INTEREST RATE STRUCTURE OF COMMERCIAL BANKS AND ITS IMPACT ON DEPOSIT AND LENDING OF MONEY

Submitted by

Bishnu Devi Shrestha

Patan Multiple Campus

Campus Roll No.: 107/062

Exam Roll No.:1457/064

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RECOMMENDATION

This is to certify that the thesis

Submitted by:

Bishnu Devi Shrestha

Entitled

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

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Keshav Ghimire Thapa	**Bishnu Gopal Khimbaja**	**Babu Ram Singha**
Thesis Supervisor	**Co-ordinator, MBS Program**	**Asst. Campus Chief**

Date: ……..……

VIVA-VOCE SHEET

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

Bishnu Devi Shrestha

Entitled

INTEREST RATE STRUCTURE OF COMMERCIAL BANKS AND ITS IMPACT ON DEPOSIT AND LENDING OF MONEY

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

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

Viva-Voce Committee

Chairperson, Research Committee ----------

Member (Thesis Supervisor) ----------

Member (External Expert) ----------

Date: ----------

DECLARATION

I hereby, declare that the work reported in this thesis entitled **"INTEREST RATE STRUCTURE OF COMMERCIAL BANKS AND ITS IMPACT ON DEPOSIT AND LENDING OF MONEY"** submitted to Patan Multiple Campus, Patandhoka, is my original piece of work done in the form of partial fulfillment of the requirement for the Master's Degree in Business studies under the supervision and guidance of **Mr.Keshav Ghimire** Patan Multiple Campus.

.....

Bishnu Devi Shrestha

Date: ---------- **Exam Roll No.:1457/065**

T.U. Ragistration No.:

7-1-25-40-98

Patan Multiple Campus

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ABBREVIATIONS

BOK	Bank of Kathmandu
CDM	Central Department of Management
Dr.	Doctor
EBL	Everest Bank Limited
Prof.	Professor
FY	Fiscal Year
MBS	Master of Business Studies
NABIL	Nepal Arab Bank Limited
NRB	Nepal Rastra Bank
r	Correlation Coefficient
S.D.	Standard Deviation
SDC	Shanker Dev Campus
TU	Tribhuvan University

CHAPTER I

INTRODUCTION

1.1 Background of the Study

The interest rate is the price charged to borrower for the loan of money. In very general term, interest rate is the price paid for credit. So, it is computed dividing the cost of borrowed fund in rupees by the amount of money actually used by the borrower. An interest rate is the cost of borrowing money. Without it, people would not be willing to lend or even save their cash, both of which require a deferment of the opportunity to give up spending in the present. But prevailing interest rates are always changing and different types of loans will offer various interest rates. The interest rate is expressed in an annual percentage basis. As the interest rate provides the price signal in the financial system, thus it is important to all the participants: the borrowers, the lenders, savers, and investors for example, higher interest rate encourages savings in greater volume and increases the lending activities of funds. Lower interest rate, in other hand, discourages the savings and reduces the lending activities as well. Interest is the price that one pays for utilising a certain amount of money for a specific period of time. Interest can thus be considered a cost for one entity and income for another. Interest is the opportunity cost of keeping your money as cash under your mattress as opposed to lending. If you borrow money, then the interest you have to pay is less than the cost of forgoing the opportunity to have the money in the present. It is the rent paid for using money provided by a lender. Essentially, there are three components in the interest rates – risk free rate, risk premium and adjustment for inflationary or deflationary situations.

Risk-free rate is paid as compensation for deferred consumption by the borrower to the lender. As a borrower derives satisfaction well in advance by bringing forward his consumption, he is required to pay some price, which can be considered as risk-free part of the interest rates.

Risk-premium depends on the credit worthiness of the borrower. Higher the perceived risk on part of the lender, more risk premium is added to the risk-free rates and vice-versa. An interest rate also has adjustments for inflationary or deflationary economic situations. When value of money is going to fall in inflationary economy, equivalent amount of premium is

added to the interest rates, whereas in deflationary economies, interest rates are discounted to factor increase in the value of the money.

Weston & Brigham (2004), in their book *"Fundamentals of Financial Management*" have identified four fundamental factors affecting the cost of money which are (a) Production opportunities (b) Time preference for consumption (c) risk & (d) inflation. They have added risk and inflation to as fundamental factors of determining interest rate. Risk is the borrower's ability to repay the loan. In financial market context, risk is the chance that financial assets will not earn the return promised. On the other hand, inflation is the tendency of prices to increase over time.

Thus we see that interest rate paid to savers depends in the following ways.

On the rate of return, producer expects to earn on invested capital
On Saver's time preference for current versus future consumption
On the risk of the loan and
On the expected rate of inflation

Deposit collection and mobilization is one of the major sources of capital formation. Deposit mobilization is primary and crucial function of any commercial bank. Bank provides facility of saving to general public and provides funds to investors, which help in mobilization of public fund in fruitful purposes, which helps in country's economic development. The collection of deposit and its mobilisation are the two sides of the same coin, in the absence of one, another cannot work i.e. without the collection of deposit, mobilisation of deposits would be quite impossible and vice versa. They both get along with another under favourable condition, interest rate being the most. Interest is the main factor in fund activities of commercial banks. Interest rate affects on the collection of deposits mobilisation of saving position.

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 amounts on the different loans provided for productive and priority and full deprived sector. However, there were limitations on certain sectors of lending such as the rate of maximum of 15 percent on the priority sector loan. And for other kinds of loans, financial institutions were given freedom to maintain the interest rate structure. In this way the government has provided freedom as well as limitations on the determination of interest rate.

A Brief Profile of Sample Banks:

Nabil Bank Limited

Nabil Bank limited, previously known as Nepal Arab Bank Limited, the first joint venture bank of Nepal, started its operation from July 1984. Nabil was incorporated with the objective of extending international standard modern banking services to various sectors of the society. The head office of Nabil is located at Kamaladi, Kathmandu. Pursuing its objective, Nabil provides a full range of commercial banking services through its 19 points of representation across the nation and over 170 reputed correspondent banks across the globe. Nabil, as a pioneer in introducing many innovative products and marketing concepts in the domestic banking sector, represents a milestone in the banking history of Nepal as it started on era of modern banking with customer satisfaction measured as a focal objective while doing business. Operations of the bank including day-to-day operations and risk management are managed by highly qualified and experienced management team. Bank is fully equipped with modern technology which includes ATMs, credit cards, state-of –art, world-renowned software from Infosys Technologies System, Banglore, India, Internet banking system and telebanking system.

Everest Bank Limited

Everest Bank Limited (EBL) started its operation from 1994 with a view and objective of extending professionalized and efficient banking services to various segments of the society. This bank is joint venture with Punjab National Bank India. The head office of EBL is located in Lazimpat. This bank is providing customer-friendly services through its branch network and over 250 correspondent banks across the globe. All the branches of the banks are connected through Anywhere Branch Banking System (ABBS), which enables customers to do all their transactions from any branches other than where they have their account. On equity holding PNB has 20% equity participation in its total share holding and also has under taken management responsibility under a technical service agreement and promoter holding 50% and rest 30% held by general public. The main purpose of EBL is to extend professional banking services to various sectors of the society of Nepal and thereby contributing in the economic development of the country.

Bank of Kathmandu (BOK)

Bank of Kathmandu, established in 1993 in collaboration with the Siam Commercial Bank, Thailand under the Company Act and the major objective is to operate commercial banking activities throughout the country with the approval of NRB. The SIAM Commercial Bank diluted its holding to the Nepalese citizens in 1998. Its ownership capital structure is General Public 91.68%, Organized Institution and Nepalese promoters hold 8.32%. Since its major shares are owned by general public, it is regarded as the Bank of Nepalese promoters.

BOK has become a prominent name in the Nepalese banking sector. This bank has today become a landmark in the Nepalese banking sector by being among the few commercial banks, which is entirely managed by Nepalese professionals and owned by the general public. BOK started its operation in March 1995 with the objective to stimulate the Nepalese economy and take it to newer heights. BOK also aims to facilitate the nation's economy and to become more competitive globally. To achieve these, BOK has been focusing on its set objective right from the beginning.

To highlight its few objectives:
To contribute to the sustainable development of the nation by mobilizing domestic saving and channelizing them to productive areas.
To use the latest banking technology to provide better, reliable and efficient service at a reasonable cost.
To facilitate trade by making financial transaction easier, faster and more reliable through relationship with foreign banks and money transfer agencies.
To contribute to the overall social development of Nepal

With the aim of providing banking services at the customer's fingertips, BOK has started Internet Banking and Alert Service. In Internet Banking, BOK provides Customer e-banking (Core, Retail and Bill payment) as well as corporate e-banking facilities (Trading financing and web based Cash Management). This bank has 39 branches and its head office is located at Kamalpokhari, Kathmandu.

1.2 Statement of the Problem

Banking sector has always been the promising sector giving high return and value to its promoters and shareholders; their down looking financial scenarios has created very less

investment alternatives and comparatively lower return. Our country showed several banks within short period of time fighting for small amount of market share, which requires excessive force making high operational cost. Interest rates as a major tool to change the fortune of the bank it has always been modified as per situation and economy. After commercial banks received autonomy to determine their own interest rate they have greater burden to carry if it is to shoulder responsibility to drag country towards prosperity. An appropriate interest rate is always sought to keep both parties i.e. depositors and borrowers at profitable minimum. Due to stiff competition between the banks to increase the volume of deposit and loans and investments it has been working under very less interest spread which is able to hardly cover total cost. This has been because of excessive availability of financial institutions. Moreover frequent changes of interest rate within and outside the bank has changed the banking habit of individual depositors. There has been high tendency to transfer fund from less interest bearing bank to higher interest bearing ones while lower rated lending banks are seeing huge loan applications.

The change in interest rates certainly has deep impact on the activities of the commercial banks. This study basically deals with such impacts of interest rate on the deposit mobilization. The main attempt of this study has been tried to answer the following questions. What will be the impact of fluctuations in the interest rates on deposit, loan and investment?

Whether interest rate structure affects the investment of commercial bank?

What are the various methods that commercial banks in Nepal use to calculate the interest rate they charged to borrowers?

What are the other major qualitative factors that shape the interest rate in commercial banking sectors?

1.3 Objectives of the Study

The main objective of this study is to identify the structure of the interest rate of commercial banks and its impact on deposit and lending. And in order to achieve primary objective, the sub objectives are highlighted as below:-

To study the interest rate structure on deposits and lending of Nepalese commercial banks

To study and analyze the relationship of interest rate on the volume of deposits of commercial banks

To study and analyze the relationship of interest rate structure on the volume of lending of commercial banks

1.4 Significance of the Study

As the interest rate provides the price signal in the financial system, thus it is important to all the participants: the borrowers, the lenders, savers, and investors for example, higher interest rate encourages savings in greater volume and increases the lending activities of funds. Lower interest rate, in other hand, discourages the savings and reduces the lending activities as well. Hence economic growth depends upon circulation of money and financial system facilitates it. Researcher believes that following institution and individual will be benefited from the study.

Individuals who have keen interest in Nepalese economy and banking sector.
Investors, depositors, borrowers and others who are directly and indirectly involved on financial market.
By the help of this study, general public can know the interest rates offered by banks for deposits of the Nepalese commercial banks.
The study of interest rate and its impact on deposits would provide information to the management of concern banks that would be helpful to take corrective actions in the banking activities.
This study provides valuable information that is necessary for the management of the banks, shareholders, general public and related parties.

1.5 Limitations of the Study

Though this study has been attempted to an accurate and deficiency free, the use of different econometric models for the analysis of impact of interest rate on deposit mobilisation may have rendered it quite reliable. For the completion of this study, some facts are to be considered as the limitation which are presented as below:

This study is based on secondary data. Accuracy depends upon the data collection and provided by the banks.
This study covers only 5 fiscal years.

The conclusions drawn on the basis of the study are based on five year data. The data are taken from annual reports of the concerned banks and report and bulletins of Nepal Rastra Bank.

The samples are taken only from commercial banks, other financial intermediaries are not included in the study.

As the samples have been drawn at random for convenience there may exist some sampling errors and the sample size may not be sufficient to generalize the finding.

1.6 Organization of the study

The whole study has been categorized into five major chapters. The first chapter is the introductory part of the study, which consists of general background, statement of the problems, significance of the study, objectives of the study, Research hypothesis and limitation of the study. Second chapter deals with review of literature, consists of theoretical as well as empirical literature review. In theoretical part, all the theoretical aspects interest has been studied in empirical part previous researches done in the same topic has been considered. Chapter three is related to research methodology which guidelines of the research which deals on research design, population and sample size, source of data, data collection and processing techniques and analysis of tools. The fourth chapter is the main body of the research i.e. data presentation and analysis, attempts to analyze and evaluated data with the help of analytical tools and interpret all the result into the unit of empirical findings and results. Chapter five is the concluding part of the research which deals with summary, conclusion and recommendations for further improvement. Finally, bibliography and appendices have also been incorporated.

CHAPTER II

REVIEW OF LITERATURE

Review of literature is an essential part of research studies. It is a way to discover what other research in the area of our problem has uncovered. A critical review of the literature helps the researcher to develop through understanding and insight into previous research works that relates to the present study. The purpose of reviewing the literature is to develop some expertises in one's area loose what new contribution can be made and to receive some ideas for developing a research deign. In other words, there has to be continuity in research. This chapter highlights upon the existing literature. In this chapter, attempts have been made to review the literature related to interest rate structure and its impact on lending and deposit of commercial banks in Nepal. Both the theoretical aspect as well as findings of the previous studies has been included here so as to identify the broad aspects of interest rates structure and its impact on lending and deposit of commercial banks in Nepal. This chapter is going to show the problems posed by different researchers and writers and the solutions and strategies they exerted. The main motto of this chapter is to show how far and how much our present study is associated with different past researches. So, different journals, articles, books and research works were reviewed.

2.1 Conceptual Framework

Different authors have defined interest and deposit in different ways. A review of these definitions is important in order to have a better insight into this subject matter. This part, therefore deals with the concept of interest and deposit, the evolution of these concepts and their different components.

A rate which is charged or paid for the use of money is known as interest rate. Interest is the amount paid by a borrower to a lender above the amount (the principal) that has been borrowed. An interest rate is often expressed as an annual percentage of the principal. It is calculated by dividing the amount of interest by the amount of principal. Conceptually, interest is both a payment and receipt for the use of money. Interest, therefore, can be considered from the above two point. If interest is paid, it can be considered as a "cost". One the other hand, if interest is received, it can be considered as a "return". Since, money can return over a period of time, interest rates are often considered as an expression of the time

value of money. It is the price of credit but unlike other price in the economy, the rate of interest is really a ratio of two quantities-the money cost of borrowing divided by the amount of money actually borrowed, usually expressed on an annual percentage basis. For example, if a lender (such as a bank) charges a customer Rs100 in a year on a loan of Rs1000, then the interest rate would be 100/1000 *100% = 10%.

The neo-classical economist however 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. 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. 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: 113).

A more thorough definition of an interest rate can be found in The Economist's Dictionary of Economics. In part they defined the "rate of interest" as:-

"The proportion of sum of money that is paid over a specified period of time in payment for it's loan. It is the price a borrower has to pay to enjoy the use of cash which he does not own, and the return a lender enjoys for differing his consumption or parting with liquidity. The rate of interest is a price that can be analyzed in the normal framework of demand and supply."

Keynes in his book "The General Theory of Employed, Interest and Money" brought forward his view about the rate of interest. Community's liquidity preferences and quantity of money determine the level of or rate of interest. These three things liquidity preferences, quantity of

money and rate of interest are negatively correlated. At low rated interest the liquidity preferences of community is high and it is low at big rate of interest (Keynes, 1936).

According to modern view interest rate determination depends up on the investment, the marginal efficiency of capital is the rate of interest and investment is equal to the desire volume of saving.

Thus, the total investment=Total Saving or I=S

Keynes had argued that interest stems directly from the supply of and demand for money itself rather than the use of money. Liquidity is the unique characteristics of money and calls the demand for money to hold liquidity preferences. It is this which requires the payment of interest. The marginal efficiency of capital determines the degree of liquidity preference and the rate of investment and interest there on.

According to Crosse determination of interest rate depends on "when funds are plentiful, market rate generally tends to decline, bank seek loan more aggressively, and therefore lower their rates induce marginal borrower to come into the market. When funds are scare banks raise their rates and potential borrowers may differ the use of credit or seek it elsewhere. This chapter lays the foundation of the present work. It discusses in brief about the theoretical concept of interest rate and its relation with other subjects.

2.1.1 Interest Rate Strategies of NRB

In the monetary system of all countries, the central bank is an apex institutions of the monetary system, which seeks to regulate the functioning of the financial institutions of the country. Nepal Rastra Bank as the central bank under the Nepal Rastra Bank Act 1955 was established in 26th April, 1956. Its function was to supervise commercial banks and to guide the basic monetary policy of the nation. Its major aims were to regulate the issue of paper money; secure countrywide circulation of Nepalese currency and achieve stability in its exchange rates, mobilize capital for economic development and for trade and industry growth; develop the banking system in the country, thereby ensuring the existence of banking facilities; and maintain the economic interests of the general public. Nepal Rastra Bank also was to oversee foreign exchange rates and foreign exchange reserves.

Nepal Rastra Bank is an autonomous and corporate body having perpetual succession. It started its operations with a total number of 23 employees including the Governor and the Chief Accountant. In the initial years of its operation, Bank had to focus its attention on abolishing the dual currency system, regulating the circulation of Nepalese currency throughout the kingdom and maintaining stability of exchange rates of the Nepalese currency. For this purpose, the bank opened its offices and currency exchange counters in various parts of the country. Currently, NRB has 7 main offices all over Nepal. NRB is authorized to determine the interest rate charged and offered by the commercial banks and financial institutions. There was full discretion to NRB in determining interest rate structure of banks and financial institutions in the period of 1960 to 1975. The financial system reforms started after the liberalization of interest rates in 1984 when commercial banks were given autonomy to fix interest rates over and above the central banks rates by 1.5 percentage points on saving and 1 percentage point on term deposits. The financial institutions got freedom in fixing their interest rates in their deposit and loans in 1986. However, there was limitation imposed on certain sectors of lending such as the rates of maximum of 15 percent on the priority sectors loan and for the other kinds of loans financial institutions were given freedom to maintain the interest rate structure. On December 1993, Banks and finance companies were not allowed to have more than 6 percentage interest rate spread between deposit and lending rates. Commercial banks were obliged to publish their interest rates and variations were permitted only to the extent of 1 percent on deposit and 2 percent in the lending rates between borrowers for the same purpose.

Interest is both a payment and receipt for the use of money. Interest, therefore, can be considered from the above two points. If the interest is paid, it can be considered as a 'cost'. On the other hand, if interest is received, it can be considered as a 'return'. Since, money can earn a return over a period of time; interest rates are often considered as an expression of the time value of money and are expressed in percentage. All business organizations or individuals are responsive to interest rate of the banks and financial institutions in one way or another. A variety of interest rate risk exists in the financial markets. However, in the context of Nepal, interest rate is regulated by the central bank during the early stage of financial market, development taking the period from 1955 to 1965. But gradually dramatic change had been made in the regulation on the interest rate by the central bank i.e. Nepal Rastra Bank according to the compatibility of the banks and financial institutions through liberalization. In the early mid 1980's Nepal has adopted liberal economic policy as a result of which many banks and financial institutions came into existence. Regulation of the financial system aimed at control of the economy rater than foster safety and soundness of financial system. But the interest rate deregulation, curtailment or elimination of directed credits, lifting entry and exit barriers for financial intermediaries, restructuring of banking system and institution of regulatory and supervisory mechanism are some of the components which open the door of such liberalization. There was full discretions to NRB in determining interest rate structure of banks and financial institutions from the period 1960 to 1975 as it was the sole and whole institution authorized to determine the interest rate as per NRB act (Shrestha & Bhandari,2007:128).

The era of interest rate liberalization started in November 16, 1984 when NRB granted autonomy to commercial banks to fix the rates of interest over and above the NRB rates by 1.5 and 1.0 percentage points respectively on saving and term (fixed) deposit. NRB directed commercial banks to reduce the interest rates by 2 percent points than the normal credit for agricultural and cottage industries in 18 remote districts. Interest rates policy in Nepal was characterized by an elaborate system of mandatory deposit and lending rates for commercial banks and other financial institutions before the deregulatory moves of May 1996. The interest rates were further liberalized in May 29, 1986 when commercial banks were allowed to fix rates higher than the minimum deposit rates fixed by the NRB. Commercial banks were also set free to fix lending rates except certain item in the priority sector. The minimum interest rates were 8.5 percent on saving deposit and 12.5 percent for one year fixed deposit. The interest rates on fixed deposit with a maturity period or less than one year were left to the

discretion of the banks themselves. Regarding lending rates, the interest rate was at 15 percent maximum. On August 22, 1992, NRB issued some directives to commercial banks and other financial institutions to clearly spell out the interest rate on deposits. NRB also suggested to commercial banks and other financial institutions to limit the spread of interest rate at 6 percent within Mid- December 1993. A further instruction to banks and financial institution was issued in 2002 and now the interest rate spread required to be maintained by commercial banks and financial institutions has also been removed.

2.1.2 Interest Rates and Investment Pattern

According to the survey conducted by NRB (the interest rate in unorganized sector in Nepal) interest rates has increased significantly, especially in recent years, in the unorganized sector. It is for the increment in the investment because a significant part of the resources come from deposit and is used largely to provide credit for private sector.

2.1.3 Interest Rates and Deposit Mobilization

Interest is the price paid for the acceptance of deposit, and remuneration received for allowing others to use unutilized deposit for their benefit. A high interest rate diverts the resources from unproductive tangible assets to financial claims. R.D. Pant mentioned that the changing interest rates in deposits change the saving habit of the Nepalese individuals. High interest rate in deposit helped to raise the saving, especially from rural area. Lower rates loan showed huge increment in sale and purchase of land building and vehicles in the recent year.

2.1.4 Interest Rate and Monetary Policy

There is deep relationship between interest rate and monetary policy. Monetary policy works by controlling the cost and availability of credit. During inflation, the central bank raises the cost of borrowing and reduces the credit creating capacity of the commercial bank, this ultimately increases the interest rate of bank. Increasing the money supply can lower the interest rates.

2.1.5 Interest Rate and Profitability

Schulz explains that, "an important aspect of interest rate policy is setting of an appropriate margin between the lending and deposit rate. If the margin is too high, banks will make excessive profits and this may lead to waste of saved resources. If it is low, it will discourage intermediation and devitalize financial institution (Schulz, 1978).

2.1.6 Interest Rates and Price Level Changes

The changes in the interest rate and price level move together because they are interlinked with one another. The relation with each other is termed below.

