

**THE STUDY ON TREND IN INTEREST RATE OF COMMERCIAL
BANKS OF NEPAL AND ITS CONSEQUENCES ON DEPOSIT AND
LOAN**



**A THESIS SUBMITTED TO THE DEAN OF MANAGEMENT OFFICE
TRIBHUVAN UNIVERSITY**

SUBMITTED BY:
MANOJ KUMAR BASNET
NEPAL COMMERCE CAMPUS
TU Regd. No: 5-1-22-77-99
Roll No: 1300/064
Exam Roll No: 250288

**In partial fulfillment of the requirement for the degree of
Master of Business Studies (M.B.S.)
March 2012**

5th March 2012

RECOMMENDATION

This is to certify that the Thesis

Submitted by:

MANOJ KUMAR BASNET

Entitled:

**“THE STUDY ON TREND IN INTEREST RATE OF COMMERCIAL
BANKS IN NEPAL AND ITS CONSEQUENCES ON DEPOSIT AND
LOAN”**

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

.....

.....
Mr.Balan Kumar Rajbanshi	Dr.Sushil Bhakta Mathema	Mr.Rajeshwor Neupane
(Thesis Supervisor)	(Head of Research Department)	(Campus Chief)

Date:

VIVA-VOCE SHEET

We have conducted the viva-voce of the thesis presented

By

MANOJ KUMAR BASNET

Entitled:

**THE STUDY ON TREND IN INTEREST RATE OF COMMERCIAL
BANKS OF NEPAL AND ITS CONSEQUENCES ON DEPOSIT AND
LOAN**

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

Master Degree of Business Studies (M.B.S)

Viva-Voce Committee

Head, Research Department

Member (Thesis Supervisor)

Member (External Expert)

DECLARATION

I, Manoj Kumar Basnet(M.B.S, Roll No.1300/064) hereby declare that the work reported in this thesis **“THE STUDY ON TREND IN INTEREST RATE OF COMMERCIAL BANKS IN NEPAL AND ITS CONSEQUENCES ON DEPOSIT AND LOAN”** submitted to the Dean of Management office, Tribhuvan University is the result of my own work done, investigation and effort, except where otherwise stated. It has been done in the form of partial fulfillment of the requirement for the Masters Degree in Business Studies (M.B.S) under the supervision of Mr. Balan Kumar Rajbanshi and Dr. Sushil Bhakta Mathema respectively.

I want to assure the team that this thesis will not be submitted for any other degree henceforth.

.....
Manoj Kumar Basnet
Researcher
T.U Regd No.5-1-22-77-99
Campus Roll No.1300/064
Exam Roll No.250288

6th March 2012

**To,
The Campus Chief
Nepal Commerce Campus
Tribhuvan University
Minbhavan, Kathmandu
Nepal**

Re: Submission of Thesis

Dear Sir,

I am Manoj Kumar Basnet belongs to M.B.S (Batch of 2064..Roll No.1300/2064).I am very glad to inform you that I have completed my thesis entitled “**THE STUDY ON TREND IN INTEREST RATE OF COMMERCIAL BANKS OF NEPAL AND ITS CONSEQUENCES ON DEPOSIT AND LOAN**” after the months of research under the supervision of my respected teachers Mr.Balan Kumar Rajbanshi and Dr.Sushil Bhakta Mathema.

I am submitting this thesis now and I would like to request you for the arrangement of VIVA- VOCE Examination as early as possible.

Thanking you.

Yours Sincerely,

.....
Manoj Kumar Basnet
Roll No.1300/2064
T.U Redg.No.5-1-22-77-99
Exam Roll No.250288
Contact Nos.01-4484552(Res)
9851036416(Mobile)

Acknowledgments

This thesis arose in part out of months of research that has been done since I came to complete my master's degree. I have worked with a great number of people whose contribution is assorted ways to the research and the making of the thesis deserved special mention. It is a pleasure to convey my gratitude to them all in my humble acknowledgments.

In the first place, I would like to record my gratitude to my respected teacher Mr. Balan Kumar Rajbanshi for his supervision, advice and guidance from the very early stage of this research as well as giving me extraordinary experiences throughout the work. Above all and most needed, he provided me encouragement and support in various ways, which is priceless in every aspect.

I gratefully acknowledge Mr. Dr. Sushil Bhakta Mathema, research head for Nepal Commerce campus for his advice, supervision and special contribution. His involvement in this thesis has triggered and nourished my intellectual maturity. I am grateful in every possible way and hope to keep up a long relation in future and also I am indebted to him more than he knows.

I gratefully acknowledge the cooperation received in collecting necessary data, information, and their research materials from Administration and Librarian of Nepal Commerce Campus, Nepal Rastra Bank, NABIL Bank, Nepal Investment Bank and Bank of Kathmandu. I would express my sincere thanks to them.

I would like to express my sincere gratitude to my parents and family members, especially My Brother Mr. Saroj Kumar Basnet for providing me with the opportunity to be where I am. Likewise my special thanks goes to my friend Mr. Rabi Rayamajhi and Abhishek Shrestha for their valuable suggestions, Co-operations and regular assist to complete this study.

Finally, I would like to Thank everybody who was important to the successful realization of this thesis, as well as expressing my apology that I could not mention personally one by one.

Manoj Kumar Basnet

Table of Contents

RECOMMENDATION	i
VIVA-VOCE SHEET	ii
DECLARATION	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v-vii
LIST OF TABLE	viii
LIST OF FIGURE	ix-x
ABBREVIATIONS	xi
	Page No.
Chapter- I: Introduction	1-16
1.1 Background of the study	1
1.2 History of Banking Development in Nepal	2
1.3 Interest Rate Strategies of NRB	6
1.4 Profile of Sample Commercial Banks under Study	9
1.5 Statement of the Problem	12
1.6 Objectives of the Study	13
1.7 Research Hypothesis	13
1.8 Significance of the Study	14
1.9 Limitations of the Study	15
1.10 Organization (Plan) of the study	15
Chapter- II: Review of Literature	17-47
2.1 Introduction	17
2.2 Concepts and Meaning of Interest Rates	17
2.3 Functions/Role of the interest rate in the Economy	18
2.4 Theories of determining interest rate	19
2.4.1 Classical theory of interest rates	19
2.4.2 The Loanable Funds Theory of Interest	23
2.4.3 The Liquidity Preference Theory of Interest Rate	29

2.4.4 The Rational Expectation Theory	32
2.5 Factors Affecting the Difference in Interest Rates	34
2.6 Concept of Deposit	36
2.7 Types of Deposit	37
2.8 Importance of Deposit	38
2.9 Concept of Lending (Credit)	39
2.10 Factors Affecting the Volume of Credit	39
2.11 Term structure of Interest Rate	40
2.11.1 Pure Expectation Theory	40
2.11.2 The Liquidity Premium Theory	41
2.11.3 The Segmented-Markets or Hedging-Pressure Argument	42
2.11.4 Preferred Habitat Theory	43
2.12 Review of Related Studies	43
2.13 Research Gap	46
Chapter- III: Research Methodology	48-52
3.1 Introduction	48
3.2 Research Design	48
3.3 Source of Data and Collection Procedure	49
3.4 Population and Sample	49
3.5 Tools for Data Analysis	50
3.5.1 Arithmetic Mean	50
3.5.2 Standard Deviation	50
3.5.3 Correlation of Coefficient	51
3.5.4 Coefficient of Determination	51
3.5.5 t-test for significance for Correlation Coefficient	52
Chapter-IV: Data Presentation and Analysis	53-84
4.1 Introduction	53
4.2 Analysis of Deposit and Interest Rates	53
4.2.1 NABIL Bank Limited	54

4.2.2 Nepal Investment Bank Ltd	59
4.2.3 Bank of Kathmandu	63
4.3 Analysis of Fluctuation in Lending Interest Rate and Its Relation with Lending Amount	68
4.3.1 NABIL Bank Ltd	68
4.3.2 Nepal Investment Bank Ltd	71
4.3.3 Bank of Kathmandu	75
4.4 Analysis of relation between Deposit Rate and Lending Rate	78
4.4.1 NABIL Bank Ltd	78
4.4.2 Nepal Investment Bank Ltd	79
4.4.3 Bank of Kathmandu	81
4.5 Major Findings	82
Chapter-V: Summary, Conclusion and Recommendation	85-90
5.1 Summary	82
5.2 Conclusion and Findings	84
5.3 Recommendation	86

Bibliography

Appendix

List of Tables

Table No.	Title	Page No.
4.1	Interest rate structure of NABIL on deposits (Mid-July 2006 to 2010)	54
4.2	Relationship between Interest Rate on Deposit and Deposit amount of NABIL	56
4.3	Interest rate structure of NIBL on deposits (Mid-July 2006 to 2010)	58
4.4	Relationship between Interest Rate on Deposit and Deposit amount of NIBL	60
4.5	Interest rate structure of BOK on deposits (Mid-July 2006 to 2010)	63
4.6	Relationship between Interest Rate on Deposit and Deposit amount of BOK	65
4.7	Lending rate of NABIL on different sectors during last five FYs	68
4.8	Lending rate of NIBL on different sectors during last five FYs	71
4.9	Lending rate of BOK on different sectors during last five FYs	74
4.10	Relationship between Interest Rate on Deposit and Lending of NABIL	78
4.11	Relationship between Interest Rate on Deposit and Lending of NIBL	79
4.12	Relationship between Interest Rate on Deposit and Lending of BOK	81

List of Figures

Figure	Title	Page No.
2.1	The substitution effect relating Savings & Interest Rates	21
2.2	The Investment Demand Schedule	22
2.3	The Equilibrium rate of Interest in the Classical Theory	22
2.4	The Interest Rate & Volume of Saving	24
2.5	The Supply of Loanable Funds	25
2.6	Total Supply of Loanable Funds	26
2.7	Total Demand for Loanable Funds	28
2.8	Equilibrium Rate of Interest in Loanable Funds Theory	28
2.9	The Demand of money as a function of the Rate of Interest	29
2.10	Quantity of Money Demanded	29
2.11	Quantity of Money Supplied	29
2.12	Effect of an increase in the money Supply on the Rate of Interest	31
2.13	Effect of a decrease in the money Supply on the Rate of Interest	31
2.14	Money Supply & Interest Rates	31
2.15	Equilibrium Interest Rates under Rational Expectation Theory	33
4.1	Interest Rate on Saving and Fixed Deposits of NABIL	55
4.2	Deposit Amount of NABIL during different Fiscal Years	57
4.3	Deposit Rate of NABIL during different Fiscal Years	60
4.4	Interest Rate on Saving and Fixed Deposits of NIBL	61
4.5	Deposit Amount of NIBL during different FYs	61
4.6	Deposit Rates of NIBL during different FYs	62
4.7	Interest Rate on Saving and Fixed Deposits of BOK	64
4.8	Deposit Amount of BOK during different FYs	66
4.9	Deposit Rates of BOK during different FYs	66
4.10	Average Lending Rate of NABIL during different FYs	70
4.11	Lending Amount of NABIL during different FYs	70
4.12	Average lending rate of NIBL during different FYs	73
4.13	Lending Amount of NIBL during different FYs	73
4.14	Average lending rate of BOK during different FYs	76

4.15 Lending Amount of BOK during different FYs	77
4.16 Relationship between Deposit Rate and Lending Rate of NABIL	79
4.17 Relationship between Interest Rate on Deposit and Lending of NIBL	80
4.18 Relationship between Interest Rate on Deposit and Lending of BOK	82

ABBREVIATIONS

A/C	Account
BOK	Bank of Kathmandu
CPI	Consumer Price Index
NIBL	Nepal Investment Bank Limited
et. al.	And others
Fig. (s)	Figures
FY	Fiscal Year
GDP	Gross Domestic Product
GNP	Gross National Product
i.e.	That is
LC	Letter of Credit
Ltd	Limited
NGO	Non Government Organization
NRB	Nepal Rastra Bank
PIN	Price Index Number
PPI	Product Price Index
Rs.	Rupees
T-Bills	Treasury Bills
Vol. (s)	Volume
WPI	Wholesale Price Index

CHAPTER I

INTRODUCTION

1.1 Background of the Study

It has been well known that trade, commerce and industry are the signs of healthy economic development of every country. The current pace of the economic growth and the level economic development attained over the years indicate the potentiality to compete in the international market. But the pace of economic development of Nepal is still in its infant stage. Government has now initiated various economic policies like industrial policy, trade policy, foreign investment policy and privatization policy to accelerate the economic growth and development of the country.

With the implicit objective of the economic development of the country, Nepal has adopted mixed and liberal economic policy. Especially after the restoration of the democracy, the concept of the liberalization policies has been incorporated as directive principal and state policies. As a result of the liberal economic policy thrust adopted in the eighties, various multinational companies, finance companies and joint venture banks came into existence.

Oxford dictionary defines bank as an organization that provides various financial services, for example keeping or lending money.

The primary functions of banks are exchange, lending and borrowing of money but now it perform so many function and activities in numerous ways. Bank performs several financial, monetary and regulation functions, which are very essential for the economic development of the country. Bank draws idle money from the people who are not using at present and are holding for future and supplies loan to those who are in a position to use it for productive purpose. Modern bank can be considered as evolved from the ancient goldsmiths. Bank provides proper facilities and can serve important contribution to develop different sectors of the economy, so bank plays vital role in evaluating financial system of the economy and it is significant from the other financial institutions with respect to both pattern of resource mobilization and deposition. Thus, it is obviously true that banks are the backbone for the resources mobilization. Bank is an

institution for receiving, lending, exchanging and safeguarding money and in some cases issuing notes and transacting other financial business (*Dictionary of English Language, 2005*).

1.2 History of Banking Development in Nepal

Modern banks can be considered as evolved from ancient gold-smiths. Before 1848 B.S. the gold smiths used to store people's gold and other valuable goods and charge nominal charge against the deposit. That time people deposited their gold and valuable goods for the sake of security rather than earning interest (*Ojha & Rajabahak, 1965:117*).

In ancient Nepal, historical record shows that Gunna Kama Dev, the king of Kathmandu, borrowed money to rebuild his Kingdom in 723 A.D. some 57 years thereafter, a merchant Shankhadar introduced Nepal Sambat by clearing all the indebtedness of the people in 880 A.D.(Nepal Bank Patrika, 2037B.S). After Jayasthiti Malla, the people engaged in money lending business, were called Tanka Dhari. Money lending business became quite popular in Nepal. Thus the role of Tanka Dhari was similar to that of banking agent. Still in the practice of Tanka Dhari was not free from Problem. There were mal practices and frauds associated. Consequently, with the growing consciousness and awareness of this, Ranoddip Sing, a Rana Prime Minister got interested in the problem and took concrete step by establishing a government financial institution knows as Tejarath Adda at 1880 A.D. This Tejarath Adda helped the public and government staff by supplying easy and cheap credit at 5% interest on the security of gold and silver ornaments outside the Kathmandu also (*Ojha & Rajabahak, 1965*).

So the role of Tejarath cannot be ignored on enlistment of Nepalese economy and it should be taken as beginning of the banking sector in the banking development. Although, services provided by the Tejarath were extended in other parts of the country, its benefit was not available to the society as a whole. So the monopoly of local moneylenders was still on practices in the rural areas.To eliminate this drawback and monopoly, in 1937 A.D. The Tejarath was replaced by commercial bank called Nepal Bank Limited (NBL) which markets the beginning of new era in history modern banking in Nepal (*Rising Nepal, 1977:4*). Nepal has not experienced long banking system in the world. So the history of banking development in Nepal very short

compared to the banking development of world. Nepal Bank Act 30 Kartik, 1994 B.S (1937A.D) allows the Commercial Bank (CB) to extend loans and advances for a period not more than six months.

Thus the establishment of NBL solved the prevailing financial inconveniences of the people. As a result the numerous activities were increased especially in the field of trade and commerce. Till the establishment of Nepal Rastra Bank (NRB) the major functions of NBL was the function as a central bank also. So it was serving two purposes that are of central and of commercial banks.

Having felt the need of development of banking sector and to help the government formulate monetary policies, Nepal Rastra Bank was set up in 2013 B.S. as the central bank of Nepal. Since then, it has been functioning as the government bank and has contributed to the growth of financial sector. Though Nepal Rastra Bank, at present, adopted a deregulatory approach, it requires continuous modification in the view of fast changing world. Integrated and speedy development of the country is possible only when competitive banking services reaches nooks and corners of the country. In order to fulfill this objectives, government set up Rastriya Banijya Bank in 2022 B.S (23 Jan, 1966) as a fully government owned commercial bank (*Dahal & Dahal, 2002:11*).

With the coming up of Rastriya Banijya Bank, banking services spread to both the rural and urban areas. Despite being an agricultural country, our farming system is the traditional one to consume more cost and yield less. To get rid of this problem, scientific agriculture is imperative, which requires adequate finance and specialist of the field. To meet these ends, Agricultural Development Bank was established in 2024 B.S. Moreover, Nepal Industrial Development Corporation had already been set up in 2016 B.S. to transform the agro-based economy to the industrial one and Security Exchange Center to enhance capital market activities. From 2024B.S. onwards, the Government of Nepal established five rural development banks namely: Eastern, Central, Western, Mid-Western, Far-western Rural Development Bank Respectively.

In order to operate all commercial banks incorporated in Nepal, uniformity of laws of banking acts are essential. So a Commercial Bank act 2031 B.S. was enacted and has been amended

many times in accordance with the needs. With the promulgation of the act, Nepal witnessed growth in the number of banks from private sector and the number continues to grow even today. Now the act has been replaced by an umbrella act called Bank and Financial Institutions Act, 2063. This act governs not only the commercial banks but also all the financial institutions operating within the country. It classifies commercial banks as category 'A' financial institution, development bank as 'B', finance companies as 'C' and micro-finance as 'D' respectively.

1.3 Meaning of Commercial Banks

Commercial Banks are those banks, which perform all kind of banking function as accepting deposits, advancing credits, credit creation and agency function etc. They provide short –term credit, medium term credit and long term credit for trade and industry. They also operate off-balance sheet functions such as issuing guarantee, bonds, letter of credit, etc.

In every country, outset of economic development is quite different but there is no debate about the significant role of banking sector for the economic development of the countries, as they are considered as the main source of finance.

The list of commercial banks established till March 2011.

