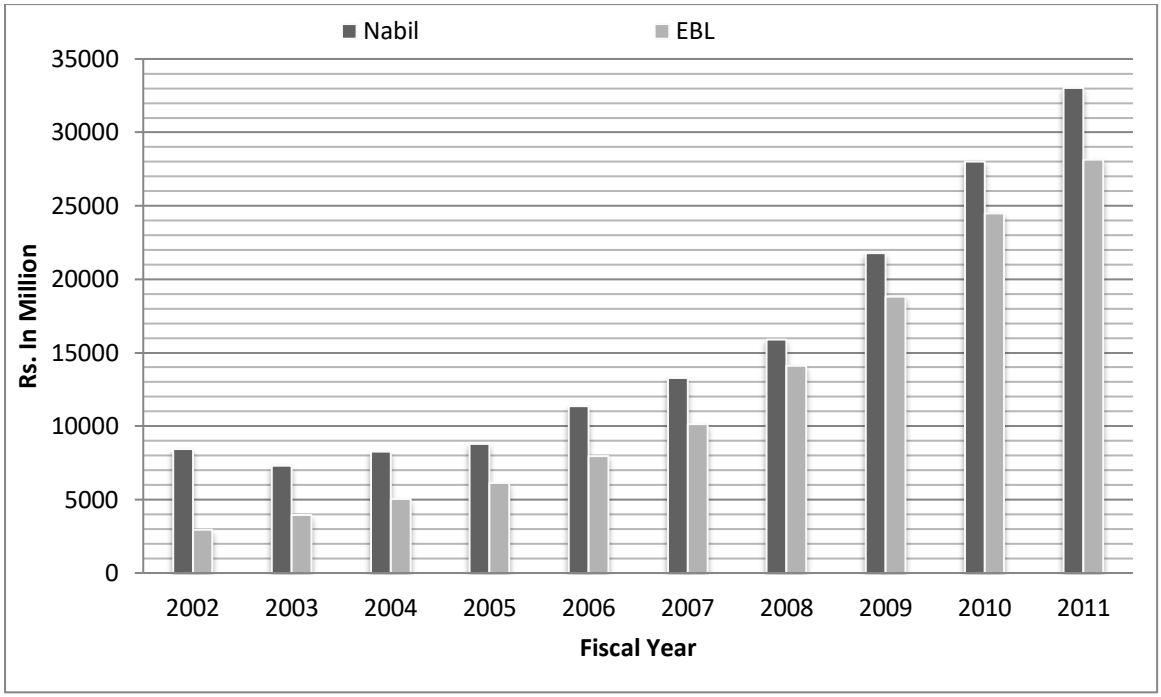
Lending Amounts of Sample Banks **Year**	**Lending Amounts (Rs. In Millions)**	
	SBL	**LBL**
2002	8437.60	2963.70
2003	7328.20	3969.60
2004	8267.80	5030.90

2005	8769.70	6116.60
2006	11360.30	7944.10
2007	13278.80	10154.90
2008	15903.00	14100
2009	21769.70	18836.40
2010	27997.10	24469.60
2011	33031.00	28156.40
Mean	15614.32	12174.22

Source: Banking and financial statistics NRB (2002 to 2011)

Figure: 4.6

Lending Position of Sample Banks



The above table shows the lending amount of sample banks. Over the study period, the amount of lending of SBL is decrease in 2003 after that increasing trend up to 2011 and LBL has increasing trend of lending amount over the study period.

The above table 4.6 clear that there is positive relationship between lending rate and lending amount i. e. if lending rate is increase the amount of deposit also increase and if the lending rate is decrease the amount of lending also decrease.

4.3 Analysis of Credit Deposit Ratio (CD Ratio)

The total credit is the amount of loan and advance and bills purchased. Loan is the sum of the money that will be repay by the borrower. It shows the effectiveness of firm to utilize the collected deposit, higher the ratio higher the firm effectiveness.

$$\text{Credit deposit ratio (CD Ratio)} = \frac{Total\ Credit}{Total\ Deposit}$$

Table: 4.7

Computation of CD Ratio of SBL

Year	Total Credit (C) (Rs. In Millions)	Total Deposit (D) (Rs. In Millions)	CD Ratio (C/D Ratio) (In %)
2002	8437.6	15838.9	53.27
2003	7328.2	15370.6	47.68
2004	8267.8	13437.7	61.53
2005	8769.7	14098.0	62.21
2006	11360.3	14586.8	77.88
2007	13278.8	19348.4	68.63
2008	15903	23342.4	68.13
2009	21769.7	31915.0	68.21
2008	27997.1	37348.3	74.96
2011	33031	46334.8	71.29
Mean ± SD			65.38 ± 9.39
CV			14.37%

Source: Banking and financial statistics NRB (2002 to 2011)

Table 4.7 shows that there is a greater relationship between deposits and credit. Increase in deposits leads to increase in the loan and advance. The above analysis shows that more than 65% of the deposited amount has been succeeded to mobilize the resources. Its highest ratio is 77.88% and lowest ratio is 47.68%. The higher amount of deposit of this bank than credit is due to the constriction of this bank in deposit collection. The bank successes to attract people to deposit their savings. Higher the CD ratio indicates the more effective working policy of the bank. So that, higher utilization of the resources in the bank means good managing ideas or policy of the bank.

Figure: 4.7

Trend of CD Ratio of SBL

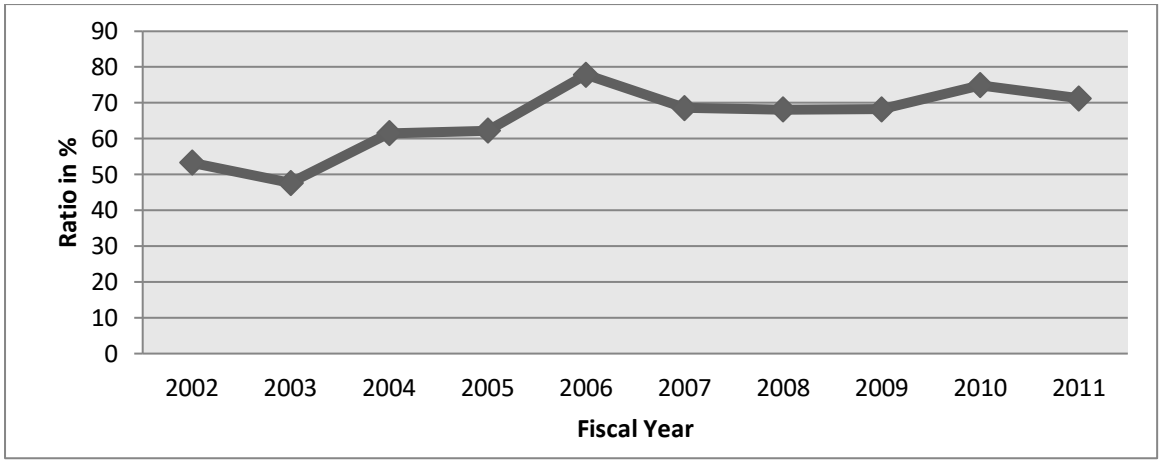


Table: 4.8

Computation of CD Ratio of LBL

Year	**Total Credit (C) (Rs. In Millions)**	**Total Deposit (D) (Rs. In Millions)**	**CD Ratio (C/D Ratio) (In %)**
2002	2963.7	4774.5	62.07
2003	3969.6	5461.1	72.69
2004	5030.9	6694.9	75.15
2005	6116.6	8064	75.85
2006	7944.1	10079.8	78.81
2007	10154.9	13802.5	73.57
2008	14100	19097.7	73.83
2009	18836.4	23976.3	78.56
2008	24469.6	33322.9	73.43
2011	28156.4	36932.3	76.24
Mean ± SD			74.02 ± 4.69
CV			6.34%