High interest rate accompany "high" price and "low" interest rate accompany "low" price.
Interest rates tends to be high when price are rising and vice-versa.
Interest rate movement lags behind price level change.

Weston and Bringham mentioned the price level trends affect interest rates-in-two important ways. The nominal interest rates the contract, or stated interest rate reflects expectation about future price level behaviour. If prices are rising and expected to rise further, the expected rate of inflation is added to the interest rate that would have prevailed in the absence of inflation to adjust for the decline in purchasing power represented by price increase (Weston and Bringam, 1984).

2.1.7 Function of Interest Rate

According to Maxwell the three basic functions which interest rates can perform are:

The interest rate can mobilize saving. It is the price for saving used by savers to equate marginal rates of substitution between present and future consumption. Under Nepal's imperfect market conditions. It also has a strong effect on the choice of assets which saving are embodied. A rise in the interest rate produces a substitution from unproductive tangible assets held as inflation hedge into financial claims. This substitution as well as any increase in the savings rate frees resources for productive investment.

The interest rate is an efficient rationing device for the allocation of scarce resources between alternative investments. It is almost invariably superior in this respect to rationing on the basis of the decisions of a bureaucrat in a planning agency, the quantity of the collateral offered, the political influence of the borrower, "name" or the preferences of corrupt loan officers.

The interest rate can provide a social discount rate for decision to save and invest. In this role, it equates plans to save and invest. Here it acts as a market cleaning devices, influencing in an optimal manner the choices of what to produce and how to produce it interest rate can discourage highly capital incentive techniques of production in countries where capital is scarce, instead encouraging greater use of labour. Where labour is plentiful and capital scarce, the interest rate directs entrepreneurial activities into simple things with simple technologies, but with high return to capital.

Neupane mentioned in his research work that interest rate varies among nations. It depends upon their economic activities and existing policies. In every economy, we find inverse relationship between investment and interest rate. Higher the interest rate, lower the investment and vice-versa. Direct relationship may be found between interest rate and savings. With the lower interest rate, the deposit also falls down. So while determining the interest rates there should always be equality in saving and investment. Appropriate interest rates scan direct investment in the proper field. For resources, interest rates should be positive.

In Nepal, interest rate can perform the following functions:
The interest rates mobilize savings;

The interest rate is an effective rationing device for the allocation of the scare resources between alternative investments.

The interest rate can provide a social discount rate for decision to save and invest.

Interest rate has the guideline for directing the investment into productive sector. The cheaper interest rate of the commercial banks diverted the capital into unproductive and speculative sectors.

2.1.8 Theories of Determining interest Rate

Various interest rate theories have been propounded by various economists, which describe how interest rate is determined in various situations. Some well known theories of interest rates are as follows:-

2.1.8.1 Classical theory of interest rates

One of the oldest theories concerning the determinants of the pure or risk free interest rate is the classical theory of interest rates, developed during the eighteenth and nineteenth century by a number of British economists and elaborated by Irving Fisher in 1930. The classical theory argues that the rate of interest is determined by two forces: (1) the supply of savings, derived mainly from the households and (2) the demand for investments capital, coming mainly from the business sectors (Rose, 1997:193).

Savings by Households

Generally, most of the savings in modern industrialized economics is carried out by individuals and families. For these households, saving is simply abstinence from consumption spending. Current saving therefore is equal to the difference between current income and current consumption expenditures.

In making the decision on the timing and amount of saving to be done, households typically consider several factors: the size of current and long-term income, the desired savings target and the desired proportion of income to be set aside in the form of savings. Generally, the volume of household saving rises with income. Higher income families and individuals tend to save more and consume less relative to their total income than families with lower incomes.

Although income levels probably dominate saving decisions, interest rates also play an important role. Interest rates affect an individual's choice between current consumption and saving for future consumption. The classical theory of interest assumes that individuals have a definite time preference for current over future consumption.

A rational individual, it is assumed, will always prefer current enjoyment of goods and services over future enjoyment. Therefore, the only way to encourage an individual or family to consume less now and save more is to offer a higher rate of interest on current savings. If more were saved in the current period at a high rate of return, future consumption would be increased.

The classical theory considers the payment of interest a reward for waiting the postponement of current consumption in favor of greater future consumption. Higher interest rates increase the attractiveness of saving relative to consumption spending, encouraging more individuals to substitute current saving for some quantity of current consumption. This so called Substitution Effect calls for positive relationship between interest rates and the volume of savings. Higher interest rates bring forth a greater volume of current savings. For example, if the rate of interest in the financial markets rises from 5 to 10 percent, the volume of current saving by households is assumed to increase from 100 million to 200 million.

Saving by Business Firms

Not only households but also business saves. Most businesses hold savings balances in the form of retained earnings (as reflected in their equity or net worth accounts). In fact, the increase in retained earnings reported by businesses each year is a key measure of the volume of current business savings which supplies most of the money for annual investment spending by business firms.

The volume of business saving depends on two key factors: the level of business profits and the dividend policies of corporations. These two factors are summarized in the retention ratio, the ratio of retained earnings to net income after taxes. This ratio indicates the proportion of business profits retained in the business for investment purposes rather than paid out as dividends to the owners.

The critical element in determining the amount of business savings is the level of business profits. If profits are expected to rise, businesses will be able to draw more heavily on earning

retained in the firm and less heavily on the money and capital markets for funds. The result is a reduction in the demand for credit and a tendency toward lower interest rates. On the other hand, when profits fall but firms do not cut back on their investment plans, they are forced to make heavier use of money and capital markets for investment funds. The demand for credit rises and interest rates may rise as well.

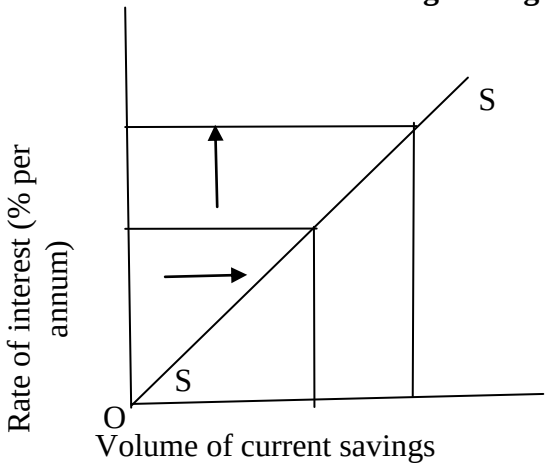
Although the principal determinant of business saving is profits, interest rates also play a role in the decision of what proportion of current operating cost and long-term investment expenditures should be financed internally and what proportion externally. Higher interest rates in the money and capital markets typically encourage firms to use internally generated funds more heavily in financing projects. Conversely, lower interest rates encourage greater use of external funds from the money and capital markets.

Saving by Government

Governments also save, though less frequently than households and businesses. In fact, most government saving (i.e. a budget surplus) appears to be unintended saving that arises when government receipts unexpectedly exceed the actual amount of expenditures. Income flows in the economy (out of which government tax revenues arise) and the pacing of government spending programs are the dominant factors affecting government savings.

The total supply of funds is sum of above three elements as SS on figure no. 2.1

Figure 2.1: The Substitution Effect Relating Saving and Interest Rate

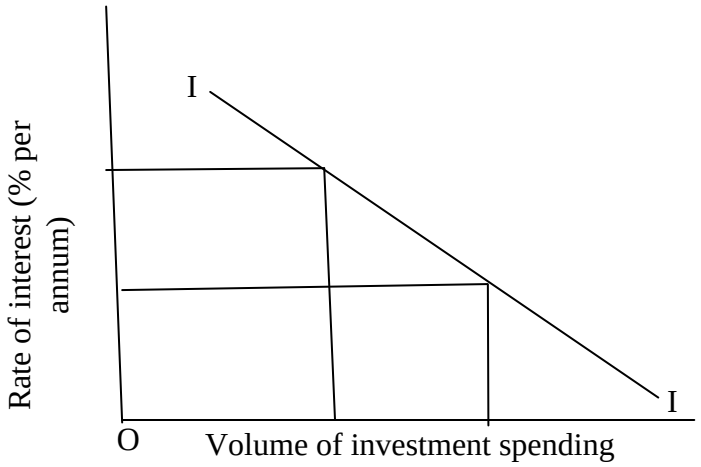


The Demand for Investment Funds

The savings made by household, business, government are important determinants of interest rate but they are only one side of determinants. The other factor is investment spending made by business firms government and in some case by households. Business requires huge amounts of funds each year to purchase equipment, machinery and inventories and to support to construction of new buildings and other physical facilities. The majority of business expenditures for these purposes consist of what economists call replacement investment. But according to the classical economists, interest rate and investing fund have inverse relationship (Rose, 1997:195).

At low rate of interest more investment project becomes economically viable. On the other hand, if the rate of interest rises to high levels, fewer investment projects will be pursued and fewer funds will be required from the financial markets as figure no. 2.

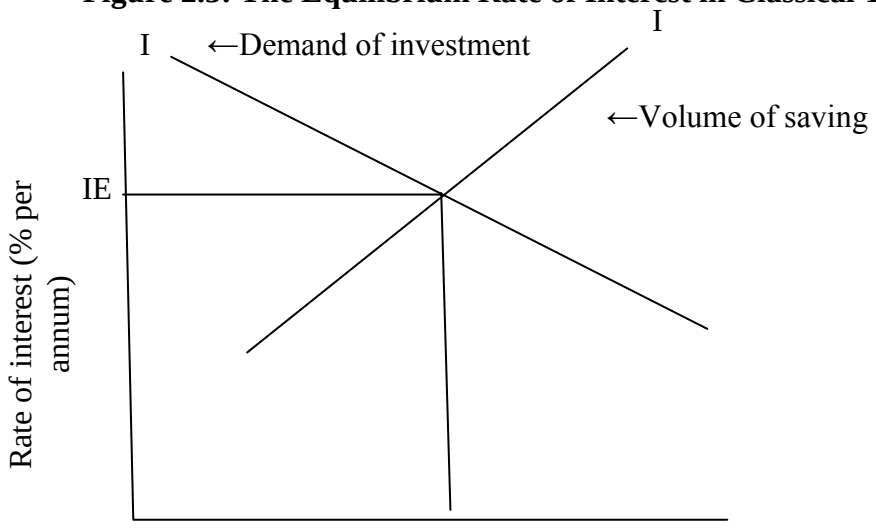
Figure 2.2: The Investment Demand Schedule



The Equilibrium Rate of Interest in the Classical Theory of Interest

According to the classical economists, the interest rate in the financial market and determined by the interplay of the supply of saving and demands for investment. Specifically, the equilibrium of interest is determined at the point where the quantity of saving supplied to the market is exactly equal to quantity of funds demanded for investment. As shown in the figure below this occurs at point E, where the equilibrium rate of interest is IE and the equilibrium quantity of capital funds traded in the financial markets is QE.

Figure 2.3: The Equilibrium Rate of Interest in Classical Theory



The market rate of interest moves toward its equilibrium level. However, supply and demand forces change so fast that the interest rate rarely has an opportunity to settle in at a specific equilibrium level. At any given time, the rate is probably above or below its true equilibrium level but moving towards that equilibrium. If the market rate is temporarily above

equilibrium, the volume of savings exceeds the demand for investment capital creating an excess supply of savings. Savers will offer their fund at lower and lower rates until the market interest rate approaches to equilibrium. Similarly, if the market rate is temporarily below equilibrium, investment demand exceeds the quantity of saving available. Business firm will bid up interest rate until it approaches the level at which the quantity saved equals to quantity of funds demanded for investment purpose.

2.1.8.2 The Loanable Funds Theory of Interest

Developed by Swedish economist Knut Wicksell (1851-1926), the loanable funds theory of interest states that interest rates are determined by the supply and demand of loanable funds in the capital markets. This explanation emphasizes the flow of funds by suppliers of loanable funds (lenders) and the flow of funds by the demanders of loanable funds (borrowers). It is a monetary theory of interest since it focuses on the financial factors that influence interest rate (i.e. borrowing and lending). In addition, loanable funds theory of the rate of interest suggests that investments and savings determine the long-term level of interest rates, whereas short-term rates are determined by financial and monetary conditions in the economy. The loanable fund theory is a short-run, partial equilibrium explanation in which some factors produce a change in the interest rate and on the level of employment, income and production of the resulting impact. Rather, the loanable funds theory focuses on the factors that underlay the supply and demand schedules for loanable funds and on their interaction (Cooper & Fraser, 1983:160).

Supply of Loanable funds

The major sources of supply of loanable funds are from two sources: (1) The amount of saving by households business, governments and (2) The amount of new money created by the commercial banking system.

Domestic Saving- Saving refers to the postponement of current consumption. The decision to save is the decision to forgo current consumption in order to have a larger quantity of consumption in the future. Individual or households save for a variety of reasons but there is little evidence to suggest that the quantity of loanable funds supplied through saving is clearly influenced by the level of the interest rate. A higher interest rate represents a greater reward to the saver for postponing current consumption and thus might be expected to produce a higher quantity of saving for some individuals. In general case, the quantity of saving

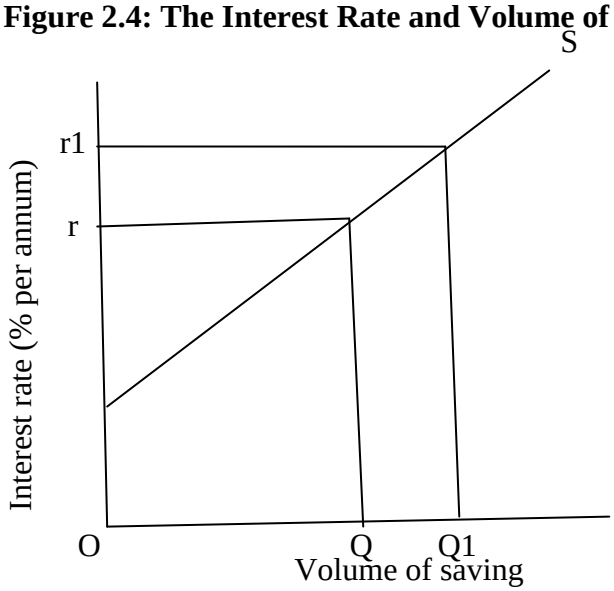
supplied by individuals is principally determined by the level of income and it is influenced to a lesser degree by the level of interest rates.

Business saving refers to the net income after taxes of the firm, less any cash dividends i.e. retained earnings. There is a little reason to believe that the volume of saving at business firm is strongly influenced by the level of interest rates.

For governments, the volume of saving is defined as the difference between revenues and expenditures such that saving exist which revenues exceed expenditures such that saving exists when revenues exceed expenditures (a budget surplus).

To summarize, saving (the postponement of current consumption) may be done by households, business and governments. The volume of saving of each of these units is influenced by a variety of factors of which the interest rate is one. As a result, we might expect that the relationship between the interest rate and the volume of saving. For example, at interest rates of ‘r’, the volume of saving would be Q. The responsiveness of saving to change in interest rates is quite small.

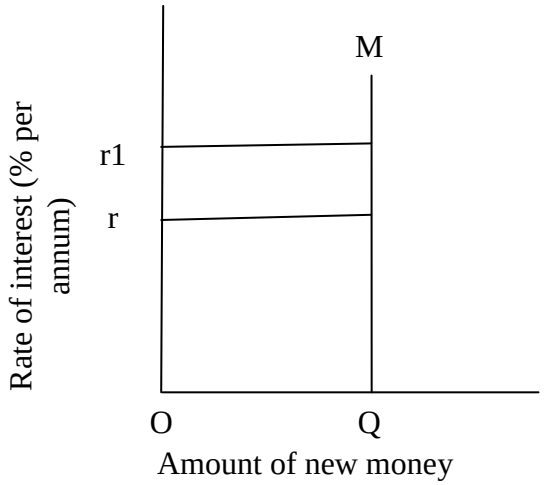
Figure 2.4: The Interest Rate and Volume of Savings



New Money- Although the volume of saving is the principal source of loanable funds in financial markets, the supply of loanable fund may be increased through the creation of new money beyond the amount made possible by current saving. The amount of new money created is determined jointly by the actions of the commercial banking system and the central bank. Commercial banks use any excess reserves to make loans and purchase securities and create money (demand deposit) through the credit creation process. However, the ability of commercial banks to create money is limited by the central bank through the use of its monetary policy tools like open-market operations, reserve requirement change and discount rate changes.

There is little evidence that either the central bank or commercial banks are substantially influenced in the money creation process by the level of interest rates. The principal Factor that determines the volume of new money created by the banking system is the amount of reserves and the principal factors that determine the amount of reserve is central bank monetary policy. Neither of these factors could be directly influenced by the level of interest rates. We may therefore, draw the relationship between the amount of new money created and interest rate as shown in figure 2.5. The volume of new money supplied is Q and at the higher interest rate ‘r’, the amount of new money created is the same Q. essentially, change in the money supply are determined by factors other than the interest rate.

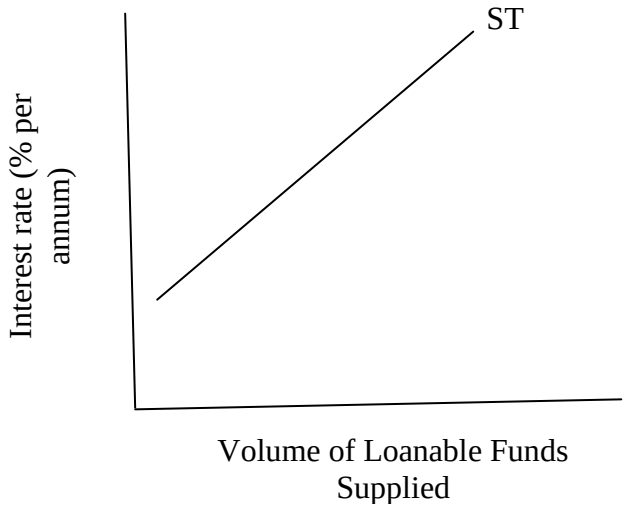
Figure 2.5: The Supply of Loanable Funds



Total Supply for Loanable Fund

In summary, the total supply of loanable fund is the sum of the supply of savings and the amount of new money created. This supply schedule of loanable fund may be increased either by an increase in the desire to save by business, households and governments or by the creation of more new money by commercial banking system. Conversely, the supply of Volume of saving of loanable fund may fall because of a reduction in the desire to save.

Figure 2.6 Total Supply of Loanable Funds



The Demand for Loanable Fund

The demand for loanable fund is composed of the demand by household, business and governments.

Consumer (Household) Demand- Domestic consumers demand loanable funds to purchase a wide variety of goods and service on credit. Recently research indicates that consumers are not particularly responsive to the non price terms of a loan such as the down payment, maturity and size of installment payments. This implies that consumer demand for credit is relatively inelastic with respect to the rate of interest. Certainly a rise in interest rate leads to some reduction in the quantity of consumer demand for loanable fund (particularly when home mortgage credit is involved) whereas a decline in interest rate stimulates some additional consumer borrowing. However, along the consumer's relatively inelastic demand schedule, a substantial change in the rate of interest must occur before the quantity of consumer demand for funds changes significantly.

Domestic Business Demand-The credit demands of domestic business generally are more responsive to changes in the rate of interest than in consumer borrowing. Most business credit is for such investment purposes as the purchase of inventories and new plant and equipment. As noted earlier, in our discussion of the classical theory of interest, high interest rate eliminates some business investment projects from consideration because their expected rate of return is lower than the cost of funds. On the other hand, at lower rate of interest, many investment projects look profitable with their expected returns exceeding the cost of funds. Therefore, the quantity of loanable funds demanded by the business sector increases as the rate of interest falls. The total demand for loanable fund is shown in the following figure 2.7 where DT is total demand.

Government Demand-Government demand for loanable funds is a growing factor in the financial market but doesn't depend significantly on the level of interest rates. Government decision on spending and borrowing depends in response to social needs and the public welfare not the rate of interest. Moreover, in case of central government, it has the power both to tax and to create money to pay its debts. State and local government demand on the other hand, is slightly interest elastic because many local governments are limited in their borrowing activities by legal interest rate ceilings. When open market rates rises above these

ceiling, some state and local governments are prevented from offering their securities to the public.

Total Demand for Loanable Fund-The total demand for the loanable fund is the sum of domestic consumer, business and government credit demands. These demand curve slopes downward and to the right with respect to the rate of interest. Higher rate of interest lead some businesses, consumers and governments to curtail their borrowing plans; lower rates bring forth more credit demand.

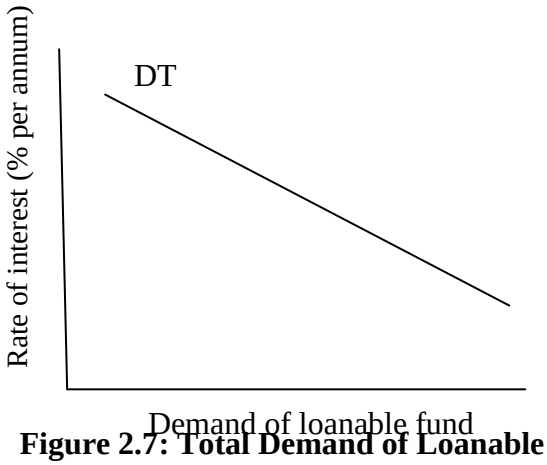


Figure 2.7: Total Demand of Loanable Funds

The Equilibrium Rate of Interest in the Loanable Funds Theory

The two forces of supply and demand for loanable funds determine not only the volume of lending and borrowing in the economy but also the rate of interest. The interest rate tends towards the equilibrium point at which the supply of loanable funds equals the demand for loanable funds. If the interest rate is temporarily above equilibrium, the quantity of loanable funds supplied by domestic savers and foreign lenders, by banking system, and from the dishoarding of money exceeds the total demand for loanable funds and the rate of interest will be bid down. On the other hand, if the interest rate is temporarily below equilibrium, loanable funds demand will exceed the supply. The interest rate will be bid up by borrowers until it settles at equilibrium once again.