S.N. COMMERCIAL BANKS

1. Nepal Bank Limited Ltd.
2. Rastriya Banijya Bank Ltd.
3. NABIL Bank Ltd.
4. Nepal Investment Bank Ltd.
5. Standard Chartered Bank Nepal Ltd.
6. Himalayan Bank Ltd.
7. Nepal SBI Bank Ltd.
8. Nepal Bangladesh (NB) Bank Ltd.
9. Everest Bank Ltd.
10. Bank of Kathmandu Ltd.
11. Nepal Credit and Commerce Bank Ltd.
12. Lumbini Bank Ltd.

13. Nepal Industrial and Commercial Bank Ltd.
14. Machhapuchhre Bank Ltd.
15. Kumari Bank Ltd.
16. Laxmi Bank Ltd.
17. Siddhartha Bank Ltd.
18. Agriculture Development Bank Ltd.
19. Global Bank Ltd.
20. Citizen Bank International Ltd.
21. Prime Commercial Bank Ltd.
22. Sunrise Bank Ltd.
23. Bank of Asia Nepal Ltd.
24. Development Credit Bank Ltd.
25. NMB Bank Ltd.
26. Kist Bank Ltd.
27. Janata Bank Ltd.
28. Mega Bank Ltd.
29. Commerz and Trust Bank Ltd.
30. Civil Bank Ltd.
31. Century Bank Ltd.
32. Sanima Bank (Currently got approval from NRB for Commercial Bank)

(Source: www.nrb.org.np)(Mid-March 2011)

During the last two and half decades the number of financial institutions has grown significantly. At the beginning of the 1980s there were only two commercial bank and development banks in the country. Induction of economic liberalization policy, particularly the financial sector liberalization provided impetus in the establishment of new bank and non bank financial institutions. Consequently, by the end of Mid- March 2011 there are 32 "A" class commercial banks, 78 "B" class Development banks, 79 "C" class finance companies, 18 "D" class micro-credit development banks, more than 5000 saving and credit co-operatives, and 45 NGOS. (www.nrb.org.np).

Banking sector has been known as the integral part of the economy. Banks and other financial institutions perform various activities. Among these, one of the major functions of the banks and other financial institutions is to act as financial intermediaries wherein they collect funds from the surplus units and distribute as loans to those deficit units in the economy by providing interest to depositors and charging interest from the borrowers. In doing so, the financial intermediaries provide a link between saving and investment and between the present and the future. As a consequence, savers can earn higher returns from their saving and borrowers can execute their investment plans to earn future profits. Further, financial intermediation crucially affects the net return to savings and the gross return for investment too. The spread between these two returns mirrors the banks interest margins, in addition to transaction costs and taxes borne directly by savers and investors. This suggests that bank interest spreads can be interpreted as an indicator of the efficiency of the banking system.

Banks as an intermediary can influence savers to save and then deposit their money in bank by providing them attractive interest rate. Interest rate is one of the important factor which influence people to save and deposit their savings in banks for long period. “Interest is payment for the use of money”. Therefore, when savers deposit their savings in bank, the banks pays certain percentage of interest on savings. As the banks have acquired more deposits, they can lend the funds to the needy businessmen, entrepreneurs and earn interest-based income by charging certain percentage of interest on loan so that money can be used in the productive sector. The rate of interest is the price a borrower must pay to secure loanable fund from a lender for an agreed upon the time period.

1.3 The Interest Rate Strategies of NRB

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

banking system in the country, thereby ensuring the existence of banking facilities; and maintain the economic interests of the general public. Nepal Rastra Bank also was to oversee foreign exchange rates and foreign exchange reserves.

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

Interest is both a payment and receipt for the use of money. Interest, therefore, can be considered from the above two points. If the interest is paid, it can be considered as a 'cost'. On the other hand, if interest is received, it can be considered as a 'return'. Since, money can earn a return over a period of time; interest rates are often considered as an expression of the time value of money and are expressed in percentage. All business organizations or individuals are responsive to interest rate of the banks and financial institutions in one way or another. A variety of interest

rate risk exists in the financial markets. However, in the context of Nepal, interest rate is regulated by the central bank during the early stage of financial market, development taking the period from 1955 to 1965. But gradually dramatic change had been made in the regulation on the interest rate by the central bank i.e. Nepal Rastra Bank according to the compatibility of the banks and financial institutions through liberalization. In the early mid 1980's Nepal has adopted liberal economic policy as a result of which many banks and financial institutions came into existence. Regulation of the financial system aimed at control of the economy rather than foster safety and soundness of financial system. But the interest rate deregulation, curtailment or elimination of directed credits, lifting entry and exit barriers for financial intermediaries, restructuring of banking system and institution of regulatory and supervisory mechanism are some of the components which open the door of such liberalization. There was full discretion to NRB in determining interest rate structure of banks and financial institutions from the period 1960 to 1975 as it was the sole and whole institution authorized to determine the interest rate as per NRB act (*Shrestha & Bhandari, 2007:128*).

The era of interest rate liberalization started in November 16, 1984 when NRB granted autonomy to commercial banks to fix the rates of interest over and above the NRB rates by 1.5 and 1.0 percentage points respectively on saving and term (fixed) deposit. NRB directed commercial banks to reduce the interest rates by 2 percent points than the normal credit for agricultural and cottage industries in 18 remote districts. Interest rates policy in Nepal was characterized by an elaborate system of mandatory deposit and lending rates for commercial banks and other financial institutions before the deregulatory moves of May 1996. The interest rates were further liberalized in May 29, 1986 when commercial banks were allowed to fix rates higher than the minimum deposit rates fixed by the NRB. Commercial banks were also set free to fix lending rates except certain item in the priority sector. The minimum interest rates were 8.5 percent on saving deposit and 12.5 percent for one year fixed deposit. The interest rates on fixed deposit with a maturity period or less than one year were left to the discretion of the banks themselves. Regarding lending rates, the interest rate was at 15 percent maximum. On August 22, 1992, NRB issued some directives to commercial banks and other financial institutions to clearly spell out the interest rate on deposits. NRB also suggested to commercial banks and other financial

institutions to limit the spread of interest rate at 6 percent within Mid- December 1993. A further instruction to banks and financial institution was issued in 2002 and now the interest rate spread required to be maintained by commercial banks and financial institutions has also been removed.

1.4 Profile of the Sample Commercial Banks under Study

NABIL Bank Ltd.

Nepal Investment Bank

Bank of Kathmandu

NABIL Bank Limited

NABIL Bank Limited (NABIL) commenced its operation on 12 July, 1984 as the first Joint Venture bank of Nepal. Dubai Bank Limited, Dubai (DBL) was the initial foreign joint venture partner with 50% investment. Later, it was acquired by Emirates Bank International Limited, Dubai (EBIL). NABIL Bank Limited had the official name Nepal Arab Bank Limited till 31st December 2001. NABIL Bank Limited is the pioneer in introducing much innovative banking service in banking sector of Nepal with almost 50 branches and counters in all major cities. It is the only bank having its presence at Tribhuvan International Airport, only international airport of this country. Also the number of outlets in the country is the highest among the joint venture and private banks operating in Nepal. Success of NABIL is a milestone in the banking history of Nepal as it paved the way for the establishment of many commercial banks and financial institutions. NABIL provides a full range of commercial banking services through its outlets spread across the nation and reputed correspondent banks across the globe. Moreover NABIL has a good name in the market for its highly personalized services to customers. So, NABIL bank received as "Bank of the Year: 2004". The share subscription of the NABIL is divided in 5 parts. NB International Ltd. Has taken 50%, Nepalese Public has taken 30%, Nepal Industrial Development Corporation has taken 6.15%, Rastriya Beema Samsthan has taken 9.67% and the remaining 0.33% of share is taken by Nepal stock Exchange.

Nepal Investment Bank Ltd. (NIBL)

Nepal Investment Bank Ltd. (NIBL), previously Nepal Indosuez Bank Ltd., was established in 1986 as a joint venture between Nepalese and French partners. The French partner (holding 50% of the capital of NIBL) was Credit Agricole Indosuez, a subsidiary of one the largest banking group in the world.

With the decision of Credit Agricole Indosuez to divest, a group of companies comprising of bankers, professionals, industrialists and businessmen, had acquired on April 2002 the 50% shareholding of credit Agricole Indosuez in Nepal Indosuez Bank Limited..... The name of the bank has been changed to Nepal Investment Bank Ltd. upon approval of bank's Annual General Meeting, Nepal Rastra Bank and Company Registrar's office with the following shareholding structure.

A group of companies holding 50% of the capital

- J Rashtriya Baniya Bank holding 15% of the Capital.
- J Rashtriya Beema Sansthan holding the same percentage.
- J The remaining 20% being held by the General Public (which means that NIBL is a Company listed on the Nepal Stock Exchange).

NIBL, which is managed by a team of experienced bankers and professionals having proven track record. To be the leading Nepali bank, delivering world class service through the blending of state-of-the-art technology and visionary management in partnership with competent and committed staff, to achieve sound financial health with sustainable value addition to all stakeholders.

NIBL has become the prominent name in Nepalese Banking sector and one of the popular domestic banks. Besides general banking, The Bank is providing almost all modern banking services like e-banking, Mobile Banking, Credit Card (Visa & Master) Services, Merchant Services with latest banking technology at a reasonable cost. This bank has 67 ATMS which is considered to be the largest ATM Networks in the country. The Bank has 41 branches almost all over the country and its head office is located at Durbarmarg, Kathmandu.

The Bank has been awarded Banker of the year for the year of 2003,2005,2008 and 2010 respectively.

Bank of Kathmandu (BOK)

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

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

To highlight its few objectives:

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

With the aim of providing banking services at the customer's fingertips, BOK has started Internet Banking and Alert Service. In Internet Banking, BOK provides Customer e-banking (Core, Retail and Bill payment) as well as corporate e-banking facilities (Trading financing and web based Cash Management). This bank has 44 branches and 52 ATMS and its head office is located at Kamalpokhari, Kathmandu.

Bank of Kathmandu has awarded Banker of the Year for the year of 2011 from the Banker – Financial Times, London.

1.5 Statement of the Problem

Capital formulation and its proper utilization are highly essential for economic development of the country. As the banks and financial institutions have a significant role to play in the economic development of a country, more emphasis should be placed in enhancing deposits from savers and lending to those potential investors/ borrowers which require financing from the banks by providing interest to the depositors and charging interest to the borrowers. Generally, when interest provided in deposits is very less, people keep their surplus fund idle. In the same way when interest charge on lending is very high the possible investors will also be unable to borrow funds for investment. Majority of people are in need of money to invest in productive sector and more capital is needed even to use modern technology which can be possible only through the banks. The village money lenders are providing credit on excessively high interest rate and even collecting deposits in low interest rate. If financial intermediaries like bank and financial institution do not play important role in channeling saving to productive sectors in such situation it will not be possible for capital to formulate and to compete in the international market. The general policy and practices followed by Nepal with respect to interest rate charged and offered by banks and financial institutions is a subject of great debate, especially in recent years. When credit becomes more costly and less available, total spending for goods and services falls, businesses cut back production and reduce their inventories. As a result, unemployment rises and economic growth slows down. However, interest on deposits must be able to increase the amount of deposits by encouraging people to save their income and on the other hand, lending rate of interest must be attractive to the investors so that they will be able to enjoy the benefit by utilizing borrowed funds. This can be possible only when the fund seeking people will be able to earn more than what they pay as interest on borrowing funds. But whether the financial system of Nepal is able to attain such situations or not is a matter of concern for us.

The problems of this study are specified in the form of following research questions:

1. What is the impact of liquidity position (demand or supply) of organization in interest rate charged and offered by Nabil Bank, Nepal Investment Bank and Bank of Kathmandu?
2. What are the various methods that commercial banks in Nepal use to calculate the interest rate they charged to borrowers?
3. What are the other major qualitative factors that shape the interest rate in commercial banking sectors?

1.6 Objectives of the Study

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

- ❖ To study the interest rate structure on deposits and lending of Nepalese commercial banks (Nabil Bank, Nepal Investment Bank and Bank of Kathmandu).
- ❖ To study and analyze the relationship of interest rate on the volume of deposits of commercial banks
- ❖ To study and analyze the relationship of interest rate structure on the volume of lending of commercial banks
- ❖ To provide suggestions on the basis of findings of the study.

1.7 Research Hypothesis

A hypothesis is a conjectural statement of the relation between two or more variables. It consists of decision rules required for drawing probabilistic inferences about the population parameters. By testing the hypothesis, we can find out whether it deserves the acceptance or rejection of the hypothesis. Generally, two hypotheses are set up at one time. If one of the hypotheses is accepted then other is rejected and vice versa. The null hypothesis is called the hypothesis of difference.

- ❖ Is there any significant correlation between interest rate and deposits of commercial banks?

Null Hypothesis, H_0 : $\rho=0$ i.e. interest rate provided on deposits and the volume of deposit of commercial banks are not correlated

Alternative Hypothesis, H_1 : $\rho \neq 0$ i.e. interest rate provided on deposit and deposit amount of commercial banks are correlated

- ❖ Is there any significant correlation between interest rate and lending of commercial banks?

Null Hypothesis, H_0 : $\rho=0$ i.e. interest rate charged on lending and lending amount of commercial banks are not correlated

Alternative Hypothesis, H_1 : $\rho \neq 0$ i.e. interest rate charged on lending and lending amount of commercial banks are correlated

- ❖ Is there any significant correlation between interest rate of deposit and lending of commercial banks?

Null Hypothesis, H_0 : $\rho=0$ i.e. interest rate provided on deposit and charged on lending of commercial banks are not correlated

Alternative Hypothesis, H_1 : $\rho \neq 0$ i.e. interest rate provided on deposit and charged on lending of commercial banks are correlated.

1.8 Significance of the Study

This study will try to help analyze the interest rate structure of commercial banks in Nepal and try to develop some ideas to know whether it influences deposits and lending. This being an important aspect for the economic development of the country has not much been emphasized that means very few number of research work has been found in this topic. Hence, it is hoped that the finding of the study to some extent will help the policy makers to make strong policy regarding interest rate charged on deposits and lending in Nepalese context. Similarly, it can be fruitful resource for teachers, students, researchers and academicians in abstracting some useful information about interest rate, deposits and lending.

1.9 Limitations of the Study

The study is limited by the following steps:

1. Reliability of study depends upon the reliability of published and the genuineness of the respondents (basically based on secondary data).
2. As the samples have been drawn at random for convenience there may exist some sampling errors and the sample size may not be sufficient to generalize the finding.
3. This study covers only 5 fiscal years.
4. The samples are taken only from Commercial Banks; other financial intermediaries are not included in the study.
5. The deposit amount and lending amount of the commercial banks are influenced by several factors. However, this study mainly focuses on the interest rate.

1.10 Organization (Plan) 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, acknowledgments, table of contents, list of figure, list of table, abbreviation used etc have been presented.

Chapter I: Introduction

The first chapter consists on introduction of the study, background of the study, History of Banking development in Nepal, statement of the problems, significance of the study, objectives of the study, Research hypothesis and limitation of the study.

Chapter II: Review of Literature

This chapter includes review of the literature, which was obtained during the review of books, articles, journals, reports and other relevant materials.

Chapter III: Research Methodology

This chapter deals on research design, population and sample size, source of data, data collection and processing techniques and analysis of tools.

Chapter IV: Data Presentation and Analysis

This chapter attempts to analyze and evaluated data with the help of analytical tools and interpret all the result into the unit of empirical findings and results.

Chapter V: Summary, Conclusion and Recommendations

This chapter covers on the results and findings and recommend some suggestions

CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

Generally Speaking, literature review is a body of text that aims to review the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. The review of literature is a very essential aspect of the research. A critical literature review within a specific field or interest of research is one of the most important, but also complex activities in the process of research. This chapter highlights upon the existing literature. In this chapter, attempts have been made to review the literature related to interest rate structure and its impact on lending and deposit of commercial banks in Nepal. Both the theoretical aspect as well as findings of the previous studies has been included here so as to identify the broad aspects of interest rates structure and its impact on lending and deposit of commercial banks in Nepal. This chapter is going to show the problems posed by different researchers and writers and the solutions and strategies they exerted. The main motto of this chapter is to show how far and how much our present study is associated with different past researches. So, different journals, articles, books and research works were reviewed.

2.2 Concepts and Meaning of Interest Rates

A rate which is charged or paid for the use of money is known as interest rate. Interest is the amount paid by a borrower to a lender above the amount (the principal) that has been borrowed. An interest rate is often expressed as an annual percentage of the principal. It is calculated by dividing the amount of interest by the amount of principal. Conceptually, interest is both a payment and receipt for the use of money. Interest, therefore, can be considered from the above two point. If interest is paid, it can be considered as a "cost". One the other hand, if interest is received, it can be considered as a "return". Since, money can return over a period of time, interest rates are often considered as an expression of the time value of money. It is the price of credit but unlike other price in the economy, the rate of interest is really a ratio of two quantities-the money cost of borrowing divided by the amount of money actually borrowed, usually expressed on an annual percentage basis. For example, if a lender (such as a

bank and financial institutions) charges a customer Rs100 in a year on a loan of Rs1000, then the interest rate would be $100/1000 * 100\% = 10\%$.

- ❖ The neo-classical economist however defined the interest as the price for the use of loanable funds. But the modern economist, in their effort to avoid these divergent and controversial views about the nature of interest, have explained it in terms of productivity, saving, liquidity preference and money. In other words, interest is the rewards for the pure yield of capital of saving for forgoing of liquidity and surplus of money. The rate of interest, according to Keynes, is a purely monetary phenomenon and in his theory, he has presented “a proposition that the rate of interest influences the level of economic activity by first influencing the rate of real investment in the economy”. According to him, the real investment is in fixed capital or durable machines. Schulz has also expressed his view that, “An important aspect of interest rate policy is the setting of an appropriate margin between the lending and deposit rate. If the margin is too high, bank will make excessive profits and this leads to waste of save resources. If it is too low, it will discourage intermediation and devitalize financial institutions. At the same time, the demand for credit goes on increasing being affected by the cheap loan rates. Hence, it can be concluded that changes in interest rate structure produce either positive or negative impact upon the growth of a developing economy such as ours” (*Rose, 2003:113*).

2.3 Functions/Role of the interest rate in the Economy

The interest rate performs various important functions in the economy. Some of them are as follows:-

- ❖ It helps to flow of current saving to investment to boost up the economy.
- ❖ It brings into the balance the supply of money with the demand for money.
- ❖ It rations the available supply of credit, generally providing loanable funds to those investment projects with the highest expected returns. The government can use interest as an important tool to adopt policy through the volume of saving and investment. The government can lower the interest rate to stimulate borrowing and investment for unemployment and increase the growth (*Sarad sigdel, 2065:128*).