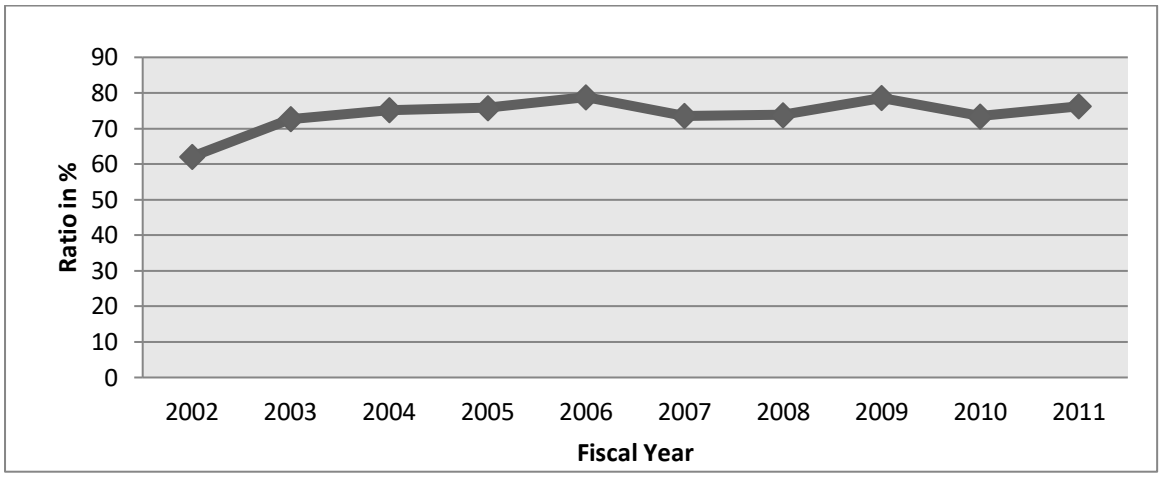
Source: Banking and financial statistics NRB (2002 to 2011)

Table 4.8 shows that more than 74% of the deposited amount has been succeeded to mobilize the resources. Its highest ratio is 78.81% and lowest ratio is 62.07%. The bank successes to attract people to deposit their savings.

Higher the CD ratio indicates the more effective working policy of the bank. So that, higher utilization of the resources in the bank means good managing ideas or policy of the bank.

Figure: 4.8

Trend of CD Ratio of LBL



4.4 Growth Ratio Analysis

Table: 4.9

Growth Ratio of Deposit & Credit

Banks	Variables	Growth Rate
SBL	Deposit	13.07%
	Credit	16.37%
LBL	Deposit	25.52%
	Credit	28.42%

Source: Appendix X

Table 4.9 shows that the growth ratio of total deposit and credit of SBL & LBL during the study period. The growth ratios of deposit of SBL & LBL are 13.07% & 25.52% and the growth ratio of lending of SBL & LBL are 16.37% & 28.42% respectively. It shows that the bank is utilizing the collected deposit as per the growth of total deposit. Therefore, it can be concluded that the bank seems in better condition to increase the growth ration of total credit

4.5 Analysis of Cash & Bank Balance to Total Deposit Ratio

Table: 4.10

Cash & Bank Balance to Total Deposit Ratio

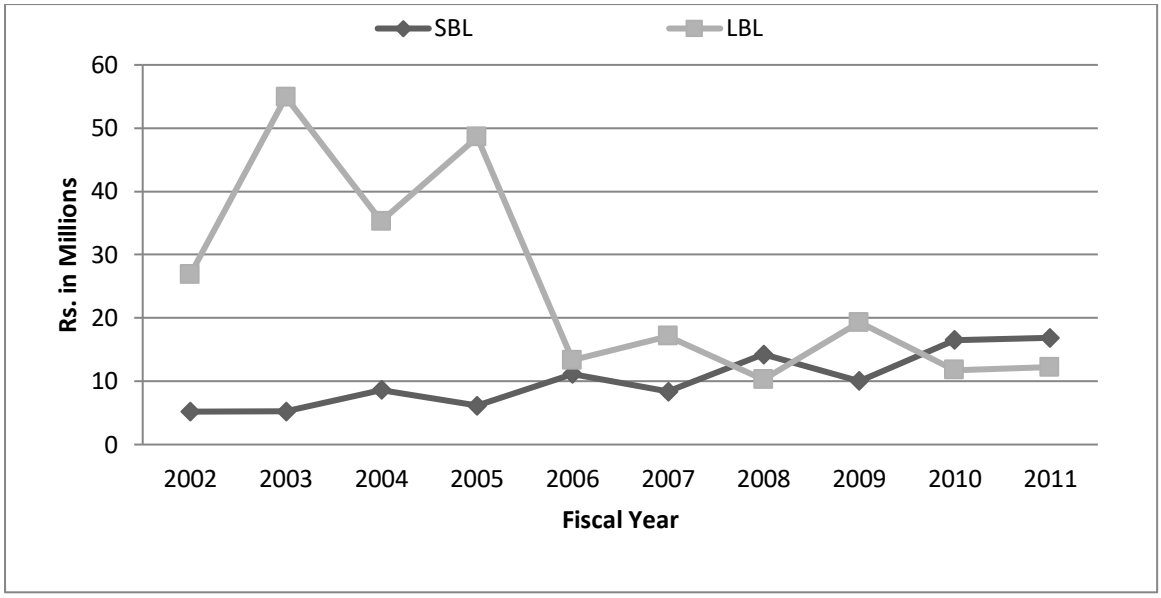
Year	**Banks**	
	SBL	**LBL**
2002	5.20	26.91
2003	5.26	54.92
2004	8.60	35.28
2005	6.17	48.57
2006	11.13	13.35
2007	8.37	17.14
2008	14.26	10.28
2009	10.02	19.28
2010	16.51	11.78
2011	16.87	12.22
Mean	10.24	24.97
SD	4.39	16.14
CV	42.83%	64.64%

Source: Appendix XII & XIII

Table 4.10 shows the cash and bank balance to total deposit ratio of sample banks for the study period of ten years. The ratios of both banks are in fluctuating trend over the study period. Comparatively the ratios of LBL are greater than the ratios of SBL except the fiscal year 2008 & 2010. The average ratios of SBL and LBL are 10.24 & 24.97 percentages and the standard deviation are 4.39 & 16.14 percentages of SBL & LBL respectively. The CV of SBL & LBL is 42.83 and 64.64 percentages, which shows the greater variability of cash and bank balance to total deposit ratio in each year.

