

# CHAPTER - I

## INTRODUCTION

### 1.1 General Background

Nepal is the country of mixed economy. Both state controls cum private participation are being observed in the country. Nepal is dependent in foreign aid too. Dependency upon foreign aid is dramatically inclining in each year. For the development of trade and industry within the country, it is essential to invest capital in huge level. Small scale capital scattered throughout the country must be mobilized in order to promote investment. Nepalese people are poverty stricken as well as characterized by low saving capacity. Ergo, it is also known as the country of low capital investment.

So far as economic aspect of Nepal is concerned, it is forcing rapidly to reform through concerned, it is now forcing rapidly to economic reform through settlement of different acts, and provision and inviting largely the foreign investment coincide with private participation within the country especially after the restoration of democracy within the country in 2046 BS. The economic plight of Nepal is neither satisfactory nor praiseworthy. However there are ample probable areas, where lots of opportunities prevail.

Country is having unequal distribution of national income. Population is increasing in geometric progression where as corns and physical amenities are increasing in arithmetic progression. The contribution of agricultural sector to the GDP stood as 38.9% where as that of non agricultural sector to the same stood at 61.1%.

The formation and utilization of capital are shaped by many factors like prosperity of country, GDP of country, export-import of country, lending-deposit pattern, and interest rate and so on. In modern economy banks and financial institutions plays

the major role for capital generation and utilization. In other words they take part actively in funds mobilization. Keeping other factors constant, interest rate also plays the dominant role in borrowing and lending.

To induce more saving, financial institution can play a vital role by providing attractive interest rate and offer a different scheme. The people of the least developed countries are not much concerned about saving as most parts of earnings are spent in hand to mouth consumption. Even if some people are able to save their money, they show their interest to invest such surplus funds on non-productive sectors like gold, land, vehicles and so on. Banks and financial companies, as intermediaries, can attract savers to save more by providing them attractive interest rate and accept the deposit.

## **1.2 Interest rate structure in Nepal**

Before studying the relationship of interest rate and other factors, it is better to know average structure of interest rate that were prevailed in the country during the past four years. Though the detail about analysis about this are analyzed in chapter four, but the table no 1-1 below tries to give the glimpse of the lending rate and deposit rate of different financial institutions:

**Table: 1-1 Structure of Interest Rates (Percentage per Annum)**

	Mid-July				
	2004	2005	2006	2007	2008
<b>Nepal Rastra Bank</b>					
Bank Rate	5.5	5.5	5.5	5.5	6.25
Refinance Rates	2.0-5.5	2.0-5.5	2.0-5.5	1.5-5.5	1.5-6.25
<b>Government Securities</b>					
Treasury Bills (91 days)	3.78	2.98	1.47	3.94	3.25
National Saving Certificates	8.0-13.25	7.0-13.0	7-13.0	6.5-13.0	6.5-8.5
Development Bonds	3.0-8.0	3.0-8.0	3.0-8.0	3.0-8.0	3.0-8.0
<b>Inter bank Rate</b>	1..96	4.50	0.71		
<b>Commercial Banks</b>					
<b>Deposit Rates</b>					
Saving Deposits	2.5 - 6.25	2.5 - 6.0	2.0 – 5.0	1.75-5	2.5-5
Time Deposits					
1 Months	2.0-4.5	2.0-5.5	2.0-3.5	2-3.5	2.0-3.5
3Months	2.5-5.0	2.5-5.0	2.0-4.0	1.5-4.0	1.5-4.0
6Months	2.5-6.0	2.5-6.0	2.5-4.5	2.5-4.5	1.75-.5
1 Years	3.5-7.0	3.0-7.0	2.75-6.0	2.25-5.0	2.25-5.0
2Years and above	3.25-8.0	3.25-7.5	3.0-6.5	2.5-6.05	2.5-6.4
<b>Lending Rates</b>					
Industry	7.0-14.0	8.5-14.0	8.5-13.5	8.25-3.5	8.0-3.5
Agriculture	12.0-14.0	10.5-4.5	10.5-3.0	10.0-3.0	9.5-3.0
Export Bills	6.5-12.0	4.0-12.5	4.0-11.5	4.0-12.0	5.0-1.5
Commercial Loans	7.0-16.0	7.5-16.0	9.0-14.5	8.0-14.0	8.0-4.0
Overdrafts	11.0-17.0	10..0-7.0	10.0-6.0	5.0-14.5	6.5-4.5
<b>Cash Reserve Ratio (CRR)</b>					
With NRB	6.0	6.0	6.0	6	6
Cash in Vault	3.0	2.0	--	-	-

Source: Macroeconomics Indicators of Nepal, NRB, Research Department, Statistics Division, January 2009 Quarterly Economic Bulletin of NBR.

[Note: The average lending rate of any sector is calculated by adding the two rates and divided it by 2 i.e. for example for industrial sector average lending rate it is calculated as  $(7\% + 15\%) \div 2 = 11\%$ ]

According to the structure of interest rate in presented in table 1-1, both lending and deposit rates are declining (except the National Saving Certificates) during the period of 2004 to 2008 mid-July. But in deposit rate in saving deposit, 1 month's time deposit is increased in the year 2008. Similarly lending rates in export bills and overdrafts are increased in year 2008 i.e. treasury bills. %. As per principle, interest rates T-bills, are the bases for all kinds of interest rate, so decline in interest rate may leads to decline in interest rate of others. The interest rates of National saving certificates remain less volatile than other during the

observation periods. Similarly the interest rate of development bonds remains same for the Five year of periods.

The other bank interests was 1.96% on 2004 mid-July but it decrease to 0.71% when it came during the mid-July of 2006 and then reach 2.13% in year 2008 mid-July. It seems that Nepalese commercial banks have excess liquidity in year 2004, 2006 and 2008 but less liquidity in year 2005 and 2007. The most of the commercial bank classified their deposits into two sections –Saving Deposits and Time Deposits and offered the different interest rates on them.

Ranges from 2.5% to 6.25% in the year of 2004 but this rate declined to the range of 2.0% to 5% when it came to the year of 2008. If the mean is taken, then the average interest rate on 4.25% in 2005, 3.625% in 2006, 3.375% in 2007 and 3.5% in 2008. This shows that the interest rate on saving deposit has decreasing tendency. In the same way, the interest rate on time deposits also shows the decreasing trend. In Nepalese economy, time deposits are classified in five categories: 1 month, 3 months, 6 months, 1 year and 2 years and above. In one month time deposits interest rate remains almost same. Though the table shows the decreasing in interest, but it shows that spread between maximum and minimum rates narrow down by 1% when it comes from 2004 to 2006. For 3 months time deposit rate, the maximum interest rate range was 2.5% to 5% in 2004 where as this rate reached to the range of 1.5% to 4%. Similarly the 6 months time deposit rates also shows the decreasing tendency. The lowest range was 2.5% at the beginning but it reached to and became stable at 1.75% up to 2008. In case of 1 year's rate, the lowest range rate fluctuates more than maximum range of same. From figure it is clear that, in 2004 the lowest range rate was 3.5% but this rate falls up to 2.25% when it was 2008. But there was less fluctuation in maximum range i.e. it fell to 5.0% from highest 7.75%. At last, for 2 years and above interest rate, maximum range fell by 1.6% where as the minimum range fell just by 1.0 % during 5 years Period.

For lending also, the table shows that average interest also fell during the 5 years period. But in case of lending there was wide range in maximum and minimum range. The lending rate was categorized in five parts: Industry, Agriculture, Export Bills, Commercial Loans and Overdrafts. Among all, the highest rate was

for overdrafts. It was up to 17% per annum similarly the lowest lending rate was on export bills. If the average of all is taken then industrial sector lending rate was 10.75%, 11.25%, 11%, 10.875% and 10.75% respectively. It shows that, on past five years the interest rate of industry was around 11% on average. Similarly for Agriculture sector the average interest rate was 13%, 12.5%, 11.75%, 11.54% and 11.25%. This shows that the industrial lending rate was cheaper when it reaches to 2008. For Export bills the average rate was 9.25%, 8.25%, 7.75% 8.05% and 8.25%. For Commercial loans this average lending rate was 11.5%, 11.75%, 11.75%, 11.0% and 11.0%. For Overdrafts it was 14%, 13.55, 13%, 9.75% and 10.5% respectively.

### **1.3 History of Banking in Nepal**

The history of banking system in Nepal is the form of money lending can be traced back in the reigning period of Guna Kam Dev, the king of Kathmandu.

Tankedhari a especial class of people was established to deal with the lending activities of money towards the end of 14<sup>th</sup> century at the ruling period of king Jayasthiti Malla.

During the prime ministerial period of Ranodip Sing, one financial institution was established to give loan facilities to the public in general in the terms of 5% interest but "Teharath" did not accept money from public.

On 30<sup>th</sup> kartik 1994 Nepal Bank Limited loan established for the first time to provide modern and organized banking facilities upto 2012, only NBL provided services to the public as an organized bank, later NRB(Nepal Rastra Bank) act 2012 was made to established NRB as a central bank to manage, control and develop monetary system in Nepal. NRB was formally established in 14<sup>th</sup> of Baisakh 2013, 2013 and its capital at the time of starting was set up in 2022 to fulfill the growing need of the country. Similarly Banijya Bank was set up in 2022 to fulfill the growing need of the country. The birth of this bank brought a new

landmark | the history of banking facility in the country. Like other developed countries Nepal also facility in Nepal. Like other developed countries Nepal also took policy of open economy to develop good competition in the banking field. Hence the joint venture bank policy is taken. Today more than 25 commercial bank are operating to provide modern banking services and facilities to boost the economy condition of the country.

The financial sector reform was initiated in mid 1980s under the liberal economic policy of Nepal Government under this policy; Nepal Government first opened the banking sector to the foreign investors. In July 1985, commercial banks were allowed for the first time to accept current and fixed deposits on foreign currency (US Dollars and Sterling Pound). On May 26, 1986 NRB deregulated the interest rate regime and authorized the interest rate regime at any prescribed level above its minimum prescribed level.

## **1.4 Introduction of Sample Bank under Study**

### **Nepal Bank Limited (NBL)**

Nepal Bank Limited is the first bank to commence its business in Nepalese economy. After the enactment of “Nepal Bank Law” in B.S. 1994, this bank was established in 30 kartik, 1994 B.S. Most of the banking functions in Nepalese market are on track after the establishment of this bank. At the time of establishment, beside commercial functions, this bank performed all the other functions that should be done by Central bank of the country except issuing notes (money). But after the establishment of central bank, Nepal Rastra Bank, this bank transformed itself as a pure commercial bank. The government of Nepal, HMG, has 41% share and general public have 59% shares on this bank. Now this bank is passing with many twists and turns in present competition market. This bank is also one of the governments owned bank having 96 branches (NRB Bulletin 7, Mid-July) all over the country. With the foreign management team, this bank is now in the process of recovery.

## **Rastra Banijya Bank (RBB)**

Another government owned bank in Nepalese market is Rastra Banijya Bank. During this dissertation, this bank is also running by outsider foreign management. This bank was established in 10 Magh, 2022 B.S. on the ground of “Commercial Bank Act” 2021 B.S. This bank played a great role to uplift the agricultural, industrial and commercial sector of the country since its establishment. This is the largest commercial bank among all seventeen commercial bank in Nepal. It has 116 branches scattered all over the countryside. This bank has highest amount of deposit as well as granted highest amount of loan till this study. So this bank is important sample for this study.

## **Nepal Bangladesh Bank (NBB)**

Nepal Bangladesh Bank Ltd. was established in June 1994 with an authorized capital of Rs. 240 million and paid up capital of Rs 60 million as a joint venture bank with IFIC of Bangladesh. Currently the bank has an authorized capital of Rs 719.9 millions. Its head office is situated at New Baneshwor, Bijuli Bazar, Kathmandu. The prime objective of this bank is to render banking services to the different sectors like industries, traders, businessmen, priority sector, small entrepreneurs and weaker section of the society and every other people who need banking services. During the period of 10 years of its operation it has been able to provide excellent services to its clients. The bank has introduced its first ATM facility at Kathmandu plaza, putalisadak branch to give 24 hours 365 days banking services to their valued customers. The bank has earned the glory of providing the services to almost all the top business houses of the country and it occupies one of the leading positions among the joint venture banks in Nepal. The bank is still pursuing to accommodate as many clients as possible.

## **Himalayan Bank Limited (HBL)**

Himalayan Bank Limited was established in 1992 by the distinguished business personalities of Nepal in partnership with Habib Bank Limited, one of the largest commercial banks of Pakistan. The bank's operations commenced in January 1993. It is the sixth commercial bank of Nepal with maximum shareholding by the Nepalese Private Sector. Besides commercial activities, the bank also offers industrial and merchant banking facilities. The bank at present has five branches in the Kathmandu valley and ten branches outside the valley. The bank is also operating a counter in the premises of the Royal Palace. The bank has a very aggressive plan of establishing more branches in different parts of the kingdom in the near future. The bank's policy is to extend quality and personalized service to its customers as promptly as possible. The bank, as far as possible, offers tailor-made facilities to its clients, based on their unique needs and requirements, to extend more efficient services to its customers. Himalayan Bank has been adopting innovative and latest banking technology. This has not only helped the bank to constantly improve its service level but has also kept it prepared for future adoption of new technology. HBL has been listed on the Nepal stock exchange since July 5, 1993. The share participation of the bank is 51% Nepalese Promoters, 14% employment provident fund, 15% general public and 20% Habib Bank of Pakistan.

## **Agriculture Development Bank (ADB/N)**

ADB/N was established in 1968 under the Agriculture Development Bank Act 1967. The bank inherited the assets and liabilities of the cooperative bank, which was established in 1963. In 1973 the Land Reform and Savings Corporation, a similar institution established in 1966, was merged with the bank. ADB/N is an autonomous organization under the supervision of the Ministry of Finance of His Majesty's Government of Nepal. The bank has been working as a premier rural credit institution since the last three decades, contributing more than 80% of the shares in meeting institutional credit in Nepal.



Under The ADB/N act, the bank is entrusted with the responsibilities of initiating effective approaches for the development of agriculture. The Bank is committed to raise the economic condition of farmers by availing credits and capital inputs in easy and smooth manner. The subsequent amendments of the Act empowered the bank to finance small farmers on group liability and expand its scope of financing to promote cottage industries. The amendments of the Act also permitted the bank to engage in commercial banking activities for the mobilization of domestic resources.

The main functions of the Bank are to:

- a. Provide short, medium and long-term agricultural loans to individual farmers, group of farmers, corporate bodies and village committees.
- b. Provide loans and technical services for the purchase of inputs and capital items such as fertilizers, insecticides, feed, farm machinery, irrigation equipment, canal construction, boring of pump-sets and sprinklers.
- c. Provide loans for the purchase of livestock
- d. Finance for cottage small-scale industries.
- e. Finance for cold store, warehousing and other marketing facilities.
- f. Finance for the capital goods necessary for the development of alternative sources of energy.
- g. Supervise small farmers' development programs to uplift the socio-economic status of small farmers.
- h. Undertake commercial banking functions to generate resources.
- i. Provide training to the beneficiaries and the bank staff.

The ADB/N is only development Bank in Nepal which has been adopting a “Three window system” to operate its activities in the following areas 1) Development Financing Sector 2) Target group sector through Small Farmers Development Program and 3) Commercial banking sector.

## 1.5 Statement of the Problems

Interest plays the dominant role in borrowing and lending. Simply, interest rate is defined as- price a borrower must pay to secure scarce loanable funds from lender for an agreed-upon period. It is the price of credit. But unlike other prices 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. Interest has direct relation with economic growth and development. According to economic theory (other things remain constant), low interest rate is impetus for high investment. And this high investment leads to high production, high employment, more income and ultimately growth in economy. So by this study it is going to explore: It wants to know that the decline in interest rate increases the lending activities Or what is the actual condition on this regard in Nepalese financial market place? Nepal's main export is basically raw materials. It means that Nepal is exporting raw materials instead of producing goods and services from these. If cheap financing is available, many factories could be established to reap benefits from utilization of resources, which would increase the employment, standard of living and status of country economy.

This study is going to identify: Is there any positive relation of interest rate and inflation as per theory and in same way high interest rate is stimulus for high savings. Thus through this thesis, it is going to discover: what is the relation of deposit and interest rate? Or Does substitution effect is truly applicable in our Nepalese context.

More specifically, the main focus of this study is to solve the main questions arises here.

- 1) What is the relationship between high interest rate and saving?
- 2) What is the relationship between interest rate and borrowing amount?
- 3) Does inflation has high positive or negative relation with interest rate in Nepalese context?

## 1.6 Objectives of the Study

The basic objective of the study is to find out the relationship of interest rate with other three variables that is, Deposit, Inflation and Credit that are currently prevailing in Nepalese market. In the similarly way this study aims to identify whether the theories that are taught in university courses are applicable or not in Nepalese context. The point wise break down of the objectives of the study is as follows:

- a. To explore the relation of interest rate with deposit amounts (existence of substitution effect) in Nepalese market.
- b. The objective is to find out, whether the deposit amount increases with increase in interest rate or not. i.e. **Substitution effect**.
- c. To identify the sensitivity of interest rate to the investment.
- d. The objective is to find out whether the **inverse relation of interest rate and investment** is true or not.
- e. To find out the relationship of interest rate with inflation in Nepalese market.
- f. To suggest for the improvement on the basis of findings of the study.

## 1.7 Needs and Importance of the Study

Inflation is important factor in the financial market. All countries in the world have some magnitude of inflation. While this study is being conducted, the existing inflation rate in our country is around 5%. Inflation rate is added to real rate of return to determine the market interest rate. So higher the inflation, higher will be the interest rate.

Similarly, higher interest rates generally bring forth a greater volume of savings and stimulate the lending of funds whereas a lower rate of interest led to the flow of savings and reduce lending activity but increases the demand for loan. Higher

interest rates tend to reduce the volume of borrowing and capital investment and lower rates stimulate borrowing and investment spending.<sup>1</sup>

The abovementioned theory may not come true, especially for developing country like Nepal because, most of the theories of financial markets are determined by the studies which had been conducted on developed countries like USA, Japan, and UK and so on.

So it helps to develop some ideas about the interest rate and its impact upon deposits, credit and inflation in the Nepalese context. By doing so, more knowledge can be achieved about the true pictures of Nepalese market.

This study is also considered to be useful to various parties such as further researchers, students, teachers, financial institutions, general individuals etc.

## **1.8 Limitation of the Study**

Each and every study has its own limitation, no study can be free from constraints such as economic resources, time etc. All the necessary data may not be available due to business secrecy. This study too is no exception and is characterized by the following limitations:

- a. This study is conducted financially rather than technically or experimentally (that is experiment research).
- b. This study is conducted only for suggesting the concerned limited but not for directing.
- c. Only one factors -interest rate- is taken for the study. Impact of other aspects (factors) besides interest has not been studied.
- d. Stipulated time and resources also may have existed as limitation of this study.

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<sup>1</sup> Peter S. Rose, *Money and Capital Markets: Financial Institution and Instrumental in a Global Marketplace* (6/e), Irwin, Chicago, 1997, p. 15.

- e. The reliability of this study greatly depends upon the accuracy of the data provided and collected. Hence it is not free from limitation of primary and secondary data.
- f. The samples have been drawn at random for convenience, so there may exit some sampling error. And the sample size may not be sufficient to generalize the findings.
- g. This study covers only seven fiscal years.
- h. The sample are taken only from commercial banks, other financial intermediaries are not included in the study.
- i. Time and budget limitation.

## 1.9 Hypothesis Formulation

Testing of hypothesis is one of the most important aspects of the research study. It is the quantitative statement about the population parameter. In other words, it is an assumption that is made about the population parameter and then its validity is tested. By testing the hypothesis we can find out whether it deserves the acceptance or rejection of the hypothesis. The acceptance of hypothesis means there is no any sufficient evidence provided by the sample to reject it and does not necessarily imply that it is true. The main goal of testing of hypothesis is to test the characteristics of hypothesized population parameter based on sample information whether the difference between the population parameter and sample statistic is significant or not.<sup>2</sup>

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<sup>2</sup> P. K. Sharma & A.K. Chaudhary, *Statistical Methods (2/e)*, Khanal Books Prakashan, Katmandu, 2000, p. 87.

The hypotheses formulated for this study are as follows:

**Null hypothesis H<sub>0</sub>: = 0**

- a. Population correlation coefficient is zero. In other words, the variables (deposit interest rate and deposit amounts) are uncorrelated in Nepalese financial market.
- b. Population correlation coefficient is zero. In other words, the variables (Credit interest rate and credit or loan amounts) are not correlated in Nepalese financial market.
- c. Population correlation coefficient is zero. In other words, there does not exist any correlation between interest rate on deposit and interest rate on lending.
- d. Population correlation coefficient is zero. In other words, the variables in population (inflation and interest rate on deposit) in Nepalese financial market are not correlated.
- e. The variables in population (inflation rate and interest rate on lending) in Nepalese financial market are not correlated.

**Alternative hypothesis H<sub>1</sub>: ≠ 0**

- a. Population correlation coefficient is not equal to zero. In other words, the variables (deposit interest rate and deposit amounts) are correlated.
- b. Population correlation coefficient is not equal to zero. In other words, the credit interest rate and credit or loan amounts are correlated.
- c. Population correlation coefficient is not equal to zero. In other words, there exist correlation between interest rate on deposit and interest rate on lending.
- d. The variables in population (inflation rate and interest rate on deposit) in Nepalese financial market are correlated.
- e. The variables in population (inflation rate and interest rate on lending) in Nepalese financial market are correlated.

## **1.10 Organization of the Study**

This study has been divided into five chapters and is organized as follows:

### **Chapter 1: Introduction**

The first chapter is the introduction chapter which deals with subject matter of the study consisting of the background of the study, history of banking in Nepal, information of banks under study, statement of the problem, objective of the study, significance of study and hypothesis formulation.

### **Chapter 2: Review of Literature**

The second chapter deals with the review of literature with concept of some terminology of interest rate, inflation, deposit and saving. It includes conceptual framework along with the review of books, journals, previous study, research paper and review of unpublished thesis of various students.

### **Chapter 3: Research Methodology**

The third chapter deals with the research methodology used in this study. It consists of introduction, research design and sources of data, population and sample, data gathering procedures and analysis of data.

### **Chapter 4: Analysis and Interpretation of the Data**

Fourth chapter is the analytical presentation of the study. This chapter consists of the analysis, interpretation and major finding of the study. This is the most important part of the study.

### **Chapter 5: Summary, Conclusion and Recommendation**

Fifth chapter deals with the summary, Conclusion and Recommendation of the study. The bibliography and appendices is also included in this chapter.

# CHAPTER – II

## REVIEW OF LITERATURE

### 2.1 Introduction

The review of literature is a crucial aspect of planning of the study. The main purpose of literature review is to find out what work have been done in the area of research problem on the study and what has not been done in the field of research study being undertaken. It is an essential part of all studies. It is a way to discover what other researchers have covered and left in the area. A critical review of the literature helps the researcher to develop a thorough understanding and insight into previous research works that relates to the present study. It is also a way to avoid investigation problems that have already been definitely answered. Thus a literature review is the process of locating, obtaining, reading and evaluating the research literature in the area of the student's interest. The purpose of literature review is to find out what research studies have been conducted in one's chosen field of study and what remains to do. Ergo, authentic and honest attempts are being made to highlight the gist relating with the concerned topic from various books, reports, journals, and research published by various institutions, unpublished dissertations submitted by master level student have been reviewed. To ensure the precise, lucid and concrete views about the stated topic, the entire review work is portrayed in the point wise break down as given below:-

1. Conceptual Review
2. Review of related studies.



## 2.2 Conceptual Review

It encompasses the review of textbooks and other reference material such as newspaper, magazines, research articles, journals and past thesis.

Financial institutions occupy the paramount role in the development of the country. These institution not only mobilize saving but also promote investment in the different enterprises of the national economy that spontaneously assist in alleviating poverty, uplifting employment and there 'by developing the society and country as a whole. Thus, the development of financial institutions (commercial banks, finance companies and insurance companies) is regarded as one of the crucial yardstick for measuring the level of economic development of a nation. Nepal the one of the poorest countries in the world is in need of additional capital investment to propel the rate of economic growth. Domestic and foreign capital (i.e. grants and loans) are two major chunks of capital available for investment and earlier is crux and stable source of capital to bear sustainable development of a nation.

Finance companies accelerates internal resources mobilization process as per directives as Nepal Rastra Bank. The rate of growth of saving is very low and country is relying on foreign capital (i.e. loan). To bridge gap in demand of capital than saving (i.e. internal supply). Hence, liberal and open market policy stimulates thrives financial institutions.

Book named "Banking Management" says that in banking sector or transaction, and unavoidableness of loan management and its methodology is regarded very important. Under this management many subject matters are considered and thought, for example, there are subject matters like the policy of loan flow, the document of loan flow, loan administration, audit of loan, renewable of loan, the condition of loan, flow, the provision of security, the provision of the payment of the capital and its interest rate and other such procedures. This management plays a great role in healthy competitive activities.

The interest rate is the price of money; the price of renting the use of the resources that money commends for a specified by the free interplay of supply and demand in a market economy. The price of the money, the interest rate, plays a vital role in the allocation of resources and in the decision making of consumers and business. For example, an increase in the interest rate provides additional incentives for individuals and others to postpone current consumption (save) and thereby free resources for investment. Government policies intended to expand the volume of saving should aim at increasing the attractiveness of saving by increasing the return to saving – the interest rate.

## 2.2.1 Concept of Interest

In financial markets there are numerous interest rates exists. These differences are due to the risk premium associated with the issuer. Even securities issued by the same borrowers often carry a variety of interest rates. In this section, we focus upon those basic forces that influence the level of different interest rates.

To uncover these basic rate-determination forces, however, we must make a simplifying assumption. We assume in this chapter that there is one fundamental interest rate in the economy known as the pure or real rate of interest which is the component of all interest rates. The closest approximation to this pure rate in the real world is the market yield on the government bonds minus inflation. The rate of interest on Treasury bond is called risk free rate of interest which consists of real rate of interest plus premium for inflation. It is a rate of return presenting no risk of financial loss to the investor and representing the opportunity cost of holding idle cash, because the investor can always invest in no risk bonds and earn this minimum rate of return. Once pure rate of interest is determined, all other interest rates may be determined from it by examining the expected future inflation and special characteristics of the securities issued by individual borrowers. For example, only the government can borrow at risk-free interest rate; other borrowers pay higher rates that due to the greater risk of loss attached

to their securities. Difference in liquidity, marketability and maturities are other important factors causing interest rate to differ from the pure or risk free rates<sup>3</sup>  
In this study mainly four theories of interest are reviewed. They are:

## **THE CLASSICAL THEORIES OF INTEREST RATES<sup>4</sup>**

This is one of the oldest theories concerning the determinants of pure or risk-free interest rate. It was propounded during the 18<sup>th</sup> and 19<sup>th</sup> 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 households and 2) the demand for investments capital coming mainly from the business sector.

### **Saving by Households:**

Generally most of the saving in modern industrialized economies is carried out by individual and families. For these households, saving is simply abstinence from consumption spending. Current savings, therefore, are 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 (i.e. the propensity to save). Generally, the volume of household savings 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 rate also plays an important role. Interest rates affect an individual's choice between saving and current consumption. The classical theory of interest assumes that individual 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 saving in the current period at a

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<sup>3</sup> Peter S. Rose, *Money and Capital Markets: Financial Institution and Instrumental in a Global Marketplace (6/e)*, Irwin, Chicago, 1997, p. 26.

<sup>4</sup> Ibid p.p. 193 - 196

higher rate of return, future consumption and future enjoyment would be increased. The classical theory considers the payment of interest as a reward for waiting the postponement of current consumption in favor of greater future consumption. Higher interest rate increase the attractiveness of saving (and future consumption) for some quantity of current consumption. This so-called **substitution effect** calls for a positive relationship between interest rates and the volume of savings. Higher interest rates bring forth a greater current volume of savings. If the rate of interest in the financial markets rises from 5 to 10 percent, the volume of current savings by households is assumed to increase from \$ 100 to \$200 billion<sup>5</sup>

### **Saving by Business Firms:**

Not only households, but also businesses save and direct a portion of their savings into the financial markets to purchase securities and make loans. 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 business each year is a key measure of the volume of current business saving. And these retained earnings supply 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 then the level of business profits. If profits are expected to rise, business will be able to draw more heavily on earnings 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 falls but firms do not cut back on their investment plans, they are forced to make heavier use of the 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,

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<sup>5</sup> Ibid p.p. 193

interest rates also play a role in the decision of what proportion of current operating costs 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 demand for investment funds:**

The savings made by business, government and households are important determinants of interest rate but they are only one side of determinants. The factor is investment spending, made by business firms, government and in some case households. Business requires huge amounts of funds each year to purchase equipment, machinery and inventories and to support the 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 economist, interest rate and invest able fund have inverse relationship. At low rates of interest, more investment projects become 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.

## The Equilibrium Rate of Interest in the Classical Theory of Interest:

According to the classical economists, the interest rates in the financial markets were determined by the interplay of the supply of saving and the demand for investment. Specifically, the equilibrium rate of interest is determined at the point where the quantity of savings supplied to the market is exactly equal to the quantity of funds demanded for investment. To support this in figure no 2-1 this occurs at point E where the equilibrium rate of interest is  $i_E$  and the equilibrium quantity of capital funds traded in the financial markets is  $Q_E$ .

The market rate of interest moves towards 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 equilibrium. Similarly, if the market rate is temporarily below equilibrium, investment demand exceeds the quantity of savings 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.