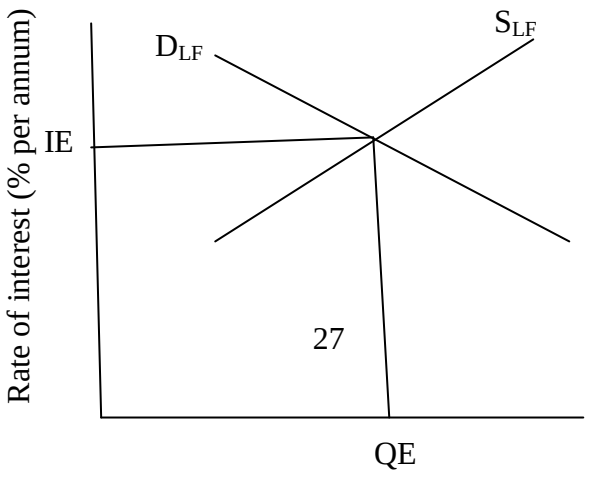


Figure 2.8: Equilibrium Rate of Interest in Loanable Fund Theory

2.1.8.3 Liquidity Preference Theory of Interest Rate

The loanable funds approach to interest rate determination focuses on supply and demand for loanable fund. The liquidity preference theory is an alternative approach which focuses on the liquidity preference instead of the supply and the demand for money. It is assumed that individuals inherently prefer money among all financial assets since money can be used to make payments and provide perfect liquidity. Wealth holders are persuaded to hold financial assets other than money only because these non-money assets are money less the demand for money holdings and greater the income, greater the demand for other financial assets and vice versa *(Rose, 1997:209).* The demand schedule for money can thus be depicted as a function of the rate of interest as shown in figure 2.9.

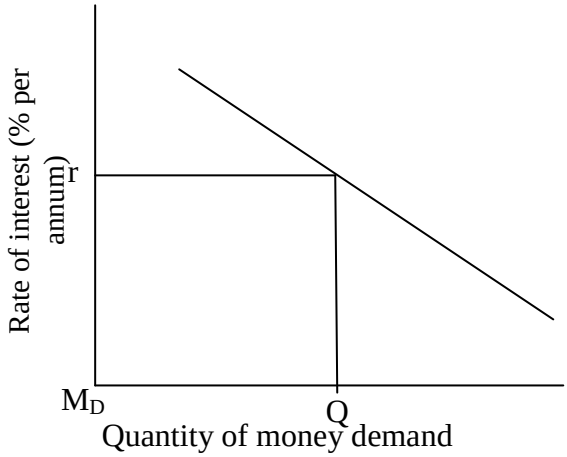


Figure 2.9 The demand of Money as a function of rate of interest

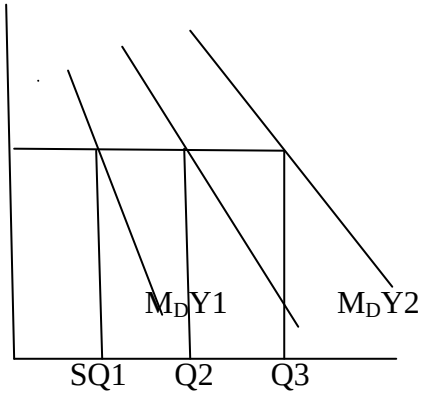


Figure 2.10: Quantity of Money Demanded

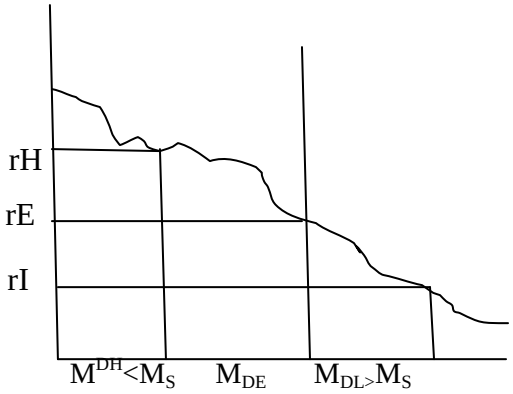


Figure 2.11: Quantity of Money Supplied

Thus, the greater the income, the greater will be the quantity of money demanded at a given rate of interest and vice versa. The relationship is depicted in fig 2.10 where MDY1**,** MDY2**,** MDY3 represent the demand for money at the successively higher income level Y1**,** Y2**,** Y3**.** Thus for a given income level, say Y2 and a given money supply the rate of interest (r_E) is viewed as determined by the supply-demand equilibrium depicted in fig 2.11 where M_S is the

supply of money. The equilibrium interest rate r_E is obtained by action of individuals seeking to maintain desired levels of cash balances. Since the amount of desired money holding is a function of the rate of interest, there is only one rate of interest at which the demand for money balance is the same as the amount of the money supply. At a rate of interest higher than r_E**,** say r_H in fig 2.11 individual in the aggregate will be holding more money (MS) then they desire MDH at that rate of interest (the total supply of money must be held by the public). To rid them of "excess" cash, individual purchase interest bearing financial assets, driving their prices up and their interest rate down. This occurs until the rate of interest falls to r_E at which MDE=MS.

The outcome of course is that public still holds in the aggregate, the same amount of money but at the lower rate of interest, this is now the desired amount. On the other hand, if the interest rate is lower than r_E say r_L in fig 2.11 the public will be holding smaller money balance (Ms) that they desire (MDL**)** at that rate of interest. As a result, in order to obtain more cash in this situation, individual sell interest bearing securities, the aggregate effect of which is lower security prices and higher interest rates. The interest rate will thus rise to r_E at which point desired cash holdings equals the supply of cash.

A principal aspect of the liquidity preference model is that changes in the money affect the rate of interest. In the liquidity preference framework, with income and the price level assumed to be constant, an increase in the money supply will lower r_E the equilibrium rate of interest (fig 2.12) and decrease in the money supply will rise r_E (fig 2.13).

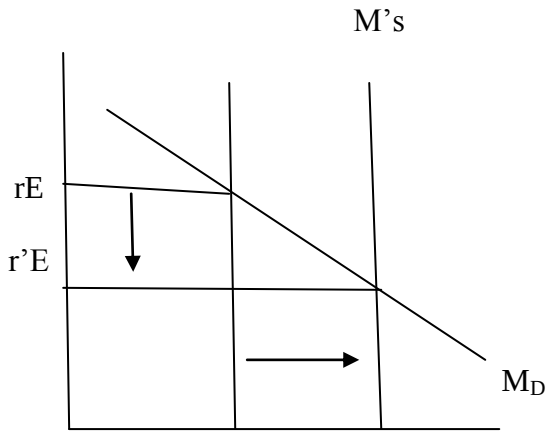


Figure 2.12: Effect of an increase in the money Supply on the rate of interest

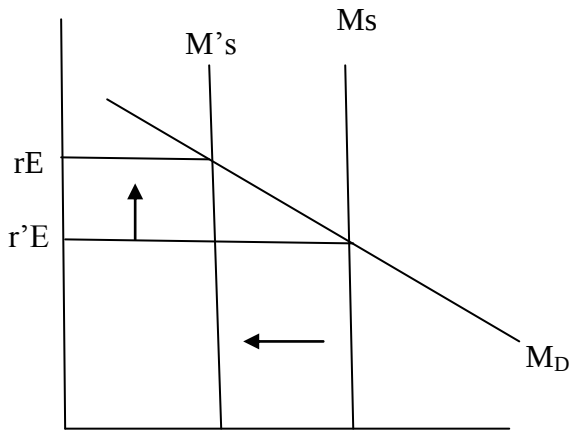
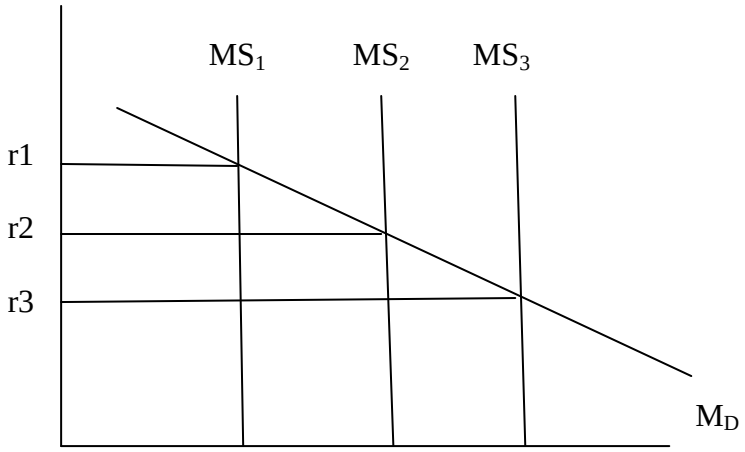


Figure 2.13: Effect of decrease in the money supply on the rate of interest

In summary, when the money supply is MS1, the rate of interest is r_1. As the money supply expands to MS2 and MS3, the rate of interest falls to r_2 and r_3 respectively. The process by which interest rates fall as M3 expands can again be interpreted in terms of public preference for money holding relative to other financial assets such as interest bearing securities. For example, as in fig 2.14, when the money supply expands from MS1 and MS2, individual find themselves holding larger cash balance than they desire at interest rate r_1. As they seek to reduce money holding by purchase of security, security price rise and interest rate fall until a new equilibrium is established at interest rate r_2 where MD=MS.

Figure 2.14: Money Supply and Interest Rate



2.1.8.4 Factors Affecting the Difference in 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, 1993:169).* For this, there are various factors affecting the difference in interest rate:-

Credit or Default Risk

Liquidity Risk

Marketability Risk

Call or Prepayment Risk

Servicing Costs

Exchange Rate Risk

Taxability

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.

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.

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.

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.

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.

Exchange Rate Risk-

A foreign company establishing manufacturing facility in Nepal might be inclined to issue shares and or bonds denominated in Nepalese rupees rather than foreign 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.

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 it's 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.

2.2 Review of Previous Studies

2.2.1 Review of Articles and Journal

Rameshwori Pant (2056), in *Nepal Bank Patrika* viewed the management of internal loan is directly affected by the interest rate. According to her, the interest rate determines the level of investment which can be invested by the investors. In case of perfect financial market, interest rate is determined by the supply of money (which can be invested) and its demand (from private sector, government sector). But in developing countries interest rate must be higher because of governments' high demand for capital.

Sahindra Shrestha (2000), in *Prashasan: The Nepalese Journal of Public Administration* mentioned that top banks have comparatively lower dependency than smaller banks; smaller banks are prone to face higher impact of interest rate on mobilization of its fund. This is the reason why smaller banks need to increase deposit interest rate and decrease lending rate to minimize the expected negative impact of interest rate. He came to the following findings:

The wider spread of interest rate help the commercial banks to manage the higher liquidity position and good profitability.

A high interest in deposit and low in lending is important to attract customer to the bank but facilities offered by banks also plays an important role for the success of banks.

An appropriate and realistic interest rate on lending can help in the optimum utilization of available resources.

Bhandari (2001) in *Prashashan : The Nepalese Journal of Public Administration* mentioned that "Impact of Interest Rate structure on investment portfolio of Commercial Banks of Nepal." He found the deposit rate and lending rate increased slightly immediately after liberalization of interest rate on Aug. 31, 1999 but started to decline thereafter. To point out his findings:

Interest rate structure of commercial banks greatly influenced their profitability which depends upon their interest spread.

Deposit rate is still the most important determinant of the deposit collection of the commercial banks.

Lower rate of interest helped increase the credit flow.

Commercial banks investment in government and other securities dramatically increased in the following year of the interest rate liberalization.

Many commercial banks invest a small part of their resource in non-fund based area.

The study showed decreasing trend of increasing ratio of loan and advance of commercial banks to their resources.

The study also shows the increasing demand for credit can be met only increasing deposit collection.

Khati (2004), in *Nepal Bank Patrika* viewed to share, according to him the overall performance of commercial banks is satisfactory and NRB has to pay more active role to enhance the operation. He further writes:

Liquidity position of commercial banks is satisfactory.

The coefficient of correlation of deposit and lending and investment of commercial banks have better position.

The coefficient of interest rates and deposits of commercial banks do not have better position.

The trend of deposit, loan and advances and investment and investment to deposits is in decreasing trend.

He concluded his thesis mentioning that the interest rate has played important role in deposit mobilization of the bank. So, the structure of interest rate should be changed according to the need of nation.

K.C (2064), in *Nepal Bank Patrika* published an article on "Interest Rate Policies." In his article he mentioned interest rate is one of the main weapons of monetary policy.

He mentioned the following facts regarding interest rate. The level of interest rate depends upon the internal liquidity, situation of external interest rates, change in exchanging rate etc. Interest rate also depends upon the change in real national income, return on alternative income, number of financial institutions and the capacity of financial institutions.

The desire to save money of the general people is closely related with the rate of interest on deposit but the rate of interest on deposit of financial institution itself depends up on the liquidity position of the bank and the amount of loan demanded low rate of interest adversely affects the saving mobilization, flexibility of capital and effective utilization of capital resources while higher interest rate affects investment negatively.

Less spread shows the ability of financial institutions. But it is necessary to keep appropriate spread level for financial institutions to maintain them qualified in this sector.

2.2.2 Review of Theses

For the depth understanding of interest rate and it's impact some relevant books, research paper, articles and genuine thesis are also reviewed to share knowledge left by past researcher and books. The review of the old but valuable literatures is done in following order:

Rajbhandary (2000) conducted a study entitled *"The Interest Rate Structure of Commercial Banks in Nepal."* The objective of his study was to show the relation of interest rate with saving and fixed deposits; with loans and advances and with interest earning (i.e. interest received on loan minus interest paid on deposits).

His analysis concludes that the time deposits are positively and significantly correlated with the interest rates. There is significant correlation between the saving deposits and the rate of interest. Fixed deposit is more sensitive to the interest rate revision done by NRB. The correlation between the growth of fixed deposits and the interest rate particularly from 1994 and 2000 is most significant but the relation between interest rate and loan and advances is less significant. Among the entire sector, the private sector seems most sensitive to interest rate change. Most of the loans too correlated positively if absolute cumulative figure are taken. But the growth rate of total loans and advances except investment on government securities is negatively correlated more with the weighted average rate of interest since 1994. The growth of loan to private sector is also negatively correlated with interest rate since 1991. Negative correlation between loans and interest rate meant that loan decrease at higher interest rate and vice versa.

The net interest earning is depended upon interest coverage. The total interest received and the total interest paid significantly correlated in the case of both of the banks i.e. Nepal Bank Limited and Rastriya Banijya Bank, the sample organizations of the study. In his view that NRB can well monitor the credit flow and profits of the commercial banks in Nepal by manipulating the rates of interest. It can manipulate the demand for and supply of money.

Shetry (2001) conducted a study entitled *"Interest rate structure and its relation with deposits, inflation and credits in Nepal"* in with the following objectives:
To present a concrete picture of the interest rate structure in Nepal
To predict the relationship between interest rate and other economic variable like deposit, inflation, and credit flow in Nepal
To analyze the impact and the implication of the policy of interest rate of NRB

With the above mentioned objectives, he was of the view that deposit depends upon numerous factors besides income, inflation and interest rates and he concluded his study as:
If other variable are kept constant, institutional interest rate is important explanatory variable to influence the volume of deposit in Nepal.
Interest rates play an important role in under developed country like Nepal where the demand for capital is increasing at each level of income. An appropriate interest rate can divert investment in proper field. This means that the upward movement in the deposit rates increases the volume of deposits.
According to him, the fixation of attractive interest rates on deposit has been responsible for the substantial growth in the volume of deposits in recent years.
He also opines that most of the commercial banks in Nepal are concentrated only in the urban areas. Regarding deposit mobilization in the present context, the urban areas have occupied major parts of the credit and the credit is concentrated in urban areas. The volume of deposit has overcome the volume of credit.
Finally, the relationship between credit flow and loan rates is found out to be negative. If the loan rate of interest is in concession, there is the possibility of raising investment and thus the volume of credit.

Bhatta (2004) 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 conclusions drawn by Bhatta 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 simple correlation coefficient between deposit rate and deposit amount of sample banks were highly negative. But out of them, correlation coefficient analysis of one sample bank is

found to be negative. It means that in that case the theory doesn't match the analysis. So, writer concludes that case the result appears in that study was different than the theory.
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. So, he 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 (2005) has conducted a research on *"Interest rate and its relation with Deposit, Lending and Inflation in Nepal."* In this study, the disseminator tries to portrait the relation of interest rate with deposit and lending amount (i.e. existence of substitution effect). The findings drawn by Mr. Parajuli from his study 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. He also concluded that the spread between deposit interest rate and lending interest rate is in decreasing trend.

Khanal (2067) has conducted a research work on *"Impact of Interest Rate on Deposit Mobilization in Nepalese Commercial Banks."* The objective of the study was to understand and analyze the impact of interest rate on deposit mobilization and its long term effects on the profitability of the selected banks. Beside the main objectives following are the specific objectives:
To study the interest rate spread and its impact on the profitability of the bank.
To study the dominance of the interest income to the total earning of the bank.
To find out the perception of bankers regarding impact of interest rate on deposit collection and mobilization.

To achieve the objective of this study, analytical as well as comparative research design was used. Some statistical accounting tools have been applied to examine facts and analytical techniques were adopted to evaluate the impact of interest rate on deposit mobilization and profitability of the banks. From the study following major findings are obtained:

The figures of interest earned to total assets showed banks are behaving in similar patterns. This ratio is in increasing pattern. Over the years the ratio lies between 5 to 7 percent.

Interest coverage ratio reveals that these banks are maintaining comparatively higher interest coverage ratio than others. Here the Nabil Banks is comparatively in strong position.

The total loan to total deposit ratio of Everest Bank Limited and Nabil Bank Limited shows that EBL has comparatively invested high portion of its deposit funds into lending than NABIL. So EBL has been much aggressive in lending larger portion of its deposit funds.

Total investment to total deposit shows fluctuating investment pattern. NABIL has invested higher than EBL. Bigger banks do not depend on lending of its deposit, they foresee the future prospects in investments and take risk to uncertain venture that's why they invested as high as in investment.

Net interest income of these banks shows NABIL has maintained comparatively higher net interest income than EBL. Both banks have positive growth rates.

Ghimire (2067) has conducted a research study on *"Interest Rate of Commercial Banks and Its Impact on Deposit And Lending of Money."* The primary objective of this study was to identify the structure of the interest rate of commercial banks and its impact on deposit and lending. In order to achieve primary objective, the sub objectives are highlighted as below:-

To study and analyze the relationship of interest rate on the volume of deposits of commercial banks

To study and analyze the relationship of interest rate structure on the volume of lending of commercial banks

The thesis will cover and include the financial and statistical tools to analyze the data in order to reach to the conclusion of the research. In order to get the concrete results from this research, data are analyzed, by using different types of tools.

On the basis of above entire presentation and analysis of relevant data of sample banks using various analytical tools, the major findings are as follows:

The interest rate on both deposit and lending of all sample banks are found to be in fluctuating (generally decreasing) trend. But, on the contrary to this, deposit amount and lending amount is increasing every year.

The saving deposit amount and saving interest rate have inverse relationship of all sample banks (except NABIL). The value of correlation coefficient between saving deposit rate and saving deposit amount of sample banks under study is found as 0.431192, -0.745084, -0.810354 for NABIL, EBL and BOK respectively. These values show that there is high degree of inverse relationship except NABIL.

Analysis of fixed deposit amount and fixed interest rate shows positive relationship for NABIL, EBL and BOK. The correlation coefficient is found as 0.99026, 0.628976, 0.660947, for NABIL, EBL and BOK. This shows that the people depositing more money in fixed deposit are affected by yield rate on fixed deposit.

2.3 Research Gap

Previous researchers covered all the commercial banks and some were either on case study between two commercial banks or some were on the particular bank branch. But this study focused on some particular sample banks. This study covers the recent and an updated data of all the sample banks. Moreover this study has not been done by previous researcher as separately. Thus, to fill the gap, this study had been conducted. However, no one has done study on "Interest Rate Structure and Its Impact on Deposit and Lending" with reference to EBL, NABIL and BOK. Therefore, the researcher attempts to study in this area.

CHAPTER III

RESEARCH METHODOLOGY

Research methodology is the procedure by which researcher go about their work of describing, explaining and predicting phenomenon. In other words, research methodology describes methods and process applied in the entire aspect of the study. In this chapter, efforts have been made to present and explain the specific research design for the sake of attaining the research objective. This chapter has been organised into five sections. Section one presents the research design, while section two describes the Population and sample. Section three describes the data collection procedure. Section four explains the methods of analysis employed in this study. Similarly, the definitions of key terms are described in the last sections.

3.1 Research Design

Research design is the plan, structure and strategy of the investigation conceived as to obtain answers to research questions and to control variance. The research design is an integrated frame that guides the researcher in planning and executing the research work (Wolf and Pant, 2005). This study follows descriptive research design. Although descriptive research cannot predict and control conditions and events, it contributes to science primary by building a foundation of facts upon which exploratory hypotheses may be constructed, by checking the validity of existing theories and by directing attention toward alternative hypothesis which better fit the facts.

3.2 Population and Sample

The population of the study comprises of all 31 commercial banks that are operating within the kingdom of Nepal. As the study of whole population makes the study cumbersome and also collecting and analyzing the information and data of all the commercial banks is not practical due to time constraint and unavailability of resources, only 3 commercial banks are chosen as samples from the population. The following are the banks that are considered as the sample banks for the study are as follows:-

1. NABIL Bank Ltd.
2. Everest Bank Ltd.

3. Bank of Kathmandu Ltd.

This study will try to explore the objectives set in the previous section and it is also expected that this study will help in analyzing the interest rate structure regarding deposit and lending.

3.3 Source of Data and Collection Procedure

As per nature of the study, the study is solely based on secondary data. For the study purpose, annual reports of Sample banks and NRB are used as the major sources of data. In addition to this, Published annual report, balance sheet, prospectus, annual general meeting and unpublished office records, journals, magazines, articles, government and university publications, NRB as well as the web site of various banks have been used as the sources of secondary information. Personal observation and some informal interview methods have been conducted for more information and authenticity about the various published data as the primary data.

3.4 Tools for Data Analysis

The thesis has covered and included the financial and statistical tools to analyze the data in order to reach to the conclusion of the research. In order to get the concrete results from this research, data are analyzed, by using different types of tools. As per the topic requirement, emphasis is given on statistical tools, I am planning to use following for the study:

3.4.1 Arithmetic Mean

The most popular and widely used measure of representing the entire data by one value is called arithmetic mean. It is the sum of the entire observations dividend by the number of observation. In such a case, all the items are equally important. In this study, arithmetic mean is used as per the necessity for analysis. It is computed by using following formula:

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

3.4.2 Standard Deviation

The standard deviation is a statistic used as a measure of the dispersion or variation in a distribution, equal to the square root of the arithmetic mean of the squares of the deviations

from the arithmetic mean. It is the best tools to study fluctuation in any data. It is usually denoted by the letter sigma (σ). It is calculated as:

S.D. (σ) = $\sqrt{\sum \left(X - \overline{X}\right)^2 / n}$

Greater the magnitude of standard deviation higher will be the fluctuation and vice versa.

