INTEREST RATE BEHAVIOUR OF COMMERCIAL BANKS IN NEPAL

A THESIS

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RECOMMENDATION

This is to certify that the thesis

Submitted by:

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Entitled:

"INTEREST RATE BEHAVIOUR OF COMMERCIAL BANKS IN NEPAL"

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

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We have conducted the viva – voce examination of the Thesis

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"INTEREST RATE BEHAVIOUR OF COMMERCIAL BANKS IN NEPAL"

And found the Thesis to be the original work of the student written in accordance with the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirements for Master Degree of Business Studies (M.B.S.).

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DECLARATION

I hereby declare that this thesis entitled **"Interest Rate Behavior of Commercial Banks In Nepal"** Submitted to Research Department of Nepal Commerce Campus, Faculty of Management, Tribhuvan University, is my original work as partial fulfillment of the requirements of the degree of Master in Business Studies (M.B.S.), this is prepared under the supervision of Prof. Dr. Sushil Bhakta Mathema and Mr.Madan Kandel, Nepal Commerce Campus.

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This research study “Interest Rate Behavior 0f Commercial Banks In Nepal” which is a partial fulfillment for the Degree of Master of Business Studies (MBS) under the course designed by the Faculty of Management, T.U., is based on the prescribed research format involving the use of qualitative and quantitative model to explain the relationship between interest rates prevailed in the Nepalese Financial Market and their determining factors. Since, there was lack of such study relating to interest, it is hoped that this study will add one brick on the wall and will be beneficial to other researchers, students and teachers rate and their impact on prevailed interest rates taking the views and experiences of various activities.

Many helpful hands are involved to support me for preparing this thesis. I would like to express my deep gratitude to Prof. Dr. **Sushil Bhakta Mathema** Chairperson Research Department & thesis supervisor, Nepal Commerce Campus and thesis supervisor Mr. **Madan Kandel** for his scholarly guidance and support all the time despite his busy schedule. Without his guidance and valuable suggestion it would have been extremely difficult to bring this in this form.

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ABBREVIATIONS

ATM	Automated Teller Machine
B.S.	Bikram Sambat
CB	Commercial Bank
CEO	Chief Executive Director
d.f.	Degree of Freedom
F.Y.	Fiscal Year
GDP	Gross Domestic Product
HBL	Himalayan Bank Limited
i.e	That Is
Ltd.	Limited
MBS	Master of Business Studies
NA	Not Available
NABIL	Nepal Arab Bank Limited
NBL	Nepal Bank limited
NBBL	Nepal Bangaladesh Bank Limited
NEPSE	Nepal Stock Exchange
NMB	Nepal Merchant and Banking Finance Co. Ltd
NRB	Nepal Rastra Bank
Pvt	Private
RBB	Rastriya Banijya Bank
Rs.	Rupees
SBI	States Bank of India
TU	Tribhuvan University
US	United States
Viz	Namely
%	Percentage

CHAPTER -I

INTRODUCTION

1.1 GENERAL BACKGROUND

Financial institutions in Nepal, as an organized sector for capital mobilization, was started after the advent of Nepal Bank Limited in 1994 B.S as a joint venture between government and private sector under Nepal Bank Act 1994. It was the pioneer institution of modern banking system. Before that "Tejarath Adda" was fulfilling the banking need of the people, to some extent, by providing Loan on security, Nepal Rastra Bank was established on 14th Baisakh 2013 B.S under Nepal Rastra Bank Act 2012 to monetize the economy and to avoid the dual monetary system. Nepal Rastra Bank is the Central Bank, which formulates monetary and fiscal policies to strengthen and develop the financial system. A fully government owned bank; Rastriya Banijya Bank was established in 2022 B.S. under commercial Bank Act 2021. Similarly agriculture development bank was established in 2024 B.S. under its respective Act. After the restoration of democracy in 2046 B.S. and liberalization policy adopted by government, some commercial banks, development banks and finance companies emerged to provide banking facilities to the people. According to NRB, 32 commercial banks, 88 development banks,24 Micro finance development banks,70 finance companies, 16 credit co-operative (limited banking), 36 financial NGOs & 2 other Institutions are in operation taking license from Nepal Rastra Bank *(Source: Mid July 2012).* These different institutions collect money from public in different forms and invest in different sectors in different forms. These organizations survive by making profit and profit for these institutions is different between the interest rate they provided and earned minus operating expenses. So, interest rate is crucial in survival and development of financial institutions.

1.1.1 Interest: The Price of Money

When we examine how money affects economic activity, we will focus on the interest rate, which is often called "The price of money". Interest is the payment made for the use of money. The interest rate is the amount of the interest paid per unit of time expressed as a percentage of the amount borrowed. In other words, people must pay for opportunity to borrow money. The cost of borrowing money, measured in rupee per year per rupee borrowed, is the interest rate *(Samuelson, 1999: 469).*

Financial institutions, as financial intermediaries, collect money from savers in the form of deposit and provide that for business sector in the form of loan. These institutions pay the interest to the depositors for the money- borrowed from them and charge interest from the borrowers for money-lent to them.

As defined earlier, the interest rate is the price of money: the price renting the use of resources that money commands for a specified period of time. As with any price determined by the free market play of demand and supply in a market economy, the price of money-the interest rate plays a vital role in the allocation of resources and in the decision making of consumers and businesses. For example, an increase in the interest rate provides additional incentives to individuals and others to postpone current consumption and there by free resources for investment. Government polices intended to expand the volume of saving; should aim at increasing the attractiveness of saving by increasing the return to saving- the interest. Interest rates send price signals to borrowers, lenders, and savers. Higher interest rate generally brings a greater volume of savings and stimulates the lending of funds. Lower rate of interest, on the other hand, tend to dampen the flow of borrowing and reduce lending activity. Higher interest rates tend to reduce the volume of borrowing and capital investment, and lower rates stimulate borrowing and investment spending *(Rose, 1997: 101).*

Investment is function of interest rate. The quality and flow of investment determines the income in the economy. Therefore, the impact of interest rate is on both the saving and investment in the economy. Further the borrowings and saving are always influenced by the interest rates. The cost of production which depends upon the production function is influenced by the interest rate, since the credit is also one of the components of production process. The saving in investment in the economy which are influenced by the interest rates are the real economic variables. The incomes and expenditures of the variable sectors of the economy result in excess savings or excess investment in each of the sectors. *(Vaidya, 2002:17)* The sector having excess savings provides them to those with excess investment.

Interest rate in the free market economy is determined by the free interplay of the demand and supply forces. Although interest rate is influenced by various factors, the main factors which determine the interest rate are demand for and supply of loanable fund. If supply

increases and demand remains constant, interest rates in the market decrease. Similarly if demand for loanable fund increases and supply remain constant, interest rates in the market increase. But Nepalese economy has not developed up to that level so that free market can determine the interest rates. Nepal Rastra Bank, as a guardian, fixes the terms and conditions regarding the interest and other activities of financial institutions in Nepal. But recent years, banks are permitted to fix the interest rate they charge and offer on loan and deposit.

1.1.2 Brief History of Interest Rate in Nepal

While observing the historical background of the interest rate structure of Nepal, frequent changes can be noticed. 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. A study of annual reports of Nepal Rastra Bank (NRB) avails the changes made, the objectives behind such changes and their justifications. *(Source: Annual Report-2008, NRB)*

On April 13, 1965 the interest on deposits was increased by one percentage point which prevailed to August 30, 1966. Similarly other two categories of fixed deposits 3 to 5 years and above five years were created and interest rate on those two types of deposits was 5 percent and 6 percent respectively. On August 31, 1966, the interest rate on all types of deposit was increased approximately by one percentage point. The interest structure was again revised on April 14, 1971. The rate of interest on saving deposit were raised to 5 percent (increased by 0.5 percentage point) but the rate of interest on 3 months and 6 months fixed deposit were reduced. However, the rate on fixed deposits having the maturities of more than one year was raised varyingly by 1 to 1.75 percentage points Another change in interest rate structure was introduced on July 16,1974.the interest rate on saving deposits was fixed at 6.5 percent; that on fixed deposits of three and six months maturities were kept constant and interest rate on all other categories of fixed deposits were raised by two percentage points The lending rates of commercial banks were also revised respectively. The lending rates were lowered in some cases, however, the loan for unproductive purposes were made costlier by two percentage points. Giving different justifications, NRB issued directives to the banks and financial institutions to apply new interest rates from April 18, 1975 which was a drastic change. The interest rate was increased from 6.5% to 8% on saving deposits and that on fixed deposits of 3 months and

6 months were increased to 4 percent and 10 percent respectively. The interest rate on one -year deposits was increased from 9.5 percent to 16 percent and all two years and above fixed deposits rate was increased from 9.75 percent to 16 percent. Prior to the revision there were nine different categories of lending carrying the interest rate between 8 to 15 percent. But the revision categorized the loan only in two categories.15 percent interest rate was applicable to all the loans to small sectors, agriculture sector, industry, export credit and credit against development bonds whereas 18 percent minimum rate was fixed for other purposes. The interest rate on the loan against fixed deposit receipts was fixed two percent high than on fixed deposits. On February 12, 1977, NRB revised interest rate again. The rate offered on savings and three month fixed deposits was lowered to 9 percent (by one percentage point). But the interest rate on year fixed deposits was lowered by 2 percentage point to 12 percent and that on two years and above fixed deposit was also declined by two percentage point. Next amendment in interest rate was made on 15 June,1982, and the interest rates on all types of deposits were increased by 0.5 percentage point. And the lending rates on all types of loans were raised by one percentage point. NRB authorized the commercial banks and other financial institutions to charge an additional 2.5 percent interest above the specific rate on all over due loans and minimum of 17 percent interest rate on misutilized loan to agriculture, industry and service sectors. A provision of one percent rebate for timely repayments was also made. NRB further revised the interest rate on August 17, 1982 which was a slight change on lending rate only. Giving right in offering the interest rate on saving and time deposit to the extent of 1.5 percent and 1 percent respectively above prevailing rate, NRB issued direction to the commercial banks. On May 29, 1986, commercial banks and financial institutions were given freedom in fixing the interest rate on deposits and loans. But the higher limit and lower limit was fixed by NRB. The minimum of 8.5 percent interest rate was fixed for saving deposits. The rate on fixed deposits of less one year's maturity needed to be at least not less than the rate on saving deposits. Minimum of 12 percent interest rate was fixed on one year fixed deposits. The interest rate on more than one year's fixed deposits could be fixed by the banks themselves but that ought to be higher than the rate on one year fixed deposit. Banks and financial institutions were given freedom to fix lending rate subject to a minimum of 15 percent for the priority sector. On August 31, 1989, commercial banks and financial institutions were granted complete freedom in determining their own deposit and

lending rates. They had also been given complete freedom to make rules and working procedures about the kinds of deposits, time period of deposits, repayment conditions, penal interest rates and interest capitalization over due loans. *(Source: Bank and financial intuitions Act 2063)* NRB since then it has not administered and regulated interest rate. Monetary management has been conducted through open market operation. However, on August 22, 1992 NRB issued some directives to banks and financial institutions to clearly spell out the interest on deposits of at least up to one year, not to create the range of percentage in interest rates on credit of same types and purposes and, to stop fixing the interest rate on flat basis. In addition to this, NRB also instructed the bank and financial institutions to limit their interest rate on deposit and credit at 6 percent within the mid-December 1993. Then after, NRB has not regulated interest directly but has given instructions in time to time regarding the interest rate and terms and conditions of lending and keeping accounts. At last instructions to banks and financial institutions were issued in 2002. Currently interest rate spread required to be maintained by bank and financial institutions has also been removed.

As previously stated, the interest rate structure in the beginning was prey central bank's matter of concern. But considering the needs of the country, NRB took a flexible approach in making some adjustments in interest rates by putting control on it. However, the impact of economic liberalization in developing countries as result of financial globalization began to influence Nepal. This ultimately brought deregulation in interest rate by leaving the interest rate to be determined by market forces.

1.2 PROFILE OF SELECTED COMMERCIAL BANKS

Commercial banks in Nepal have been establishing to maintain economic facilities and welfare to provide loan to agriculture, industry and for commercial purpose and to provide banking services and facilities to the public. Commercial banks in Nepal, establish under the company act and commercial bank act. Currently 32 commercial banks with their 1369 branches (Source mid June 2012) with in the country are operating their functions-adopting deposit, providing loans and more other. NBBL was established to improve the rural activities in Nepal.

The word bank only means to focus commercial bank. In short, we could say those organizations whose transaction is money and credit said to be bank. The word bank is said to have organized from the French word "Banque" and Italian word "Banca". Its

literal meaning is to lend cash, money and to exchange money sitting on the bench respectively. In ancient time, goldsmith where exchanging money sitting on the bench. Their branches used to be broken by the depositors when they were unable to meet their liabilities. Gradually people started to keep their gold, metals and coins and other valuable ornaments with goldsmith and moneylenders. It was observed that money was not withdrawn at once. Hence they started lending on interest. They started to lend deposited money for the short time period. They receive interest from their invested amount. Later on that type of transaction were developed as banking transaction and the bank is originated.

In other word, the bank is an institution whose essential operation is to take deposit from public and to lend money. Banks accumulate idle money from general public by providing attractive sound interest rate in their deposits and disburse the collected deposits as a loan to business organizations, industries, agriculture sector and needy people etc. So we can say that the main task of commercial bank is to mobilize idle sources in productive areas by collecting it from scattered sources and generating profit. The bank plays an important role in our economy by providing effective service efficiently towards the attainment of economic development.

Banking has come to present advanced form through various stages. Traditional form of banking was traced during the civilization of Greek, Rome and Mesopotamia. But the first modern banking institution was originated at Italy in 1157 A.D named as "The Bank of Venice". "The Bank of England" was established in 1694 A.D as the first central bank; add a strong brick on the development of banking sector. After this evolution, there came a remarkable change in the process of establishing the banking institution. This was a big landmark in the history of banking development. The ideal of commercial banks rapidly spread all over the world only after the foundation of this bank.

In Nepal, banking in true sense of term started with the inception of "Nepal Bank Ltd." on 30th Kartik, 1994 B.S. is carried out functions of commercial Bank. Having felt the need of a central Bank," Nepal Rastra Bank" was established in 2013 B.S. under the Central Bank Act, 2012 to fulfill the adequate services for increasing commercial activities in the country. "Rastriya Banijya Bank (R.B.B)" was established in 2022 B.S. as a fully government owned commercial bank. Now there are 32 commercial banks in total. On the

other hand there are 88 development banks, 70 finance companies and many other financial institutions.

Commercial banks approved by Nepal Rastra Bank to perform commercial bank functions till the date:

S.N	Name of Commercial Banks	Operation Date (in A.D.)
1.	Nepal Bank Ltd.	1937/11/15
2.	Rastriya Banijya Bank Ltd.	1966/01/23
3.	**Nabil Bank Ltd.**	1984/07/16
4.	Nepal Investment Bank Ltd.	1986/03/09
5.	Standard Chartered Bank Nepal Ltd.	1987/02/28
6.	**Himalayan Bank Ltd.**	1993/01/18
7.	Nepal SBI Bank Ltd.	1993/07/07
8.	**Nepal Bangladesh Bank Ltd.**	1994/06/06
9.	Everest Bank Ltd.	1994/10/18
10.	Bank of Kathmandu Ltd.	1995/03/12
11.	Nepal Credit and Commerce Bank Ltd.	1996/10/14
12.	Lumbini Bank Ltd.	1998/07/17
13.	NIC Asia Bank Ltd.	1998/07/21
14.	Machhapuchchhre Bank Ltd.	2000/10/03
15.	Kumari Bank Ltd.	2001/04/03
16.	Laxmi Bank Ltd.	2002/04/03
17.	Siddartha Bank Ltd.	2002/12/24
18.	Agriculture Development Bank Ltd.	1968/01/21
19.	Global IME Bank Ltd.	2007/01/02
20.	Citizens Bank International Ltd.	2007/04/20
21.	Prime Commercial Bank Ltd.	2007/09/24
22.	Sunrise Bank Ltd.	2007/10/12
23.	Grand Bank Nepal Ltd.	2008/05/25
24.	NMB Bank Ltd.	2008/06/02
25.	Kist Bank Ltd.	2009/05/07

26.	Janata Bank Nepal Ltd.	2010/04/05
27.	Mega Bank Nepal Ltd.	2010/07/23
28.	Civil Bank Ltd.	2010/11/26
29.	Century Commercial Bank Ltd.	2011/03/10
30.	Sanima Bank Ltd.	2012/02/15

(Source mid July 2014)

Nabil Bank:

The history of banking dates back to sixteenth centuries. However, in Nepal formal banking system was introduced only in November 1937 with the establishment of Nepal Bank Ltd. (NBL) which is regarded as pioneer institution of modern banking system and served as a sole financial institution of the country for nearly two decades. Prior to the establishment of this bank, the banking needs of people were fulfilled to certain extend only by the organized financial institution" The Tejarath Adda". However, the services it offered were not sufficient. Actually, the formation of high committee board" Udyog Parishad" was indeed a landmark in opening new avenue in field of banking, industries and commerce. Accordingly NBL was established in November 1937 under Nepal Bank Act as joint venture between government and private sector and replaced the "Tejarath Adda" by taking over its operation and overcoming its limitations

Nabil Bank Limited is the first commercial joint venture bank of Nepalese banking history. It was established in 1984, July 16 under the company act 1964. It was established under a technical service agreement with Dubai Bank Limited, Dubai, which was later merged with Emirates Bank Limited, Dubai.

Now its present shareholdings are distributed as follows:

1) 50% is owned by NB International Ltd. (Ireland)

2) 6.15% by Nepal Industrial Development Corporation

3) 10% by Other Institutional Investors

4) 3.85% by Other Promoters Group and

5) 30% by Public Share holders

Nabil Bank is the most successful joint venture organization in Nepal registering strong growth in balance footings as well as profits year after year.

The bank provides a complete range of personal, Commercial, corporate banking and related financial services through its 49 branches and 2 counters. The head office of Nabil bank Ltd. is located at Nabil Center, Beena Marga, Durbar Marg, Kathmandu, Nepal. Out of total branches 22 branches are in the Kathmandu valley and remaining branches are in Chandragadhi,Birtamod,Damak,Biratnagar,Itahari,Dharan,Khandbari,Janakpur,Charikot, Dhulikhel,Hetauda,Birgunj,Narayangadh,Gorkha,Beshishar,Pokhara,Baglung,Bhalwadi,Bhairahawa,Butwal,Ghorahi,Tulsipur,Nepalgunj,Dhangadi & Mahendranagar. Their counters are serving at Kathmandu Metropolitan City Office, KTM & Pokhara Airport, Pokhara. The main function of head office is to check account of branches, control their credit, suggest for operating accounting and other managerial function and it handle a certain number of special customer of Kamaladi branch having all commercial functions.

A board of directors is formed by the act. The board of directors control and organize the regulation and management functions.

Functions of Nabil Bank Limited:

Nabil Bank Ltd. has been providing different services and products to their customer from their 49 branches inside the Kathmandu valley and outside. It has announced some distinct product, services and activities, which are as follows:

1) Tele-banking:

To provide more prompt and efficient service to customer, Nabil bank Ltd has been the innovator in introducing tele-banking service. The customer just have to dial a pre-specified telephone number and they will be able to make inquiries about balance and statement.

2) Western Union Money Transfer:

Nabil is the sole principle Agent Bank in Nepal of Western Union Financial services and facilitates transfer of funds; through on on-line computer system, instantly to or from more various countries.

***3) Cards and ATMs*:**

Among the many 'first' to the credit of Nabil, the business of credit card Issuance and acquiring is one. It introduced Master Card to the Nepalese market,

Nepalese Rupees and US Dollars and now also issues Visa Card and is shortly to introduce Visa Electron.

A growing network ATM facility is available to account holders. Debit cards with PIN numbers are issued to enable customers to avail of 24 hour ATM facility through 85 ATM counters.

4) Correspondent Relationships:

Nabil has 190 correspondent banking relationships and has drawing arrangement with Banks in 47 countries.

***5) Swift*:**

Nabil is a member of SWIFT. It provides SWIFT services to its customers.

Introduction of Deposit:

Among many functions of commercial bank, the main function is deposit function, which all the commercial banks perform. In simple, deposit is the function of collecting money from savers. Bank accepts deposits from those that can save but can't utilize profitably. People know that by depositing in the bank they could avail with many more facilities.

By saving in the bank, people have the opportunity of earning interest, useful in future contingencies; avoid risk, such as theft lost, accidents. The deposits of commercial bank are increasing because people know its importance. To attract the people toward the deposit, bank maintains different types of deposit account. These are:

Fixed deposit account:

In this account money is deposited for a fixed period of time, which cannot be withdrawn before the maturity of time. The rate of interest on this account is higher than other accounts. It is also known as time deposit or time liabilities. Generally this is for 3 months, 6 months, 1 year, 2 years, 3 years, 4 years and 5 years.