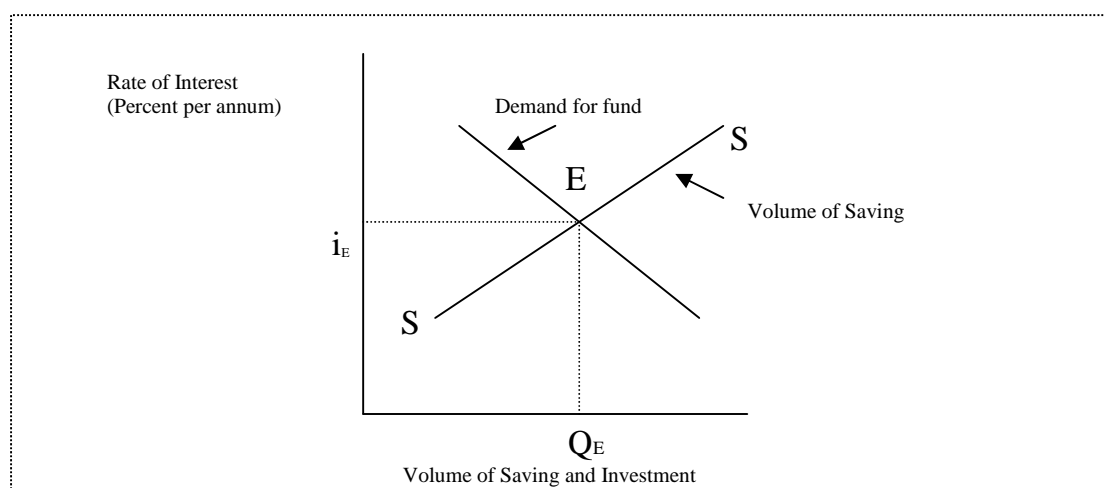


Fig No 2-1: The Equilibrium rate of interest in the classical Theory

## **THE LONABLE FUND THEORY:**

In this theory, the main theme is the supply and demand for loan able funds (i.e. lending & borrowing) determines the interest rate. This explanation emphasizes the flow of funds by suppliers of loan able funds (lenders) and the flow of funds by the demanders of loan able funds (borrowers). It is a monetary theory of interest since it focuses on the financial factors that influence interest rates (i.e. borrowing and lending). In addition, the loan able fund theory is a short-run, partial equilibrium explanation in which some factor or factors produce a change in the interest rate, but there is no analysis of the long-run impact of this change in the interest rate on the level of employment, income, and production of the resulting impact of changes in employment, income and production on the interest rate. Rather, the loan able fund theory focuses on the factors that underlay the supply and demand schedules for loan able funds and on their interaction.

### **Supply of Loan able Funds:**

The major sources of supply of loan able fund 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.

### **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.<sup>6</sup> Individual or household save for a variety of reasons but there is little evidence to suggest that the quantity of loan able 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 savings 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.

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<sup>6</sup> Kerry S. Cooper & Fraser R. Donald, *The financial marketplace (5/e)*, Addison wesky publication, New York, 1983, p. 97.

Business saving refers to the net income after taxes of the firm, less any cash dividends i.e. retained earnings. There is 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 exists when revenues exceed expenditures.

### **New Money:**

Although the volume of saving is the principal source of loan able funds in financial markets, the supply of the loan able funds 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 deposits) through the credit creation process. However, the ability of commercial bank to create money is limited by the central bank through the use of its monetary policy tools like open-market operations, reserve requirement changes, 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 determines the amount of reserve is central bank monetary policy.

### **The Demand for Loan able Fund:**

The demand for loan able fund is composed of the demand by individual, business and governments.



**Consumer Demand:**

Domestic consumers demand loan able funds to purchase a wide variety of goods and service on credit. Recent research indicates that consumers are not particularly responsive to the rate of interest whey they seek credit but focus instead principally on the non price terms of a loan, such as the down payment, maturity and size or 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 rates 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, a 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 rates 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.

**Government Demand:**

Government demand for loan able funds is a growing factor in the financial markets 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 ceilings, some state and local governments are prevented from offering their securities to the public.

### **2.2.2 Factors influencing the difference in interest rates:**

Though it is assumed deposit increases as interest increases but interest rate is affected by numerous factors. In real world, different financial institution quotes different interest rate. It means that the same types of instrument carries different interest rate so there is presence of interest spread. For this difference there are numbers of factors influencing the difference in interest rates.<sup>7</sup>

- a. Credit or default risk
- b. Marketability or liquidity risk
- c. Call or prepayment risk
- d. Servicing costs
- e. Exchange rate risk
- f. Taxability

#### **a. Credit of Default Risk:**

Credit or default risk involves the potential that a saver will receive less principal and interest on the financial claim that the contract specifies. Default risk is related to the probability that some or all of the initial investment will not be returned. The degree of default risk is closely related to the financial condition of the company.<sup>8</sup> Credit risk requires making estimates of the potential for loss. This probability is then converted into an interest rate premium, the credit or default risk premium

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<sup>7</sup> Kenneth J. Thygeson, *Financial markets and institutions* (4/e), Harper college publisher, New York, 1993, p.45.

<sup>8</sup> John M. Cheney &, Edward A. Moses, *Fundamental of Investment* (7/e), West publishing company, New York, 2000, pp.15-20.

and added to the saver's required nominal yield. Typically, the securities issued by the government, (esp. T-bills), are considered to be credit risk free.

**b. Marketability Risk:**

Marketability is the capability of being sold quickly at low transaction cost.<sup>9</sup> Marketability risk deals with the degree of difficulty in being able to convert a financial claim into cash at its most recent transaction price or very close to it. Savers who purchase investments with poor marketability expect to be compensated for the lack of marketability. This represents an additional interest spread and is referred to as the marketability or liquidity risk premium.

**c. 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 provision are referred to as call provision. On financial claims such as home mortgage and installment auto loans, they are called pre-payment provisions. These provisions are options. The borrower has the option to call or prepay the debt. The investor in the financial claim that is callable or subject to repayment accepts risk. The risk is that if interest rates fall, the borrower will call the bond or prepay the mortgage. The investor receiving the cash funds that he or she cannot reinvest it at an interest rate as high as the rate on the previous investment. This risk is called a call or prepayment risk. The compensation that investors demand to accept this risk is an additional interest spread reoffered to as the call option premium.

**d. Servicing Cost:**

Some financial claims are difficult to service. This means that the process of collecting interest and principal payments providing accurate records or monitoring the ongoing credit position of the borrowing involves considerable operating costs. Lenders must be compensated for the

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<sup>9</sup> Meir Kohn, *Financial Institution and markets (5/e)*, Tata McGraw Hill publishing, New Delhi, 1999, p. 203.

servicing costs. This cost is included in the interest rate charged and is referred to as the servicing cost.

**e. Exchange Rate Risk:**

As our financial markets have become more global, there has been a significant growth in the borrowing and investing in foreign denominated financial claims. A Nepalese company establishing a manufacturing facility in Belgium might be inclined to issue bonds denominated in Belgium francs rather than Nepali Rupees. Investors also have available to them many investments that are denominated in foreign currencies. This transaction involves exchange rate risk. This risk relates to the potential that the rate of exchange between the domestic currency and foreign denominated currency will change as a result of any number of factors. The primary risk for the borrower is that the value of the domestic currency. This results in an unexpected cost on the international loan. 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.

**f. Taxability:**

The final factor influencing the change in interest rate is taxability. Financial claim income is typically subject to taxation. Since the value of a financial claim is based on its anticipated cash flow, taxation acts to reduce those cash flows. Not all incomes are taxable equally.

### **2.2.3 Concept of Deposit:**

Deposit is a sum of money lodged with a bank, discount house or other financial institution<sup>10</sup>. Deposit is nothing more than the assets of an individual which is given to the bank for safe-keeping with an obligation to get something (interest) from it. To a bank these deposits are liabilities. Commercial bank Act 2031 (1974)

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<sup>10</sup> Manohar K Shrestha & Dipak B Bhandari, *Financial Markets and Institutions (3/e)*, Asmita Books Publishers & Distributors, Kathmandu, 2003, p. 107.

defines “Deposits” as the amount deposited in a current, savings or fixed accounts of a bank or financial institution.<sup>11</sup> The deposits are subject to withdrawals by means of cheques or on a short notice by customers. There are several restrictions on these deposits, regarding the amount of deposit, number of withdrawal etc. They are used more as investments and hence they earn some interest. The rate of interest varies depending on the nature of the deposits. The bank attracts deposits from customers by offering different rates of interest and different kinds of facilities. Though the bank plays an important role in influencing the customer to part with his funds and open deposit accounts with it, it is ultimately the customer who decides whether s/he should deposit his surplus funds in current deposit a/c, saving deposits or fixed/time deposit a/c. Bank deposits arise in two ways. When the banker receives cash, it credits the customer’s account, it is known as a primary or a simple deposit. People deposit cash in the banking system and thereby convert one form of money, cash, into another form, bank money. They prefer to keep their money in deposit accounts and issue cheques against them to their creditors. Deposits also arise when customers are granted accommodation in the form of loans. When a bank grants a loan to a customer it doesn’t usually pay cash but simply credits the customers account with the amount of loan. Of course, there is nothing that prevents the borrower from withdrawing the entire amount of borrowing in cash but quite often s/he retains the amount with the bank in a deposit.

#### **2.2.4 Types of Deposit**

There are different types of deposits. But for this study, major three types of deposit are taken. They are:

##### **Current Deposit:**

A current deposit is a running account with amounts being paid into and drawn out of the account continuously. These accounts are also called demand deposits or demand liabilities since the banker is under an obligation to pay money in such

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<sup>11</sup> Dilli Raj Bhandari, *Banking and Insurance Principle & Practice (7/e)*, Aayush Publication, Kathmandu, 2005, p.97.

deposits on demand. The account never becomes time barred, because the limitation does not run until a demand is made by the customer on the bank for the payment of deposit. These accounts are generally opened by business houses, public institutions, corporate bodies and other organization whose banking transactions are numerous and frequent. As these deposits are payable on demand, banker is obliged to keep larger cash reserves than are needed in the case of fixed and savings deposits. This type of account is just a facility offered by the bank to its customers. So such deposit doesn't yield any interest return.

The deposit in which an amount is immediately paid at the time of any account holder's demand is called demand deposit.<sup>12</sup> Its transaction is continual & a very small portion of such deposit can be invested in the productive sector. Though the bank cannot gain significant profit by investing it in new sector, this is one of the facilities given to the customer. Therefore, the bank doesn't give interest on this account. For this study this types of deposit is not suitable.

### **Saving Deposit:**

According to Commercial Bank Act 2031 (1974) saving account means "An account of amounts deposited in a bank for savings purposes." The saving deposit bears the features of both of the current and fixed period's deposits. Saving accounts are mainly meant for non-trading customers who have some potential for saving and who don't have numerous transactions entering their account. While opening the account the minimum compensating balance differ according to the banks rule. Similarly there is also divergence as to how much amount of money can be withdrawn. But if the customers want to withdraw more money from the bank which is not allowed by it but if s/he gives pre-information to the banks, s/he can withdraw more money. The bank fixes the minimum and maximum amount of withdraw able through a cheque from this deposit. If the bank goes into liquidation, priority is given to the saving deposit than current and fixed deposits while repaying the liabilities.

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<sup>12</sup> I.bid

### **Fixed Deposit:**

Fixed deposits constitute a very important resource for banks as bank need not keep greater reserve in respect of such deposits. Under the commercial Bank Act 2031 (1974), "Fixed account means as account of amounts deposited in a bank for certain period of time." The customers opening such account deposit their money in the account for a fixed period. Usually, only the person or institution who wants to gain more interest opens such type of account. High interest rate is paid to this deposit as compare to saving deposits. The bank and the customer can take benefit from this deposit. The bank invests this money on the productive sector and gains profit and the customer too can be made his financial transaction stronger by getting more interest from this deposit. The principal amount with interest must be returned to the customer after expiry of fixed time.

In England these deposits are repayable subject to a period of notice and hence known as time deposit or time liabilities means that these are withdraw able subject to a period of notice and not on demand.<sup>13</sup> Fixed deposit receipt is not transferable by endorsement and certainly not negotiable. However the debt covered by the fixed deposit receipts can be assigned. Bank generally gives loans up to 90% of the deposit against the security of the deposit. For this bank charge some interest higher than the interest allowed on the deposit.

### **2.2.5 Importance of Deposit:**

Deposit arises from saving. An individual's income equals consumption plus saving. S/he deposits the saved part of income in the bank and gets interest from it. Banks in turn lend this money and earn profit by charging high interest rates. And the borrowers from banks, invests this fund in productive sectors yielding more return than the borrowed interest. This investment leads to create new employment opportunity in the economy. Ultimately due to new employment the purchasing power of the economy increases and finally GDP and growth of the country occurs. It means that the deposit has very important role in the economy. There is a direct relationship between deposit of banks and the investment in the

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<sup>13</sup> M. Radhaswamy & S. V. VasuDevan, *Text book of bank (8/e)*, S chand & company Ltd, New Delhi, 1979, p. 209.

economy. If the volume of deposit is low, the investment in the economy also lags behind due to lack of resources. The deposit of banks is the accumulated capital which can directly be invested. There is a great need of such deposit in the developing countries. Deposit includes the idle money of the public, bank being the inter-mediator to accept this sort of money and help to channelize this in productive sector. So the importance of banks and financial intermediaries is larger in present context.

### **2.2.6 Concept of Lending (Credit):**

Another important function of commercial bank is to provide different types of loans or credit. The word 'credit' means 'trusting'. In credit transaction the lender (or banks) must have confidence in the borrower that s/he will be able to repay the money. In credit transactions, the creditor turns over to the debtor to repay an equivalent amount usually money in future plus an added sum called interest. In other words the commercial bank earns profit by lending the amount in terms of loan or credit and in return it gets interests. Banks' loans are classified as: A) Loans and advances, b) Overdrafts c) cash credit d) discounting of bills and so on.<sup>14</sup> But besides this, the other forms of credit are: Bills of Exchange, cheques, Drafts, Promissory Note, Letter of Credit (LC), Travelers' cheque, Treasury Bills (T-Bills), Book Credit e.t.c.

If credit is made to the government the credit is known as public credit and if credit is transacted by the private for his own purposes the credit becomes private. There are certain distinctions between public and private credit. Bank credit refers to the credit taken by the banks. Bank is the major source of credit to both private and public debtor. Sometimes bank also takes credit. There is another type of credit known as investment credit and commercial credit which can be divided according to the purposes of using credit. The former refers to the credit which is used for investment and the latter for trade purposes. Similarly, another classification is consumer's credit and producers' credit. The latter type of credit

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<sup>14</sup> Manohar K Shrestha & Dipak B Bhandari, *Financial Markets and Institutions (2/e)*, Asmita Books Publishers & Distributors, Kathmandu, 2003, pp. 104-109.



is the advances made to individuals firms, companies and governments, which are used to facilitate the carrying on of the various branches of utility creation.

### **2.2.7 Factors affecting the volume of Lending**

The volume of credit within a country depends upon different factors. For this study only the effect of interest rate is taken into consideration and other factors are not considered. Some of the factors affecting the volume of credit are as follows:

**a. Credit (Lending) Rate:**

If the bank credit rate is very high then, the volume of credit expansion is less and vice versa. It means that volume of credit and interest rate of credit has inverse relation. People invest very little in productive sectors when the interest rate is high in the market economy.

**b. Rate of Return:**

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

**c. Investment Opportunity:**

If the investment opportunity within the country is high, the volume of credit becomes high. The basic thing for investment stimulation is easy and cheap credit etc.

**d. Pace of Financial Development:**

If there are enough banking facilities to provide loans in easy terms, the volume of credit may be high. It is due to the lack of cheap money lenders that rural people are deprived of loan. If the banking facilities within the nation is expanded, the volume of credit rises.

**e. Basic Infrastructure:**

Like transportation, marketability, availability of raw materials also plays an important role in raising the volume of credit in the country.

**f. Political Condition:**

Political condition, especially political in-stability, is also one of the major causes of low volume of credit. In such a case none would like to risk his capital in new ventures. The present condition of the country is the glaring example of this.

In addition to aforementioned point, other factors like trade condition, currency condition are also the factors affecting the volume of credit.

## **2.2.8 Concept of Inflation**

Inflation in common sense is increment in general or average price level in the whole economy. It means that it is the increase in general price level, not the increase in individual prices. Inflation is not a temporary fluctuation in price but it is a sustained and appreciable increase in price<sup>15</sup>. Due to the increase in general level in price, the value of purchasing power of money declines as there is an inverse relationship between the general level of price and value of money. According to Economist Crowther "Inflation means a state in which the value of money is falling i.e. prices are increasing." Inflation is a general rise in prices across the economy. This is distinct from a rise in the price of a particular good or service. Individual prices rise and fall all the time in a market economy, reflecting consumer choices and preferences, and changing costs. If the price of one item - say a particular model of car - increases because demand for it is high, we do not think of this as inflation. Inflation occurs when most prices are rising by some degree across the whole economy<sup>16</sup>.

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<sup>15</sup> Shyam Joshi, *Micro and macro Economic Analysis (3/e)*, Taleju Pustak Bitarak, Kathmandu, 2000, p. 78.

<sup>16</sup> <http://www.bankofengland.co.uk/targettwopointzero/inflation/whatsInflation.htm>

During inflation, the cost of living increases rapidly, so inflation severely hurts the people who depend on the income from fixed income securities like bonds, and preferred stock. Similarly as purchasing power of money falls as well as the **debtors** gain, and the **creditors** losses.

Inflation has severe social, political and economic effects. Hence, some like to call it 'worst than taxes' and 'legal robbery.' During last 30- 40 years, almost all countries of the world have experienced some degree of inflation. For example, Germany, Russia, Austria in 1920s and Hungary, Romania, China and again Germany in 1940s had experienced the strain of hyper-inflation. Inflation brings political instability. According to Milton Friedman the rise of Hitler was due to hyper-inflation. Today each and every nation of the world is suffering from the economic evil of inflation. The trend of rising prices has the general phenomenon of every country. The most developed and industrialized countries have adopted various method like credit control via bank interest rate, checking money supply and various other price control policies yet they have not been able to remain aloof from this disease. On the other hand the developing nations who have much less sufficient type of economy are suffering severely from both domestic as well as imported inflation.

If the rate of increase in money incomes overcomes the rate of increase in production, there is excess purchasing power in the hands of public. Inflation is reflected in high prices and increased imports.

There are many theories regarding how inflation occurs in an economy. Some of these theories are demand-pull inflation, cost-push inflation, wage-push inflation etc. similarly there are various methods of checking inflation, such as, government spending, taxes which lie under fiscal tool of checking inflation and higher reserve requirements, open market operation etc. which lie under the monetary method of checking inflation. But these are not going to be discussed here because these are not the concern of our present study.

## Inflation in Nepal:

According to the “National Urban Consumer Price Index”, published by Research Department of Nepal Rastra Bank, the inflation rate on different fiscal years are as follows (Table 2-1).

**Table No 2-1: CPI and Inflation Rate during last Seven Years**

FY	Food & Beverage		Non-food & Services		Overall Index	
	Index	% Change	Index	% Change	Index	% Change
2002	136.1	0.4	133.4	7.1	134.9	3.5
2003	133.0	-2.3	144.2	8.1	138.1	2.4
2004	137.9	3.7	147.2	2.1	142.1	2.9
2005	144.0	4.4	154.6	5.0	148.9	4.8
2006	148.8	3.3	161.8	4.7	154.8	4.0
2007	151.3	3.6	164.6	4.9	157.2	4.3
2008	-	-	167.5	4.6	-	-

Source: NRB Research Department.

### 2.2.9 Inflation and Interest Rates:

Inflation occurs when the average price level in the economy rises. Interest rates represent the “price” of credit. Are they also affected by inflation? The answer is yes. There is positive correlation between interest rates and inflation.

In other words, increase in inflation increases the interest rates. But the exact effect of inflation on interest rate is not identified yet. On this regards, there are many theories. Here in this case, mainly two theories are going to be discussed.

### The Nominal and Real Interest Rates:

Before exploring the **relationship between inflation and interest rates**, several key terms must be understood. In this connection one should be familiar with nominal rate and real rate of interest. The **nominal rate** is published or quoted interest rate on a security or loan. These rates are the actual rates that are used to transact with the customers. In other words, “nominal rate of return are money

rates of return that are not adjusted for the effect of inflation”<sup>17</sup> For example an announcement in the financial press that major commercial banks have raised their prime lending rate to 10 percent per annum indicates what nominal interest rate is now being quoted by banks to their best customers. <sup>18</sup>. Similarly, the real interest rate is the return to the lender or investor measured in terms of its actual purchasing power. In a period of inflation, of course, the real rate will be lower than the nominal rate. An investment’s real rate of interest during some period is calculated by removing the rate of inflation from the nominal return i.e. by using following equation:

$$(1+rr) = \frac{(1+r)}{(1+q)}$$

Where,

rr = real rate of return

r = nominal rate of return

q = inflation rate

### **The Fisher Effect:**

Economic theory tells us that interest rates reflect expectations about likely future inflation rates. In countries where inflation is expected to be high, interest rate also will be high, because investors want compensation for the decline in the value of the money. This relationship was first formalized by economist Irvin Fisher and is referred to as the Fisher effect. According to Fisher effect, nominal interest rate is related to the real rate by the following equation:

$$\text{Nominal interest rate} = \text{Expected real rate} + \text{Inflation Premium} \\ + (\text{Expected real rate} \times \text{Inflation Premium})$$

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<sup>17</sup> Jack Clark Francis, *Investment analysis and management (11/e)*, post graduate publication, New York, 1999, pp. 209-212.

<sup>18</sup> Peter S. Rose, *Money and Capital Markets: Financial Institution and Instrumental in a Global Marketplace (6/e)*, Irwin, Chicago, 1997, p. 49.

According to Fisher, the cross-product term in the above equation (i.e. Expected real rate  $\times$  Inflation Premium) is often eliminated because it is usually quite small except in countries experiencing severe inflation. So the Fisher's equation can be written as

$$\text{Nominal Interest Rate} = \text{Expected Real Rate} + \text{Inflation Premium}$$

Clearly, if the expected real interest rate is held fixed, changes in nominal rate will reflect shifting inflation premium. It means that if inflation premium increases then nominal rate also increases. But this does not necessarily mean that an increase in expected inflation automatically increases nominal interest rates. There are several different views on this matter but according to Fisher expected rate of return tends to be relatively stable over time because it depends on such long term factors as the productivity of capital and the volume of savings in the economy. Therefore, a change in the inflation premium is likely to influence only the nominal interest rate, at least in the short run. The nominal rate will rise by the full amount of the expected increase in the real rate of inflation.

If this view, known today as the Fisher effect, is correct, it suggests a method of judging the direction of future interest rate changes. To the extent that a rise in the actual rate of inflation causes investors to expect greater inflation in the future, higher nominal interest rates will soon result. Conversely, a decline in the actual rate of inflation may cause investors to revise downward their expectations of future inflation, leading to lower nominal rates. This will happen because, in an efficient market, investors will be compensated for the risk of expected changes in the purchasing power of their money.

### **The Harrod-Keynes Effect of Inflation:**

There is another view about **inflation-interest rate relationship** propounded originally by British economist Sir Roy Harrod. This view conflicts with that of Fisher's effect. It is based upon the Keynesian liquidity preference theory of interest rate. Harrod argues that the real rate will be affected by inflation but the

nominal rate need not be. Following the liquidity preference theory, the nominal interest rate is determined by the demand for and supply of money. Therefore unless inflation affects either the demand for and supply of money, the nominal rate must remain unchanged regardless of what happens to inflationary expectations. According to this principle, Harrod argues that a rise in inflationary expectations will lower the real rate of interest. In liquidity preference theory, the real rate measures the inflation-adjusted return on bonds. However, conventional bonds, like money, are not a hedge against inflation, because their rate of return is fixed by contract. Therefore, a rise in the expected rate of inflation lowers investors' expected real return from holding bonds. If the nominal rate of return on bonds remains unchanged, the expected real rate must be squeezed by expectations of rising prices.

### **2.2.10 Tools to Measure Inflation:**

There is no completely satisfactory way to summarize the price changes that have occurred over a given time period for the large number of goods and services available in the country. Nevertheless, the government has attempted to do so by measuring the cost of specific mix of major items (a basket of goods, consisting of specified quantities and qualities of various items of food, clothing, housing and health care products bought by the average urban household.<sup>19</sup>) at various point of time. The "overall" price level computed for this representative combination of items is termed as cost-of-living index. The percentage change in this index over a given time period can be viewed as a measure of the inflation that took place from the beginning of the period to the end of the period.

Similarly most governments compute a number of alternative price indices in order provide a wider choice for analysis. Nevertheless, many people tend to focus on one index as an indicator of the price level .Generally, in most of the countries, Consumer price Index, CPI, is used as this tools to calculate the

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<sup>19</sup> Jack Clark Francis, *Investment analysis and management (11/e)*, post graduate publication, New York, 1999, p. 215.

inflation rate. The percentage change in the CPI over time measures the rate of inflation, as shown below in equation. The inflation rate is denoted by q.

$$q = \frac{CPI_1 - CPI_0}{CPI_0}$$

Where,  $CPI_1$  = Consumer price index of period 1

$CPI_0$  = Consumer price index of period 0

Nepal Rastra Bank too, uses CPI as the tools to measure inflation in the country taking 1995/96 fiscal year as base index.

## 2.3 Review of Related Studies

The Ordinance relating to bank and financial intuition has been promulgated that has been bought into existence February 4, 2004. The bank and Financial intuitions Ordinance ,2004 has replaced the existing Agricultural Bank Acts 2024, Commercial Bank Act and the finance Companies Act and has bought all such institutions under the preview of a single Act. Though this ordinance came as an achievement in the financial sector reform program, it is being a matter of debate among the various finance experts that the ordinance having six months existence time should be enacted? At this time since there is no parliament in the country and the parliament is authorized to enact Permanent Law. IT is obvious that the financial sector must go through uncertainty in the future The ordinance, popularly as Umbrella Act.

The ordinance is comprehensive and prescribes in detail the provision for licensing, incorporation, governance and merger and dissolution procedure for banks and financial institution (FIs). This is significant improvement over the existing Acts but apprehensions is expressed about the discretionary power that the Ordinance has vested on Nepal Rasta Bank. But beside this, there are some



other theses which are related to this study to some extents. The review and the extract from them are presented in this section.

A study by **Kishore Khatri Chettri's** on "Interest rate structure and its relation with deposits, inflation and credits in Nepal"<sup>20</sup>, 1980, tried to identify the relationship of interest rate with three other factors, deposit, credit and inflation. Though this study has similar topic as of Mr. Chettri's but some of his objectives were different than this study. According that thesis, the objectives were:

- a. To present a concrete picture of the interest rate structure in Nepal.
- b. To predict the relationship between interest rate and other economic variables like deposit, inflation and credit flow in Nepal.
- c. To analyze the impact and implementation of the policy of interest rate of Nepal Rastra Bank.
- d. To provide suggestions and recommendations for improvement in the rate structure in Nepal.

Keeping above mentioned objectives, Mr. Chettri found that interest rate is the important explanatory variables to influence the volume of real deposits and the variables like inflation and the real income are not significant variable to influence the volume of real deposits.

Similarly, he found that rate of interest is directly affected by the rate of inflation. For loan rate of interest and loan amount, he found that loan rate of interest also affects the credit flows. It means that they have inverse relationship but rate of interest doesn't have so much influence upon credit flows like that of deposit rates on deposits.

Finally in his conclusion, he found that deposit depends upon numerous factors besides income, inflation and interest rates. If other variables are kept constant, the institutional interest rate is the important explanatory variable to influence the volume of deposit in Nepal. It means that, at the time of disseminators study, i.e.

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<sup>20</sup> Kishor Khatri Chettri, *Interest rate structure and its relation with deposits, inflation and credit in Nepal*, an unpublished M.A. thesis, T.U. Kathmandu, 1980, p.56.

during 1980s, increase in the deposit interest rates increases the volume of deposit. Similarly the relationship with income and inflation could not come significant. According to him, the fixation of attractive interest rates on deposits has been responsible for the substantial growth in the volume of deposits in recent years. In the same manner for inflation, he has concluded:

“The inflation within the country is very high since few years. In fact the prices in Nepal are affected by the movement in Indian price level than by domestic monetary expansion. Prices in Nepal are linked with Indian because of the 500 miles open boarder and the availability of Indian goods and currency. There is no consolidated type of money and capital markets in Nepal. Commercial bank branches are concentrated in the urban areas. Regarding deposit mobilization in the present context the urban area has occupied more than 80% and the flow of credit is also centralized only in urban areas. On the other hand, the volume of deposits has overcome the volume of credit which means to say that banks are not getting new investment opportunities.”

Finally the relationship between credit flow and loan rates was found out to be negative. If the loan rate of interest is concessional, there is the possibility of raising investment and thus the volume of credit.

Another study was made by **Sashi Bhatta** on 2004 in the topic “Interest Rate and its effect on Deposit and Lending”<sup>21</sup>. In this study, the disseminator tries to portrait the relation of interest rate with deposit and lending amount. Her findings and the findings made by Mr chettri are seems to be different. According to Mr chettri’s finding, all the relation matches with the theory but Mrs Bhatta’s finding on deposit was not as per theory. But other matters are same as Mr Chettri’s. The conclusion drawn by Mrs Bhatta is:

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

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<sup>21</sup> Sashi Bhatta, *Interest Rate and its effect on Deposit and Lending*, an unpublished M.B.S thesis, T.U. Kathmandu, 2004, p.75.

- b. Lending rates of all sample banks under study are also in decreasing trend; means that every year lending rates of sample banks under study have decreased.
- c. 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.
- d. 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 conclude that the result appears in that study was different than the theory.
- e. 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 she 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.

Finally her conclusion about her study, in her own words, as follow:

“There is significant relationship between deposit rate and deposit amount and lending rate and lending amount of almost all commercial banks except one. Test of significance for correlation coefficient between inflation rate and deposit and lending rate shows that these variables are not correlated.”

A study made on the topics “Determinants of Interest Rates in Nepalese Financial Markets”<sup>22</sup>, by **Mr. Jhabindra Pokharel** (2004) also give some ideas about the interest rates in Nepalese markets. Though, this thesis tried to identify the factors that shape the interest rates in Nepalese markets, it also tried to explore the

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<sup>22</sup> Jhabindra Pokharel, *Determinants of Interest Rates in Nepalese Financial Markets*, an unpublished M.B.S thesis, T.U. Kathmandu, 2004, p. 49.

relationship between the interest rate, deposits, credit rates and inflation. Among different objectives, some objectives that match to this study are:

- a. To show the relationship between the liquidity position and interest rate on deposit and lending.
- b. To identify the effect of inflation on interest rate charged and offered by various Nepalese financial institutions.
- c. To identify the different methods used by Nepalese financial institutions to calculate interest on lending.

During the study, Mr. Pokharel found similar result as discovered by the Mrs. Bhatta. According to Mr. Pokharel, the major findings of the study are:

The correlation coefficient between interest rate on deposit and amount of deposit collected of all sample organizations were highly negative. It means that, deposit amount of all sample banks are found to increase even if the interest rate of deposit, the attracting factors for deposit, is decreasing. This is against the theory. According to theory, there must be positive relationship. Similarly in case of lending rate and lending amount, Mr. Pokharel found the result as suggested by the theory. It means, the correlation coefficient between amount loaned and interest rate on lending of 10 sample bank is found to be highly negative. In other words, negative coefficient of other organizations means that more amounts is demanded at lower interest which means that when demand increases, price (interest rate on lending) also increases.