2.4 Theories of Determining interest Rate

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

2.4.1 Classical theory of interest rates

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

Savings by Households

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

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

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

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

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

Saving by Business Firms

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

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

The critical element in determining the amount of business savings is the level of business profits. If profits are expected to rise, businesses will be able to draw more heavily on earnings retained in the firm and less heavily on the money and capital markets for funds. The result is a reduction in the demand for credit and a tendency toward lower interest rates. On the other hand, when profits fall but firms do not cut back on their investment plans, they are forced to make heavier use of money and capital markets for investment funds. The demand for credit rises and interest rates may rise as well.

Although the principal determinant of business saving is profits, interest rates also play a role in the decision of what proportion of current operating cost and long-term investment expenditures should be

financed internally and what proportion externally. Higher interest rates in the money and capital markets typically encourage firms to use internally generated funds more heavily in financing projects. Conversely, lower interest rates encourage greater use of external funds from the money and capital markets.

Saving by Government

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

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

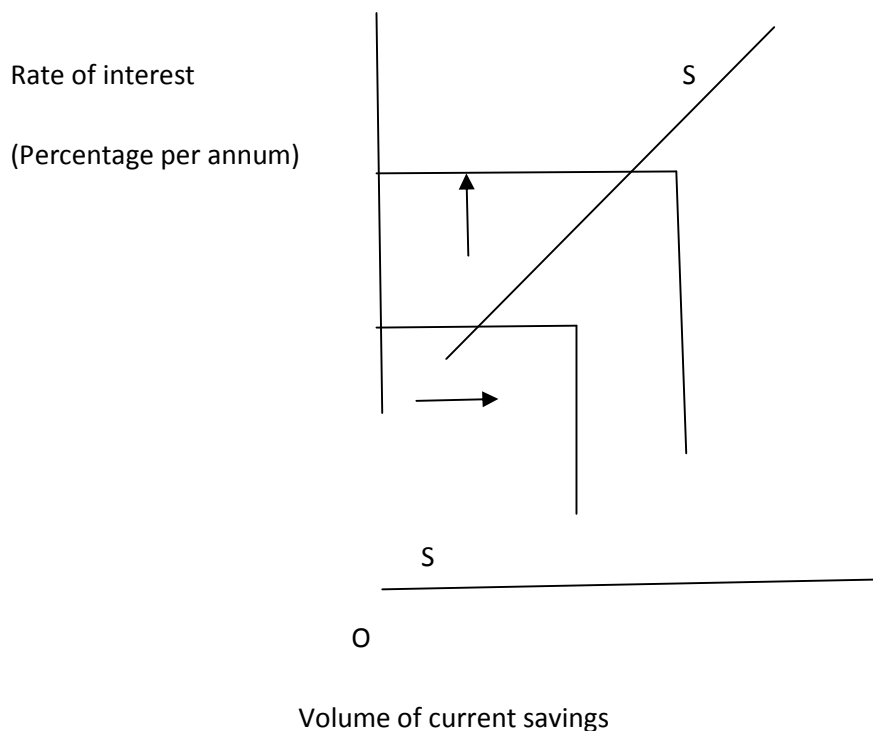


Fig:- 2.1 The Substitution effect relating saving and Interest rate.

The Demand for Investment Funds

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

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

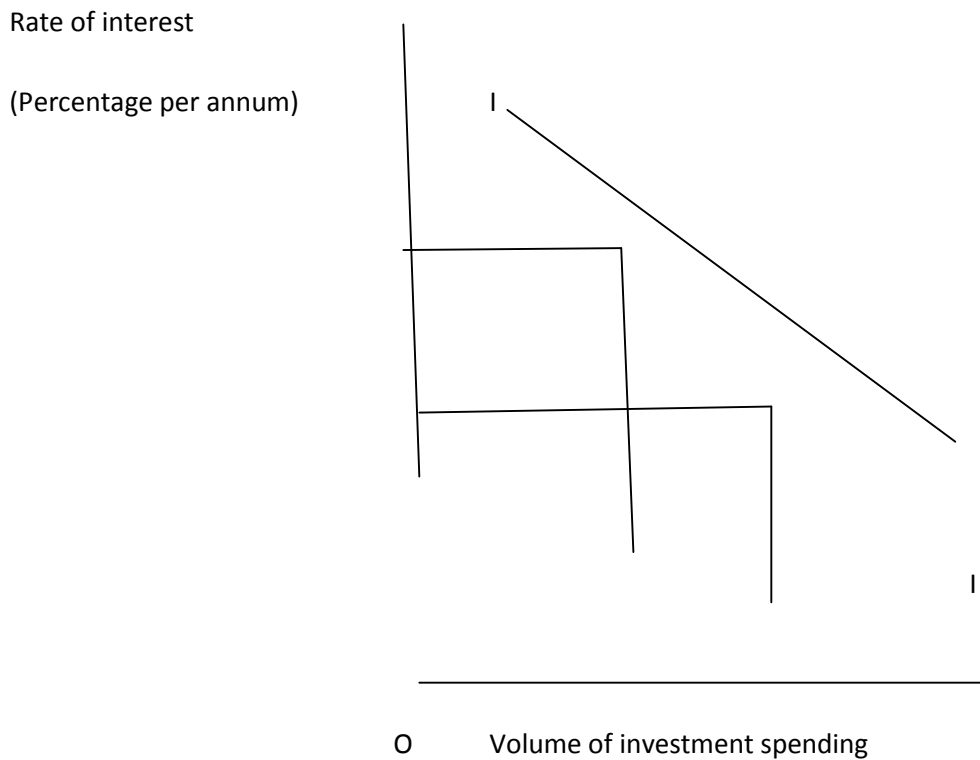


Fig:- 2.2 The investment demand schedule

The Equilibrium Rate of Interest in the Classical Theory of Interest

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

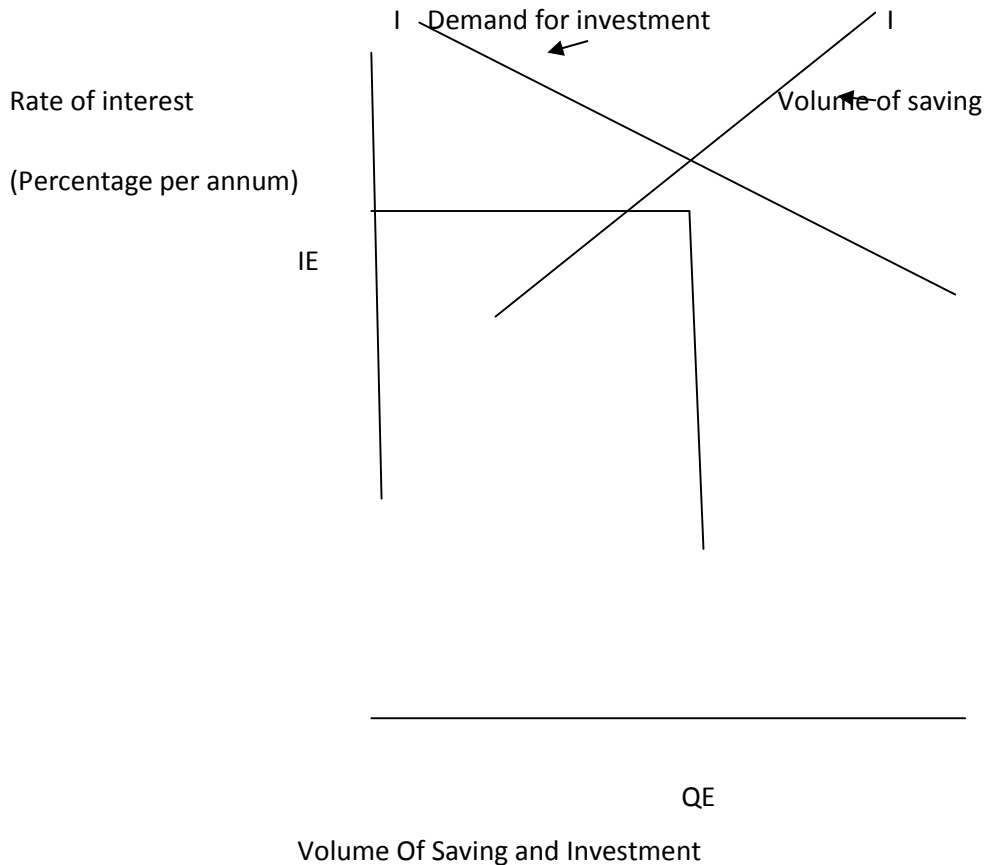


Fig:- 2.3 The Equilibrium Rate Of Interest In Classical Theory

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

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

2.4.2 The Loanable Funds Theory of Interest

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

Supply of Loanable funds

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

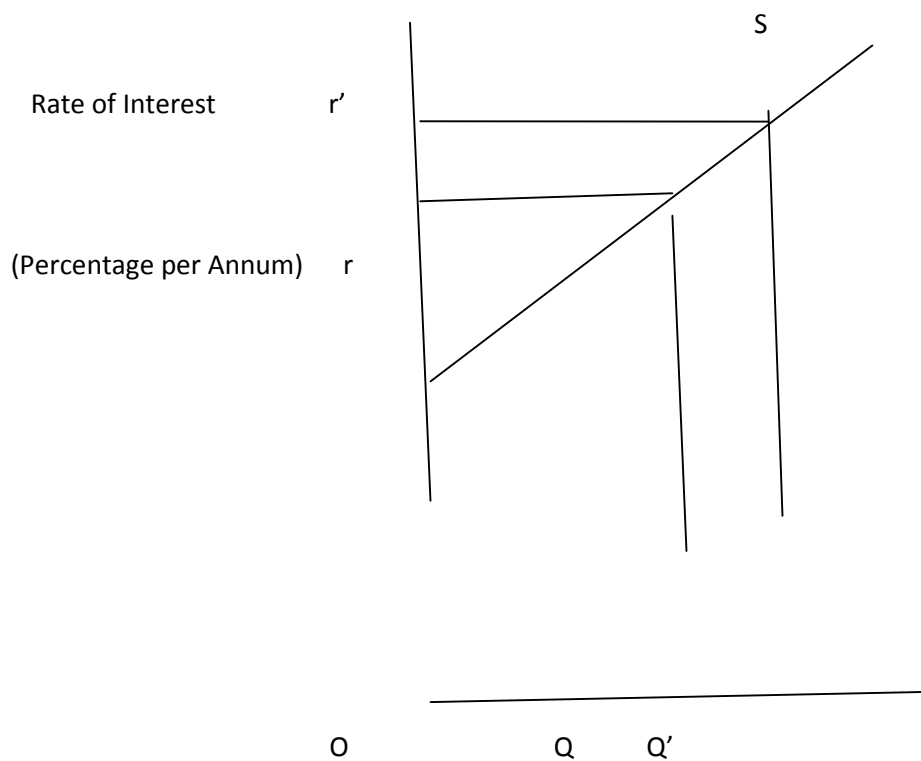
Domestic Saving- Saving refers to the postponement of current consumption. The decision to save is the decision to forgo current consumption in order to have a larger quantity of consumption in the future. Individual or households save for a variety of reasons but there is little evidence to suggest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

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

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

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

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

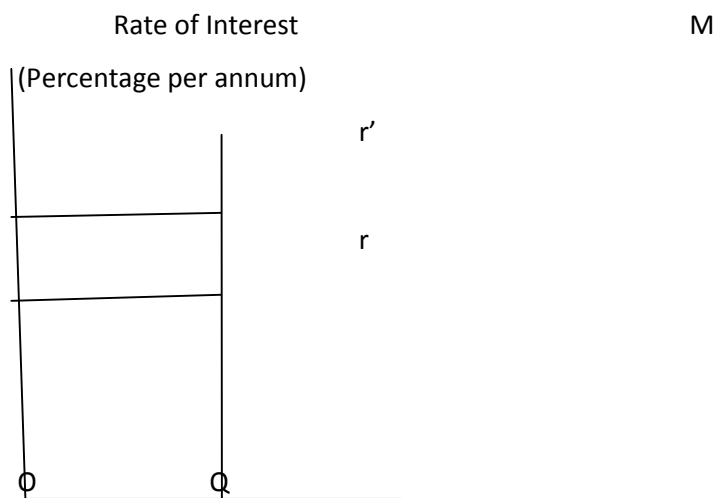


Volume of Saving

Fig:- 2.4 The Interest Rate and Volume Of Savings

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

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



Amount of New Money

Fig:- 2.5 The Supply of Loanable Funds

Total Supply for Loanable Fund

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

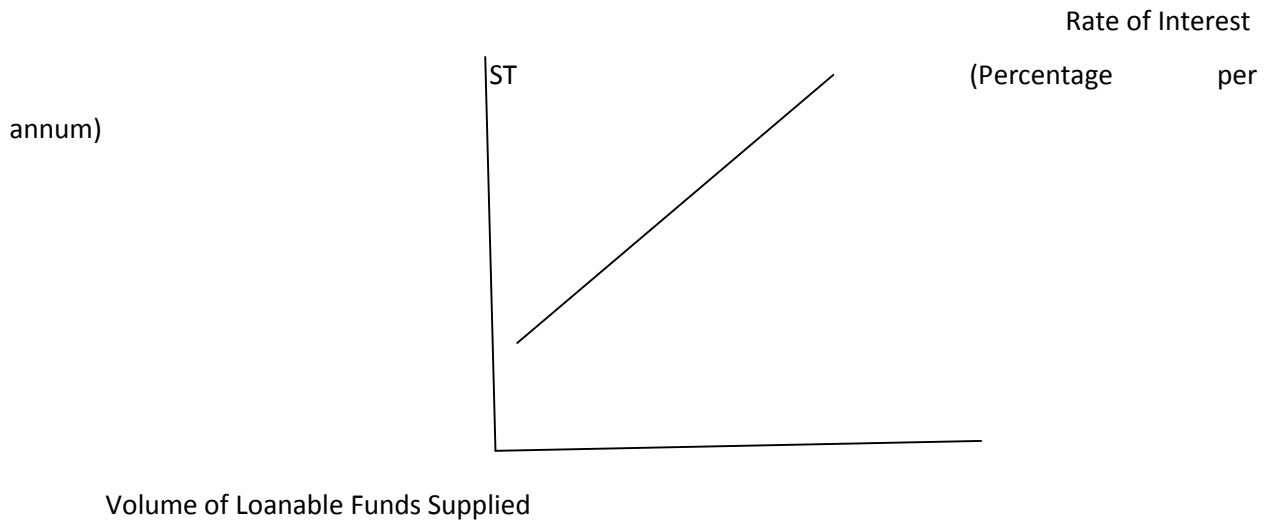


Fig:- 2.6 Total Supply of Loanable Funds

The Demand for Loanable Fund

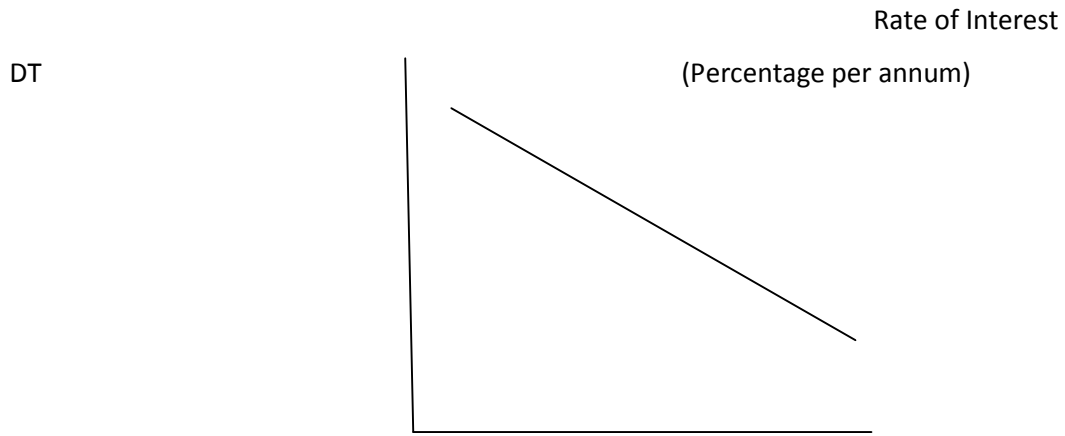
The demand for loanable fund is composed of the demand by household, business and governments.