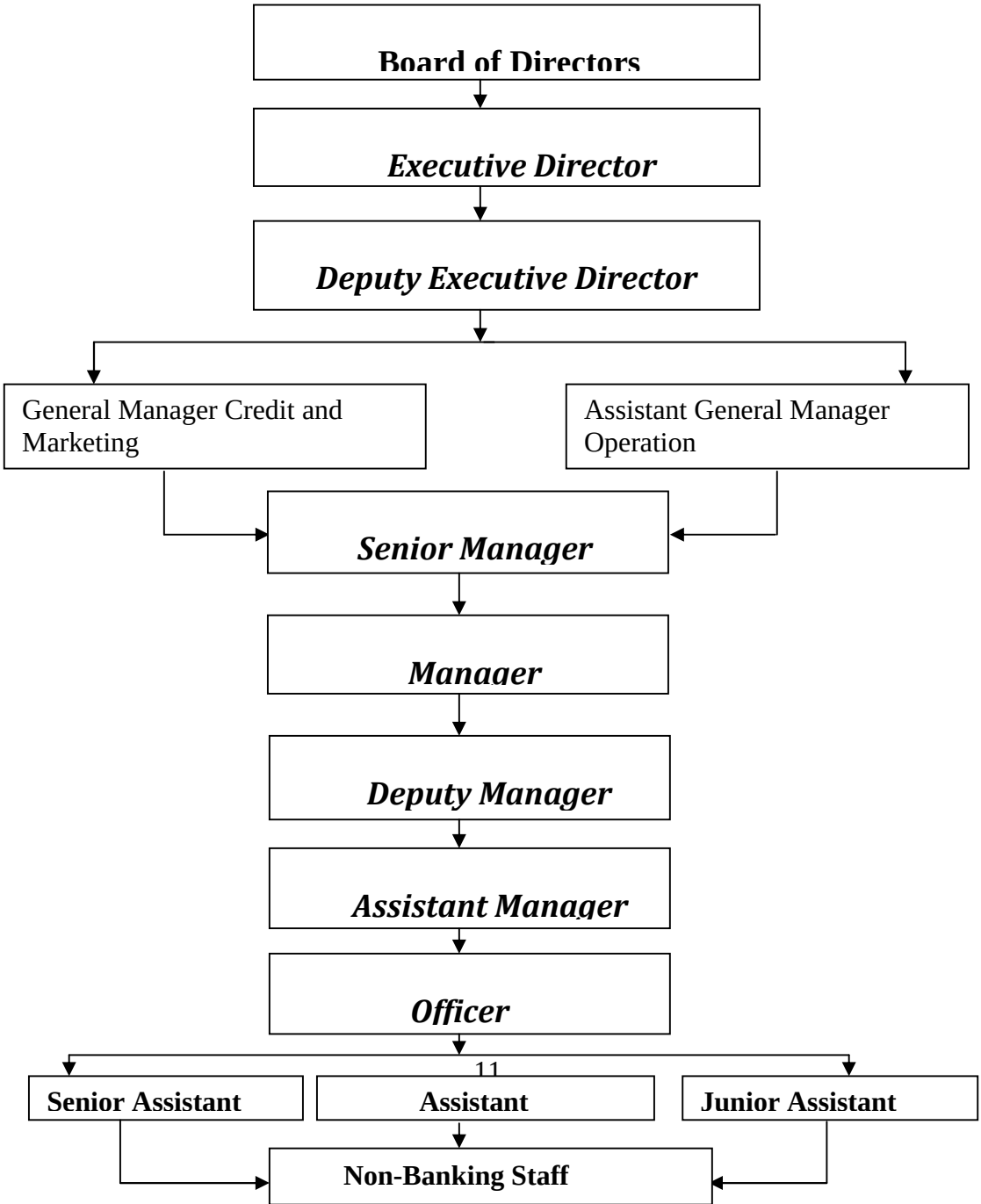
Saving deposit account:

The main aim of this account is to encourage and mobilize small saving of the middle class and general public. In this account only the limited account can be withdrawn and the bank deposit provide lower rate of interest in comparison to fixed deposit account.

Current deposit account:

This is the most important types of deposit maintain by the businessman and institutions. Money from this account can be withdrawn at any amount at any time during the office hours up to balance of his account. Bank paid no interest in such account but but depositors may have to pay incidental (handling) charges to the bank for the services rendered by the bank. It is also called demand deposit.

Organizational Structure of Nabil Bank:



Himalayan Bank Limited (HBL):

Himalayan Bank Limited was established in 1992 AD by the distinguished business personalities of Nepal in partnership with Employees Provident Fund and Habib Bank Limited, one of the largest commercial banks of Pakistan. But the banks operation was commenced from January 1993 only. It is the first 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 the 15 branches in Kathmandu Valley they are Thamel, Maharajgunj, New Road, Bhaktapur, Patan, Soyambhu,New Baneshwor, Sorakhutte, Dilli Bazar etc and 25 branches outside the valley, they are Damak, Baglung, Birgunj, Pokhara, Dharan, Palpa etc. The bank is also operating a counter the premise of the Royal Palace. The Bank has a very aggressive plan of establishing more branches in different parts of 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 the 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 further adoption of new technology. HBL is committed to be a **"BANK WITH A DIFFERENCE",** which was awarded during 2059 BS as **"NATIONAL EXCELLENCE AWARD"** by FNCCI. HBL has listed on Nepal stock exchange in July 5, 1993. The Share participation of the bank is 65% Other Entities, 15% general public and 20% Foreign Ownership.

Member

Mr. Manoj Bahadur Shrestha (Chairman)

Mr. Ashoke S. Rana (Chief Executive Officer)
Mr. Ejaz Qadeer Gill (Senior General Manager)
Mr. Sushiel Joshi (General Manager)

Capital Structure (Source: Mid July 2012)

Share Capital	Current Year	Last Year
Authorized Capital: (30,000,000 ordinary share @ Rs 100 per share.)	3,000,000,000	3,000,000,000
Issued Capital: (24,000,000 ordinary share @ Rs. 100 per share)	2,400,000,000	2,000,000,000
Paid up Capital: (24,000,000 ordinary share @ Rs. 100 per share)	2,400,000,000	2,000,000,000

Nepal Bangladesh Bank

A bank is an institution, which accepts deposit from public, and intern advances loans by creating credit. In other words, a Banks is an organization whose main operation are concerned with accumulation of temporary idle money of the general public for the purpose of advancing and lending to other expenditure. Bank collect deposit from general public by providing them sound interest and invest those accumulated fund to business houses, industry, agricultural sector and needy individual. Banks are the channel through which money are mobilized and distributed throughout the economy. According to crowther "the banker's is to take the debts of other people to offer his own exchange, and there by create money"a defines a bank as "An organization principle operations are concerned with the accumulation of the temporarily idle money of the general public for the purpose of advancing to other for expenditure" Banks play a vital role in the economic development of a country. Commercial banks are those who pool together the saving community and arrange for their productive use CB are the heat of financial system .CB occupies an important place in the economic development of our country, by playing active roles have changed the economic structure of the world.

Modern banking is originated in mediaeval Italy, despite strong Christian prohibitions against usury according to the canon low. First of all the Bank of Venice was established in Venice, Italy in 1157A.A.Which was the first ancient bank, then after Bank of Barcelona and Bank of Genoa ware established in 1401 and 1407 respectively Banking slowly spread to the rest of the Europe. In English the banking began with the English goldsmith only after 1640. After the establishment of the bank of England in 1694 there came a remarkable change in the process of developing the banking institutions. This was big landmark in the history of banking development. After the establishment of this bank, the idea of CBs rapidly spread all over the world.

First if all Nepal Bank Limited was established in Kartik 30, 1994 B.S. Nepal bank limited and Rastriya Banijya Bank were only the CBs operating over the last three decades in Nepal before the opening of foreign joint venture Banks.

Therefore the initial joint venture Banks in Nepal are Nepal Arab Bank limited, Nepal Indosuez Bank limited, Standard Chartered Bank Nepal Limited, Nepal Bangladesh Bank

Ltd, Himalayan Bank Ltd, Everest Bank Ltd, Nepal Bank of Ceylon Ltd, Bank of Kathmandu and Nepal S.B.I Bank limited.

Nepal Bangladesh Bank was established in June 1994 under the company Act 1964. NBB was established with an authorized capital of Rs.240 million and paid up capital of Rs. 60 million as joint venture Bank with IFIC Bank Ltd of Bangladesh. It was established with the equity of 50% financed by Bangladesh bank (IFIC) Bangladesh, 20% by Nepalese established organization and the rest 30% was issued to general public .The Bank is managed by International finance investment and commercial Bank Ltd of Bangladesh, In accordance with joint venture and Technical services agreement signed it and Nepali promoters.

The Prime objective of the bank is to render banking service to the different sectors like industries traders, businessman, priority sector, small entrepreneur and weaker section of the society and every other people who need banking service. The head office of NBBL is situated at Bijuli Bazar, New Baneshowor, Kathmandu. At present, the Bank is providing Modern Banking services to its clients through 20 branches situated at Putalisadak, New Road, Bhaisepati, Janakpur, kalimati, Butwal, Hetauda, Birgunj, Nepalgunj, Biratnagar, Pokhara, Lalitpur, Bhaktapur etc. Considering the need of the clients from other part of the country, the Bank has formulated its policy of geographical expansion. Up to now it has accommodated a large number of clients and has been able to provide excellent services to its clients.

The Share participation of the bank is 16.29% Other Institutions, 48.35% general public, 12.41% Others and 22.95% Foreign Ownership (Source, Mid July 2012).

1.3 FOCUS OF THE STUDY

Most of the public limited financial institutions in Nepal are profit motivated. These organizations survive who can make profit in the long-run. The profit for these organizations is the interest spread between sources and uses of funds. The main focus of

this study is to examine the influencing factors of interest rate in Nepalese banking sector taking sample of three commercial banks. Interest rate is believed as one of the most important factors for the development of financial institutions and financial system as a whole. This study also attempts to analyze the methods used by various financial institutions to calculate the interest. The study is also concentrated on whether the theories on interest rate founded by various economists match in Nepalese context or not. Since interest rate is the main concern of every individual who saves (deposits) and borrows money, it is important to study about interest rate. Therefore this study focuses on the interest rate of different financial institutions and the central bank's role regarding interest rate.

1.4 STATEMENT OF THE PROBLEM

Most of the natural resources of the Nepal are not being utilized due to the capital inadequacy. Nepal is exporting raw material instead of producing goods and services from these. If financing is available many factories could be established to take benefit from utilization of resources which would increase the employment, standard of living and status of country's economy. Financial institutions in Nepal are committed to avail the capital. Different institutions have been established targeting different group. Interest charged and offered by the institutions was regulated by central bank until before few years. But now these institutions are free to fix their interest rate.

In various books of economics and financial institutions interest occupies a crucial part. While studying of the evolution of interest rate, many theories have been introduced as time spent and changes have taken place in market structure and expectations. Assumptions of these theories were different and different factors were considered as crucial in different time. As a developing country, Nepalese market has not been reached its maturity but in recent years institutions are determining their interest rate themselves. Thus it is important to know whether the interest rate is determined by market forces or by managerial discretion. Some of the previous researchers in their thesis had studied in the limited areas such as interest rate structures, impact of interest rate on portfolio of commercial banks, inflationary aspect of Nepal Rastra bank, interest rate and lending policy etc. These studies are also very old i.e. of 1980s.This type of study has not been found yet in current scenario.

It seems to be not only general public but also university graduates in commerce or business administration cannot calculate the true or effective interest rate. Bankers and other financial institutions use various methods of interest calculation. Correspondingly, true effective rate also differs. Therefore, this researcher has influenced to analyze that what factors affect interest rate and what are the methods used in interest calculation. More specifically this study is an attempt to answer the following questions:

a) What is the impact of liquidity position of organization in interest rate charged and offered by banks in Nepalese market? (Demand and Supply forces).
b) Is the market interest rate affected by inflation?
c) What are the various methods that banks in Nepal use to calculate the interest rate they charged to borrowers?
d) What is the magnitude of correlation between interest rate and inflation?
e) What are the other major qualitative factors that shape the interest rate in Nepalese financial sector?

1.5 OBJECTIVES OF THE STUDY

The major objectives of this research are as follows.

a) To evaluate the effect of determinants on the fluctuation of interest rate
b) To identify the different methods used by Nepalese Commercial Banks to calculate the interest rate
c) To determine whether the interest rate on Nepalese Commercial Banks sector is satisfactory or not
d) To suggest a recommended on the basis of major findings.

1.6 SIGNIFICANCE OF THE STUDY

Financial system of the nation performs a number of activities that are essential for a modern private–enterprise economy. The most important functions that financial system performs are as follows:

Consists of providing the means by which payments for transactions are accomplished and savings are accumulated and channeled it to investment users. The financial system determines both the cost of credit and how much credit will be able to pay for the thousand

of goods and services we purchase daily. Paying for goods and services, saving, lending, borrowing and investing all activities are carried out within the frame work of financial system. When credit becomes more costly (that is, higher interest rate) and less available total spending for goods and services falls. As a result unemployment rises and economic growth slows down as business cut back their production. In contrast, when the cost declines (i.e. lower interest rate) and the loanable funds become more readily available, total spending in economy increases, more jobs are created and economic growth accelerates *(Cooper & Fraser, 1982: 3).* Hence economic growth depends upon circulation of money and financial system facilitates it.

In modern world, the expenditure of both government and private sectors is increasing. Investment is needed at any stage of economy. But the private sectors, in most of the developing countries including Nepal, are suffering from financial crises. People are less aware about banking system. Financial intermediaries are insufficient to mobilize the saving of the country. Some established institutions are also city based. Small amount of saving is also not utilized in productive investment rather than spending in construction of houses, luxuries goods, ornaments etc. But the question is why the financial institutions of the country could not attract more savings? Are the monetary authorities in this country wrong in determining the rate of interest? Or what the rate of interest can do in this situation? Similarly, the financial institutions of this nation are not being able to lend more. On the other hand, inflation is troubling developing countries like Nepal. Can interest rate play any role in this connection? It is not only without reason that Keynes and modern economists paid special attention to the role of interest rate in the economic field.

Nepalese interest rate varies time to time, region to region and sector to sector. The fluctuation in interest rate is a regular phenomenon in developing countries. So, it is quite necessary to develop some ideas about the impact of interest rate to the economy. Furthermore, it is important to know the policies of financial institutions regarding rate of interest and its impact on various financial aspects of the financial institutions. This study is also considered to be useful to various parties such as further researchers, students, teachers, financial institutions, general individuals etc. Keeping all these views into consideration the study of interest rate seems worthwhile in the context of Nepal.

1.7 RESEARCH HYPOTHESIS

A quantitative statement about population parameter is called a hypothesis. In other words it is an assumption that is made about the population parameter and then its validity is tested. It may or may not be found valid in verification. The act of verification involves testing the validity of such assumptions which, when undertaken on the basis of sample evidence, is called statistical hypothesis or testing of hypothesis *(Sharma & Chaudhary, 2002: 229).* The main goal of testing hypothesis is to test the characteristics of hypothesized population parameter based on sample information whether the difference between the population parameter and sample statistics in significant or not.

The hypotheses formulated for this study are as follows:

1. First hypothesis is related to the significance of the correlation coefficient between liquidity (supply or deposits) and interest rate.

   Null hypothesis, Ho: $\rho = 0$ i.e. population correlation coefficient is equal to zero. In other words, population correlation coefficient between amount deposited and interest rate in Nepalese Banking Sector are not correlated.

   Alternative hypothesis, H_1: $\rho \neq 0$ i.e., population correlation coefficient is not equal to zero. In other words, the variables in population (amount deposited and market interest rate) on deposit are correlated.

2. Second hypothesis is related to the significance of the correlation coefficient between loan demand (amount loaned) and lending rate.

   Null hypothesis , Ho: $\rho = 0$ i.e. population correlation coefficient is zero which means that the variables in the population i.e. amount loaned and lending rates in Nepalese Banking sector are not correlated.

   Alternative hypothesis, H_1: $\rho \neq 0$ i.e., population correlation coefficient is not equal to zero. In other words, amount loaned and lending rates are in Nepalese Banking sector correlated.

3. Third hypothesis is related to the test of significance of the correlation coefficient between interest rate on deposit and lending.

Null hypothesis, Ho: $\rho=0$ i.e., there does not exist correlation between interest on deposit and lending in Nepalese banking sector.

Alternative hypothesis, H_1: $\rho\neq0$ i.e., there exists correlation between interest rate on deposit and lending in Nepalese Banking sector.

4. Fourth hypothesis is related to the test of significance of the correlation coefficient between inflation rate and interest rate on deposit.

   Null hypothesis, Ho: $\rho=0$ i.e., population correlation coefficient is zero which means that the variables in population (inflation rate and interest rate on deposit) in Nepalese banking sector are not correlated.

   Alternative hypothesis, H_1: $\rho\neq0$ i.e., population correlation coefficient between inflation and interest on deposit in Nepalese banking sector are correlated.

5. Fifth hypothesis is related to the test of significance of the correlation coefficient between inflation and lending rate.

   Null Hypothesis, Ho:$\rho=0$ i.e., population correlation coefficient is zero which means that variables in population (inflation and lending rate) in Nepalese banking sector are not correlated.

   Alternative hypothesis, H_1: $\rho\neq0$ i.e., population correlation coefficient is not equal to zero that means variables in population i.e., inflation and lending rate in Nepalese banking sector are correlated.

6. Sixth hypothesis is related to the test significance of the correlation coefficient between interest rate and risk- free rate of interest.

   i. Null Hypothesis, Ho: $\rho=0$ i.e., the interest rate on deposit and risk- free rate of interest in Nepalese banking sector are not correlated .

   Alternative hypothesis, H_1: $\rho\neq0$ i.e., the interest rate on deposit and risk- free rate of interest in banking sector are correlated.

   ii. Null Hypothesis, Ho: $\rho=0$ i.e., the interest rate on lending and risk- free rate of interest in Nepalese banking sector are not correlated.

Alternative Hypothesis, H_1: $\rho \neq 0$ i.e., the interest rate on lending and risk- free rate of interest in banking sectors are correlated.

1.8 LIMITATIONS OF THE STUDY

This study is limited by the followings:

a. Reliability of study depends upon the reliability of published and the genuineness of the respondents.
b. As the sample have been drawn at random for convenience there may exist some sampling errors and the sample size may not be sufficient to generalize the findings
c. This study covers only 4 fiscal years (2008-2012).
d. The samples are taken only from commercial banks; other financial intermediaries are not included in the study.
e. Since this study is for the purpose of fulfillment of the 'Master degree', stipulated time and resources are also the limitation for the study.
f. Interest rate and its determining factors are only considered. Impact of other aspects beside interest has not been studied.

1.9 ORGANIZATION OF THE STUDY

This study is divided in 5 chapters. Prior to the body of the thesis several pages of preliminary materials such as title page, approval sheet, viva sheet, acknowledgements, table of contents, list of figure, list of table, abbreviation used etc have been presented. Chapter one is the introduction which contains background of the study, brief history of interest rate in Nepal, focus of the study, statement of problem, objectives of the study, significance of the study, research hypothesis, limitations of the study and organization of the study. Chapter two is review of literature, which consists of the review from books journals and thesis. Chapter three is research methodology and it contains research design, population and sample, sources and nature of data, procedure of sampling and data collection, data processing and presentation, and data analysis tools. Chapter four is presentation and analysis, which contains presentation of data in various ways and its interpretation. Last chapter is the summary, conclusion, and recommendation.

After the body of the thesis bibliography and appendices are presented as supplementary materials.

Chapter I: Introduction

(This Chapter contains background of the study, profile of selected commercial banks, focus of the study, statement of problem, objectives of the study, significance of the study, research hypothesis, limitations of the study and organization of the study)

Chapter II: Review of Literature

(Chapter two is review of literature, which consists of the review from books, journals and thesis)

Chapter III: Research Methodology

(Chapter three is research methodology and it contains research design, population and sample, sources and nature of data, procedure of sampling and data collection, data processing and presentation, and data analysis tools)

Chapter IV: Data Presentation and Analysis

(Chapter four is presentation and analysis, which contains presentation of data in various ways and its interpretation)

Chapter V: Summary, Conclusion and Recommendation

(Last chapter is the summary, conclusion, and recommendation)

CHAPTER-II

REVIEW OF LITERATURE

2.1 INTRODUCTION

The next step is to develop concepts and ideas about the selected topic by reviewing all the relevant materials regarding the study. In fact, review of literature begins with a search for a suitable topic and continues throughout the duration of the research work. It deals with a literature survey of existing volumes of similar related subjects. Review of literature means reviewing research studies or other related propositions in the related area of the study, so that all the past studies, their conclusions and deficiencies may be known and further research can be conducted. It is an integral and mandatory process in research works .The main reason for a full review of research in past is to know the outcomes of those investigations in areas where similar concepts and methodologies had been used successfully.

2.2 REVIEW OF THEORIES/CONCEPTUAL FRAMEWORK

2.2.1 Meaning of Interest

As we know that interest rate is one of the important variables in economics and finance. Generally, a payment made by a borrower to the lender for the money borrowed and is expressed as a rate percent per year is simply known as interest. But in economics widely different views have been put forth from the time to Aristotle to present day. Aristotle recognized only animal husbandry and stock rising as two legitimate industries whose product could be lent and interest earned on them.

In economics interest has been defined in a variety of ways. Commonly interest is regarded as the payment for the use or service of capital. If retained by the owner, it can be used by him/her for further production and the additional product he/she gets through the employment of his capital to someone else; if he/she would have received interest in returns. As Carver said that interest is the income which goes to the owner of capital.