Similarly considering about the relationship between interest rate on deposit and on lending for all sample banks, disseminator found it to be highly positive correlated. In his own words, it is "Variation in one rate also brings variation in another rate in same direction." Therefore it is concluded both interest rate are determining factor of each other.

In same manner, the researcher explored that the relation between interest rate on deposit and inflation rate is little positive. Theoretically there should be positive correlation between these two variables. Due to little positive correlation, it is concluded that the interest rate in Nepalese Financial market is affected by

inflation rate to some extent. Similarly the same result is obtained when it is tried to explore the relationship between lending rate and inflation rate. It means, theoretically there should be a positive and perfect relationship between them. Practically, the researcher found it but the degree of positive correlation is somewhat less. So on this the researcher concluded that “Interest rate on lending in Nepalese Financial Market is affected by inflation only to some extent.” Finally, the relationship of interest rate on lending with risk-free rate is both positive and negative. It means that interest rate on lending in Nepalese Financial Markets is not affected by risk-free rate of interest.

**Narendra Bahadur Rajbhandary**, 1978, conducted a study on “The Interest Rate Structure of Commercial Banks in Nepal”<sup>23</sup>. 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 1974 to 1977 is most significant. But the relation between the interest rates and the loan and advances is less significant. Among all the sectors, the private sector seems most sensitive to interest rate change. Most of the loans too correlated positively if absolute cumulative figures are taken. But the growth rate of total loans and advances except investment on HMG securities is negatively correlated more with the weighted average rate of interest since 1973. The growth of loans to private sector is also negatively correlated with interest rate since 1971. Negative correlation between loans and interest rate meant that loans decrease at higher interest rate and vice-versa.

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<sup>23</sup> Narendra B. Rajbhandary, *The Interest Rate Structure of Commercial Banks in Nepal*, an unpublished M.A thesis, T.U. Kathmandu, 1978, p.96.

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. He is in 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 also manipulate the demand for and supply of money.

Another study conducted by **Shree Krishna Shrestha** in 1979 upon the title of “Interest Rate and its Impact upon Resource Mobilization and Utilization”<sup>24</sup> is also seems to be relevant to review here. Since his study is too old, interest rate at that time was purely the central bank’s phenomenon. In this study, it has concluded that the frequent change in interest rates was disliked by customers except changing the interest rates as directed by NRB. Shrestha suggested the commercial banks to quote stable rates as far as possible. He also recommended that the method of calculating interest should be used in such a way that the previous customers and depositors who are already involved in banking transaction should not be affected adversely. He also suggested charging high interest rate on loan to luxurious goods as in unproductive sectors and a lower rate on productive and small scale industries.

## **2.4 International Articles Related to this Subject**

### **Inflation: Inflation and Interest Rates<sup>25</sup>**

Whenever it is hear the latest inflation update on the news, chances are that interest rates are mentioned in the same breath. In the United States, interest rates are decided by the Federal Reserve. The Fed meets eight times a year to set short-term interest rate targets. During these meetings, the CPI is one significant factors in the Fed’s decision. Interest rates directly affect the credit market (loans) because higher interest rates make borrowing more costly. By changing interest rates, the Fed tries to achieve maximum employment, stable

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<sup>24</sup> Shree Krishan Shrestha, *Interest Rate and its Impact upon Resource Mobilization and Utilization*, an unpublished M.A thesis, T.U. Kathmandu, 1979, p. 27.

<sup>25</sup> <http://www.investopedia.com/pdf/tutorials/inflation.pdf>

prices, and a good level growth. As interest rates drop, consumer spending increases and this in turn stimulates Economic growth.

Contrary to popular belief, excessive economic growth can in fact be very detrimental. At one extreme, an economy that is growing too fast can experience hyperinflation, resulting in the problems already mentioned earlier. At the other extreme, an economy with no inflation has essentially stagnated. The right level of economic growth, and thus inflation, is somewhere in the middle. It's the Fed's job to maintain that delicate balance. A tightening, or rate increase, attempts to head off future inflation. An easing, or rate decrease, aims to spur on economic growth.

While inflation is a major issue, it is not the only factor informing the Fed's decisions on interest rates. For example, the Fed might ease interest rates during a financial crisis to provide liquidity (flexibility to get out of investments) to U.S. financial markets, thus preventing a market meltdown.

**Inflation and Investment:** When it comes to inflation, the question on many investors' minds is: "How will it affect my investments?" This is an especially important issue for people living on a fixed income, such as retirees. The impact of inflation on your portfolio depends on the type of securities you hold. If you invest only in stocks, worrying about inflation shouldn't keep you up at night. Over the long run, a company's revenue and earnings should increase at the same pace as inflation. The exception to this is stagflation. The combination of a bad economy with an increase in costs is bad for stocks. Also, a company is in the same situation as a normal consumer -- the more cash it carries, the more its purchasing power decreases with increases in inflation. The main problem with stocks and inflation is that a company's returns tend to be overstated. In times of high inflation, a company may look like it's prospering, but in reality inflation is the reason behind the growth. When analyzing financial statements, it is also important to remember that inflation can wreak havoc on earnings depending on what technique the company is using to value inventory. We discuss this in detail in our article, "Inventory Valuation for Investors: FIFO and LIFO." Fixed-income investors are the hardest hit by inflation. Suppose that a year ago you invested

\$1,000 in a T-bill that yielded 10%. You are about to collect the \$1,100 owed to you. Is your \$100 (10%) return real? Of course not! Assuming inflation was positive for the year; your purchasing power has fallen, and thus so has your real return. We have to take into account the chunk inflation has taken out of your return. If inflation was 4%, then your return is really 6%. This example highlights the difference between nominal interest rates and real interest rates. The nominal interest rate is the growth rate of your money, while the real interest rate is the growth of your purchasing power. In other words, the real rate of interest is the nominal rate reduced by the rate of inflation. In our example, the nominal rate is 10% and the real rate is 6% ( $10\% - 4\% = 6\%$ ). As an investor, you must look at your real rate of return. Unfortunately, investors often look only at the nominal return and forget about their purchasing power altogether.

## **2.5 NRB Directives and Interest Rate in Nepal**

Taking the reference of history on interest rates, we observe different changes in interest rate. The sole controller for regulating interest rate in Nepal is central bank, Nepal Rastra Bank. In the beginning, the interest rate charged and offered by banks and financial institutions was mentioned at a lower level with a view to stimulate real income and employment. However, dramatic change had been made time to time. Regulation of interest rate by Nepal Rastra Bank is made in the early stage of financial market development taking the period from 1955 to 1965. But NRB gradually began to liberalize the determination of interest rate on a phase-wise basis according to compatibility of the banks and the financial institutions that have developed in the country. In the early mid 1980's the country has adapted liberal economic policy. Number of finance companies and commercial banks began to develop and government made the liberal policy in maintaining the interest rate were encouraged for commercial banks, established under joint venture in association with foreign banks in private sectors. Similarly, deregulated of interest rate was applied to under financial companies established finance company acts. Likewise other financial institutions like development



banks, micro financial institutions. NGOs and licensed cooperative under, NRB were also made competitive in the determination of interest. The central bank, the sole institution authorized to determine the interest rate as per NRB act. There are full discretions to NRB in determining interest rate structure of banks and financial institutions taking from the period 1960 to 1975.

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

On August 22, 1992, Nepal Rastra Bank issued some directives to commercial banks and financial institutions to clearly spell out the interest rate on deposits. Nepal Rastra Bank also instructed the bank and financial institutions to limit their interest rate spread on deposit and credit at 6 percent within the mid-December 1993. A further instruction to banks and financial institutions was issued in 2002, and now the interest rate spread required to be maintained by commercial banks and financial institutions has also been removed.

The interest rate regime in Nepalese perspective change from rigid control and monopoly of NRB from 1960-1980 to that of ultimate deregulation of interest rate and removal of spread from 1986 to 2002. At present there is complete freedom to have competitive system an important part of government's financial liberalization policy. In this way, the interest rate became a market determined phenomena rather than a regulated phenomena. The process of interest rate deregulation became a major indicative factor of the financial sector reform in the country.

The following table no 2-3 shows the development of interest rate in the Nepalese Financial Markets.<sup>26</sup>

**Table No. 2-2: Phase-wise development of Interest rate**

1960	Sole monopoly of NRB to fix interest rate on deposit and loans.
1976	NRB empowered to determine interest rate.
1980	Process continued for NRB to fix interest rate and banks and financial institution to follow it.
1986	Freedom to commercial banks to offer higher interest rates from the minimum level of interest rate fixed by NRB
1989	Interest rate fully deregulated.
1992	Issue directive to commercial banks to spell out interest rate policy encouraging competition in interest rate.
1993	Spread not to exceed 6 percent.
1999	Decrease spread to 5 percent.
2002	Removal of spread restriction.
2003	Continuing of interest rate independence of banks and financial institution
2004	Comparative consideration of market interest rate with quoted interest rate
2005	Emphasis of decreasing the spread
2006	Trend of lower rate on deposits compare to interest change on loan.
2007	Trend of increasing interest rates in commercial banks deposits.
2008	Trend of daily interest rates on deposits in commercial banks.

Source: Financial Markets and Institutions, Dr. Manohar K. Shrestha and Dipak B. Bhandari

<sup>26</sup> Manohar K Shrestha & Dipak B Bhandari, *Financial Markets and Institutions (3/e)*, Asmita Books Publishers & Distributors, Kathmandu, 2003, pp. 103-106.

# CHAPTER - III

## RESEARCH METHODOLOGY

### 3.1 Introduction

Research methodology describes the methods and processes applied in the entire subject of the related study. It is really a method of critical thinking by defining and redefining problems, formulating hypothesis of suggested solution, collecting organizing and evaluating data making decision and making conclusion to determine whether they fit the formulated hypothesis.

Research methodology is a systematic way to solve the research problem. In other words, research methodology describes the methods and process applied in the entire aspect of the study. Research methodology refers to the various sequential steps (along with a rationale of each step) to be adopted by a researcher in studying a problem with certain objectives in view.<sup>27</sup> Thus the overall approach to the research is presented in this chapter. This chapter consists of research design, sample size and selection process, data collection procedure and data processing techniques and tools.

Research is the process of systematic and in depth study on research on any particular topic, subject or area and investigation backed by the collection, compilation, presentation and interpretation of relevant details of all data. It is a careful search or inquiry in to any subject matter and Endeavour to discover or find out valuable facts, which will be useful further for application or utilization.

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<sup>27</sup> C.R. Kothari, *Research Methodology, Methods and Techniques (5/e)*, Vikash Publication House Pvt. Ltd, New Delhi, 1994, p.64.

## **3.2 Research Design**

Research design is a task of defining the research problem. A research design is the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with the economy in the procedures. It is the specification of methods and procedures for acquiring the information needed. It is the overall operational pattern of framework for the project that stipulates what information is to be collected, from which sources and by what procedures. Thus a research design is a plan for the collection and analysis of data. For research there exists different types of research design like; Historical research, Descriptive research, Case study research, Field study research, analytical research, True experimental research and so on. This study mainly concerned with historical research. If applicable, sometime descriptive and analytical approach may also be used. But generally, to show the relationship of interest rate with deposit amount, lending (credit) amount and inflation rate, past historical data are used. The relevant and needed data has been collected from various publications of different commercial banks and Nepal Rastra Bank. Both exploratory (descriptive) cum analytic along with historic type are adopted as procedure under research design. Statistical analysis is also used herein. Descriptive and analytical research designs have been used in this study.

## **3.3 Nature and Sources of Data**

The researchers use two types of sources of data collection.

- a. Primary data
- b. Secondary data.

The primary data are those which are collected fresh and for the first time, and thus happen to be original in the character. The secondary data on the other hand are those which have already been collected by someone else already, been passed through the statistical process. For this study, mainly secondary data are used. These secondary data are collected mainly from published sources like annual report, prospectus, balance sheet, newspaper, journal,

Internet and other sources. Besides this in some case, if needed, primary data can also be used. They can be collected through direct interview and observation. Some major sources of secondary data for the study are as follows:

- a) Annual Data Published of concerning organizations.
- b) Published and unpublished bullets and reports of the banks.
- c) Various Internet Websites
- d) Previous studies reports.
- e) “Banking and financial Statistics” report of Nepal Rastra Bank.
- f) Journals and others published and unpublished related documents and reports for post graduate college library and community information Center Library.
- h) Other published materials.

### **3.4 Data Collection Procedure**

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

Researchers also collected the annual report by field visiting the respective banks. NRB publications like annual report economic report, quarterly economic bulletin, Banking and financial statistic has been collected from the bank.

### 3.5 Population and Samples

The term “population” or universe for research means the universe of research study in which the research is based.<sup>28</sup> Since the research topic is about interest rate, all the lending and depository institution of Nepal are the member of population study. The population for the study comprises 17 commercial banks, 17 development banks, 57 finance companies, 34 saving and credit co-operatives, one employee provident fund and other 40 non-government financial organizations.<sup>6</sup> Among the total population only some selected institutions are taken as sample on random basis. Similarly, due to unavailability of data from all sectors, only commercial banks are chosen for this study. So precisely saying, all 17 commercial banks are the population of this study and among them, only 5 commercial banks are chosen as samples from total population. For selecting the samples, simple random sampling method is used here among different methods. Organization under study are as follows, whose general introduction and major objectives are presented in chapter one.

- a. Nepal Bank Limited.
- b. Rastriya Banijya Bank.
- c. Agriculture Development Bank/Nepal
- d. Himalayan Bank limited
- e. Nepal Bangladesh Bank.

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<sup>28</sup> Howard K. Wolf & P.R. Pant, *Social Science Research & Thesis Writing*, (2/e), Buddha Academic Enterprises Pvt. Ltd, Kathmandu, 2000, pp. 745-748.

<sup>6</sup> Jhabindra Pokharel, *Determinants of Interest Rates in Nepalese Financial Markets*, an unpublished M.B.S thesis, T.U. Kathmandu, 2004, p.84.

### 3.6 Methods of Data Analysis

Any analytical tools can be used in solving the problem of the study. For the purpose of the study, all collected primary as well as secondary data are arranged, scanned, tabulated under various heads and then after descriptive cum statistical analysis have been carried out to enlighten the study. To get the concrete results from this research, data are analyzed by using different types of tools. As per topic requirements, emphasis is given on statistical tools rather than financial tools. So for this study following statistical tools are going to use.

#### Arithmetic Mean:

It is the sum of all the observations divided by the number of observations. In such a case all the items are equally important.<sup>29</sup> As arithmetic mean is most common and popular tools for data analysis, here in this study also, arithmetic mean is used. It is computed by using following formula:

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

Where  $\bar{X}$  = Mean  
 $\sum X$  = Sum of all the Variable X  
n = Variables involved

#### Standard Deviation:

The standard deviation is the best tools to study fluctuation in any data. It is usually denoted by the letter sigma (  $\sigma$  ). Karl Pearson suggested it as a widely used measure of dispersion and is defined as the positive square root of their arithmetic mean of squares of the deviation of the given observations from their arithmetic mean of a set of value.<sup>30</sup> It can be computed by using following formula.

$$\text{S.D}(\delta) = \sqrt{\frac{1}{n} \sum (X - \bar{X})^2}$$

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<sup>29</sup> G.D. Pant & A.K. Chaudhary, *Business Statistics and Mathematics (4/e)*, Bhandupuran Prakashan, Kathmandu, 1999, p. 55.

<sup>30</sup> S.C. Gupta, *Fundamental of Statistics (2/e)*, Himalyan Publishing House, Bombay, 1998, p.446.

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

### **Coefficient of Correlation:**

By this statistical tool, the degree of relationship between two variables is identified. In other words, this tool is used to describe the degree to which one variable is linearly related to other variables. Two or more variables are said to be correlated if change in the value of one variable appears to be linked with the change in the other variables. The correlation analysis refers to the closeness of the relationship between the variables.<sup>31</sup> Correlation may be positive or negative and ranges 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) and inflation is computed in this thesis. For example, let's say that the correlation between interest rate and inflation is positive. It indicates that when inflation increases, interest rate also increases in the same direction and vice versa. For our study following reference is used<sup>32</sup>

- a. Correlation may be positive or negative and ranges from -1 to +1. When  $r = +1$ , there is positive perfect correlation; when  $r = -1$ , there is perfect negative correlation; when  $r = 0$ , there is no correlation and when  $r < 0.5$  then there is low degree of correlation.
- b. When 'r' lies between 0.7 to 0.999 (or -0.7 to -0.999), there is high degree of positive (or negative) correlation.
- c. When 'r' lies between 0.5 to 0.699, there is a moderate degree of correlation.

The simple correlation coefficient,  $r$ , is calculated by using the following formula:

$$\text{Simple Correlation Coefficient (r)} = \frac{n\sum X_1 X_2 - (\sum X_1)(\sum X_2)}{\sqrt{n\sum X_1^2 - (\sum X_1)^2} \sqrt{n\sum X_2^2 - (\sum X_2)^2}}$$

<sup>31</sup> P.K. Sharma and A.K. Chaudhary, *Statistical Methods (2/e)*, Khanal Books Prakashan, Kathmandu, 2000, p.206.

<sup>32</sup> G.D. Pant and A.K. Chaudhary, *Statistics and Quantitative Techniques (2/e)*, Nepal Sahitya Prakashan Kendra, Kathmandu, 1997, p.109.



Alternately,

$$r = \frac{Cov(X_1, X_2)}{\sqrt{VarX_1, VarX_2}}$$

Where,

$$Covariance (X_1, X_2) = \frac{1}{n} \sum (X_1 - \bar{X}_1)(X_2 - \bar{X}_2)$$

n = Total number of observations.

X<sub>1</sub> and X<sub>2</sub> = two variables, correlation between them are calculated.

$$Multiple\ Correlation\ Coefficient\ (R_{1.23}) = \sqrt{\frac{r_{12}^2 + r_{13}^2 - 2r_{12}r_{13}r_{23}}{1 - r_{23}^2}}$$

Where  $r_{12}$  = correlation coefficient between variables one and two.

$r_{23}$  = correlation coefficient between variables two and three.

$r_{13}$  = correlation coefficient between variables one and three.

Multiple correlation is used for the measure of degree of association between one variable and a group of other variables as the independent variable. It lies between 0 and 1. The close it is to '1', the better the linear relationship between the variables. The closer it is to '0', the worse is the linear relationship.<sup>33</sup>

### **Coefficient of Multiple Determinations:**

The square of the multiple correlation coefficients is called coefficient of multiple determination. It is very useful tools to interpret the value of multiple correlation coefficients. The main significance of the coefficient of multiple determinations is to represent the portion of total variation sin the dependent variable which is explained by the variations in the two independent variables.

$$Coefficient\ of\ multiple\ determination = R_{1.23}^2$$

t-test for significance of sample correlation coefficient:

---

<sup>33</sup> S.P. Gupta, *Statistical Methods (8/e)*, Sultan Chand & Sons Educational Publishers, New Delhi, 2000, p. 509.

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

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

i.e. t follows t-distribution with n-2 degree of freedom (d.f.), 'n' being the sample. The (1- ) % confidence limits for estimating population correlation coefficient ( ) are given by

$$\begin{aligned} & r \pm t_{(n-2)} \times \text{S.E.}(r) \\ & = r \pm t_{(n-2)} \times \frac{1-r^2}{\sqrt{n}} \end{aligned}$$

# CHAPTER-IV

## ANALYSIS AND INTERPRETATION OF DATA

### 4.1 Introduction

This is the section where, the filtered data are presented and analyzed. This is the one of the major chapter of 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 analyzed keeping the objectives set in mind. This chapter consists of various calculation made for the analysis of interest rate and its effects on deposit amount lending amount, and inflation rate for the sample banks. To make our study effective and precise as well as easily understandable, this chapter is categorized in three parts; presentation, analysis and interpretation. The analysis is fully based on secondary data available. In presentation section data are presented in terms of table, graph chart of figures, according to need. The presented data are then analyzed using different statistical tools mentioned in chapter three. At last the results of analysis are interpreted. Though there is no distinct line of demarcation for each section (like presentation section, analysis section & interpretation section) but the arrangement of writing is made by aforementioned way. Similarly it is also noted that almost all data used for analysis are of secondary type.

For our simplicity, in this thesis, presentation analysis and interpretation of data are made according to the nature. In other words, at first relationship of deposit and interest rate of all 6 sample banks are analyzed. After then, the relationship between interest rate and credit (lending) amount is made. Lastly the relationship between interest rate and inflation is presented. While analyzing, different statistical tools like correlation coefficient, coefficient of determination, t-statistics for significance are employed.

## 4.2 Analysis of Deposit and Interest Rate

In this section, detail study is made about deposit amount and interest rate of various banks. For this study only saving and fixed deposits are considered because current deposit doesn't earn any interest.

### 4.2.1 Rastra Banijya Bank

Prior to entering into the main topics, it is preferable to take a glance on the interest rate structure on different types of deposits. This is essential because the interest rates are generally different in magnitude for every sample banks. These differences are due to the numerous factors like maturity period, policy of bank, goodwill of organization and so on. In real world government owned bank and banks with high reputation and goodwill have lower deposit rates. Similarly, finance companies, co-operative & development bank quotes higher interest rate on deposits than commercial banks do.

**Table no 4-1: Interest rate structure on deposit of RBB as on Mid-July**

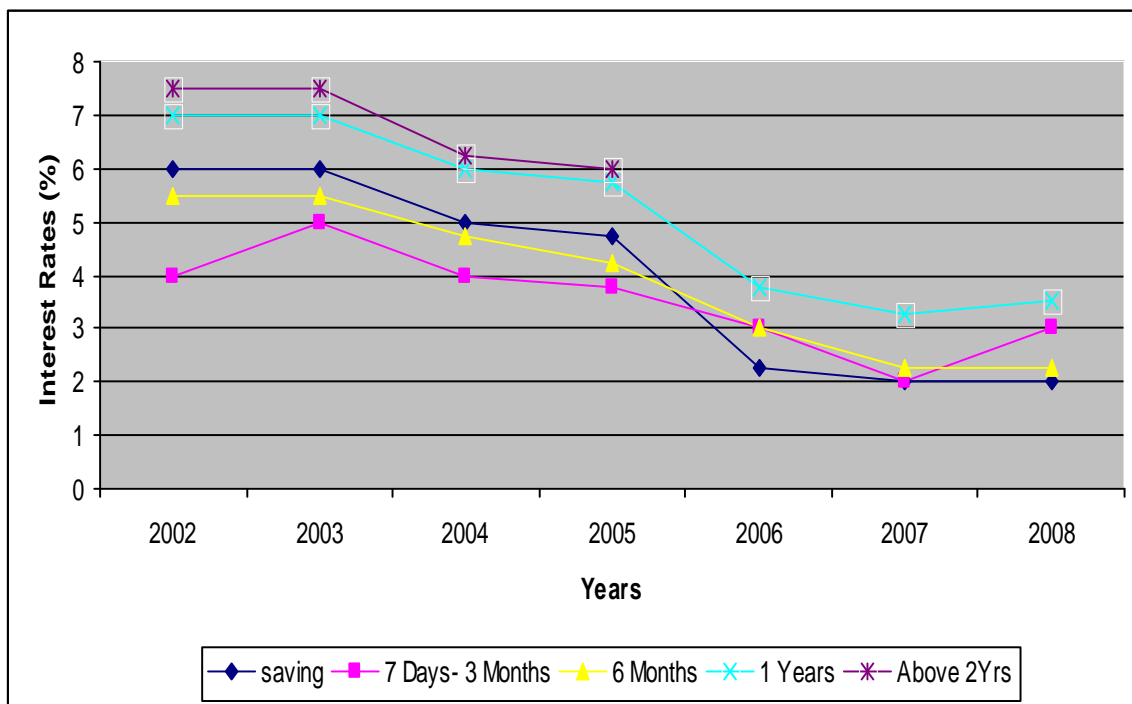
Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	6.00%	6.00%	5.00%	4.75%	2.25%	2%	2%
<b>Fixed</b>							
7 Days	-	-	-	-	-	-	-
14 Days	-	-	-	-	-	-	-
1 Months	-	-	-	-	-	-	-
3 Months	4.00	5.00	4.00	3.75	3.00	2.25	2.25
6 Months	5.50	5.50	4.75	4.25	3.00	2.5	2.5
1 Years	7.00	7.00	6.00	5.75	3.75	3.25	3.25-3.5
Above 2Yrs	7.50	7.50	6.25	6.00	-	-	-
<b>Whole Mean</b>	<b>6</b>	<b>6.2</b>	<b>5.20</b>	<b>4.90</b>	<b>3.25</b>	<b>2.5</b>	<b>2.5</b>
<b>Fixed Deposit Mean</b>	<b>6</b>	<b>6.25</b>	<b>5.25</b>	<b>4.94</b>	<b>3</b>	<b>2.67</b>	<b>2.7</b>
<b>Std. Deviation</b>	<b>1.42%</b>						

*Source: Banking and Financial Statistics, No: 42-48, NRB*

Table no 4-1 shows the deposit interest rate of RBB in 7 different FY. For this study 2002 is taken as initial year & 2008 as final years. The table portrays the interest rate that were prevailed in the Nepalese financial markets during last past 7 FYs. The data shows the decreasing tendency of interest rate. The interest rate on saving deposit in the beginning year was 6% and decreased to 2% in 2008.

This is 66.67% reduction during the 7 years period. In same manner, the bank used to quote the interest rate of fixed deposit in different short term period like 7 days, 14 days, 1 months, 2 months, 3 months and so on. For the graph purpose, in this study the average of 7 days to 3 months is taken to make the figure clearer. For other periods also the fixed deposit rate was in decreasing trend. During the 7 year period the decline percentage is 54.54%, 51.79% and 20% respectively for 6 months, 1 years and 2 years period. The decreasing tendency is not high for longer period interest rate. If the mean is taken of all (both fixed and saving) then average interest rate on deposit was 2002, 6.20% for 2003, 5.20% for 2004, 4.90% for 2005, 3% for 2006, 2.5% for 2007 and 2.53% for 2008. Similarly if average of fixed deposits of different period is taken, then the result is almost similar with “whole average”. It means the average interest rate for fixed deposit only was 6%, 6.25%, 5.25%, 4.94%, 3.25%, 2.67% and 2.7% respectively for the year 2002, 2003, 2004, 2005, 2006, 2007 and 2008. The average figures also show the decreasing tendency in interest rate except in the year 2003. At that period, the interest rate was slightly higher than year 2002 but ultimately felled to the 5.20% in the 2003. All the above described matters can be shown on figure 4-1 as follows.

**Fig 4-1 Correlation Coefficient, Coefficient of Determination and t-statistics of RBB**



The graph 4-1 reveals that, all the period interest rates are on declining trend. Saving interest rate falls every years But for fixed deposit, interest rate remain constant from the period 2002 to 2003 for 6 months, 1 year and Above 2 years. For other years, the fixed interest rate declined by some percentage every year.

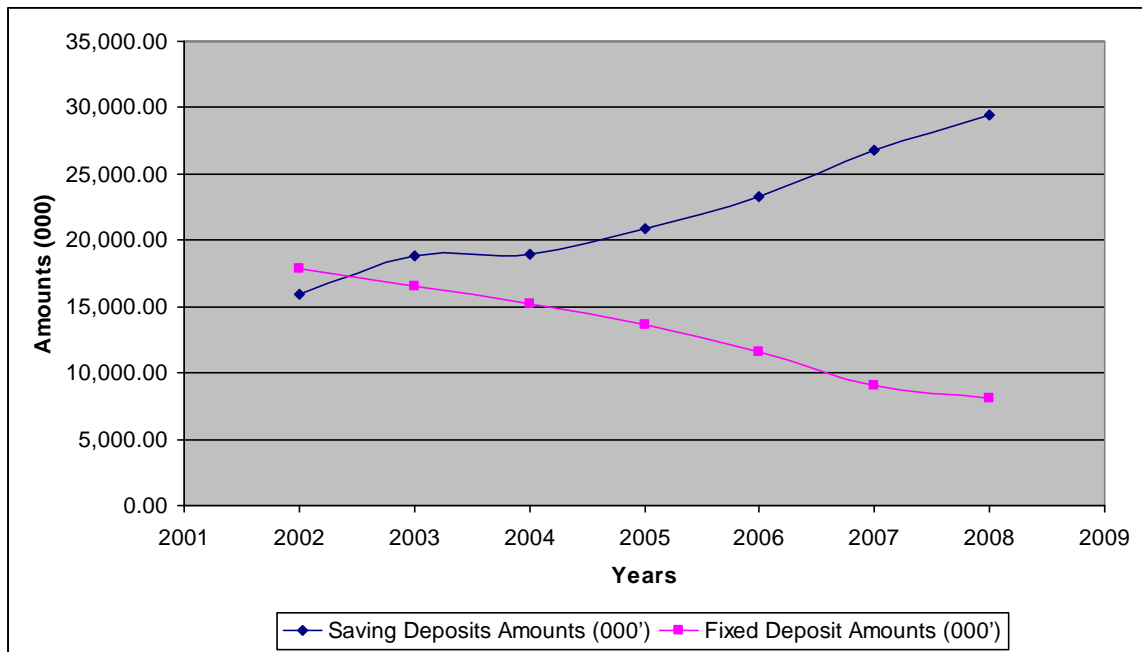
**Table No 4-2: Relationship between Interest Rate and Deposit amount of RBB**

Year	Saving Deposit Interest Rate	Saving Deposits Amounts (000')	Fixed Deposit Interest Rate	Fixed Deposit Amounts (000')		
2002	6.00	15,904.8	6.00	17,836.4		
2003	6.00	18,822.1	6.25	16,477.2		
2004	5.00	18,997.2	5.25	15,166.6		
2005	4.75	20,861.2	4.94	13,579.5		
2006	2.25	23,288.9	3.00	11,572.8		
2007	2	26848.2	2.67	9001.5		
2008	2	29494.9	2.7	8103.8		
Correlation	$r_{23} = -0.92212$		$r_{45} = 0.8372$			
Coefficient of determination	$r^2_{23} = 0.8503$		$r^2_{45} = 0.69912$			
t-statistic	t-cal= 4.4	t-tab= 2.571	significant	t-cal= 1.302	t-tab= 2.571	Insignificant

**Source: Banking and Financial Statistics, No: 42-48, NRB**

The table 4-2 shows the total amount of fixed deposit and saving deposits and the interest rates offered on such deposits by RBB on seven fiscal years starting from FY 2002 to FY 2008. The table portrays that the both interest rate has been decreased by greater magnitude. Deposit amount has been increased by more than 1.85 times during the study period. It means they move in opposite direction i.e. decrease in interest rate increases the amount of deposit and vice versa. Therefore they should have negative relationship. It can be quantified by calculating correlation coefficient between them. This relationship can also be shown in graph as shown in figure 4-2.