3.4.3 Correlation of Coefficient

Correlation is an analysis of the covariance between two or more variable and correlation analysis deals with the degree of relationship between variables. The correlation analysis refers the classes of the relationship between the variables. In other words, this tool is used to describe the degree to which one variable is linearly related to the other variables. Two variables are said to be correlated if the change in the value of one variable (independent) affects the change in the other variables (dependent). Correlation analysis enables us in determining the degree and direction of relationship between two variables. However, it does not tell us anything about the cause and effect relationship. Correlation may be positive or negative and range from -1 to +1. Simple correlation between interest rate and deposit amount, interest rate and credit or lending amount and interest rate (both deposit rate and lending rate) is computed in this thesis. Let's take an example that the correlation between interest rate and deposit is positive which indicates that when interest rate increases, deposit also increases in the same direction and vice versa.

The simple correlation coefficient (r) is calculated by using following formula:

Simple Correlation Coefficient/Karl person's Correlation Coefficient (r)

$$= \frac{Co\ \text{var}\ iance\ (X_1, X_2)}{\sigma(X_1)\sigma(X_2)}$$

Where, Covariance (X_1X_2) = 1/n $\{(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)\}$

Or,

Actual Mean Method = $\frac{\sum x_1 x_2}{\sqrt{\sum x_1}\sqrt{\sum x_2}}$

$$= \frac{\sum \left(X_1 - \overline{X}_1\right)\left(X_2 - \overline{X}_2\right)}{\sqrt{\sum \left(X_1 - \overline{X}_1\right)^2}\sqrt{\sum \left(X_2 - \overline{X}_2\right)^2}}$$

3.4.4 Coefficient of Determination

The square of the simple correlation coefficient is called coefficient of determination and it is very useful in interpreting the value of simple correlation coefficient. The main significance of the coefficient of determination is to represent the portion of total variations due to independent variable. It measures the percentage of total variation in dependent variable explained by independent variable.

Coefficient of determination $(r_{12})^2 = (r_{12})^2$

3.4.5 t-test for significance for Correlation Coefficient

If 'r' is the observed sample correlation coefficient of 'n' pairs of observations from bivariate normal population, the test statistics for significance of correlation under null hypothesis is given by

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

I.e. t follows t-distribution with n-2 degree of freedom (d.f.), 'n' being the sample size.

CHAPTER IV

DATA PRESENTATION AND ANALYSIS

In this section, all the collected data are presented in the filtered form and are analysed thoroughly. This is the one of the major chapter o this study because it includes detail analysis and interpretation of data from which concrete result of Nepalese market can be obtained. In this chapter the relevant data and information necessary for the study are presented and analysed keeping the objectives set in mind. This chapter consists of various calculations made for the analysis of interest rate and its effects on deposit of sample bank. This chapter consists of detail analysis and interpretation of data relating to interest rate on deposit, deposit collection amount of each selected organization from Nepalese financial system. This chapter is categorized in three parts presentation, analysis and interpretation. The analysis is based on secondary data. In presentation section data are presented in terms of table, graph chart of figures, according to need. The presented data are then analysed using different statistical tools which are mentioned in chapter three. At last the results of analysis are interpreted. For our simplicity, in this thesis, presentation, analysis and interpretation of data are made according to the nature. After then, the relationship between interest rate and deposit amount is made.

4.1 Analysis of Deposit and Interest Rates

Detail study is made about deposit amount and interest rate of sample banks in this part. Deposit is that amount which is deposited by savers in commercial banks of other financial institutions for safe keeping as well as for earning the interest from it. Deposits are the main sources of resources to meet growing demands of financial existence. The existence of commercial banks basically depends upon the mobilization of deposits. The commercial banks may function when they have adequate deposits. Higher the volume of deposit, higher will be the volume of profit. So, a commercial bank first of all tries to mobilize as much deposit as possible. One of the main objectives of commercial bank is to safeguard the amount deposited by the general deposits on its mobilization in an effective manner.

4.1.1 NABIL Bank Limited

Table 4.1: Interest rate structure of NABIL on deposits (Mid-July 2006 to 2010)

Deposits\ Year	**2006**	**2007**	**2008**	**2009**	**2010**
Saving	2.00	2.00	2.00	2.00	3.00
Fixed					
7 Days					
14 Days	2.50	1.75	3.00		
1 Month	3.00	2.00	3.50	3.50	7.50
2 Months					
3 Months	3.25	2.75	6.75	4.50	8.50
6 Months	3.50	3.00	6.75	4.50	8.50
1 Year	4.00	4.00	6.75	5.50	9.50
2 Years/ Above	4.125	4.00	6.75	8.25	11.50
Fixed Deposit Mean	**3.40**	**2.83**	**5.29**	**5.85**	**9.40**
Whole Mean	**3.20**	**2.71**	**4.82**	**5.20**	**8.33**
S.D.(σ)	**1.9767**				

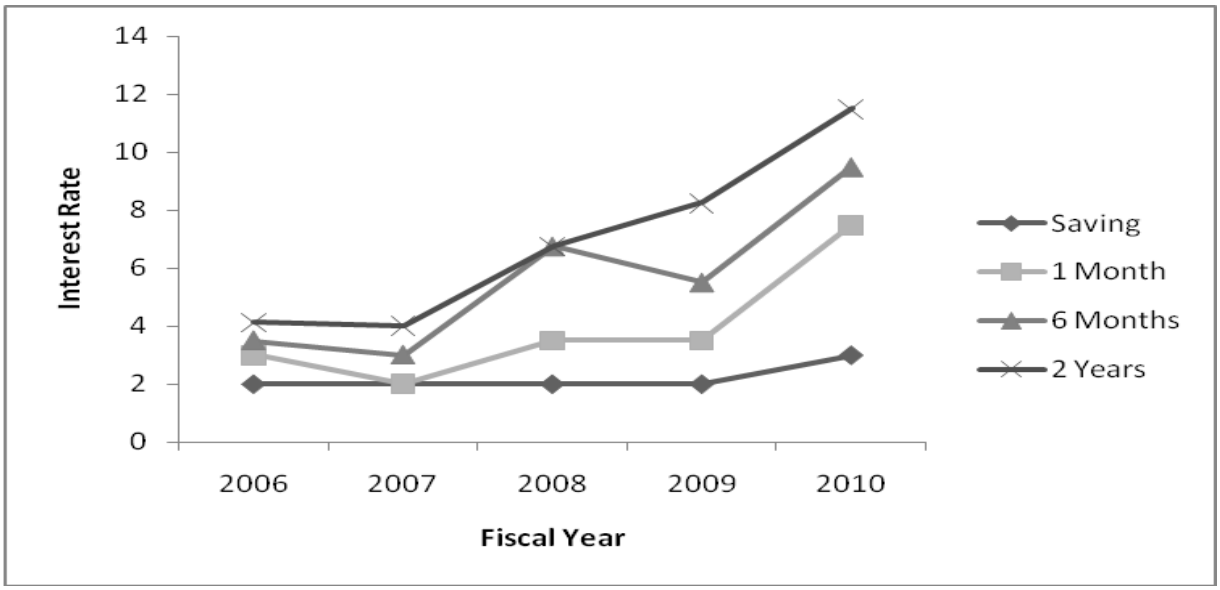
Source: Statistics, Interest Rate Structure, NRB

(Note: Calculation of Whole Mean, Standard Deviation is shown in appendix I)

Table 4.1 shows the interest rate structure on deposit of NABIL Bank during the last five fiscal years. For this study 2006 is taken as initial year and 2010 as final year. The Table shows interest rates which prevailed in the Nepalese financial markets during last past five years. Data shows the decrease of interest rate in year 2007 that of 2006 and then it shows the increasing tendency till the year 2010 and the year 2010 witnessed the highest rise in interest rate of all the five years. The interest rate on saving was 2.00% in the year 2006 and remained constant till the year 2009 and it increase to 3.00% in the year 2010. Hence, saving deposit rate shows constant trend till 2009 and then increase in 2010. In the same way, bank used to quote the interest rate of fixed deposit in different short term period like 7 days, 14 days, 1 month, 2 months, 3 months and so on. The interest rate on fixed deposit is in increasing trend during the five fiscal years except for the 2007 and witnessed highest increase in the year 2010. Table shows that average interest rate on fixed deposit were 3.40% for the year 2006, 2.83% for the year 2007, 5.29% for the year 2008, 5.85% for the year 2009 and 9.40% for the year 2010. Similarly, average interest rate for deposit was 3.20%, 2.71%, 4.82%, 5.20% and

8.33% for the year 2006, 2007, 2008, 2009 and 2010 respectively. The average figures also show the increasing tendency in interest rate expect the year 2007.

Figure 4.1 Interest Rate on Saving and Fixed Deposits of NABIL



The above figure 4.1 shows the trends of interest rate on saving and fixed deposits. Deposit rate on saving as well as fixed is in increasing trend. The saving interest rate has remained more or less constant. Similarly, fixed deposit rate has increased every year except the year 2007. The graph in this study shows the average of 1month, 6 months and 2 years is taken in fixed deposit to make the figure clear.

Calculation of Correlation Coefficient, Coefficient of Determination and t-statistics

Table 4.2: Relationship between Interest Rate on Deposit and Deposit amount of NABIL

(Rs. in million)

Year (1)	**Saving Deposit Interest Rate (2)**	**Saving Deposit Amount (3)**	**Fixed Deposit Interest Rate (4)**	**Fixed Deposit Amount (5)**
2006	2.00	8770.80	3.40	3450.20
2007	2.00	10187.40	2.83	5435.20
2008	2.00	12159.97	5.29	8464.09
2009	2.00	14620.40	5.85	8310.70
2010	3.00	13783.60	9.4	14711.07
Correlation	**r_{23} = 0.4311929**		**r_{45} = 0.990260**	
Coefficient of Determination	**r_{23}^2 = 0.1859273**		**r_{45}^2 = 0.980615**	
t- statistics	**t-cal = 0.827752** **t-tab = 3.182**	**Insignificant**	**t-cal = 12.31** **t- tab = 3.182**	**Significant**

Source: Statistics, Interest Rate Structure, Sources and Uses of Funds, NRB

(*Note: Interest rate on deposit is taken from the rate calculated in table 4.1 and calculation of Correlation Coefficient, Coefficient of Determination and t-statistics is calculated as shown in appendix I)*

Table 4.2 shows that the total amount of fixed deposit and saving deposit and the interest rate offered on such deposits of NABIL during last five fiscal years starting form 2006 to 2010. Table shows that the interest rate of saving deposit remains constant except the year 2010 while the interest rate of fixed deposit is increasing continuously except for the year 2007. On the other hand, total saving deposit amount is in increasing pattern except the year 2010 and fixed deposit in the year 2009. Hence, in case of saving there is negative relation between interest rate and deposit. This shows people do not stop to save despite the constant in interest rate. With the increase in income, saving deposit increases without any incentive in interest rate. However, in case of fixed deposit, there is positive relation between interest rate and deposit. Since fixed deposit offers very less liquidity as compared to saving deposit, depositors seek high interest rate to forego the current liquidity as envisaged by Keynes Liquidity Preference Theory.

It could be quantified by calculating correlation coefficient between them. This relationship can also be shown in figure 4.2 and 4.3.

Figure 4.2 Deposit Amount of NABIL during different Fiscal Years

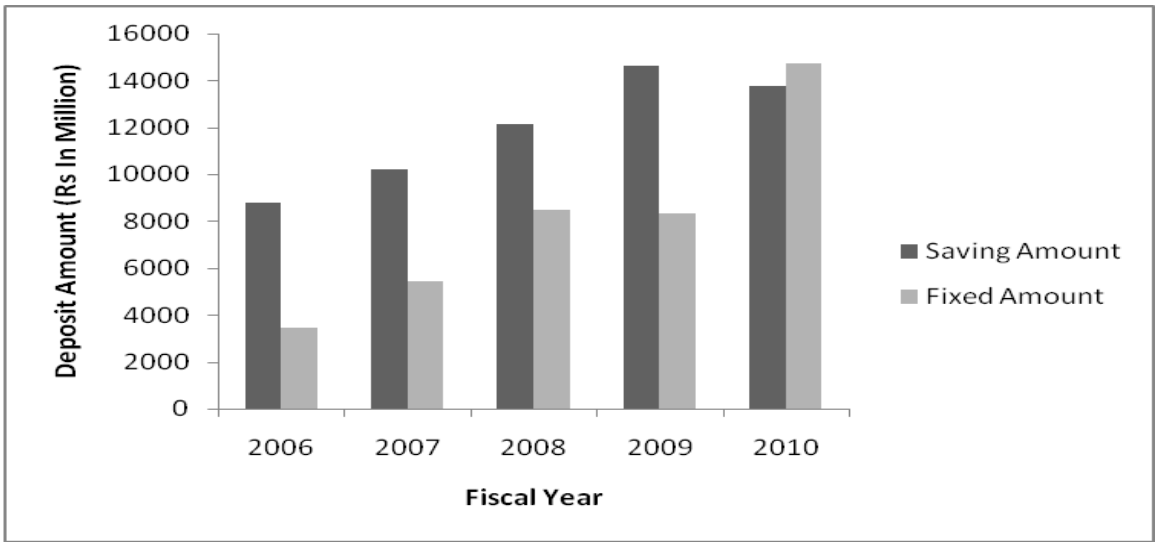


Figure 4.3 Deposit Rate of NABIL during different Fiscal Years

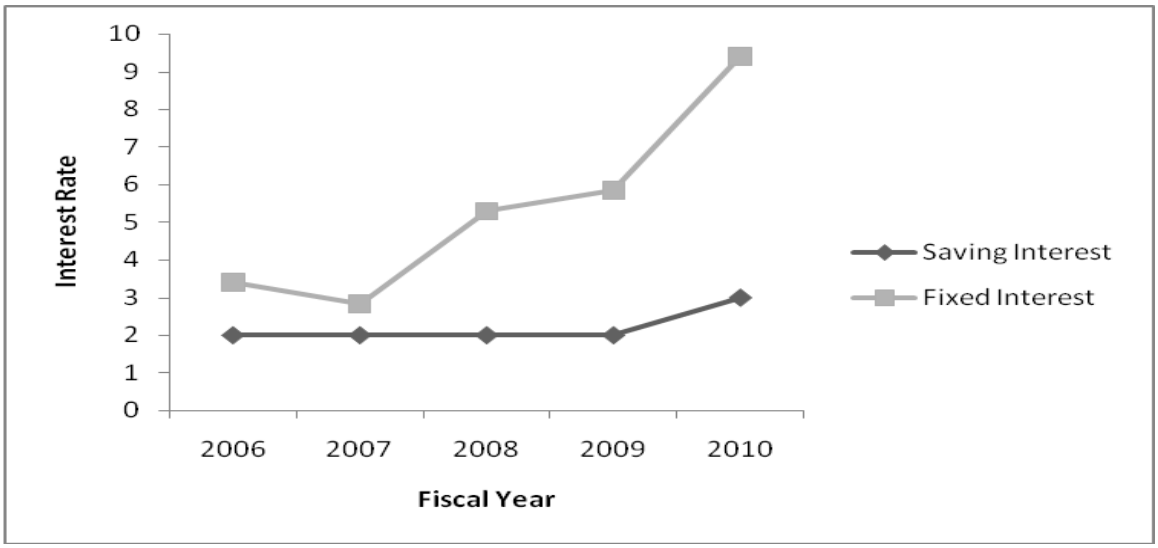


Table 4.2 shows that the interest rate on saving deposit has increased from 2.00% to 3.00% during five fiscal years. In the period, the deposit amount has increased from Rs 8770.80 to Rs 14620.40 and decreases in the year 2010 to Rs 13783.60 millions. This shows that in spite of constant in the interest rate on saving deposit, the saving amount increased within the period except of fifth year. Similarly, table shows that the fixed interest rate has increased from 3.40% to 9.4% in year 2006 to 2010. On effect of this increase, the amount of fixed deposit has also increased from Rs 3450.20 million to Rs 14711.07 million.

To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. The calculation of correlation coefficient between saving deposit interest and saving deposit amount (r_{23}) = 0.4311929. This positive correlation coefficient indicates that they have positive relationship with each other. Constant in interest rate is followed by an increase in saving deposit amount and vice versa. The coefficient of determination between these two variables is r_{23}^2= 0.1859273 which means 18.59% total variation in dependent variable (saving deposit amount) has been explained by independent variable (interest rate) and remaining percentage of 81.41% is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variable is t-cal = 0.827752. Since the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab= 3.182) is more than the calculated value (t-cal = 0.827752), the correlation coefficient is insignificant. This means the variables mentioned (interest rate on saving deposit and amount of saving deposit) for NABIL are not correlated and alternative hypothesis (Ho) is accepted which means there is positive relationship between interest rate on deposit and saving deposit amount of NABIL.

In the same manner, the correlation coefficient for fixed deposit interest rate and fixed deposit amount r_{45} = 0.990260. This shows that these two variables are positively correlated i.e. when interest rate on fixed deposit increase, the deposit amount also increases and vice versa. The coefficient of determination between these two variables is r_{45}^2 = 0.980615 which mean 98.06% of total variable (fixed deposit) is explained by independent variable (fixed deposit rate) and remaining 1.94% is the effect of other variables. The t-value for testing the significance of the correlation coefficient between variables t-cal = 12.31 which is more than the tabulated t-value (t-tab = 3.182) at 5% level of significance for two tail at (5-2) degree of freedom. The conclusion can be drawn that correlation coefficient between these two variables is significant. This means null hypothesis (H1) is accepted i.e. there is negative relationship between fixed deposit interest rate and fixed deposit amount of NABIL.

4.2.2 Everest Bank Ltd (EBL)

Table 4.3: Interest rate structure of EBL on deposits (Mid-July 2006 to 2010)

Deposit\ Year	**2006**	**2007**	**2008**	**2009**	**2010**
Saving	3.25	3.00	3.00	3.00	3.00

Fixed					
7 Days					
14 Days					
1 Month		2.75			
2 Months		2.75			
3 Months	3.00	3.00	3.00	3.00	3.00
6 Months	3.50	3.50	3.50	3.50	3.50
1 Years	4.00	4.00	5.00	5.00	5.00
2 Years/ Above	4.50	4.50	5.375	5.375	5.375
Fixed Deposit Mean	**3.75**	**3.42**	**4.22**	**4.22**	**4.22**
Whole Mean	**3.65**	**3.36**	**3.98**	**3.98**	**3.98**
S.D.(σ)	**0.2501**				

Source: Statistics, Interest Rate Structure, NRB

(Note: Calculation of whole mean standard deviation is shown in appendix I)

Table 4.3 shows the interest rate structure on deposit of Everest Bank during the last five fiscal years. For this study 2006 is taken as initial year and 2010 as final year. Table shows those interest rates were prevailed in the Nepalese financial markets during last past five years. The data shows very fluctuating tendency of interest rate. The interest rate on saving deposit is 3.25% in the year 2006 and it decreased by 0.25% in the year 2007 and remains constant till the year 2010. However, the interest rate on fixed deposit has a fluctuating trend during the five fiscal years. The table shows that average interest rate on fixed deposit is 3.75% for the year 2006, it steeply declines to 3.42% for the year 2007, and it rises to 4.22% for the year 2008 and then remains constant till the year 2010. Similarly, average interest rate for deposit were 3.65% for the year 2006, 3.36% for the year 2007 and 3.98% for the year 2008, 2009 and 2010 respectively. The average figures also show the fluctuating tendency in interest rate.

Figure 4.4: Interest Rate on Saving and Fixed Deposits of EBL

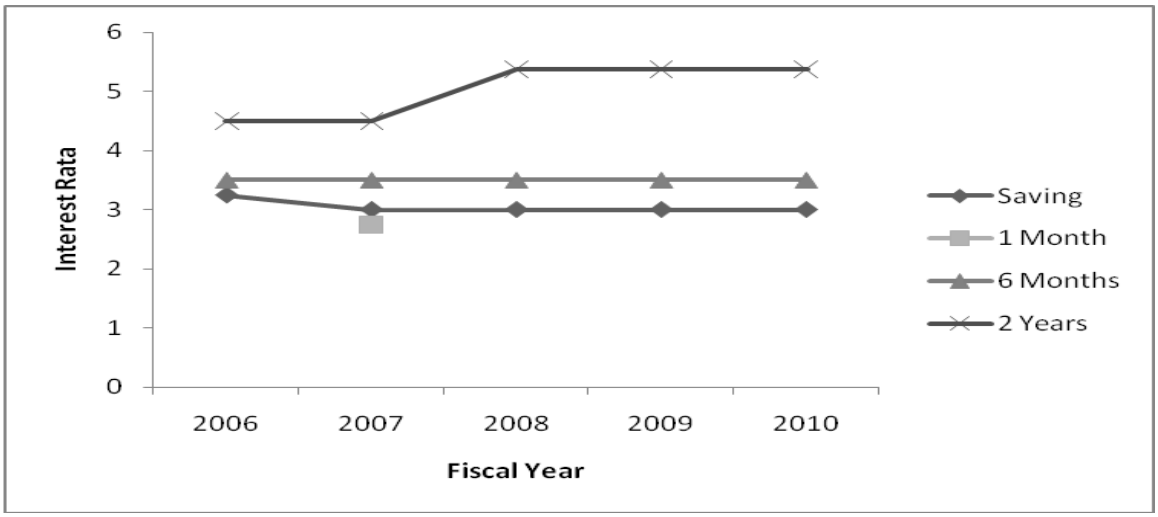


Figure 4.4 clearly shows the fluctuating tendency of EBL during the five fiscal years. In the second year there was a decrease in the interest rate. The interest rate moderately increased in the third year, then remains constant up to the fifth year. This overall figure shows that the interest rate is in fluctuating trend.

Calculation of Correlation Coefficient, Coefficient of Determination and t-statistics

Table 4.4 Relationship between Interest Rate on Deposit and Deposit amount of EBL

(Rs in million)

Year (1)	**Saving Deposit Interest Rate (2)**	**Saving Deposit Amount (3)**	**Fixed Deposit Interest Rate (4)**	**Fixed Deposit Amount (5)**
2006	3.25	6929.20	3.75	4298.20
2007	3.00	9018.00	3.42	5658.70
2008	3.00	11883.86	4.22	6598.01
2009	3.00	14782.33	4.22	7094.68
2010	3.00	13360.00	4.22	10440.28
Correlation	**r_{23} = -0.745084**		**r_{45} = 0.628976**	
Coefficient Of Determination	**r_{23}^2 = 0.555150**		**r_{45}^2 = 0.395611**	
t- statistics	**t- cal = -2.59689** **t- tab = 3.182**	**Insignificant**	**t- cal = 1.40131** **t- tab = 3.182**	**Insignificant**

Source: Statistics, Interest Rate Structure, Sources and Uses of Funds, NRB

(*Note: Interest rate on deposit is taken from the rate calculated in table 4.3 and calculation of Correlation Coefficient, Coefficient of Determination and t-statistics is calculated as shown in appendix I)*

Table 4.4 shows that the total amount of fixed deposit and saving deposit and the interest rate offered on such deposits of EBL during last five fiscal years starting from 2006 to 2010. The Table shows that the interest rate of saving deposit is decreased and then constant and that of fixed deposit is fluctuating continuously. On the other hand, saving deposit amount is increasing in every fiscal year except the year 2010 has decreased and fixed deposit amount is increasing in every fiscal year. Therefore, there is a negative or no relationship between saving deposit and interest rate of EBL

It could be quantified by calculating correlation coefficient between them. This relationship can also be shown in figure 4.5.