According to classical economists, it is only by postponing consumption that capital can be created. Since to abstain consumption is disagreeable and painful, or the lender is paid a

reward in the form of interest. The people abstain consumption, they save and thus interest becomes the reward for saving. Saving, however doesn't involve sacrifice of abstinence on the path of rich. To avoid the fallacy, Marshall substituted the word 'waiting' for abstinence and thus interest is rewarded for waiting.

The Austrians led by John Roe and Bohm Bawerk and followed by Fisher in American Considered interest to be the premium for time preference. People prefer present to the future and hence they attach more importance to present goods. In order to induce them to postpone enjoyment of goods from the present to future, they must be compensated in the form of interest. Interest is thus the difference between the present enjoyment and future enjoyment of same goods.

The neo- classical economists, however, define it as the price for the use of loanable funds. But the modern economists in their effort to avoid these divergent and controversial views about the nature of interest, have explained it in terms of productivity, saving, liquidity preference and money. In other words, interest is simultaneously the reward for the pure yield of capital, for saving, for the foregoing of liquidity and the supply of money.

- Gross and pure interest: The payment which the borrower makes to lender excluding the principal is gross interest. Net interest is the payment for the use of capital or money only. It is normally the same during a period of time even in different markets.

- Reward for risk taking: The Lender exposes himself to risk when he/she lends money. Gross interest includes the reward for risk-taking. The greater the risk element the higher will be the rate of gross interest. Unsecured loans are more risky than secured loans and they carry high premium rate i.e. interest rate.

- Reward for inconvenience: When a lender loans money he/she forgoes its use for the duration of the loan. His/her money is locked up and cannot be used for money profitable purpose or, if he/she needs this amount for his personal use, he/she will have to undergo the inconvenience of arranging it from some other sources. In

fixing the rate of interest the lender includes in it the reward for such inconvenience.

- Reward for management: The lender has to incur expenditure in keeping proper accounts of the borrowers. He/she buys account books and even maintains staff. He/she has to remind the borrowers and sometimes has to file a suit for the recovery of loans. The payment that the lender receives from the borrower also includes the expenses for management.

- Pure interest is what remains with the lender after deducting the reward for risk-taking, management and inconvenience from gross interest.

2.2.2 Interest Rates as the Allocation Mechanism

In market based economics, price is the allocating mechanism. When it is the market for allocating savings, interest rates become the price mechanism. Borrowers with unusually productive investment opportunities, as measured in terms of risk and return, can pay saver a higher income in the form of an interest rate on the savings they borrow than borrowers with less productive investors. The return may also be in the form of ownership in business through the common stock of a company *(Johnson, 1993: 101).*

2.2.3 Functions of the Rate of Interest in the Economy

The rate of interest performs several important roles or functions in the economy:

- It helps guarantee that current savings will flow into investment to promote economic growth.
- It rations the available supply of credit, generally providing loan able funds to those investment projects with the highest expected returns.
- It is also an important tool of government policy through its influence government maintains control over the volume of saving and investment. If the economy is growing too slowly and unemployment is rising, the government can use this tool to lower interest rates in order to stimulate borrowing and investment and accelerate the production and development. On the other hand, an economy

experiencing rapid inflation has traditionally called for a government policy of higher interest rates to slow both borrowing and spending *(Rose, 2003: 113).*

2.2.4 Theories on Interest Rate

In the pages of the financial press "the interest rate" is frequently used. In truth, there is no such thing as "interest rate", for there exist thousands of different interest rates in the financial system. 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-determining forces, however we must make a simplifying assumption. We assume, in this section, that there is fundamental interest rate in the economy known as the pure or risk- free rate of interest, which is a component of all interest rates. The closest approximation to this pure rate in the real world is the market yield on government bonds. It is a rate of return presenting little or no risk of financial losses to the investor and representing the opportunity cost of holding idle cash, because the investor can always invest in low- risk bonds and earn this minimum rate of return.

Once the pure interest rate is determined, all other interest rates may be determined from it by examining the special characteristics of the securities issued by individual borrowers. For example, only the government can borrow at approximately the pure or risk-free interest rate other borrowers pay higher than this rate due to the higher risk of losses attached to their securities. Difference in liquidity, marketability, and maturity are other important factors causing interest rates to differ from the pure or risk-free rate. First, however, we must examine the forces that determine the pure or risk free interest rate itself. 5 Various theories have been propounded by various economists in different time explaining the pure/risk-free interest rates. All these theories of interest rate include the notion of inflation, i.e., the decrease in purchasing power of money *(Johnson, 1993:101)*.

Classical Theory of Interest Rates:

One of the oldest theories concerning the determinants of the pure or risk- free interest rate is the classical theory of interest rate developed during the 18^{th} and 19^{th} centuries by number of British economists and elaborated by Irving Fisher (1930) earlier in this

century. The classical theory argues that the rate of interest is determined by two forces: the supply of saving derived mainly from household, and the demand for investment capital coming mainly from the business sector *(Rose, 1997:7).*

Supply of Saving:

Saving by households: The most of the saving in the modern industrialized economics is carried out by household (individuals and family). For these households, saving is simply abstinence from consumption spending. Therefore, current saving is equal to the different between current income and current consumption expenditure. Generally, the volume of household saving rises with income. Higher- income families and individuals tend to save more and consume less relative to their total income than families with lower income. Although income level probably dominates saving decision, interest rate also plays an important role. According to classical theory, rational individual, it is assumed, will always prefer current consumption of goods and services to future consumption. 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. The classical theory considers the payment of interest a reward for waiting-the postponement of current consumption in favor of greater future consumption. Therefore saving is the function of interest and there is positive relationship between current saving and the interest rate offered on these savings.

Saving by business: Not only households but also business save money in the form of retained earnings which supplies most of the money for annual investment spending by business firms. The critical element in determining the amount of business savings is the level of business profits. If profits are expected to rise, businesses retain the major part of the profits and borrow less from money and capital market. The result is a reduction in the demand for credit and a tendency toward lower interest rate. On the other hand, when profit fall but firms do not 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 rise and interest rate may rise as well. Hence, higher interest rate 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: Though, less frequently than households and businesses Government also saves. 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 expenditure. Income flows in the economy (out of which government tax revenue arise) and the pacing of government spending programs are the dominant factors affecting government savings. Interest rates are probably not a key factor here.

Demand for Investment Funds:

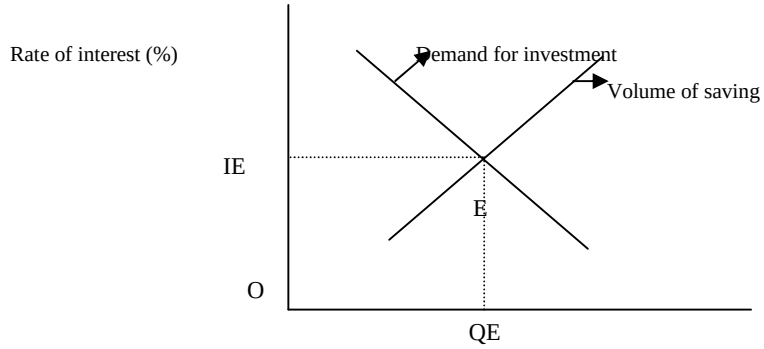
Besides business, households and government savings, the other rate- determining factor is investment spending by business firms. Businesses require huge amounts of funds each year to purchase equipment, machinery, and inventories and to support the construction of new buildings and other physical facilities. The majority of business expenditure for these purposes consists of what economists call replacement investment, that is, expenditures to replace equipment and facilities that are wearing out or are technologically obsolete. A smaller but more dynamic form of business capital sending is labeled net investment expenditure to acquire additional (new) equipment and facilities required to increase output. The sum of replacement investment plus net investment equals gross investment.

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

The Classical economists believe that interest rate in the financial markets were determined by the interplay of supply of saving and the demand for investment. As shown in present figure, this occurs at point E, where the equilibrium rate of interest is 'IE' and the equilibrium quantity of capital funds traded in the financial market is QE.

Figure No - 2.1

Equilibrium rate of interest in the classical theory



Volume of saving and investment *(Source: Theory of interest, Rose; 1997:213)*

The Liquidity Preference Theory of Interest:

The classical theory of interest has been called a long-term exploration of interest rates because it focuses on the public's thrift habits and the productivity of capital-factors that tend to change slowly. During the 1930s, British economist John Maynard Keynes (1936) developed a short- term theory of the rate of interest that, he argued, was more relevant for policy makers and for explaining near-term changes in interest rates. This theory is known as the liquidity preference theory of interest rates. Interest rate under this theory is determined by the interplay of demand for and supply of liquidity *(Rose, 1997:200).*

The Demand for Liquidity:

Keynes argued that the rate of interest is really a payment for the use of scarce resource, money. Business and individuals prefer to hold money for carrying out daily transactions and also as a precaution against future cash needs even though its yield is low or nonexistent. Investors in fixed income-securities, such as corporate and government bonds, frequently desire to hold money as a heaven against declining security prices. Interest rates, therefore, are the price that must be paid to induce money holder to surrender a perfectly liquid asset and hold other assets that carry more risk. At times the preference for liquidity grows very strong. Unless the government expands the money supply, interest rates will rise.

In the theory of liquidity preference, only two outlets for investor funds are considered: bonds and money (including bank deposits). Money provides perfect liquidity (instant Spending power); bonds pay interest but cannot be spent until converted into cash. If interest ratio arises, the market value of loans paying a fixed rate of interest falls; the investor could suffer a capital loss if those bonds were converted into cash. On the other hand, a fall in interest rates results in higher bond prices the bondholder will experience a capital gain if his or her bonds are sold for cash. According to classical theorists, it is irrational to hold money because it provided little or no return. To Keynes, however, the holding of money could be a perfectly rational act if interest rates were expected to rise, because rising rates can result in substantial losses for investors in bond.

Keynes observed that the public demand money for three different purposes. The transaction motive represents the demand for money to purchase goods and services. Some money also must be held as a reserve for future emergencies and to cover extraordinary

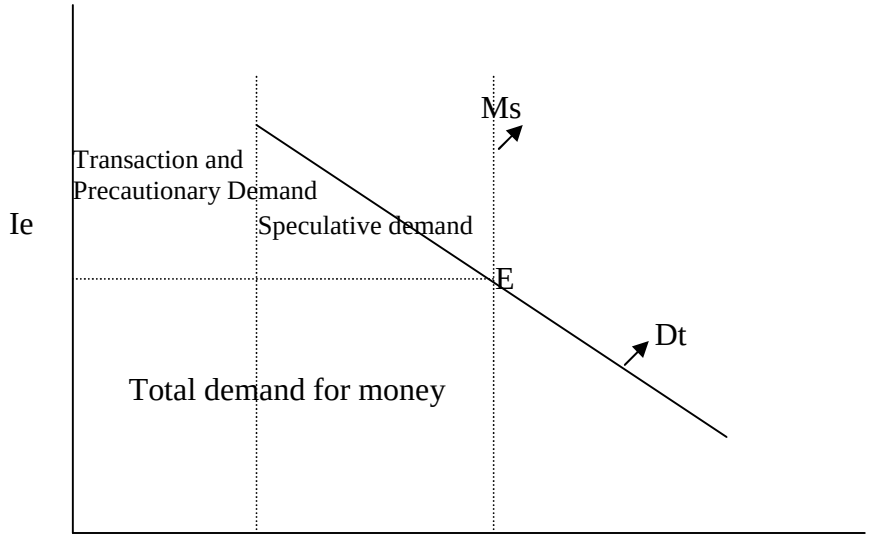
expenses. This speculative motive arises because we live in a world of uncertainty and cannot predict exactly what expenses or opportunities will arise in the future. Short-term changes in the interest rates were attributed by Keynes to a third motive for holding money- the speculative motive that stems from uncertainty about the future prices of bond. Keynes assumed that money demanded for transaction and precautionary purposes is dependent on level of national income, business sales, and prices whereas money demanded for speculative motive is dependent on short-term interest rate. Therefore, the total demand for money in the economy is simply the sum of transactions, precautionary, and speculative demands.

The Supply of Money:

Another major element determining interest rates in liquidity preference theory is the supply of money. In modern economics, the money supply is controlled, or at least closely regulated by government. Because government decisions concerning the size of the money supply presumable and guided by the public welfare, not by the level of interest rate, we assume that the supply of money is inelastic with respect to the rate of interest.

Figure No - 2.2

The Equilibrium Rate of Interest in Liquidity Preference Theory



(Source: Theory of interest, Rose; 1997:218)

Because the principal determinant of transactions and precautionary demand is income, not interest rates, these money demands are fixed at certain level of nation income, i.e., OK in

figure . Then any amount o money demanded in excess of OK represents the speculative motive and is rate sensitive. The total demand for money is represented along curve Dt and total supply is represented along JMs curve. Where demand of money equals to supply of money, the equilibrium rate is determined. Point E in the figure is the equilibrium point and i.e. the equilibrium rate. Demand and supply of money are equal to OJ.

The Loanable Funds Theory:

A view that overcomes many of the limitations of earlier theories is the loanable fund theory of interest rates. This view argues that the risk- free interest rate is determined by the interplay of two forces; the demand for and supply of credit (i.e., Loanable funds). *(Source, Rose; 1997: 205)*

The Demand for Loanable Fund Consists:

Consumer demand for loanable funds: – Domestic consumers demand loanable funds to purchase a wide variety of goods and services on credit. The 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 funds whereas a decline in interest rates stimulates some additional consumer borrowing. However, along the consumer's reality inelastic demand schedule, a substantial change in the rate of interest must occur before the quality of consumer demand for funds changes significantly.

Domestic business demand for loanable funds: - The credit demands of domestic business generally are responsive to change 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. High interest rates eliminate some profitable investment projectors where as a lower interest rates stimulate investments. Therefore, the quantity of loanable funds demanded by the business sector increases as the rate of interest falls.

Government demand for loanable funds: - Government demand for loanable fund is a growing factor in the financial markets but doesn't depend significantly of the level of

interest rates. Government decision on spending and borrowing are mad in response to social needs and public welfare, not the rate of interest.

Foreign demand for loanable funds: - Since the world has become a global village, money can be borrowed and lent across the borders. If interest rate in domestic market is lower than foreign market, foreign demand for loanable funds increases. On the other hand, if interest rate in domestic market is high, foreign demand for loanable funds decreases. Total demand for loanable funds is the sum of domestic consumer's demand, business demand, and government demand plus foreign credit demand. This demand curve slopes downward and to the right with respect to increase in the interest rate.

The Supply of Loanable Funds:

Domestic saving: - The supply of domestic savings is the principal source of loanable funds. As noted earlier, most saving is done by households and is simply the difference between current income and current consumption. Business also saves, by retaining a portion of current earnings and by adding to their depreciation resources. Government saving, while relatively rare, occurs when current revenues exceed current expenditures. The net effect of income, substitution, and wealth effects leads to a relatively interest-inelastic supply saving curve. Substantial changes in interest rate usually are required to bring about significant change in the volume of aggregate saving in the economy.

Dishoarding of money balances: - The public's demand for money (cash balance) varies with interest rates and income levels. The supply of money, on the other hand, is closely controlled by the government. Clearly the two-money demand and money supply-need not be the same. The difference between demand and supply is known as hoarding. While public's demand for cash balances exceeds the supply, positive hoarding of money takes place as some individuals and business attempt to increase their cash balance at the expense of others. On the other hand, when the public's demand for money is less than the supply available, negative hoarding (dishoarding) occurs. Hoarding reduces the volume of loanable funds available in the financial market where as dishoarding increases such funds.

Creation of money by domestic banking system: - Commercial banks and non banking thrifts institutions offering payments accounts have the unique ability to create credit by

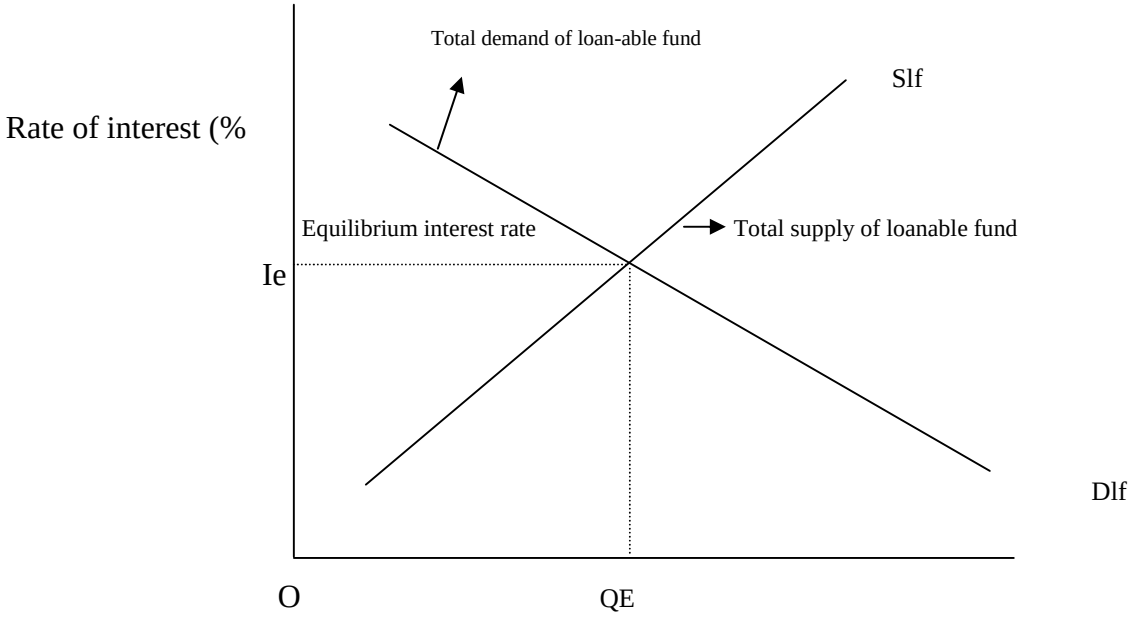
lending and investing their excess resources. Credit created by domestic banking system represents an additional source of loanable funds.

Foreign lending to domestic funds market: - Foreign lender provides large amounts of credit to domestic borrowers. These inflowing loanable funds are particularly sensitive to the difference between domestic interest rate and interest rate in foreign financial market.

The total supply loanable fund is the sum of domestic saving, dishoarding of cash balance, foreign lending, and new credit created by domestic banking system. The supply curve rise with higher rate of interest, indicating a greater supply of loanable fund will flow into the money and capital markets when the returns from lending increase.

Figure 2.3

Equilibrium rate of interest in the loanable fund theory



(Source: Rose; 1998:203)

In above figure, 'Dif' is the total demand curve for loanable funds and 'Slf' is the supply curve of loanable fund. 'e' is the equilibrium rate of interest and 'QE' is the equilibrium volume of loanable fund borrowed and demand.

Rational Expectation Theory of Interest:

The rational expectation theory assumes that equilibrium interest rate depends upon the changes in investor's expectation regarding future security prices and return. Investor's decision towards the borrowing and lending funds come from the availability of new information. When new information appears about investment, saving or the money supply, investors begin immediately to translate that new information into decisions to borrow and lend funds. So rapid is the process of the market digesting new information that security prices and interest rates presumably impound the new data from virtually the moment they appear. In absence of new information, next period's interest rate will equal to current period's interest rate. In other words, the knowledge of past interest rate will not be a reliable forecast of future interest rate. In a perfectly efficient market, it is impossible to win excess returns continuously by trading on publicly available information *(Rose, 1997:109).*

The important assumptions and conclusions of the rational expectation theory are that:

i) The price of securities and interest rates should reflect all available information and the market uses all this information to establish a probability distribution of expected future prices and interest rates.

ii) Changes in rates and security prices are correlated only with unanticipated, (not anticipated), information.

iii) The correlation between rates of return in successive time periods is zero.

iv) No unexploited opportunities for profit (above a normal return) can be found in the securities' market.

v) Transaction and storage costs for securities are negligible and information costs are small relative to the value of securities traded

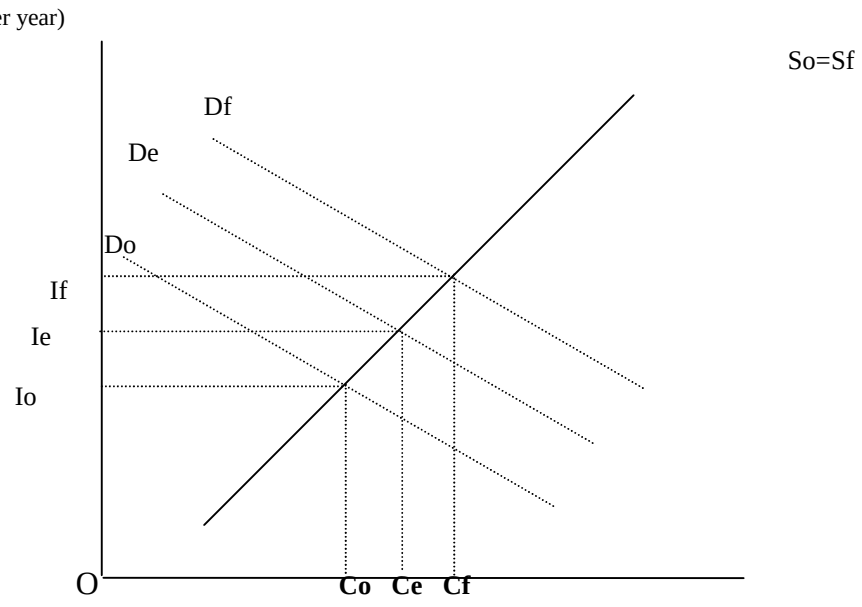
vi) Expectation concerning future security prices and interest rates are formed rationally and efficiently.