**Fig 4-2: Relationship between Saving and Fixed Deposit of RBB during different Years**



According to table no 4-2, the interest rate on saving deposit has been decreased from 6% to 2.0% during 7 FYs. The declining tendency is little. In same period the deposit amount was Rs 15904.8 millions but this amount increases to Rs. 29494.9 millions. It means interest rates fell by 66.67%, where as deposit amount rises by 175.44% within the period of seven years.

Similarly, for fixed deposit the table 4-2 shows that total amount of fixed deposit and interest rate on fixed deposit offered by RBB on seven consequent FY started from 2002 to FY 2008. The table reveals that average fixed interest rate has been decreased drastically during the seven FYs. At the FY 2002 the average interest rate was 6% on fixed deposit but later on every year this interest rate started to decrease and at 2006 it remained at 2.7% per annum on average. On effect of this decline, the amount of fixed deposit also declined, the amount of fixed deposit also started to decrease in some respect. The table shows that up to the FY 2002, there is no effect on fixed deposit amount by the declination of interest rate but after the FY 2002, decrease in interest rate also decreases the fixed deposit amount. In this regards, the substitution effect holds true in the case of fixed deposit.

To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. If correlation coefficient is calculated for saving deposit and deposit amount, then it is  $(r_{23}) = -0.9221$ . This high negative correlation coefficient indicates that they have inverse relationship among 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 RBB for saving account is not applicable. The coefficient of determination between these two variables is  $r^2_{23} = 0.8503$  which means that total variation in dependent variable (saving deposit amount) has been explained by independent variable (interest rate) to the extent of 85.03% and remaining is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variables is  $-5.30$  ( $|t| = 5.30$ ). Since the tabulated t-value at 5% level of significance for 5 degree of freedom ( $t_{\text{tab}} = 2.571$ ) is less than calculated value ( $t_{\text{cal}} = 5.30$ ), the correlation coefficient is significant. This means the variables mentioned (interest rate on saving deposit & amount of saving deposit) for RBB are significantly correlated and an increase (decrease) in the amount of deposit brings a decrement (increment) in interest rate on saving deposit.

In the same manner, the correlation coefficient between interest rate on fixed deposit and fixed deposit amount ( $r_{45}$ ) is 0.837. This means that these two variables are moderately co-correlated when interest rate on fixed deposit decreases (increases) the deposit amount also decreases (increases). This is exactly the matter what the theory (substitution effects) says. The coefficient of determination between these two variables is  $r^2_{45} = 0.699$ , which means 69.90% of total variables in dependent variables (deposit unit) is explained by the independent variable (deposit rate) & remaining is due to the effect of other factors. Similarly test of significance of correlation coefficient between deposit rate and deposit amount gives the value of  $t = 3.41$ . The tabulated value at 5% significant level with d.f. 5 is 2.571 (i.e.  $t_{\text{tab}} = 2.571$ ). Here  $t_{\text{cal}} > t_{\text{tab}}$  so  $H_1$  is accepted i.e. there is significant relation between two variables. Though the correlation coefficient and t-statistics indicates that the both variables have moderate level of relationship.



## 4.2.2 Nepal Bank Limited

The general structure of deposit interest rate of Nepal Bank Limited (NBL) is shown below on table no 4-3.

The table shows the interest rate of NBL during the last seven FYs. The trend of interest rate shows that it is in decreasing trend. It is similar with that of RBB. The interest rate on saving deposit shows that it was 5.5% during the period of 2002 and remain same in the next year and then decreased by 0.5% 2004 and 0.25% on following year. But after 2005 the interest rate remains almost same at 2.5%.

Similarly the interest rate on fixed deposit also fell during the seven fiscal years by small percent. The interest rate on short period but little flexible in long periods.

**Figure 4-3: Interest rate structure on deposit of NBL on Mid-July**

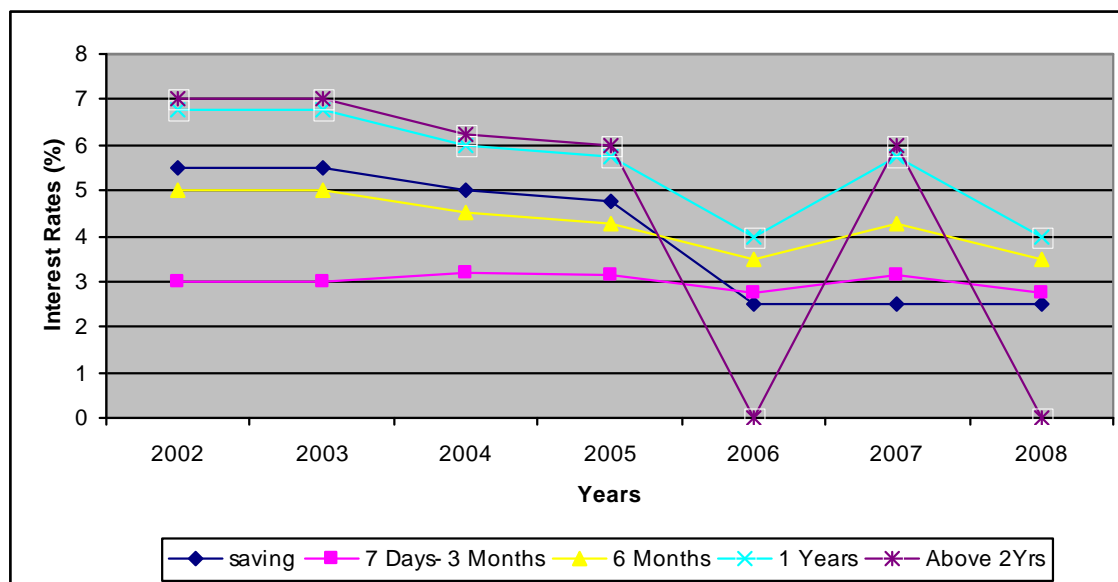
Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	5.50%	5.50%	5.00%	4.75%	2.5%	2.5%	2.5%
<b>Fixed</b>							
7 Days	2.00	2.00	2.00	2.00	-	-	-
14 Days	2.50	2.50	-	-	-	-	-
1 Months	3.50	3.50	3.50	3.25	2.50	2.75	2.75
2 Months	-	-	-	3.50	2.75	-	-
3 Months	4.00	4.00	4.00	3.75	3.00	3.00	3.00
6 Months	5.00	5.00	4.50	4.25	3.50	3.25	3.25
1 Years	6.75	6.75	6.00	5.75	4.00	3.75	3.75
Above 2Yrs	7.00	7.00	6.25	6.00	-	-	-
<b>Whole Mean</b>	<b>4.54</b>	<b>4.54</b>	<b>4.46</b>	<b>4.16</b>	<b>3.05</b>	<b>3.05</b>	<b>3.05</b>
<b>Fixed Deposit Mean</b>	<b>4.39</b>	<b>4.39</b>	<b>4.38</b>	<b>4.07</b>	<b>3.15</b>	<b>3.18</b>	<b>3.18</b>
<b>Std. Deviation</b>	<b>0.5724%</b>						

Source: Banking and Financial Statistics, No: 42-48, NRB

It is also clear that the falling gap for long term fixed deposit is large where as for short term deposit the falling gap is little. In other words, both long term and short term interest rates falling rate is similar in later year but in previous year the falling rate is fast for long term fixed deposit where as falling rate was slow for

short term fixed deposit. These tendencies can also be shown in graph no 4-3 as follows:

**Figure No 4-3: Interest Rate of NBL on Deposits during different Years**



By graph 4-3 also it is clear that declining tendency is high in former period than in later periods. Similarly, lower periodic rate remains almost constant in later years.

### Correlation Coefficient, Coefficient of Determination and t-statistics of NBL

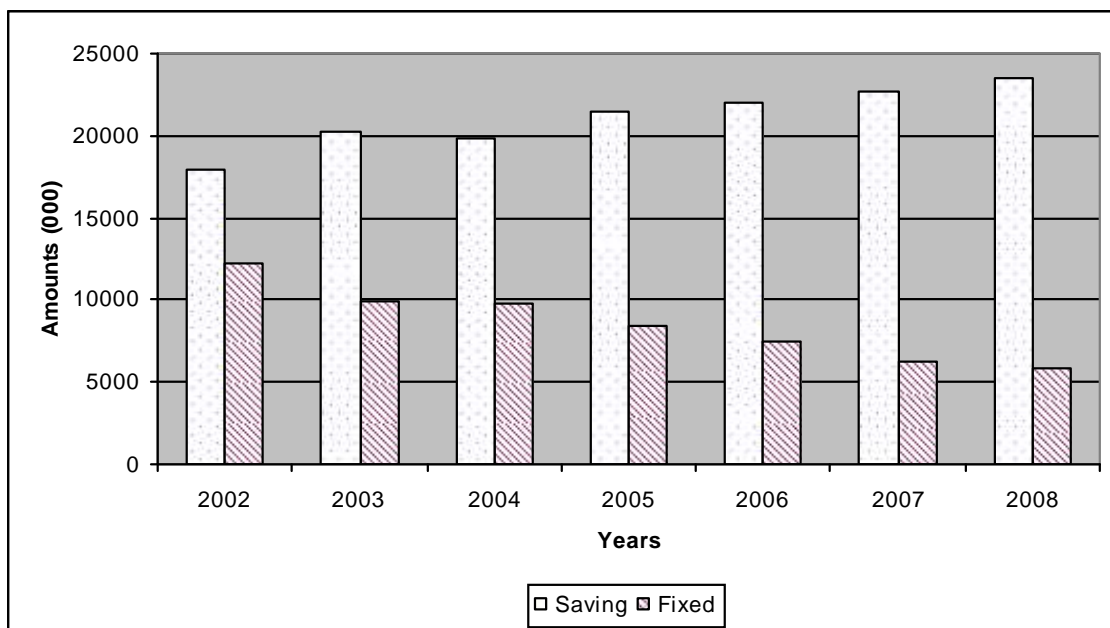
**Table No 4-4: Relationship between Interest Rate and Deposit amount of NBL**

Year	Saving Deposit Interest Rate	Saving Deposits Amounts	Fixed Deposit Interest Rate	Fixed Deposit Amounts		
2002	5.50	17888.4	4.39	12275.8		
2003	5.50	20281.6	4.39	9921.8		
2004	5.00	19851.5	4.38	9731.8		
2005	4.75	21534.5	4.07	8396.9		
2006	2.50	22063.0	3.15	7481.0		
2007	2.5	22671.8	3.18	6269.26		
2008	2.5	23547.9	3.18	5790.9		
Correlation	$r_{23} = -0.90123$		$r_{45} = 0.93216$			
Coefficient of determination	$r^2_{23} = 0.81125$		$r^2_{45} = 0.868847$			
t-statistic	t-cal=4.644	t-tab= 2.571	Significant	t-cal=4.292	t-tab= 2.571	Significant

Source: Banking and Financial Statistics, No: 42-48, NRB

In table no 4-4 saving amount and deposit rates are arranged in systematic order. The outlook of the table shows that the interest has been falling since 2002 on both saving and fixed deposits. But the amount of saving deposit has not been in decreasing trend. It is increasing every year. This indicates that the condition for NBL is opposite to the substitution theory. The case is same for fixed deposit too. The interest rate has been falling every year since 2002. But in case of fixed deposited amount has also been falling as the interest rate. It indicates that with decrease in interest rate, fixed deposit amount also decreases. But the declining speed of interest rate is quite higher than that of declining speed of deposit amount. This suggest that they may have positive relationship but to determine the magnitude of relation, correlation coefficient should be calculated and to identify the strong ness or weakness of relationship it is necessary to calculate the t-test. But prior to all it is clear if we show these relations on graph 4-4.

**Figure No 4-4: Deposit Amount of NBL during different Years**



The correlation coefficient (using excel program) for saving interest rate and deposit amount,  $r_{23}$ , is found to be negative of = -0.90121. This value indicates that they two have very high negative or inverse relationship. Increase in one variables lead to decrease in other variables. This is extremely against the theory suggested by the “substitution effect”. Similarly, the coefficient of determination

between two variables,  $r^2_{23}$ , is 0.8114 which means that total variation in interest rate on deposit has been explained by supply of deposits to the extent of 81.14 percent and remaining is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variables is 4.6441 (t-cal=4.6441), which is significantly greater than tabulated t value (t-tab = 2.571) at 5 percent level of significance with 5 degree of freedom. Since the calculated value is significantly greater than table value, the conclusion is drawn that correlation coefficient between variables is significant. This means that the interest rate on saving deposit and deposit amount of NBL are significantly correlated and increase in the supply of fund (deposit) brings the decrease in interest rate on deposit. That is the substitution theory is not applicable for the saving deposit of NBL.

Similarly, correlation coefficient for fixed deposit interest rate and fixed deposit amount,  $r_{45}$ , is found to be 0.8873. This shows that they have positive correlation. It means that the increase in deposit interest rate stimulates saving on fixed deposit. This relation can be clearly explained by the coefficient of determination, which is 0.7865 means that total variation in interest rate on fixed deposit has been explained by supply of deposits to the extent of 78.65 percent and remaining 21.35 percent is the effect of other variables. The t-value for testing the significance of the correlation coefficient between variables is 4.2924 (t-cal=4.2924), which is significantly higher than tabulated t value (t-tab = 2.571) at 5 percent level of significance with 5 degree of freedom. Since the calculated value is significantly higher than tabulated value, the conclusion can be drawn that correlation coefficient between variables is significant. This means that though the correlation between interest rate on saving deposit and deposit amount of NBL shows the very less positive correlation, the t-test indicates that there is no significant correlation between them.

### 4.2.3 Agriculture Development Bank/ Nepal

The general interest rate structure of ADB/N for last fiscal years is given on the table 4-5. Though the ADB/N has transaction on both agriculture sector and non-agriculture (commercial) sectors, here for this study only the interest rate of commercial sector is taken in consideration.

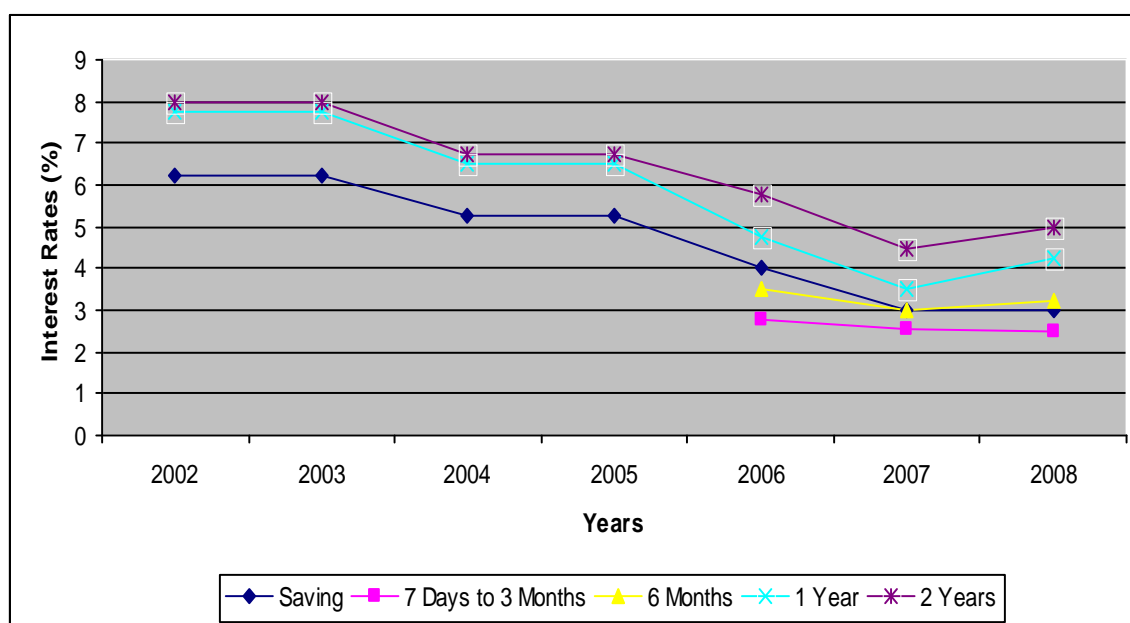
**Table no 4-5: Interest rate structure on deposit of ADB/N as on Mid-July**

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	6.25	6.25	5.25	5.25	4.00	3.00	3.00
<b>Fixed</b>							
7 Days	-	-	-	-	-		
14 Days	-	-	-	-	-		
1 Months	-	-	-	-	2.50	2.60	2-2.29
2 Months	-	-	-	-	-		
3 Months	-	-	-	-	3.00	2.5	2.5-2.75
6 Months	-	-	-	-	3.50	3.00	3-3.25
1 Years	7.75	7.75	6.50	6.50	4.75	3.5	4 -4.25
Above 2Yrs	8	8	6.75	6.75	5.75	4.45	4.25-5
<b>Whole Mean</b>	<b>6.50</b>	<b>6.50</b>	<b>6.50</b>	<b>6.50</b>	<b>6.50</b>	<b>3.04</b>	<b>3.25</b>
<b>Fixed Deposit Mean</b>	<b>7.88</b>	<b>7.88</b>	<b>6.63</b>	<b>6.63</b>	<b>5.25</b>	<b>3.05</b>	<b>3.32</b>
<b>Std. Deviation</b>	<b>1.8533</b>						

Source: Banking and Financial Statistics, No: 42-48, NRB

The table 4-5 shows the interest rate structure of ADB/N on saving deposits and fixed deposits. The deposit rates are also in decreasing trends. For saving deposit, it is found that the interest rate has been declined by 50% during the last seven FYs. Each year there was around 1 percent declination but in constant rate. This can be illustrated on graph as figure no 4-5.

**Figure No 4-5: Interest Rate of ADB/N on Deposits during Different Years**



The figure no 4-5 shows that all interest rates are in declining condition, but one uniqueness is seen in the graph. That is the interest rate remained constant for at least one year before it started to fall. Saving interest rate and 1 year fixed deposit interest rate remains less volatile than other categories interest.

**Correlation Coefficient, Coefficient of Determination and t-statistics of ADB/N**

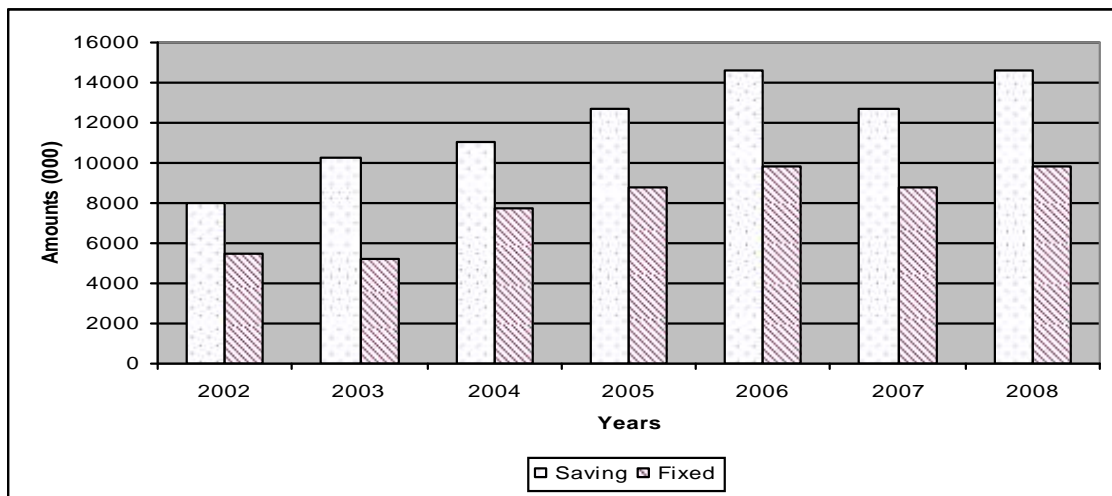
**Table No 4-6: Relationship between Interest Rate and Deposit amount of ADB/N**

Year	Saving Deposit Interest Rate	Saving Deposits Amounts	Fixed Deposit Interest Rate	Fixed Deposit Amounts		
2002	6.25	8016.9	7.88	5498.4		
2003	6.25	10257.3	7.88	5182.3		
2004	5.25	11002.9	6.63	7754.3		
2005	5.25	12732.2	6.63	8756.2		
2006	4.00	14632.6	5.25	9846.8		
2007	3	15121.7	3.1	10087		
2008	3	16087.9	3.5	11443.4		
Correlation	$r_{23} = -0.94426$		$r_{45} = -0.914431$			
Coefficient of determination	$r^2_{23} = 0.8914$		$r^2_{45} = 0.83622$			
t-statistic	t-cal=6.405	t-tab=2.571	Significant	t-cal=5.0521	t-tab=2.571	Significant

**Source: Banking and Financial Statistics, No: 42-48, NRB**

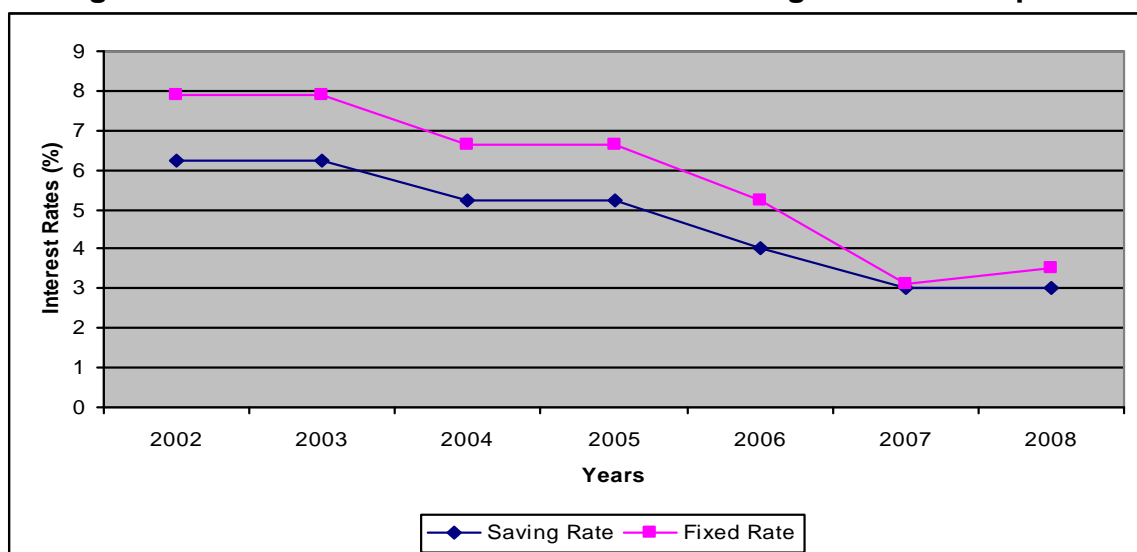
Table no 4-6 shows that interest rate and deposit amount are moving in opposite direction. To get the exact relation it is necessary to calculate the correlation coefficient and t-test. Here the data shows that both saving and fixed deposits are out of substitution effect. To verify it, the value of correlation and t-statistics is necessary. But prior to this it is effective if tabular value can be shown on graph as figure 4-6.

**Figure No 4-6: Deposit Amount of ADB/N during different Years**



Similarly the relationship between interest rate of saving and fixed deposit can be shown in figure no 4-7 as:

**Figure No 4-7: Interest Rates of ADB/N on Saving and Fixed Deposit**



The figure no 4-6 shows that the deposit amount of ADB/N is in increasing trend. The increasing tendency is high for saving deposit but for fixed deposit, the trend is increasing slowly. Similarly figure 4-7 shows that both the interest rate of fixed and saving deposits are in decreasing tendency. Their fluctuating pattern is almost similar which can be seen clearly on the graph no 4-7.

The correlation coefficient for saving deposit and its interest rate is found to be  $r_{23} = -0.94423$  which means that deposit amount and its interest rate have higher degree of negative correlation. It means increase in one variable result the decrease in other variables. Similarly the coefficient of determination,  $r^2_{23} = 0.891432$  which means that the value of dependent variables is dependent on independent variables to the extent of 89.14 percent. Similarly the t-test for same shows that the calculated value of t is 6.4853 (t-cal = 6.4853). This value is very greater than the t-tabulated value (t-tab = 2.571) at 5 degree of freedom and 5% level of significance. Therefore when t-cal > t-tab, then  $H_1$  or alternative hypothesis is accepted i.e. the variables are significantly correlated or their relationship is significant.

Similarly for fixed deposit, the coefficient of correlation ( $r_{45}$ ) is -0.914431, which is negative with high degree of inverse relationship. This is the extremely opposite case as compare to the correlation coefficient of RBB and NBL. The t-statistics for fixed deposit shows that its calculated value for t is 5.0521, which is higher than the tabulated value of t i.e. t-cal > t-tab. In such case alternative hypothesis is accepted and null hypothesis is rejected. This indicates that the two variables are correlated or their relationship is significantly correlated.

The analysis of ADB/N also shows that substitution effect is not applicable for bank. That is the case is similar for all three government owned banks, meaning that there is no substitution effect for all three banks- RBB, NBL and ADB/N.



## 4.2.4 Himalayan Bank Limited (HBL)

The general interest rate structure for HBL for saving deposit and fixed deposits during past seven fiscal years is as follows:

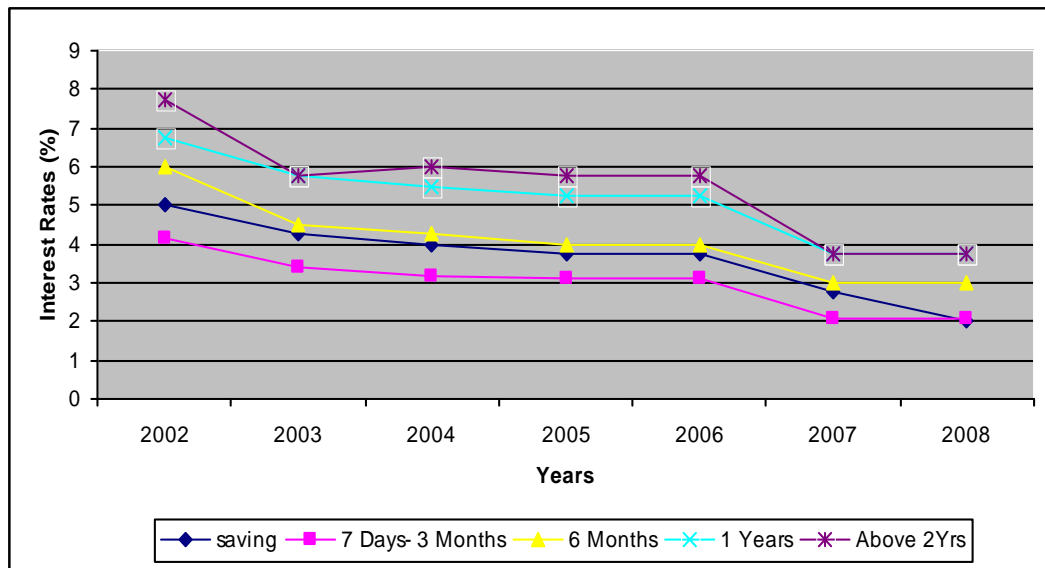
**Table no 4-7: Interest rate structure on deposit of HBL as on Mid-July**

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	5	4.25	4	3.75	3.75	0.4-2.75	2
<b>Fixed</b>							
7 Days	-	-	-	-	-	-	-
14 Days	3	2.5	2.3	2.3	2.3	1.75	1.75
1 Months	4.5	3.5	3.3	3.3	3.3	2	2
2 Months	-	-	-	-	-	-	-
3 Months	5	4.25	4	3.75	3.75	2.5	2.5
6 Months	6	4.5	4.25	4	4	3	3
1 Years	6.75	5.75	5.5	5.25	5.25	3.75	3.75
Above 2Yrs	7.75	5.75	6.00	5.75	5.75	3.75	3.75
<b>Whole Mean</b>	<b>5.42</b>	<b>4.35</b>	<b>4.20</b>	<b>4.02</b>	<b>4.01</b>	<b>2.786</b>	<b>2.678</b>
<b>Fixed Deposit Mean</b>	<b>5.5</b>	<b>4.38</b>	<b>4.23</b>	<b>4.06</b>	<b>4.05</b>	<b>2.79</b>	<b>2.79</b>
<b>Std. Deviation</b>	<b>0.8761</b>						

Source: Banking and Financial Statistics, No: 42-48, NRB

From table 4-7 it is clear that the interest rate on deposit of HBL is also in decreasing trend. But during last fiscal year the declining rate shows the unique features. During the first period out of seven FYs, the declining rate of average interest rate is fast, around one percentage point every year, but after 2003 the declining speed is very slow i.e. decline in decimal only. The whole average interest rate is 4.35% in 2003 but it was 4.20%, 4.02% and 4.01% in FY 2004, 2005, and 2006 respectively. Similarly the average fixed deposit rate is 4.38%, 4.23%, 4.06% and 4.05% in FY 2003, 2004, 2005, and 2006 respectively. It means that decline speed of deposit interest rate of HBL slowed down after FY 2003 because it declined by only decimal each year up to 2006. This phenomenon can be portrayed in the graph as figure no 4-8.

**Figure No 4-8: Interest Rate of HBL on Deposits during Different Years**



The graph no 8 also shows that up to FY 2002 the declining rate is high but after FY 2003 to 2006 the declination speed is very slow.