Figure 4.5: Deposit Amount of EBL during different FY

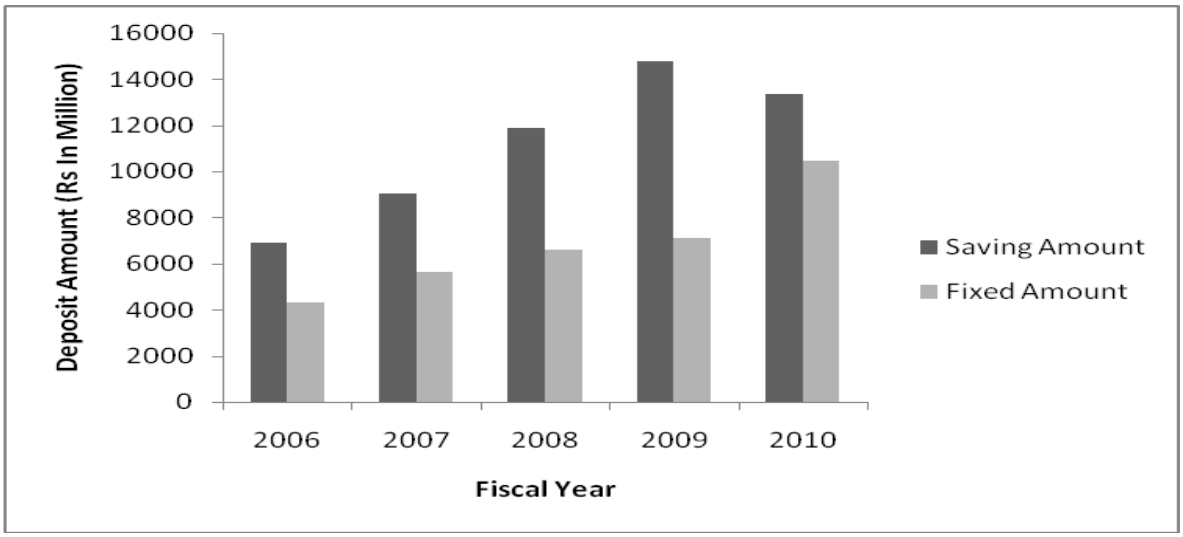


Figure 4.5 shows deposit amount is continuously rising each fiscal year except saving deposit in the year 2010. Similarly, the interest rate of fixed deposit and saving deposit can also be shown on figure 4.6 as:

Figure 4.6: Deposit Rates of EBL during different FYs

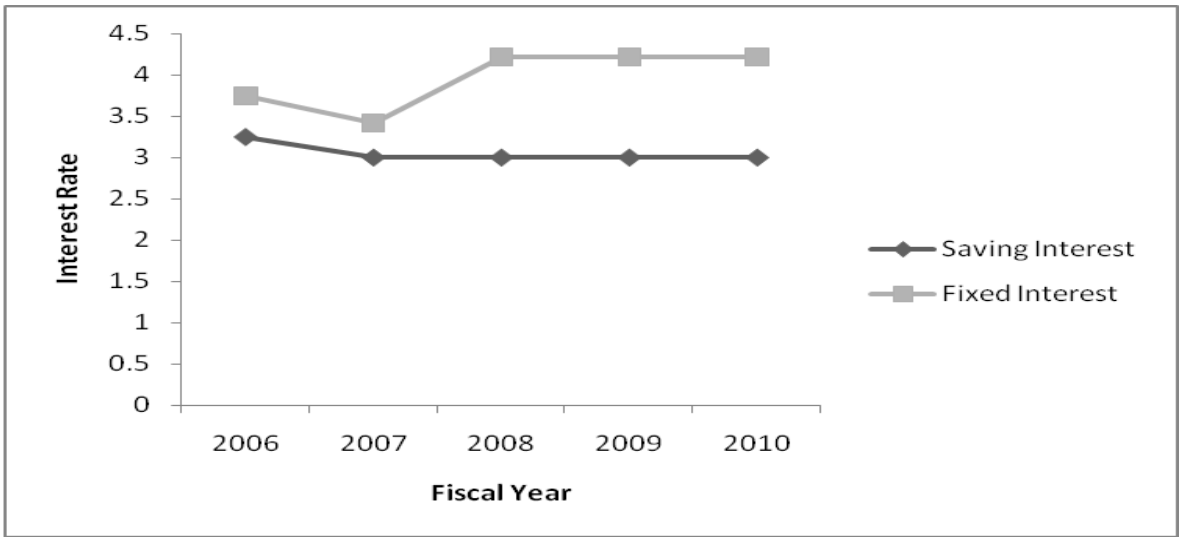


Table 4.4 shows the decrease of interest rates in saving deposit and then remains constant and fluctuating trend in fixed deposit. To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. The calculation of correlation coefficient between saving deposit interest and saving deposit amount (r_{23}) = -0.745084. This negative correlation coefficient indicates that they have inverse relationship with each other. Decrease in interest rate is followed by an increase in saving deposit amount and vice versa. This shows that the substitution effect in case of EBL for saving account is not applicable. The coefficient of

determination between these two variables is r_{23}^2 = 0.555150 which means 55.51% of total variation in dependent variable (saving deposit amount) is explained by independent variable (interest rate) and remaining 44.49% is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variable is t-cal = -2.59689 (|t| = 2.59689). Since the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182) is greater than the calculated value (t-cal = 2.59689), the correlation coefficient is insignificant. This means the variables mentioned (interest rate on saving deposit and amount of saving deposit) for EBL are not correlated and null hypothesis (H0) is accepted which means there is no relationship between interest rate on saving deposit and the amount of saving deposit of EBL.

In the same manner, the correlation coefficient for fixed deposit interest rate and fixed deposit amount is r_{45} = 0.628976. The figure indicates that these two variables are directly correlated but the magnitude of correlation is very low. In other words, change in one variable cause the change in other variable in the same direction. The coefficient of determination between these two variables is r_{45}^2 = 0.395611 which mean 39.56% of total variable (fixed deposit) is explained by independent variable (fixed deposit rate) and remaining 60.44% is the effect of other variables. The t-value for testing the significance of the correlation coefficient between variables is t-cal = 1.40131 which is less than the tabulated t-value (t-tab = 3.182) at 5% level of significance for two tail at (5-2) degree of freedom. The conclusion can be drawn that correlation coefficient between these two variables is insignificant. This means null hypothesis (H0) is accepted i.e. there is no relationship between deposit interest rate and deposit amount of EBL.

4.2.3 Bank of Kathmandu (BOK)

Table 4.5: Interest rate structure of BOK on deposits (Mid-July 2006 to 2010)

Deposit\ Year	**2006**	***2007***	***2008***	***2009***	***2010***
Saving	2.50	2.25	2.25	2.25	2.25
Fixed					
7 Days	1.50	1.50	2.00	2.00	3.00
14 Days	2.00	2.00	2.50	2.50	3.50
1 Month	2.50	2.50	3.00	3.00	4.00
2 Months					
3 Months	3.00	3.00	3.50	3.50	4.50
6 Months	3.50	3.25	4.00	4.00	6.00
1 Year	4.25	3.63	5.00	5.00	8.50
2 Years/ Above	5.13	3.63	5.50	5.50	8.83

Fixed Deposit Mean	**3.13**	**2.79**	**3.64**	**3.64**	**5.47**
Whole Mean	**3.05**	**2.72**	**3.469**	**3.469**	**5.47**
S.D.(σ)	**0.807765**				

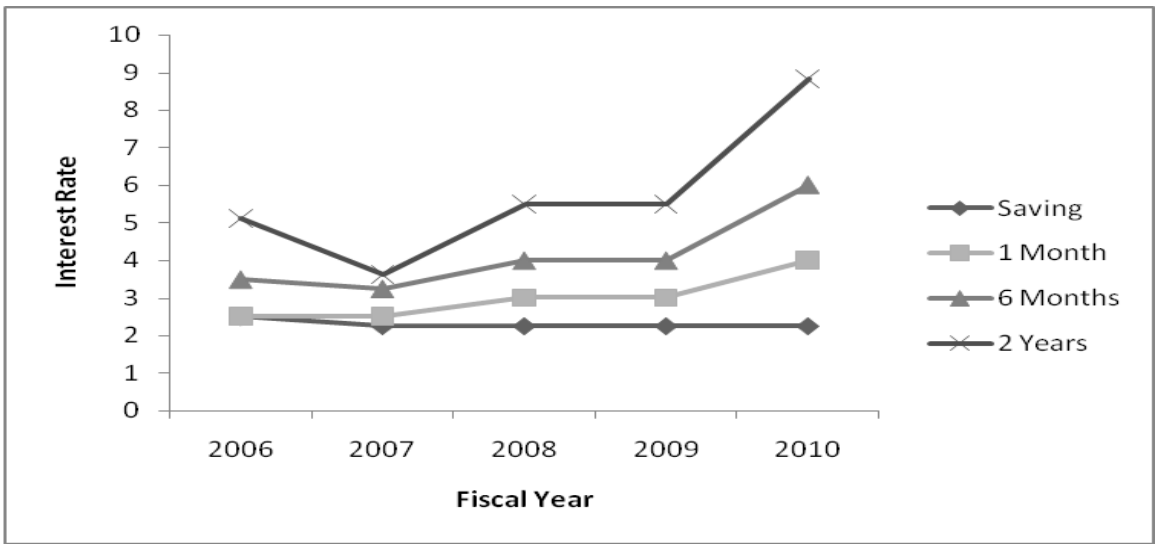
Source: Statistics, Interest Rate Structure, NRB

(Note: Calculation of whole mean standard deviation is shown in appendix I)

Table 4.5 shows the interest rate structure on deposit of BOK during the last five fiscal years. For this study 2006 is taken as initial year and 2010 as final year. The data shows the decreasing and constant tendency of interest rate. The interest rate on saving deposit is 2.50% in the year 2006 which decreases to 2.25% in the year 2007 and remains constant till the year 2010.

The interest rate on fixed deposit, on the other hand, does not show any specific trend, it is fluctuating every year during the five fiscal years. The table shows that average interest rate on fixed deposit is 3.13% in the year 2006 which decreases to 2.79% in the year 2007, rapidly increase to 3.64% in year 2008 and remains constant till the year 2010. Hence, there is no any identifiable trend in fixed deposit interest rate. Similarly, average interest rate on deposit is 3.05% in the year 2006 which reaches to 5.07% in the year 2010 with some fluctuations in between but falling sharply in the year 2007. The average figures also show the fluctuating tendency in interest rate.

Figure 4.7: Interest Rate on Saving and Fixed Deposits of BOK



The above figure 4.7 clearly shows the fluctuating tendency of interest rate of BOK during the five fiscal years. The entire figure shows that the saving interest rate is on constant trend where fixed interest rate is on fluctuating trend.

Calculation of Correlation Coefficient, Coefficient of Determination and t-statistics

Table 4.6: Relationship between Interest Rate on Deposit and Deposit amount of BOK

(Rs in million)

Year (1)	**Saving Deposit Interest Rate (2)**	**Saving Deposit Amount (3)**	**Fixed Deposit Interest Rate (4)**	**Fixed Deposit Amount (5)**
2006	2.50	4582.00	3.13	2709.80
2007	2.25	5526.80	2.79	3037.20
2008	2.25	6595.20	3.64	3703.10
2009	2.25	7260.30	3.64	4474.60
2010	2.25	6723.20	5.47	6383.60
Correlation	**r_{23} = 0.810354**		**r_{45} = 0.660947**	
Coefficient of Determination	**r_{23}^2 = 0.656673**		**r_{45}^2 = 0.436852**	
t- statistics	**t- cal = -2.3954 t- tab = 3.182**	**Significant**	**t- cal = 1.5255 t- tab = 3.182**	**Insignificant**

Source: Statistics, Interest Rate Structure, Sources and Uses of Funds, NRB

(*Note: Interest rate on deposit is taken from the rate calculated in table 4.9 and calculation of Correlation Coefficient, Coefficient of Determination and t-statistics is calculated as shown in appendix I)*

Table 4.6 shows that the total amount of fixed deposit and saving deposit and the interest rate offered on such deposits of BOK during last five fiscal years starting form 2006 to 2010. Table shows that the interest rate of saving deposit is in decreased and remains constant but that of fixed deposit is fluctuating continuously. On the other hand saving deposit amount is increasing in every fiscal year except the year 2010. Fixed deposit amount is also increasing in every fiscal year. Therefore, there is a negative relationship between deposit interest rate and deposit amount of BOK.

It could be quantified by calculating correlation coefficient between them. This relationship can also be shown in figure 4.8.

Figure 4.8: Deposit Amount of BOK during different FY

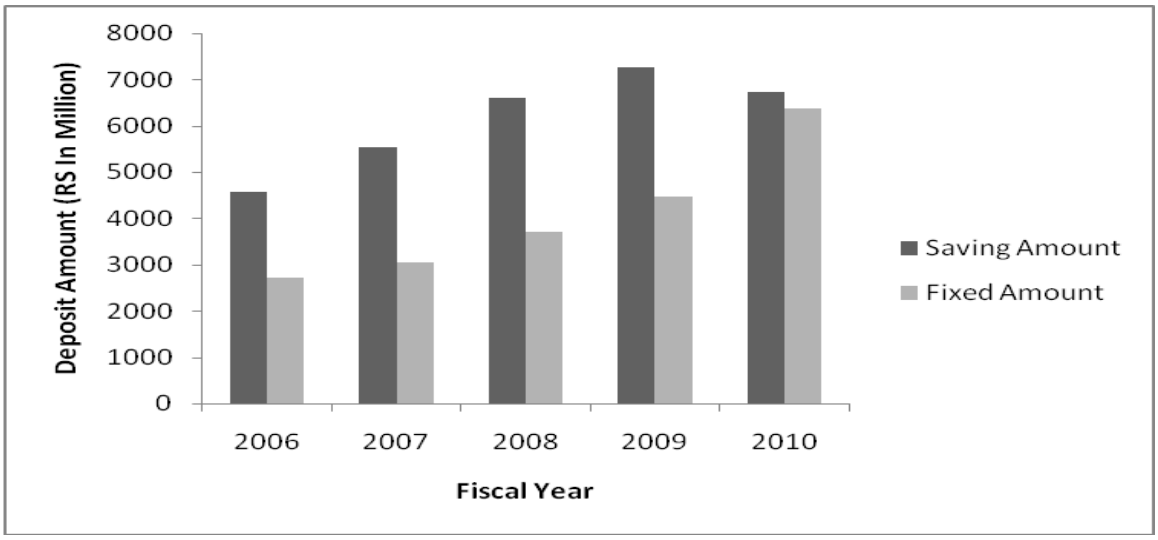


Figure 4.8 shows saving deposit amount is continuously rising each fiscal year except the year 2010 but fixed deposit amount seems to grow each year without any fluctuation. It means that there is rise in fixed deposit amount. Similarly, the interest rate of fixed deposit and saving deposit can also be shown on figure 4.9 as:

Figure 4.9: Deposit Rates of BOK during different FYs

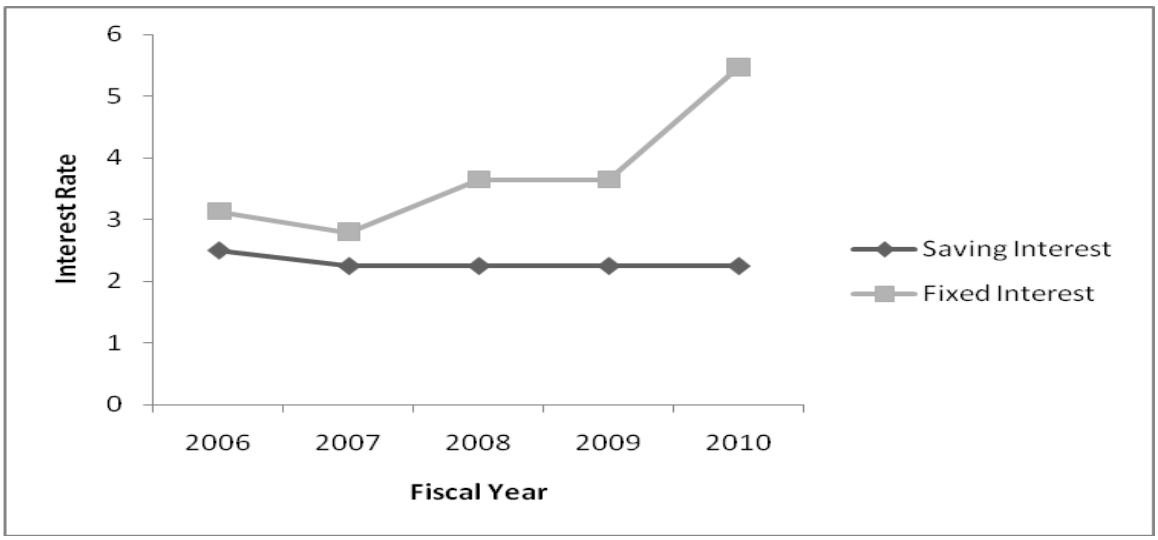


Table 4.9 shows the constant and fluctuating trend of interest rates both in saving and fixed deposit respectively. The saving deposit rate is in decrease and then remains constant. On the other hand, the fixed deposit interest rate is also in fluctuation trend except the year 2008 and 2009 where it remains constant. To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. The calculation of correlation coefficient between saving deposit interest and saving deposit amount (r_{23}) = -0.810354. This high negative correlation coefficient indicates that they have inverse relationship with each other. Decrease and constant in interest rate is followed by an increase in saving deposit amount and vice versa. This shows that the substitution effect in case of BOK for saving account is not applicable. The coefficient of determination between these two variables is r_{23}^2 = 0.656673 which means 65.66% total variation in dependent variable (saving deposit amount) has been explained by independent variable (interest rate) and remaining 34.34% is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variable is t-cal = -2.3954 (|t| = 2.3954). Since the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182) is less than the calculated value (t-cal = 2.3954), the correlation coefficient is significant. This means the variables mentioned (interest rate on saving deposit and amount of saving deposit) for BOK are significantly correlated and alternative hypothesis (H1) is accepted which means there is no relationship between interest rate on saving deposit and saving deposit amount of BOK.

In the same manner, the correlation coefficient for fixed deposit interest rate and fixed deposit amount r_{45} = 0.660947. The positive sign indicates that these two variables are positively correlated. In other words, change in one variable cause the change in other variable in the same direction. This case is in favor of the substitution effect. The coefficient of determination between these two variables is r_{45}^2 = 0.436850 which mean 43.68% of total variable (fixed deposit) is explained by independent variable (fixed deposit rate) and remaining 56.32% is the effect of other variables. The t-value for testing the significance of the correlation coefficient between variables is t-cal = 1.5255 which is less than the tabulated t-value (t-tab = 3.182) at 5% level of significance for two tail at (5-2) degree of freedom. The conclusion can be drawn that correlation coefficient between these two variables is not significant. This means null hypothesis (H_0) is accepted i.e. there is no relationship between deposit interest rate and deposit amount of BOK.

4.3 Analysis of Fluctuation in Lending Interest Rate and Its Relation with Lending Amount

In this section, the relationship between lending interest rate and lending amount is presented and analysis. Generally, when there is higher interest rate (especially lending or credit rate) in the economy, people normally borrow lesser amount than the period when lending interest rate is low. Theoretically, there is inverse relationship between lending interest rate and lending amount i.e. when there is low lending rate, then there should be higher amount of borrowing by the user of fund and vice versa. Higher amount of borrowing indicates higher investment in the country or higher transaction in trade. This is necessary for the growth of the economy. So, this study tries to explore the relationship between lending rate and lending amount in Nepalese economy.

4.3.1 NABIL Bank Ltd.

NABIL bank ltd grants credit on different sectors like export credit, import L/C, priority sectors, Term Loan, Against Govt. Bond, working capital, hire purchase and so on. The lending rates on different sectors differ during different fiscal years.

Table 4.7 shows the lending interest rate, average lending interest rate, and correlation coefficient, coefficient of determination, t-value and standard deviation of NABIL during last five FY.

Table 4.7: Lending rate of NABIL on different sectors during last five FYs

(Rs in million)

Sectors\Years	**2006**	**2007**	**2008**	**2009**	**2010**
Overdraft					
Export Credit	9.5	8.75	8.75	11.00	12.50
Import L/C	9.75	8.75	8.75	11.00	12.50
Against FDR	7.00	7.00	7.00	9.50	12.00
Against Govt. Bond	7.25	7.25	7.25	10.00	14.00
Against BG/CG	9.00	7.50	7.50	10.50	15.00
Against other Guarantee	10.00	8.50	8.50		
Industrial Loan					
Commercial Loan					
Priority Sector	11.50	10.25	10.25		
Deprived Sector	7.50	6.75	7.00	8.00	10.00
Term Loan	12.00	10.50	10.50	11.50	14.50
Working Capital Loan	11.00	9.75	9.75	11.00	13.50
Hire Purchase	9.50	9.25	9.75		
Others	10.00	9.25	9.50	11.25	15.50
Average Lending Rate (1)	**9.50**	**8.62**	**8.71**	**10.41**	**13.28**
Loan Amount (2)	**13021.00**	**15657.10**	**21514.63**	**27816.56**	**32902.83**
Correlation Coefficient (r_{12})	**-0.818898**				
Coefficient Of Determination (r_{12}^2)	**0.670595**				
t- statistics	**t- cal = -2.47129** **t- tab = 3.182**			**Insignificant**	
S.D.(σ)	**1.714113**				

Source: Statistics, Interest Rate Structure, Sources and Uses of Funds, NRB

(*Note: Calculation of Correlation Coefficient, Coefficient of Determination, t-statistics and standard deviation is shown in appendix II)*

Table 4.7 shows the lending interest rate on different area is in increasing trend. Table shows that the maximum interest rate is 15.50% and 12.50% in FY2010 and minimum rate is 6.75% in FY 2007. This shows the interest rate increased drastically during the five FYs period. Generally the productive sector loan rate like commercial loan, industrial loan are not given and priority sector loan, working capital loan and so on rises less in magnitude than non productive sector loan (like overdraft, loan against government bond, BG/CG rate and so on). For example during the last five FYs rises of import L/C rate was by 3.75%. In the same manner, the rises magnitudes were 0%, 0%, 4.25% for against other guarantee, hire purchase and others loan. The rises percentage were 0%, 3%, 4%, 23.75% in priority sector, deprived sector, term loan and working capita loan rate respectively. According to theory, in order to induce the investment in the country or expansion of trade, the productive sector loan should be available at cheaper rate. But the figure shows that these sectors loan were some what costlier than other non productive loan.