If the money and capital markets are highly efficient in the way we have described, this implies that interest rate will always be at or very near their equilibrium levels. Any deviation from equilibrium rate dictated by demand and supply forces will be almost instantly eliminates security trader who hope to consistently earn windfall profits from correctly guessing whether interest rates are 'too high' (and therefore will probably rise) are unlikely to be successful in the long run. Interest rates fluctuations around equilibrium

are likely to be random and momentary. If market participants were expecting increased demand for credit (with supply unchanged), an unexpected announcement of reduced credit demand implies lower interest rates in the future. Similarly, a market expectation of less credit demands in the future (with supply unchanged), when confronted with an unexpected announcement a higher credit demand; implies that interest rate will rise. We can illustrate the foregoing points about the rational expectation theory of interest by modifying the loanable funds theory of interest so that its demand and supply schedules reflect not just actual demand and supply but also the expected demand for and supply of loanable funds. The following figure depicts the equilibrium rate of interest under rational expectation theory. 'Do' and 'So' reflect the actual demand and supply of loanable funds in current period, while 'Df' reflects the actual demand for loanable funds that will prevail in the next (future) time period. The supply of loanable funds is assumed to be the same in both time periods, (So=Sf).

Figure 2.4

Equilibrium interest rates under rational expectation theory



(Source: Rose; 1998:253)

Now imagine that during the current period, the government makes an unexpected announcement of its increased need to borrow more money in future period 'F' due to an

unusually large budget deficit. The result is a new expected demand for loanable funds curve ‘De’, Projected to prevail in the next(future) period ‘F’ but as viewed by borrowers and lenders today in time period ‘O’. In this case, the equilibrium interest rate in the current period will not be ‘ Io’, but rather ‘Ie’, where the expected demand curve ‘De’ intersects the actual supply curve ‘So’. The equilibrium quantity of loanable funds traded in the current period then will be ‘Ce’ not ‘Co’. This is because, according to the rational expectation theory, borrowers and lenders will act as rational agents, using all the information they posses (including expected events) to price financial assets today. When the future period arrives, the equilibrium interest rate will rise to rate ‘If’ and the quantity of loanable funds traded then will be ‘Df’. The equilibrium rate moves upward because the demand for loanable funds in period ‘F’ is more than the expected future loanable-funds in period ‘F’ is more than the expected future loanable- funds demanded as seen by market participants in period ‘O’.

Suppose, on the other hand, that actual loanable- funds demanded in period ‘F’ increases upward and beyond ‘Do’ but by a smaller amount than was anticipated by investors in the market in period ‘O’. Demand schedule ‘Df’ would then fall somewhere between ‘Do’ and ‘De’. The equilibrium interest (with supply curve unchanged) would be lower than i.e. laying somewhere between ‘Io’ and ‘Ie’.

2.2.5 Interest Rate Movements and Its Relevance

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

Interest rate movements can affect the values of virtually all securities. They have a direct influence on the market values of debt securities such as money market securities, bound and mortgages. This is conferment in the chapters on financial markets, when the main determinants of the market value of each security and identified. Interest rates have an indirect effect on the values of stocks and exchange rates. Since the price movements of

derivatives are partially influenced by the price of underlying instruments, the prices of derivatives representing debt securities or stock or currencies are affected by interest rate movements. Thus, all participants in financial markets closely monitor interest rate movements. So they can restructure their position in securities to benefit from any expected movements in interest rate. *(Madura, 2001:19)*

Interest rate movements also affect the value of most financial institutions. Both the cost of funds to depository institutions and the interest received on same loans are affected by interest rate movements. In additional, the market value of securities (such as bonds) held by of financial institutions closely monitor interest rate movements so they can capitalize on favorable movements or reduces their institutions exposure to unfavorable movements.

2.2.6 Economic Factors that Affect Interest Rates

Although it is useful to identify those who supply or demand loanable funds, it is also necessary to recognize the underlying economic forces that cause a change in the supply of or demand for loanable funds. The following economic factors influence the demand for or supply of loanable funds and therefore influence interest rates.

2.2.6.1 Impact of Economic Growth on Interest Rates

Assume that as a result of more optimistic economic projections, most business increase their planned expenditures for expansion, which translates into additional borrowing. The aggregate demand schedule would shift outward (to the right). The supply-of- loanable-funds schedule may also shift, but is more difficult to know how it should shift. It is possible that the increased expansion by business could lead to more income for construction crew and others, who service the expansion. Thus, the quantity of savings, and therefore of loanable funds supplied at any possible interest rate could increase causing on outward shift in the supply schedule. Yet, there is no assurance that the volume of savings will truly increase. Even if a shift were to occur, it would likely to be of a smaller magnitude than the shift in the demand schedule.

As an example, we can consider how a slowdown in economy would affect the demand and supply schedules of loanable funds and equilibrium interest rate. The demand schedule

would shift inward (to the left), reflecting less demand for loanable funds at any possible interest rate. The supply schedule could possibly shift a little, but it is questionable which way it would shift. One could argue that a slowdown should cause increased interest rate. The supply schedule could possibly shift a little, but it is questionable which way it would shift. One could argue that a slowdown should cause increased saving at any possible interest rate as households prepared for the possibility of being laid off. Yet, the gradual reduction in labor income that occurs during an economic slowdown could reduce households' ability to save historical data support this latter expectation. Any shift that did occur would likely be minor relative to the shift in the demand schedule. Therefore, the equilibrium interest rate is expected to decrease.

2.2.6.2 Impact of Inflation of Interest Rates

One of the most serious problems confronting economies around the global in recent years is inflation. Inflation is defined as a rise in the average level of prices for all goods and services. Some prices of individual goods and services are always rising while others are declining. However, inflation occurs when the average level of all prices in the economy rise *(Rose, 1997:203)*

However, inflation occurs when an increase in some general index of price, such as the consumer Price Index or board-based Implicit Gross National Product Deflector, takes place.

There is positive correlation between inflation and interest rate in the market. Since the inflation reduces the purchasing power of consumer (investors), they must be compensated or the decreased purchasing power. Therefore, an increase in inflation leads to increase in quoted market interest rate to maintain purchasing power. This increment in interest rate is known as inflation premium. The implicit Gross national Product Deflector is sometimes referred to as the overall price index since it incorporated the prices on all subcomponents of the gross national product: consumption, investment, government spending and export.

The fisher Effect:

A well known economist Irving Fisher in 1996 has developed a relationship between nominal and real rate of interest. According to Fisher, if expected real interest rate is held

fixed, changes in nominal rate will reflect shifting inflation premium (i.e., changes in the public's view on expected inflation). He argued that the expected real rate of return tends to stable over time because it depends upon the long terms factors like productivity of capital, volume of saving in economy etc, in short term, the nominal interest is only influenced by the change in the inflation premium. So, rise in the expected inflation rate causes the same rise in the nominal interest rate.

The Harrod- Keynes Effect of Inflation:

Fisher effect of inflation contradicts with the views developed by the British economist Sir Roy Harrod. Harrod's view is based on Keynesian liquidity preference theory of interest. According to him, real rate is affected by the inflation but nominal rate need not to be affected. Under liquidity preference theory, the nominal rate is determined by the demand for and supply of money of funds. Therefore, unless inflation affects either the demand or supply of money, the nominal rate must remain unchanged whatever may be the expectation of inflation. Harrod argued that a rise in inflationary expectation will lower the real rate of interest.

There is less than one-to-one relationship between changes in expected inflation and nominal interest rates with the inflation cause wealth, income and depreciation effect. That is, a rise in expected inflation reduces the real rate of return to lender and derives the nominal interest rates higher but rise in nominal rate is less than the increase in expected inflation. But according to the inflation-caused income tax effect, if an investor desire to protect (i.e. hold constant) his or her expected real after-tax of return, then the nominal rate has to increase by a greater amount than any rise in the expected inflation rate because otherwise real after tax returns will decline when inflation increases *(Rose, 1997:245).*

Impact of Price Deflation:

Deflation tends to force real interest rates higher even as nominal interest rates drop downward zero. These elevated real interest rates tend to slow investment spending and decrease the development of new jobs. Real economic output will decline as factors come to produce less and business profit fall. At the same time lenders gain at an expenses of borrowers because the formers purchasing power rises, and business trying to borrow

money has to struggle to raise the capital they require to grow and put people back to work.

The price deflating can result in lower output (production) of goods and services, but forces real interest rates upward. However, businesses and the financial system are much better positioned to deal with moderate deflation, in part because of the development of so many risks management tools (such as financial future contracts, swaps, and options).

2.2.6.3 Impact of Money Supply on Interest Rates

The Central bank can affect the supply of loanable funds by increasing or reducing the total amount of deposit held by commercial bank or their depository institutions. When the central bank increases the money supply (loanable funds), which places downward pressure in interest rate. However, if the central bank's action affect inflationary expectations, this world also increase the demand for loanable fund, which could offset the effect of the increase in the supply of funds. If the central bank (as a monetary authority) reduces the money supply, it reduces the supply of loanable funds. Assuming no change in demand, this action places upward pressure on interest rates. *(Madura, 2001:31)*

2.2.6.4 Impact of Budget Deficit on Interest Rates

When the government enacts fiscal policies that result in more expenditures than tax revenue, the budget deficit is increased .How an increase in the government deficit would affect the interest rates, assuming no other changes in habits by consumers and firms occur a higher government deficit increases the quantity of loanable funds demanded at any prevailing interest rate, causing an outward shift in the demand schedule. Assuming no offsetting increase in supply schedule, interest rate will rise .Given a certain amount of loanable funds supplied to market (though savings),excessive government demand for these funds tend to "crowd out" the private demand (by consumers and corporations) for funds.

The government may be willing to pay whatever is necessary to borrow these funds, while the private sector may not. This impact is known as the "crowding- out effect".

There is a counterargument that the supply schedule might outward, if the government creates more jobs by spending more funds than it collects from the public (this is what causes the deficit in the first place). If this were to occur, the deficit might not necessarily place upward pressure on interest rates. Much research has investigated this issue (in U.S.A.) and in general, has shown that higher deficits place upward pressure on interest rates.

The increase in public debt refers an increase in government's demand for loanable funds. However, because other factors can offset this increased demand, the increased demand for loanable funds by the government does not always result in higher interest rates.

2.2.7 Term Structure of Interest Rates

The relationship between the rates of return (yields) on financial instruments and their maturity is called the term structure of interest rates. *(Rose, 1997:250)* This term structure may be presented visually by drawing a yield curve for all securities having the same credit quality. The yield curve considers only the relationship between the maturity and term of a loan or security and its yield at one moment in time (all other influencing factors held constant). For example, we cannot draw a yield curve for securities bearing different degree of credit risk or subject to different tax laws because both risks and tax laws affect relative yields along with maturity.

2.2.7.1 Pure Expectation Theory

According to the pure expectation theory, the term structure of interest rates (as reflected in the shape of the yield curve) is determined solely by expectations of future interest rates to understand how interest rate expectations may influence the yield curve, assuming that the annualized yields of short-term and long-term securities are similar; that is, the yield curve is flat. Then investors begin to believe that interest rates will rise. They will respond by investing their funds mostly in the short –term so that they can soon reinvest their funds at higher yields after interest rates increase. When investors flood the short-term market and avoid the long-term market, they may cause the yield curve to adjust. The larger supply of funds in short-term markets will force annualized yield down. Meanwhile, the reduced supply of long-term funds forces long-term yields up. *(Madura, 2001:51)*

Even though the annualized short-term yields become lower than annualized long-term yields, investors in short-terms funds are satisfied, because they expect interest rates to rise. They will make up for the lower short-term yield when the short-term securities mature, and they invest at a higher rate (if interest rate rises) at maturity.

Assuming that the borrowers who plan to issue securities also expect interest rates to increase, they would prefer to look in the present interest rate to a long period of time. Thus, borrowers would generally prefer to issue long-term securities rather than short-term securities. This results in a relatively small demand for short-term funds. Consequently, there is downward pressure on the yield of short-term funds; there is also an increase in the demand for long-term funds. Overall the expectations of higher interest rates change the demand for funds and supply of funds in different maturity markets, which forces the original flat yield curve to pivot upward and become upward slopping.

2.2.7.2 The Liquidity Premium View of the Yield Curve

Security dealers who trade actively in the financial markets frequently argue that other factors besides interest rate expectations also exert a significant impact on the character and shape of the yield curve. Liquidity premium is one of them. *(Rose, 1997:255)*

Long term securities tend to have more volatile market prices than short-term securities. Therefore, the investors face greater a risk of capital loss when buying long-term financial instruments. This greater risk of less will be important to an investor who is risk averse (not risk neutral as in the expectation theory). To overcome the risk of capital loss, investors must be paid an extra return in the form of an interest rate (term) premium to encourage them to purchase long term financial instruments. This additional rate or yield premium for giving up liquidity (known as the liquidity premium) would tend to give yield curves a bias toward a positive slope. The liquidity premium view does not preclude the important role of interest rate expectations in influencing the shape of the yield curve. Rather, it argues that other factors, such as liquidity play an important role as well.

Liquidity argument may help explain why yield curves tend to flatten out at the longest maturities. There are obvious difference in liquidity between a 1-year and 10-year bond, but it is not clear that major differences in liquidity exists between a 19- year bond and a 20-year bond, for example. Therefore, the size of the required liquidity (or term) premium may decrease for securities bearing longer maturities.

2.2.7.3 The Segmented- Markets or Hedging-Pressure Argument

A strong challenge to the expectations theory appeared in the 1950s and 1960s in the form of the market segmentation argument or hedging-pressure theory of the term structure of interest rates. The underlying assumptions are that all securities are not perfect substitutes in the mind of investors. Maturity preference exist among some investor groups, and these investors will not stay from their desired maturity range unless induced to do so by higher yields or their favorable terms on longer-or shorter-term securities.

Why would some investors prefer one maturity of security to other? Market segmentation theorists find the answer in a fundamental assumptions concerning investor behavior, especially the investment behavior of financial intermediaries, such as investment companies, pension funds, and banks. These investor groups, it is argued, often act as risk minimizers rather than profit maximizers as assume under the expectations hypothesis. They prefer to hedge against the risk fluctuations in the prices and yields of securities by balancing the maturity structure of their assets with the maturity structure of their liabilities. The portfolio strategy reduces the risks of fluctuating income and less of principal.

The existence of maturity preferences among investors groups implies that the financial markets are not one larger pool of loanable funds but rather are segmented into a series of submarkets. Thus, the market for securities of medium maturity (5 to 10) year securities attracts different investors groups than the market for longer-term (over 10 to 15 year) securities.

The segmented-markets or hedging pressure theory does not rule out the possible influence of expectations in shaping the term structure of interest rates, but it argues that other factors related to maturity-specific demand and supply forces are also important.

2.2.7.4 Preferred Habitat Theory

The preferred habitat theory of term structure accepts the expectation theory premise of substitution and the segmentation theory premises that substitution is risky for borrowers and savers. However, this theory is not rigid as either of them. Simply but preferred habitat accepts the notion of maturity substitution, but only if the borrowers and the savers are compensated with a more favorable interest rate. The additional return to the investor is known as liquidity premium. The preferred habitat theory accepts the expectation theory but claims that the yield curve is not an accurate representation of market expectations. This is because the preferred habitat theory recognizes the existence of a liquidity premium built into the yields for bonds of certain maturities *(Thygerson, 1992:36)*

This theory argues that investors seek at their preferred habitat along the scale of varying maturities of securities that matches their risk preferences, tax exposure, liquidity need, regulatory requirements, and planned holding period. Thus, according to the preferred habitat theory, factors other than expectations alone play a role in shaping the character of the yield curve.

Proponents of preferred habitat argue that investors derive their expectations about future interest rates on the basis of historical experience – the recent trend of interest rates and what history suggests is a "normal" range for rates. In the short – term, the majority of investors expect current interest rate tends to persist into the future; thus, rising interest rates in recent weeks often lead to the expectation that rates will continue to rise in the near term. However, investors generally expect that, given sufficient time (months or years), interest rate will return to their historical average *(Rose, 1997:256)*

2.2.8 Specific Risk and Cost Factors Affecting Interest Rates

In the preceding section, we examined the factors that cause the interest rate or yield on one security to be different from the interest rate or yield on another. These factors

included the maturity period or term of a loan and expected inflation. In this section, our focus is upon to learn why not one but, in fact, thousands of different interest rates exist in the economy. To analyze yield differentials between securities, therefore, we must understand thoroughly, all the factors that shape interest rates in the money and capital markets *(Rose, 1997:247).*

Marketability: One of the most important considerations for an investor is whether a market exists for those assets he/she would like to acquire. Can an asset be sold quickly, or must the investor wait sometime before suitable buyers can be found? This is the question of marketability, and financial instruments vary widely in terms of the ease and speed with which they can be converted into cash Investors (lenders) are conscious about the marketability of security and if security is less marketable, they seek compensation for that inconvenience (i.e. waiting for the security to be converted into cash).Therefore a less marketable security carries higher interest rate while a readily marketable security carries relatively a smaller interest rate.

Marketability is positively related to size (total sale or total assets) and reputation of the institution issuing the securities and to the number of similar securities outstanding. Marketability is a decided advantage to the security purchaser (lender of funds). In contrast, the issuer of securities is not particularly concerned about any difficulties, the purchaser may encounter in the resale (secondary) market unless lack of marketability significantly influences security sales in the primary market.

Liquidity: Marketability is closely related to another feature of financial assets that influences their interest rate or yield: their degree of liquidity. A liquid financial asset is readily marketable. In addition, its price tends to be stable over time and it is reversible, meaning the holder of the asset can usually recover his/ her funds upon resale with little risk of loss. Because the liquidity feature of financial assets lowers their risk, liquid assets carry lower interest rates. Inventory strongly interests in maximum profitability try to minimize their holding of liquid assets.

Default Risk: Another important factor causing interest rate to differ one from another is the degree of default risk carried by individual securities. Investor's securities face many different kinds of risk, but one of the most important is default risk-the risk that a borrower will not make all promised payments at the agreed –upon times. All securities except government securities are subject to varying degree of default risk. The yield on a risky security is positively related to the risk of borrower default as perceived by investor's yield on risky security.

Yield on risky security =Risk- free rate of interest +Default risk premium

The higher the default risk associated with a risky security, the higher the default risk premium on that security and greater the required rate of return (yield) that must be attached to the security as demanded by investors in the market place. Any adverse development, such as a downturn in economy or serious financial difficulties that makes a borrower appear riskier will lead the market to assign a higher default risk premium to his security. And if risk – free rate remains unchanged, the security's risky yield must rise and its price must decline.

Inflation and Default Risk Premium: we show that inflation can course interest rates to rise as investors in the financial markets demand to be compensated with higher nominal returns when the level of expected inflation or uncertainty about future inflation goes up. However, inflation also appears to affect the size of default-risk premiums on risky securities. Default risk premiums (often called 'quality spreads') tend to be higher and more volatile when inflation is high and volatile. Greater uncertainty about inflation, as Wheelock (1997) notes, tends to produce a "Flight to qualify" in the financial instruments. This is one of the many ways in which high and volatile price inflation can disrupt the efficient functioning of a market –oriented economy. *(Rose, 2003:99)*

Call or Prepayment Risk: Many corporate bonds and mortgages, must municipal bonds, and some government bonds issued in today's financial markets carry a call privilege. This provision of bonds contract (indenture) grants the borrowers the option to retire all or a portion of a bond issue by buying back the securities in advance of maturity. The call

privilege is an advantage to the security issuer because it grants greater financial flexibility and the potential for reducing future interest costs. On the other hand, the call privilege is a distinct disadvantage to the security buyer, who may suffer a decline in expected holding – period yield of the security is called. Therefore, securities that carry a call privilege generally set at lower process and higher interest rates than non callable securities moreover; there is an inverse relationship between the length of the call deferment period and the required rate of interest on callable securities. The longer the period of deferment and therefore, the longer the investor is protected against early redemption, the lower the interest rate the borrower must pay. *(Rose, 2003:287)*

Taxability: Taxes imposed by the government have profound effect on the returns earned by investors on financial assets. The income from most securities –interest or dividends and capital gains-is subject to taxation at the stipulated rate. This tax treatment reduces the investor's real income. Thus the security, the income from which is subject to higher taxation, carries higher rate than the securities, the income from which is subject to lower tax or tax exemption. Therefore, a corporate bond issuer must pay high yield (interest) than a municipal bond.

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 borrower involves considerable operation cost, certainly it makes sense that the cost of servicing Rs. 10 million of small auto loans is higher than the cost of servicing the same rupees amount of treasury bonds. The auto loans would involve collection payments and accounting for 800-1200 different loans. The Treasury bonds involve two interest payments per year. Lender must be compensated for the servicing cost. This cost is included in the interest rate charged, and is referred to as the servicing cost (SC).