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

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

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

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

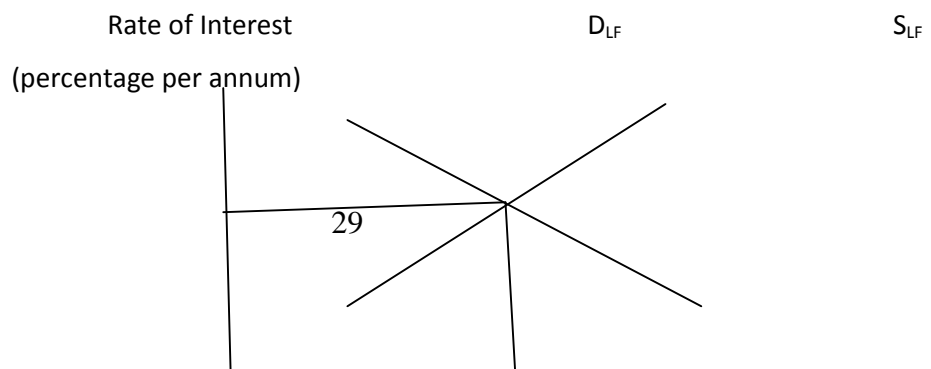


Demand of Loanable Funds
Demand of Loanable Funds

Total
Fig: - 2.7 Total

The Equilibrium Rate of Interest in the Loanable Funds Theory

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



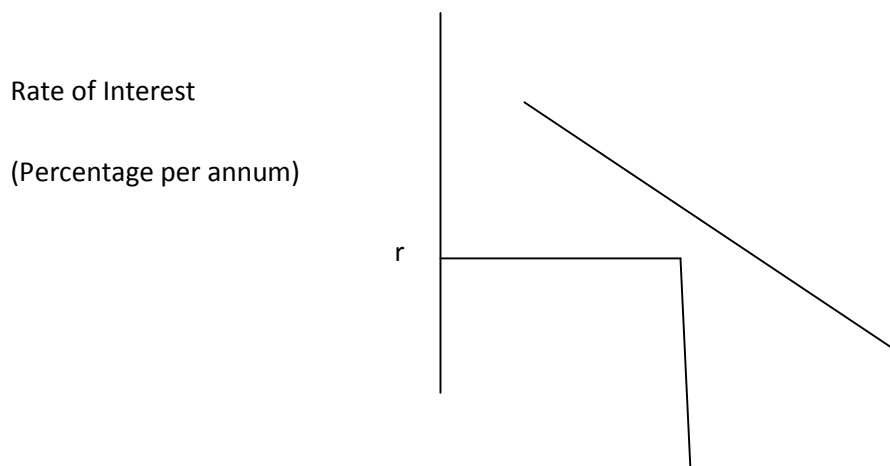
IE

QE

Fig:- 2.8 Equilibrium Rate of Interest in Loanable Fund Theory

2.4.3 The Liquidity Preference Theory of Interest Rate

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



M_D ————— Q

Quantity of Money Demand

Fig:- 2.9 The demand of Money as a function of rate of interest

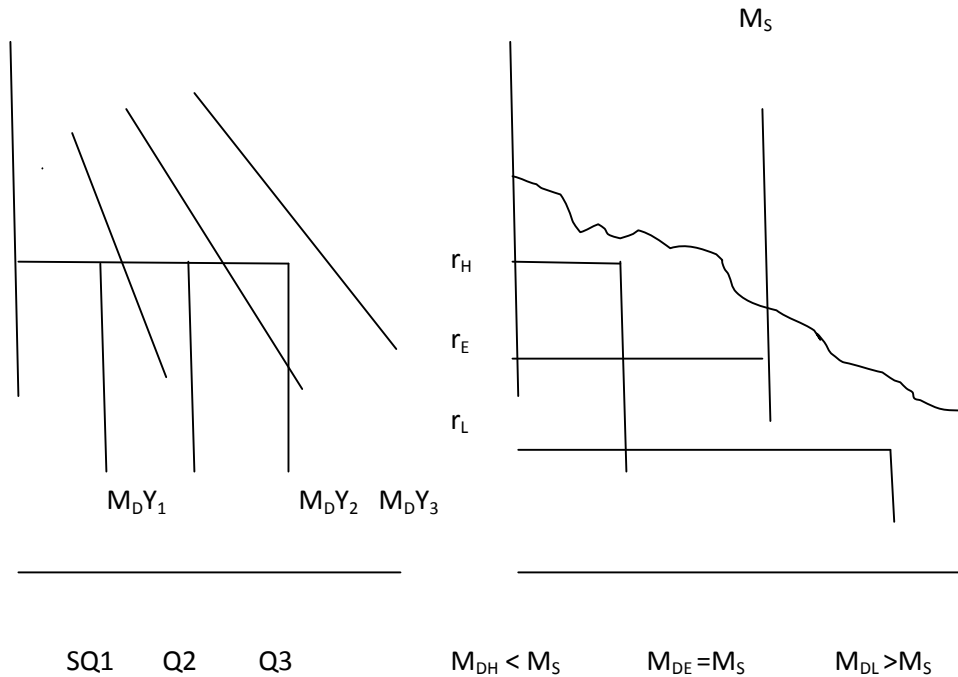


Fig.2.10 Quantity of Money Demanded Fig.2.11Quantity of Money Supplied

Thus, the greater the income, the greater will be the quantity of money demanded at a given rate of interest and vice versa. The relationship is depicted in fig 2.10 where M_{DY1} , M_{DY2} , M_{DY3} represent the demand for money at the successively higher income level Y_1 , Y_2 , Y_3 . Thus for a given income level, say Y_2 and a given money supply the rate of interest (r_e) is viewed as determined by the supply-demand equilibrium depicted in fig 2.11 where M_s is the supply of money. The equilibrium interest rate r_e is obtained by action of individuals seeking to maintain desired levels of cash balances. Since the amount of desired money holding is a function of the rate of interest, there is only one rate of interest at which the demand for money balance is the same as the amount of the money supply. At a rate of interest higher than r_e , say r_h in fig 2.11 individual in the aggregate will be holding more money (M_s) than they desire M_{DH} at that rate of interest (the total supply of money must be held by the public). To rid them of

“excess” cash, individual purchase interest bearing financial assets, driving their prices up and their interest rate down. This occurs until the rate of interest falls to r_E at which $M_{DE}=M_S$.

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

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

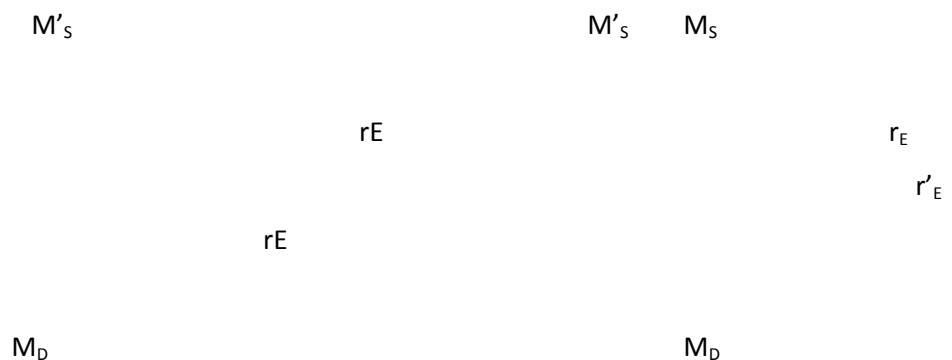


Fig. 2.12 Effect of an increase in the
Money Supply on the rate of interest

Fig. 2.13 Effect of decrease in the money
Supply on the rate of interest

In summary, when the money supply is MS_1 , the rate of interest is r_1 . As the money supply expands to MS_2 and MS_3 , the rate of interest falls to r_2 and r_3 respectively. The process by which interest rates fall as M_3 expands can again be interpreted in terms of public preference for money holding relative to other financial assets such as interest bearing securities. For example, as in fig 2.14, when the money supply expands from MS_1 and MS_2 , individual find themselves holding larger cash balance than they desire at interest rate r_1 . As they seek to reduce money holding by purchase of security, security price rise and interest rate fall until a new equilibrium is established at interest rate r_2 where $M_D=MS$.

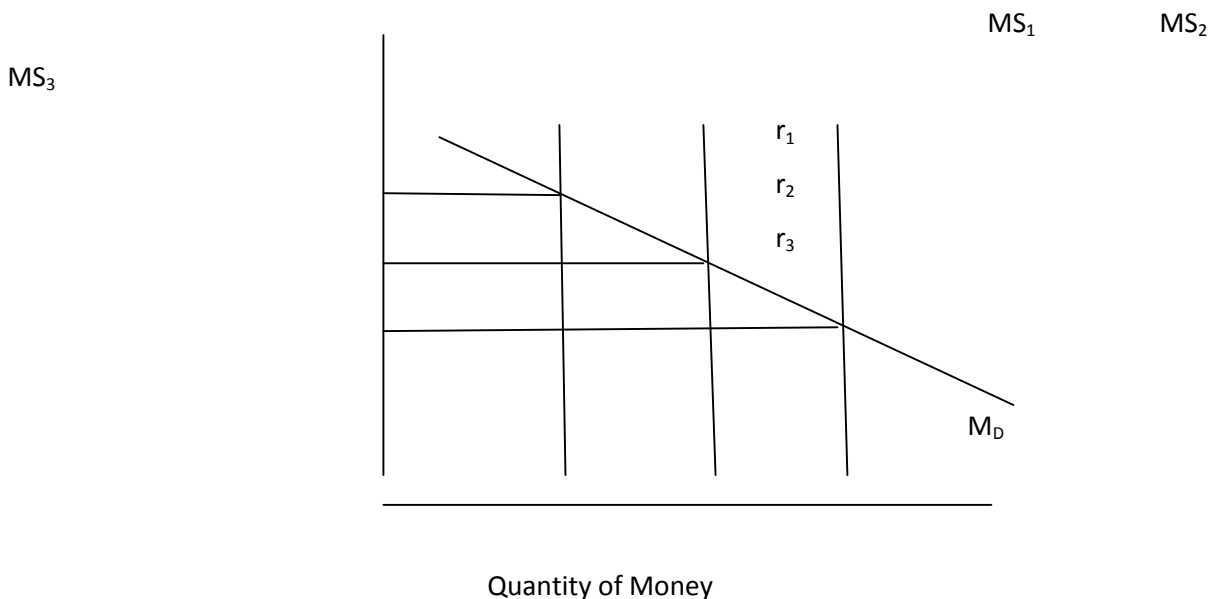


Fig:- 2.14 Money Supply and Interest Rate

2.4.4 The Rational Expectation Theory

Expectation theory, also termed expectation, is one of the most common economic theories of term structure. It comes in several variations, the most widely known being the unbiased expectation theory. This theory is new for the financial markets and institutions. It builds on a growing body of research evidence that “the money and capital markets are highly efficient institutions on digesting new information affecting rates and security prices”. This expectation theory assumes that equilibrium interest rate depends upon the change in the expectation of the investors regarding future security

prices and return. The decision of the investor towards the borrowing and lending funds come from all available new information. When new information appears about investment, saving or the money supply, investors begin immediately to translate that new information into decision to borrow and lend funds. So, rapid is the process of the market digesting new information that security prices and interest rate will be equal to current period interest rate. In other words, the knowledge of past interest rate will not be reliable forecast of future interest rate. In a perfect efficient market, it is impossible to win excess return

continuously by trading on publicly available information (*Rose, 1997:211*).

The important assumption and conclusion of the rational expectation theory are (1) 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 (2) change in rates and security prices are correlated only with unanticipated information (3) the correlation between rates of return in successive time periods is zero (4) expectation concerning future security prices and interest rates are formed rationally and efficiently.

If the money and capital market are highly efficient in the way we have described, this implies that interest rates will always be at or very near their equilibrium levels. Any deviation from equilibrium rate dictated by demand and supply force will almost instantly eliminate security trader who hope to consistently earn windfall profits from correctly guessing whether interest rate 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 monetary. 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 demand in the future (with supply unchanged) when confronted with an unexpected announcement of higher credit demand, implies that interest rate will rise.

We can illustrate the foregoing points about that 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 that will prevail in the next future time period. The supply of loanable funds is assumed to be the same in both time period ($S_0=S_f$).

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' 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 'I_o', but rather 'I_e', where the expected demand curve 'D_e' intersects the actual supply curve 'S_o'. The equilibrium quantity of loanable funds traded in the current period then will be 'C_e' not 'C_o'. This is because, according to the rational expectation theory, borrowers and lenders will act as rational agents, using all the information they possess (including expected events) to price financial assets today. When the future period arrives, the equilibrium interest rate will rise to rate 'I_f' then quantity of loanable funds traded will be 'D_f'. The equilibrium rate moves upward because the demand for loanable funds in period 'f' is more than expected future loanable funds demanded as seen by market participants in period 'o'. Suppose, on the other hand, the actual loanable funds demanded in period 'F' increases upward and beyond 'D_o' but by a smaller amount than was anticipated by investors in the market in period 'o'.

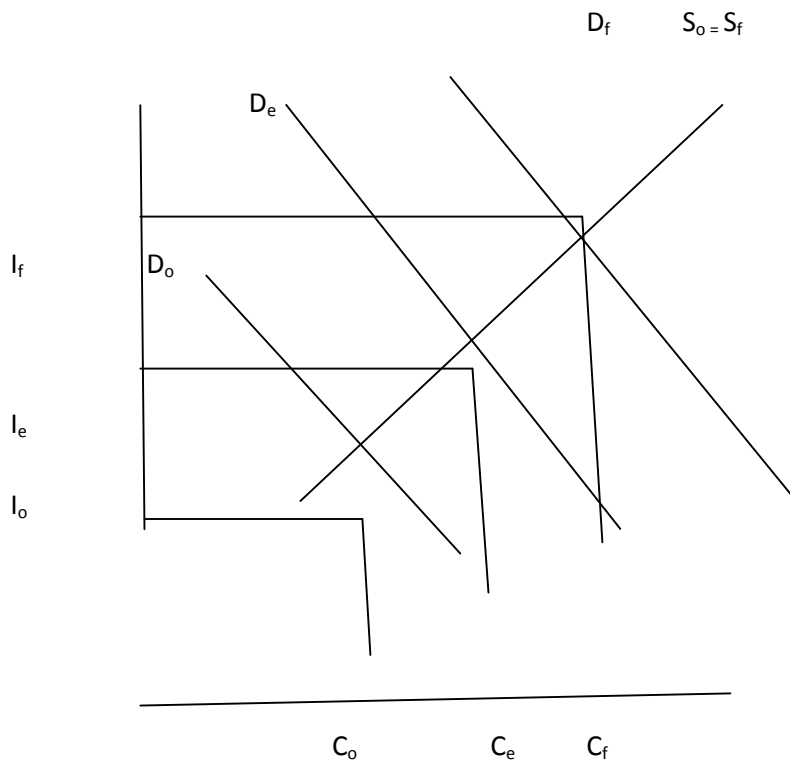


Fig:- 2.15 Equilibrium Interest Rates Under Rational Expectation Theory

Demand schedule 'D_f' would then fall somewhere between 'D_o' and 'D_e'. The equilibrium interest (with supply curve unchanged) would be lower than i.e. laying somewhere between 'I_o' and 'I_e'.

2.5 Factors Affecting the Difference in Interest Rates

Although it is assumed that deposit increase as interest increases but interest rate is affected by numerous factors. In real world, different financial institutions quote different interest rate. It means that the same type of instrument carries different interest rate at the same time, so there is presence of interest spread (*Kohn, 1993:169*). For this, there are various factors affecting the difference in interest rate:-

Credit or Default Risk

Liquidity Risk

Marketability Risk

Call or Prepayment Risk

Servicing Costs

Exchange Rate Risk

Taxability

Credit or Default Risk- The credit risk is the most commonly associated risk. It determines the different amount individuals or firms pay based on their credit worthiness. Different parties will be offered different rates on debt obligations (such as loans). The measure of credit worthiness of an individual is called a credit rating or credit score. Other entities (such as governments and companies) will acquire a bond rating if they are active in bond markets. Credit risk requires making estimates of the possibility of loss due to this reason. This probability is then converted into an interest rate premium, the credit or default risk premium and added to the saver's required nominal yield. The credit spread between an instrument and its risk free equivalent is called the risk premium.

Liquidity Risk- A desirable quality of assets that are to be part of a precautionary reserve is liquidity. An asset is liquid if it can be turned into cash quickly without loss. But the risk that the lender might not be able to get cash on short notice is called the liquidity risk. The difference in interest rate due to liquidity risk is called liquidity spread.

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

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

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

Exchange Rate Risk-

A foreign company establishing manufacturing facility in Nepal might be inclined to issue shares and or bonds denominated in Nepalese rupees rather than foreign dollars. Investors also have available to them many investments involving exchange rate risk. This risk refers to the potentiality that the rate of exchange between the domestic currency and foreign denominated currency will change as a result of any factors. The primary risk for the borrower is the devaluation of the domestic currency. This results in an unexpected cost on the international loans, since the loan would have to be repaid in the foreign currency that has risen in value relative to the domestic currency. This potential change in currency values must be reflected in computing the cost of borrowing.

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

2.6 Concept of Deposit

An arrangement whereby an individual or organization may place cash for the safekeeping in a bank, discount house or financial institution is known as deposit. Deposit is nothing but it is a type of asset. It is understood that the institution may invest the cash and pay the depositor a specified amount of interest and that the depositor can reclaim the full value of the account according to the agreed upon procedures governing the account. The account holder retains rights to their deposit, although restrictions placed on access depend upon the terms and conditions of the account and the provider. The deposit account would be shown as a liability owed by the bank to its customer. Commercial Bank Act 2031 defines 'deposits' as the amount deposited in a current, saving or fixed accounts of a bank or financial institution. The deposits are subject to withdrawals by means of cheque on a short notice by customers. There are several

restrictions on these deposits, regarding the amount of deposit, numbers of withdrawal etc. they are used more as investments and hence they earn some interest. The rate of interest varies depending on the nature of the deposits. The bank attracts deposits from customers by offering different rates of

interest and different kinds of facilities. Though the banks pay an important role in influencing the customer to save and open deposit account with it, it is ultimately the customer who decides where S/he should deposit his surplus funds in current deposit account, saving deposit or fixed/time deposit account. Bank deposits arise in two ways. When the banker receives cash, it credits the customer's account, it is known as a primary or a simple deposit. People deposit cash in the banking system and thereby convert one form of money, cash into another form, bank money. They prefer to keep their money in deposit account and issue cheques against them to their creditors. Deposits also arise when customers are granted accommodation in the form of loans. Of course, there is nothing that prevents the borrower from withdrawing the entire amount of borrowing in cash but quite often s/he retains the amount with the bank as deposit (*Shrestha and Bhandari, 2003:73*).

2.7 Types of Deposit

In practice, there are mainly three type of deposit in banks. They are:-

Current deposit

A current deposit is a running account in the banking heritage offering various flexible payment methods to allow customers to distribute money directly to others. Most current accounts have a cheque book; offer the facility to arrange standing orders, direct debits and payment via a debit card. Current accounts may also allow borrowing via overdraft facility. These accounts are also called demand deposit or demand liabilities since a deposits account held at a bank or other financial institution is the funds deposited in which are payable on demand. The primary purpose of demand accounts is to facilitate cashless payments by means of check, bank draft, direct debit, electronic fund transfer, etc. These accounts are generally opened by business houses, corporate bodies, public institutions and other organizations whose banking transactions are numerous and frequent so that the amount is being paid into and drawn out of the account continuously. As these deposit are payable on demand, banker is obliged to keep larger cash reserves than are needed in the case of fixed and saving deposits. These types of account are just a facility offered by the bank to its customers. So, such deposit doesn't yield an interest return.

Saving Deposit

According to Commercial Bank Act 2031 saving account means “An account of amount deposited in a bank for saving purposes.” Saving deposit are accounts maintained by commercial bank, savings and loan associations, credit unions, and mutual savings banks that pay interest but can not be used directly as money (by, for example, writing a check). Saving accounts are maintained by a customer with a depository institution for the purpose of accumulating funds over a period of time. Funds deposited in a savings account may be withdrawn only by the account owner or a duly authorized agent, or on the owner’s nontransferable order. The bank fixes the minimum and maximum amount to be withdrawn through a cheque from the deposit. The account may be owned by one or more persons. Some accounts require funds to be kept on deposit for a minimum length of time, while other permits unlimited access to funds. Funds can be deposited or withdrawn at will, and most savings accounts pay interest from day of deposit to day of withdrawal. The account holding financial institution may require up to seven day’s notice before approving withdrawals; most, however, have waved this right.