Figure: 4.9

Trend of Cash & Bank Balance to Total Deposit Ratio



4.6 Correlation Analysis

To find out the correlation between two continuous variables, Karl Pearson's co-efficient of correlation (r) is used. One of the very convenient and useful way of interpreting the value of coefficient of correlation(r) between the two variables is coefficient of determination, which is denoted by r^2. It explains the total variation in dependent variable is explained by independent variable.

The significance of coefficient of correlation (r) is tested with the help of 't' test. If calculated 't' is less than or equal to tabulated value of 't' it falls in the accepted region and null hypothesis is accepted or 'r' is not significant, if calculated 't' is greater than tabulated 't' null hypothesis is rejected or 'r' is significant of correlation in the population.

4.6.1 Relationship between Deposit Rate and Deposit Amount

Coefficient of correlation measures the degree of relationship between two variables, Deposit Rate (DR) & Deposit Amount (DA). DR is independent variable (X_1) and DA is dependent variable (X_2). The purpose of computing is

to find out the relationship between DR and DA is going to same direction or opposite direction.

Table 4.11

Correlation between Deposit Rate and Deposit Amount

Factors	**Banks**	
	SBL	**LBL**
r	0.5422	-0.2615
r^2	0.2940	0.0683
Calculated 't' Value	1.825	0.766
Tabulated 't' Value	2.262	2.262
Remarks	Insignificant	Insignificant

Source: Appendix IV & V

From the Table 4.11, the values of coefficient of correlation (r) of LBL & SBL are -0.2615 & 0.5422 respectively which shows that there is a negative correlation between DR and DA of LBL but the correlation of SBL bank is positive it shows the positive relationship between DR and DA of SBL. The value of coefficient of determination (r^2) is 0.2940 and 0.0683 of SBL and LBL, which shows that 29.40% and 6.83% of the total variation in dependent variable (DA) is explained by independent variable (DR). The calculated 't' value of SBL and LBL are less than the tabulated value i.e. 1.825 < 2.262, and 0.766 < 2.262 respectively, therefore it reveals that the relationship between DR and DA has not come out significant statistically. The insignificant in the correlation coefficient might be because of the small sample size.

4.6.2 Relationship between Lending Rate and Lending Amount

Coefficient of correlation measures the degree of relationship between two variables, Lending Rate (LR) & Lending Amount (LA). LR is independent

variable (X_1) and LA is dependent variable (X_2). The purpose of computing is to find out the relationship between LR and LA is going to same direction or opposite direction.

Table 4.12

Correlation between Lending Rate and Lending Amount

Factors	**Banks**	
	SBL	**LBL**
r	0.7158	-0.6679
r^2	0.5124	0.4461
Calculated 't' Value	2.896	2.539
Tabulated 't' Value	2.262	2.262
Remarks	Significant	Significant

Source: Appendix VI & VII

From the Table 4.12, the values of coefficient of correlation (r) of LBL is -0.6679 which shows that there is a negative correlation between LR and LA of LBL but the correlation of SBL bank is positive it shows the positive relationship between LR and LA of SBL. The value of coefficient of determination (r^2) is 0.5124 and 0.4461 of SBL and LBL, which shows that 51.24% and 44.61% of the total variation in dependent variable (LA) is explained by independent variable (LR). The calculated 't' value of SBL and LBL are higher than the tabulated value i.e. 2.896 > 2.262, and 2.593 > 2.262 respectively, therefore it reveals that the relationship between LR and LA has come out significant statistically.

4.7 Least Square Linear Trend Analysis

4.7.1 Trend Analysis of Deposit Amount

Under this topic, an effort has been made to calculate the trend value of DA of SBL and LBL with comparatively under nine years study period and project the trend for next five years. The following table describes the trend values of DA of sampled banks for five years.

Table: 4.13

Comparative Trend Analysis of Deposit Amount

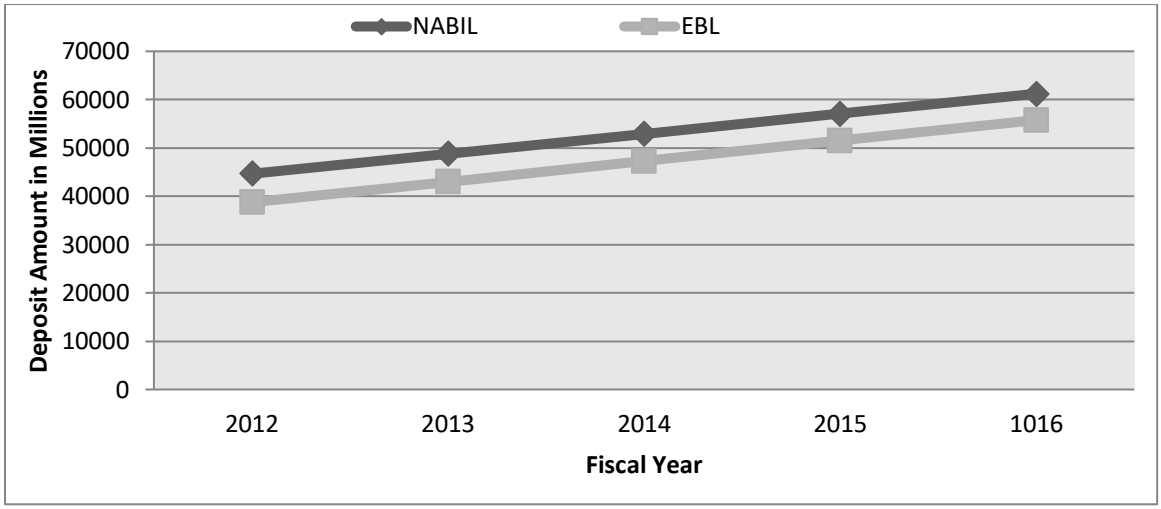
Fiscal Year	**Banks (Rs in Millions)**	
	SBL	**LBL**
2012	44663.53	38751.99
2013	48801.08	43003.91
2014	52938.63	47255.83
2015	57076.18	51507.75
1016	61213.73	55759.67
Mean (a)	23975.78	17492.39
Rate of Change (b)	4137.55	4251.92
Trend Equation(Y)	Y = 23975.78 + 4137.55X	Y = 17492.39 + 4251.92X

Source: Appendix IX

The above table 4.13 and figure 4.10 shows that the trend line of DA of sample banks are increasing trend. 'Y' has shown the trend value of total DA. Since, the calculated value of 'b' is positive of both sample banks; it is found that the bank's DA is increasing with time. Comparatively the slope of equation of SBL is high and its trend line is sloping upward rapidly. If other things remaining the same, it shows that the DA increasing by Rs. 4137.55 and increase by Rs. 4251.92 millions every year of SBL and LBL respectively.

Figure: 4.10

Trend Line of DA of SBL & LBL



4.7.2 Trend Analysis of Lending Amount

Under this topic, an effort has been made to calculate the trend value of LA of SBL, and LBL with comparatively under nine years study period and project the trend for next five years. The following table describes the trend values of LA of sampled banks for five years.