Exchange Rate Risk: As today's financial markets have become more global, there has been a significant growth in the borrowing and investing in foreign denominated financial claims. A U.S. company establishing a manufacturing facility in Nepal might be inclined to issue shares and/or bonds denominated in Nepalese rupees rather than U.S. dollars.

Investors also have available to them many investments involve exchange rate risk. This risk relates to the potentiality that the rate of exchange between the domestic currency and foreign denominated currency will change as a result of any numbers of factors. The primary risk for the borrower is that the value of the currency borrowed rises in relation to 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. This potential change in currency values must be reflected in computing the cost of borrowing. Although it is not possible to accurately forecast future exchange rates, actual forward exchange rates in different countries do reflect differences in interest rates between countries. These forward exchanges are not good forecasts of the future because they create exchange rate risk for borrowers and investors.

Investment Risk: The reinvestment risk appears generally to all investors that generate cash flows for the investors prior to the maturity of the investment. When the yield to maturity is computed on investments, it is assumed in the calculation process that all cash flows are invested at the yield computed. The internal rate of return (IRR) calculation found in any text book on business finance shows that one of the limitations of the internal rate of return calculation for investments is the assumption that all the cash flows received before the end of the maturity (investment period) are invested at the IRR.

The reinvestment problem creates reinvestment risk for investors. This is the risk that the cash flows received before the maturity of the investment cannot be reinvested are the yield to maturity of the investment.

2.2.9. Relationship between Interest Rates and Security Prices

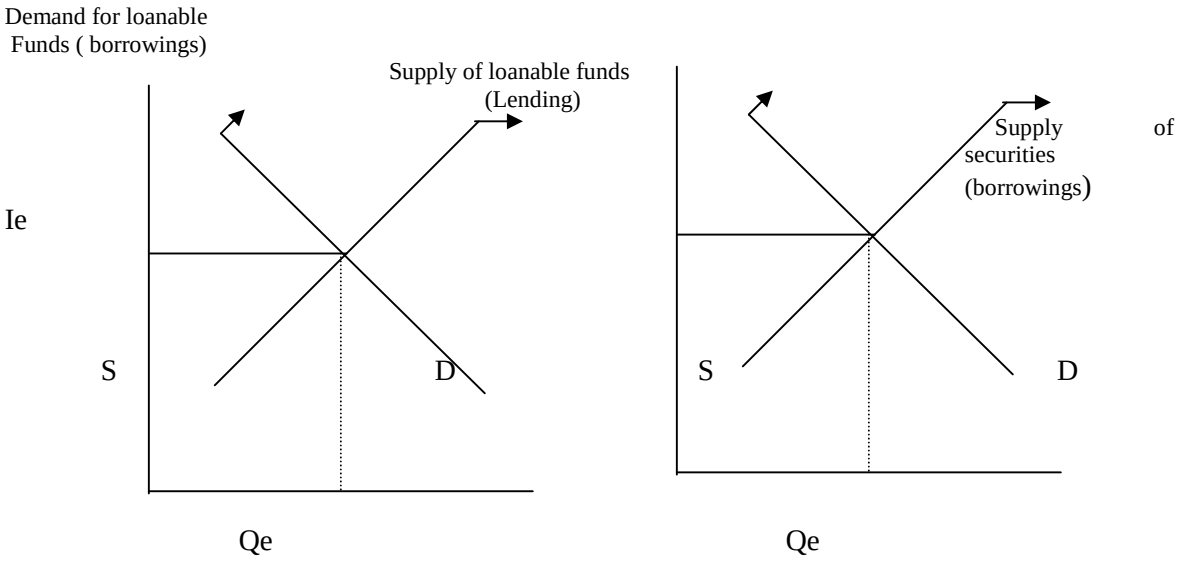
The Price of a security and its yield or rate of return is inversely related. A rise in yield implies a decline in price; conversely, a fall in yield is associated with a rise in the security's prices. *(Rose, 1997:277)*

Investing funds in financial assets can be viewed from two different perspectives, the borrowing and lending of money or the buying and selling of securities. As noted earlier, the equilibrium rate of interest from the lending of funds (borrowers) supply securities to

the financial market place, and suppliers of loanable funds (lenders) demand securities as an investment. Therefore, the equilibrium rate of interest or yield on a security and equilibrium price of that security are determined at one and the same instant and are simply different aspects of the sample phenomenon, the borrowing and the lending of loanable funds.

Figure: 2.5

Equilibrium security prices and interest rates



(Source: Rose; 1997:673)

Presented figure shows demand and supply curves for both the rate of interest (yield) and the price of securities. The supply of loanable funds curve (representing lending) in the interest rate diagram (2.5A) is analogous to the demand for securities curve (also representing lending) in the price of securities diagram (2.5B). Similarly, the demand for loanable funds curve (representing borrowing) in the interest rate diagram is analogous to the supply of securities curve (also representing borrowing) in the pride of securities diagram.

We note in diagram 2.5B that borrowers are assumed to issue a larger volume of securities at a higher price and that lenders will demand more securities at a lower price. In diagram 2.5A, on the other hand, borrowers demand a smaller quantity of loanable interest rate (yield). The equilibrium interest rate (yield) in figure 2.5A is determined at point 'Ie',

where the demand for and supply of loanable are equal. Similarly, in figure 2.5B the equilibrium price for securities lies at ping 'Pe', where the demand for and supply of securities are equal. Only at the equilibrium interest rate and an equilibrium security price will both borrowers and lenders be content with the volume of lending and borrowing taking place within the financial system.

2.2.10. How Open Market Operations Affect Interest Rates?

Even though most interest rates are market determined and the central bank has considerable authority and powerful mechanisms to affect the level of interest rates by controlling the supply of loanable funds. The primary tool is open market operation. Through open market operation, the central bank purchases or sells securities. These are primarily treasury securities. When central bank purchased the securities it adds to the supply of loanable funds. The sellers of the securities the central bank purchased can reinvest in other loans and investments. When the central bank sells securities, the opposite occurs. *(Thygerson, 1992: 81)*

When the central bank uses open market operation to increase bank funds, banks have more funds that can be loaned out. This can influence various market determined interest rates. First, the interest rate on loans between banks may decline as some banks have a larger supply of excess funds to lend out. Second, banks with excess funds may offer new loans at lower interest rates in order to make use of their funds. Third, these banks may also lower interest rates offered on deposits because they have more than adequate funds to conduct existing operations. *(Madura, 2001:81)*

As bank deposit rate decline household with available fund may search for alternative investments such as treasury securities or other debt securities, the yield will decline. Thus open market operation used to increase bank funds influence not only bank deposits and loan rates but the yields on other debt securities as well. The reduction in yields on debt securities lowers the cost of borrowing for the issuers of new debt securities. This can encourage potential borrower (including corporations and individuals) to borrow and make expenditure that they might not have made if interest rates were higher.

If open market operation is used to reduce banks' fund by selling the treasury securities; by increasing the level of discount rate; and by increasing the reserve requirements; the opposite effect occurs. More banks have different funds and fewer banks have any excess funds. Thus there is upward pressure on the interest rate offered to bank deposits. As bank deposit rate rises, some investors may be encouraged to create bank depositors rather than invest in other debt securities thereby increasing the yield offered on the instruments.

The actions of the central bank also affect the level of aggregate employment and inflation. The central bank tends to foster simulative open-market policies when the economy has slack resources and high unemployment, and restrictive policies during period low unemployment and rising inflation.

2.2.11 Interest Rates Charged by Institutional Lenders

Institutional lender of fund - bank credit unions, credit unions, insurance companies-finance companies-often employ different methods to calculate the rate of the interest charged on their loans. Four commonly use methods used for calculation institutional loan rate are presented here.

A. The simple interest method/Collect method

If the interest rate is paid at the maturity of a loan, the stated rate of interest is the effective rate of interest *(Weston & Copeland, 1992:847).* Both the amounts of interest and principal are paid at the end or maturity period of loan, under this method.

Effective interest rate = Interest amount/ amount borrowed

B. Discount Method

Many commercial loans, especially those used to raise working capital are extended on a discount basis. This so-called discount method for calculation loan rates determines the total interest charge to the customer on the basis of the amount to be repaid. However, the borrower receives as proceeds of the loan only the difference between the total amount owed and the interest bill (*Rose, 1997:231).*

Effective interest rate = interest Paid/Net loan proceeds

C. Add on Installment Rate of Interest

A method for calculating loan interest rates often used by commercial banks is the add-on the full principal of the loan, and the sum of interest and principal is divided by the number of payment to determine the rupee amount of each payment *(Rose, 1997:273).*

The effective interest rate can be found from following equation by solving for r.

Borrowed amount = Periodic Payments * PVIFA r%, n periods.

N= Number of payments, r= stated interest rated/ number of payments

PVIFA= Present Value Interest Factor for an Annuity.

D. Regular Installment

In this method of interest calculation, equal periodic installments are determined by dividing the total amount of loan by present value of interest factors for an annuity at the stated rate. These periodic amounts of payments include both the interest and some part of principal. In this method interest is calculated only on remaining balance of principal. Effective interest rate can be found by solving for in the following equation.

Loan amount = periodic payment (VIFA r,n)

r = stated rate/number of payments

n= total number of payments

2.3 REVIEW OF PREVIOUS THESIS

In this section some previous theses relevant to this study are reviewed. Some relevant theses regarding to this study are as follows:

A study done by **Neupane (1997)** entitled "*Money, Interest Rates, and Financial Development in Nepal*" found that interest rate is one of the most important devices for resource mobilization and interest rate plays a major role in the financial development of Nepal. He viewed that institutional interest rates are lower in our country. This caused imp lances between credit demanded and supplied. This Fact derived proper people from getting enough credit facilities. On the other hand, commercial banks are providing credit

facilities only for trade and commercial purposes. Finally he makes the conclusion that to mobilize the resources and to divert time in to productive work; institutional interest rate should be made higher.

A study done by **Rajbhandary (1978)** entitled *"The Interest Rate Structure of Commercial Banks in Nepal"*, the objective of his study was to show the relation of interest rate with saving and fixed deposits; with loans and advances; and with interest earning (i.e. interest received on loan minus interest paid on deposits).

His analysis concludes that the time deposits are positively and significantly correlated with the interest rates. There is significant correlation between the saving deposits and the rate of interest. Fixed deposit is more sensitive to the interest rate revision done by NRB. The correlation between the growth of fixed deposits and the interest rate particularly from 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 NG 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.

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.

A study done by **Pandey (1979**) entitled *"Money Supply, Level of Prices and Interest Rate Structure"* taking objective to show the relationship among money supply, price level and interest rate structure. She has analyzed the factor affecting money supply and price level. But she has explained the interest-rate-history showing what NRB had done to interest rate rather than showing the relationship of interest with price level and money supply. It might be relevant because interest rate, at the time, was fully controlled by NRB.

A study done by **Shrestha (1979)** entitled *"Interest Rate and its Impact upon Resource Mobilization and Utilization"* also seems relevant to review here, Since his study is too old, interest rate at the time was purely the central bank's phenomenon. He, in his study, has concluded that the frequent change in interest rates was disliked by customers except changing the interest rates as directed by NRB. Shrestha has suggested that the commercial banks to quote stable rate 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 luxury goods as in unproductive sectors and a lower rate on productive and small scale industries.

A study done by **Kshetry (1980)** entitled *"Interest Rate Structure and its Relation with Deposits Inflation and Credit in Nepal"* shows the relationship between interest rate and other economic variables like deposit, inflation and credit flow. His study concludes the following:

Keeping other variables constant, the institutional interest rate is the important explanatory variable to influence the volume of deposits in Nepal. This means that the upward movement in the interest rate on deposit increases the volume of deposit. The relationship between income and interest rate and between inflation and interest rate could not come significant. He found that the price level of Nepal is linked with Indian prices and also found very high inflation (10-17%) during his study period and also found out the negative relationship between credit flow and loan rate.

His suggestion to commercial banks is to fix the concessional interest rate in order to promote the cottage and small scale industries; and to monetarists to consider the rate of inflation while determining the interest rate on deposits.

A study done by **Bhusal (1995)** entitled "*An Analysis of Causes of Inflation in Nepal*". He has shown the relationship of inflation with various factors such as growth rate, income level, cost of holding money, Indian inflation and price level, deficit financing, but he failed to show the relationship between interest rate and inflation.

A study done by **Bhandari (1978)** entitled "*The Impact of Interest Rate Structure on investment portfolio of commercial Banks of Nepal"*, has concluded followings:

Rate of commercial Banks have been fluctuating. Deposits and lending rates were increased immediately after liberalization of the interest rate on August 31, 1989 but, however, started to decline which have helped in increasing the credit flow. Interest rate structure has direct influence on profitability of commercial banks. Decreasing lending rate helps to increase the profitability through increasing the credit. Deposits are more interest rate conscious and positively co-related. Loans and advances of commercial banks have been found to be continuously increasing with decline in interest rates. Effective interest rate structure helps in proper utilization of resources as measured by loan to deposit ratio. Most of the banks are having similar interest rate structure with lessens the importance of liberalization of interest rate.

A study done by **Dongol (2003)** entitled "*Impact of Interest Rate on Financial Performance of Commercial Banks"* concludes that most of the commercial banks contradict the general financial theories. The relation between amount of deposit and interest rate on deposit, in general concept, must be positive. But deposits are increasing despite the decrease in the general level of interest. The result of such phenomenon is that there are fewer investment opportunities for the banking sector as well as general investors. The relation between total amount of loan and the lending rate is negative and significant. However, the change in the total amount of loan flow is not proportionate with the change in the lending rate.

Correlation between interest rate and inflation is not significant. Not only interest rate is responsible to shape the profitability of banks but also the operating efficiency also has major influence on it.

2.4 RESEARCH GAP

This study includes the variables like deposit amount, interest rate on deposit, amount of loan, lending rate, inflation and risk-free rate and their relationship of three commercial banks (NABIL, HBL & NBBL). I want to prove that this research is an original one should be the foundation for the future researchers to know about the behavior of Interest Rate of Nepalese Banking and Financing Sector. For the researchers are requested to research about the different factors influencing interest rate like maturity period, open border with India, political instability etc.

My study is different than other's study due to the following reasons.

1. I have researched the Commercial Banks.
2. No current thesis is available in interest rate of commercial banks as on date.
3. This study includes the very recent information of NRB.
4. It shows current interest rate and deposit policy applied by sampled financial institution.
5. The study particularly shows how these companies are growing despite of critical market situation.
6. The study incorporates the latest technology (fully computerized) adopted by these financial institutions.

CHAPTER-III

RESEARCH METHODOLOGY

3.1 INTRODUCTION

A systematic way to solve the research problem is called research methodology. It describes the methods and processes applied in the entire aspect of the study. It refers to the various sequential steps (along with a rational of each step) to be adopted by a researcher in studying a problem with certain objectives in view.*(Kothari, 1994:99)* 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.

3.2 RESEARCH DESIGN

A research design 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 *(Paul & Donald, 1997:45).* The research design followed for this study is historical, analytical and descriptive. To determine the effect of inflation and liquidity on interest rate, historical data are analyzed and the research design followed is also analytical. For some qualitative interest rate influencing factors, the research design is descriptive as per the objectives of the study.

3.3 POPULATIONS AND SAMPLE

All the lending and depository institutions of Nepal are population of the study. Currently, there are 32 commercial banks and 70 finance companies in Nepal. Out of them 3 Commercial Banks are taken as sample on the basis of financial performances.

3.4 SOURCES AND NATURE OF DATA

This study requires both primary and secondary data. To show the relation between variables involved secondary data are used. Some primary data-opinion, experience and thoughts of practioners are also analyzed and presented. The sources of secondary data have been collected from published annual reports, published bulletins and prospectus of concerned organizations, various publications of Nepal Rastra Bank, various thesis and

various papers, journals, magazines and websites. The resource of primary data is experiences of various profession persons from different institutions who helped research by filling the questionnaire supplied to them

3.5 DATA COLLECTION PROCEDURE/ TECHNIQUE

Secondary data on annual reports of concerning organization, interest rate structure of such organizations and introductory profiles of the institutions are collected by visiting the respective organizations and from their web sites. Some secondary data of sample organizations and Nepal Rastra Bank's regulation upon them are collected from the central office of NRB, Baluwatar.

Primary data have been collected though questionnaire supplied to 10 respondents, five respondents answered the questionnaires. Some part of primary data consists of direct interview with mangers of concerning institutions.

3.6 DATA PROCESSING AND PRESENTATION

Data collected for the study are presented in various forms. Most of the secondary data are presented in tabular form and some graphical presentation is also used. Since the primary data collected are more subjective they are presented in tables and graphs and conclusions have been drawn. So far as the computation is concerned, it has been done with the help of scientific calculator and computer software Program.

3.7 DATA ANALYSIS TOOLS

There are two techniques to determine the data.

a) Financial Tools
b) Statistical Tolls

Statistical tools -

a) Correlation
b) Co-efficient of multiple determinations
c) T-Test

e) Graphical Approach

No financial tools are applied.

A) Correlation

Correlation analysis is the statistical tool that we can use to describe the degree to which one variable is linearly related to other variables. Two or more variables are said to be correlated if change in the value of one variable appears to be related or linked with the change in the other variables. Correlation is an analysis of the covariance between two or more variable. The measure of correlation, called correlation coefficient summarizes, in one figure, the degree and direction of correlation. The correlation analysis refers the closeness of the relationship between the variables *(Sharma & Chaudhary, 2000:420)*. Correlation may be positive or negative and ranges from -1 to +1. Simple correlation between inflation and interest rate and between liquidity and interest rate is determined in this study. Similarly multiple correlation coefficients between above mentioned variables also has been determined assuming interest rate is dependent and other two variables are independent.

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

$$\text{or,} \quad (r) = \frac{\text{Cov}(X_1, X_2)}{\sqrt{\text{Var } X_1}\ .\ \sqrt{\text{Var } X_2}}$$

$$\text{Where, Co variance } (X_1, X_2) = \frac{1}{n}\sum (X_1 - \overline{X_1})(X_2 - \overline{X_2})$$

n = total number of observations

X_1 and X_2 = two variables, correlation between which is calculated

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

Where, r_{12} = correlation coefficient between variable one and two

r_{13} = correlation coefficient between variable one and three

r_{23} = correlation coefficient between variable two and three

B) Co-efficient of multiple determinations

The square of multiple correlation coefficients is called coefficient of multiple determination and it is very useful in interpreting the value of multiple correlation coefficient. The main significance of the multiple determinations is to represent the proportion of total variations in the dependent variable which is explained by the variations in the two independent variables.

Co-efficient of multiple determinations $R_{1.23}^2$

C) T-test for Significance of Correlation coefficient (When number of samples $\leq$ 30)

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

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

i..e.'t' follows t-distribution with n-2 degree of freedom (d.f.).

Confidence limit for estimating population correlation coefficient (ρ)

1-α % confidence limits for estimating population correlation coefficient (ρ) are given by;

$r + t_{\sim}(n-2) \times S.E.(r)$ $\qquad$ $t_{\sim}$ = Level of significance

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

D) Graphical approach:

All the necessary information and data can be shown in figures. We can use Trend Line and Bar Diagrams where necessary.

CHAPTER-IV

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter is the main body of the study, which includes details analysis, and interpretations of data relating to interest rate on deposit and lending, deposit collection, and loan advances of each selected organizations from Nepalese financial system. Relations between variables i.e. between interest on deposit and interest rate on loan observed, analyzed and interpreted. To show the response of interest rate toward inflation rate and real rate of interest, correlation between these variables has been analyzed. The data and information gathering from the different sources has been analyzed. The data and information gathered from the different sources, as described in previous chapter, have been broadly grouped into the following two groups.

- For the quantitative analysis, various published data from NRB and concerned organizations' publications have been analyzed for showing their relationship.
- For qualitative analysis primary data collected by means of questionnaire and direct interview with respondent (various personnel from various institution, most of them are credit managers of the concerned organization) have been presented and analyzed.

Different tables and diagrams have been used to make the result clearly understandable.

4.2 ANALYSIS OF SECONDARY DATA

4.2.1 QUANTITATIVE ANALYSIS (CORRELATION ANALYSIS)

If two or more quantities vary in sympathy so that movements in one trend to be accompanied by corresponding movements in the other(s), then they are said to be correlated. Thus, the correlation analysis is generally used to describe the degree to which one variable is related to another. It helps to identify whether a positive or a negative relationship exists, the relation is significant or not; and to establish cause and effect relationship.

The correlations analysis, a statistical tool, has been used here to show the relationship between various variables assumed to be influencing factors of interest rate charged and offered by sample institutions. Multiple correlations have also been computed to show the simultaneous effect of two factors on interest rate. The coefficient of correlation is also tested using t-statistics of hypothesis to show whether it is statistically significant or not. Detail analysis of individual institution is presented in coming sections.

The followings are the interest rate on deposit and Lending of Himalayan Bank Limited (HBL).