Fixed Deposit

A fixed deposit is a money deposit at a bank that cannot be withdrawn for a certain “term” or period of time. When the term is over it can be withdrawn or it can be held for another term. Generally speaking, the longer term the better the yield on the money. A deposit of funds in a savings institution under an agreement stipulating that (a) the funds must be kept on deposit for a stated period of time, or (b) the institution may require a minimum period of notification before a withdrawal is made. They are different from saving account in that the fixed deposit has a specific, fixed term-often three months, six months, or one to five years and, usually a fixed interest rate. It is intended that the fixed deposit be held until maturity, at which time the money may be withdrawn together with the accrued interest. Usually, the person or institution who wants to gain more interest opens such type of account. In exchange for keeping the money on deposit for the agreed on term, institutions usually grant higher interest rate than they do on accounts from which money may be withdrawn on saving account.

2.8 Importance of Deposit

The income of an individual is divided into consumption and saving. Deposit arises from saving. S/he deposits the saved part of income in the bank and gets interest from it. Banks in turn lend this money and earn profit by charging high interest rates. The borrowers from banks, invests this fund in the productive sectors yielding more return than the interest on borrowed fund. This investment leads to create new employment opportunity in the economy. Ultimately, due to the new employment the purchasing power of the economy increases and finally GDP and growth of the country occurs. It means that the deposit has very important role in the economy. There is a direct relationship between deposit of banks and the investment in the economy. If the volume of deposit is low, the investment in the economy also lags behind due to lack of resources. The deposit of banks is the accumulated capital which can directly be invested. There is a great need of such deposit in the developing countries. Deposit includes the idle money of the public, bank being the mediator to accept this sort of money and help to channelize this in productive sector. So, the importance of banks and financial intermediaries is larger in present context.

2.9 Concept of Lending (Credit)

The word "credit" means "trusting". In credit transaction, the lender (or banks) must have confidence in the borrower that s/he will be able to repay the money. In credit transactions, the creditor turns over to the debtor to repay an equivalent amount usually money in future plus an added sum called interest. In other words, the commercial bank earns profit by lending the amount in terms of loan or credit and in return it gets interests. Banks loan are classified as (a) Loan advances (b) Overdraft (c) Cash credit (d) Discounting of bills and so on. But besides this, the other forms of credit are: Bills Exchange, Cheques, Drafts, Promissory Note, Travelers Cheque, Treasury Bills (TBills), Letter of Credit (LC), Book Credit etc. (*Shrestha & Bhandari, 2004:255*).

If credit is made to the government the credit is known as public credit and if credit is transacted by the private for his own purposes the credit becomes private. There are certain distinctions between public and private credit. Bank is the major sources of credit to both private and public debtors. Sometimes banks also take credit. There is another type of credit known as investment credit and commercial credit which can be divided according to the purposes of using credit. The former refers to the credit which is

used for investment and the latter for trade purposes. Similarly, another classification is consumer's credit and producer's credit. The latter type of credit is the advances made to individuals firms, companies and governments, which are used to facilitate the production of goods and services.

2.10 Factors Affecting the Volume of Credit

The volume of credit depends upon different factors which are as follows:-

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

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

Investment Opportunity- If the investment opportunity within the country is high, the volume of credit becomes high. The basic thing for investment stimulation is easy and cheap credit etc. more investment opportunity will be available when the interest rate is low.

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

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

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

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

2.11 Term structure of Interest Rate

The relationship between the rates of return on financial instruments and their maturity is called the term structure of interest rate (*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 curve for securities bearing different degree of credit risk subject to different tax laws because both risks and tax laws affect relative yields along with maturity.

2.11.1 Pure Expectation Theory

According to the pure expectation theory, the term structure of interest rates 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; i.e., the yield curve is flat (*Madhura, 2001:51*).

Expectations theory was first developed by Irving Fisher in 1930. The Expectation theory assumes that investors are indifferent to risk and in efficient markets they will buy and sell debt securities of different maturities until the expected return on all assets is equal across all time periods. Therefore, current long term rates are based on current and expected future short-term rates. The expectation theory is the principal theory underlying the calculation of future and forward rates.

The expectation theory can explain three different shapes for the yield curve. When investors expect rates to increase in the future, the yield curve will be upward sloping. When investors expect rates to remain constant, the yield curve will be flat. Finally, when investors expect rates to fall, the yield curve will be downward sloping. Specifically, long-term rates are the geometric average of the current and future short term rates (*Kiran Thapa, 2065:255*).

2.11.2 The Liquidity Premium Theory

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

This theory is the extension of the expectations theory. The liquidity premium theory is derived from the premise that long-term bond prices are more volatile than short-term bond prices. In a world of uncertainty, investors prefer to hold short-term securities because they can be converted into cash with little risk of capital loss. Therefore, investors must be offered a liquidity premium to buy longer-term securities that have higher risk of capital losses. The liquidity premium theory states that long term rates are equal to geometric average of current and expected short-term rates plus liquidity risk premium that increases with the maturity of the security. Therefore, the liquidity theory explains the following facts: (1) interest rate on bonds of different maturities tend to move together over time, (2) Yield curves are usually upward sloping, (3) when short term interest rates are low, yield curves are more likely to have steep upward slope, whereas when short term interest rates are high, yield curves are more likely to be inverted (*Kiran Thapa, 2065:256*).

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 loss 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.

2.11.3 The Segmented-Markets or Hedging-Pressure Argument

A strong challenge to the expectations theory appeared in the 1950s and 1960 in the form of the market segmentation argument or hedging-pressure theory of the term structure of interest rates. The key assumption in the market segmented theory is that bonds of different maturities are not substitutes at all, so the expected return from holding a bond of one maturity has no effect on the demand for a bond of another maturity.

The market segmentation theory segmented the markets for different maturity bonds as completely separate. The interest rate for each bond with a different maturity is then determined by the supply and

demand for the bond with no effects from expected returns on other bonds with other maturities (*Kiran Thapa, 2065:256*).

Why would some investors prefer one maturity of security over 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 fund, and banks. These investor groups, it is argued, often act as risk minimizers rather than profit maximizers as assumed under the expectations hypothesis. They prefer to hedge against the risk fluctuations in the price and yield of securities by balancing the maturity structure of their assets with the maturity structure of their liabilities.

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 to10) year securities attracts different investors groups than the market for longer term (over 10 year) securities.

2.11.4 Preferred Habitat Theory

The Preferred Habitat Theory view is closely allied with the market segmentation theory view, though it also brings in elements of the expectations and liquidity premium arguments, thus providing a composite theory of the determinants of the yield curve.

Preferred Habitat argues that investors select a preferred maturity range along the yield curve on the basis of their risk preferences, tax exposure, liquidity requirements, binding regulations, expectations and other factors. Each investor will tend to stay in his or her preferred maturity habitat unless induced to leave by higher yields or other considerations. Moreover, investors expect that interest rates will tend to move back toward their normal range based on historical experience (*Kiran Thapa, 2065:257*).

2.12 Review of Related Studies

Under this segment, several studies have been conducted by different researchers. Some of them as are supposed to be relevant for the justification of need and importance of this study is presented below:

➤ **Mr. Rajbhandary(1998)** conducted a study entitled “The Interest Rate Structure of Commercial Banks in Nepal” . The objective of his study was to show the relation of interest rate with saving and fixed deposits; with loans and advances and with interest earning (i.e. interest received on loan minus interest paid on deposits).

His analysis concludes that the time deposits are positively and significantly correlated with the interest rates. There is significant correlation between the saving deposits and the rate of interest. Fixed deposit is more sensitive to the interest rate revision done by NRB. The correlation between the growth of fixed deposits and the interest rate particularly from 1974 and 1977 is most significant but the relation between interest rate and loan and advances is less significant. Among the entire sector, the private sector seems most sensitive to interest rate change. Most of the loans too correlated positively if absolute cumulative figure are taken. But the growth rate of total loans and advances except investment on government securities is negatively correlated more with the weighted average rate of interest since 1973. The growth of loan to private sector is also negatively correlated with interest rate since 1971. Negative correlation between loans and interest rate meant that loan decrease at higher interest rate and vice versa.

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

➤ **Mr. Kshetry(1980)** conducted a study entitled “Interest rate structure and its relation with deposits, inflation and credits in Nepal” in with the following objectives:

- ❖ To present a concrete picture of the interest rate structure in Nepal
- ❖ To predict the relationship between interest rate and other economic variable like deposit, inflation, and credit flow in Nepal
- ❖ To analyze the impact and the implication of the policy of interest rate of NRB

With the above mentioned objectives, he was of the view that deposit depends upon numerous factors besides income, inflation and interest rates and he concluded his study as:

- ❖ If other variable are kept constant, institutional interest rate is important explanatory variable to influence the volume of deposit in Nepal.
 - ❖ Interest rates play an important role in under developed country like Nepal where the demand for capital is increasing at each level of income. An appropriate interest rate can divert investment in proper field. This means that the upward movement in the deposit rates increases the volume of deposits.
 - ❖ According to him, the fixation of attractive interest rates on deposit has been responsible for the substantial growth in the volume of deposits in recent years.
 - ❖ He also opines that most of the commercial banks in Nepal are concentrated only in the urban areas. Regarding deposit mobilization in the present context, the urban areas have occupied major parts of the credit and the credit is concentrated in urban areas. The volume of deposit has overcome the volume of credit.
 - ❖ Finally, the relationship between credit flow and loan rates is found out to be negative. If the loan rate of interest is in concession, there is the possibility of raising investment and thus the volume of credit.
- **Mr. Bhatta(2004)** conducted a study entitled “Interest Rate and its effect on Deposit and Lending” with the following objectives:-

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

The conclusions drawn by **Bhatta** are as follows:-

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

- ❖ Analysis shows that interest rates on lending are far higher than deposit rates of sample banks. The correlation coefficient between these two variables (deposit rate and lending rate) of sample banks comes highly positive.
 - ❖ The simple correlation coefficient between deposit rate and deposit amount of sample banks were highly negative. But out of them, correlation coefficient analysis of one sample bank is found to be negative. It means that in that case the theory doesn't match the analysis. So, writer concludes that case the result appears in that study was different than the theory.
 - ❖ The correlation analysis between lending rate and lending amount of all sample banks under study comes highly negative. This relation between two variables (lending rate and lending amount) of sample banks matches with the theory which says with the increase in lending rate, lending amount decreases and vice-versa. So, he concluded that lending rate is the most important determinant of loan and advances of all commercial banks. This makes clear that borrower's seem more interest conscious.
- Another study was made on the topic "Interest rate and its relation with Deposit, Lending and Inflation in Nepal" by **Mr. Parajuli** in 2005. In this study, the disseminator tries to portrait the relation of interest rate with deposit and lending amount (i.e. existence of substitution effect). The findings drawn by **Mr. Parajuli** from his study were as follows:-
- ❖ The interest rate on both deposit and lending of all the sample banks are found to be in decreasing trend. Theoretically, there is positive relationship between saving amount and saving interest rate but here negative relationship is found. It states that there is no substitution effect in Nepalese financial market.
 - ❖ Analysis of fixed deposit amount and fixed interest rate shows negative relationship except RBB and NBL. Theoretically, there is negative relationship between lending interest rate and lending amount. In this study for the 5 sample banks except NBL have negative correlation between these two variables.
 - ❖ The relationship between interest rate on deposit and inflation rate is positive. Similarly, the correlation between interest rate on lending and inflation rate is found to be

moderately positive. He also concluded that the spread between deposit interest rate and lending interest rate is in decreasing trend.

2.13 Research Gap

After reviewing those related literature, we have approached to following points, which certainly provide guideline to present study:

Interest rate refers to a rate which is charged or paid for the use of money. Interest is the amount paid by a borrower to a lender above the amount (the principal) that has been borrowed.

In finance literature, there is different form of theory of interest. They are classical theory, loanable fund theory, liquidity preference theory, and rational expectation theory. The term structures of interest rate are pure expectation theory, liquidity premium view of yield curve, segmented-marketed or hedging-pressure argument, and preferred habitat theory.

Interest rate of deposit and lending is playing important role for bank and financial institution. Deposit is an arrangement whereby an individual or organization may place cash for the safekeeping in a bank, discount house or financial institution. The type of deposits is current, saving, fixed deposit.

In credit transactions, the creditor turns over to the debtor to repay an equivalent amount usually money in future plus an added sum called interest. In other words, the commercial bank earns profit by lending the amount in terms of loan or credit and in return it gets interests. After observing some Nepalese studies and those master degree theses, following point can be found:

- ❖ Deposit rates of all the sample banks under study are in decreasing trend
- ❖ Lending rates of all the sample banks under study are also in decreasing trend
- ❖ The correlation coefficient between these two variables (deposit rate and lending rate) of sample banks comes highly positive.
- ❖ The simple correlation coefficient between deposit rate and deposit amount of sample banks were highly negative.
- ❖ The correlation analysis between lending rate and lending amount of all sample banks under study comes highly negative.

This study includes the deposit amount, interest rate on deposit, amount of loan, lending rate, and their relationship of 3 commercial banks (NABIL, NIBL, and BOK). This research should be the foundation for the future researchers to know about Interest Rate of Commercial Banks and its Impact on Deposit and Lending of Money.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

Generally, Research methodology means the way in which we went about doing our research.

Research methodology is the term that basically means the science of how research is done. It is the way to systematically and logically solve a problem and help us to understand the whole thing. (*Emerithus Debator, Expert Educator*)

Research methodology is common parlance that refers to a search for knowledge. As per the Webster International Dictionary, research is a careful critical inquiry or examination is seeking facts and principles; diligent investigation is order to ascertain something (*Saravanel, 1990:1*).

Research Methodology is a way to systematically solve the research problem (*Kothari, 1990:10*). It is understood as a science of studying how the research is done scientifically. In it we study the various steps that are generally adopted by a researcher, studying the research problem among with the logic behind them.

With a view to attain the overall objective of examining the interest rate and its impact on deposit and lending of commercial banks in Nepal, this study attempts to identify the impact of interest rate on lending and deposit of commercial banks in Nepal. To achieve the stated objectives certain methodology should have to be followed which is discussed in this chapter. It provides a description of methods and procedures for collecting and analyzing the data.

3.2 Research Design

“A research design is the arrangement of continuous collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure” (*Kothari 1992*).

“Research design is a purposeful scheme of action proposed to be carried out in a sequence during the process of research focusing on the management problem to be tackled”. It explains the methods, procedure and entire process necessary for complete a research work. The present study is mainly descriptive. Hence, it follows both explanatory as well as analytical technique. Selection of both types of research decision views that the quality and quantity of information are to be verified.

3.3 Source of Data and Collection Procedure

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

3.4 Population and Sample

A small portion chosen from the population for studying its properties is called a sample and the number of units in the sample is known as the sample size. The method of selecting a small portion of the population for the study and to draw conclusion about the characteristics of the population is know as sampling. The population of the study comprises of all 31 commercial banks that are operating within the kingdom of Nepal. As the study of whole population makes the study cumbersome and also collecting and analyzing the information and data of all the commercial banks is not practical due to time constraint and unavailability of resources, only 3 commercial banks are chosen as samples from the population. The following are the banks that are considered as the sample banks for the study are as follows:-

1. NABIL Bank Ltd.
2. Nepal Investment Bank Ltd.

3. Bank of Kathmandu Ltd.

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

Justification

These commercial banks are very popular in the market and are performing vital role for the growth and economic development of the country. NABIL bank won bank of the year award as well as other banks have also received such and alike awards in different periods of time. So, these all banks are competitors. Therefore, I am selecting these banks for study in interest rate structure and its impact on lending and deposit of commercial banks in Nepal.

3.5 Tools for Data Analysis

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

3.5.1 Arithmetic Mean

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

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

Where, \bar{X} = Means

$\sum X$ = Sum of all variable X

n = Variables involved

3.5.2 Standard Deviation

The standard deviation is a statistic used as a measure of the dispersion or variation in a distribution, equal to the square root of the arithmetic mean of the squares of the deviations from the arithmetic mean. It is the best tool to study fluctuation in any data. It is usually denoted by the letter sigma (σ). It is also known as "Root Mean-Square Deviation" and is computed by using following formula:

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

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

3.5.3 Correlation of Coefficient

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

deposit is positive which indicates that when interest rate increases, deposit also increases in the same direction and vice versa.

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

$$\text{Simple Correlation Coefficient/Karl Pearson's Correlation Coefficient (r)} = \frac{\text{Covariance}(X_1, X_2)}{\sqrt{\sum(X_1)^2} \sqrt{\sum(X_2)^2}}$$

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

Or,

$$\text{Actual Mean Method} = \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2} \sqrt{\sum x_2^2}}$$

$$= \frac{\sum f_{X_1} Z_{\bar{X}_1} \sum f_{X_2} Z_{\bar{X}_2}}{\sqrt{\sum f_{X_1} Z_{\bar{X}_1}^2} \sqrt{\sum f_{X_2} Z_{\bar{X}_2}^2}}$$

n= Total number of observation

X₁ and X₂ = two variables, correlation between them are calculated.

3.5.4 Coefficient of Determination

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

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

3.5.5 t-test for significance for Correlation Coefficient

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

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

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

CHAPTER IV

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The main objective of this chapter is detailed presentation, analysis and their interrelationship of the data and other available information concerning interest rate of commercial banks (sample banks) and their impact in deposit and lending of money from which result of Nepalese commercial banks and their market can be obtained. The relevant data and information necessary for the study and to show the relationship between variables i.e. between interest rate on deposit and deposit amount and interest on lending and lending amount are presented analyzed and interpreted keeping the objectives set in mind. This chapter is categorized into three parts; presentation, analysis, interpretation and findings. The analysis is fully based on secondary data. Firstly, data are presented in terms of table, graph chart of figures according to the need. The presented data are then analyzed using various statistical tools as mentioned in chapter three according to the requirement of the study and at last interpretation is made as per properties of presented data and calculated value.

To make the study clear and result oriented, presentation, analysis and interpretation of the study is made one after another bank. At first the interest rate structure is shown (that of deposit and lending) then after the relationship between interest rate on deposit and deposit amount and relationship between interest rate on lending and lending amount is shown and analyzed. Finally relationship between deposit rate and lending rate is calculated and analyzed. Analysis is made on the basis of different statistical tools like standard deviation, correlation coefficient, coefficient of determination, and t-statistics for significance.