**Correlation Coefficient, Coefficient of Determination and t-statistics of HBL**

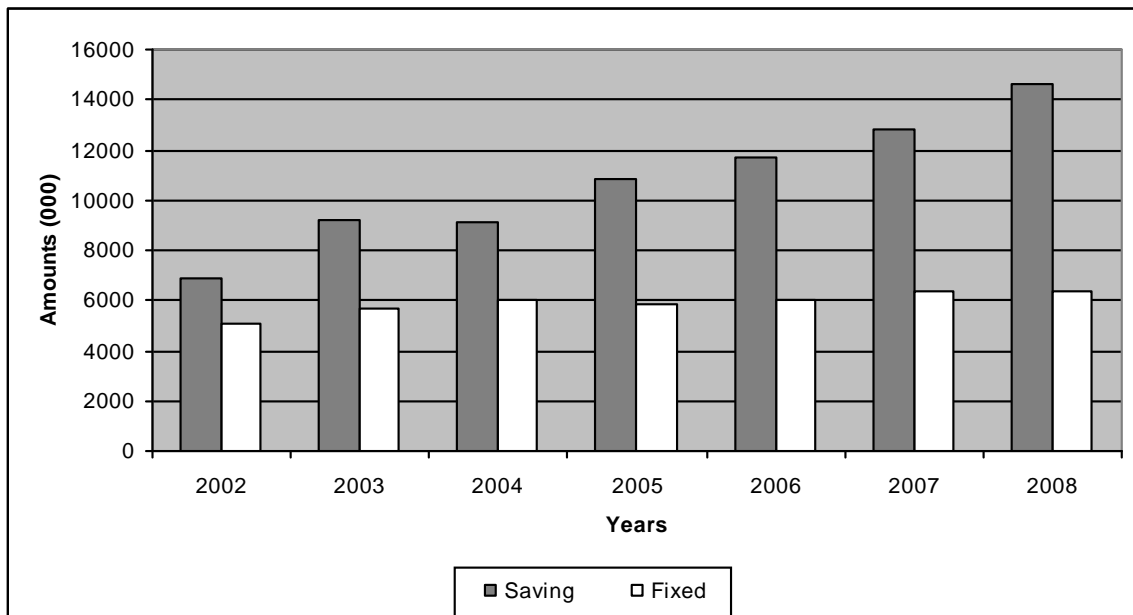
**Table No 4-8: Relationship between Interest Rate and Deposit amount of HBL**

Year	Saving Deposit Interest Rate	Saving Deposits Amounts	Fixed Deposit Interest Rate	Fixed Deposit Amounts		
2002	5.00	6844.3	5.5	5109.4		
2003	4.25	9164.1	4.38	5668.1		
2004	4.00	9102.8	4.23	6044.9		
2005	3.75	10840.8	4.06	5880.7		
2006	3.75	11719.7	4.05	6043.7		
2007	0.4-2.75	12852.4	2.79	6364.3		
2008	2	14582.8	2.79	6350.2		
Correlation	$r_{23} = -0.90485$		$r_{45} = -0.94587$			
Coefficient of determination	$r^2_{23} = 0.818753$		$r^2_{45} = 0.89468$			
t-statistic	t-cal= 4.7525	t-tab= 2.571	Significant	t-cal= 6.51719	t-tab= 2.571	Significant

Source: Banking and Financial Statistics, No: 42-48, NRB

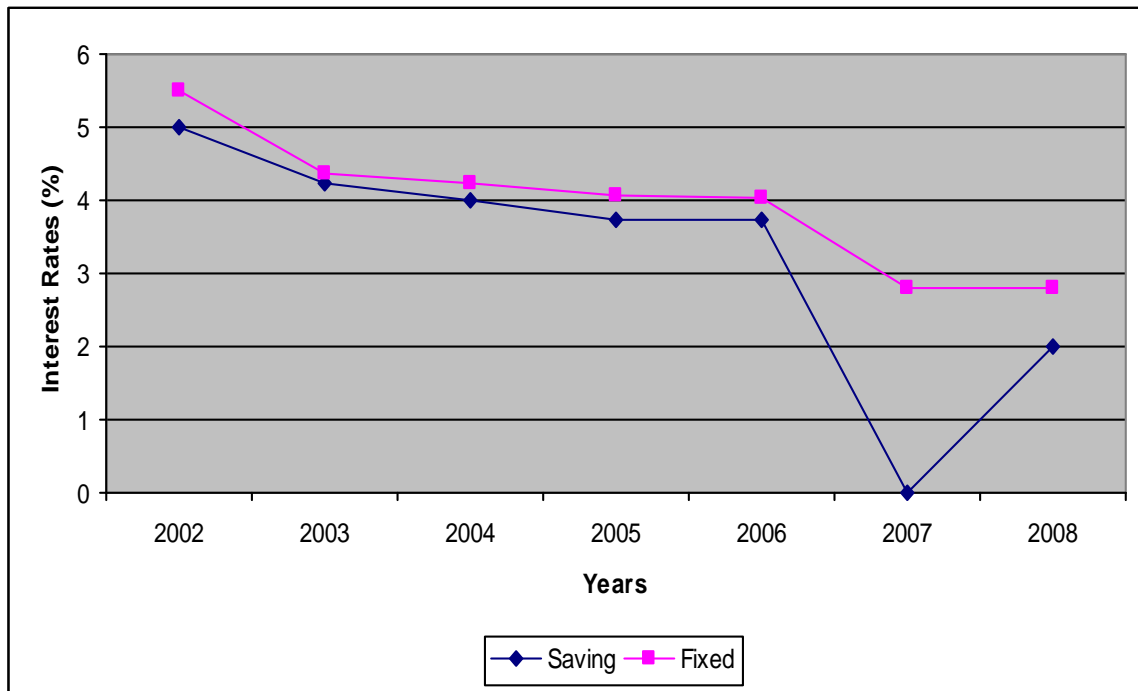
The table 4-8 shows the amount of saving deposit and its interest rate as well as amount of fixed deposit and its interest rate for seven fiscal year. The table indicates that, in one hand deposit rates are declining where as in other hand deposit amount is increasing in each fiscal year. This suggests that interest rate and deposit amount may have negative relationship, i.e. when one variable is found to be increased, other variable is found to be decreased and vice versa. This situation can be revealed in graph as figure no 4-9 in following ways:

**Figure No 4-9: Deposit Amount of HBL during different Years**



The graph 4-9 shows saving deposit amount is continuously rising each year but fixed deposit amount is seems to grow each year with some fluctuation. It means that there is rise and fall for fixed deposit amount. Similarly the interest rate of fixed deposit and saving deposit can also be shown on figure 4-10

**Figure No 4-10: Interest Rates of HBL on Saving and Fixed Deposit**



To quantify the exact relationship between interest rate and deposit amount, it is necessary to calculate the co-relation coefficient. The correlation coefficient of saving deposit amount and its interest rate is -0.90485. It means that these two variables have very high negative relationship. Though the two variables don't have direct relationship but correlation coefficient tells that increase in one variable result the decrease in other variables. The case is similar to fixed deposit also. The correlation coefficient for fixed deposit rate and amount is -0.94587 ( $r_{34} = -0.94587$ ), which is also very high negative correlation. Therefore for both saving and fixed deposit, the case is against the substitution effect. The coefficient of determination of correlation coefficient of saving deposit is 0.818753 ( $r^2_{23} = 0.818753$ ) which indicates that the relation between deposit and interest rate is tied up to the level of 81.8753percent and remaining other percentage by other factors. In same manner for fixed deposit the value of coefficient of determination is 0.89468.

The value of t-statistics for saving deposit and saving interest is found to be 4.7525 (t-cal = 4.7525). The tabulated value for this condition at 5% level of significance with 5 degree of freedom is 2.571. It means that in this case t-calculated is greater than t-tabulated. So alternative hypothesis is accepted, which means that there is significant correlation between saving deposit and interest rate. Similarly for fixed deposit, the calculated value for t is 6.51719 (t-cal = 6.51719). This value is also greater than t-tabulated. So in this case also the magnitude of correlation coefficient is highly significant.

Thus from both case (saving and fixed deposit) it is clear that there is no substitution effect in the context of HBL.

#### 4.2.5 Nepal Bangladesh Bank (NBB)

As similar to previous part, it is better to present the general interest rate structure before entering to the main analysis. The interest rate structure for NBB on saving and fixed deposits for past seven FYs are as presented on table 4-9.

**Table no 4-9: Interest rate structure on deposit of NBB as on Mid-July**

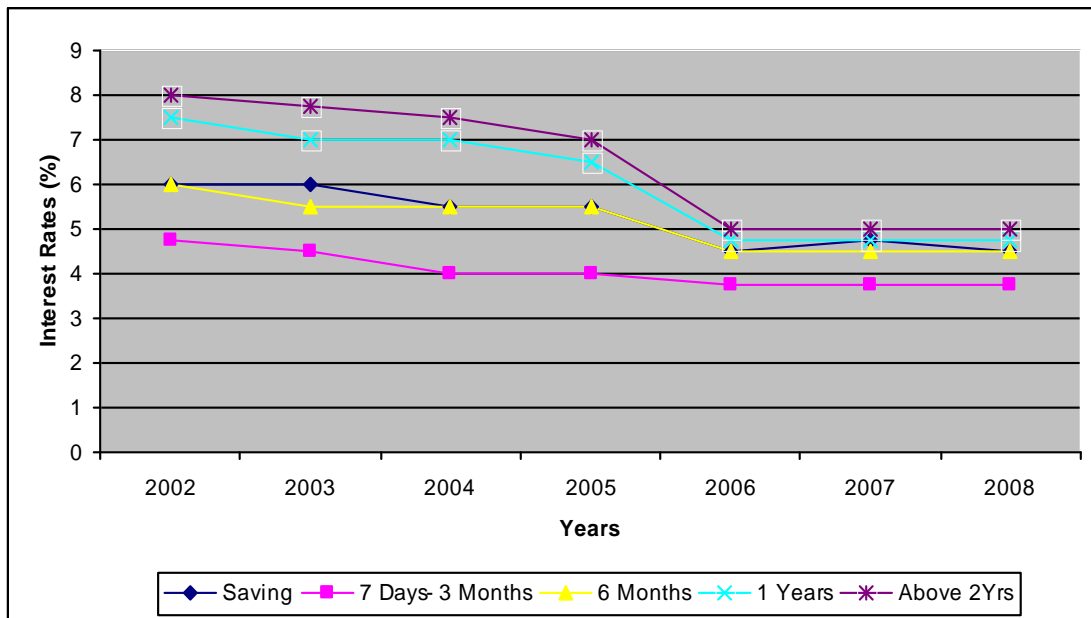
Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	6.00	6.00	5.50	5.50	4.50	4.75	4.5
<b>Fixed</b>							
7 Days	-	-	-	-	-	-	-
14 Days	-	-	-	-	-	-	-
1 Months	4.00	4.00	3.50	3.50	3.50	3.5	3.5
2 Months	-	-	-	-	-	-	-
3 Months	5.50	5.00	4.50	4.50	4.00	4	4
6 Months	6.00	5.50	5.50	5.50	4.50	4.5	4.5
1 Years	7.50	7.00	7.00	6.50	4.75	4.75	4.75
Above 2Yrs	8.00	7.75	7.50	7.00	5.00	5	5
<b>Whole Mean</b>	<b>6.17</b>	<b>5.88</b>	<b>5.59</b>	<b>5.42</b>	<b>4.38</b>	<b>4.42</b>	<b>4.375</b>
<b>Fixed Deposit Mean</b>	<b>6.20</b>	<b>5.85</b>	<b>5.60</b>	<b>5.40</b>	<b>4.35</b>	<b>4.35</b>	<b>4.35</b>
<b>Std. Deviation</b>	<b>0.73445</b>						

Source: Banking and Financial Statistics, No: 42-48, NRB

The table 4-9 portrays the interest rate of NBB on saving deposit and fixed deposits. All the interest rate on deposit is on decreasing trend. But the tendency towards decrement is similar to HBL because interest rates on first few FY were decreasing on large gap. But after 2003 the falling pace was very slow as they fell on gap of decimals. But this case doesn't not match with the government owned bank; RBB, NBL & ADB/N. On these three banks, the declination rate was almost similar for all periods.

In the seven years fiscal periods, the interest rate is decline by almost half. This can be shown clearly if average of all interest rate is taken. The average interest rate for whole (both fixed and saving) account is 8.45%, 6.84%, 6.17%, 5.88%, 5.59%, 5.42% & 4.38% for the year 2002, 2003, 2004, 2005, 2006, 2007 & 2008 respectively. This tendency can be exhibited in the pictorial form as in figure no 4-13 as follows.

**Figure No 4-11: Interest Rate of NBB on Deposits during Different Years**



The figure 4-11 shows that during 2002 the spread between interests rate on different term period is in uniform pattern. The interest rate lied in between 3.5% to 8%. This uniformity of spread is maintained up to the FY 2005 but after the FY 2005 the range of all interest rate narrowed down as in figure and all interest lied in between 4 percentage point to 6 percentage point. The overall figure shows that the interest rate is on decreasing trend.

### Correlation Coefficient, Coefficient of Determination and t-statistics of NBB

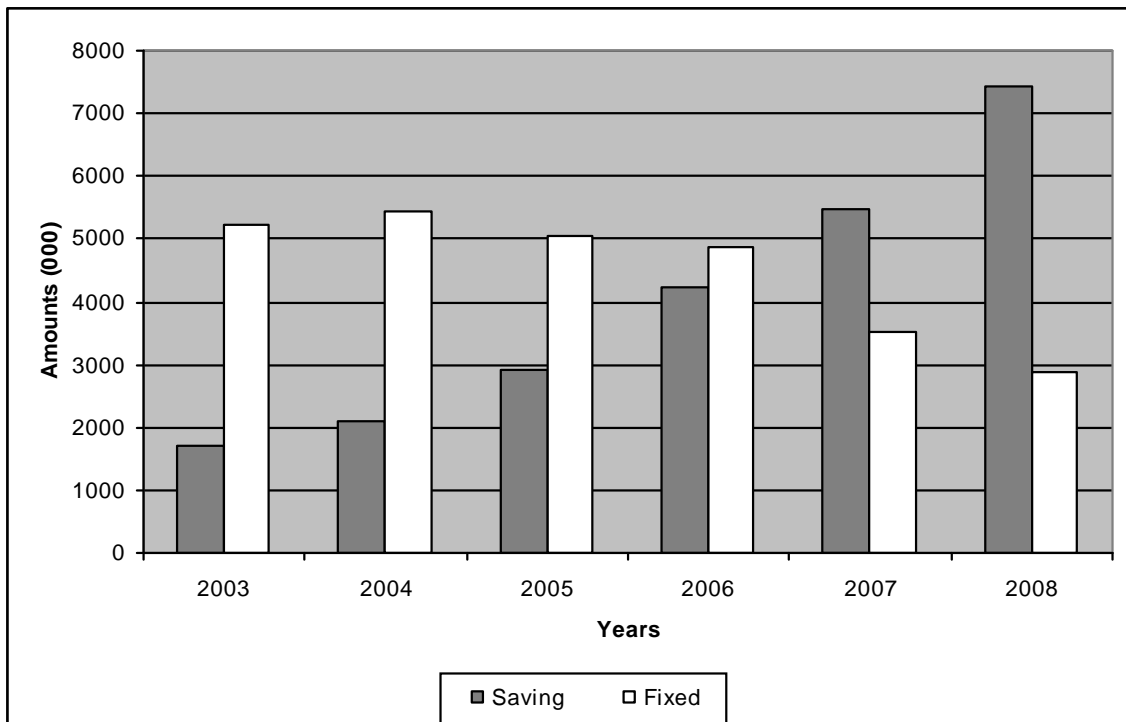
**Table No 4-10: Relationship between Interest Rate and Deposit amount of NBB**

Year	Saving Deposit Interest Rate	Saving Deposits Amounts	Fixed Deposit Interest Rate	Fixed Deposit Amounts		
2002	6.00	1101.9	6.20	4356.5		
2003	6.00	1694.9	5.85	5236.8		
2004	5.50	2086.9	5.60	5453.6		
2005	5.50	2913.6	5.40	5031.6		
2006	4.50	4225.9	4.35	4875.7		
2007	4.75	5475.2	4.35	3536.6		
2008	4.5	7414.8	4.35	2867.0		
<b>r</b>	$r_{23} = -0.884708$		$r_{45} = -0.74712$			
<b>r<sup>2</sup></b>	$r^2_{23} = 0.782708$		$r^2_{45} = 0.5584$			
t-statistic	t-cal= 4.2438	t-tab= 2.571	Significant	t-cal= 2.5135	t-tab= 2.571	Insignificant

Source: Banking and Financial Statistics, No: 42-48, NRB

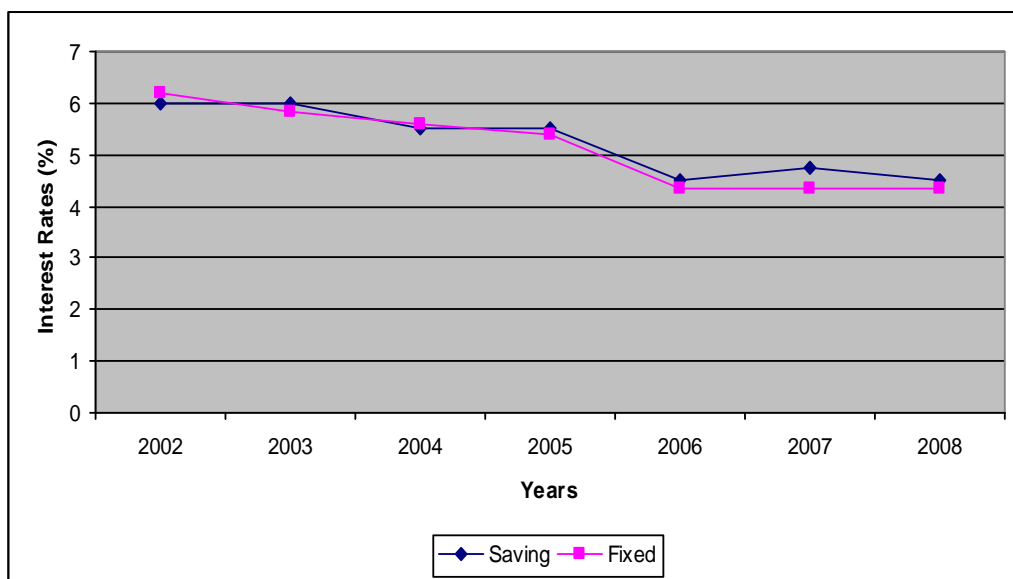
The table 4-10 also shows both deposit amount are in increasing trend though the interest rate of both of them is in declining trend. It means interest rate and deposit amount have inverse relationship. But to find exact quantity of inverse relationship it is necessary to compute the correlation coefficient. Prior to this it is helpful if the data are presented on graph no 4-12.

**Figure No 4-12: Deposit Amount of NBB during different Years**



The graph shows that NBB collected more funds on fixed deposit than saving deposits in last seven FYs. But this case was opposite in other banks. Similarly the relationship of saving interest rate and deposit interest rate can be shown on figure no 4-13 as follow.

**Figure No 4-13: Interest Rates on Saving and Fix Deposit of NBB**





If the excel sheet is used to compute the correlation coefficient, then the value for correlation between saving deposit and interest rate is 0.884708 ( $r_{23} = -0.884708$ ). This is high degree of negative correlation. It means that during the last seven fiscal years, there was sharp increase in saving deposit amount even though there was sharp decline in saving interest rates. The coefficient of determination  $r^2_{23} = 0.782708$ . Similarly the calculated value for t is 4.2438 for saving account. The value of tabulated t at 5 d.f. and 5% level of significance is only 2.571. So for saving account  $t\text{-cal} > t\text{-tab}$ , and hence alternative hypothesis is accepted. It means that there is significant relationship between two variables (deposit amount and interest rate).

In same manner for fixed deposit, the value of correlation coefficient is  $r_{45} = -0.74712$ , which indicates that the two variables have positive relationship. In other words, when increment occurs on one variable occur then there also occur increment on other variables. To identify the significance or insignificance of this correlation, it is necessary to calculate the value of t-statistics. The calculated value of t is 2.5135. Similarly the tabulated value for t is 2.571, which is less than calculated t. As a result null hypothesis is rejected and alternate hypothesis is rejected. It means that the correlation coefficient is highly significant. Thus from the both study it reveals that substitution effect is not applicable for NBB.

### **4.3 Analysis of Lending and Interest Rate**

This is second area of the analysis where mainly the relationship between lending interest rate and its effect upon lending amount is measured. Generally, when there is higher interest rate (esp. lending or credit rate) in the economy, people normally borrow lesser amount than the period when lending interest rate is low. According to theory, when there is low lending rate, then there should be higher amount of borrowing. 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 context.

### 4.3.1 Rastra Banijya Bank

The sector where RBB grant its credit during last seven FYs and their corresponding interest rate, average interest rate and lending amount are presented in the table 4-11 below.

**Table 4-11: Lending Rate of RBB on Different Sectors during Seven Years**

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	16.50	13.50	11.75	11.25	12.20	11	11
Export Credit	15.00	12.00	11.50	10.00	9.50	8	8
Import LC	12.00	13.00	12.00	10.00	10.00	9	9
HMG Bond	11.00	14.00	10.50	10.0	7.00	7	7
BG/CG	-	10.50	10.00	9.25	9.25	8.5	8.5
Other Guarantee	15.00	10.50	-	-	-	-	-
Industrial Loan	15.50	15.00	14.50	11.75	12.00	-	-
Commercial Loan	16.50	15.50	15.00	-	-	-	-
Priority Sector Loan	14.00	14.00	13.00	12.00	12.00	13	11.5
Working Capital	14.00	14.50	13.75	12.50	11.00	-	-
Hire Purchase	16.00	14.00	13.50	12.00	12.00	11	11
Others	16.50	15.5	15.00	12.00	12.00	11	11
<b>Average Int. Rate(1)</b>	<b>14.73</b>	<b>13.5</b>	<b>12.78</b>	<b>11.08</b>	<b>10.70</b>	<b>9.375</b>	<b>9.375</b>
Lending Amount(2)	29140.6	28424.7	28576	28258.9	26781.87	26422	25378.6
Correlation ( $r_{12}$ )	0.9072						
Coefficient of determination ( $r_{12}^2$ )	0.82264						
<b>t-statistics</b>	t-cal = 4.818		t-tab = 2.571		Significant.		

Source: Banking and Financial Statistics, No: 42-48, NRB

[Note: For all case, the higher ceiling of interest rate is taken from the table, as per suggestion of NRB research department.]

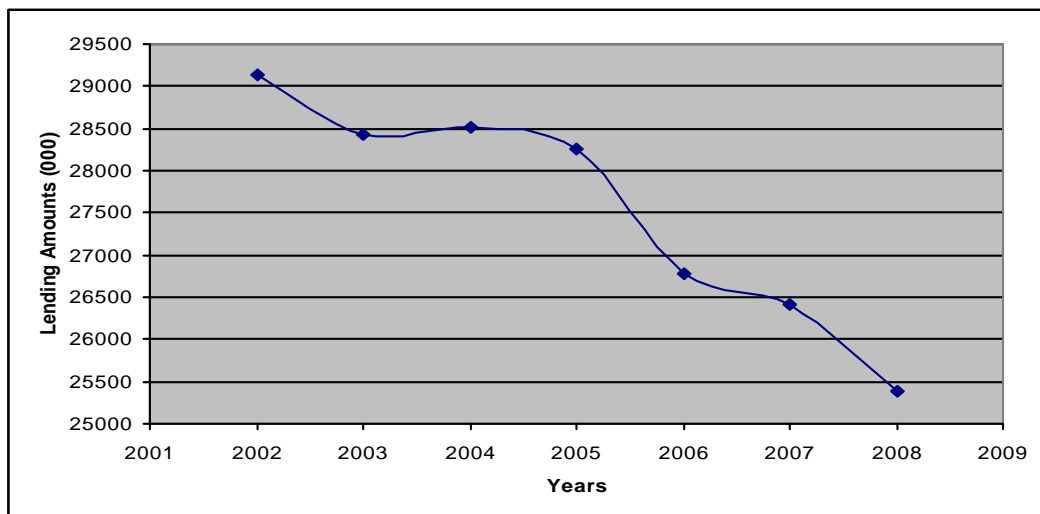
Lending activity of commercial banks can be diversified into different sectors. But according to the publication of Nepal Rastra Bank- Banking & Financial statistics- the loan of commercial banks are classified in different sub-sectors like overdraft, export credit, Import LC, commercial loan and so on. Besides this there are other section (area) when bank provides loan and these areas are placed in the topic of "others". For this study, lending area are categorized as classified by NRB.

According to table 4-11 it shows that interest rate on lending on different area are in declining stage. The table shows that the maximum interest rate is 16.5% in FY 2002 and, minimum rate is 5% on FY 2008. This shows that the interest rate was decline drastically during the seven FYs periods. Generally the productive sector

loan rate (like commercial loan, industrial loan, priority sector loan, working capital rate and so on) decline 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 seven FYs declination of overdraft rate was by 5.5%. In same manner, the declining magnitudes were 5%, 4.5%, and 4% for overdraft, other and hire purchase. 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 average lending interest rate was 14.73 (2002), 13.5%( 2003), 12.78 %( 2004), 11.08 %( 2005), 10.70% (2006), 9.375%( 2007), & 9.375% (2008). The standard deviation for average interest rate was 2.01%, which shows the deviation from mean return. The average rate is also in decreasing trend. The decreasing tendency was not smooth. It means the rate declined each year with different rate. In preceding year the declination was quite fast where as the declining tendency was little in later year. This concludes that interest rate on lending is also in decreasing tendency for past few years. With harmony to interest rate, the lending amount of RBB is also seen to be in decreasing tendency but with some fluctuation. These can also be present in figure no 4-14.

**Figure No 4-14: Lending Amount of RBB during different Years**



### **Correlation Coefficient, Coefficient of Determination and t-Statistics of RBB**

From table 4-11 the correlation coefficient (simple correlation) between lending rate and lending amount ( $r_{23}$ ) is -0.907. According to our classification, this negative correlation is “moderate degree” correlation. In this case it is clear that interest rate on lending & lending amount has inverse relationship. It means they move in opposite direction i.e. increase in lending rate result decrease in total lending amount. This situation matches with the actual theory. According to the theoretical concept of lending rate and lending amount, people prefer or use more money when the market interest rate is low in the market. So the case is true for RBB also. The simple determination of correlation coefficient ( $r_{12}^2$ ) is 0.82264 when total lending amount is taken as dependent variable and lending rate as independent variables, then 0.82264% of total variation in dependent variable is explained by lending rate and remaining percentage is due to the effect of other variables in the economy. Test of significance of correlation coefficient between lending rate and lending amount also verify the fact. The calculated value of t-statistics is 4.818 ( $t\text{-cal} = 1.5416$ ). This value is less than tabulated value,  $t\text{-tab} = 2.571$  with level of significance 5% and d.f. 5. In this condition,  $H_1$  is accepted. It means that there is significant correlation between the two variables. In other words their relation is significant. Though the correlation coefficient shows that these two variables have moderate level of correlation, but t-statistics verify that their relation is insignificant. In conclusion, the inverse relationship between lending rate and lending amount is not exactly applicable for RBB.

### **4.3.2 Nepal Bank Limited**

The sector where NBL granted its credit during last seven FYs and their corresponding interest rate, average interest rate and lending amount are presented in the table 4-12 below.

Table 4-12 shows the lending interest rate structure of NBL on different sectors. This interest rate is somewhat lower in value as compared to interest rate of RBB (table 4-11). It means that there was some difference in interest rate between the

two government run banks. For example in overdraft the RBB quoted the interest rate 17.50% per annum on FY 1999 where as in same period the NBL quoted the interest rate of 17.00% per annum for overdraft. In same manner the figure15 and figure16 indicate that the lending interest rate of NBL was lesser than the lending interest rate of RBB. The average interest rate with standard deviation 2.03% also verifies the above statement about two banks' lending interest rate.

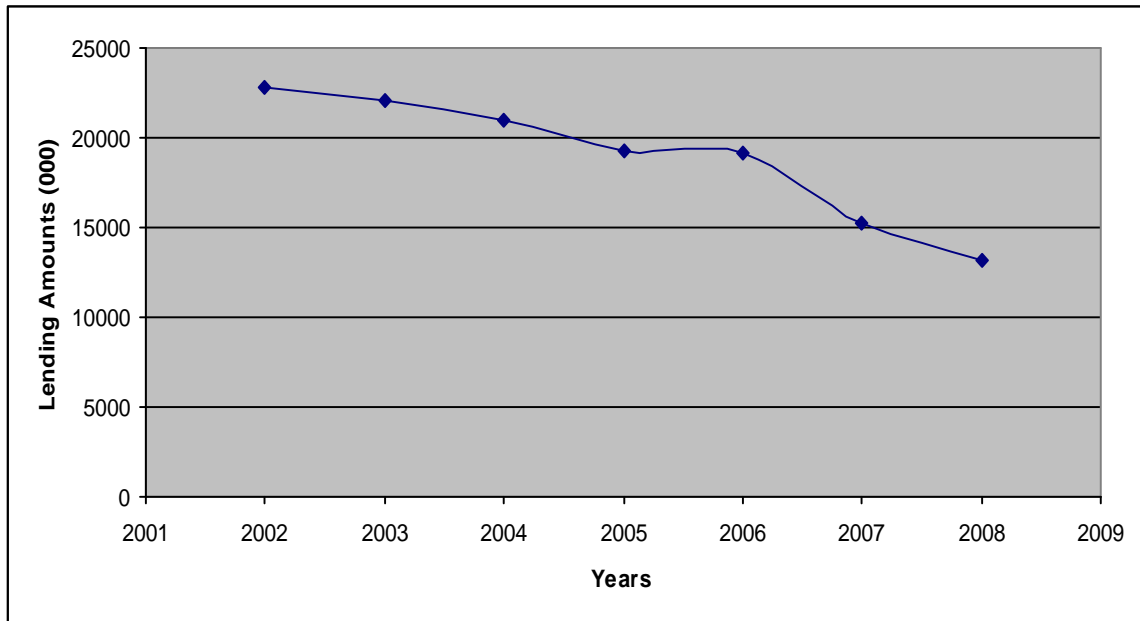
**Table 4-12: Lending Rate NBL on Different Sectors during Seven Years**

<b>Sector</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Overdraft	15.00	15.00	14.00	10.00	10.00	10.00	10.00
Export Credit	11.00	11.00	11.00	8.50	8.50	8	8
Import LC	11.00	11.00	11.00	8.50	-	-	-
HMG Bond	8.00	8.00	7.00	7.00	7.00	6.5	6.5
BG/CG	10.00	10.00	10.00	8.75	8.75	7	7
Industrial Loan	14.00	14.00	13.00	13.00	-	-	-
Commercial Loan	14.50	14.50	13.50	13.50	-	-	-
Priority Sector Loan	14.00	14.00	13.50	10.50	10.50	10	10
Poorer Sector Loan	10.50	10.50	10.00	8.00	8.00	7.5	7.5
Working Capital	14.00	14.00	13.00	10.00	10.00	10.00	10.00
Hire Purchase	14.00	14.00	14.00	11.00	11.00	10.5	10.5
Others	16.00	16.00	14.00	11.00	12.00	11	11
<b>Average Int. Rate(1)</b>	<b>12.67</b>	<b>12.67</b>	<b>12</b>	<b>9.98</b>	<b>9.53</b>	<b>8.61</b>	<b>8.61</b>
<b>Lending Amount(2)</b>	<b>22863.7</b>	<b>22062.3</b>	<b>20997.5</b>	<b>19266.1</b>	<b>19141.7</b>	<b>15191.6</b>	<b>13225.7</b>
Correlation ( $r_{12}$ )	0.83014						
Coefficient of determination ( $r_{12}^2$ )	0.68914						
<b>t-statistics</b>	t-tab = 2.571/		t-cal = 3.3293		significant		

According to the table 4-12, it is clear that all the lending interest rate fell by 1.50% to 7% within the seven FYs. During first phase of seven FYs, the average interest rate declined quite fastly with greater magnitude but in middle of the FY it remained stagnant. Again after middle year the momentum of speed rises up. During the period especially hire purchase rate, against government bond rate, BG/CG rate, import L/C rate, and overdraft lending rate fell drastically. They fell by 5% to 7% on average. Whereas other sector lending rate of NBL also fell but their magnitude was less. It means that commercial sector loan rate, industrial loan rate were not decreased by large percentage. So it can be said that only non-productive sector loan rates were declined drastically during the seven FYs as compared to productive sector loan. The case is similar with the RBB. With rhythm to lending interest rate, the study of lending amount shows that, it is also

in decreasing trend. The trend shows that it is fluctuating. In other words, up to the FY 2002, the lending amount was in increasing tendency but after 2002 onward the amount is decreasing. This may happen because after FY 2002, the interest rate declined in faster speed. The average lending rate of each FY and their corresponding lending is exhibited in the figures 4-15.