If the average of each fiscal year is taken, then it shows that average lending interest rate is in increasing trends from the year 2007 i.e. 9.5%, 8.62%, 8.71%,10.41%, 13.28% in FYs 2006, 2007, 2008, 2009 and 2010 respectively. The standard deviation for average interest rate is 1.71% which shows the deviation from mean return. With harmony to interest rate, the lending amount of NABIL is also seen to be in increasing tendency. The fluctuation in lending interest rate and lending amount can be seen in the following figures.

Figure 4.10: Average Lending Rate of NABIL during different FYs.

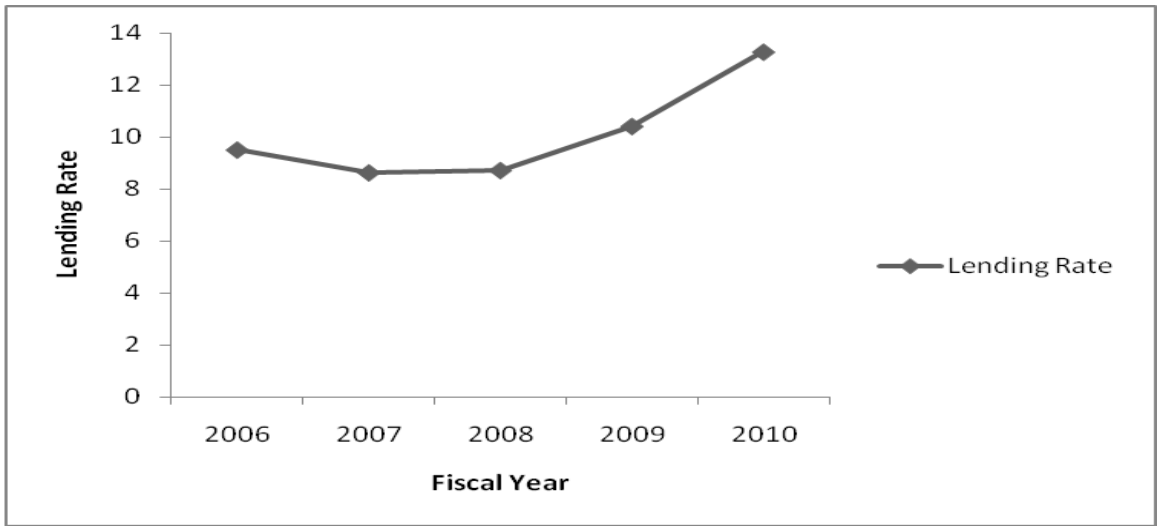
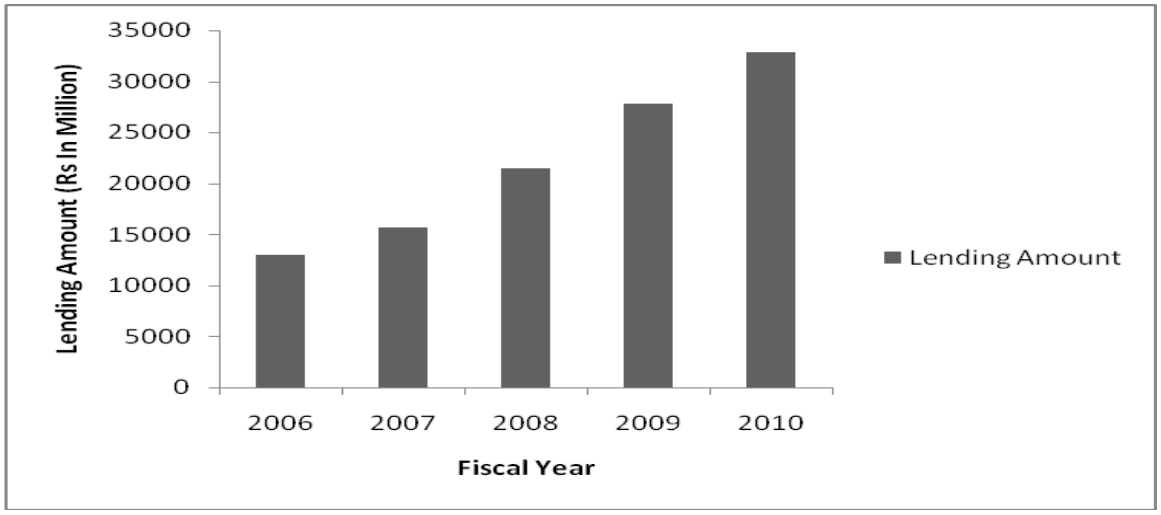


Figure 4.11: Lending Amount of NABIL during different FYs.



The above figure no. 4.10 and 4.11 show the trends of lending interest rate and lending amount of NABIL during different fiscal years. The interest rate has slightly increased during the five fiscal years. Similarly, the lending amount is also in increasing trend during the five fiscal years.

Correlation Coefficient, Coefficient of Determination and t-statistics of NABIL

From table 4.7 the correlation coefficient between lending rate and lending amount (r_{12}) is -0.818898. According to our classification, this negative correlation is of "moderate degree" and there is positive relationship between lending interest rate and lending amount. It means that increase in lending interest rate result increase in total lending amount. According to the theoretical concept of lending rate and lending amount, people prefer or use money when the market interest rate is low in the market. Similarly, the coefficient of determination is (r_{12}^2) = 0.670595. When total lending amount is taken as dependent variable and lending rate as independent variable, then 67.05% of total variation in dependent variable is explained by

lending rate and remaining percentage of 32.95% is due to the effect of other variable in the economy. The test of significance of correlation coefficient between lending rate and lending amount also verify the fact. The calculated value of t-statistics is -2.47129 which is lower than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). In this condition, H_0 is acceptable. It means that there is not correlation between two variables. In other words, the relation is insignificant. In conclusion, the positive relationship between lending rate and lending amount is applicable for NABIL.

4.3.2 Everest Bank Limited (EBL)

Table 4.8: Lending rate of EBL on different sectors during last five FYs

(Rs in million)

Sectors\Years	**2006**	**2007**	**2008**	**2009**	**2010**
Overdraft	9.50	9.50	9.75	9.75	9.75
Export Credit	7.50	7.50	8.75	8.75	8.75
Import L/C	8.38	8.38	8.50	8.50	8.50
Against FDR					
Against Govt. Bond	5.50	5.50	7.50	7.50	7.50
Against BG/CG	8.00	8.00	8.00	8.00	8.00
Against other Guarantee					
Industrial Loan	9.50	9.50	9.50	9.50	9.50
Commercial Loan	9.50	9.50	9.50	9.50	9.50
Priority Sector					
Deprived Sector	7.25	7.25	7.50	7.50	7.50
Term Loan	9.50	9.50	9.75	9.75	9.75
Working Capital Loan	9.50	9.50	9.75	9.75	9.75
Hire Purchase	6.50	9.50	9.75	9.75	9.75
Others	7.75	7.75	8.00	8.00	8.00
Average Lending Rate (1)	**8.20**	**8.44**	**8.85**	**8.85**	**8.85**
Loan Amount (2)	**10124.00**	**14059.20**	**18814.29**	**24366.20**	**28129.69**
Correlation Coefficient (r_{12})	**0.8900049**				
Coefficient Of Determination (r_{12}^2)	**0.792108**				
t- statistics	**t- cal = 3.3809 t- tab = 3.182**		**Insignificant**		
S.D.(σ)	**0.270510**				

Source: Statistics, Interest Rate Structure, Sources and Uses of Funds, NRB

(*Note: Calculation of Correlation Coefficient, Coefficient of Determination, t-statistics and standard deviation is shown in appendix II)*

Table 4.8 shows the lending interest rate, average lending interest rate, correlation coefficient, coefficient of determination, t-value and standard deviation of EBL during different FYs. The interest rate of EBL is in increasing trend and remains constant from the year 2008. The table shows that the maximum interest rate is 9.75% in FY2008, 2009, 2010 and minimum rate is 5.5% in FY 2007. This table shows the interest rate rises slowly during the five FYs period.

In the FY 2006, the average interest rate is 8.20%. But in later year, the interest rate increased by 0.24% in the year 2007, 0.41% in the year 2008 and remains constant till the year 2010. The table shows that average lending interest rate is in increasing trends except 2008, 2009 and 2010 remains constant i.e.8.20% in 2006, 8.44% in 2007, 8.85% in 2008 till 2010 respectively. The standard deviation for average interest rate is 0.2705 which shows the deviation from mean return. With harmony to interest rate, the lending amount of EBL is also seen to be in increasing tendency where as the lending rate is also increasing. This table shows that there is the positive relation between interest rate and interest amount. But to get the exact numerical result of relationship, correlation coefficient is necessary to be calculated. The figure for changing trend of interest rate and lending amount is given on figure no. 4.12 and 4.13.

Figure 4.12: Average lending rate of EBL during different FYs

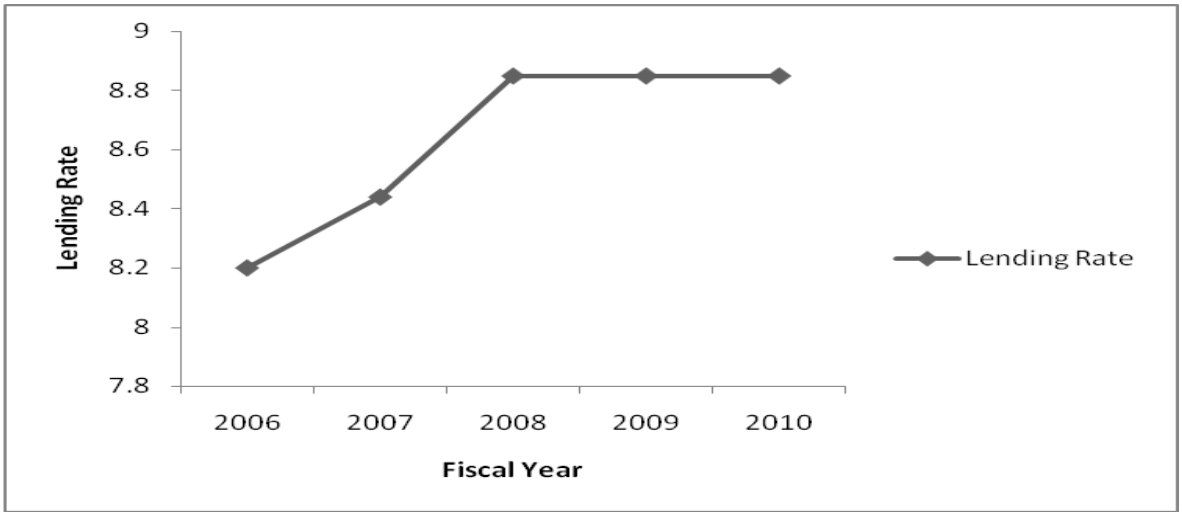
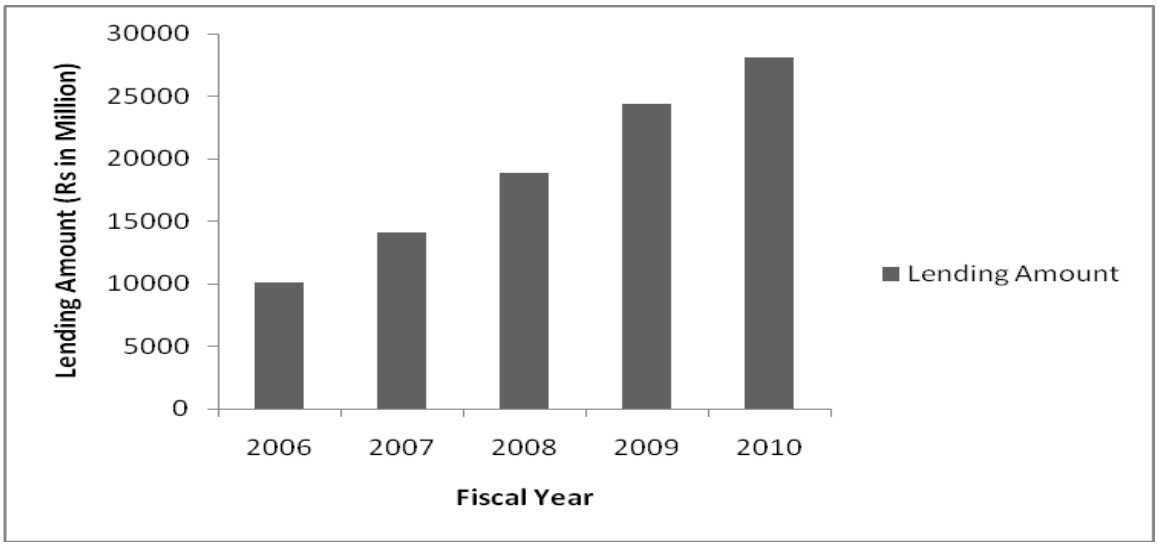


Figure 4.13: Lending Amount of EBL during different FYs



The above figure 4.12 and 4.13 show the trends of lending interest rate and lending amount of EBL during different fiscal years. The interest rate has slightly increased during the five fiscal years. It rises from 8.20% to 8.85%. Similarly, the lending amount is in increasing trend during the five fiscal years despite the rise or constant in interest rate. We can conclude that there is no relationship between lending rate and lending amount of EBL.

Correlation Coefficient, Coefficient of Determination and t-statistics of EBL

From table 4.12, the correlation coefficient between lending rate and lending amount (r_{12}) is 0.8900049. According to our classification, this positive correlation is of "moderate degree" which indicates that there is positive relationship between lending interest rate and lending amount. It means that increase in lending interest rate result increase in total lending amount. According to the theoretical concept of lending rate and lending amount, people prefer or use money when the market interest rate is low in the market. Similarly, the coefficient of determination is (r_{12}^2) 0.792108. When total lending amount is taken as dependent variable and lending rate as explained by lending rate as independent variable, then 79.21% of total variation in dependent variable is explained by lending rate and remaining percentage of 20.79% is due to the effect of other variable in the economy. The test of significance of correlation coefficient between lending rate and lending amount also verify the fact. The calculated value of t-statistics is 3.3809 which is more than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). In this condition, H_0 is rejected and H1 is acceptable. It means that there is correlation between two variables. In

other words, the relation is insignificant. In conclusion, the relationship between lending rate and lending amount is applicable for EBL.

4.3.3 Bank of Kathmandu (BOK)

Table 4.9: Lending rate of BOK on different sectors during last five FYs

(Rs in million)

Sectors\Years	**2006**	**2007**	**2008**	**2009**	**2010**
Overdraft	11.75	11.75	11.75	11.75	14.50
Export Credit	7.75	7.75	7.75	11.00	13.00
Import L/C	10.25	10.25	10.25	11.00	12.50
Against FDR	7.50	7.50	7.50	9.25	13.50
Against Govt. Bond	7.25	7.25	7.25	9.50	12.50
Against BG/CG	9.25	9.25	9.25	9.75	12.50
Against Other Guarantee	7.50	7.50	7.50		
Industrial Loan	11.75	11.75	11.75		
Commercial Loan	12.25	12.25	12.25		
Priority Sectors					
Deprived Sectors	8.75	8.75	8.75	8.75	13.00
Term Loan	11.75	11.75	11.75	12.00	14.00
Working Capital Loan	11.75	11.75	11.75	11.75	14.00
Hire Purchase	9.25	9.25	9.25	10.50	13.25
Others	9.25	9.25	9.25	10.75	11.00
Average Lending Rate (1)	**9.71**	**9.71**	**9.71**	**10.52**	**13.06**
Loan Amount (2)	**7525.00**	**9663.60**	**12692.90**	**14894.70**	**16847.10**
Correlation Coefficient (r_{12})	**0.784553**				
Coefficient of Determination (r_{12}^2)	**0.615524**				
t- statistics	**t- cal = 2.1915** **t- tab = 3.182**			**Insignificant**	
S.D.(σ)	**1.297416**				

Source: Statistics, Interest Rate Structure, Sources and Uses of Funds, NRB

(*Note: Calculation of Correlation Coefficient, Coefficient of Determination, t-statistics and standard deviation is shown in appendix II)*

Table 4.9 shows the lending interest rate, average lending interest rate, correlation coefficient, coefficient of determination, t-value and standard deviation of BOK during different FYs. The interest rate of BOK is also in increasing trend. The table shows that the maximum interest rate is 14.50% in FY2010 and minimum rate is 7.25% in FY 2008. Generally the productive sector loan rate (like commercial loan, industrial loan, priority sector loan, working capital rate and so on) declines (except working capital rises in 2010). On other hand non productive sector loan (like overdraft, loan against government bond, BG/CG rate and so on) rises in year 2009 and 2010. For example during the last five FYs rises of hire purchase

rate was by 4% during 2006 to 2010. In the same manner, the rising magnitude for export credit was by 5.25% during different fiscal years. Overdraft remains constant during different fiscal years except rises by 2.75% in the year 2010. Loan against Govt bond rises to 5.25%. Industrial loan and commercial loan is 0% from the year 2009. Thus, we can say that there is the fluctuation of interest rate in these non productive sectors. But there is rise of interest rate for the productive deprive sectors and others. According to theory, in order to induce the investment in the country or expansion of trade, the productive sector loan should be available at cheaper rate. But the figure shows that these sectors loan were some what costlier than other non productive loan.

The standard deviation for average interest rate is 1.2974 % which shows the deviation from mean return. With harmony to interest rate, the lending amount of BOK is also seen to be in increasing tendency. This table shows that there is the positive relation between interest rate and interest amount. But to get the exact numerical result of relationship, correlation coefficient is should be necessary to calculate. The figure for changing trend of interest rate and lending amount is given on figure no. 4.14 and 4.15.

Figure 4.14: Average lending rate of BOK during different FYs

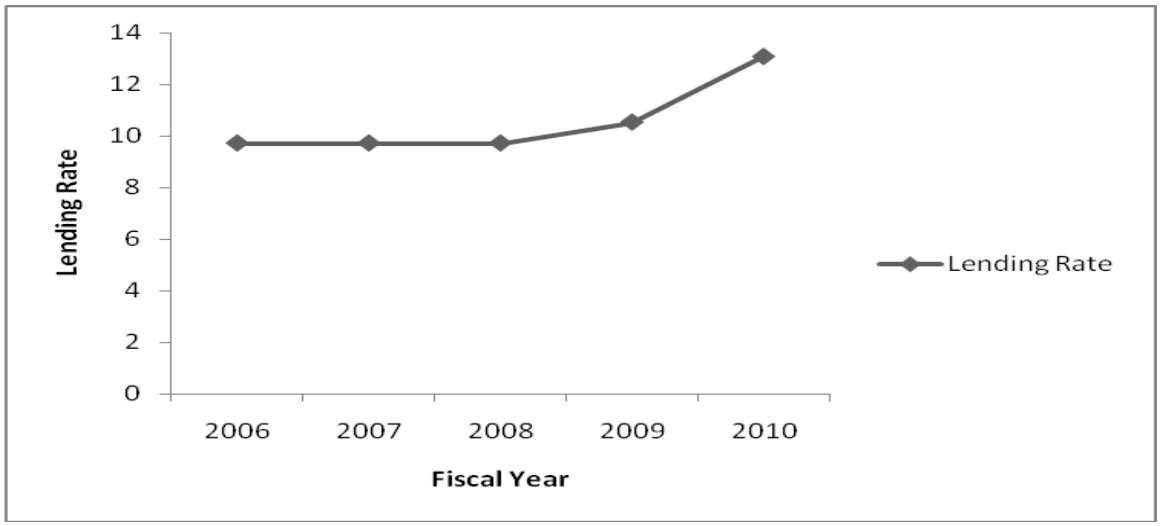
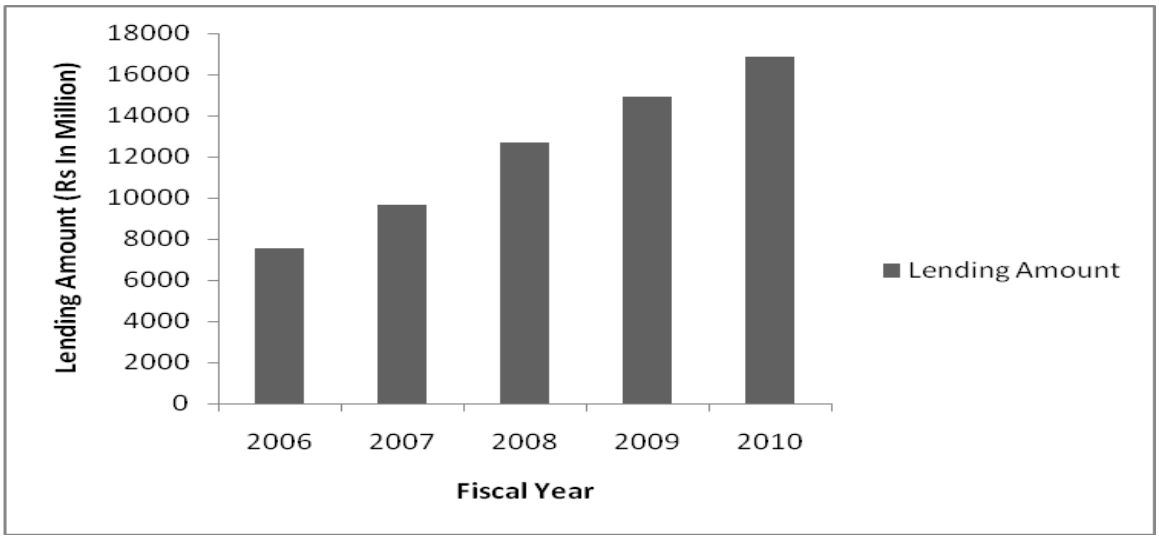


Figure 4.15: Lending Amount of BOK during different FYs



The above figure 4.14 and 4.15 show the increasing trends of lending interest rate and lending amount of BOK during different fiscal years. The interest rate has slightly increased in during the five fiscal years. It falls from 9.71% to 13.06%. Similarly, the lending amount is in increasing trend during the five fiscal years. We can conclude that there is positive relationship between lending rate and lending amount of BOK.