4.2 Analysis of Deposit and Interest Rates

In this section, detail study of fluctuation in interest rate on deposit of 3 sample banks is studied. For this study, only saving and fixed deposits are taken, as current deposit does not earn any interest. The interest rates are generally different in magnitude for every sample banks. These differences are due to the numerous factors like maturity period, policy of bank, goodwill of organization and so on. Hence in

real, government owned bank and banks with reputation and goodwill have lower deposit rates. Similarly, finance companies, co-operative and development banks quote higher interest rate on deposits than commercial banks.

4.2.1 NABIL Bank Limited

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

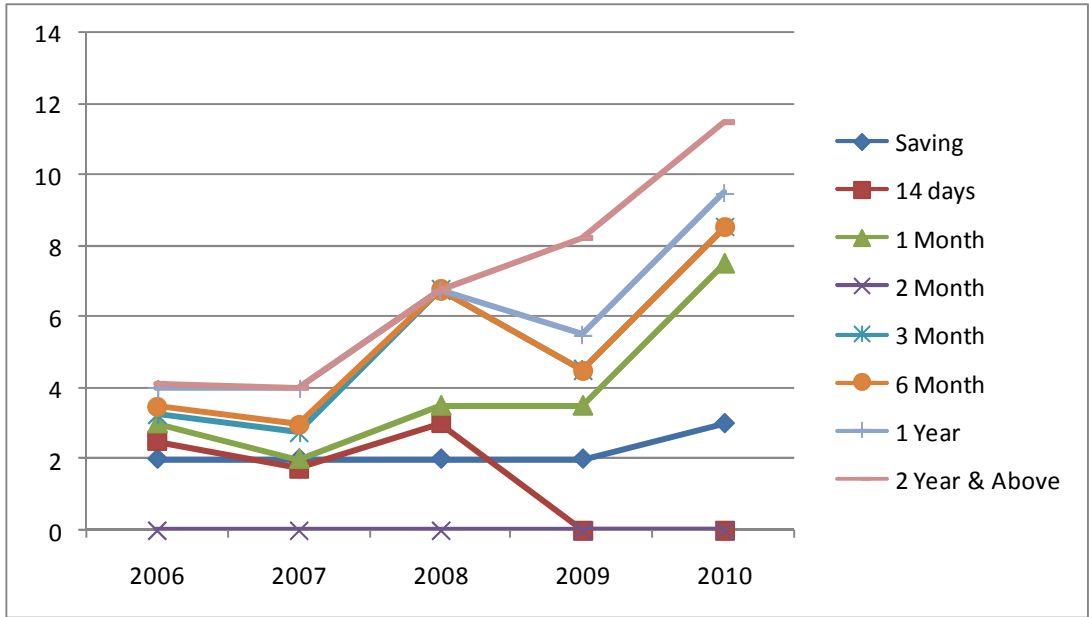
Deposits\ Year	2006	2007	2008	2009	2010
Saving	2.00	2.00	2.00	2.00	3.00
Fixed					
7 Days					
14 Days	2.50	1.75	3.00		
1 Month	3.00	2.00	3.50	3.50	7.50
2 Months					
3 Months	3.25	2.75	6.75	4.50	8.50
6 Months	3.50	3.00	6.75	4.50	8.50
1 Year	4.00	4.00	6.75	5.50	9.50
2 Years/ Above	4.125	4.00	6.75	8.25	11.50
Fixed Deposit Mean	3.40	2.91	5.58	5.25	9.1
Whole Mean	3.20	2.78	5.07	5.20	8.08
S.D.(†)	1.963				

Source: Statistics, Interest Rate Structure, NRB

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

Table 4.1 shows the interest rate structure on deposit of NABIL Bank during the last five fiscal years. For this study 2006 is taken as initial year and 2010 as final year. The Table shows interest rates which prevailed in the Nepalese financial markets during last past five years. Data shows the decrease of interest rate in year 2007 that of 2006 and then it shows the increasing tendency till the year 2010 and the year 2010 witnessed the highest rise in interest rate of all the five years. The interest rate on saving was 2.00% in the year 2006 and remained constant till the year 2009 and it increase to 3.00% in the year 2010. Hence, saving deposit rate shows constant trend till 2009 and then increase in 2010. In the same way, bank used to quote the interest rate of fixed deposit in different short term period like 7 days, 14 days, 1 month, 2 months, 3 months and so on. The interest rate on fixed deposit is in increasing trend during the five fiscal years except for the 2007 and witnessed highest increase in the year 2010. Table shows that average interest rate on fixed deposit were 3.40% for the year 2006, 2.91% for the year 2007, 5.58% for the year 2008, 5.25% for the year 2009 and 9.10% for the year 2010. Similarly, average interest rate for deposit was 3.20%, 2.78%, 5.07%, 5.20% and 8.08% for the year 2006, 2007, 2008, 2009 and 2010 respectively. The average figures also show the increasing tendency in interest rate expect the year 2007.

Figure 4.1 Interest Rate on Saving and Fixed Deposits of NABIL



The above figure 4.1 shows the trends of interest rate on saving and fixed deposits. Deposit rate on saving as well as fixed is in increasing trend. The saving interest rate has remained more or less constant. Similarly, fixed deposit rate has increased every year except the year 2007. The graph in this study shows the average of 14 days, 1 month, 2 month, 3 month, 6 months, 1 year and 2 years is taken in fixed deposit to make the figure clear.

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

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

(Rs. in million)

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposit Amount (3)	Fixed Deposit Interest Rate (4)	Fixed Deposit Amount (5)
2006	2.00	8770.80	3.40	3450.20
2007	2.00	10187.40	2.91	5435.20
2008	2.00	12159.97	5.58	8464.09
2009	2.00	14620.40	5.25	8310.70
2010	3.00	13783.60	9.1	14711.07
Correlation	$r_{23} = 0.4311929$		$r_{45} = 0.9659$	
Coefficient of Determination	$r_{23}^2 = 0.1859273$		$r_{45}^2 = 0.9330$	
t- statistics	$t\text{-cal} = 0.827752$ $t\text{-tab} = 3.182$	Insignificant	$t\text{-cal} = 6.80$ $t\text{-tab} = 3.182$	Significant

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

(Note: Calculation is shown in appendix I)

Table 4.2 shows that the total amount of fixed deposit and saving deposit and the interest rate offered on such deposits of NABIL during last five fiscal years starting from 2006 to 2010. Table shows that the interest rate of saving deposit remains constant except the year 2010 while the interest rate of fixed deposit is increasing continuously except for the year 2007. On the other hand, total saving deposit amount is in increasing pattern except the year 2010 and fixed deposit in the year 2009. Hence, in case of saving there is negative relation between interest rate and deposit. This shows people do not stop to save despite the constant in interest rate. With the increase in income, saving deposit increases without

any incentive in interest rate. However, in case of fixed deposit, there is positive relation between interest rate and deposit. Since fixed deposit offers very less liquidity as compared to saving deposit, depositors seek high interest rate to forego the current liquidity as envisaged by Keynes Liquidity Preference Theory.

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

Figure 4.2 Deposit Amount of NABIL during different Fiscal Years

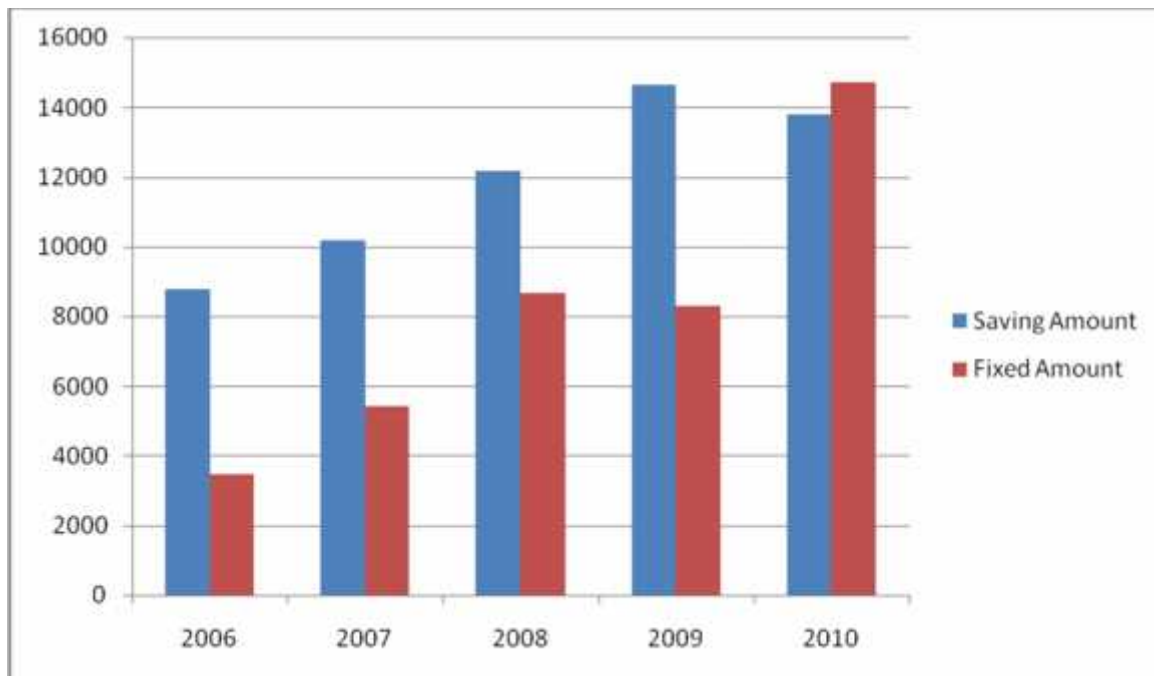


Figure 4.3 Deposit Rate of NABIL during different Fiscal Years

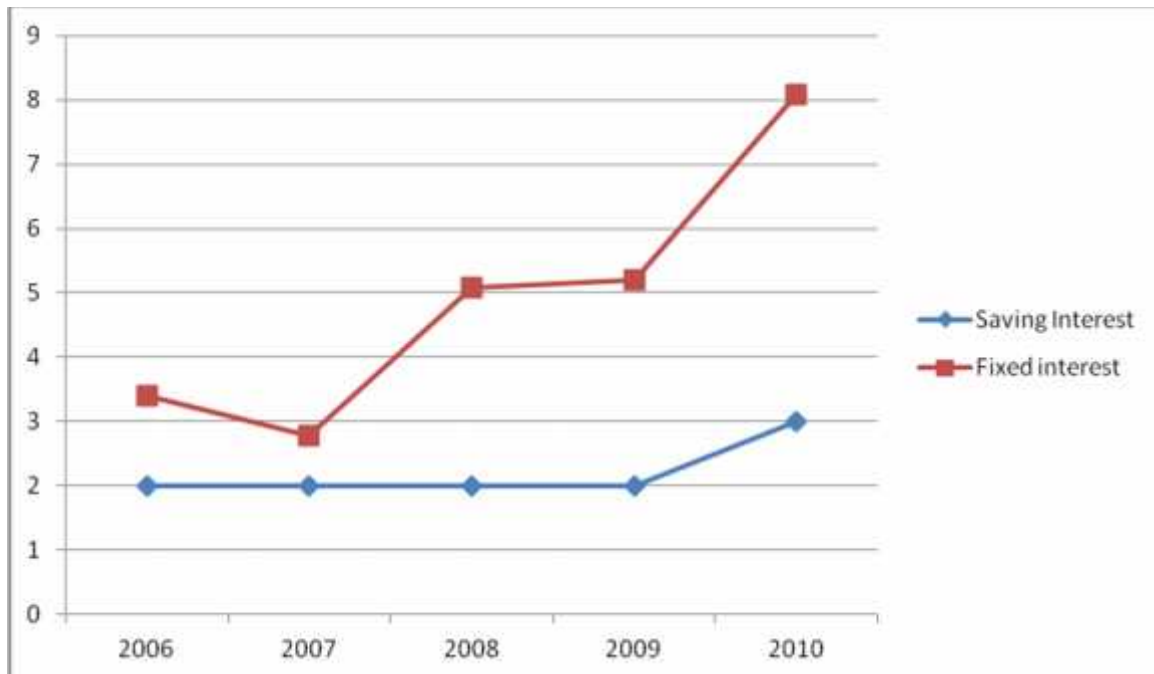


Table 4.2 shows that the interest rate on saving deposit has increased from 2.00% to 3.00% during five fiscal years. In the period, the deposit amount has increased from Rs 8770.80 to Rs 14620.40 and decreases in the year 2010 to Rs 13783.60 millions. This shows that in spite of constant in the interest rate on saving deposit, the saving amount increased within the period except of fifth year. Similarly, table shows that the fixed interest rate has increased from 3.40% to 9.10% in year 2006 to 2010. On effect of this increase, the amount of fixed deposit has also increased from Rs 3450.20 million to Rs 14711.07 million.

To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. The calculation of correlation coefficient between saving deposit interest and saving deposit amount (r_{23}) = 0.4311929. This positive correlation coefficient indicates that they have positive relationship with each other. Constant in interest rate is followed by an increase in saving deposit amount and vice versa. The coefficient of determination between these two variables is $r_{23}^2 = 0.1859273$ which means 18.59% total variation in dependent variable (saving deposit amount) has been explained by independent variable (interest rate) and remaining percentage of 81.41% is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variable is $t\text{-cal} = 0.827752$. Since the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom ($t\text{-tab} = 3.182$) is more than the

calculated value ($t\text{-cal} = 0.827752$), the correlation coefficient is insignificant. This means the variables mentioned (interest rate on saving deposit and amount of saving deposit) for NABIL are not correlated and alternative hypothesis (H_0) is accepted which means there is no relationship between interest rate on deposit and saving deposit amount of NABIL.

In the same manner, the correlation coefficient for fixed deposit interest rate and fixed deposit amount $r_{45} = 0.9693$. This shows that these two variables are positively correlated i.e. when interest rate on fixed deposit increase, the deposit amount also increases and vice versa. The coefficient of determination between these two variables is $r_{45}^2 = 0.9395$ which mean 93.95% of total variable (fixed deposit) is explained by independent variable (fixed deposit rate) and remaining 6.05% is the effect of other variables. The t-value for testing the significance of the correlation coefficient between variables $t\text{-cal}(= 6.80)$ which is more than the tabulated t-value ($t\text{-tab} = 3.182$) at 5% level of significance for two tail at (5-2) degree of freedom. The conclusion can be drawn that correlation coefficient between these two variables is significant. This means null hypothesis (H_1) is accepted i.e. there is relationship between fixed deposit interest rate and fixed deposit amount of NABIL or two phenomenon.

4.2.2 Nepal Investment Bank Ltd (NIBL)

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

Deposit\ Year	2006	2007	2008	2009	2010
Saving	2.50	2.50	2.50	2.50	2.50
Fixed					
7 Days					
14 Days	1.25	1.25	1.25	1.25	1.25
1 Month	1.75	1.75	1.75	1.75	1.75

2 Months					
3 Months	2.625	2.625	2.625	2.625	2.625
6 Months	2.875	2.875	2.875	2.875	2.875
1 Years	3.625	3.625	5.25	5.25	5.25
2 Years/ Above	3.875	3.875	5.75	5.75	5.75
Fixed Deposit Mean	2.67	2.67	3.25	3.25	3.25
Whole Mean	2.64	2.64	3.14	3.14	3.14
S.D.(†)	0.2501				

Source: Statistics, Interest Rate Structure, NRB

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

Table 4.3 shows the interest rate structure on deposit of Nepal Investment Bank during the last five fiscal years. For this study 2006 is taken as initial year and 2010 as final year. Table shows those interest rates were prevailed in the Nepalese financial markets during last past five years. The data shows there is almost consistency tendency of interest rate. The interest rate in first two years and last three years is same. The interest rate on saving deposit is 2.50% in the year 2006 and remains constant till the year 2010. However, the interest rate on fixed deposit has a fluctuating trend during the five fiscal years. The table shows that average interest rate on fixed deposit is 2.67% for the year 2006, it went constant for the year 2007, and it rises to 3.25% for the year 2008 and then remains constant till the year 2010. Similarly, average interest rate for deposit were 2.64% for the year 2006, 2.64% for the year 2007 and 3.14% for the year 2008, 2009 and 2010 respectively. The average figures also show the fluctuating tendency in interest rate.

Figure 4.4 Interest Rate on Saving and Fixed Deposits of NIBL

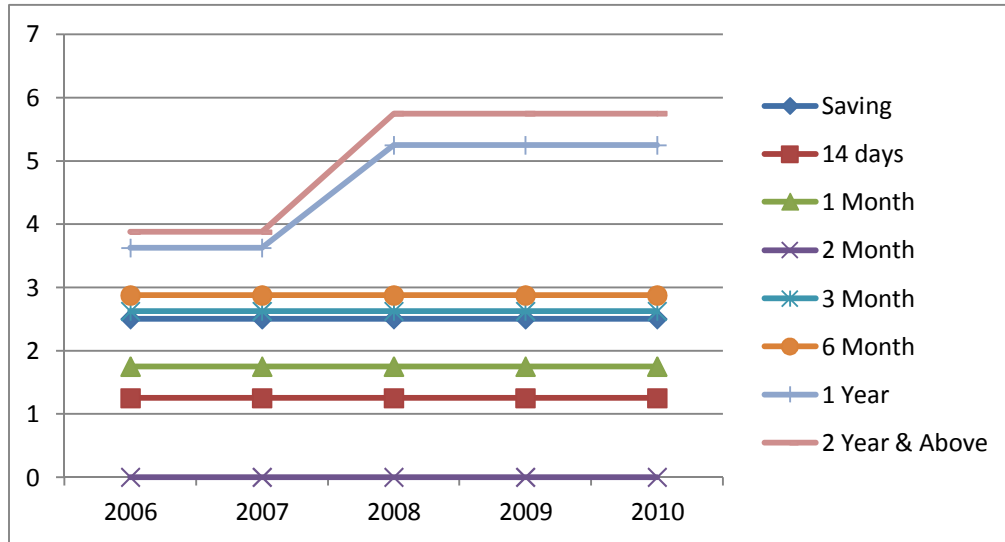


Figure 4.4 clearly shows the fluctuating tendency of NIBL in interest rate during the five fiscal years. In the second year the interest rate remained same as of first year. The interest rate moderately increased in the third year, then remains constant up to the fifth year. This overall figure shows that the interest rate is in fluctuating trend except in saving account.