**Figure no 4-15: Lending Amount of NBL during Different FY**



**Correlation Coefficient, Coefficient of Determination and t-Statistics of NBL**

To find the exact relationship between the lending interest rate and lending amount, it is necessary to use some of the statistical tools like correlation coefficient, coefficient of determination. Similarly, to verify the correlation coefficient, student t-statistics is applied. For this case, the correlation coefficient between NBL’s average interest rate and lending amount is 0.83014 ( $r_{12} = 0.83014$ ). It means that, according to our classification, this is low degree of positive correlation. Increase in one variable result the increase in other variables but in low magnitude. In other words, if one variable increases by one percentage, then other variable increases by 83%. The result of correlation is against the theory. Because according to theory there should negative correlation. In other word, decrease in interest rate should be followed by increase in lending amount. But this case doesn’t happen for NBL. The coefficient of determination  $r_{12}^2 = 0.68914$ , which means that the relationship between two

variable (lending amount and rate) is defined up to 64.27% only. Similarly, the calculation of t statistics gives the value to t as 2.99 i.e.  $t\text{-cal} = 3.3293$ . The tabulated value for t at 5 d.f. and 5% level of significance is 2.571. Therefore, in this case t-calculated is greater than t-tabulated. Hence, alternative hypothesis is accepted. It indicates that the relationship shown by correlation coefficient is not significant.

In conclusion, it can be said that the lending interest rate and lending amount don't have relationship. This is not as per theory suggests.

### 4.3.3 Agriculture Development Bank/Nepal (ADB/N)

As previously mentioned, ADB/N grants the loan broadly in two sectors; agricultural and non-agricultural (commercial) sectors. But for this study only the lending of commercial sector is focused. The general lending interest rate, lending area, average lending rate and lending amount during the seven fiscal years are presented in figure 4-13.

**Table 4-13: Lending Rate ADB/N on Different Sectors during Seven Years**

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	18.00	18.00	17.00	17.00	16.00	15.5	12.5
Export Credit	-	-	-	-	-	-	-
Import LC	-	-	-	-	-	-	-
HMG Bond	-	-	-	-	-	-	6.5
BG/CG	-	-	-	-	-	-	-
Industrial Loan	15.00	15.00	14.00	14.00	13.00	13.00	10
Commercial Loan	16.00	16.00	15.50	15.50	14.00	11-14	11
Priority Sector Loan	-	-	-	-	-	-	-
Poorer Sector Loan	-	-	-	-	-	-	-
Working Capital	-	-	-	-	-	-	-
Hire Purchase	16.00	16.00	15.00	15.00	13.00	10-13	10
Others	16.00	16.00	15.00	15.00	13.50	12.5-15.5	10-12.5
<b>Average Int. Rate(1)</b>	<b>16.20</b>	<b>16.20</b>	<b>15.30</b>	<b>15.30</b>	<b>13.90</b>	<b>12.6</b>	<b>10.125</b>
<b>Lending Amount(2)</b>	<b>4590.4</b>	<b>5700.5</b>	<b>6847.8</b>	<b>8794.7</b>	<b>9221.2</b>	<b>10698</b>	<b>11215.9</b>
Correlation ( $r_{12}$ )	-0.8846						
Coefficient of determination ( $r_{12}^2$ )	0.78256						
<b>t-statistics</b>	t-cal= 4.2438		t-tab = 2.571		Significant.		

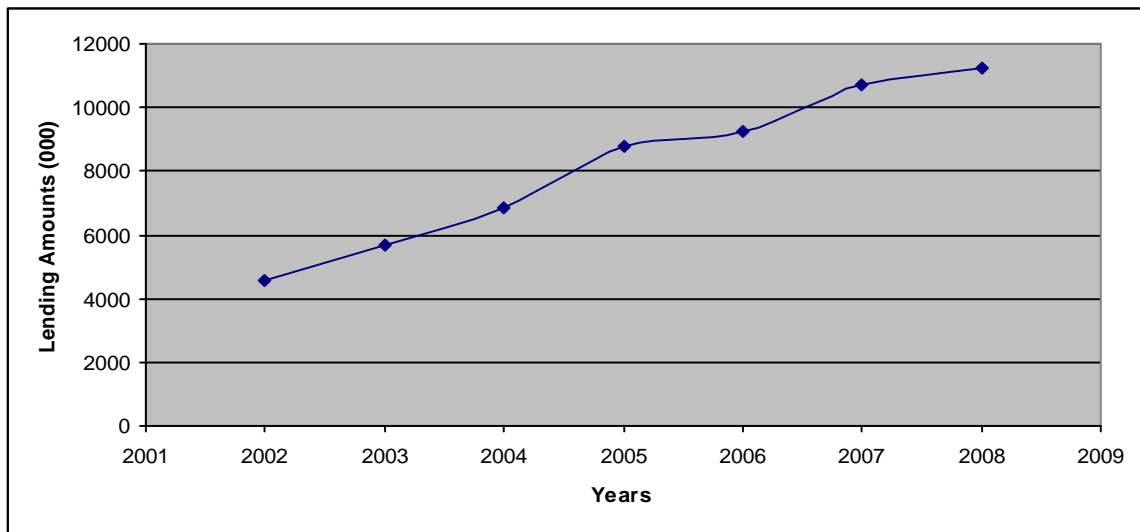
Source: Banking and Financial Statistics, No: 38-44, NRB

The table 4-13 shows the lending interest rate of ADB/N on different sectors in different FY. It is also notable that for commercial purpose, ADB/N had granted credit only on certain sectors in past FY. They are shown on the table 4-13. Comparing the lending rate of three banks, RBB, NBL and ADB/N it is found that ADB/N had the highest lending interest rate among all. After this RBB had second highest interest rate and NBL had the least interest rate. Even though the interest rate on lending of ADB/N is high in first period of seven FYs, on later years interest rate gradually starts to decrease. Every year interest rate has declined by almost one percentage point. For the case of ADB/N in all sectors declining rate was similar. It means that there was equal fall in interest rate on each loan sector. But this is not the case for RBB and NBL because in those banks, there was rapid fall on non productive sector and less fall on non-productive sectors. In past seven FYs the highest interest rate was 19% on overdraft. This is the maximum rate among all. Later within seven FYs this rate fell to 15.5% p.a. when it approached to FY 2007. In same manner most of the rate fell by on average 4% from the previous lending rate. To see the position, it is better to give glance on average lending rate during last seven FYs. The average interest rate was 16.2%, 16.2%, 15.3%, 15.3%, 13.9% 12.6 and 10.125 in FY 2002, 2003, 2004, 2005, 2006, 2007 & 2008 respectively.

In effect of decline in interest rate, the lending amount of ADB/N is also found to be increasing drastically during the seven fiscal years. During the period of seven years, the lending amount was tripled. This is what the theory says. But to know the exact relationship it is necessary to compute the correlation coefficient. Prior to all it is rational if the data on the table 4-13 are present on the graph no 4-16.



**Figure no 4-16: Lending Amount of ADB/N during Different Years**



### **Correlation Coefficient, Coefficient of Determination and t-Statistics of ADB/N**

By using excel spread sheet, correlation coefficient, average, standard deviation and other necessary statistics can be calculated. The correlation coefficient between lending rate and lending amount for ADB/N is -0.8846. This is very high degree of correlation. The negative sign indicates that, the two variables have opposite or inverse relationship, meaning decrease in one variables leads to increase in other variables. For this case, decrease in interest rate stimulates the lending amount or vice versa. The coefficient of determination for correlation coefficient is 0.78256. In other words, the relationship between one variable is defined by another is up to the level of 78.25%.

To verify the correlation coefficient statistically, it is better if t-statistics is used. The calculated value for t is 4.242 i.e.  $t\text{-cal} = 4.242$ . Similarly the tabulated value for t at 5 degree of freedom with 5% level of significance is 2.571 i.e.  $t\text{-tab} = 2.571$ . Comparing  $t\text{-cal}$  and  $t\text{-tab}$ , it is found that  $t\text{-cal} > t\text{-tab}$  so in such case alternate hypothesis is accepted meaning the relation shown by the correlation coefficient is highly significant. In other words, two variables are significantly correlated or the increase in lending amount is due to the decrease in lending rate. Lending rate is significant factor for that. From this analysis, it is verify that theory matches with the lending case of ADB/N.

#### 4.3.4. Himalayan Bank Limited (HBL)

HBL also grant credit on different area like commercial loan, industrial loan, overdraft, working capital and so on. These rates on the different fiscal years are as follows:

**Table 4-14: Lending Rate HBL on Different Sectors during Seven Years**

<b>Sector</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Overdraft	14.50	13.00	13.75	13.25	13.25	9-12	9-12
Export Credit	11.00	9.50	9.50	9.50	9.50	8.75	8.75
Import LC	13.50	13.00	12.75	12.25	12.25	11.75	11.75
HMG Bond	10.00	8.50	8.00	8.00	8.00	5-6	5-6
BG/CG	11.00	9.50	10.50	10.50	10.50	9.25	9.25
Industrial Loan	15.50	14.00	13.50	13.00	13.00	12.75	12.75
Commercial Loan	15.50	14.00	13.75	13.25	13.25	12.5	12.5
Priority Sector Loan	14.50	14.00	13.00	13.00	13.00	12.25	12.25
Poorer Sector Loan	9.00	8.50	8.50	8.50	8.50	8.25	-
Term Loan	15.00	13.50	13.50	13.00	13.00	11.75	11.75
Working Capital	14.00	13.20	13.25	13.00	13.00	-	-
Hire Purchase	15.50	13.00	13.00	13.00	13.00	11.5	11.5
Others	17.50	16.25	16.25	15.75	15.75	13.5	13.5
<b>Average Int. Rate(1)</b>	<b>13.58</b>	<b>12.30</b>	<b>12.25</b>	<b>12.00</b>	<b>12.00</b>	<b>9.35</b>	<b>9.35</b>
<b>Lending Amount(2)</b>	<b>5372</b>	<b>7423.2</b>	<b>9176.9</b>	<b>9673.5</b>	<b>11074.2</b>	<b>13081.7</b>	<b>14017.3</b>
Correlation ( $r_{12}$ )	-0.8682						
Coefficient of determination( $r_{12}^2$ )	0.75379						
<b>t-statistics</b>	t-cal = 3.9124	t-tab = 2.571	Significant.				

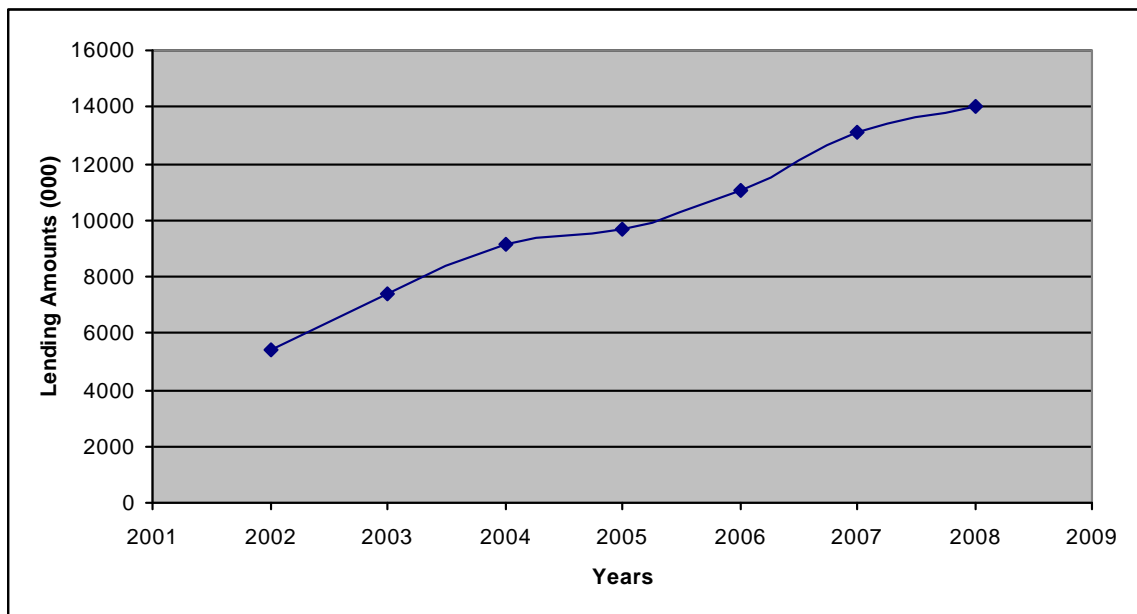
Source: Banking and Financial Statistics, No: 38-44, NRB

The table 4-14 shows the interest rate of HBL on lending on seven fiscal years granted in different sectors. With comparison to above aforementioned bank, HBL lending rate was somewhat lower than quoted by other bank. This may be due to the competition because those aforementioned banks are government owned bank where as HBL is private sector leading commercial bank. The maximum interest rate quoted by the HBL during seven FYs was 17.50% on “other” categories. The interest rate of HBL is also in decreasing trend. But the decreasing magnitude is very little. This is so because, the interest rate of HBL during FY 2002 was very low as compare to other three banks. It means that at 2002 the average interest rate of HBL was 13.81% where as other banks had average lending rate more than 16%. During seven years period the interest rate falls to 12% on average. It means that interest rate falls by only 2.19% on average. Conversely, the lending amount of HBL is seen to be in increasing trend. In comparison to 2004 lending, lending of 2008 is two times more. So it

can be said that lending of HBL was expanded rapidly within that seven fiscal periods. These phenomenon shows that lending interest rate and lending amount have inverse relationship.

To quantify this relationship, it is necessary to calculate correlation coefficient and t-statistics. But prior to this it is fruitful if the trend of lending interest rate and lending amount is shown in the figure as in figure no 4-17.

**Figure no 4-17: Lending Amount of HBL during Different Years**



The above figure shows that the lending amount of the bank is very much increasing in every year. As compare to the year 2002 and 2008, it is more than double.

### **Correlation Coefficient, Coefficient of determination and t-Statistics of HBL**

The correlation coefficient of HBL between lending amount and lending rate is -0.8682. It is high degree negative correlation. It indicates that increment in one variable result the decrement in other variables or vice versa. In this case decrease in lending interest rate increases the lending amount. People preferred more credit from the HBL when bank reduced the lending interest rate. This is similar with the saying of theory. Similarly the coefficient of determination between two variable ( $r^2_{12}$ ) = 0.7537. It means that the relationship between dependent variable and independent variable is defined up to the extent of 75.37%. In other words, the increase in lending amount by decrease in interest rate is defined up to the extent of 83.27% where as remaining percentage is due to other factors.

Similarly the t-statistics for HBL is 3.9124 (i.e. t-cal = 3.9124). The tabulated value at 5% level of significance with 5 d.f. is 2.571. Comparing the t-tab and t-cal, it is clear that t-cal > t-tab, so alternative hypothesis is accepted and null hypothesis is rejected. It means that the relation shown by correlation coefficient is highly significant. That is, the inverse relation shown by two variables – lending rate & lending amount – is strong. The increase in demand of lending amount is due to the decrease in lending rate. Therefore, according to t-statistics, the lending rate is also another strong as well as important factor that shape the lending amount. In conclusion the inverse relation of HBL on two variables is in accordance with theory.

### **4.3.5 Nepal Bangladesh Bank (NBB)**

At last, another bank for analysis is Nepal Bangladesh Bank. This bank also grants the credit to its customers in different sectors. But according the NRB bulletin “Banking and Financial Statistics” the bank provided the loan to its customers on following sectors.

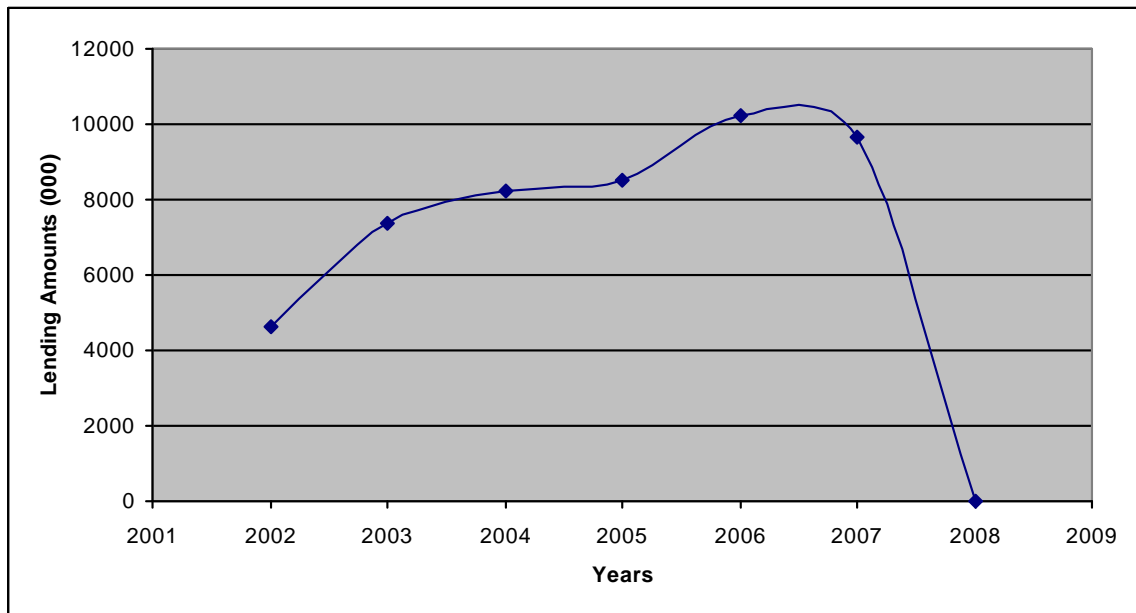
**Table 4-15: Lending Rate NBB on Different Sectors during Seven Years**

<b>Sector</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Overdraft	15.5	15.00	14.50	14.00	13.00	-	-
Export Credit	12.50	12.00	11.75	11.75	10.50	9-9.5	9-9.5
Import LC	13.50	-	-	-	10.50	-	-
HMG Bond	11.00	9.00	9.00	9.00	8.50	7.5	7.5
BG/CG	15.00	13.00	13.00	13.00	12.00	8	8
Industrial Loan	15.00	14.50	14.00	14.00	-	10-12	10-12
Commercial Loan	15.50	15.00	14.50	14.00	-	8-9.5	8-9.5
Priority Sector Loan	13.00	13.00	13.00	13.00	11.00	10	10
Poorer Sector Loan	12.00	12.00	12.00	12.00	10.00	9.5	9.5
Term Loan	15.00	14.00	14.00	13.50	12.00	-	-
Working Capital	-	-	-	-	-	-	-
Hire Purchase	15.00	14.50	14.50	14.00	12.50	6-10.5	6-10.5
Others	16.50	15.00	14.50	14.00	13.00	13.00	13.00
<b>Average Int. Rate(1)</b>	<b>14.13</b>	<b>13.36</b>	<b>13.16</b>	<b>12.93</b>	<b>11.30</b>	<b>9.08</b>	<b>9.08</b>
<b>Lending Amount(2)</b>	<b>4611.8</b>	<b>7347.4</b>	<b>8222.1</b>	<b>8491.9</b>	<b>10253.6</b>	<b>9654</b>	<b>-</b>
Correlation ( $r_{12}$ )	-0.8634						
Coefficient of determination ( $r_{12}^2$ )	0.74545						
<b>t-statistics</b>	t-cal = 3.8221		t-tab = 2.571		Significant.		
<b>Std. Deviation</b>	1.33%						

Source: Banking and Financial Statistics, No: 38-44, NRB

The table 4-15 shows the lending interest rate structure of NBB on seven FYs on different sectors. From table it is clear that the interest rates of NBB are in falling stage. During the first phase of FY the interest rate fell by large gap. But in later year the falling speed was low. This phenomenon can be seen clearly with the study of average interest rate. The average interest rate for FY 2002, 2003, 2004, 2005, 2006, 2007 and 2008 are 14.13%, 13.36%, 13.16%, 12.93%, 11.30%, 9.08% and 9.08% respectively. The average interest rate shows that the interest jump by high percentage gap and later on fell with little gap. In this bank also, lending interest of non-productive loan falls more than lending interest rate on productive sector loan. In the same manner, for lending amount, the lending amount of NBB increased each year. During the last FY the lending amount rises by around 3 times. This is very significant figure among these 5 aforementioned sample banks. This shows that the lending amount and interest have negative relationship. But to get the exact numerical result of relationship correlation should be necessary to calculate. The figure for changing trend of interest rate and lending amount is given on figure no 4-18.

**Figure no 4-18: Lending Amount of NBB during Different Years**



### **Correlation Coefficient, Coefficient of Determination and t-Statistics of NBB**

The correlation coefficient of NBB between lending amount and lending rate is - 0.8634. It is high degree of negative correlation. It indicates that increment in one variable result the decrement in other variables or vice versa. Decrement in lending interest rate increases the lending amount because people preferred more credit from the HBL when bank reduced the lending interest rate. This condition matches with the theory. Similarly the coefficient of determination between two variable ( $r^2_{12}$ ) = 0.7454. It means that the relationship between dependent variable and independent variable is defined up to the extent of 74.54%. The remaining percentage is due to other factors.

Similarly the calculate value for NBB is 5.125 (i.e.  $t\text{-cal} = 5.125$ ). The tabulated value of t-statistics at 5% level of significance with 5 d.f. is 2.571. Comparing the  $t\text{-tab}$  and  $t\text{-cal}$ , it is clear that  $t\text{-cal} > t\text{-tab}$ , so alternative hypothesis is accepted and null hypothesis is rejected. It means that the relation shown by correlation coefficient is highly significant. That is the inverse relation shown by two variables – lending rate & lending amount – is strong. In conclusion the inverse relation of NBB on two variables is accordance with theory.

## 4.4 Analysis of Inflation and Interest Rate (Deposit & Lending Rate)

Another variable that affects the interest rate in the economy is the inflation. In general condition, inflation and interest rate have positive effect. It means that, when inflation increases in the economy, the interest rate also increases. 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, the prevailing situation of each bank is going to observe.

### 4.4.1 Rastriya Banijya Bank (RBB)

The interest rate on deposit, interest rate on lending of RBB and inflation of the country during the seven FYs were tabulated on table 4-16.

**Table No 4-16: Inflation Rate and Interest Rate of RBB**

<b>Fiscal Year</b>	<b>CPI (1)</b>	<b>Inflation (2) %</b>	<b>Deposit Rate(3)</b>	<b>Lending Rate (4)</b>
2002	130.4	11.4	6.45	15.85
2003	134.9	3.5	6.00	14.73
2004	138.1	2.4	6.20	13.50
2005	142.1	2.9	5.20	12.78
2006	148.9	4.8	4.90	11.08
2007	154.8	4.0	3.25	10.70
2008	161.8	4.5	2.67	10.80
Correlation coefficient. $r_{23}$		0.264153854	Coefficient of Determination	
Correlation coefficient. $r_{24}$		0.491951207	Coefficient of Determination	
<b>t-statistics</b>	<b>t-cal (Deposit) =0.612</b>	<b>t-tab = 2.571</b>	<b>Insignificant</b>	
	<b>t-cal (Lending) =1.263</b>	<b>t-tab = 2.571</b>	<b>Insignificant</b>	

Source: NRB, Research Department

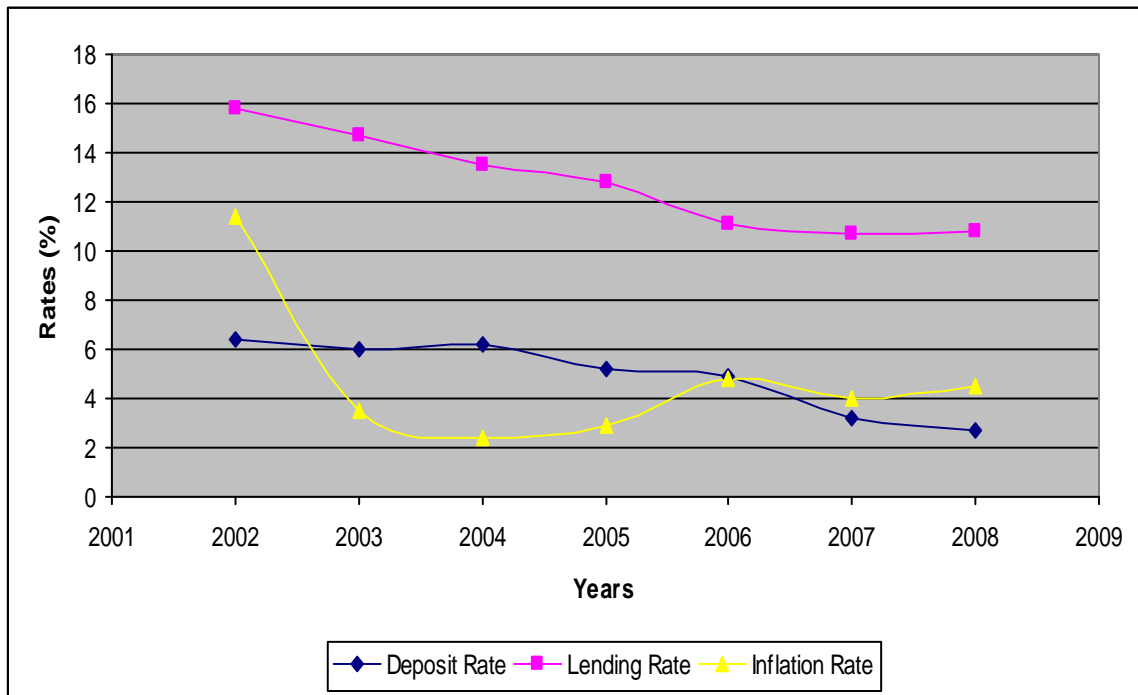
Note: The average interest rate of deposit and lending is taken from “Whole Mean” and “average lending rate” respectively. (For this case, values are taken from table4-1 and table 4-11)

From table 4-16 it is clear that the inflation rate during the last seven FYs was in fluctuating trend. Though it seems to decreasing but it has some variation. With similar to declining inflation, the interest rate of both lending and deposit are

seems to be declining. The relationship among these three elements can be portrayed in the figure no 4-19 as follows.

From figure no 4-19, it is clear that during the FY 2002 the inflation rate, 11.4%, was higher than deposit interest rate, 6.45%. This inflation rate decreases to 3.5% during 2003. In the middle of 2002 the inflation decreases below the deposit rate. In same manner, during the FY 2006 inflation rate and deposit rate was almost similar. But after 2006 the inflation started to rise and at FY 2007 inflation remains slightly above the deposit rate. At FY 2008 inflation rate is higher than deposit interest rate. These all indicates that the actual earning or real rate or return for the deposit holder was negative. In those periods, when inflation rate exceed the deposit rate, the deposit holder lost their income rather than earn. But in the case of lending rate, it was very much higher than the inflation rate. So bankers don't lose their income as compared to deposit holder. Due to this the interest spread between the deposit and lending was very high during the first part of the seven FYs.

**Figure No 4-19: Inflation Rate, Deposit Rate and Lending Rate of RBB**





If correlation coefficient of between deposit and inflation is taken, the value of  $r$  is 0.360710 i.e.  $r_{23}=0.264153854$ . This positive correlation indicates that the deposit rate and inflation have moderate level of positive relationship. Increase in inflation increases the deposit interest rate but very little in magnitude.

In order to verify the strong ness or weakness of relationship, calculation of t-statistics is necessary. The calculated value of  $t$  for given correlation coefficient is 0.6124. The tabulated value for it with 5% level of significance with 5 d.f. is 2.571. Here in this case tabulated value of  $t$  is greater than calculated value of  $t$ . in such case, alternative hypothesis is accepted which means that the correlation coefficient between deposit and lending is not significance. In other words, the deposit rate of RBB is not correlated with the inflation rate and movement in inflation rate does not affect the interest rate on deposit significantly.

In same manner, the correlation between lending rate and inflation is found to be 0.130111. ( $r_{24} = 0.491951207$ ) This is also moderate level correlation. It means the two variables move in same direction but not in similar rate. Their movement is weak. In order to verify the significance of correlation coefficient, t-statistic is calculated. The calculated value of  $t$  is 1.263 and tabulated value is 2.571. Here the case is similar with deposit. It means that, whatever the correlation coefficient reveals for the relationship of two variables, but the two variables are not significantly correlated. This concludes that fisher effect is not practically applicable for RBB.

#### **4.4.2 Nepal Bank Limited (NBL)**

The interest rate on deposit, interest rate on lending of NBL and inflation of the country during the seven FYs were tabulated on table no 4-17.