Correlation Coefficient, Coefficient of Determination and t-statistics of BOK

From table 4.9, the correlation coefficient between lending rate and lending amount (r_{12}) is 0.784553. This positive correlation indicates that there is positive relationship between lending interest rate and lending amount. It means that increase in lending interest rate result increase in total lending amount. According to the theoretical concept of lending rate and lending amount, people prefer or use money when the market interest rate is low in the market. Similarly, the coefficient of determination (r_{12}^2) is 0.615524. When total lending amount is taken as dependent variable and lending rate as independent variable, then 61.55% of total variation in dependent variable is explained by lending rate and remaining percentage of 38.45% is due to the effect of other variable in the economy. The test of significance of correlation coefficient between lending rate and lending amount also verify the fact. The calculated value of t-statistics is 2.1915 which is less than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). In this condition, H_0 is acceptable. It means that there is no correlation between two variables. In other words, the relation is insignificant. In conclusion, there is no relationship between lending rate and lending amount of BOK.

4.4 Analysis of relation between Deposit Rate and Lending Rate

Generally, there is positive relation between interest rate on deposit and interest on lending. On this ground, different theory has been propounded like Fisher effect, Harrod- Keynes effect and so on. This all phenomenon have been already explained in the chapter two. To measure the actual relationship between interest rate on deposit and lending, the prevailing situation of each bank is analyzed.

4.4.1 NABIL Bank Limited

Table 4.10: Relationship between Interest Rate on Deposit and Lending of NABIL

Years	**Deposit Rate**	**Lending Rate**
2006	3.20	9.50
2007	2.71	8.62
2008	4.82	8.71
2009	5.20	10.41
2010	8.33	13.28
Correlation Coefficient (r_{12})	**0.907484**	
Coefficient of Determination (r_{12}^2)	**0.823527**	
t- statistics	**t- cal = 3.7416** **t- tab = 3.182**	**Significant**

(Note: The average interest rate of deposit and lending is taken from "Whole Mean" and "Average Lending Rate" respectively. For this case, values are taken from table 4.1 and *4.7. Calculation of Correlation Coefficient, Coefficient of Determination and t-statistic is shown in appendix III)*

Figure 4.16 Relationship between Deposit Rate and Lending Rate of NABIL

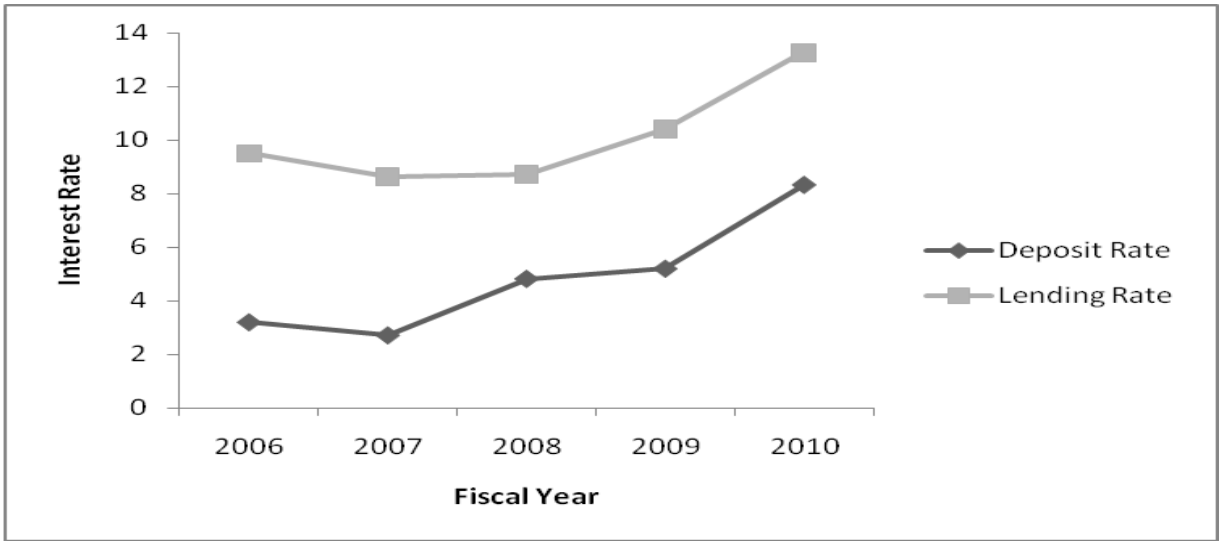


Table no. 4.10 shows the trend of interest rate on both deposit and lending of NABIL. The lending interest rate and deposit interest rate shows decreasing and then increasing trend during five fiscal years. The correlation coefficient between two variables (r_{12}) = is 0.907484. The positive sign indicates that there is positive relationship between deposit interest rate and lending interest rate. The coefficient of determination (r_{12}^2) is 0.823527 which indicates that the variation in dependent variable is explained up to 82.35% by independent variable and remaining 17.65% is due to the effect of other variables in the economy. Similarly, the calculated t-value between the two variables is 3.74162 which is more than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). Hence, it is significant and null hypothesis (H0) is rejected i.e. (H1) is accepted which means there is positive relationship between deposit interest rate and lending interest rate of NABIL.

4.4.2 Everest Bank Ltd. (EBL)

Table 4.11: Relationship between Interest Rate on Deposit and Lending of EBL

Years	Deposit Rate	Lending Rate
2006	3.65	8.20
2007	3.36	8.44
2008	3.98	8.85

2009	3.98	8.85
2010	3.98	8.85
Correlation Coefficient (r_{12})	**0.688258**	
Coefficient of Determination (r_{12}^2)	**0.473699**	
t- statistics	**t- cal = 1.6432** **t- tab = 3.182**	**Insignificant**

(Note: The average interest rate of deposit and lending is taken from "Whole Mean" and "Average Lending Rate" respectively. For this case, values are taken from table 4.3 and 4.8. Calculation of Correlation Coefficient, Coefficient of Determination and t-statistic is shown in appendix III)

Figure 4.17: Relationship between Interest Rate on Deposit and Lending of EBL

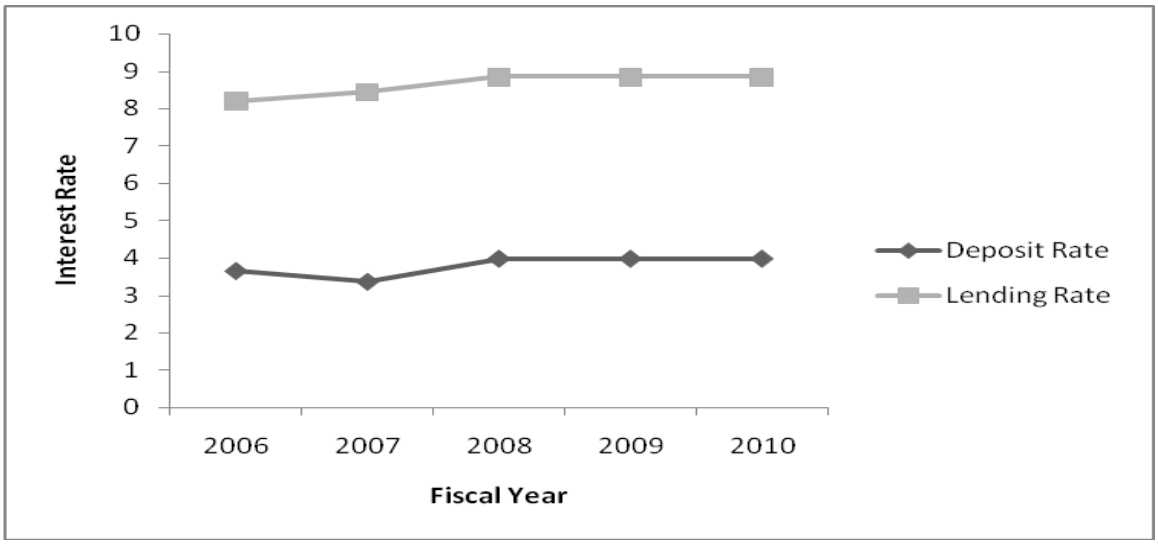


Table 4.11 shows the trend of interest rate on both deposit and lending of EBL. The trend of deposit interest rate is fluctuation during five fiscal years and lending rate is in increasing trend. Lending rate steeply rises in the second and third year and remains constant up to fifth year. The deposit rate is decrease in the second year and increase in third year and then remains constant up to fifth year. The correlation coefficient between two variables (r_{12}) is 0.688258. The positive sign indicates that there is positive relationship between deposit interest rate and lending interest rate. Both the deposit interest rate and lending interest rate are in increasing trend. The coefficient of determination (r_{12}^2) is 0.473699 which indicates that the variation in dependent variable is explained by 47.36% by independent variable and

remaining 52.64% is due to the effect of other variables in the economy. But, the calculated t-value between the two variables is 1.6432 which is less than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). Hence, it is insignificant and null hypothesis (H0) is accepted which means there is a no relationship between deposit interest rate and lending interest rate of EBL.

4.4.3 Bank of Kathmandu (BOK)

Table 4.12: Relationship between Interest Rate on Deposit and Lending of BOK

Years	**Deposit Rate**	**Lending Rate**
2006	3.05	9.71
2007	2.72	9.71
2008	3.47	9.71
2009	3.47	10.52
2010	5.07	13.06
Correlation Coefficient (r_{12})	**0.954633**	
Coefficient of Determination (r_{12}^2)	**0.911324**	
t- statistics	**t- cal = 5.5525** **t- tab = 3.182**	**Insignificant**

(Note: The average interest rate of deposit and lending is taken from "Whole Mean" and "Average Lending Rate" respectively. For this case, values are taken from table 4.5 and 4.9. Calculation of Correlation Coefficient, Coefficient of Determination and t-statistic is shown in appendix III)

Figure 4.18: Relationship between Interest Rate on Deposit and Lending of BOK

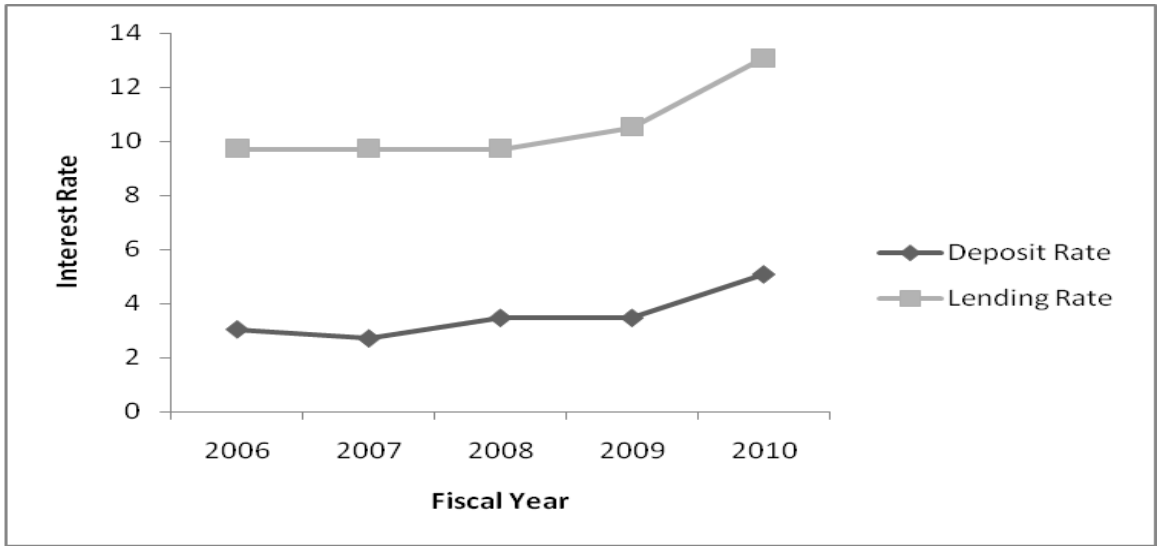


Table 4.11 shows the trend of interest rate on both deposit and lending of BOK. The interest rate on lending is in increasing trend during five fiscal years where as the interest rate on deposit is fluctuating every year decreasing in the second year, increasing again in the third year and remains constant in fourth year and finally increasing in fifth year. The correlation coefficient between two variables (r_{12}) is 0.954633. The positive sign indicates that there is positive relationship between deposit interest rate and lending interest rate. The coefficient of determination (r_{12}^2) is 0.911324 which indicates that the variation in dependent variable is explained by 91.13% by independent variable and remaining 8.07% is due to the effect of other variables in the economy. Similarly, the calculated t-value between the two variables is 5.5525 which is more than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). Hence, it is significant and null hypothesis (H0) is rejected and Alternative hypothesis (H1) is accepted which means there is a relationship between deposit interest rate and lending interest rate of BOK.

4.5 Major Findings

On the basis of above entire presentation and analysis of relevant data of sample banks using various analytical tools, the major findings have been followed:

The interest rate on both deposit and lending of all sample banks are found to be in fluctuating (generally decreasing) trend. But, on the contrary to this, deposit amount and lending amount is increasing every year.

The saving deposit amount and saving interest rate have inverse relationship of all sample banks (except NABIL). The value of correlation coefficient between saving deposit rate and saving deposit amount of sample banks under study is found as 0.431192, -0.745084, -0.810354 for NABIL, EBL and BOK respectively. These values show that there is high degree of inverse relationship except NABIL. That means if one variable increases, other variable decrease and vice versa. This case is against the theory of substitution effect.

From the analysis of coefficient of determination for deposit amount ranging from 0.18592 to 0.65667, it is found that the 18.59% to 65.66% of total variation in deposit amount of sample banks is explained by the deposit rate (independent variable) and remaining percentage are due to the effect of other factors in the economy.

The t-statistic between saving deposit amount and saving deposit rate is insignificant which also clarify that the above two variables have strong positive correlation expect NABIL. Hence, the result is totally against the theory as the research shows that people deposit more money in saving deposit when the interest rate decreases or remains constant.

Analysis of fixed deposit amount and fixed interest rate shows positive relationship for NABIL, EBL and BOK. The correlation coefficient is found as 0.99026, 0.628976, 0.660947, for NABIL, EBL and BOK. According to correlation coefficient, there is substitution effect. This shows that the people depositing more money in fixed deposit are affected by yield rate on fixed deposit.

From the analysis of coefficient of determination for fixed deposit ranging from 0.395611 to 0.980615, it is found that the 39.56% to 98.06% of total variable in fixed deposit amount of sample banks is explained by the deposit rate (independent variable) and remaining percentage are due to the effect of other factors in the economy.

The t-test clarify that the relationship is not strong. The calculated value of t is less than the tabulated value of t in case of all the banks (except NABIL), so t-test indicates that there is no significant relationship between those two variables (except NABIL).

The above data shows that there is positive relationship between lending rate and lending amount. It means that change in one of the variable doesn't affect demand of funds. By using correlation tools, it can be inferred that EBL and BOK have less degree of correlation where as NABIL has highly negative relationship.

Though EBL and BOK have less degree of correlation between lending rate and lending amount, the t-statistic is insignificant for NABIL, EBL and BOK which means that there is no relationship between lending rate and lending amount. So, increase in lending amount is not due to the decrease in lending interest rate but due to the other reason.

The correlation coefficient between deposit rate and lending rate is 0.907484, 0.688258, and 0.954633 for NABIL, EBL and BOK respectively. This indicates that there is positive relationship between deposit rate and lending rate. So, the increase in one variable causes increase in another variable.

The t-value of the sample NABIL and BOK is significant where as EBL is insignificant. It means that NABIL, BOK has positive relationship between deposit rate and lending rate. So, the changes in one variable cause change in another variable in same direction. But, in the case of EBL which is insignificant, it is not due to the change in one variable cause change in other variable in same direction but due to other reason.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter mainly consists of three parts summary, conclusion and recommendation. In summary portion revision of all four chapters are made viz. introduction, literate review, research methodology and analysis of data. Then conclusion is drawn following analysis part and comparing the theoretical aspect and analysis. Conclusion part answers whether practically relates to theory. Based on conclusion necessary suggestions are presented in recommendation part i.e. various measures are recommended to concerned organization for the improvement of the current condition of interest rate structure of the commercial bank of Nepal so that the banks can mobilise their deposits more smoothly and properly in the near future.

5.1 Summary

Due to high competition between the financial institutions, the collected high amount of deposit from public is not properly invested. It is due to lack of demand for fund. So, it raised the problems of investment. Proper mobilization of deposit plays a vital role in the development of economy of the nation. Accepting deposit from savers and transferring the collecting deposit to the investment sector in one of the major functions of banking business. To collect deposit bank provide certain percentage of interest and when amount is loaned outside certain percentage of interest is charged to them. Even though these are various factors in the economy that affects deposit amount and lending amount of the banks with the curiosity to be clear about interest rate structure of commercial banks and to be clear about whether interest rate influence deposit amount this study is made.

Economic development implies the development of all sectors of Nation. In order to gear up development process, high and sustainable economic growth is necessary. Banking development helps to develop the whole sector 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. In order to mobilize the limited capital, the government of Nepal adopted the liberalization policy. As a result up to now 31 commercial banks, 78 development banks, 18 micro credit development banks, 79 financial companies, 16 saving and co-operatives and

45 financial NGOs 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. 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. 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 by five years data and mainly concerns the below issues:

To examine the interest rate structure on deposit and lending of Nepalese commercial banks
To study and analyze the relationship of interest rate on deposit amount and lending amount of commercial banks

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, objectives of the study, research hypothesis 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. Similarly, the term structure of interest rate are:- Pure Expectation Theory, The Liquidity Premium View of

the Yield Curve, The Segmented-Markets or Hedging-Pressure Argument, Preferred Habitat Theory explains in this chapter.

Research design used is mainly analytical. Out of the total financial system 3 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, coefficient of determination and t-statistics.

5.2 Conclusion

From the analysis of relevant data of sample banks under the study; using various statistical tools mentioned in chapter three and from their findings conclusion have drawn. Lending interest rate of the productive sector loan such as commercial loan, industrial loan, trade credit, working capital loan were decreased or increase less in comparison to increase in the non productive sector loan. After presentation and data analysis of relevant data of sample commercial banks under study, using various analytical tools, some major findings of this study as evaluated and found in analysis are summarized as follows:-

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 no exist for all sample banks. 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 five FYs, people accumulated most of their funds on saving and fixed accounts though they don't get appropriate interest on it. As well as banks are providing high interest on fixed deposit due to the crises of liquidity from last 3 years in banks. 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 role 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, what ever 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.

From the study, it is found that the interest rate of saving deposit is decreasing and remains constant whereas on other hand saving deposit amount is increasing in every fiscal year. Therefore, there is a no relationship between deposit interest rate and deposit amount of all sample banks as proved by negative correlation coefficient of all banks except NABIL.

In case of fixed deposit, all the sample banks have positive correlation coefficient between interest rate and deposit indicating positive relation between fixed deposit interest rate and deposit amount. But as per t-test the relation is significant in case of NABIL and insignificant in case of EBL and HBL. Hence, there is no relation between fixed deposit interest rate and fixed deposit amount. Thus the decrease or increase in deposit is not due to change in interest rate but due to other factors. Therefore, it is concluded that for fixed deposit also, there is no substitution effect at all. Hence, in case of fixed deposit also, the conclusion is not in line with the theory. Fixed depositors are not motivated by interest rate but by the safety of investment, guarantee of return, easy liquidity offered by the banks. Interest rate is not the key factor in mobilizing fixed deposit.

According to theory, there is negative relationship between lending rate and lending amount. The study found that all the sample banks have positive relationship between lending rate and lending amount. But among them, NABIL has strong relationship as required by theory. The increment in loanable fund for NABIL is due to not increase in lending rate because of other factor as this relationship is proved statistically insignificant. As well as EBL and BOK increase in lending amount is not due to the increase in lending rate but may be due to other factor, as it lowers t-calculated value than tabulated value for BOK and highest t- calculated value than tabulated value for EBL which indicated insignificant 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 high degree of 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. Lending rate of same banks is highly affected by deposit rate.

5.3 Recommendation

Base on the analysis and interpretation of data some weaknesses or drawbacks have been found in the concerned banks. For the improvement of such weaknesses following recommendations have been given:

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 business due to low interest rate in bank. Hence, banks in Nepal had to face huge liquidity crisis in the recent past years due to the investment in unproductive sector as well as black money marketing. In consequence of which, we could see hopping rise in interest rate of banks for deposit collections.

NRB has suggested in providing clear cut policies related to interest rates on both deposit and lending rate.

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 as well as help to grow the financial and economical sectors. 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. 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.

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.

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.

Although the belief is that high interest rates tend to avoid capital flights to India and other third country, yet the actual fact is that increase in interest rate of government securities has compelled banks to raise interest rate on deposits and there by making lending to productive sectors costly. Thus, it is advisable to lower interest on government securities enjoying tax advantage so that there will be better effect on deposit and lending rates

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APPENDICES

APPENDIX - I

Calculation of Mean and Standard Deviation of Nabil Bank

Whole Mean	$X-\overline{X}$	$(X-\overline{X})^2$
3.20	-1.65	2.7225
2.71	-2.14	4.5796
4.82	-0.03	0.0009
5.20	0.35	0.1225
8.33	3.48	12.1104
$\sum X$ = 24.26		$\sum (X-\overline{X})^2$ = 19.5359

Where,

Fixed Deposit Mean = Total Fixed Deposit / n

Whole Mean (X) = Total Deposit / n

$$\text{Mean } (\overline{X}) = \frac{\sum X}{n} \quad \Rightarrow \frac{24.26}{5} = 4.85\ \%$$

The average interest rate on deposit of Nabil Bank is 4.85 %.

$$\text{Standard Deviation } (\sigma) = \sqrt{\sum (X-\overline{X})^2 / n} \quad \Rightarrow \sqrt{19.59/5} = 1.9767\%$$

Standard Deviation of interest rate on deposit of Nabil Bank is 1.9767%.

Calculation of Correlation Coefficient, Coefficient of Determination and t-Statistics of Nabil Bank.