Table 4.1

Interest Rate on Deposit and Lending of HBL

Fiscal Year	Deposit Amount (Rs. in Million) "a"	Interest Rate on Deposit "b"	Loan Amount (Rs. in Million) "c"	Interest Rate on Lending "d"	Inflation Rate "e"	Risk Free Rate "f"
2008	22760.9	4.01	13081.7	10.69	4.0	2.93
2009	24831.1	2.87	13245.1	9.12	4.5	2.50
2010	26456.3	2.68	15515.7	9.12	4.6	2.84
2011	28765.2	3.8	14367.4	9.8	5.0	3.1

Source: Annual Reports of HBL (2008) and various bank and financial statistics published by NRB (Mid-Jan 2012)

Note: Interest rate on deposits is taken as the average of the rates on various types of deposits and interest rate on lending is taken as the average of quoted rates for various sectors.

Table 4.1 depicts the total amount deposited; average interest offered on such deposits; total amount loaned; interest rate charged on such -lending of HBL for four fiscal years covering from F.Y. 2008/2009 to 2011/2012. Table 4.1 also contains the inflation rate and risk free rate (91 days Treasury bill; rate) for the same fiscal years. The correlation coefficient between interest rate and other variables are presented in table 4.2. Lower part of table 4.2 contains the multiple correlation coefficient and coefficient of multiples determination. The correlation coefficient between interest rate on deposits and amount

deposit *(r_{ab})* is -0.9123. This means that these two variables are highly negatively correlated. When supply of loanable fund (supply of deposit) increase, the interest rate on such deposit decreases and vice versa. We have assumed that interest rate is dependent factor, which is determined by supply of loanable fund. Hence, the negative correlative correlation between these two variables exists. The coefficient of determination between these two variables, r^2_{ab} is 0.8322 which means that 83.22 percent of total variation in interest rate on deposit has been explained by independent variable i.e. amount of deposit collected and remaining is due to the effect of other factors in the economy. T-statistics for the testing the significance of the correlation is 3.86. Since the tabulated t-value at 5 percent level of significance for 3 degree of freedom (3.18) is less than the calculated value, correlation coefficient is significant. This means that the variables mentioned (interest rate on deposit and amount deposited) of HBL are significantly correlated and an increase (decrease) in the amount of deposit brings a decrement (increment) in interest rate on deposit.

Table 4.2

Correlation Analysis of HBL

Variables	Coefficient of Correlation	Coefficient Determination	T-statistics	Table Value	Remarks
r_{ab}	-0.9123	0.8322	3.86	3.18	Significant
r_{bd}	0.9950	0.9900	17.23	3.18	Significant
r_{cd}	-0.7868	0.6190	2.20	3.18	Insignificant
r_{be}	-0.5483	0.3006	1.13	3.18	Insignificant
r_{bf}	0.7080	0.5012	1.73	3.18	Insignificant
r_{de}	-0.5169	0.2671	1.04	3.18	Insignificant
r_{df}	0.6989	0.4884	1.69	3.18v	Insignificant

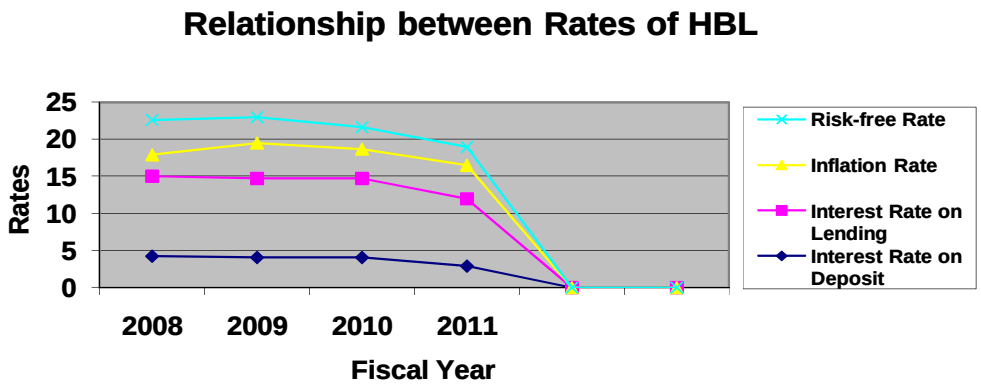
Source: Various bank and financial statistics published by NRB (Mid-Jan 2012) and appendix-2

Multiple Correlations	Coefficient of Multiple Determinations
$R_{b.ad}$=0.9971	$R^2_{b.ad}$ = 0.9944
$R_{d.bc}$=0.9975	$R^2_{d.bc}$ = 0.9951

$R_{b.ef}$=0.7079 $R^2_{b.ef}$ = 0.5012

$R_{d.ef}$=0.7004 $R^2_{d.ef}$ = 0.4906

Figure: 4.1



The correlation coefficient between interest rate on lending and amount of loan advanced, r_{cd}, has been found negative (-0.7868) which means that variables are highly negatively correlated. According to the assumption of the study interest rate is dependent and there should be a positive correlation between these two variables, which means that increased demand of loanable fund also causes increment in the interest rate. But this negative correlation of coefficient between these variables tells that more loans [funds] is demanded at lower rate i.e demand is dependent on interest rate. The coefficient of determination r^2_{cd} of 0.6190 means that 61.90 percent of total variation in amount loaned has been explained by the variation in interest rate on lending and remaining is the effect of other factors. T-value for testing the significance of the correlation coefficient is 2.20 which is less than table value of 3.18. Since, the calculated t-value 2.20 is less than the tabulated value at 5 percent level of significance for 3 degree of freedom, the correlation coefficient is insignificant. Therefore, it can be concluded that the amount loaned and interest on lending of HBL are not significantly correlated and the movement in interest rate on lending of HBL does not affect the loan amount significantly.

Similarly, the correlation coefficient between interest rate on lending and interest rate on deposit, r_{bd}, is 0.9950 which means that these two variables are highly positively correlated. The direction and proportion of movement of both rate is same if interest rate on deposit increases, the interest rate on lending also increases in almost same proportion and vice versa. The coefficient of determination between these variables, r^2_{bd}, is 0.9900 which means that 99.00 percent of total variation in dependent variable (interest rate on lending) has been explained by the variation in independent variable (interest rate on deposit) and remaining variance is the response of the other factors in the economy. Test statistics for testing the significance of the correlation coefficient is 17.23 which is highly greater than tabulated value. Since the calculated t-value is highly greater than tabulated value at 5 percent level of significance for 3 degree of freedom (3.18) the correlation coefficient is highly significant which means that interest rate on deposit and that on lending of HBL are highly correlated and movement in interest rate on deposit brings the movement in interest rate on lending.

Another variable in economy that affects interest rate is the inflation. The correlation coefficient between interest rate on deposit and inflation rate, r_{be} is -0.5483 which means that these two variables are negatively correlated. An increment in inflation brings decrement in interest rate on deposit and vice versa. In general concept there is positive correlation between these variables. The coefficient of determination r^2_{be}, of 0.3006 means that, of the total variation in dependent variable (interest rate on deposit); only 30.06% has been explained by the variation in independent variable (inflation rate). T-value for testing the significance of the correlation coefficient is 1.13 which is less than the tabulated t-value for the 3 degree of freedom at 5 percent level of significance, 3.18. Since, the calculated value is less than 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 rate does not affect the interest rate on deposit significantly.

Another variable in the economy that is considered to be affecting factor of interest rate in financial market is the risk-free rate. The correlation coefficient between interest rate on deposit of HBL and the risk-free rate (rate on 91 days Treasury bill), r_{bf} is 0.7080 which shows that the variables are positively correlated. The change in risk-free leads the change

in the interest rate in same direction. The coefficient of determination r^2_{bf} is 0.5012 which means that 50.12 percent of total variation in interest on deposit is due to the effect of the variation in dependent variable (risk-free-rate) and remaining is the effect of other factors. The t-test value for testing the significance of the correlation coefficient is 1.73 which is less than the table value for 3 degree of freedom at 5 percent level of significance, 3.18. From this it is revealed that interest rate on deposit of HBL is not significantly correlated with the risk-free rate and risk-free rate does not affect interest rate on deposit of HBL significantly.

Similarly the relationship of interest on lending of HBL with inflation has also been examined. The coefficient of correlation between inflation and interest rate on lending r_{de}, is -0.5169 which shows that the variables are negatively correlated. Movement in inflation rate leads movements in interest rate on lending in opposite direction. The coefficient of determination between these variables, r^2_{de}, is 0.2671 which means that 26.71% of total variation in dependent variable (interest rate on lending) has been explained by the variation in independent variable (inflation rate) and remaining is due to the effect of other factors. The t-value for testing the significance of correlation coefficient is 1.04. Since, the calculated t-value is smaller than the tabulated t-value for 3 degree of freedom at 5 percent level of significance 3.18; the variables are not correlated significantly. This means that the lending rate of HBL is not significantly correlated with the inflation rate.

The effect of risk-free rate of interest on interest rate on lending of HBL has also been examined through the analysis of correlation between these variables. The coefficient of correlation between these variables, r_{df} is 0.6989. This means that there is positive relationship between these variables. Since, interest rate is dependent on risk-free rate; the variation in risk-free rate brings the variation in interest rate on lending in the same direction. The coefficient of determination between variables is 0.4884 which indicates that 48.84% of total variation in interest rate on lending is explained by the variation in risk-free rate and remaining is the effect of other factors. The t-value for testing the significance of the correlation coefficient is 1.69. Since, the calculated t-value is smaller than table value at 5 percent level of significance for 3 degree of freedom (3.18), the

correlation coefficient is not significant. This means that the interest rate on lending of HBL is not significantly affected by the risk-free rate.

To examine the combined effect of two factors on interest at once, multiple correlation coefficients has also been computed. The multiple correlation coefficient taking interest rate on deposit as dependent and amount deposited and interest rate on lending as independent, $R_{b.ad}$, is 0.9971. The coefficient of multiple determination, $R^2_{\ b.ad}$, is 0.9944 which means that 99.44% of total variation in interest rate on deposit has been explained by two independent variables a and d. Similarly the multiple correlation coefficient assuming interest rate on deposit as dependent and inflation and risk-free rate as independent, $R_{b.ef}$, is 0.7079. The coefficient of multiple determinations $(R^2_{b.ef})$ is 0.5012 which means that 50.12% of total variation in dependent variable (interest rate on deposit) has been explained by other two independent variables (inflation and risk free rate) and remaining variation has been explained by other variables.

Similarly the multiple correlation coefficient taking interest rate on lending as dependent and amount loaned and interest rate on deposit as independent, $R_{d.bc}$, is 0.9975. The coefficient of multiple determinations, $R^2_{d.bc}$ is 0.9951 which means that total variation in dependent variables has been explained by two independent variables to the extent of 99.51% and remaining is the effect of other factors. The multiple correlation coefficient assuming interest rate on lending as dependent and inflation and risk-free rate as independent, $R_{d.ef}$, is 0.7004. The coefficient of multiple determination, $R^2_{d.ef}$, is 0.4906 has meaning that 49.06% of total variation in dependent variable (interest rate on lending) is the effect of inflation and risk-free rate and remaining is due to the effect of other factors.

The following is the Interest Rate on Deposit and Lending of NABIL Bank Limited (NABIL)

Table 4.3

Interest Rate on Deposit and Lending of NABIL

Fiscal Year	Deposit Amount (Rs. in Million) "a"	Interest Rate on Deposit "b"	Loan Amount (Rs. in Million) "c"	Interest Rate on Lending "d"	Inflation Rate "e"	Risk Free Rate "f"
2008	14098.0	2.80	8769.7	9.60	4.0	2.93
2009	14586.6	3.20	11078.0	9.35	4.5	2.50
2010	19348.4	3.20	13021.3	9.54	4.6	2.84
2011	21234.5	3.20	14021.8	9.35	5	3.0

Source: Annual Reports of NABIL and various bank and financial statistics published by NRB (Mid-Jan 2012)

Note: Interest rate on deposits is taken as the average of the rates on various types of deposits and interest rate on lending is taken as the average of quoted rates for various sectors.

Table 4.3 shows the amount of deposit, interest rate on deposit, amount of loan advance and interest rate on lending of NABIL bank for five year from 2008/09 to 2011/12. Similarly it also contains the inflation rate and risk-free rate of interest of the same period. The correlation coefficients between variables have been presented in table 4.4 and it also contains the coefficients of multiple correlations. To test the significance correlation coefficient, t-values have also been presented. The correlation coefficient between amount deposited and interest rate on deposits, r_{ab}, is 0.1037. This means that these two variables are less correlated and the relationship is positive. The positive relationship shows that when deposit increases (i.e. supply of fund) the interest rate i.e. return on deposit also increases. The coefficient of determination between these two variables r^2_{ab}, is 0.0107 which means that total variation in interest rate on deposit has been explained by supply of deposits to only 1.07 percent and remaining is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variables, 0.18 is significantly smaller than tabulated t-value at 5 percent level of significance for 3 degree of freedom, 3.18. Since, the calculated value is significantly smaller than table value, the conclusion is drawn that correlation coefficient between variables is significant. This means that the interest rate on deposit and deposit amount of NABIL are not significantly

correlated and increase in the supply of fund i.e. deposit brings the increment in interest rate on deposit.

Table 4.4

Correlation Analysis of NABIL

Variables	Coefficient of Correlation	Coefficient Determination	T-statistics	Table Value	Remarks
r_{ab}	0.1037	0.0107	0.18	3.18	Insignificant
r_{bd}	0.2410	0.0580	0.43	3.18	Insignificant
r_{cd}	-0.4157	0.1728	0.79	3.18	Insignificant
r_{be}	-0.2148	0.0461	0.38	3.18	Insignificant
r_{bf}	0.6159	0.3793	0.56	3.18	Insignificant
r_{de}	-0.9606	0.9227	5.98	3.18	significant
r_{df}	0.7718	0.5956	2.10	3.18	Insignificant

Source: Various bank and financial statistics published by NRB (Mid-Jan 2012)

Multiple Correlation

$R_{b.ad}$= 0.2473

$R_{d.bc}$=0.5264

$R_{b.ef}$=0.7522

$R_{d.ef}$=0.9609

Coefficient of Multiple Determination

$R^2_{b.ad}$ = 0.0612

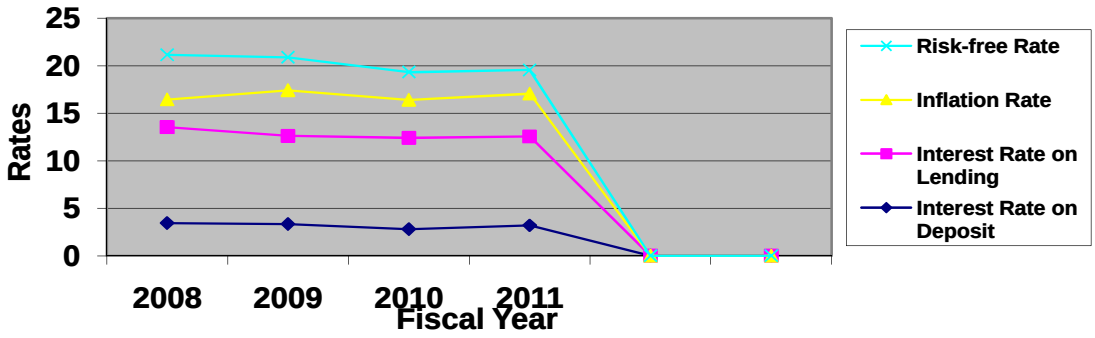
$R^2_{d.bc}$ = 0.2772

$R^2_{b.ef}$ = 0.5659

$R^2_{.d.ef}$ = 0.9234

Figure: 4.2

Relationship between Rates of NABIL



The correlation coefficient between amounts of loan-advanced and interest rate on lending, r_{cd}, is -0.4157. This means that the variables are negatively correlated. This negative

correlation coefficient reveals that when interest on lending decreases, the amount of loan advanced increases. Here the amount of loan is dependent variable which is affected by interest rate on lending. The coefficient of determination, r^2_{cd}, is 0.1728 which means that 17.28 percent of total variation in dependent variable (amount loaned) has been explained by the variation in independent variable (interest rate on lending) and remaining is due to the effect of other factors. T-value for testing the significance of the correlation coefficient between variables c and d is 0.79. Since the calculated t-value 0.79 is significantly less than the tabulated t-value at 5 percent level of significance for 3 degree of freedom (3.18), correlation coefficient is not significant which means that the variables (interest rate on lending and amount loaned) are not significantly correlated. An increase (decrease) in interest rate on lending brings the decrement (increment) in amount loaned by NABIL.

Similarly, the correlation coefficient between interest rate on lending and interest rate on deposit, r_{bd}, is 0.2410. This shows that there is a positive correlation between these two variables. The positive correlation shows that an increment in interest rate on deposit brings almost same proportion increment in interest on lending because the correlation coefficient is positive. The coefficient of determination between these two variables, r^2_{bd}, is 0.0580 which has a meaning that 5.80 percent of total variation in the interest rate on lending has been explained by the variation in interest rate on deposit and remaining is due to the effect of other factors. T-value for testing the significance of the correlation coefficient in 0.43 which is smaller than the table value at 5 percent level of significance for 3 degree of freedom is 3.18. Since the calculated value is less than the table value, the correlation coefficient is most significant which means that change in interest rate on lending has not any significant i.e. the change in interest rate on deposit brings no change in interest rate on lending significantly.

Inflation is also considered as an affecting factor of interest rate. Hence the effect of inflation has also been analyzed. The correlation coefficient between interest rate on deposit and inflation rate, r_{be}, is -0.2148 which shows that there is negative correlation between these two variables. When inflation increases, the interest rate on deposit offered by NABIL decreases. The coefficient of determination, r^2_{be}, is 0.0461 means that, of the total variation in dependent variable (interest rate on deposit) is explained by the variation

in independent variable (inflation rate) to 4.61% and other variables are responsible for remaining variation. T-value for testing the significance of the correlation coefficient is 0.38 which is smaller than the table value. Since the calculated value is smaller than the tabulated for 3 degree of freedom at 5 percent level of significance, 3.18, the variables are not significantly correlated. Even 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 NABIL.

Similarly the impact of risk-free rate on interest on deposit has been examined through the correlation analysis. The correlation coefficient between these variables, r_{bf}, is 0.6159 which shows the positive correlation between variables and tells that increase (decrease) in interest rate offered on deposit is caused by increase (decrease) in risk-free rate. The coefficient of determination of 0.3793 between variables, r^2_{bf}, shows that 37.93% of total variation in interest rate on deposit has been explained by the variation in risk-free rate and remaining is due to the effect of other factors. The t-value for testing the significance of the correlation coefficient is 0.56 which is smaller than the table value at 5 percent level of significance for 3 degree of freedom, 3.18. Since, the calculated value is smaller than table value; the coefficient of correlation is statistically insignificant. Hence we conclude that the variables, interest rate on deposit and risk-free rate are not correlated even if analysis shows the positive correlation coefficient of 0.6159.

The correlation coefficient of -0.9606 between inflation and interest rate on lending, r_{de}, shows that the variables are correlated and relationship is negative. Increase in inflation causes decrease in interest rate on lending. The coefficient of determination between variables, r^2_{de}, is 0.9227 which shows that 92.27% of total variation in interest rate on lending of NABIL has been explained by inflation rate and remaining is due to the effect of other factors. The t-value for testing the significance of correlation coefficient is 5.98 which are greater than table value at 5 percent level of significance for 3 degree of freedom, 3.18. As the calculated value is greater than table value, the correlation coefficient is significant which means that increase (Decrease) on inflation r_{de} causes also increase (decrease) in the interest rate on lending.

Another affecting factor of interest rate is risk-free rate of interest on 91 days Treasury bill rate. Whether the impact of risk-free rate in interest on lending is significant or not has been analyzed. The correlation between variables, r_{df}, shows a positive coefficient of 0.7718 which shows that there exists the positive correlation between these variables. The coefficient of determination between these variables is 0.5956 which tells us that 59.56% of total variation in interest on lending is the effect of risk-free rate and remaining is the effect of other factors. The test statistics (t-value) for testing the significance of correlation coefficient is 2.10 which is smaller than tabulated value at 5 percent level of significance for 3 degree of freedom, 3.18. Since, the calculated value is smaller than tabulated value; the correlation coefficient is not significant. Even if analysis shows a positive correlation, we can say that variables are not significantly correlated and risk-free rate of interest has not any significant impact on interest rate on lending charged by NABIL because the coefficient of correlation is statistically insignificant.

To know the effect of two factors at once on interest rate, multiple correlations has been computed and presented at the lower part of table 4.4. the multiple correlation coefficient between interest rate on deposit and amount deposited and interest rate on lending taking interest rate on deposit as independent and other two as independent, $R_{b.ad}$ is 0.2473. The coefficient of multiple determinations, $R^2_{b.ad}$ is 0.0612 which shows that variation to the extent of 6.12% in dependent variable has been explained by two independent variables and remaining is by other factors. Similarly, the multiple correlation coefficient between interest rate on deposit and inflation rate and risk-free rate of interest taking interest rate on deposits dependent and other two as independent, $R_{b.ef}$, 0.7522. The coefficient of multiple determinations, $R^2_{b.ef}$, 0.5659 which shows that 56.59% of total variation in dependent variables is the effect of independent variables and remaining is the effect of other factors.