Table: 4.14

Comparative Trend Analysis of LA

Fiscal Year	**Banks (Rs in Millions)**	
	SBL	**LBL**
2012	33010.13	29288.86
2013	36329.81	32507.11
2014	39649.49	35725.36
2015	42969.17	38943.61
1016	46288.85	42161.86
Mean (a)	16411.73	13197.61
Rate of Change (b)	3319.68	3218.25
Trend Equation(Y)	Y = 16411.73 + 3319.68X	Y = 13197.61 + 3218.25X

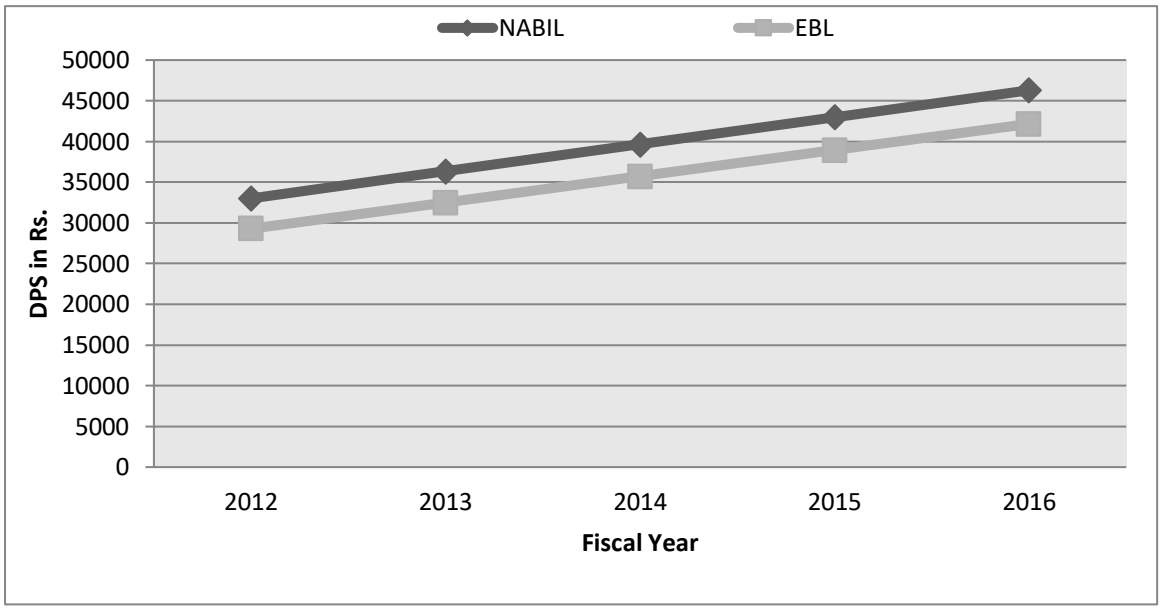
Source: Appendix VIII

Table 4.14 and figure 4.11 shows that the trend line of LA of sample banks are increasing trend. 'Y' has shown the trend value of total LA. Since, the

calculated value of 'b' is positive of both sample banks; it is found that the bank's LA is increasing with time. Comparatively the slope of equation of SBL is high and its trend line is sloping upward rapidly. If other things remaining the same, it shows that the LA increasing by Rs. 3319.68 and increase by Rs. 3218.25 millions every year of SBL and LBL respectively.

Figure: 4.11

Trend Line of LA of SBL & LBL



4.8 Major Findings

- The average interest rate of SBL bank on fixed deposit is 5.50% in 2002 and 2003 but it was 4.50%, 3.75%, 4%, 4.13%, 3.88%, 5.38%, 7.50% and 9.75% in FY 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2011 respectively. Similarly the saving deposit interest rate is 4%, 4%, 2.75% and 2.50% and 3% in FY 2002, 2003, 2004, 2005 and 2006 respectively after that the rate of interest remain constant up to the FY 2010 at the rate of 2% and increase in 2011.
- The average value of SDIR of SBL is 2.73% and the FDIR is 5.39%. The Standard Deviations of SDIR, and FDIR are 0.79% and 1.91% respectively, it means SDIR is less variability in compare to FDIR. The

CV of SDIR and FDIR ratio of RBB is 28.83% and 35.41% respectively which indicate that FDIR is more variable than SDIR.

- The interest rate on saving deposit of LBL is 5.25% in the 2002 to 2004 but it was 5% in 2005, 3.25% in 2006 & 2007 after that the rate is constant at the rate of 3%. It shows that the interest rate is in constant during FY 2002 to 2004, it decrease at 2005 to 2007 after that constant up to 2011. Similarly the average fixed deposit interest rate is 6.50%, 6.50%, 6.13%, 5.75%, 3.75%, 4.25% and 4.25% in FY 2002, 2003, 2004, 2005, 2006, 2007 and 2008 respectively after that the rate of interest remain constant up to the FY 2011 at the rate of 5.13%.
- The average value of SDIR of LBL is 3.93% and the FDIR is 5.25. The Standard Deviations of SDIR, and FDIR are 1.09% and 0.97% respectively, it means FDIR is less variability in compare to SDIR. The CV of SDIR and FDIR ratio of RBB is 27.85% and 18.44% respectively which indicate that SDIR is more variable than FDIR.
- The average interest rate in lending of SBL is in decreasing trend except the year 2010 and 2011 and the average interest rate in lending of LBL is in fluctuating trend over the study period. Over the study period, the average lending rate of SBL is high than LBL. The average lending rates are 11.71 and 10.85% of SBL and LBL respectively.
- The amount of lending of SBL is decrease in 2003 after that increasing trend up to 2011 and LBL has increasing trend of lending amount over the study period.
- SBL has more than 65% of the deposited amount has been succeeded to mobilize the resources. Its highest ratio is 77.88% and lowest ratio is 47.68% and that of LBL has 74%. Its highest ratio is 78.81% and lowest ratio is 62.07%.
- The values of coefficient of correlation (r) of LBL is -0.2615 which shows that there is a negative correlation between DR and DA of LBL but the correlation of SBL bank is positive it shows the positive relationship between DR and DA of SBL.

- The value of coefficient of determination (r^2) is 0.2940 and 0.0683 of SBL and LBL, which shows that 29.40% and 6.83% of the total variation in dependent variable (DA) is explained by independent variable (DR).
- The calculated 't' value of SBL and LBL are less than the tabulated value i.e. 1.825 < 2.262, and 0.766 < 2.262 respectively, therefore it reveals that the relationship between DR and DA has not come out significant statistically.
- The values of coefficient of correlation (r) of LBL is -0.6679 which shows that there is a negative correlation between LR and LA of LBL but the correlation of SBL bank is positive it shows the positive relationship between LR and LA of SBL.
- The value of coefficient of determination (r^2) is 0.5124 and 0.4461 of SBL and LBL, which shows that 51.24% and 44.61% of the total variation in dependent variable (LA) is explained by independent variable (LR).
- The calculated 't' value of SBL and LBL are higher than the tabulated value i.e. 2.896 > 2.262, and 2.593 > 2.262 respectively, therefore it reveals that the relationship between LR and LA has come out significant statistically.
- Deposit amount of sample bank's is increasing with time. If other things remaining the the DA increasing by Rs. 4137.55 and increase by Rs. 4251.92 millions every year of SBL and LBL respectively.
- Lending amount of sample bank's is increasing with time. If other things remaining the same, the LA increasing by Rs. 3319.68 and increase by Rs. 3218.25 millions every year of SBL and LBL respectively.
- The average ratios of SBL and LBL are 10.24 & 24.97 percentages and the standard deviation are 4.39 & 16.14 percentages of SBL & LBL respectively. The CV of SBL & LBL is 42.83 and 64.64 percentages.