For Saving Deposit:

Years	Rate (x_1)	Deposit(x_2)	$(X_1-\overline{X}_1)$	$(X_2-\overline{X}_2)$	$(X_1-\overline{X}_1)(X_2-\overline{X}_2)$	$(X_1-\overline{X}_1)^2$	$(X_2-\overline{X}_2)^2$
2006	2.00	8770.80	-0.2	-3133.634	626.7268	0.04	9819662.046
2007	2.00	10187.40	-0.2	-1717.034	343.4068	0.04	2948205.757
2008	2.00	12159.97	-0.2	255.536	-51.1072	0.04	65298.6473
2009	2.00	14620.40	-0.2	2715.966	-543.1932	0.04	7376471.31
2010	3.00	13783.60	0.8	1879.166	1503.332	0.64	3531264.85
	$\sum X_1$ = 11	$\sum X_2$ =59522.17			$\sum$ = 1879.166	$\sum$ = 0.8	$\sum$ = 23740902.6

$$\text{Mean } (\overline{X}_1) = \frac{\sum X_1}{n} \quad \Rightarrow \frac{11}{5} \quad \Rightarrow 2.2\ \%$$

$$\text{Mean } (\overline{X}_2) = \frac{\sum X_2}{n} \quad \Rightarrow \frac{59522.17}{5}$$

= 11904.434%

Karl Person's Correlation Coefficient (r_{23}) = $\frac{\sum x_1 x_2}{\sqrt{\sum x_1}\sqrt{\sum x_2}}$

$= \frac{\sum (X_1 - \overline{X_1})(X_2 - \overline{X_2})}{\sqrt{\sum (X_1 - \overline{X_1})^2}\sqrt{\sum (X_2 - \overline{X_2})^2}}$ $\Rightarrow \frac{1879 \quad .166}{\sqrt{0.8}\sqrt{237409 \quad .62}}$ $\Rightarrow$ 0.431192

Therefore Correlation coefficient between Saving interest rate and Saving deposit amount of Nabil Bank is 0.431192.

Coefficient of Determination $(r_{23})^2$ = 0.1859273

t- Statistics (t) = $r\frac{\sqrt{n-2}}{\sqrt{1-r^2}}$ $\Rightarrow 0.4311929\frac{\sqrt{5-2}}{\sqrt{1-0.1859273}}$ $\Rightarrow$ 0.827752

For Fixed Deposit:

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X_1})$	$(X_1 - \overline{X_1})^2$	$(X_2 - \overline{X_2})$	$(X_2 - \overline{X_2})^2$	$(X_1 - \overline{X_1})(X_2 - \overline{X_2})$
2006	3.40	5450.20	-1.954	3.8181	-3024.052	9144890.50	5908.99760
2007	2.83	5435.20	-2.524	6.3706	-3039.052	9235837.06	7670.56724
2008	5.29	8464.09	-0.064	0.004096	-10.162	103.26624	0.650368
2009	5.85	8310.70	0.496	0.246016	-163.552	26749.2567	-81.121792
2010	9.4	14711.07	04.046	16.370	6236.818	388897898.77	25234.1656
	$\sum X_1$ =5.35	$\sum X_2$ =42371.26		$\sum$ = 26.808812		$\sum$ = 57305478.85	$\sum$ = 38814.3808

Again, Mean ($\overline{X_1}$) = $\frac{\sum X_1}{n}$ $\Rightarrow \frac{26 \quad .77}{5}$ $\Rightarrow$ 5.354 %

Mean ($\overline{X_2}$) = $\frac{\sum X_2}{n}$ $\Rightarrow \frac{42371 \quad .26}{5}$ $\Rightarrow$ 8474 .252 %

Karl Person's Correlation Coefficient (r_{45}) = $\frac{\sum x_1 x_2}{\sqrt{\sum x_1}\sqrt{\sum x_2}}$

$= \frac{\sum (X_1 - \overline{X_1})(X_2 - \overline{X_2})}{\sqrt{\sum (X_1 - \overline{X_1})^2}\sqrt{\sum (X_2 - \overline{X_2})^2}}$ $\Rightarrow \frac{38814 \quad .3808}{\sqrt{26 \quad .808812}\sqrt{57305478 \quad .85}}$ $\Rightarrow$ 0.990260

Therefore Correlation coefficient between Fixed interest rate and Fixed deposit amount is of Nabil bank is 0.990260.

Coefficient of Determination $(r_{45})^2$ = 0.980615

t- Statistics (t) = $0.990260 \frac{\sqrt{5-2}}{\sqrt{1-0.980615}} \Rightarrow 12.31$

Calculation of Mean and Standard Deviation of EBL.

Whole Mean	X- $\overline{X}$	(X- $\overline{X}$)^2
3.65	-0.14	0.0196
3.36	-0.43	0.1849
3.98	0.19	0.0361
3.98	0.19	0.0361
3.98	0.19	0.0361
$\sum X$ = 18.95		$\sum \left(X - \overline{X}\right)^2$ = 0.3128

Where,

Fixed Deposit Mean = Total Fixed Deposit / n

Whole Mean (X) = Total Deposit / n

Mean ($\overline{X}$) = $\frac{\sum X}{n} \Rightarrow \frac{18.95}{5}$ = 3.79 %

The average interest rate on deposit of EBL is 3.79 %.

Standard Deviation (σ) = $\sqrt{\sum \left(X - \overline{X}\right)^2 / n} \Rightarrow \sqrt{0.3128 / 5}$ = 0.25011%

Standard Deviation of interest rate on deposit of EBL is 0.25011%.

Calculation of Correlation Coefficient, Coefficient of Determination and t-Statistics of EBL

For Saving Deposit:

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	3.25	6929.20	0.2	0.04	-4265.478	18194302.57	-853.0956
2007	3.00	9018.00	-0.05	0.0025	-2176.678	4737927.116	108.8339
2008	3.00	11883.86	-0.05	0.0025	689.182	474971.8291	-34.4591
2009	3.00	14782.33	-0.05	0.0025	3587.652	12871246.87	-179.3826
2010	3.00	13360.00	-0.05	0.0025	2165.322	4688619.364	-108.2661
	$\sum X_1$ =15.25	$\sum X_2$ =55973.39		$\sum$ = 0.05		$\sum$ = 40967067.75	$\sum$ = -1066.3695

Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{15.25}{5} \Rightarrow 3.05\ \%$

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{55973.39}{5}$

$= 11194.678\ \%$

Karl Person's Correlation Coefficient $(r_{23}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2}\sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$\Rightarrow \frac{-1066.3695}{\sqrt{0.05}\sqrt{40967067.75}} \Rightarrow -0.745084$

Therefore Correlation coefficient between Saving interest rate and Saving deposit amount of EBL is -0.745084.

Coefficient of Determination $(r_{23})^2 = 0.5551502$

t- Statistics (t) = $r\frac{\sqrt{n-2}}{\sqrt{1-r^2}} \Rightarrow -0.745084\frac{\sqrt{5-2}}{\sqrt{1-0.555150}} \Rightarrow -2.59689$

For Fixed Deposit:

Years	Rate (x_1)	Deposit (x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	3.75	4298.20	-0.216	0.046656	-2519.774	6349261.011	544.271184
2007	3.42	5658.70	-0.546	0.298116	-1159.274	1343916.207	632.963604
2008	4.22	6598.01	0.254	0.064516	-219.964	48384.1613	-55.870856
2009	4.22	7094.68	0.254	0.064516	276.706	76566.21044	70.283324
2010	4.22	10440.28	0.254	0.064516	3622.306	13121100.76	920.065724
	$\sum X_1$ =19.83	$\sum X_2$ =34089.87		$\sum$ = 0.53832		$\sum$ = 20939228.35	$\sum$ = 2111.71298

Again, Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{19.83}{5} \Rightarrow 3.966\ \%$

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{34089.87}{5} \Rightarrow 6817.974\ \%$

Karl Person's Correlation Coefficient $(r_{45}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2} \sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$$\Rightarrow \frac{2111.71298}{\sqrt{0.53832}\ \sqrt{20939228.35}} \Rightarrow 0.628976$$

Therefore Correlation coefficient between Fixed interest rate and Fixed deposit amount of EBL is 0.628976.

Coefficient of Determination $(r_{45})^2 = 0.395611$

t- Statistics (t) $= 0.990260 \frac{\sqrt{5-2}}{\sqrt{1-0.395611}} \Rightarrow 1.401318$

Calculation of Mean and Standard Deviation of BOK.

Whole Mean	X- $\overline{X}$	(X- $\overline{X}$)^2
2.72	-0.83	0.6889
3.469	-0.081	0.006561
3.469	-0.081	0.006561
3.469	-0.081	02.3104
$\sum X$ = 17.778		$\sum (X - \overline{X})^2$ = 03.262422

Where,

Fixed Deposit Mean = Total Fixed Deposit / n

Whole Mean (X) = Total Deposit / n

Mean ($\overline{X}$) = $\frac{\sum X}{n}$ $\Rightarrow$ $\frac{17.778}{5}$ = 3.55 %

The average interest rate on deposit of BOK is 3.55 %.

Standard Deviation (σ) = $\sqrt{\sum \left(X - \overline{X}\right)^2 / n}$ $\Rightarrow$ $\sqrt{3.262422 / 5}$ = 0.8077650%

Standard Deviation of interest rate on deposit of BOK is 0.807765 %.

Calculation of Correlation Coefficient, Coefficient of Determination and t-Statistics of BOK.

For Saving Deposit:

Years	Rate (x_1)	Deposit(x_2)	$\left(X_1 - \overline{X}_1\right)$	$\left(X_1 - \overline{X}_1\right)^2$	$\left(X_2 - \overline{X}_2\right)$	$\left(X_2 - \overline{X}_2\right)^2$	$\left(X_1 - \overline{X}_1\right)\left(X_2 - \overline{X}_2\right)$
2006	2.50	4582.00	0.2	0.04	-1555.5	2419580.25	-311.1
2007	2.50	5526.80	-0.05	0.0025	-610.7	372954.49	30.535
2008	2.25	6595.20	-0.05	0.0025	457.7	209489.29	-22.885
2009	2.25	7260.30	-0.05	0.0025	1122.8	1260679.84	-56.14
2010	2.25	6723.20	-0.05	0.0025	586	343396	-29.3
	$\sum X_1$ =11.5	$\sum X_2$ =30687.5		$\sum$ = 0.05		$\sum$ = 4606099.87	$\sum$ = - 388.89

Mean ($\overline{X}_1$) = $\frac{\sum X_1}{n}$ $\Rightarrow$ $\frac{11.5}{5}$ $\Rightarrow$ 2.3 %

Mean ($\overline{X}_2$) = $\frac{\sum X_2}{n}$ $\Rightarrow$ $\frac{30687.5}{5}$

= 6137.5%

Karl Person's Correlation Coefficient (r_{23}) = $\frac{\sum \left(X_1 - \overline{X}_1\right)\left(X_2 - \overline{X}_2\right)}{\sqrt{\sum \left(X_1 - \overline{X}_1\right)^2} \sqrt{\sum \left(X_2 - \overline{X}_2\right)^2}}$

$\Rightarrow$ $\frac{-388.89}{\sqrt{0.05}\sqrt{4606099.87}}$ $\Rightarrow$ -0.810354

Therefore Correlation coefficient between Saving interest rate and Saving deposit amount of BOK is -0.810354.

Coefficient of Determination $(r_{23})^2$ = 0.656673

t- Statistics (t) = r $\frac{\sqrt{n-2}}{\sqrt{1-r^2}}$ $\Rightarrow$ -0.810354 $\frac{\sqrt{5-2}}{\sqrt{1-0.656673}}$ $\Rightarrow$ -2.3954

For Fixed Deposit:

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	3.13	2709.80	-0.604	0.364816	-1351.86	1827525.46	816.52344
2007	2.79	3037.20	-0.944	0.891136	-1024.46	1049518.292	967.09024
2008	3.64	3703.10	-0.094	0.008836	-358.56	128565.2736	33.70464
2009	3.64	4474.60	-0.094	0.008836	412.94	170519.4436	-38.81636
2010	3.64	6383.60	1.736	3.013696	2321.94	5391405.364	4030.88784
	$\sum X_1$ =18.67	$\sum X_2$ =20308.3		$\sum$ = 4.28732		$\sum$ = 18013203.83	$\sum$ = 5809.3898

Again, Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{18.67}{5} \Rightarrow 3.734$ %

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{20308.3}{5}$

= 4061.66 %

Karl Person's Correlation Coefficient $(r_{45}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2} \sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$\Rightarrow \frac{5809.3898}{\sqrt{4.28732}\sqrt{18013203.83}} \Rightarrow 0.660947$

Therefore Correlation coefficient between Fixed interest rate and Fixed deposit amount of BOK is 0.660947.

Coefficient of Determination $(r_{45})^2 = 0.436850$

t- Statistics (t) = $0.990260 \frac{\sqrt{5-2}}{\sqrt{1-0.436850}} \Rightarrow 1.5255$

APPENDIX – II

Calculation of Correlation Coefficient, Coefficient of Determination t- Statistics and Standard Deviation of Nabil Bank.

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	9.5	13021.00	-0.604	0.364816	-9161.424	83931689.71	5533.500
2007	8.62	15657.10	-1.484	2.202256	-6525.324	42579853.3	9683.5808
2008	8.71	21514.63	-1.394	1.943236	-667.794	445948.8264	930.904836
2009	10.41	27816.56	0.306	0.093636	5634.136	31743488.47	1724.0456
2010	13.28	32902.83	3.176	10.086976	10720.406	114927104.8	34048.0094
	$\sum X_1$ =50.52	$\sum X_2$ =110912.12		$\sum$ = 14.69092		$\sum$ = 273628085.1	$\sum$ = 51920.04064

Where,

Average lending rate = Total lending rate / n

Mean ($\overline{X}_1$) = $\frac{\sum X_1}{n} \Rightarrow \frac{50.52}{5} \Rightarrow 10.104\ \%$

Mean ($\overline{X}_2$) = $\frac{\sum X_2}{n} \Rightarrow \frac{110912.12}{5}$

= 22182.424%

Karl Person's Correlation Coefficient (r_{12}) = $\frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2 \sqrt{\sum (X_2 - \overline{X}_2)^2}}}$

$\Rightarrow \frac{51920.04064}{\sqrt{14.69092}\ \sqrt{273628085.1}} \Rightarrow 0.8188984$

Therefore Correlation coefficient between lending rate and loan(lending) amount is of Nabil bank is 0.8188984.

Coefficient of Determination $(r_{23})^2 = 0.670595$

t- Statistics (t) = $r\frac{\sqrt{n-2}}{\sqrt{1-r^2}} \Rightarrow 0.8188984\frac{\sqrt{5-2}}{\sqrt{1-0.670595}} \Rightarrow -2.47129$

Standard Deviation (σ) = $\sqrt{\sum (X - \overline{X})^2 / n}$

= i.e, $\sqrt{\sum (X_1 - \overline{X}_1)^2 / n} \Rightarrow \sqrt{14.69092 / 5}$ = 1.714113%

Calculation of Correlation Coefficient, Coefficient of Determination t- Statistics and Standard Deviation of EBL.

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	8.20	10124.00	-0.438	0.191844	-8974.676	80544809.3	3930.908088
2007	8.44	14059.20	-0.198	0.039204	-5039.476	25396318.35	997.81624
2008	8.85	18814.29	0.212	0.044944	-284.386	80875.397	-60.289832
2009	8.85	24366.20	0.212	0.044944	5267.524	27746809.09	1116.715088
2010	8.85	28129.69	0.212	0.044944	9031.014	81559213.87	1914.574968
	$\sum X_1$ =43.19	$\sum X_2$ =95493.38		$\sum$ = 0.36588		$\sum$ = 215328026	$\sum$ = 7899.724552

Average lending rate = Total lending rate / n

Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{43.19}{5} \Rightarrow 8.638\ \%$

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{95493.38}{5}$

$= 19098.676\%$

Karl Person's Correlation Coefficient $(r_{12}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2}\sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$$\Rightarrow \frac{7899.724552}{\sqrt{0.36588}\sqrt{215328026}} \Rightarrow 0.8900049$$

Therefore Correlation coefficient between lending rate and loan (lending) amount of EBL is 0.8900049.

Coefficient of Determination $(r_{23})^2 = 0.792108$

t- Statistics (t) = $r\frac{\sqrt{n-2}}{\sqrt{1-r^2}} \Rightarrow 0.8900049\frac{\sqrt{5-2}}{\sqrt{1-0.792108}} \Rightarrow 3.3809$

Standard Deviation $(\sigma) = \sqrt{\sum (X - \overline{X})^2 / n}$

$= \text{i.e, } \sqrt{\sum (X_1 - \overline{X}_1)^2 / n} \Rightarrow \sqrt{0.36588 / 5} = 0.270510\%$

Calculation of Correlation Coefficient, Coefficient of Determination t- Statistics and Standard Deviation of BOK.

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	9.71	7525.00	-0.832	0.692224	-4799.66	23036736.12	3993.31712
2007	9.71	9663.60	-0.832	0.692224	-2661.06	7081240.324	2214.00192
2008	9.71	12692.90	-0.832	0.692224	368.24	135600.6976	-306.37568
2009	10.52	14894.70	-0.022	0.000484	2570.04	6605105.602	-56.54088
2010	13.06	16847.10	2.518	6.340324	4522.44	20452463.55	11387.50392
	$\sum X_1$ =52.71	$\sum X_2$ =61623.3		$\sum$ = 8.41748		$\sum$ = 57311146.29	$\sum$ = 17231.9064

Average lending rate = Total lending rate / n

Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{52.71}{5} \Rightarrow 10.542\ \%$

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{61623.3}{5}$

$= 12324.66\%$

Karl Person's Correlation Coefficient $(r_{12}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2} \sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$$\Rightarrow \frac{17231.9064}{\sqrt{841748}\ \sqrt{57311146.29}} \Rightarrow 0.7845539$$

Therefore Correlation coefficient between lending rate and loan (lending) amount of BOK is 0.7845539.

Coefficient of Determination $(r_{23})^2 = 0.615524$

t- Statistics (t) = $r \frac{\sqrt{n-2}}{\sqrt{1-r^2}} \Rightarrow 0.784553 \frac{\sqrt{5-2}}{\sqrt{1-0.615524}} \Rightarrow 2.1915$

Standard Deviation $(\sigma) = \sqrt{\sum (X - \overline{X})^2 / n}$

$= \text{i.e, } \sqrt{\sum (X_1 - \overline{X}_1)^2 / n} \Rightarrow \sqrt{8.41748 / 5} = 1.29749\ \%$

APPENDIX – III

Calculation of Correlation Coefficient, Coefficient of Determination t-Statistics of Nabil Bank.

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	3.20	9.5	-1.652	2.729104	-0.604	0.364816	0.997808
2007	2.71	8.62	-2.142	4.588164	-1.484	2.202256	3.178728
2008	4.82	8.71	-0.032	0.001024	-1.394	1.943236	0.044608
2009	5.20	10.41	0.348	0.121104	0.306	0.093636	0.106488
2010	8.33	13.28	3.478	12.096484	3.176	10.086976	11.046128
	$\sum X_1$ =24.26	$\sum X_2$ =50.52		$\sum$ = 19.53588		$\sum$ = 14.69092	$\sum$ = 15.37376

Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{24.26}{5} \Rightarrow 4.852\ \%$

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{50.52}{5}$

$= 10.104\%$

Karl Person's Correlation Coefficient $(r_{12}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2}\sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$$\Rightarrow \frac{15.37376}{\sqrt{19.53588}\ \sqrt{14.69092}} \Rightarrow 0.907484$$

Therefore Correlation coefficient between deposit rate and lending rate of Nabil bank is 0.907484.

Coefficient of Determination $(r_{23})^2 = 0.823527$

t- Statistics (t) = $r\frac{\sqrt{n-2}}{\sqrt{1-r^2}} \Rightarrow 0.907484\frac{\sqrt{5-2}}{\sqrt{1-0.823527}} \Rightarrow 3.74162$

Calculation of Correlation Coefficient, Coefficient of Determination t- Statistics of EBL.

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	3.65	8.20	-0.14	0.0196	-0.438	0.191844	0.026858
2007	3.36	8.44	-0.43	0.1849	-0.198	0.0392014	0.08514
2008	3.98	8.85	0.19	0.0361	0.212	0.044944	0.04028
2009	3.98	8.85	0.19	0.0361	0.212	0.044944	0.04028
2010	3.98	8.85	0.19	0.0361	0.212	0.044944	0.04028
	$\sum X_1$ =3.79	$\sum X_2$ =43.19		$\sum$ = 0.3128		$\sum$ = 0.36588	$\sum$ = 0.232838

Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{18.95}{5} \Rightarrow 3.79\ \%$

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{43.19}{5}$

$= 8.638\%$

Karl Person's Correlation Coefficient $(r_{12}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2}\sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$\Rightarrow \frac{0.232838}{\sqrt{0.3128}\ \sqrt{0.36588}} \Rightarrow 0.688258$

Therefore Correlation coefficient between deposit rate and lending rate of EBL is 0.688258.

Coefficient of Determination $(r_{23})^2 = 0.473699$

t- Statistics (t) = $r \frac{\sqrt{n-2}}{\sqrt{1-r^2}} \Rightarrow 0.688258 \frac{\sqrt{5-2}}{\sqrt{1-0.473699}} \Rightarrow 1.6432$

Calculation of Correlation Coefficient, Coefficient of Determination t- Statistics of BOK.

Years	Rate (x_1)	Deposit(x_2)	$(X_1 - \overline{X}_1)$	$(X_1 - \overline{X}_1)^2$	$(X_2 - \overline{X}_2)$	$(X_2 - \overline{X}_2)^2$	$(X_1 - \overline{X}_1)(X_2 - \overline{X}_2)$
2006	3.05	9.71	-0.506	0.256036	-0.832	0.692224	0.420992
2007	2.72	9.71	-0.836	0.698896	-0.832	0.692224	0.695552
2008	3.47	9.71	-0.086	0.007396	-0.832	0.692224	0.071552
2009	3.47	10.52	-0.086	0.007396	-0.022	0.000484	0.001892
2010	3.47	13.06	1.514	2.292196	2.518	6.340324	3.812252
	$\sum X_1$ =3.556	$\sum X_2$ =10.542		$\sum$ = 3.26192		$\sum$ = 8.41748	$\sum$ = 5.00224

Mean $(\overline{X}_1) = \frac{\sum X_1}{n} \Rightarrow \frac{17.78}{5} \Rightarrow 3.556\ \%$

Mean $(\overline{X}_2) = \frac{\sum X_2}{n} \Rightarrow \frac{52.71}{5}$

$= 10.542\%$

Karl Person's Correlation Coefficient $(r_{12}) = \frac{\sum (X_1 - \overline{X}_1)(X_2 - \overline{X}_2)}{\sqrt{\sum (X_1 - \overline{X}_1)^2}\sqrt{\sum (X_2 - \overline{X}_2)^2}}$

$$\Rightarrow \frac{5.00224}{\sqrt{3.26192}\sqrt{8.41748}} \Rightarrow 0.954633$$

Therefore Correlation coefficient between deposit rate and lending rate of BOK is 0.954633.

Coefficient of Determination $(r_{23})^2 = 0.911324$

t- Statistics (t) = $r\frac{\sqrt{n-2}}{\sqrt{1-r^2}} \Rightarrow 0.954633\frac{\sqrt{5-2}}{\sqrt{1-0.911324}} \Rightarrow 5.552$