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

Table 4.4 Relationship between Interest Rate on Deposit and Deposit amount of NIBL (In Millions)

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposit Amount (3)	Fixed Deposit Interest Rate (4)	Fixed Deposit Amount (5)
2006	2.50	10642.20	2.67	7510.80
2007	2.50	10742.20	2.67	7516.80
2008	2.50	13688.80	3.25	7944.20
2009	2.50	10542.20	3.25	6516.90
2010	2.50	13783.64	3.25	14711.07
Correlation	$r_{23} = 0$		$r_{45} = 0.718$	

Coefficient	Of	$r_{23}^2 = 0$		$r_{45}^2 = 0.515524$	
Determination					
t- statistics		t- cal = 0	Insignificant	t- cal = 1.7867	Insignificant
		t- tab = 3.182		t- tab = 3.182	

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

(Note: Calculation is shown in appendix1)

Table 4.4 shows that the total amount of fixed deposit and saving deposit and the interest rate offered on such deposits of NIBL during last five fiscal years starting from 2006 to 2010. The Table shows that the interest rate of saving deposit is constant throughout the five years and that of fixed deposit is very little fluctuating . On the other hand, saving deposit amount is increasing in every fiscal year except the year 2009 whereas fixed deposit amount is increasing in every fiscal year except 2009. Therefore, there is a no relationship between saving deposit and interest rate of NIBL.

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

Figure 4.5 Deposit Amount of NIBL during different FY

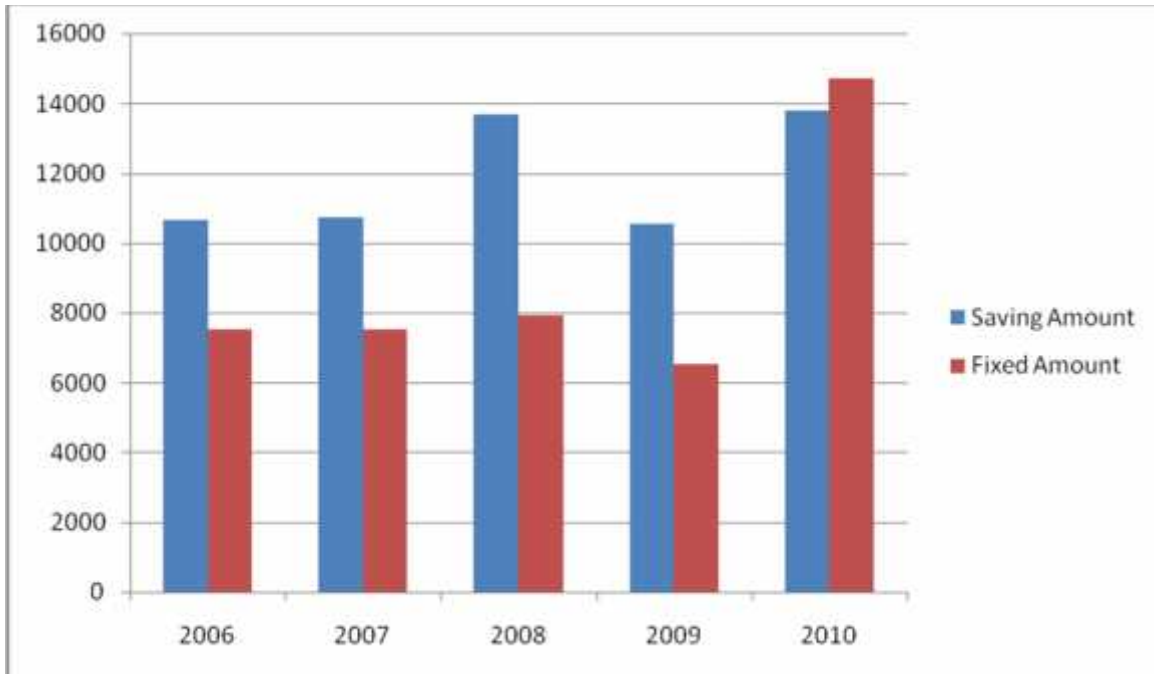


Figure 4.5 shows deposit amount is continuously rising each fiscal year except saving deposit in the year 2010. Similarly, the interest rate of fixed deposit and saving deposit can also be shown on figure 4.6 as:

Figure 4.6 *Deposit Rates of NIBL during different FYs*

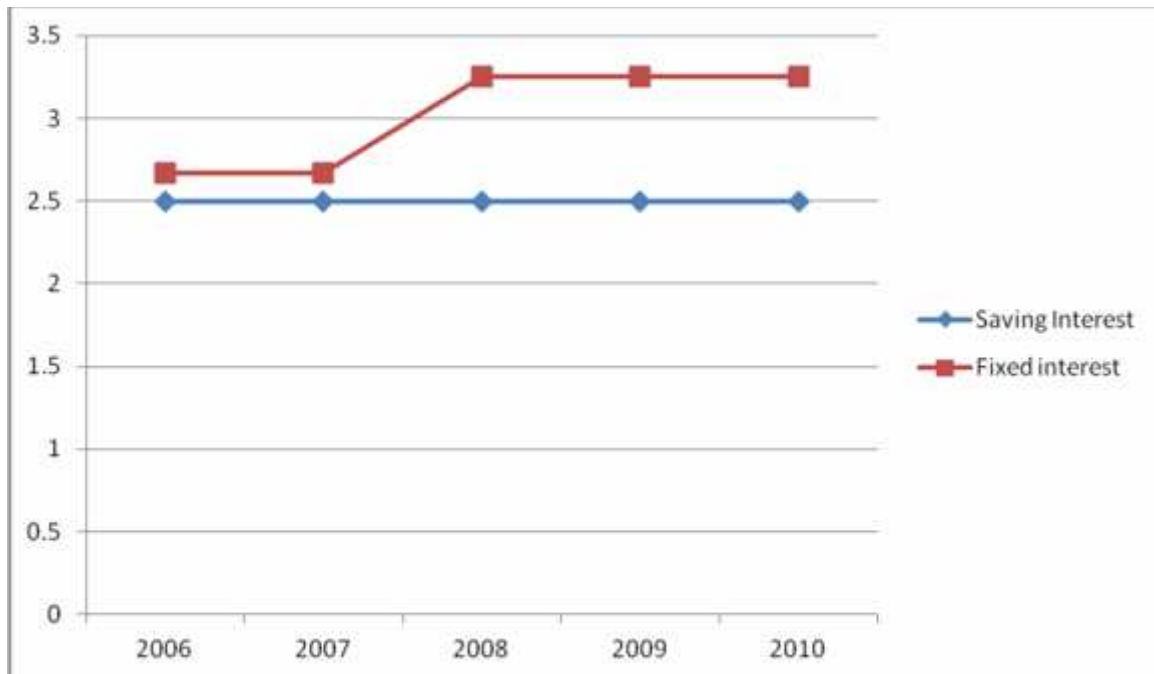


Table 4.4 shows the consistency in interest rates in saving deposit throughout the five fiscal years whereas in fixed deposit, the interest rate is increasing order and remains constant for the last three years and fluctuating trend in fixed deposit. To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. The calculation of correlation coefficient between saving deposit interest and saving deposit amount (r_{23}) = 0. This null correlation coefficient indicates that they is no linear relationship in deposit and saving interest rates. Constant in interest rate is followed by an increase in saving deposit amount except in the year 2009. This shows that the substitution effect in case of NIBL for saving account is not applicable. The coefficient of determination between these two variables is $r_{23}^2 = 0$ which means 0% of total variation in dependent variable (saving deposit amount) is explained by independent variable (interest rate) and remaining 100% is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variable is $t\text{-cal} = 0$. Since the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom ($t\text{-tab} = 3.182$) is greater than the calculated value ($t\text{-cal} = 0$), the correlation coefficient is insignificant. This means the variables mentioned (interest rate on saving deposit and amount of saving deposit) for NIBL are not correlated and null hypothesis (H_0) is accepted which means there is no relationship between interest rate on saving deposit and the amount of saving deposit of NIBL.

Like as above, the correlation coefficient for fixed deposit interest rate and fixed deposit amount is $r_{45} = 0.718$. The figure indicates that these two variables are directly correlated but the magnitude of correlation is very low. In other words, change in one variable cause the change in other variable in the same direction. The coefficient of determination between these two variables is $r_{45}^2 = 0.516$ which mean 51.60% of total variable (fixed deposit) is explained by independent variable (fixed deposit rate) and remaining 49.40% is the effect of other variables. The t-value for testing the significance of the correlation coefficient between variables is $t\text{-cal} = 1.7867$ which is less than the tabulated t-value ($t\text{-tab} = 3.182$) at 5% level of significance for two tail at (5-2) degree of freedom. The conclusion can be drawn that correlation coefficient between these two variables is insignificant. This means null hypothesis (H_0) is accepted i.e. there is no relationship between deposit interest rate and deposit amount of NIBL.

4.2.3 Bank of Kathmandu (BOK)

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

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

2 Years/ Above	5.13	3.63	5.50	5.50	8.83
Fixed Deposit Mean	3.13	2.79	3.64	3.64	5.47
Whole Mean	3.05	2.72	3.469	3.469	5.07
S.D.(†)	0.807765				

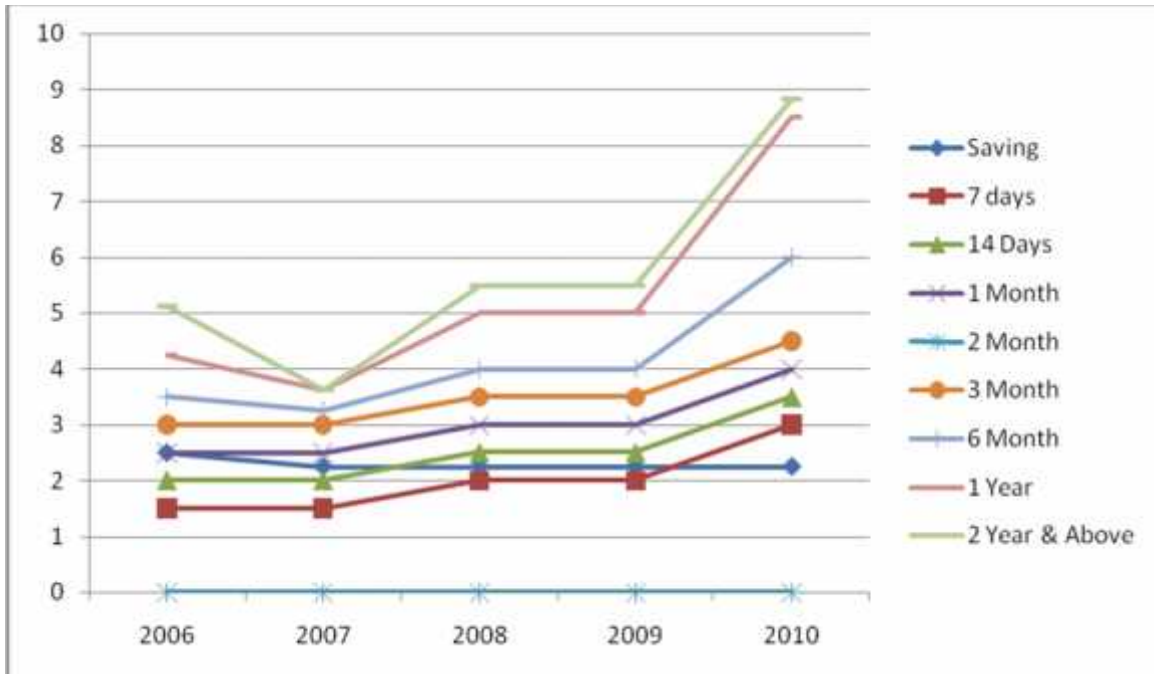
Source: Statistics, Interest Rate Structure, NRB

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

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

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

Figure 4.6 Interest Rate on Saving and Fixed Deposits of BOK



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

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

Table 4.7 Relationship between Interest Rate on Deposit and Deposit amount of BOK

(Rs in million)

Year (1)	Saving Deposit Interest Rate (2)	Saving Deposit Amount (3)	Fixed Deposit Interest Rate (4)	Fixed Deposit Amount (5)
2006	2.50	4582.00	3.13	2709.80
2007	2.25	5526.80	2.79	3037.20
2008	2.25	6595.20	3.64	3703.10
2009	2.25	7260.30	3.64	4474.60

2010	2.25	6723.20	5.47	6383.60
Correlation	$r_{23} = -0.810354$		$r_{45} = 0.660947$	
Coefficient of Determination	$r_{23}^2 = 0.656673$		$r_{45}^2 = 0.436852$	
t- statistics	t- cal = -2.3954 t- tab = 3.182	Insignificant	t- cal = 1.5255 t- tab = 3.182	Insignificant

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

(Note: Calculation is as shown in appendix I)

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

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

Figure 4.8 Deposit Amount of BOK during different FY

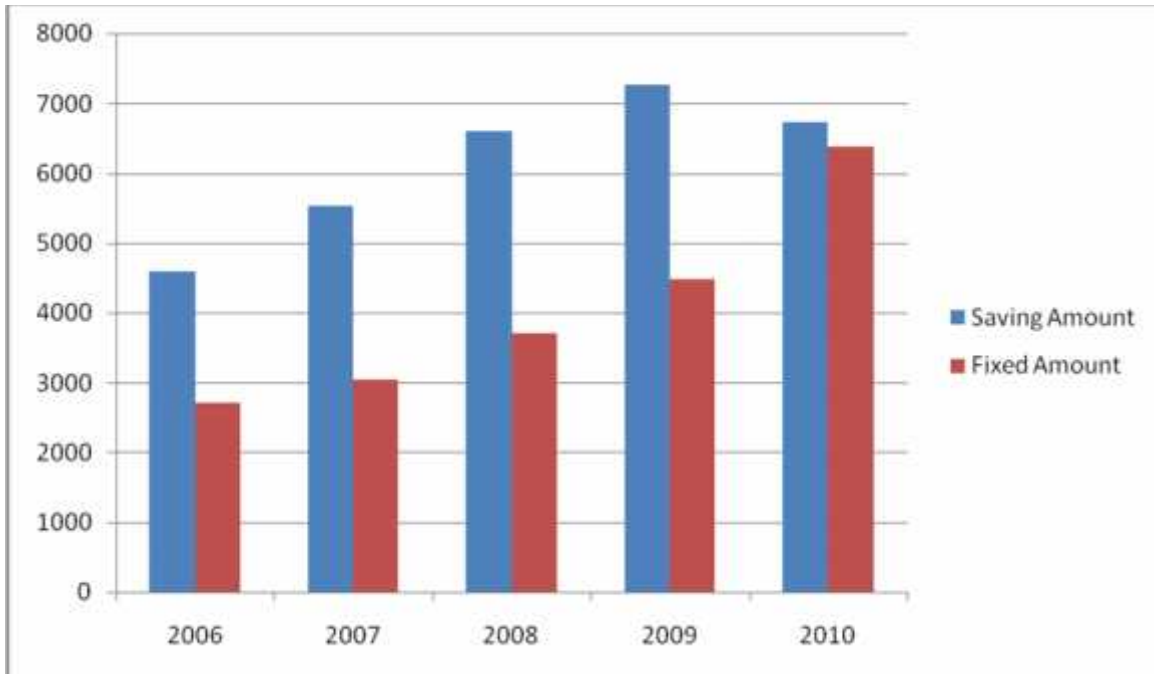


Figure 4.8 shows saving deposit amount is continuously rising each fiscal year except the year 2010 but fixed deposit amount seems to grow each year without any fluctuation. It means that there is rise in fixed deposit amount. Similarly, the interest rate of fixed deposit and saving deposit can also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

Figure 4.9 *Deposit Rates of BOK during different FYs*

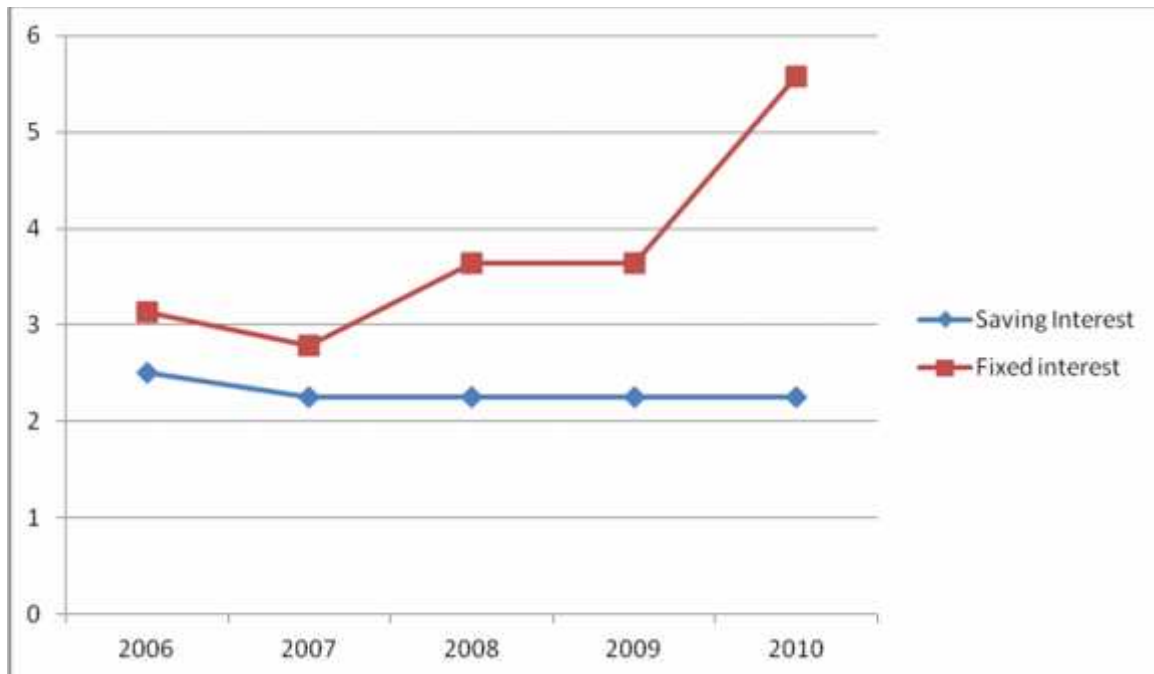


Table 4.9 shows the constant and fluctuating trend of interest rates both in saving and fixed deposit respectively. The saving deposit rate is in decrease and then remains constant. On the other hand, the fixed deposit interest rate is also in fluctuation trend except the year 2008 and 2009 where it remains constant. To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. The calculation of correlation coefficient between saving deposit interest and saving deposit amount (r_{23}) = -0.810354. This high negative correlation coefficient indicates that they have inverse relationship with each other. Decrease and constant in interest rate is followed by an increase in saving deposit amount and vice versa. This shows that the substitution effect in case of BOK for saving account is not applicable. The coefficient of determination between these two variables is $r_{23}^2 = 0.656673$ which means 65.66% total variation in dependent variable (saving deposit amount) has been explained by independent variable (interest rate) and remaining 34.34% is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variable is $t\text{-cal} = -2.3954$ ($|t| = 2.3954$). Since the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom ($t\text{-tab} = 3.182$) is greater than the calculated value ($t\text{-cal} = 2.3954$), the correlation coefficient is insignificant. This means the variables mentioned (interest rate on saving deposit and amount of saving deposit) for BOK are significantly correlated and alternative hypothesis (H_0) is accepted which means there is no relationship between interest rate on saving deposit and saving deposit amount of BOK.