- The growth ratios of deposit of SBL & LBL are 13.07% & 25.52% and the growth ratio of lending of SBL & LBL are 16.37% & 28.42% respectively.

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter is the last part of this study which is the most important chapter for the research because this chapter extracts of all the previously discussed chapters. When a study is completed, we should summarize and conclude in specific form, as it is an important issue in research. In this chapter, summary and conclusion made after analyzing and interpreting the necessary data regarding structure of interest rates and its impact on deposit and lending of selected commercial banks. Finally, constructive suggestions and recommendation, which can be of immense help to improve interest rates and its impact on deposit and lending of commercial banks. In this way, an attempt has been made to summaries the whole study in this chapter categorizing in three subsections namely summary, conclusion and recommendation.

5.1 Summary

Banking sector plays an important role in the economic development of the country. Commercial banks are one of the vital aspects of this sector, which deals in the process of channelizing the available resources in the needed sectors. It is the intermediary between the deficit and surplus of financial resources. After the adoption of economic liberalization policy, particularly the financial sector liberalization that paved the way for establishment of new banks and non-bank financial institutions in the country. Consequently, by the end of mid-march 2012, 32 commercial banks are established within the financial system of Nepal which is hoped to contribute for economic development by playing important role in the financial system of the country and living standard of people. Financial institution act as an intermediary between the individual who lend and who borrow. These institutions accept deposits and in turn lend it to people who are in need of financial resources. These institutions make the flow of fund easier. So we cannot deny the role a

bank plays in developing an economy. It pools the fund scattered in the economy and mobilizes them to the productive sector. As focus on the above explanation the study has covered on the study of interest rates regarding its impact on deposit and lending byten years data and mainly concerns the below issues:

Though there are various factors in the economy that affects the volume of deposit and lending, interest rate is one of the major factor that affect deposit and lending amount. With the major objective of showing relationship between deposit rate and deposit amount i.e. substitution effect, lending rate and lending amount, this study is undertaken.

The study is conducted to identify whether some of the theories of finance and economics are applicable or not in the Nepalese financial markets. The major theories are substitution effect, fisher effect and inverse relationship between interest rate and lending amount. For this purpose, brief introduction about Nepalese economy, interest rate, sample organizations, statement of problem, and significance of the study and limitation of study are made in the first chapter of this dissertation.

In second chapter, theoretical review as well as review of previous research has been made. Different views about interest, function of interest, theories of interest, types of interest, factors affecting interest rate and so on are reviewed. Of the theories of interest, the main four theories: – The Classical Theory, Liquidity Preference Theory, Loanable Fund Theory and Rational Expectation Theory are reviewed. Similarly, the factor affecting interest rate like credit or default risk, liquidity risk, marketability risk, call or prepayment risk, servicing cost, exchange rate risk, taxability are explained. Similarly, factors affecting the volume of credit like credit risk, rate of return, investment opportunity and so on are explained. Research design used is mainly analytical. Out of the total financial system, two commercial banks are chosen for sample purpose. The study is mainly based on secondary data used for the analysis. These all are

made on third chapter. Secondary data are collected form NRB,s economic reports and annual reports of related banks. Lastly on fourth chapter, collected data are presented in tabular and graphic form and analyzed using various financial and statistical tools like mean, standard deviation, correlation coefficient and t-statistics.

5.2 Conclusion

However, as per t-test the relation is significant. Hence, there is relation between deposit interest rate and deposit amount. Therefore, it is concluded that for deposit also, there is no substitution effect at all. According to the theory, there is positive relationship between deposits rate and deposit amount. But the analysis of substitution effect for both fixed and saving deposit shows that substitution effect do not exist for all sample banks. After Presentation and data analysis of relevant data of sample commercial banks under study, using various analytical tools, some major's findings of this study as evaluated and found in analysis. are summarized as follows: But as per t-test the relation is not significant

In case of deposit, Both banks have negative correlation coefficient between interest rate and deposit and as per t-test the relation is significant. It may be due to the increase in liquidity position of people as well as commercial banks. As people have less investment opportunity, they put their money in banks and other financial institution rather than to hold. This may be due to the fact that, in the last 10 FYs people accumulated most of their funds on saving accounts though they don't get appropriate interest on it. It may be just because of unavailability of other reliable place of investment, political instability and feeling of insecurity among people. The depositors place interest rate's rowle as secondary in their decision for keeping deposit in the banks. Absence of better investment opportunities, expectation of inflationary pressures and the associated safety, liquidity and profitability, whatever are their respective roles, must have been the factors responsible for increase in volume of deposit

despite downscaling introduced in interest rates during the review period. This might have produced negatives relationship between interest rates and deposits.

The interest rates on both deposit and lending of sample banks are found to be in decreasing trend. But contrary to this, deposit amount and lending amount is increasing every year. From the study, it is found that the interest rate of saving deposit is decreasing continuously whereas on other hand saving deposit amount is increasing in every fiscal year. Therefore, there is a negative relationship between deposit interest rate and deposit amount of both sample banks as proved by negative correlation coefficient of both banks as well as successful significant t-test of both banks.

From the study, there is negative correlation coefficient between lending rate and lending amount of LBL, this negative correlation indicates that there is inverse relationship between lending interest rate and lending amount, as per t-test the relation is significant for all sample banks. Therefore it is conclude that there is substitution effect at all. According to theory, there is negative or inverse relationship between lending rate and lending amount. The study found that LBL has inverse relationship between lending rate and lending amount. But, increase in lending amount is not due to the decrease in lending rate but may be due to other factor, as it higher t-calculated value than tabulated value which indicated significant relationship between variables under study. So it can be concluded that the lending interest rate is also an important factor for expansion or contraction of lending amount.

It is found that deposit rate and lending rate of sample banks are moved into same direction. There is positive correlation between deposit rate and lending rate which indicates that change in one variable causes to change in other variable in same direction. Banks want to maintain the interest rate spread (i.e. difference of lending rate and deposit rate) to achieve uniform profitability due to which the positive relation between the rates is witnessed. But decrease in

deposit interest rate is more than decrease in lending rate which is constraint for investment.

5.3 Recommendations

Productive sector implies trade, commerce, industry, hydropower, tourism and cultural sectors.Unproductive sector implies consumer loans, hire purchase loans, personal loans, pledge loans and those sectors which do not create wealth and do not add to GDP of the country. Commercial banks should emphasize on the repayment on loan and provide incentive to borrowers to encourage paying loan. Good repayment of loans is the strength of commercial banks. Commercial banks are suggested to charge higher rate in unproductive sectors and lower rate in productive sectors. So that scarce deposit collected from public goes to productive sector which ultimately enhances GDP and productivity of the country and provides safety to the deposits. On the contrary if deposit gets invested in unproductive sector, it does not generate any productive return and ultimately collapses rendering losses to banks and depositors as well.

Commercial banks should formulate and implement a client oriented service policy while fixing deposit rates and lending rates. It helps the banks to face the cutthroat competition very boldly. Base on the above conclusion following suggestions can be recommended to related banks and concerned parties.