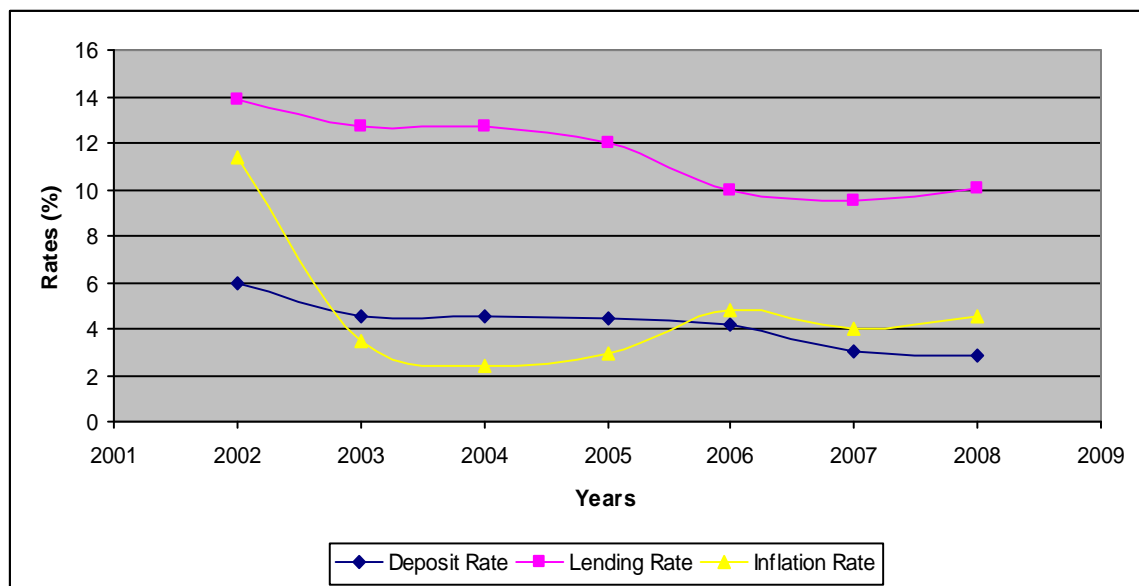
**Table no 4-17: Inflation Rate and Interest Rate of NBL**

Fiscal Year	CPI (1)	Inflation (2) %	Deposit Rate(3)	Lending Rate (4)
2002	130.4	11.4	5.96	13.86
2003	134.9	3.5	4.54	12.67
2004	138.1	2.4	4.54	12.67
2005	142.1	2.9	4.46	12.00
2006	148.9	4.8	4.16	9.98
2007	154.8	4.0	3.05	9.53
2008	161.8	4.5	2.85	10.03
Correlation coefficient. $r_{23}$		0.58824	Coefficient of Determination 0.34603	
Correlation coefficient. $r_{24}$		0.40272	Coefficient of Determination 0.16218	
<b>t-statistics</b>	<b>t-cal (Deposit)</b> <b>=1.626</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>
	<b>t-cal (Lending)</b> <b>=0.983</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>

Source: NRB, Research Department

The relationship that is shown on table can be presented on the graph no 4-20. According to graph it is clear that, during the beginning of the period, the inflation rate was higher than the deposit rate but at the middle of the 2002 the inflation of the country decline down below the deposit rate. In same manner, the inflation rate again rose in the end of FY 2005 and remains above the deposit rate till that date. But the rate of lending was very higher than inflation during the seven FYs. In both case it is similar with RBB.

**Figure No 4-20: Inflation Rate, Deposit Rate and Lending Rate of NBL**



Similarly, the correlation coefficient between deposit interest rate and inflation,  $r_{23}$ , is found to be 0.58824 and correlation coefficient between lending rate and inflation,  $r_{24}$ , is 0.402727. It indicates that these variables have positive correlation between inflation rates. But their level of correlation is moderate. In other words, when inflation rises, then both interest rates rise. To find out the strength or weakness of relationship, t-statistics is necessary.

The calculated value of t is 1.626 for deposit and 0.983 for lending. They both are lesser than the tabulated value of t at 5% level of significance with 5 d.f. In such condition null hypothesis is rejected and alternative hypothesis is accepted. That is coefficient of correlation is statistically insignificant. It can be inferred that the variables, both interest rate and inflation are not correlated even if analysis shows the positive correlation coefficient of 0.6814 and 0.55177 for deposit and lending respectively.

#### 4.4.3 Agriculture Development Bank/Nepal (ADB/N)

The inflation rate during the last seven fiscal years, deposit rate of ADB/N, lending rate of ADB/N are tabulated in table no 4-18.

**Table no 4-18: Inflation Rate and Interest Rate of ADB/N**

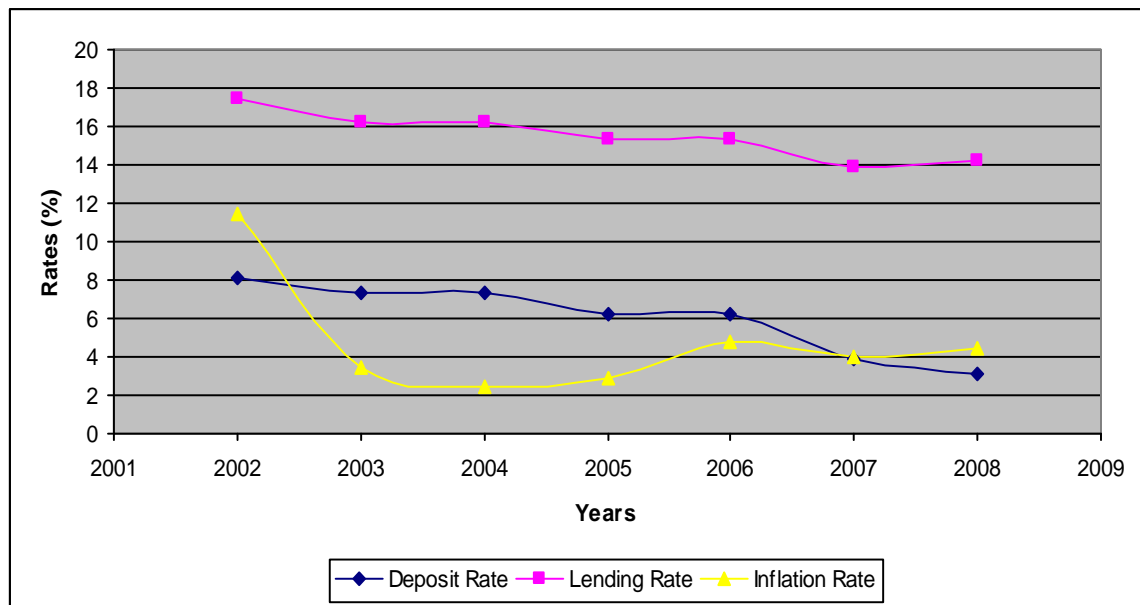
<b>Fiscal Year</b>	<b>CPI (1)</b>	<b>Inflation (2) %</b>	<b>Deposit Rate(3)</b>	<b>Lending Rate (4)</b>
2002	130.4	11.4	8.15	17.40
2003	134.9	3.5	7.33	16.20
2004	138.1	2.4	7.33	16.20
2005	142.1	2.9	6.17	15.30
2006	148.9	4.8	6.17	15.30
2007	154.8	4.0	3.92	13.90
2008	161.8	4.5	3.08	14.20
Correlation coefficient. $r_{23}$		0.33642	Coefficient of Determination	
Correlation coefficient. $r_{24}$		0.54006	Coefficient of Determination	
<b>t-statistics</b>	<b>t-cal (Deposit) =0.798</b>		<b>t-tab = 2.571</b>	<b>Significant</b>
	<b>t-cal (Lending) =1.464</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>

Source: NRB, Research Department

According to the table 4-18 the average interest rate (average of both fixed and saving deposit) was 8.15% in 1999. On comparing the deposit rate and inflation, deposit remained above or higher than inflation rate except in FY 1999. This situation increases the deposit holders earning position. As similar with other banks, the lending rate of last seven FYs was higher than inflation rate. To make more precise, the above table are plotted on the graph as figure no 4-21.

The graph no 4-21 shows that the fisher effect was applicable for the interest rate of ADB/N because both the interest rate increases with the increase with inflation and decrease with the decrease in inflation. The inflation started to rise after the year 2005 but in very little pace.

**Figure No 4-21: Inflation Rate, Deposit Rate and Lending Rate of ADB/N**



The correlation coefficient between deposit interest rate and inflation for the case of ADB/N is found to be very highly positive i.e.  $r_{23} = 0.33642$ . This indicates that whenever inflation rise in the country the ADB/N also raised its deposit rate and vice versa. In this manner, the depositor holders of ADB/N never get negative real return during the last seven fiscal years except FY 2002. To verify this, if the

value of t-statistics is calculated then it is 0.798. The tabulated value for same at 5% level of significance and 5 d.f. is 2.571. So in this case t-calculated is greater than t-tabulated. This indicate that the relationship between two i.e. correlation coefficient is significant.

For lending rate and inflation rate, the correlation coefficient is 0.54006. This is moderate level of correlation. Similarly the value of t-calculated is 1.434. Since the value of t-calculated is less than tabulated value at 5% level of significance and 5 d.f. it can be said that the correlation coefficient is insignificant.

Thus it can be inferred that for ADB/N the deposit interest rate and inflation have positive relationship as suggested by Fisher but for the lending interest rate and inflation don't have the relationship as suggested by Fisher.

#### **4.4.4 Himalayan Bank Limited (HBL)**

The interest rate on deposit, interest rate on lending of HBL and inflation of the country during the seven FYs were tabulated on table 4-19.

The table 4-19 shows that the interest rate of deposit was fallen below the inflation rate on FY 2002 and 2006. At FY 2007, the depositor gets the interest rate equal to the inflation rate and at FY 2008; inflation rate is higher than deposit rate. Except FY 2004, 2005 & 2006 the depositor's real return was negative because inflation rate was higher than average deposit rate. Similarly, it is also seen that the lending rate was higher than inflation rate in every FY. But in FY 2002 the inflation rate and lending rate was nearly equal. This situation protects the lender but hurt the borrower. Because nominal rate (market rate) is computed by adding inflation premium to real rate of return. So when inflation rate is greater than market rate then real rate is negative.

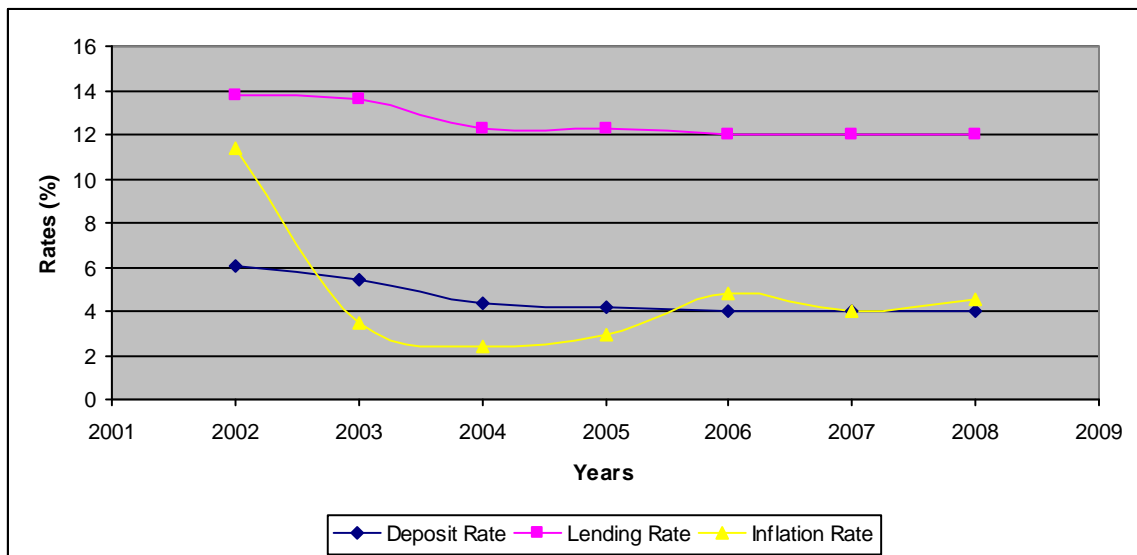
**Table no 4-19: Inflation Rate and Interest Rate of HBL**

Fiscal Year	CPI (1)	Inflation (2) %	Deposit Rate(3)	Lending Rate (4)
2002	130.4	11.4	6.07	13.81
2003	134.9	3.5	5.42	13.58
2004	138.1	2.4	4.35	12.30
2005	142.1	2.9	4.20	12.25
2006	148.9	4.8	4.02	12.00
2007	154.8	4.0	4.01	12.00
2008	161.8	4.5	4.01	12.00
Correlation coefficient. $r_{23}$		0.7077	Coefficient of Determination	
Correlation coefficient. $r_{24}$		0.6110	Coefficient of Determination	
<b>t-statistics</b>	<b>t-cal (Deposit) =2.24</b>	<b>t-tab = 2.571</b>		<b>Insignificant</b>
	<b>t-cal (Lending) =1.73</b>	<b>t-tab = 2.571</b>		<b>Insignificant</b>

Source: NRB, Research Department

The same phenomenon can be expressed by the help of graph 4-22.

**Figure No 4-22: Inflation Rate, Deposit Rate and Lending Rate of HBL**



The correlation coefficient between interest rate on deposit and inflation rate,  $r_{23}$  is 0.7077 which means that these two variables are positively correlated. An increment in inflation brings increment in interest rate on deposit and vice-versa. In general concept also, there is positive correlation between these variables.

The coefficient of determination  $r^2_{23} = 0.5008$  means that of the total variation in dependent variable (deposit interest rate); only 50.08% has been explained by the variation in independent variable (inflation rate). Similarly the t-value for testing the significance of the correlation coefficient is 2.24 which is less than the tabulated t-value for the 5 degree of freedom at 5 percent level of significance, 2.571. Since the calculated value is less than the tabulated value the correlation coefficient is not significant which means that interest rate on deposit of HBL is not correlated with the inflation rate and movement in inflation rates doesn't affect the interest rate on deposit significantly.

Similarly the relationship of interest rate on lending of HBL with inflation has also been examined. The coefficient of correlation between inflation and interest rate on lending,  $r_{24}$  is 0.6110 which shows that the variables are positively correlated. Movement in inflation rate leads movement in interest rate on lending in same direction. The t-value for testing the significance of correlation coefficient is 1.73. Since the calculated t-value is smaller than the tabulated t-value for 5 degree of freedom at 5 percent level of significance 2.57, the variables are not correlated significantly. This means that the lending rate of HBL is not significantly correlated with the inflation rate.

#### **4.4.5 Nepal Bangladesh Bank (NBB)**

The inflation rate during the last seven fiscal years, deposit rate of ADB/N and lending rate of NBB are tabulated in table no 4-20.

The table shows the structure of inflation, deposit rate and lending rate. During the seven FYs, inflation rate exceed the deposit rate only on the FY 2002 where inflation rate was 11.4% and deposit rate was 6.84%. Besides this, in other FY the deposit rate of NBB exceeded the inflation rate. Similarly for lending rate, in all years, interest rate of lending exceeds the inflation rate. The entire four rates were in decreasing trend but inflation was in increasing trend with little bit fluctuation. If the value of the table 4-20 is plotted in the graph then it will be seen like figure no 4-23.

**Table no 4-20: Inflation Rate and Interest Rate of NBB**

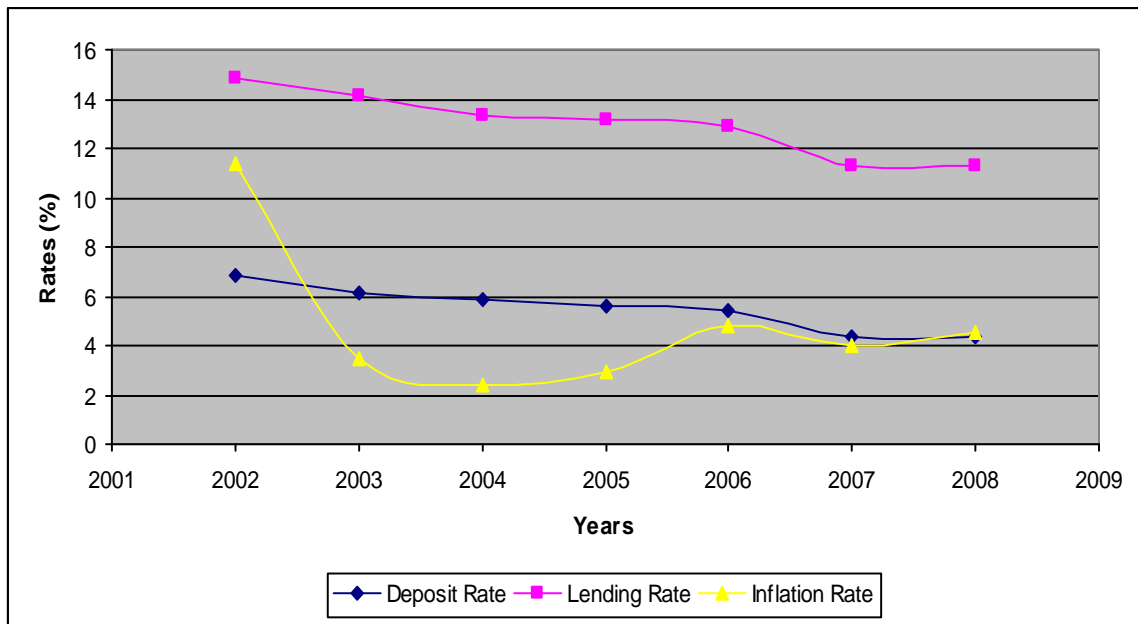
<b>Fiscal Year</b>	<b>CPI (1)</b>	<b>Inflation (2) %</b>	<b>Deposit Rate(3)</b>	<b>Lending Rate (4)</b>
2002	130.4	11.4	6.84	14.88
2003	134.9	3.5	6.17	14.13
2004	138.1	2.4	5.88	13.36
2005	142.1	2.9	5.59	13.16
2006	148.9	4.8	5.42	12.93
2007	154.8	4.0	4.38	11.30
2008	161.8	4.5	4.38	11.30
Correlation coefficient. $r_{23}$		0.4928	Coefficient of Determination 0.2429	
Correlation coefficient. $r_{24}$		0.47725	Coefficient of Determination 0.2277	
<b>t- statistics</b>	<b>t-cal (Deposit) =1.266</b>	<b>t-tab = 2.571</b>		<b>Insignificant</b>
	<b>t-cal (Lending) =1.214</b>	<b>t-tab = 2.571</b>		<b>Insignificant</b>

Source: NRB, Research Department

The coefficient of determination,  $r_{23}^2$  is 0.2429 means that, of the total variation in dependent variable (interest rate on deposit) is explained by the variation in independent variable (inflation rate) to the extent of 24.29 percent and other variables are responsible for remaining variation. The value of t for testing the significance of the correlation coefficient is 1.266 which is smaller than the table value. Since the calculated value is smaller than the tabulated value at 5 d.f. and 5% level of significance, 2.571, the variables are not significantly correlated. Even though there exists positive correlation, but it is statistically not significant. So we can say that change in inflation has not any significant impact on interest rate on deposit of NBB.



**Figure No 4-23: Inflation Rate, Deposit Rate and Lending Rate of NBB**



The correlation coefficient between interest rate on deposit and inflation rate,  $r_{23}$  is 0.4928 which shows that there is positive correlation between these two variables. When inflation increases, the interest rate on deposit offered by NBB also increases. The coefficient of determination,  $r^2_{23}$  is 0.2429 means that, of the total variation in dependent variable (interest rate on deposit) is explained by the variation in independent variable (inflation rate) to the extent of 24.29 percent and other variables are responsible for remaining variation. The value of t for testing the significance of the correlation coefficient is 1.266 which is smaller than the table value. Since the calculated value is smaller than the tabulated value at 5 d.f. and 5% level of significance, 2.571, the variables are not significantly correlated. Even though there exists positive correlation, but it is statistically not significant. So we can say that change in inflation has not any significant impact on interest rate on deposit of NBB.

In same manner the correlation coefficient between inflation and interest rate on deposit  $r_{24}$  shows that the variables are correlated and relationship is positive. Increase in inflation causes increase in interest rate on lending. But in similar manner the t-value for testing significance of correlation coefficient ( $t\text{-cal} = 1.214$ ) is smaller than the tabulated value at 5 d.f and 5% level of significance ( $t\text{-tab} =$

2.571). As the calculated value is smaller than the tabulated value, the correlation coefficient is insignificant which means that the variables, interest rate on lending and inflation rate, are not correlated even if the analysis shows a positive coefficient of 0.62082.

## **4.5 Major Findings of the Study**

In this research date mainly secondary data are used and analysed and is computed with the help of different financial statistical tools. The study is conducted to identify the practical applicability of some of the theories in the context of Nepal that are taught on the University and colleges. With this motive, this study mainly focuses on three objectives.

- a) To determine the actual situation of substitution effect in the context of Nepalese financial markets.
- b) To determine the relationship between lending rate and corresponding lending amount.
- c) To explore the actual relationship of inflation rate and interest rate.

The major findings of financial and statistical analysis are presented below:

- 1) The analysis of substitution effect for both fixed and saving deposit shows that substitution effect do not exist for all sample banks. This means that, people are oriented to deposit more amounts even if the interest rates on deposit are falling down every year. The increasing deposit amount clarifies this fact.
- 2) According to theory, lending interest rate and lending amount should have inverse relationship. From this study, it is found that all sample banks except NBL have inverse relationship. But among them, three banks have

strong relationship as required by theory. The increment in demand of loan able fund for NBB, HBL and ADB/N is due to the decline in lending rate because this relationship is proved statistically significant. But for RBB, increase in lending amount is not due to the decrease in lending rate but may be due to other factors, as it has lower t-calculated value than tabulated value. This indicates insignificant relationship between variables under study.

- 3) For fixed and saving deposits, it is found that all sample banks except ADB/N have moderate correlation with inflation rate. Similarly, all t-test values are insignificant except ADB/N. This shows that deposit rate and inflation rate are not related significantly though the Fisher theory suggest that there should be positive relationship. The case is same for lending rate and Inflation rate too.

# CHAPTER - V

## SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter highlights some selected actionable conclusion and recommendation on the basis of major findings of the study derived from the analysis in order to carry out this study mainly secondary data are used. The analysis of data is carried out with the help of various financial and statistical tools.

### 5.1 Summary

Interest is the reward for capital for its services in production. Like the other prices, interest is the price paid for use of the capital and is expressed as a rate percent per annum. If a person borrowed Rs 100 and pays Rs 10 per annum as the price of the loan, we say that the rate of interest is 10% per annum. Thus interest is the payment made by borrowers to the lender for the use of his fund for certain period. Natural resources of the country remain unused and unutilized due to the lack of financing and technical know-how. In order to mobilize the limited capital, the government of Nepal adopted the liberalization policy. As result up to now 29 commercial banks, 45 development banks, 21 micro credit development banks, 82 finance companies, 29 saving and co-operatives and 57 financial NGOs are established within the financial system of Nepal. Financial system is hoped to develop the economy and help to raise the living standard of the people. Financial intermediaries mobilize the fund by collecting the scattered resources from the savers and provide the collected funds to the users. The intermediaries of financial systems sustain by lending the fund on higher interest rate and paying the deposit holder a little interest. It means that such organization survive by making profit through a large interest spread on deposit and lending. The decision made to charge and provide interest on lending and deposit affects the profit position of the organization. Depositors are generally attracted by

offering the higher interest rates. Similarly high credit rates de-motivate the investors as a result investment in the country shrinks down. Though there are various factors in the economy that affects the deposit amount and lending amount; 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, inflation and interest rate, this study is undertaken.

After the liberal policy adopted by the government, NRB slowly loosen the rigidity to fix the interest rate that financial intermediaries charge and offer. But time to time, NRB use to issue directives regarding overall performance of the financial institutions. Therefore, in past few years back, banks and other financial institutions get freedom to quote the interest rate on lending and deposit. This creates the competition in the Nepalese economy. In this sense, this study is conducted to identify whether some of the theories of finance and economics are applicable or not in the Nepalese financial markets. These major theories are like 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, significance of the study, research hypothesis, and so on 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, factors affecting interest rate and so on are reviewed on that chapter. On the theories of interest, mainly four theories- The Classical Theory, Liquidity Preference Theory, Loan able Fund Theory and Rational Expectancies Theory - are reviewed. Similarly the factor affecting interest rate like default risk, marketability risk, exchange rate risk and so on are explained. Similarly, the in order to identify the relationship of interest rate and inflation, Fisher effect, Harrod-Keynes effect are also studied on the second chapter.

Research design used is mainly analytical. Out of the total financial system, five commercial banks are chosen for sample purpose; mainly secondary data are used for the analysis. These all are made on third chapter. Lastly on fourth

chapter, collected data are presented in tabular and graphic form and analyzed using various statistical tools like mean, standard deviation, correlation coefficient and t-statistics.

## 5.2 Conclusion

In the common parlance interest is the payment made by a borrower to the lender for the money borrowed and is expressed as rate percent per year. But in Economics widely different views have been put forth from the time to Aristotle of the present day. Interest has been defined in a variety of ways. Commonly, interest is regarded as the payment for the use of service of capital. From the presentation and analysis of data; using different financial tools the major findings can be tabulated as follows:

**Table No 5-1: Unified (Integrated) results of all data analysis**

Particulars		RBB	NBL	ADB/N	HBL	NBB
Substitution Effect (Deposit and Interest Rate)	r (Saving rate & Deposit)	-0.922	-0.901	-0.944	-0.905	-0.885
	r (Fixed rate and Deposit)	0.837	0.932	-0.914	-0.946	-0.747
	t-cal (Saving Deposit)	5.312	4.644	6.405	4.753	4.244
	t-cal (Fixed Deposit)	3.412	4.2924	5.052	6.517	2.514
Lending and Interest	r (lending)	0.907	0.831	-0.885	-0.868	-0.864
	t-cal (lending)	4.818	3.329	4.242	3.913	3.822
Inflation and Interest Rate. (Fisher Effects.)	r (inflation & deposit)	0.264	0.588	0.336	0.707	0.4924
	r (inflation & lending)	0.492	0.403	0.541	0.611	0.477
	t-cal (inflation & deposit)	.612	1.626	0.78	2.24	1.27
	t-cal (inflation & lending)	1.262	0.983	1.464	1.73	1.22

- The interest rates on both deposit and lending of all sample banks are found to be in decreasing trend. But contrary to this, deposit amount and lending amount is increasing every year except on fixed deposit of RBB and NBL. The government run bank's fixed deposit is found to be decreasing every year.
- The saving deposit amount and saving interest rate have negative relationship ranging from -0.885 to -0.944. It means that they have highly inverse relationship, if one variable increases, other variable decreases and vice-versa. This case is against the theory of substitution effect. This may be due to the fact that, in last seven FYs, people accumulated most of their funds on saving accounts though they don't get appropriate interest on it. It may be just because of unavailability of other acceptable investment opportunity, in which a separate study can be made. Similarly, the convenience of using saving accounts provokes the investor to deposit more on saving account. Similarly the excess supply of loan able fund (saving deposit) reduces the cost of fund (interest rate of saving account.)
- To clarify the aforementioned conclusion, the t-statistic of negative correlation between saving deposit amount and saving interest rate is significant. It means that they have strong negative relationship. Therefore it is concluded that for saving deposit, there is no substitution effect.
- Analysis of fixed deposit amount and fixed interest rate shows negative relationship except RBB and NBB. The correlation coefficient for RBB and NBB is 0.837 and 0.747 respectively. The RBB and NBB both have high degree of correlation. According to correlation coefficient, the substitution effects occur for both RBB and NBB in case of fixed deposit. But for other three banks - ADB/N, HBL and NBL – the correlation coefficient is negative meaning people deposit more money even if the bank offer the lower yield rate on fixed deposit. The magnitude of correlation is very high negative value for three banks.

- Even though, the correlation coefficient of RBB and NBB for fixed deposit amount and fixed deposit interest rate is positive, the t-statistics clarify that their relationship is not strong. The calculated value of t is found to be less than the tabulated value of t, so t-test indicates that there is no significant relationship between those two variables. Thus the decrease in deposit is not due to the decrease in interest rate but due to the other reasons. Therefore it is concluded that for fixed deposit also, there is no substitution effect at all.
- One of the variables that affect the demand of fund (lending activity) is lending interest rate. Theoretically, there is negative relationship between lending interest rate and lending amount. In this study for the 5 sample bank, it is found that all sample banks except NBL and RBB have negative correlation between these two variables. By using correlation tools, it can be inferred that all the sample banks except NBL and RBB have inverse relationship as suggest by theory.
- The t-test for correlation coefficient of each sample banks for negative relationship between lending interest 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. So it can be concluded that lending interest rate is also an important factor for expansion or contraction of lending amount.
- The relationship between interest rate on deposit and inflation rate is positive. It ranges from 0.264 to 0.707. The correlation coefficient for ADB/N is statistically significant but correlation coefficient of other sample organization is statistically insignificant. According to Fisher effect, there should be positive correlation between these two variables but the interest rate in Nepalese financial market is affected by inflation rate to some extent only. In conclusion it can be said that, the Fisher effect is not properly applicable in Nepalese financial market.



- The correlation between interest rate on lending and inflation rate is found to be moderately positive. The correlation coefficient among sample banks lies between 0.403 to 0.611. For all samples, the correlation coefficients are insignificant because their value lies below the tabulated value of t. So it can be said that lending interest rate in Nepalese financial market is affected by inflation only to some extent even though the theory says to exist a positive relationship.

### **5.3 Recommendation**

It is considered that this research will be fruitful for them to improve the present condition as well as for further research. Based on the analysis, interpretation & conclusions, certain recommendation can be made here so that the concerned authorities, future researchers, academicians, bankers can get some insights on the present conditions on above topics. The major recommendations of the study are as follows:

- a. The rise in the interest rate for instant will bring a decline in investment by making it less profitable. This will mean decline in output, employment and income.
- b. Saving depends upon the level of income; it is not possible to know the rate of interest unless the income level is known beforehand. And the income level itself cannot be known without already knowing the rate of interest.
- c. The high spread between deposit interest rate and lending interest rate is another factor to be considered. Higher spread merely increases the profit figures of the banks but at the same time it reduces the deposit collection and investment in the country. So the financial institutions are suggested to reduce the interest spread as minimum as possible.

- d. As the central bank of the country, NRB has power to specify the range or spread between lending rate and deposit rate. So NRB is suggested to specify the spread when ever there is higher gap between two interest rates in the country.
- e. Though the interest rate in free market is determined by the interplay of demand and supply, the concerned parties who fixed the interest rates are suggested to include the inflation premium as far as possible while fixing the interest rates. If the rate of inflation is not considered & real rate comes out to be negative then depositors may withdraw their money and utilize it on non-productive sectors.
- f. While reducing the lending rate, it is suggested to reduce more on productive sectors than non-productive sectors. If not possible then bankers can reduce the rate of all sectors proportionately.
- g. The lending rates of same bank on same sector are found to be different i.e. quoted on range. These types of inconsistency may bring misconception about that organization. So banks are suggested to quote one consistent rate than on range.
- h. Lending institutions are suggested to invest on new areas as well as to introduce competitive customer oriented schemes on lending and borrowing so that more lending and borrowing can be promoted and over liquidity problem may be solved.
- i. From the experience of collecting the secondary data, it is suggested that NRB should pay special attention to publish detail information on timely manner. The untimely publication of the bulletins handicaps the research workers and students
- j. Sample institutions are also suggested to include their interest rate structure in their annual report as well as kindly requested for the co-operation and sincere support to the research students.