On the other hand, the multiple correlation coefficients between interest rate on lending and amount loaned and interest rate on deposit assuming interest rate on lending as dependent variable and other two as independent variables, $R_{d.bc}$ is 0.5264. The coefficient of multiple determinations, $R^2_{d.bc}$, is 0.2772 means that 27.72% of total variation in interest rate on lending has been explained by two independent variables and remaining is due to the effect of other variables. Similarly, the multiple correlation coefficient between interest rate on lending and inflation rate and risk-free rate; assuming interest rate on lending, $R_{d.ef}$

is 0.9609. The coefficient of multiple determinations, $R^2_{d.ef}$, is 0.9234, which means that 92.34% of total variation in dependent variable is the effect of other two independent variables and remaining is the effect of other factors.

The following is the Interest Rate on Deposit and Lending of Nepal Bangladesh bank Limited

Table 4.5

Interest Rate on Deposit and Lending of NBBL

Fiscal Year	Deposit Amount (Rs. in Million) "a"	Interest Rate on Deposit "b"	Loan Amount (Rs. in Million) "c"	Interest Rate on Lending "d"	Inflation Rate "e"	Risk Free Rate "f"
2008	505.91	4.07	502.31	8.5	2.1	3.71
2009	586.874	4.96	531.393	8	3.2	3.48
2010	655.046	4.44	620.572	8.75	4.0	4.93
2011	877.026	3.09	759.226	9.75	4.2	2.70

Source: Annual Reports of NBBL/N (2012)

Note: Interest rate on deposits is taken as the average of the rates on various types of deposits and interest rate on lending is taken as the average of quoted rates for various sectors. Deposit amount, interest rate on deposit, amount loaned and interest rate on loan of NBBL for four fiscal years from 2008 to 2011 are presented in table 4.5. The inflation rate and risk-free rate of interest has also been presented for the same fiscal years. Correlation coefficient between variables, their coefficient of determination and t-values are presented in table 4.6. This table also contents the multiple correlation coefficients and their determinations at its lower part.

Table 4.6

Correlation Analysis of NBBL

Variables	Coefficient off Correlation	Coefficient Determination	T-statistics	Table Value	Remarks
r_{ab}	0.8976	0.2345	3.10	3.18	Insignificant
r_{bd}	0.3456	0.0879	0.50	3.18	Insignificant
r_{cd}	-0.3456	0.2321	0.89	3.18	Insignificant
r_{be}	0.5346	0.1452	0.23	3.18	Insignificant
r_{bf}	0.8543	0.2345	2.91	3.18	Insignificant
r_{de}	-0.3024	0.0789	3.76	3.18	Significant
r_{df}	0.1222	0.0333	0.76	3.18	Insignificant

Source: Various bank and financial statistics published by NRB (Mid-Jan 2012)

Multiple Correlations

$R_{b.ad}$= 0.9728

$R_{d.bc}$=0.5592

$R_{b.ef}$=0.9549

$R_{d.ef}$=0.3408

Coefficient of Multiple Determinations

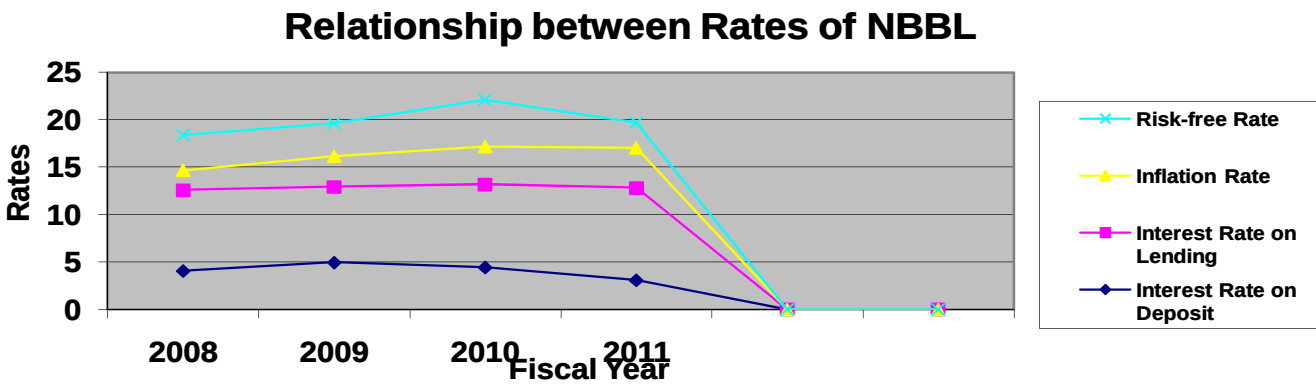
$R^2_{b.ad}$ = 0.9464

$R^2_{d.bc}$ = 0.3128

$R^2_{b.ef}$ = 0.9120

$R^2_{.d.ef}$ = 0.1162

Figure: 4.3



The correlation coefficients between interest rate on deposit and amount deposited, r_{ab}, is 0.8976 and between interest rate on lending and amount loaned, r_{cd} is -0.3456 which means that increased supply of deposit brings increment in interest rate on deposit and increased interest rate on lending brings decrement in amount loaned. The coefficient of determination, r^2_{ab}, of 0.2345 shows that 23.45% of total variation in interest rate on deposit is the effect of amount supplied (deposit). Similarly, the coefficient of determination between c and d, r^2_{cd}, shows that 23.21% of total variation in amount loaned is the effect of interest rate on lending.

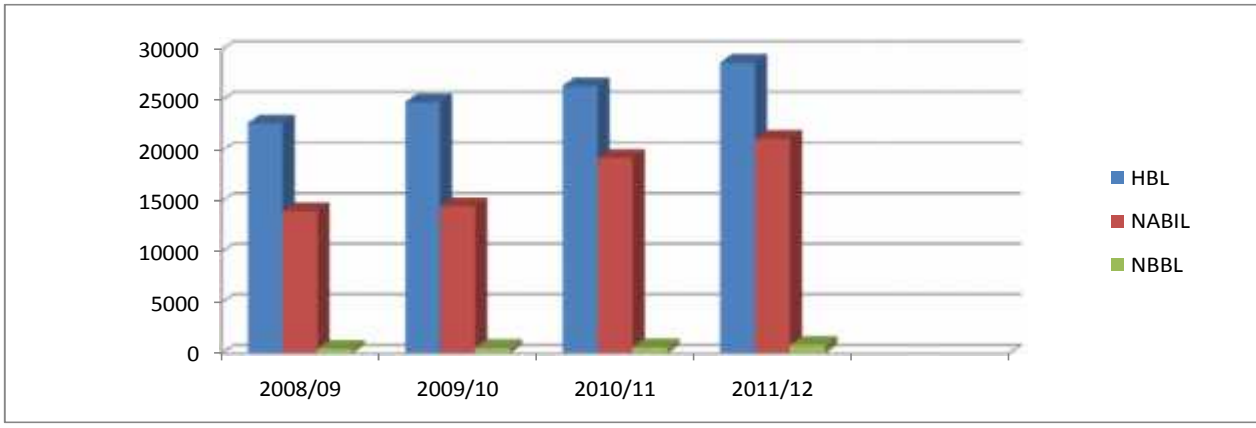
Table 4.7

Deposit Amount of Sample Organizations (Rs. in Millions)

Fiscal Year / Companies	2008/09	2009/10	2010/11	2011/12
HBL	22760.9	24831.1	26456.3	28765.2
NABIL	14098.0	14586.6	19348.4	21234.5
NBBL	505.91	586.874	655.046	877.026

Figure 4.4

Deposit Amount of Sample Organizations (Rs. in Millions)



The deposit of HBL from FY 2008/09 to 2011/012 has been increased by 26.37%. In the same year, deposit of NABIL has been increased by 50.62%. Similarly, deposit of NBBL is increased by 73.35% as compared to FY 2008/09.

All the deposit of banks and finance companies from FY 2008 to 20012 are in increasing trend. Finance companies has low amount of deposits although they have higher percentage of deposits.

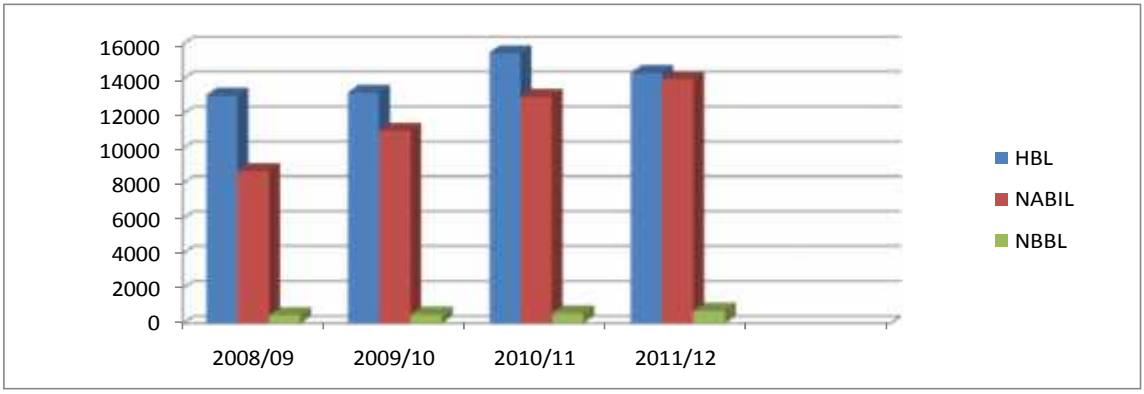
Table 4.8

Amount of Loan Disbursed by Sample Organization (Rs. in Millions)

Fiscal Year / **Companies**	**2008/09**	**2009/10**	**2010/11**	**2011/12**
HBL	13081.7	13245.1	15515.7	14367.4
NABIL	8769.7	11078.0	13021.3	14021.8
NBBL	502.31	531.393	620.572	759.226

Figure 4.5

Amount of Loan Disbursed by Sample Organization (Rs. in Million)



The loan of HBL is increased up to FY 2010/11 but it is decreased in FY 2011/12.The loan of NABIL is continuous increasing. Loan provided by NBBL is also increasing.

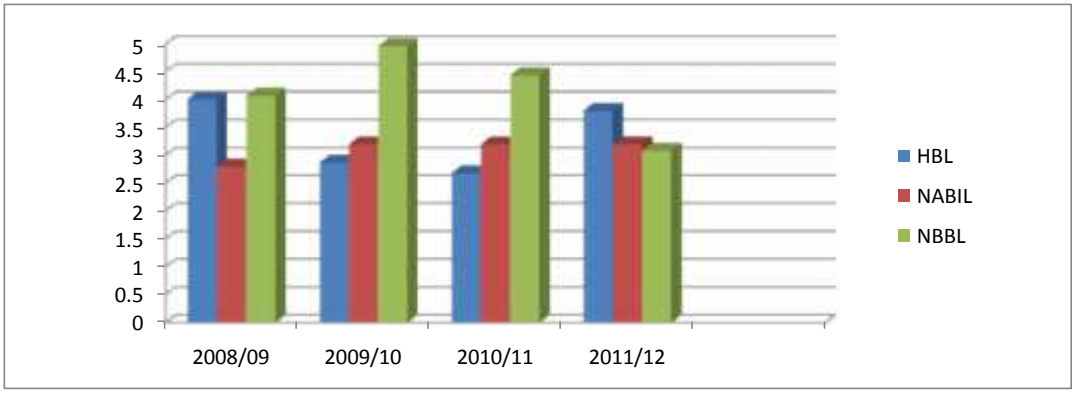
Table 4.9

Interest Rate on Deposit of Sample Organizations (in percentage)

Fiscal Year	2008/09	2009/10	2010/11	2011/12
HBL	4.01	2.87	2.68	3.8
NABIL	2.80	3.20	3.20	3.20
NBBL	4.07	4.96	4.44	3.09

Figure 4.6

Interest Rate on Deposit of Sample Organizations (in percentage)



Interest rate on deposits of HBL is decreased from FY 2008/09 to FY 2010/11 but it is increased in FY 2011/012. The interest rate on deposit of NABIL is increased from FY 2008/09 to FY 2009/10 & after that the rate is same up to FY 2011/12. The interest rate on deposit of NBBL is also increased from FY 2008/09 to 2009/10 then after the rate is decreased respectively.

Table 4.10

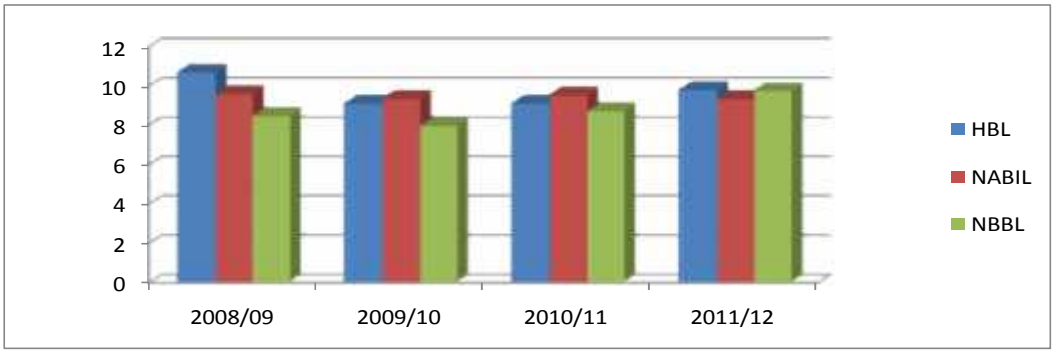
Interest Rate on Lending of Sample Organization (in percentage)

Fiscal Year / Companies	2008/09	2009/10	2010/11	2011/12
HBL	10.69	9.12	9.12	9.8

NABIL	9.60	9.35	9.54	9.35
NBBL	8.5	8	8.75	9.75

Figure 4.7

Interest Rate on Lending of Sample Organization (in percentage)



The interest rate on lending of HBL is comparatively higher than NABIL & NBBL in FY 2008/09. From FY 2009/10 to 2010/11 there is no change in interest rate on lending of HBL but it's increased in FY 2011/12. Similarly the interest on lending of NABIL & NBBL is also fluctuated from FY 2008/09 to FY 2011/12.

4.3 ANALYSIS OF PRIMARY DATA

4.3.1 QUESTIONNAIRES TO RESPONDENTS

The primary data are collected from questionnaires in this study. It helps to identify the interest rate policy of concerned organization. I have collected information from three Commercial Banks. Only three organizations replied although it was distributed to seven organizations.

In course of analyzing the data, I have not only analyzed the secondary data. To make my research work more effective and accurate, I have also collected some primary data through the means of questionnaire by the help of company's employee having different post i.e., Credit manager, Manager, CEO etc.

There are 4 respondents in total who have helped me for filling up questionnaire because of the belongings of the information I had not consult the lower level employees of the company. On the basis of answers given by them, I am going to analyze the answers. For this purpose, I arrange the information in a tabular form, which is in below, and questionnaire given with options of answers are kept in last at annex.

Table 4.11

Analysis of Respondent Answers

Q.No.							
	Yes	No	A	B	c	D	e
1			2	1			1
2	3	1				-	-
3	4					-	-
4					3	D	-
5	3				1	-	-
6				4		-	-
7			1	1	2	-	-

Source: Details of questionnaires see Appendix1

According to respondents answers from question no.1 "What are the methods of charging interest rate on lending**"** it can be said that two respondents are in favor of simple interest, one in add on installment and one in favor of others**.**

For the question no. 2 " Does interest rate both charged and provided by your organization vary according to season" three respondents say "yes" and one respondent says "no".

For the question no. 3 "Does interest rate differ according to maturity period of loan (time preference) **"",** all four respondents say "yes".

For the question no. 4 "How far the open market operation of NRB is affecting interest rate charged and provided by this institute**"** three respondents say that there is affecting to some extend and one respondent say, "not affecting at all".

For the question no. 5 "Does political instability of our country is influencing on interest rate of this institution" it can be said that three respondents are in favor of "directly influencing" and one in favor of indirectly influencing.

For the question no. 6 "In your experience, whether people deposit more or withdraw in the situation of violence & insecurity" all respondents say "withdraw more"

For the question no 7 "Does the increase in foreign employment in recent years having any impact on interest rate charged and offered by the institutions" one respondent say "yes", two say "no" and one say "too some extend"

Thus, by analyzing this primary information it is found that the result of secondary data analysis and results of primary data analysis are matches in various major aspects.

Hence, finally the major and important part of this thesis i.e. presentation and analysis of data comes to an end. Overall, interest rate behavior between Nepalese Commercial Banks was, the analysis presented here couldn't be considered complete and final. In subsequent chapter, major findings of the analysis and recommendations to remedy the situation have been presented systematically. In the like manner summary and conclusion have been drawn at the end of this thesis.

4.4 MAJOR FINDINGS FROM SECONDARY DATA

The study aim was to show the relationship between the interest rates and their determining factors. From the study of sample organizations following major findings have been drawn.

Financial Performances of three commercial bank are as follows:

- **HBL:** Amount of deposit and interest on deposit is highly negatively correlated and interest rate on deposit and lending are highly positively correlated and both the coefficient is statistically significant. Interest rate on deposit and lending with inflation are negative correlated and their coefficients are statistically insignificant. Interest rate on deposit and lending with risk-free rate are positively correlated and both the coefficient is also statistically insignificant.

- **NABIL**: We have found that interest rate on lending and inflation rate is highly negative correlated and its coefficient is statistically significant. Remaining all the coefficients is statistically insignificant. Amount of loan disbursed and interest rate on lending as well as interest rate on deposit and inflation rate are negatively correlated except other factors.
- **NBBL:** We have found that interest rate on lending and inflation rate is highly negative correlated and its coefficient is statistically significant. Remaining all the coefficients is statistically insignificant. Amount of loan disbursed and interest rate on lending as well as interest rate on deposit and inflation rate are negatively correlated except other factors.

Table 4.12

Summary Findings:

Orgn's	r_{ab}	r_{bd}	r_{cd}	r_{be}	r_{bf}	r_{de}	r_{df}
HBL	-0.9123	0.9950	-0.7868	-0.5483	0.7080	-0.5169	0.6989
NABIL	0.1037	0.2410	-0.4157	-0.2148	0.6159	-0.9606	0.7718
NBBL	0.8976	0.3456	-0.3456	0.5346	0.8543	-0.3024	0.1222

a= Amount of Deposit

b= Interest Rate on Deposit

c= Amount of Loan-Advanced

d= Interest Rate of Lending

e= Inflation Rate

f = Risk-free Rate of Interest

4.5 MAJOR FINDINGS FROM PRIMARY DATA

By analyzing this primary information it is found that the result of secondary data analysis and results of primary data analysis are matches in various major aspects. The followings are the major findings of primary data.

The methods of charging interest rate on lending: Findings said that two respondents are in favor of simple interest, one in adds on installment and one in favor of others.

Interest rate both charged and provided by organization vary according to season: three respondents say "yes" and one respondent says "no".

Interest rate differ according to maturity period of loan (time preference): All four respondents say “yes”.

Open market operation of NRB affecting interest rate charged and provided by this institute: Three respondents say that there is affecting to some extend and one respondent say, “not affecting at all.

Political instability of our country influencing on interest rate of the institution: It can be said that three respondents are in favor of “directly influencing” and one in favor of indirectly influencing.

People deposit more or withdraw in the situation of violence & insecurity: All respondents’ say, “Withdraw more.

Increase in foreign employment in recent years having impact on interest rate charged and offered by the institutions: one respondent say “yes”, two say “no” and one say “too some extend”

CHAPTER-V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter includes summary, a brief account of the whole study findings and conclusion drawn from the analysis of interest rate behaviors in Nepalese commercial banking sector suggestion or recommendations to the authorities to solve the problems on the basis of the findings.

5.1 SUMMARY

Natural resources are being remained unused due to the lack of financial and technical know-how. Circulation of money from savers to users is must for the economic development. Financial system , as an intermediary, facilities the circulation of fund by collecting scattered fund by collecting scattered fund from savers via: household (individuals and families, business and government sector of the economy) and provides the collected fund to users, Financial), business and government sectors of the economy) and provide the collected fund family) system as an organized sector in Nepal, to develop the economy and to help to rise the living standard of people through mobilizing capital, was started after the advent of Nepal Bank Limited in 1994 B.S. as a joint venture between government and private sector. Currently there are 32 commercial banks, 88 development banks,24 Micro finance development banks,70 finance companies, 16 credit co-operative (limited banking), 36 financial NGOs & 2 other Institutions are in operation within financial system of Nepal.

Financial institutions/organizations survive by making profit which is interest spread i.e. difference between interest received and interest charged. Interest is the payment made for the money and interest rate is the amount of interest paid per unit of time expressed as a percentage of the amount borrowed. What are the responsible factors for determining the interest rate in Nepalese Financial System/Market was the main purpose of this study. Nepal Rastra Bank, as central bank is the authority to fix the interest rate on deposits and loans of commercial banks and other financial institutions in Nepal since its establishment in 2013.

After the restoration of democracy and liberal policy adopted by the government, many financial institutions have been established. NRB also gave freedom to fix interest rate that they charge and offer. But NRB used to issue directive regarding overall performance of the financial institutions. Here an attempt is made to analyze the factors affecting the rate of interest. Brief introduction of sample organizations, statement of problem, significance of the study, research hypothesis, limitations of the study, chapter plan are also the components of first chapter.