- The financial institutions like Commercial banks are suggested to quote higher interest rate on deposit because it helps to generate more capital from depositors which are needed for the development of the country.
- Money gets invested in unproductive sector like gold, land and real estate due to low interest rate in bank. Hence, banks in Nepal had to face huge liquidity crunch in the recent past. In consequence of which, we could see hopping rise in interest rate of banks. NRB is suggested to

provide clear cut policies related to interest rates on both deposit and lending rate.

- The financial institutions are suggested to include the inflation premium as far as possible while fixing the interest rates. If the inflation rate is not considered and real rate come out to be negative then depositors may withdraw their money and utilize it on non-productive sectors.
- Investment should be higher yield oriented. For this they have to invest their fund in sector with higher return as well as introduce competitive customer oriented schemes. It will increase the profit position of commercial banks.

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Appendix I

Lending Rate of Siddhartha Bank Ltd.

Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Over Draft										
Export Credit	11.25	11.25	11.00	11.00	11.00	11.00	10.50	10.50	14.00	14.00
Import LC	11.50	11.50	11.00	11.00	11.00	11.00	10.50	10.50	14.00	14.00
HMG Bond	8.00	8.00	7.50	7.50	7.50	7.50	7.50	7.50	14.00	14.00
BG/CG	10.00	9.50	9.00	9.00	9.00	9.00	8.50	7.50	16.00	16.00
Industrial Loan										
Commercial	-	-	-	-	-	-	-	-	-	-
Priority Sector	14.00	13.50	13.00	13.00	12.00	12.00	11.00	11.00	-	-
Poorer Sector	10.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	10.00	12.00
Term Loan	13.50	13.00	13.00	13.00	13.00	13.00	12.00	12.00	12.50	16.00
Working Capital	13.00	12.50	12.00	12.00	12.00	12.00	11.50	11.50	15.00	15.00
Hire Purchases	14.00	13.00	12.00	12.50	12.50	12.00	12.00	12.00	-	-
Other	14.00	13.50	13.00	13.00	13.00	13.00	12.00	12.00	17.00	17.00
Average	11.93	11.48	11.05	11.10	11	10.95	10.45	10.35	14.06	14.75

Appendix II

Lending Rate of Lumbani Bank Ltd.

Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Over Draft	13.00	13.50	12.50	13.00	11.50	11.00	11.00	11.00	11.00	11.00
Export Credit	10.50	10.50	10.00	10.00	8.50	8.00	8.00	10.00	10.00	10.00
Import LC	11.00	11.75	11.75	11.75	10.00	10.00	10.00	10.00	10.00	10.00
HMG Bond	8.00	8.00	8.00	8.00	6.50	6.00	6.00	8.00	8.00	8.00
BG/CG	10.00	11.00	10.50	10.50	8.50	8.50	8.50	8.50	8.50	8.50
Industrial	13.00	13.50	13.00	13.00	12.00	11.00	11.00	11.00	11.00	11.00

Loan										
Commercial	13.00	13.50	12.50	12.50	11.50	11.00	11.00	11.00	11.00	11.00
Priority Sector	13.00	13.50	13.00	13.00	12.00	-	-	-	-	-
Poorer Sector	9.00	11.00	11.00	11.00	11.00	10.00	10.00	10.00	10.00	10.00
Term Loan	13.00	13.50	13.50	13.50	12.00	11.00	11.00	11.00	11.00	11.00
Working Capital	13.00	13.50	12.50	12.50	10.50	11.00	11.00	10.50	11.00	11.00
Hire Purchases	12.50	13.50	13.00	13.00	12.00	7.00	10.50	10.51	10.50	10.50
Other	10.00	13.50	13.50	13.50	12.00	11.00	11.00	11.00	11.00	11.00
Average	11.46	12.33	11.90	11.94	10.62	9.63	9.92	10.21	10.21	10.25

Appendix III
Average deposit of SBL & LBL

Year	SD	FD	Average	SD	FD	Average
2002	4917.1	3719.2	4318.15	1384.1	2470.2	1927.15
2003	4889	2446.8	3667.9	1733.3	2694.6	2213.95
2004	5237.4	2252.6	3745	2758	2803.4	2780.7
2005	5994.1	2310.6	4152.35	3730.7	29131.1	16430.9
2006	7026.4	2078.6	4552.5	4806.9	3444.5	4125.7
2007	8770.8	3450.2	6110.5	6929.2	3298.2	5113.7
2008	10187.4	5435.2	7811.3	9018	5658.7	7338.35

2009	12160	8464.1	10312.05	11883.9	6558	9220.95
2010	14620.4	8310.7	11465.55	14782.3	7094.7	10938.5
2011	13783.6	14711.1	14247.35	13360	10440.3	11900.15

Appendix IV

Calculation for Mean Value, & Correlation Between Deposit Rate & Deposit Amount of SBL

Year	**DR (X_1)**	**DA (X_2)**	**$x_1=X_1-\bar{x}_1$**	**$x_2=X_2-\bar{x}_2$**	**$x_1 . x_2$**	**x_1^2**	**x_2^2**
2002	4.75	4318.15	0.69	-2720.12	-1876.88	0.48	7399052.81
2003	4.75	3667.9	0.69	-3370.37	-2325.56	0.48	11359393.94
2004	3.63	3745	-0.43	-3293.27	1416.11	0.18	10845627.29
2005	3.13	4152.35	-0.93	-2885.92	2683.91	0.86	8328534.25
2006	3.5	4552.5	-0.56	-2485.77	1392.03	0.31	6179052.49
2007	3.07	6110.5	-0.99	-927.77	918.49	0.98	860757.17
2008	2.94	7811.3	-1.12	773.03	-865.79	1.25	597575.38
2009	3.69	10312.05	-0.37	3273.78	-1211.30	0.14	10717635.49
2010	4.75	11465.55	0.69	4427.28	3054.82	0.48	19600808.20
2011	6.38	14247.35	2.32	7209.08	16725.07	5.38	51970834.45
N_1 = 10 N_2 = 10	**$\sum X_1$ =40.59**	**$\sum X_2$ =70382.65**	-	-	**$\sum x_1.x_2$ = 10010.89**	**$\sum x_1^2$= 10.55**	**$\sum x_2^2$= 127859271.4**

For DR,

$$\text{Mean } (\bar{X}) = \frac{\sum X_1}{N_1} = \frac{40.59}{10} = 4.06$$

For DA,

$$\text{Mean } (\bar{X}) = \frac{\sum X_2}{N_2} = \frac{70382.65}{10} = 7038.27$$

Correlation between DR & DA,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum {x_1}^2 \sum {x_2}^2}}$$

$$= \frac{19910.89}{\sqrt{10.55 \times 127859271.47}} = 0.5422$$

$r^2 = 0.5422^2 = 0.2940$ Or, 29.40%

T-value,

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

$$= \frac{0.5422}{\sqrt{1-0.2940}} \times \sqrt{10-2} \quad = 1.82$$

Appendix V

Calculation for Mean Value, & Correlation Between Deposit Rate & Deposit Amount of LBL