- k. In order to generate more capital for the development of the economy, more deposit need to be collected by the financial institutions. For this the financial institutions are suggested to quote higher deposit interest rate as far as possible. Though this situation reduces their profit opportunities, but it will enhance the economic condition of the country in the long run.
  
- l. A lower rate of interest will increase investment, output, employment, income and savings.
  
- m. Considering the supply of capital to be interest-elastic, people might lend their present saving with the rise in the rate of interest and so increase the supply of capital.

## APPENDIX

### Structure of Interest Rates (Percentage per Annum)

	Mid-July				
	2004	2005	2006	2007	2008
<b>Nepal Rastra Bank</b>					
Bank Rate	5.5	5.5	5.5	5.5	6.25
Refinance Rates	2.0-5.5	2.0-5.5	2.0-5.5	1.5-5.5	1.5-6.25
<b>Government Securities</b>					
Treasury Bills (91 days)	3.78	2.98	1.47	3.94	3.25
National Saving Certificates	8.0-13.25	7.0-13.0	7-13.0	6.5-13.0	6.5-8.5
Development Bonds	3.0-8.0	3.0-8.0	3.0-8.0	3.0-8.0	3.0-8.0
<b>Inter bank Rate</b>	1..96	4..50	0.71		
<b>Commercial Banks</b>					
<b>Deposit Rates</b>					
Saving Deposits	2.5 - 6.25	2.5 - 6.0	2.0 – 5.0	1.75-5	2.5-5
Time Deposits					
1 Months	2.0-4.5	2.0-5..5	2.0-3.5	2-3.5	2.0-3.5
3Months	2.5-5.0	2.5-5.0	2.0-4.0	1.5-4.0	1.5-4.0
6Months	2.5-6.0	2.5-6.0	2.5-4.5	2.5-4.5	1.75-.5
1 Years	3.5-7.0	3.0-7.0	2.75-6.0	2.25-5.0	2.25-5.0
2Years and above	3.25-8.0	3.25-7.5	3.0-6.5	2.5-6.05	2.5-6.4
<b>Lending Rates</b>					
Industry	7.0-14.0	8.5-14.0	8.5-13.5	8.25-3.5	8.0-3.5
Agriculture	12.0-14.0	10.5-4.5	10.5-3.0	10.0-3.0	9.5-3.0
Export Bills	6.5-12.0	4.0-12.5	4.0-11.5	4.0-12.0	5.0-1.5
Commercial Loans	7.0-16.0	7.5-16.0	9.0-14.5	8.0-14.0	8.0-4.0
Overdrafts	11.0-17.0	10..0-7.0	10.0-6.0	5.0-14.5	6.5-4.5
<b>Cash Reserve Ratio (CRR)</b>					
With NRB	6.0	6.0	6.0	6	6
Cash in Vault	3.0	2.0	--	-	-

### Calculation of Average Interest Rate on Deposit of RBB

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	6.00%	6.00%	5.00%	4.75%	2.25%	2%	2%
<b>Fixed</b>							
7 Days	-	-	-	-	-	-	-
14 Days	-	-	-	-	-	-	-
1 Months	-	-	-	-	-	-	-
3 Months	4.00	5.00	4.00	3.75	3.00	2.25	2.25
6 Months	5.50	5.50	4.75	4.25	3.00	2.5	2.5
1 Years	7.00	7.00	6.00	5.75	3.75	3.25	3.25-3.5
Above 2Yrs	7.50	7.50	6.25	6.00	-	-	-
<b>Whole Mean</b>	<b>6</b>	<b>6.2</b>	<b>5.20</b>	<b>4.90</b>	<b>3.25</b>	<b>2.5</b>	<b>2.5</b>
<b>Fixed Deposit Mean</b>	<b>6</b>	<b>6.25</b>	<b>5.25</b>	<b>4.94</b>	<b>3</b>	<b>2.67</b>	<b>2.7</b>
<b>Std. Deviation</b>	1.42%						

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

$$\text{Whole Mean} = \frac{\sum (6 + 4 + 5.5 + 7 + 7.5)}{5} = 6\%$$

$$\text{Fixed Deposit Mean} = \frac{\sum (4 + 5.5 + 7 + 7.5)}{4} = 6\% \text{ and so on.}$$

### Calculation of Standard Deviation:

$$s.D(u) = \sqrt{\frac{1}{n} \sum (X - \bar{X})^2} = \sqrt{\frac{15.23}{7}} = 1.42\%$$

### Standard Deviation for RBB

Year	Average Interest(X)	(X - $\bar{X}$ )	(X - $\bar{X}$ ) <sup>2</sup>
2002	6	1.64	2.69
2003	6.2	1.84	3.39
2004	5.20	0.84	.706
2005	4.90	0.54	.291
2006	3.25	-1.11	1.23
2007	2.5	-1.86	3.46
2008	2.5	-1.86	3.46
	$\bar{X} = 4.36\%$		(X - $\bar{X}$ ) <sup>2</sup> = 15.23

## Credit of RBB

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	16.50	13.50	11.75	11.25	12.2	11	11
Export Credit	15.00	12.00	11.50	10.00	9.50	8	8
Import LC	12.00	13.00	12.00	10.00	10.0	9	9
HMG Bond	11.00	14.00	10.50	10.0	7.00	7	7
BG/CG	-	10.50	10.00	9.25	9.25	8.5	8.5
Other Guarantee	15.00	10.50	-	-	-	-	-
Industrial Loan	15.50	15.00	14.50	11.75	12.0	-	-
Commercial Loan	16.50	15.50	15.00	-	-	-	-
Priority Sector Loan	14.00	14.00	13.00	12.00	12.0	13	11.5
Working Capital	14.00	14.50	13.75	12.50	11.0	-	-
Hire Purchase	16.00	14.00	13.50	12.00	12.0	11	11
Others	16.50	15.5	15.00	12.00	12.0	11	11
<b>Average Int. Rate(1)</b>	<b>14.73</b>	<b>13.5</b>	<b>12.78</b>	<b>11.08</b>	<b>10.7</b>	<b>9.375</b>	<b>9.375</b>
Lending Amount(2)	29140.6	28424.7	28576	28258.9	26781.87	26422	25378.6
Correlation ( $r_{12}$ )	0.9072						
Coefficient of determination ( $r_{12}^2$ )	0.82264						
<b>t-statistics</b>	t-cal = 4.818		t-tab = 2.571		Significant.		

$$\text{Simple Correlation Coefficient (r)} = \frac{n\sum X_1 X_2 - (\sum X_1)(\sum X_2)}{\sqrt{n\sum X_1^2 - (\sum X_1)^2} \sqrt{n\sum X_2^2 - (\sum X_2)^2}}$$

Year	Lending Rate, $X_1$	Lending Amt, $X_2$	$X_1 X_2$	$X_1^2$	$X_2^2$
2002	14.73	29140.6	429241.038	216.9729	849174568
2003	13.5	28424.7	383733.45	182.25	807963570
2004	12.78	28576	365201.28	163.3284	816587776
2005	11.08	28258.9	313108.612	122.7664	798565429
2006	10.7	26781.87	286566.009	114.49	717268561
2007	9.375	26422.00	247706.25	87.89063	698122084
2008	9.375	25378.6	237924.375	87.89063	644073338
Sum	72.165	192982.7	2263481.01	975.589	5331755326

$$r = \frac{7 \times 2263481.01 - 72.162 \times 192982.7}{\sqrt{7 \times 975.589 - (72.165)^2} \sqrt{7 \times 5331755326 - (192982.7)^2}} = 0.9072$$

### Student t-statistics for hypothesis test:

Formula to compute t-calculation

$$t = \frac{r}{\sqrt{1 - r_{12}^2}} \times \sqrt{n - 2}$$

For RBB t-calculation for lending rate and lending amount is

$$t = \frac{0.9072}{\sqrt{1 - (0.9072)^2}} \times \sqrt{7 - 2}$$

$$= 4.818$$

### Interest rate structure on deposit of RBB as on Mid-July

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	6.00%	6.00%	5.00%	4.75%	2.25%	2%	2%
<b>Fixed</b>							
7 Days	-	-	-	-	-	-	-
14 Days	-	-	-	-	-	-	-
1 Months	-	-	-	-	-	-	-
3 Months	4.00	5.00	4.00	3.75	3.00	2.25	2.25
6 Months	5.50	5.50	4.75	4.25	3.00	2.5	2.5
1 Years	7.00	7.00	6.00	5.75	3.75	3.25	3.25-3.5
Above 2Yrs	7.50	7.50	6.25	6.00	-	-	-
<b>Whole Mean</b>	<b>6</b>	<b>6.2</b>	<b>5.20</b>	<b>4.90</b>	<b>3.25</b>	<b>2.5</b>	<b>2.5</b>
<b>Fixed Deposit Mean</b>	<b>6</b>	<b>6.25</b>	<b>5.25</b>	<b>4.94</b>	<b>3</b>	<b>2.67</b>	<b>2.7</b>
<b>Std. Deviation</b>	<b>1.42%</b>						

### Relationship between Interest Rate and Deposit amount of RBB

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposits Amounts (3)	Fixed Deposit Interest Rate(4)	Fixed Deposit Amounts (5)		
2002	6.00	15,904.8	6.00	17,836.4		
2003	6.00	18,822.1	6.25	16,477.2		
2004	5.00	18,997.2	5.25	15,166.6		
2005	4.75	20,861.2	4.94	13,579.5		
2006	2.25	23,288.9	3.00	11,572.8		
2007	2	26848.2	2.67	9001.5		
2008	2	29494.9	2.7	8103.8		
Correlation	$r_{23} = -0.92212$		$r_{45} = 0.8372$			
Coefficient of determination	$r^2_{23} = 0.8503$		$r^2_{45} = 0.69912$			
t-statistic	t-cal= 4.4	t-tab= 2.571	significant	t-cal= 1.302	t-tab= 2.571	Insignificant

### Interest rate structure on deposit of NBL on Mid-July

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	5.50%	5.50%	5.00%	4.75%	2.5%	2.5%	2.5%
<b>Fixed</b>							
7 Days	2.00	2.00	2.00	2.00	-	-	-
14 Days	2.50	2.50	-	-	-	-	-
1 Months	3.50	3.50	3.50	3.25	2.50	2.75	2.75
2 Months	-	-	-	3.50	2.75	-	-
3 Months	4.00	4.00	4.00	3.75	3.00	3.00	3.00
6 Months	5.00	5.00	4.50	4.25	3.50	3.25	3.25
1 Years	6.75	6.75	6.00	5.75	4.00	3.75	3.75
Above 2Yrs	7.00	7.00	6.25	6.00	-	-	-
<b>Whole Mean</b>	<b>4.54</b>	<b>4.54</b>	<b>4.46</b>	<b>4.16</b>	<b>3.05</b>	<b>3.05</b>	<b>3.05</b>
<b>Fixed Deposit Mean</b>	<b>4.39</b>	<b>4.39</b>	<b>4.38</b>	<b>4.07</b>	<b>3.15</b>	<b>3.18</b>	<b>3.1/8</b>
<b>Std. Deviation</b>	0.5724%						



### Relationship between Interest Rate and Deposit amount of NBL

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposits Amounts (3)	Fixed Deposit Interest Rate(4)	Fixed Deposit Amounts (5)		
2002	5.50	17888.4	4.39	12275.8		
2003	5.50	20281.6	4.39	9921.8		
2004	5.00	19851.5	4.38	9731.8		
2005	4.75	21534.5	4.07	8396.9		
2006	2.50	22063.0	3.15	7481.0		
2007	2.5	22671.8	3.18	6269.26		
2008	2.5	23547.9	3.18	5790.9		
Correlation	$r_{23} = -0.90123$		$r_{45} = 0.93216$			
Coefficient of determination	$r^2_{23} = 0.81125$		$r^2_{45} = 0.868847$			
t-statistic	t-cal=4.644	t-tab=2.571	Significant	t-cal=4.292	t-tab=2.571	Significant

### Interest rate structure on deposit of ADB/N as on Mid-July

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	6.25	6.25	5.25	5.25	4.00	3.00	3.00
<b>Fixed</b>							
7 Days	-	-	-	-	-		
14 Days	-	-	-	-	-		
1 Months	-	-	-	-	2.50	2.60	2-2.29
2 Months	-	-	-	-	-		
3 Months	-	-	-	-	3.00	2.5	2.5-2.75
6 Months	-	-	-	-	3.50	3.00	3-3.25
1 Years	7.75	7.75	6.50	6.50	4.75	3.5	4 -4.25
Above 2Yrs	8	8	6.75	6.75	5.75	4.45	4.25-5
<b>Whole Mean</b>	<b>6.50</b>	<b>6.50</b>	<b>6.50</b>	<b>6.50</b>	<b>6.50</b>	<b>3.04</b>	<b>3.25</b>
<b>Fixed Deposit Mean</b>	<b>7.88</b>	<b>7.88</b>	<b>6.63</b>	<b>6.63</b>	<b>5.25</b>	<b>3.05</b>	<b>3.32</b>
<b>Std. Deviation</b>	<b>1.8533</b>						

### Relationship between Interest Rate and Deposit amount of ADB/N

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposits Amounts (3)	Fixed Deposit Interest Rate(4)	Fixed Deposit Amounts (5)		
2002	6.25	8016.9	7.88	5498.4		
2003	6.25	10257.3	7.88	5182.3		
2004	5.25	11002.9	6.63	7754.3		
2005	5.25	12732.2	6.63	8756.2		
2006	4.00	14632.6	5.25	9846.8		
2007	3	15121.7	3.1	10087		
2008	3	16087.9	3.5	11443.4		
Correlation	$r_{23} = -0.94426$		$r_{45} = -0.914431$			
Coefficient of determination	$r^2_{23} = 0.8914$		$r^2_{45} = 0.83622$			
t-statistic	t-cal=6.405	t-tab=2.571	Significant	t-cal=5.0521	t-tab=2.571	Significant

### Interest rate structure on deposit of HBL as on Mid-July

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	5	4.25	4	3.75	3.75	0.4-2.75	2
<b>Fixed</b>							
7 Days	-	-	-	-	-	-	-
14 Days	3	2.5	2.3	2.3	2.3	1.75	1.75
1 Months	4.5	3.5	3.3	3.3	3.3	2	2
2 Months	-	-	-	-	-	-	-
3 Months	5	4.25	4	3.75	3.75	2.5	2.5
6 Months	6	4.5	4.25	4	4	3	3
1 Years	6.75	5.75	5.5	5.25	5.25	3.75	3.75
Above 2Yrs	7.75	5.75	6.00	5.75	5.75	3.75	3.75
<b>Whole Mean</b>	<b>5.42</b>	<b>4.35</b>	<b>4.20</b>	<b>4.02</b>	<b>4.01</b>	<b>2.786</b>	<b>2.678</b>
<b>Fixed Deposit Mean</b>	<b>5.5</b>	<b>4.38</b>	<b>4.23</b>	<b>4.06</b>	<b>4.05</b>	<b>2.79</b>	<b>2.79</b>
<b>Std. Deviation</b>	<b>0.8761</b>						

### Relationship between Interest Rate and Deposit amount of HBL

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposits Amounts (3)	Fixed Deposit Interest Rate(4)	Fixed Deposit Amounts (5)		
2002	5.00	6844.3	5.5	5109.4		
2003	4.25	9164.1	4.38	5668.1		
2004	4.00	9102.8	4.23	6044.9		
2005	3.75	10840.8	4.06	5880.7		
2006	3.75	11719.7	4.05	6043.7		
2007	0.4-2.75	12852.4	2.79	6364.3		
2008	2	14582.8	2.79	6350.2		
Correlation	$r_{23} = -0.90485$		$r_{45} = -0.94587$			
Coefficient of determination	$r^2_{23} = 0.818753$		$r^2_{45} = 0.89468$			
t-statistic	t-cal= 4.7525	t-tab= 2.571	Significant	t-cal= 6.51719	t-tab= 2.571	Significant

### Interest rate structure on deposit of NBB as on Mid-July

Deposit	2002	2003	2004	2005	2006	2007	2008
Savings	6.00	6.00	5.50	5.50	4.50	4.75	4.5
<b>Fixed</b>							
7 Days	-	-	-	-	-	-	-
14 Days	-	-	-	-	-	-	-
1 Months	4.00	4.00	3.50	3.50	3.50	3.5	3.5
2 Months	-	-	-	-	-	-	-
3 Months	5.50	5.00	4.50	4.50	4.00	4	4
6 Months	6.00	5.50	5.50	5.50	4.50	4.5	4.5
1 Years	7.50	7.00	7.00	6.50	4.75	4.75	4.75
Above 2Yrs	8.00	7.75	7.50	7.00	5.00	5	5
<b>Whole Mean</b>	<b>6.17</b>	<b>5.88</b>	<b>5.59</b>	<b>5.42</b>	<b>4.38</b>	<b>4.42</b>	<b>4.375</b>
<b>Fixed Deposit Mean</b>	<b>6.20</b>	<b>5.85</b>	<b>5.60</b>	<b>5.40</b>	<b>4.35</b>	<b>4.35</b>	<b>4.35</b>
<b>Std. Deviation</b>	0.73445						

### Relationship between Interest Rate and Deposit amount of NBB

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposits Amounts (3)	Fixed Deposit Interest Rate(4)	Fixed Deposit Amounts (5)		
2002	6.00	1101.9	6.20	4356.5		
2003	6.00	1694.9	5.85	5236.8		
2004	5.50	2086.9	5.60	5453.6		
2005	5.50	2913.6	5.40	5031.6		
2006	4.50	4225.9	4.35	4875.7		
2007	4.75	5475.2	4.35	3536.6		
2008	4.5	7414.8	4.35	2867.0		
<b>r</b>	$r_{23} = -0.884708$		$r_{45} = -0.74712$			
<b>r<sup>2</sup></b>	$r_{23}^2 = 0.782708$		$r_{45}^2 = 0.5584$			
t-statistic	t-cal= 4.2438	t-tab= 2.571	Significant	t-cal= 2.5135	t-tab= 2.571	Insignificant

### Lending Rate of RBB on Different Sectors during Seven FYs.

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	16.50	13.50	11.75	11.25	12.20	11	11
Export Credit	15.00	12.00	11.50	10.00	9.50	8	8
Import LC	12.00	13.00	12.00	10.00	10.00	9	9
HMG Bond	11.00	14.00	10.50	10.0	7.00	7	7
BG/CG	-	10.50	10.00	9.25	9.25	8.5	8.5
Other Guarantee	15.00	10.50	-	-	-	-	-
Industrial Loan	15.50	15.00	14.50	11.75	12.00	-	-
Commercial Loan	16.50	15.50	15.00	-	-	-	-
Priority Sector Loan	14.00	14.00	13.00	12.00	12.00	13	11.5
Working Capital	14.00	14.50	13.75	12.50	11.00	-	-
Hire Purchase	16.00	14.00	13.50	12.00	12.00	11	11
Others	16.50	15.5	15.00	12.00	12.00	11	11
<b>Average Int. Rate(1)</b>	<b>14.73</b>	<b>13.5</b>	<b>12.78</b>	<b>11.08</b>	<b>10.70</b>	<b>9.375</b>	<b>9.375</b>
Lending Amount(2)	29140.6	28424.7	28576	28258.9	26781.87	26422	25378.6
Correlation ( $r_{12}$ )	0.9072						
Coefficient of determination ( $r_{12}^2$ )	0.82264						
<b>t-statistics</b>	t-cal = 4.818		t-tab = 2.571		Significant.		

### Lending Rate NBL on Different Sectors during Seven FYs.

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	15.00	15.00	14.00	10.00	10.00	10.00	10.00
Export Credit	11.00	11.00	11.00	8.50	8.50	8	8
Import LC	11.00	11.00	11.00	8.50	-	-	-
HMG Bond	8.00	8.00	7.00	7.00	7.00	6.5	6.5
BG/CG	10.00	10.00	10.00	8.75	8.75	7	7
Industrial Loan	14.00	14.00	13.00	13.00	-	-	-
Commercial Loan	14.50	14.50	13.50	13.50	-	-	-
Priority Sector Loan	14.00	14.00	13.50	10.50	10.50	10	10
Poorer Sector Loan	10.50	10.50	10.00	8.00	8.00	7.5	7.5
Working Capital	14.00	14.00	13.00	10.00	10.00	10.00	10.00

Hire Purchase	14.00	14.00	14.00	11.00	11.00	10.5	10.5
Others	16.00	16.00	14.00	11.00	12.00	11	11
<b>Average Int. Rate(1)</b>	<b>12.67</b>	<b>12.67</b>	<b>12</b>	<b>9.98</b>	<b>9.53</b>	<b>8.61</b>	<b>8.61</b>
<b>Lending Amount(2)</b>	<b>22863.7</b>	<b>22062.3</b>	<b>20997.5</b>	<b>19266.1</b>	<b>19141.7</b>	<b>15191.6</b>	<b>13225.7</b>
Correlation ( $r_{12}$ )	0.83014						
Coefficient of determination ( $r_{12}^2$ )	0.68914						
<b>t-statistics</b>	t-tab = 2.571/			t-cal = 3.3293		significant	

### Lending Rate ADB/N on Different Sectors during Seven FYs.

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	18.00	18.00	17.00	17.00	16.00	15.5	12.5
Export Credit	-	-	-	-	-	-	-
Import LC	-	-	-	-	-	-	-
HMG Bond	-	-	-	-	-	-	6.5
BG/CG	-	-	-	-	-	-	-
Industrial Loan	15.00	15.00	14.00	14.00	13.00	13.00	10
Commercial Loan	16.00	16.00	15.50	15.50	14.00	11-14	11
Priority Sector Loan	-	-	-	-	-	-	-
Poorer Sector Loan	-	-	-	-	-	-	-
Working Capital	-	-	-	-	-	-	-
Hire Purchase	16.00	16.00	15.00	15.00	13.00	10-13	10
Others	16.00	16.00	15.00	15.00	13.50	12.5- 15.5	10-12.5
<b>Average Int. Rate(1)</b>	<b>16.20</b>	<b>16.20</b>	<b>15.30</b>	<b>15.30</b>	<b>13.90</b>	<b>12.6</b>	<b>10.125</b>
<b>Lending Amount(2)</b>	<b>4590.4</b>	<b>5700.5</b>	<b>6847.8</b>	<b>8794.7</b>	<b>9221.2</b>	<b>10698</b>	<b>11215.9</b>
Correlation ( $r_{12}$ )	-0.8846						
Coefficient of determination ( $r_{12}^2$ )	0.78256						
<b>t-statistics</b>	t-cal= 4.2438		t-tab = 2.571			Significant.	

### Lending Rate HBL on Different Sectors during Seven FYs.

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	14.50	13.00	13.75	13.25	13.25	9-12	9-12
Export Credit	11.00	9.50	9.50	9.50	9.50	8.75	8.75
Import LC	13.50	13.00	12.75	12.25	12.25	11.75	11.75
HMG Bond	10.00	8.50	8.00	8.00	8.00	5-6	5-6
BG/CG	11.00	9.50	10.50	10.50	10.50	9.25	9.25
Industrial Loan	15.50	14.00	13.50	13.00	13.00	12.75	12.75
Commercial Loan	15.50	14.00	13.75	13.25	13.25	12.5	12.5
Priority Sector Loan	14.50	14.00	13.00	13.00	13.00	12.25	12.25
Poorer Sector Loan	9.00	8.50	8.50	8.50	8.50	8.25	-
Term Loan	15.00	13.50	13.50	13.00	13.00	11.75	11.75
Working Capital	14.00	13.20	13.25	13.00	13.00	-	-
Hire Purchase	15.50	13.00	13.00	13.00	13.00	11.5	11.5
Others	17.50	16.25	16.25	15.75	15.75	13.5	13.5
<b>Average Int. Rate(1)</b>	<b>13.58</b>	<b>12.30</b>	<b>12.25</b>	<b>12.00</b>	<b>12.00</b>	<b>9.35</b>	<b>9.35</b>
<b>Lending Amount(2)</b>	<b>5372</b>	<b>7423.2</b>	<b>9176.9</b>	<b>9673.5</b>	<b>11074.2</b>	<b>13081.7</b>	<b>14017.3</b>
Correlation ( $r_{12}$ )	-0.8682						
Coefficient of determination ( $r_{12}^2$ )	0.75379						
<b>t-statistics</b>	t-cal = 3.9124		t-tab = 2.571		Significant.		

### Lending Rate NBB on Different Sectors during Seven FYs.

Sector	2002	2003	2004	2005	2006	2007	2008
Overdraft	15.5	15.00	14.50	14.00	13.00	-	-
Export Credit	12.50	12.00	11.75	11.75	10.50	9-9.5	9-9.5
Import LC	13.50	-	-	-	10.50	-	-
HMG Bond	11.00	9.00	9.00	9.00	8.50	7.5	7.5
BG/CG	15.00	13.00	13.00	13.00	12.00	8	8
Industrial Loan	15.00	14.50	14.00	14.00	-	10-12	10-12
Commercial Loan	15.50	15.00	14.50	14.00	-	8-9.5	8-9.5
Priority Sector Loan	13.00	13.00	13.00	13.00	11.00	10	10
Poorer Sector Loan	12.00	12.00	12.00	12.00	10.00	9.5	9.5
Term Loan	15.00	14.00	14.00	13.50	12.00	-	-
Working Capital	-	-	-	-	-	-	-
Hire Purchase	15.00	14.50	14.50	14.00	12.50	6-10.5	6-10.5
Others	16.50	15.00	14.50	14.00	13.00	13.00	13.00
<b>Average Int. Rate(1)</b>	<b>14.13</b>	<b>13.36</b>	<b>13.16</b>	<b>12.93</b>	<b>11.30</b>	<b>9.08</b>	<b>9.08</b>
<b>Lending Amount(2)</b>	<b>4611.8</b>	<b>7347.4</b>	<b>8222.1</b>	<b>8491.9</b>	<b>10253.6</b>	<b>9654</b>	<b>-</b>
Correlation ( $r_{12}$ )	-0.8634						
Coefficient of determination ( $r_{12}^2$ )	0.74545						
<b>t-statistics</b>	t-cal = 3.8221		t-tab = 2.571		Significant.		
<b>Std. Deviation</b>	1.33%						

## Inflation Rate and Interest Rate of RBB

Fiscal Year	CPI (1)	Inflation (2) %	Deposit Rate(3)	Lending Rate (4)
2002	130.4	11.4	6.45	15.85
2003	134.9	3.5	6.00	14.73
2004	138.1	2.4	6.20	13.50
2005	142.1	2.9	5.20	12.78
2006	148.9	4.8	4.90	11.08
2007	154.8	4.0	3.25	10.70
2008	161.8	4.5	2.67	10.80
Correlation coefficient. $r_{23}$		0.264153854	Coefficient of Determination	0.06977
Correlation coefficient. $r_{24}$		0.491951207	Coefficient of Determination	0.24201
<b>t-statistics</b>	<b>t-cal (Deposit) =0.612</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>
	<b>t-cal (Lending) =1.263</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>

## Inflation Rate and Interest Rate of NBL

Fiscal Year	CPI (1)	Inflation (2) %	Deposit Rate(3)	Lending Rate (4)
2002	130.4	11.4	5.96	13.86
2003	134.9	3.5	4.54	12.67
2004	138.1	2.4	4.54	12.67
2005	142.1	2.9	4.46	12.00
2006	148.9	4.8	4.16	9.98
2007	154.8	4.0	3.05	9.53
2008	161.8	4.5	2.85	10.03
Correlation coefficient. $r_{23}$		0.58824	Coefficient of Determination	0.34603
Correlation coefficient. $r_{24}$		0.40272	Coefficient of Determination	0.16218
<b>t-statistics</b>	<b>t-cal (Deposit) =1.626</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>
	<b>t-cal (Lending) =0.983</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>

### Inflation Rate and Interest Rate of ADB/N

Fiscal Year	CPI (1)	Inflation (2) %	Deposit Rate(3)	Lending Rate (4)
2002	130.4	11.4	8.15	17.40
2003	134.9	3.5	7.33	16.20
2004	138.1	2.4	7.33	16.20
2005	142.1	2.9	6.17	15.30
2006	148.9	4.8	6.17	15.30
2007	154.8	4.0	3.92	13.90
2008	161.8	4.5	3.08	14.20
Correlation coefficient. $r_{23}$		0.33642	Coefficient of Determination	
Correlation coefficient. $r_{24}$		0.54006	Coefficient of Determination	
<b>t-statistics</b>	<b>t-cal (Deposit) =0.798</b>		<b>t-tab = 2.571</b>	<b>Significant</b>
	<b>t-cal (Lending) =1.464</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>

### Inflation Rate and Interest Rate of HBL

Fiscal Year	CPI (1)	Inflation (2) %	Deposit Rate(3)	Lending Rate (4)
2002	130.4	11.4	6.07	13.81
2003	134.9	3.5	5.42	13.58
2004	138.1	2.4	4.35	12.30
2005	142.1	2.9	4.20	12.25
2006	148.9	4.8	4.02	12.00
2007	154.8	4.0	4.01	12.00
2008	161.8	4.5	4.01	12.00
Correlation coefficient. $r_{23}$		0.7077	Coefficient of Determination	
Correlation coefficient. $r_{24}$		0.6110	Coefficient of Determination	
<b>t-statistics</b>	<b>t-cal (Deposit) =2.24</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>
	<b>t-cal (Lending) =1.73</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>



### Inflation Rate and Interest Rate of NBB

Fiscal Year	CPI (1)	Inflation (2) %	Deposit Rate(3)	Lending Rate (4)
2002	130.4	11.4	6.84	14.88
2003	134.9	3.5	6.17	14.13
2004	138.1	2.4	5.88	13.36
2005	142.1	2.9	5.59	13.16
2006	148.9	4.8	5.42	12.93
2007	154.8	4.0	4.38	11.30
2008	161.8	4.5	4.38	11.30
Correlation coefficient. $r_{23}$		0.4928	Coefficient of Determination	
Correlation coefficient. $r_{24}$		0.47725	Coefficient of Determination	
<b>t-statistics</b>	<b>t-cal (Deposit) =1.266</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>
	<b>t-cal (Lending) =1.214</b>		<b>t-tab = 2.571</b>	<b>Insignificant</b>

**Note: Calculation is done by using calculator, excel work sheet and hence all the calculation is not shown here.**

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