In second chapter, theoretical review has been made. Different views about interest, functions of interest and theories determining interest rates have been reviewed in this chapter which offers insight into the functioning of the financial system. The classical theory of interest emphasizes saving and investment demand as interest rate determining forces. While the liquidity preference theory points to the demand and supply of cash balances. Loanable fund theory views interest rate as determined by the total demand for and supply of credit, while the rational expectations theory emphasizes the roles played by public expectations regarding interest rate, economy and the impact of new information on the movement of interest rates to a new equilibrium. Collectively the different theories of interest rates determination examined in this chapter. In this chapter, we consider various factors that cause the interest rate on one security or loan. The factor includes expectation of inflation, the maturity or length of a security or of loan, the risk of borrower default, taxes etc. If adjust upward the nominal interest rate on a loan to achieve their desired real rate of return. According to fisher effect, if expected inflation rates rises, the nominal interest rate on a financial assets must also be rise by exactly the same amount, point for point. The yield curve or term structure of interest rate expresses the relationship between the annual rate of return (interest rate) on a financial instrument and its term to maturity when all other factors are held constant. One curves traced in this chapter-the unbiased expectation hypothesis argues that yield curves reflect the interest rate expectations of the market place and hint at the direction, if not the magnitude, of future rate movements. Contending theories such as the liquidity premium view, the preferred habitat theories and the segment markets argument, contend that other factors in addition to expectations influenced the yield curves

or term structure of interest rate. Regardless of which theory borrow a substantial portion of their funds at the short end of the maturity spectrum and lend heavily at longer maturities.

The price of security and its yield (interest/rate of return) are inversely related. A rise in yield implies a decline in price and vice-versa. The intelligent investor must learn to distinguish one method from another because effective interest rate differs according to

method applied for calculating interest. We have examined four different methods in chapter two. Interest rate also affected by economic growth, budget deficit, money supply etc. Specific risk and cost factors affecting interest rate on debt security are marketability, liquidity, default risk, repayment risk, reinvestment risk, taxability, servicing cost, exchange rate risk etc. The study on this topic is rarely available, some theses and independent studies relating to some aspect of this study have reviewed in this chapter.

Research design used is analytical and descriptive. Out of the financial system, three banking organizations regarding of all groups has been taken as sample. Primary data are collected using questionnaire; interview and secondary data are collected from various publications. Collected data are presented in tabular and graphic form and analyzed using various statistical tools like, mean, correlation coefficient, t-statistics and coefficient of determination in chapter four. Mainly the relationship between factors assumed to be influencing the interest rate on deposit and lending has been analyzed using correlation. Some primary data are analyzed in descriptive form and conclusion has been drawn which are presented in following section.

5.2 CONCLUSION

From the analysis of data following conclusions has been drawn.

The correlation coefficient between interest rate on deposit and amount of deposit (r_{ab}) of HBL is highly negative whereas of NABIL is positive. It ranges from -0.9123 to 0.9065 among the sample organizations. All the correlation coefficients are statistically significant except NABIL. Here, we could see that NABIL have proved the theoretical concept that there must be positive correlation meaning that higher interest rate on deposit

attracts more deposit. NBBL and HBL show that interest rate (price of deposit) as dependent, which is determined by supply of fund (deposit). Thus, negative correlation shows that when supply increases, price (interest rate) decreases.

One variable assumed to be affecting interest rate on lending is amount loaned i.e. demand of fund. The correlation coefficient between amount loaned and interest rate on lending *(r_{cd})* is generally negative except. It ranges from -0.7868 to 0.7157. The correlation coefficient *(r_{cd})* of HBL and NBBL is positive means that less amount is

demanded at lower rate. But the correlation is not significant. This positive relation is due to other factors. NBL is suffering from financial sickness due to the slackness in recovery of loan and lack of fund to lend. But the negative correlation of other organizations means that more amounts is demanded at lower interest. In general, there should be positive relationship between interest rate on lending and amount loaned. But the 75% of the sample organizations show that amount of loan is affected by the interest rate rather than affecting the interest rate by amount demanded.

The relationship between interest rate on deposit and on lending *(r_{bd})* for all sample organizations is positive including highly positive correlation of NBL(i.e. 0.9950). The correlation coefficient ranges from 0.2410 to 0.9950 among sample organizations. Both HBL and NBBL have statistically significant correlation coefficients whereas NABIL has no statistically significant correlation coefficients. In one hand, positive correlation shows that both rates are dependent to each other i.e. variation in one rate also brings variation in other rate in the same direction. Therefore, both interest rates are determining factor of each other whereas in the other hand negative correlation indicates that variation in one rate brings the variation in another rate in the opposite direction. But we do not identify with this relation theoretically.

The relationship between interest rate on deposit and inflation rate *(r_{be})* among the sample organizations is negative. Here it ranges from -0.5483 to -0.2148. All the correlation coefficients of samples are statistically insignificant. Theoretically, there should be positive correlation between these two variables, according to Fisher effect. But the interest rate in Nepalese Banking sector is highly affected by inflation. Therefore, these sample organizations give negative correlation coefficients instead of positive correlation.

The correlation between interest rate on lending and inflation rate (r_{de}) is negative. The coefficient of correlation among sample organizations lies between -0.9606 to -0.3079. Most of the coefficients are insignificant except NABIL whose correlation coefficient is significant. Even though, theoretically there should be a positive rate on lending. The Nepalese Banking sectors are affected by inflation to some extent. Due to this reason, correlation coefficient of all the sample organizations has become negative.

The correlation coefficient between interest rate on deposit and amount of deposit (r_{ab}) of HBL is highly negative whereas of NABIL and NBBL is positive. It ranges from -0.234 to 0.6065 among the sample organizations. Theoretically there should be positive correlation between these two variables which has proved by our sample organizations to some extent.

The relationship between interest rate on lending and risk-free rate (r_{df}) is positive. The coefficient of correlation ranges from 0.1507 to 0.9875 among sample organizations. All the coefficients are statistically insignificant. This means that nominal interest rate on lending in Nepalese banking sector is least affected by risk-free rate of interest.

Other specific factors influencing interest rate on lending are performance of the borrowing company, collateral base, goodwill and reputation of borrower, loyalty, size of business, volume of loan, bargaining power etc.

Nepalese Banking sector is also affected by long-term economic factors like; economic and business growth rate, reduction in lending opportunity due to terrorism, conflict, insecurity etc. according to the respondents. Because of unavailability of investment opportunities, Nepalese Banking sectors are suffering from over liquidity in recent years as shown by increasing trend of deposit and decrease rate on such deposits.

In some years, there is negative interest rate on deposit i.e. interest rate on deposit is less than risk-free rate on interest. Similarly, there is negative relationship between interest rate and inflation which means that while inflation is increasing interest rate is decreasing.

Generally, Bank charges high interest rate on lending than in finance companies.

5.3 RECOMMENDATIONS

As in other developing countries, the Banking and financial sectors in Nepal are also growing in nascent stage. Nepal has committed itself to economic liberalization after

correctly recognizing that financial sector reform is an integral part of this process. The role of Banking sector should be effective towards the mobilizing the funds from savers to users.

In view of above facts and figures, the financial performance of 3 commercial Banks can be listed as follows:

a) As the NRB has authority to control and stimulate the financial system, especially money market, it is also information source for public and other concerned parties. So, NRB should publish all the information in time to provide knowledge to the depositors, lenders and other concerned parties so that they can make their decisions correctly.

b) The role of government, in market-oriented economy, is to provide security and to develop infrastructure. Our analysis shows that economic activities are slacking down due to the political activities prevailed in country. So, the investment opportunities (lending opportunities) to the financial intermediaries have been curtailed and they are also facing over liquidity problem as shown by decreasing interest rate on deposit and reduced deposit requirement. The Banking sector like other aspect of the economy is tied to the need of stable policies, sustainable peace in the country. Therefore, the government should try to maintain the political stability peace for the development of the banking sectors.
c) Government and NRB should formulate suitable policies to foster the development of money market and to motivate financial intermediaries.
d) Although, there is almost positive correlation between interest rate on deposit and lending (decrement in one rate is almost proportionate rate on lending and deposit), institutions are suggested to maintain reasonable spread between interest rates so that more lending and deposits can be stimulated.
e) Lending institutions should introduce new customer-oriented schemes of lending and borrowing so that more lending can be promoted and over liquidity problem may be solved.

f) Political stability is one of a key factor for the growth of financial activities. Financial institution might play a vital role once the political situation improves.
g) Since, Nepal is considered as rich in water resources, the sampled companies would get benefit to explore their lending in hydro sectors also.

Considering the financial performances of the said financial institutions, they are capable enough to invest and retain deposit as seen in their financial indicators. Effective interest rate differs with coded interest rate according to the different methods used in calculating and compounding interest. So, borrowers and depositors are suggested to be awarded.

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WEBSITES:

www.himalayanbank.com
www.mof.gov
www.nabil.com
www.nbbl.gov.np
www. nrb.org.

APPENDIX-I

QUESTIONNAIRES

Organization:
Date of establishment:
Address:

1. What are the methods of charging interest rate on lending?

a) Collect/Simple interest ☐ Add on Installment ☐

c) Discount Method ☐ d) Flat interest system ☐

e) Others ☐

2. Does interest rate both charged and provided by your organization vary according to season?

a) Yes ☐ b) No ☐

3. Does interest rate differ according to maturity period of loan (time preference)?

a) Yes ☐ b) No ☐

If yes, i) Higher rate for longer maturity ☐

ii) Lower rate for longer maturity ☐

4. How far the open market operation of NRB is affecting interest rate charged and provided by this institute?

a) Highly affecting ☐ b) Normally affecting ☐

c) Affecting to some extent ☐ d) Not affecting at all ☐

5. Does political instability of our country is influencing on interest rate of this institution?

a) Directly influencing ☐ b) Influencing somewhat ☐

c) Indirectly influencing ☐ d) Not at all ☐

6. In your experience, whether people deposit more or withdraw in the situation of violence & insecurity?

a) Deposit More ☐ b) Withdraw more ☐

c) No effect ☐

7. Does the increase in foreign employment in recent years having any impact on interest rate charged and offered by the institutions?

a) Yes ☐ b) To some extent ☐

c) No ☐

APPENDIX-II

For Calculation of Interest Rate on Deposit and Interest Rate on Lending of Sample Organizations:

Calculation of Average Interest Rate on Deposit of HBL: (Rate in Percentage)

Year	Saving	Average	Fixed						
			14 days	1 month	2 months	3 months	6 months	1 Year	2 Years/above
2008	4.0	4.19	2.3	3.3	-	4.0	4.25	5.5	6.0
2009	3.75	4.01	2.3	3.3	-	3.75	4.0	5.25	5.75
2010	3.75	4.01	2.3	3.3	-	3.75	4.0	5.25	5.75
2011	2.75	2.87	1.75	2.0	-	2.5	3.0	3.75	3.75

Calculation of Average Interest Rate on Lending of HBL (Credit of HBL)

Sectors	2008	2009	2010	2011
Overdraft	11.25-13.75	10.5-13.25	10.5-13.25	9-12
Export Credit	9-9.5	9-9.5	9-9.5	8.25-8.75
Import L/C	9.75-12.75	9.25-12.25	9.25-12.25	7.4-11.75
Against FDR	5.5 (+)2	5.25-(+)3	5.25-(+)3	3.75-(+) 2.5
Against HMG Bond	8.0	8.0	8.0	5-6
Against BG/CG	9.5-10.5	9.5-10.5	9.5-10.5	8.25-9.25
Against Other Guarantee	10.5	10.5	10.5	-
Industrial Loan	9-13.5	9-13	9-13	8.25-12.75
Commercial Loan	9-13.75	9-13.25	8.25-12.5	8.25-12.5
Priority Sector	12-13	12-13	12-13	11-12.25
Term Loan	12.5-13.5	12-13	12-13	9.5-11.75
Working Capital	10.75-13.25	10.5-13	10.5-13	-
Hire Purchase	12-13	11.5-13	11.5-13	9-11.5
Others	8.5-16.25	8.5-15.75	8.5-15.75	6-13.5
Average	10.83	10.69	10.69	9.12

Calculation of Correlation Coefficient between deposit amount and Average Interest Rate on Deposit of HBL

Year	Deposit Amount (a)	Interest % (b)	ab	a^2	b^2
2008	18595.2	4.19	77913.89	345781463	17.5561
2009	21002.8	4.01	84221.23	441117607.8	16.0801
2010	22760.9	4.01	91271.21	518058568.8	16.0801
2011	24831.1	2.87	71265.26	61658327.2	8.2369
	∑a=113646.3	∑b=17.76	∑ab=395574.47	$\sum a^2$=2621476977	$\sum b^2$=65.1356

Correlation-coefficient between deposit amount (a) and Interest Rate on Deposit (b)

$$r_{ab} = \frac{n\Sigma ab - \Sigma a.\Sigma b}{\sqrt{n\Sigma a^2 - (\Sigma a)^2}\sqrt{n\Sigma b^2 - (\Sigma b)^2}}$$

Where,

n = no. of fiscal years = 4

∑ab = Summarization of various "a" multiply "b" = 395574.47

∑b = Sum of Variable "b" = 17.76

∑a = Sum of Variable "a" = 113646.3

$\sum a^2$ = Sum of squares of Variables "a" = 2621476977

$\sum b^2$ = Sum of Squares of Variables "b" = 65.1356

$(\sum b)^2$ = Whole Square of Summarization "b" Variables = 315.4176

$(\sum a)^2$ = Whole Square of Summarization "a Variables = 12915481500

Calculation of Correlation Coefficient between Deposit Rate and Lending Rate of HBL.

Year	Deposit Rate (b)	Lending Rate (d)	bd	b^2	^{d2}

2008	4.19	10.83	45.3777	17.5561	117.2889
2009	4.01	10.69	42.8669	16.0801	114.2761
2010	4.01	10.69	42.8669	16.0801	114.2761
2011	2.87	9.12	26.1744	8.2369	83.1744
	∑b=17.76	∑d=50.45	∑bd=181.7275	$\sum b^2$=65.1356	$\sum d^2$=512.1899

Test of significance of correlation coefficient between deposit rate and lending rate

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Lending Amount and Average Interest Rate on Lending of HBL

Year	**Lending Amount (c)**	**Lending Rate (d)**	**cd**	**c^2**	**d^2**
2008	9673.5	10.83	104764.005	93576602.25	117.2889
2009	11074.2	10.69	118383.198	122637905.6	114.2761
2010	13081.7	10.69	139843.373	171130874.9	114.2761
2011	13245.1	9.12	120795.312	175432674	83.1744
	∑c=62590.2	∑d=50.45	∑cd=625289.072	$\sum c^2$=803515003.2	$\sum d^2$=512.1899

Test of significance of correlation coefficient between deposit rate and lending amount and Interest Rate on Lending of HBL

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Average Interest Rate on Deposit and Inflation Rate of HBL

Year	**Deposit Rate (b)**	**Inflation Rate (e)**	**be**	**b2**	**e^2**
2008	4.19	2.9	12.151	17.5561	8.41

2009	4.01	4.8	19.248	16.0801	2304
2010	4.01	4	16.04	16.0801	16
2011	2.87	4.5	12.915	8.2369	20.25
	∑b=17.76	∑e=20.8	∑be=72.682	$\sum b^2$=65.1356	$\sum e^2$=88.86

Test of significance for correlation coefficient between Interest Rate on Deposit and Inflation Rate of HBL

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Deposit Rate and Risk free Rate of HBL

Year	**Deposit Rate (b)**	**Risk Free Rate (f)**	**bf**	**b^2**	**f^2**
2008	4.19	4.71	19.7349	17.5561	22.1841
2009	4.01	3.48	13.9548	16.0801	12.1104
2010	4.01	2.93	11.7493	16.0801	8.5849
2011	2.84	2.50	7.175	8.2369	6.25
	∑b=17.76	∑f=16.46	∑bf=60.2252	$\sum b^2$=65.1356	$\sum f^2$=57.195

Test of significance of correlation coefficient between Interest Rate on Deposit and Risk free Rate of HBL

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Lending Rate & Inflation Rate of HBL

Year	Lending Rate (d)	Inflation Rate (e)	de	d^2	e^2
2008	10.83	2.9	31.407	117.2889	8.41
2009	10.69	4.8	51.312	114.2761	23.04
2010	10.69	4	42.76	114.2761	16
2011	9.12	4.5	41.04	83.1744	20.25
	∑d=50.45	∑e= 20.8	∑de=208.471	$\sum d^2$=512.1899	$\sum e^2$=88.86

Test of significance of correlation coefficient between Interest Rate on Lending and Inflation Rate of HBL

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Lending Rate and Risk free Rate of HBL

Year	Lending Rate (d)	Risk Free Rate (f)	df	d^2	f^2
2008	10.83	4.71	51.0093	117.2889	22.1841
2009	10.69	3.48	37.2012	114.2761	12.1104
2010	10.69	2.93	31.3217	114.2761	8.5849
2011	9.12	2.50	22.8	83.1744	6.25
	∑d=50.45	∑f=16.46	∑df=168.233	$\sum d^2$=512.1899	$\sum f^2$=57.195

Test of significance of correlation coefficient between Lending Rate and Risk free Rate of HBL

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Deposit Amount and Lending Rate of HBL

Year	Amount of Deposit (a)	Lending Rate(d)	ad	a^2	d^2
2008	18595.2	10.83	201386.02	345781463	117.2889
2009	21002.8	10.69	224519.93	441117607.8	114.2761
2010	22760.9	10.69	243314.02	518058568.8	1142761
2011	24831.1	9.12	226459.63	616583527.2	83.1744
	∑a=113646.3	∑d=50.45	∑ad=1136961.1	$\sum a^2$=2621476977	$\sum d^2$=512.1899

Test of significance of correlation coefficient between Deposit Amount and Lending Rate of HBL

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Deposit Rate and Lending Amount of HBL

Year	Deposit Rate (b)	Lending Loan Amount (c)	bc	b^2	c^2
2008	4.19	9673.5	40531.965	17.5561	93576602.25
2009	4.01	11074.2	4447.542	16.0801	12263905.6
2010	4.01	13081.7	52457.617	16.0801	171130874.9
2011	2.87	13245.1	38013.437	8.2369	175432674
	∑b=17.76	∑c=62590.2	∑bc=216992.63	$\sum b^2$=65.1356	$\sum c^2$=803515003.2

Test of significance of correlation coefficient between Interest Rate on Deposit and Lending Amount of HBL

t = Statistics under null hypothesis;

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

Calculation of Correlation Coefficient between Inflation Rate and Risk Free Rate of HBL

Year	Inflation Rate (e)	Risk Free Rate (f)	ef	e^2	f^2
2008	2.9	4.71	13.659	8.41	22.1841
2009	4.8	3.48	16.704	23.04	12.1104
2010	4	2.93	11.72	16	8.5849
2011	4.5	2.5	11.25	20.25	6.25
	$\sum e=20.8$	$\sum f= 16.46$	$\sum ef=66.397$	$\sum e^2=88.86$	$\sum c^2=57.195$

Test of significance of correlation coefficient between Inflation Rate and Risk Free Rate of HBL

t = Statistics under null hypothesis;

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

Calculation of Multiple Correlation Coefficients of Different Variables of HBL

Variables	Coefficient of Correlation	Coefficient of Determination
r_{ab}	-0.9123	0.8322
r_{bd}	0.9950	0.9900
r_{cd}	-0.7868	0.6190
r_{be}	-0.5483	0.3006
r_{bf}	0.7080	0.5012
r_{de}	-0.5169	0.2671
r_{df}	0.6989	0.4884
r_{ad}	-0.8850	0.7832
r_{bc}	-0.8314	0.6912
r_{ef}	-0.7840	0.6146

Multiple Correlation Coefficient ($r_{b.ad}$) = $\sqrt{\frac{r^2_{ab} + r^2_{bd} - 2 r_{ab} . r_{bd} r_{ad}}{1 - r^2_{ad}}}$

Where,

$r_{b.ad}$= Multiple Correlation Coefficient Assuming Variable "b" (Deposit Rate) as Dependent variable and other two variables "a" and Variable "d")i.e. deposit amount & Lending Rate) as independent Variables.

r_{ab} = Correlation Coefficient between variables "a" and "b" = -0.9123

r_{bd} = Correlation Coefficient between variables "b" and "d" = 0.9950

r_{ad} = Correlation Coefficient between variables "a" and "d" = 0.8850

$(r_{ab})^2 = (-0.9123)^2 = 0.8322$

$(r_{bd})^2 = (0.9950)^2 = 0.9900$

$(r_{ad})^2 = (0.8850)2 = 0.7832$

($r_{b.}$ Multiple Determinations

$(r^2_{b.ad}) = (r_{b.ad})^2 = (0.9971)^2 = 0.9944$

Multiple Correlation Coefficient ($R_{d.bc}$) = $\sqrt{\frac{r^2_{bd} + r^2_{cd} - 2 r_{bd} . r_{cd} . r_{bc}}{1 - r^2_{bc}}}$

Multiple Correlation Coefficient ($r_{b.ef}$) = $\sqrt{\frac{r^2_{be} + r^2_{bf} - 2 r_{be} r_{be} r_{bf} r_{ef}}{1 - r^2_{ef}}}$

Multiple Correlation ($r_{d.ef}$) = $\sqrt{\frac{r^2_{de} + r^2_{df} - 2 r_{de} r_{df} . r_{ef}}{1 - r^2_{ef}}}$