Year	DR (X_1)	DA (X_2)	$x_1=X_1-\bar{x}_1$	$x_2=X_2-\bar{x}_2$	$x_1 . x_2$	x_1^2	x_2^2
2002	5.88	1927.15	1.29	-5271.86	-6800.70	1.66	27792507.86
2003	5.88	2213.95	1.29	-4985.06	-6430.73	1.66	24850823.20
2004	5.69	2780.7	1.10	-4418.31	-4860.14	1.21	19521463.26
2005	5.38	16430.9	0.79	9231.89	7293.19	0.62	85227792.97
2006	3.5	4125.7	-1.09	-3073.31	3349.91	1.19	9445234.36
2007	3.75	5113.7	-0.84	-2085.31	1751.66	0.71	4348517.80
2008	3.63	7338.35	-0.96	139.34	-133.77	0.92	19415.64
2009	4.07	9220.95	-0.52	2021.94	-1051.41	0.27	4088241.36
2010	4.07	10938.5	-0.52	3739.49	-1944.53	0.27	13983785.46
2011	4.07	11900.15	-0.52	4701.14	-2444.59	0.27	22100717.30
$N_1 = 10$ $N_2 = 10$	**$\sum X_1$ =45.92**	**$\sum X_2$ =71990.05**	-	-	**$\sum x_1.x_2$ = -11271.11**	**$\sum x_1^2$= 8.79**	**$\sum x_2^2$= 211378499.20**

For DR,

$$\text{Mean } (\bar{X}) = \frac{\sum X_1}{N_1} \quad = \frac{45.92}{10} \quad = 4.59$$

For DA,

$$\text{Mean } (\bar{X}) = \frac{\sum X_2}{N_2} \quad = \frac{71990.05}{10} \quad = 7199.01$$

Correlation between DR & DA,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum {x_1}^2 \sum {x_2}^2}}$$

$$= \frac{-11271.11}{\sqrt{8.79 \times 211378499.20}} \quad = -0.2615$$

$r^2 = -0.2615^2 = 0.0683$ Or, 6.83%

T-value,

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

$$= \frac{-0.2615}{\sqrt{1-0.0683}} \times \sqrt{10-2} \quad = 0.766$$

Appendix VI

Calculation for Mean Value, & Correlation Between Lending Rate & Lending Amount of SBL

Year	**LR (X_1)**	**LA (X_2)**	**$x_1=X_1-\bar{x}_1$**	**$x_2=X_2-\bar{x}_2$**	**$x_1 . x_2$**	**x_1^2**	**x_2^2**
2002	11.93	8437.6	0.22	-7176.72	-1578.88	0.05	51505309.96
2003	11.48	7328.2	-0.23	-8286.12	1905.81	0.05	68659784.65
2004	11.05	8267.8	-0.66	-7346.52	4848.70	0.44	53971356.11
2005	11.1	8769.7	-0.61	-6844.62	4175.22	0.37	46848822.94
2006	11	11360.3	-0.71	-4254.02	3020.35	0.50	18096686.16
2007	10.95	13278.8	-0.76	-2335.52	1775.00	0.58	5454653.67
2008	10.45	15903	-1.26	288.68	-363.74	1.59	83336.14
2009	10.35	21769.7	-1.36	6155.38	-8371.32	1.85	37888702.94
2010	14.06	27997.1	2.35	12382.78	29099.53	5.52	153333240.53
2011	14.75	33031	3.04	17416.68	52946.71	9.24	303340742.22
$N_1 = 10$ $N_2 = 10$	**$\sum X_1$ =117.12**	**$\sum X_2$ =156143.20**	-	-	**$\sum x_1.x_2$ = 87457.39**	**$\sum x_1^2$= 20.19**	**$\sum x_2^2$=739182635 .34**

For LR,

$$\text{Mean } (\bar{X}) = \frac{\sum X_1}{N_1} \qquad = \frac{117.12}{10} \quad = 11.71$$

For LA,

$$\text{Mean } (\bar{X}) = \frac{\sum X_2}{N_2} \qquad = \frac{156143.20}{10} \quad = 15614.32$$

Correlation between LR & LA,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum {x_1}^2 \sum {x_2}^2}}$$

$$= \frac{87457.39}{\sqrt{20.19 \times 739182635.34}} \quad = 0.7158$$

r^2 = 0.7158² = 0.5124 Or, 51.24%

T-value,

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

$$= \frac{0.7158}{\sqrt{1-0.5124}} \times \sqrt{10-2} \quad = 2.896$$

Appendix VII

Calculation for Mean Value & Correlation Between Lending Rate & Lending Amount of LBL

Year	LR (X_1)	LA (X_2)	$x_1=X_1-\bar{x}_1$	$x_2=X_2-\bar{x}_2$	$x_1 . x_2$	x_1^2	x_2^2
2002	11.46	2963.7	0.61	-9210.52	-5618.42	0.37	84833678.67
2003	12.33	3969.6	1.48	-8204.62	-12142.84	2.19	67315789.34
2004	11.9	5030.9	1.05	-7143.32	-7500.49	1.10	51027020.62
2005	11.94	6116.6	1.09	-6057.62	-6602.81	1.19	36694760.06
2006	10.62	7944.1	-0.23	-4230.12	972.93	0.05	17893915.21
2007	9.63	10154.9	-1.22	-2019.32	2463.57	1.49	4077653.26
2008	9.92	14100	-0.93	1925.78	-1790.98	0.86	3708628.61
2009	10.21	18836.4	-0.64	6662.18	-4263.80	0.41	44384642.35
2010	10.21	24469.6	-0.64	12295.38	-7869.04	0.41	151176369.34
2011	10.25	28156.4	-0.60	15982.18	-9589.31	0.36	255430077.55
N_1 = 10 N_2 = 10	**$\sum X_1$ =108.47**	**$\sum X_2$ =121742.2**	**-**	**-**	**$\sum x_1.x_2$ = -51941.17**	**$\sum x_1^2$= 8.44**	**$\sum x_2^2$= 716542535.04**

For LR,

$$\text{Mean } (\bar{X}) = \frac{\sum X_1}{N_1} \quad = \frac{108.47}{10} \quad = 10.85$$

For LA,

$$\text{Mean } (\bar{X}) = \frac{\sum X_2}{N_2} \quad = \frac{121742.20}{10} \quad = 12174.20$$

Correlation between LR & LA,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum {x_1}^2 \sum {x_2}^2}}$$

$$= \frac{-51941.17}{\sqrt{8.44 \times 716542535.04}} = -0.6679$$

$$r^2 = -0.6679^2 = 0.4461 \text{ Or, } 44.61\%$$

T-value,

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

$$= \frac{0.6679}{\sqrt{1-0.4461}} \times \sqrt{10-2} = 2.539$$

Appendix VIII

Calculation of Trend Value of LA of Sample Banks

Fiscal Year	t	X = t-5	x^2	SBL		LBL	
				LA (Y_1)	XY_1	LA (Y_2)	XY_2
2003	1	-4	14	7328.2	-29312.8	3969.6	-15878.4
2004	2	-3	9	8267.8	-24803.4	5030.9	-15092.7
2005	3	-2	4	8769.7	-17539.4	6116.6	-12233.2
2006	4	-1	1	11360.3	-11360.3	7944.1	-7944.1
2007	5	0	0	13278.8	0	10154.9	0
2008	6	1	1	15903	15903	14100	14100
2009	7	2	4	21769.7	43539.4	18836.4	37672.8
2010	8	3	9	27997.1	83991.3	24469.6	73408.8
2011	9	4	16	33031	132124	28156.4	112625.6
Total		**0**	**58**	**147705.6**	**192541.8**	**118778.5**	**186658.8**

Calculation of intercept of 'y' when x = 0

$$a_1 = \frac{Y_1}{N_1} = \frac{147705.6}{9} = 16411.73$$

$$a_2 = \frac{Y_2}{N_2} = \frac{118778.5}{9} = 13197.61$$

Calculation of Slope of Trend Line

$$b_1 = \frac{XY_1}{X^2} = \frac{192541.8}{58} = 3319.68$$

$$b_2 = \frac{XY_2}{X^2} = \frac{186658.8}{58} = 3218.25$$

Therefore the trend line equations are:

$$Y_1 = a_1 + b_1 x$$

$$Y_2 = a_2 + b_2 x$$

Forecasted Value for Next Five Years

Year	X	SBL	LBL
		Y_1 = 16411.73 + 3319.68 X	**Y_2 = 13197.61 + 3218.25 X**
2012	4	16411.73 + 3319.68 × 5 = 33010.13	13197.61 + 3218.25 × 5 = 29288.86
2013	5	16411.73 + 3319.68 × 6 = 36329.81	13197.61 + 3218.25 × 6 = 32507.11
2014	6	16411.73 + 3319.68 × 7 = 39649.49	13197.61 + 3218.25 × 7 = 35725.36
2015	7	16411.73 + 3319.68 × 8 = 42969.17	13197.61 + 3218.25 × 8 = 38943.61
2016	8	16411.73 + 3319.68 × 9 = 46288.85	13197.61 + 3218.25 × 9 = 42161.86

Appendix IX

Calculation of Trend Value of DA of Sample Banks

Fiscal Year	t	X = t-5	x^2	SBL		LBL	
				DA (Y_1)	XY_1	DA (Y_2)	XY_2
2003	1	-4	14	15370.6	-61482.4	5461.1	-21844.4
2004	2	-3	9	13437.7	-40313.1	6694.9	-20084.7
2005	3	-2	4	14098	-28196	8064	-16128
2006	4	-1	1	14586.8	-14586.8	10079.8	-10079.8
2007	5	0	0	19348.4	0	13802.5	0
2008	6	1	1	23342.4	23342.4	19097.7	19097.7
2009	7	2	4	31915	63830	23976.3	47952.6
2010	8	3	9	37348.3	112044.9	33322.9	99968.7
2011	9	4	16	46334.8	185339.2	36932.3	147729.2
Total		0	58	215782	239978.2	157431.5	246611.3

Calculation of intercept of 'y' when x = 0

$$a_1 = \frac{Y_1}{N_1} = \frac{215782}{9} = 23975.78$$

$$a_2 = \frac{Y_2}{N_2} = \frac{157431.5}{9} = 17492.39$$

Calculation of Slope of Trend Line

$$b_1 = \frac{XY_1}{X^2} = \frac{239978.2}{58} = 4137.55$$

$$b_2 = \frac{XY_2}{X^2} = \frac{246611.3}{58} = 4251.92$$

Therefore the trend line equations are:

$$Y_1 = a_1 + b_1 x$$

$$Y_2 = a_2 + b_2 x$$

APPENDIX X

Forecasted Value for Next Five Years

Year	X	SBL	LBL
		$Y_1 = 23975.78 + 4137.55\ X$	$Y_2 = 17492.39 + 4251.92\ X$
2012	4	23975.78 + 4137.55 × 5 = 44663.53	17492.39 + 4251.92 × 5 = 38751.99
2013	5	23975.78 + 4137.55 × 6 = 48801.08	17492.39 + 4251.92 × 6 = 43003.91
2014	6	23975.78 + 4137.55 × 7 = 52938.63	17492.39 + 4251.92 × 7 =47255.83
2015	7	23975.78 + 4137.55 × 8 = 57076.18	17492.39 + 4251.92 × 8 = 51507.75
2016	8	23975.78 + 4137.55 × 9 = 61213.73	17492.39 + 4251.92 × 9 = 55759.67

Growth Ratio of Total Deposit of SBL

D_n = Rs. 46334.8 million
D_0 = Rs. 15838.9 million
n = 10 years
g =?

According to formula,

$D_n = D_0 (1+g)^{n-1}$
Or, $15838.9 = 46334.8 (1+g)^{10-1}$
Or, $(46334.8 / 15338.9) = (1+g)^9$
Or, $(3.02)^{1/9} = 1 + g$
Or, $1.1307 = 1 + g$
Or, $g = 0.1307 = 13.07\%$

Growth Ratio of Total Credit of SBL

D_n = Rs. 33031 million
D_0 = Rs. 8437.6 million
n = 10 years
g =?

According to formula,

$D_n = D_0 (1+g)^{n-1}$
Or, $33031 = 8437.6 (1+g)^{10-1}$
Or, $(33031 / 8437.6) = (1+g)^9$
Or, $(3.9147)^{1/9} = 1 + g$

Or. 1.1637 = 1 + g
Or, g = 0.1637 = 16.37%

Growth Ratio of Total Deposit of LBL

D_n = Rs. 36932.3 million
D_0 = Rs. 4774.5 million
n = 10 years
g =?

According to formula,

$D_n = D_0 (1+g)^{n-1}$
Or, $36932.3 = 4774.5 (1+g)^{10-1}$
Or, $(36932.3 / 4774.5) = (1+g)^{9}$
Or, $(7.7353)^{1/9} = 1 + g$
Or, 1.2552 = 1 + g
Or, g = 0.2552 = 25.52%

Growth Ratio of Total Credit of LBL

D_n = Rs. 28156.4 million
D_0 = Rs. 2963.7 million
n = 10 years
g =?

According to formula,

$D_n = D_0 (1+g)^{n-1}$
Or, $28156.4 = 2963.7 (1+g)^{10-1}$
Or, $(28156.4 / 2963.7) = (1+g)^{9}$
Or, $(9.5004)^{1/9} = 1 + g$
Or. 1.2842 = 1 + g
Or, g = 0.2842 = 28.42%

APPENDIX XI

Calculation of Cash & Bank Balance to Total Deposit Ratio of LBL

year	Deposit	Cash	Ratio
2002	4774.5	1284.9	26.91
2003	5461.1	2999.3	54.92
2004	6694.9	2362.1	35.28
2005	8064	3916.9	48.57
2006	10079.8	1345.2	13.35
2007	13802.5	2365.2	17.14
2008	19097.7	1963.1	10.28
2009	23976.3	4623.5	19.28
2010	33322.9	3925.4	11.78
2011	36932.3	4513.7	12.22
average			24.97
SD			16.14

APPENDIX XII

Calculation of Cash & Bank Balance to Total Deposit Ratio of SBL

year	**Deposit**	**Cash**	**Ratio**
2002	15838.9	824.1	5.20
2003	15370.6	809.2	5.26
2004	13437.7	1156.1	8.60
2005	14098	869.7	6.17
2006	14586.8	1624.2	11.13
2007	19348.4	1619.6	8.37
2008	23342.4	3329.7	14.26
2009	31915	3198.4	10.02
2010	37348.3	6164.4	16.51
2011	46334.8	7818.8	16.87
Average			10.24
SD			4.39
CV			42.83%