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

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

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

4.3.1 NABIL Bank Ltd.

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

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

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

(Rs in million)

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

Coefficient Of Determination (r_{12}^2)	0.670595	
t- statistics	t- cal = 2.47129 t- tab = 3.182	Insignificant
S.D.(†)	1.714113	

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

(Note: Calculation is shown in appendix II)

Table 4.7 shows the lending interest rate on different area is in increasing trend. Table shows that the maximum interest rate is 15.50% and 12.50% in FY2010 and minimum rate is 6.75% in FY 2007. This shows the interest rate increased drastically during the five FYs period. Generally the productive sector loan rate like commercial loan, industrial loan are not given and priority sector loan, working capital loan and so on rises less in magnitude than non productive sector loan (like overdraft, loan against government bond, BG/CG rate and so on). For example during the last five FYs rises of import L/C rate was by 3.75%. In the same manner, the rises magnitudes were 0%, 0%, 4.25% for against other guarantee, hire purchase and others loan. The rises percentage were 0%, 3%, 4%, 2.75% in priority sector, deprived sector, term loan and working capita loan rate respectively. According to theory, in order to induce the investment in the country or expansion of trade, the productive sector loan should be available at cheaper rate. But the figure shows that these sectors loan were somewhat costlier than other non productive loan.

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

Figure 4.10 Average Lending Rate of NABIL during different FYs.

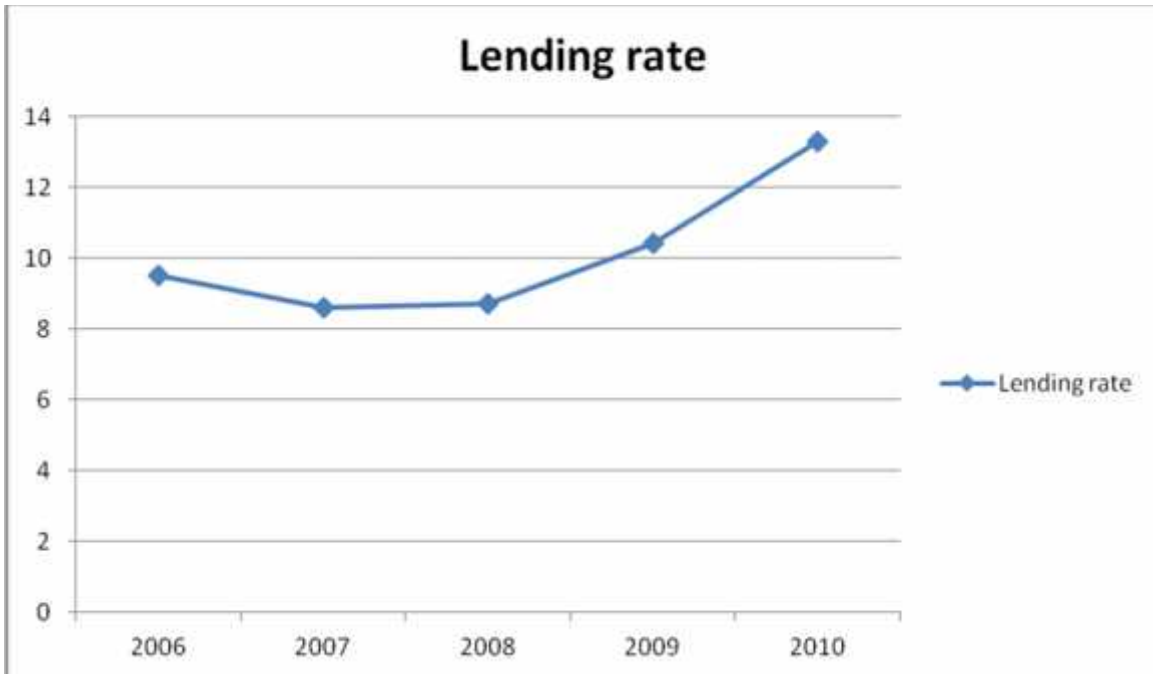
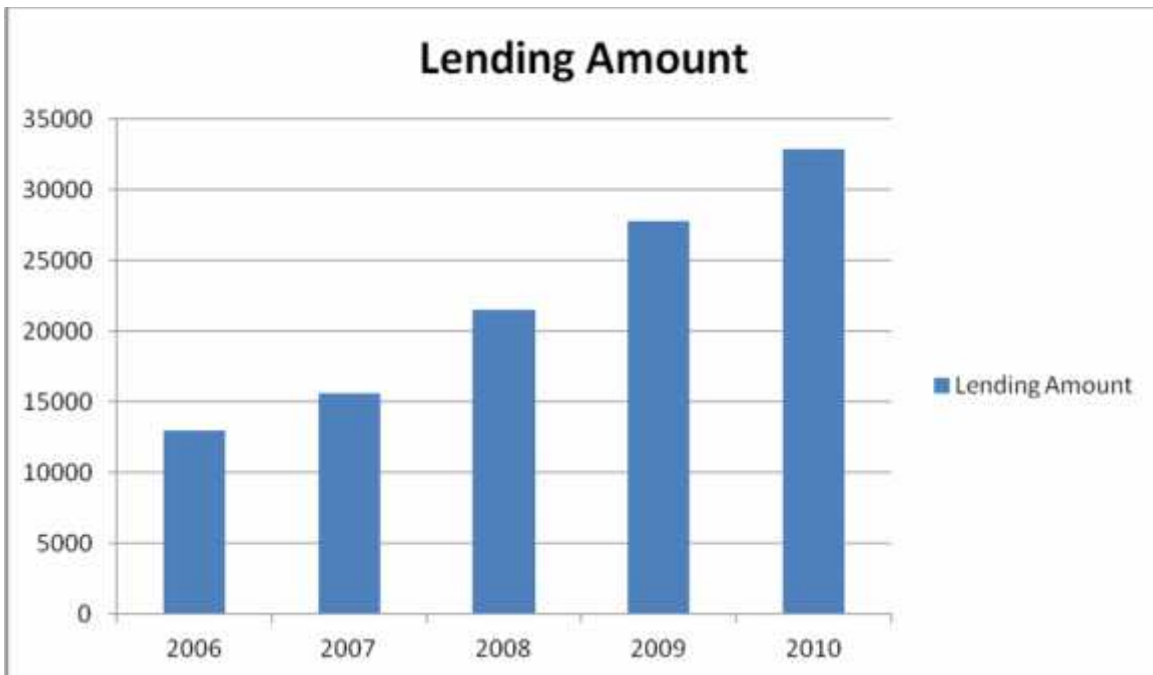


Figure 4.11 *Lending Amount of NABIL during different FYs.*



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

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

From table 4.7 the correlation coefficient between lending rate and lending amount (r_{12}) is 0.818898. According to our classification, this positive correlation is of “moderate degree” and there is positive relationship between lending interest rate and lending amount. It means that increase in lending interest rate result increase in total lending amount. According to the theoretical concept of lending rate and lending amount, people prefer or use money when the market interest rate is low in the market. Similarly, the coefficient of determination is $(r_{12}^2) = 0.670595$. When total lending amount is taken as dependent variable and lending rate as independent variable, then 67.05% of total variation in dependent variable is explained by lending rate and remaining percentage of 32.95% is due to the effect of other variable in the economy. The test of significance of correlation coefficient between lending rate and lending amount also verify the fact. The calculated value of t-statistics is -2.47129 which is lower than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). In this condition, H_0 is acceptable. It means that there is not correlation between two variables. In other words, the relation is insignificant. In conclusion, the no relationship between lending rate and lending amount is applicable for NABIL.

4.3.2 Nepal Investment Bank Limited (NIBL)

Table 4.8 Lending rate of NIBL on different sectors during last five FYs ((Rs in millions)

Sectors\Years	2006	2007	2008	2009	2010
Overdraft	10.88	10.88	10.88	10.88	10.88
Export Credit	8.00	9.38	9.38	9.38	9.38
Import L/C					
Against FDR	7.50	7.50	7.50	7.50	7.50
Against Govt. Bond	7.00	7.00	7.00	7.00	7.00
Against BG/CG	8.00	8.00	8.00	8.00	8.00
Against other Guarantee					

Industrial Loan					
Commercial Loan					
Priority Sector	8.00	8.00			
Deprived Sector	6.50	6.50	6.50	6.50	6.50
Term Loan	11.50	11.50	11.50	11.50	11.50
Working Capital Loan	11.00	11.00	10.88	10.88	10.88
Hire Purchase	10	10	10	10	10
Others	9.75	9.75	9.75	9.50	9.50
Average Lending Rate (1)	8.92	9.04	9.95	9.11	9.11
Loan Amount (2)	16577.70	17482.00	27145.50	28911.60	32902.80
Correlation Coefficient (r_{12})	0.4536				
Coefficient Of Determination (r_{12}^2)	0.20575				
t- statistics	t- cal = 0.8815			Insignificant	
	t- tab = 3.182				
S.D.(†)	0.136				

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

(Note: Calculation is shown in appendix II)

Table 4.8 shows the lending interest rate, average lending interest rate, correlation coefficient, coefficient of determination, t-value and standard deviation of NIBL during different FYs. The interest rate of NIBL is in increasing trend and remains constant from the year 2008. The table shows that the

maximum interest rate is 11.50% in FY2006, 2007, 2008, 2009, 2010 and minimum rate is 6.50%. This table shows the interest rate rises slowly during the five FYs period. In the FY 2006, the average interest rate is 8.92%. But in later year, the interest rate increased by 0.12% in the year 2007, 0.91% in the year 2008 and remains constant till the year 2010. The table shows that average lending interest rate is in increasing trends except two last fiscal years. 2009 and 2010. The standard deviation for average interest rate is 0.136 which shows the deviation from mean return. With harmony to interest rate, the lending amount of NIBL is also seen to be in increasing tendency except in the year 2009 where as the lending rate is also increasing. This table shows that there is the positive relation between interest rate and interest amount. But to get the exact numerical result of relationship, correlation coefficient is necessary to be calculated. The figure for changing trend of interest rate and lending amount is given on figure no. 4.12 and 4.13.

Figure 4.12 Average lending rate of NIBL during different FYs

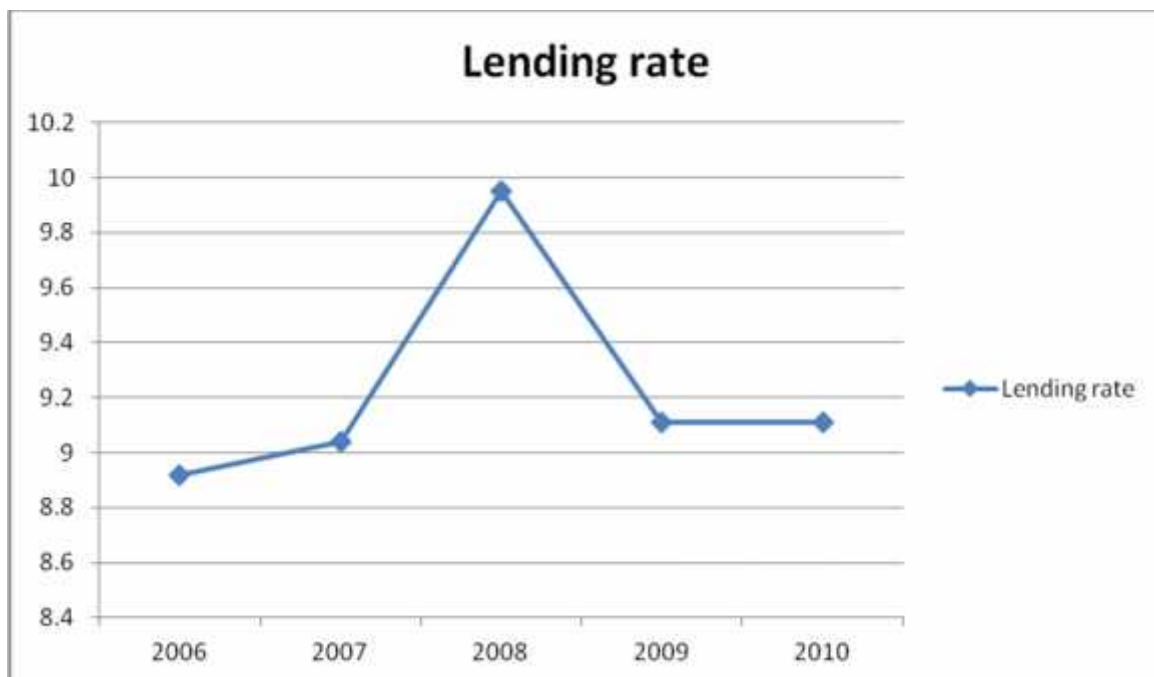
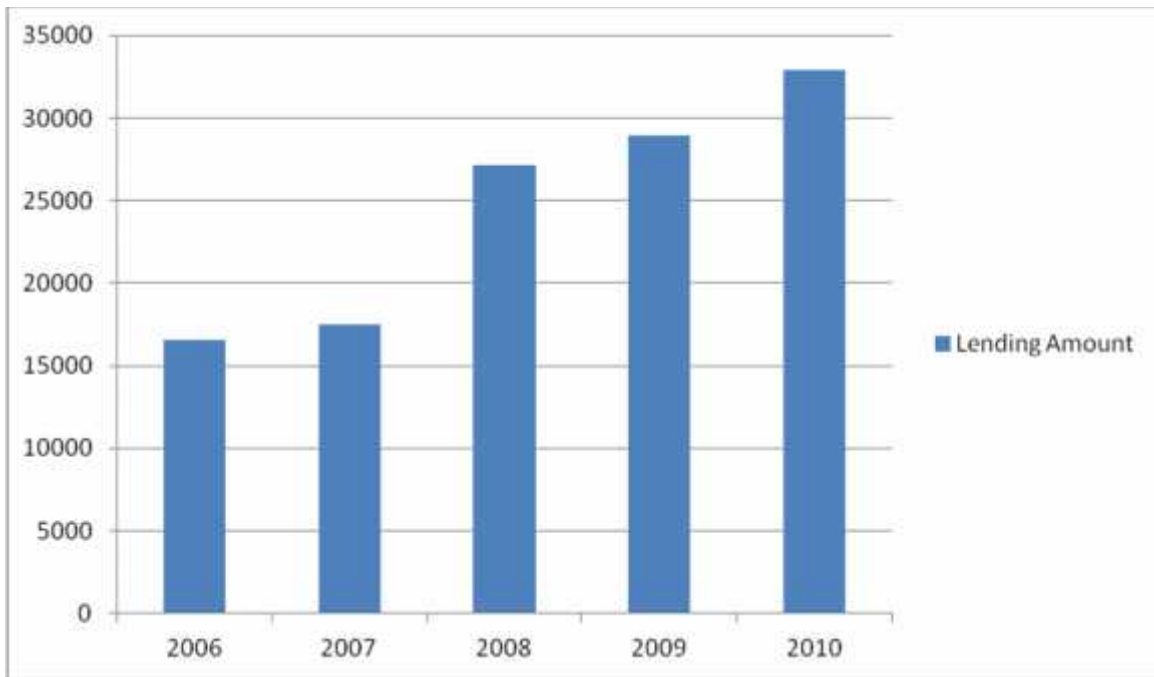


Figure 4.13 Lending Amount of NIBL during different FYs



The above figure 4.12 and 4.13 show the trends of lending interest rate and lending amount of NIBL during different fiscal years. The interest rate has slightly increased during the five fiscal years. It rises from 8.92% to 9.11%. Similarly, the lending amount is in increasing trend during the five fiscal years despite the rise or constant in interest rate. We can conclude that there is no relationship between lending rate and lending amount of NIBL.

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

From table 4.12, the correlation coefficient between lending rate and lending amount (r_{12}) is 0.4536. According to our classification, this positive correlation is of “moderate degree” which indicates that there is positive relationship between lending interest rate and lending amount. It means that increase in lending interest rate result increase in total lending amount. According to the theoretical concept of lending rate and lending amount, people prefer or use money when the market interest rate is low in the market. Similarly, the coefficient of determination is (r_{12}^2) 0.20575. When total lending amount is taken as dependent variable and lending rate as explained by lending rate as independent variable, then 20.57% of total variation in dependent variable is explained by lending rate and remaining percentage of 79.43% is due to the effect of other variable in the economy. The test of significance of correlation coefficient between lending rate and lending amount also verify the fact. The calculated value of t-

statistics is 0.8815 which is less than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom ($t_{tab} = 3.182$). In this condition, H_0 is accepted and H_1 is rejected. It means that there is no correlation between two variables. In other words, the relation is significant. In conclusion, the relationship between lending rate and lending amount is not applicable for NIBL.

4.3.3 Bank of Kathmandu (BOK)

Table 4.9 Lending rate of BOK on different sectors during last five FYs (In millions)

Sectors\Years	2006	2007	2008	2009	2010
Overdraft	11.75	11.75	11.75	11.75	14.50
Export Credit	7.75	7.75	7.75	11.00	13.00
Import L/C	10.25	10.25	10.25	11.00	12.50
Against FDR	7.50	7.50	7.50	9.25	13.50
Against Govt. Bond	7.25	7.25	7.25	9.50	12.50
Against BG/CG	9.25	9.25	9.25	9.75	12.50
Against Other Guarantee	7.50	7.50	7.50		
Industrial Loan	11.75	11.75	11.75		
Commercial Loan	12.25	12.25	12.25		
Priority Sectors					
Deprived Sectors	8.75	8.75	8.75	8.75	13.00
Term Loan	11.75	11.75	11.75	12.00	14.00
Working Capital Loan	11.75	11.75	11.75	11.75	14.00
Hire Purchase	9.25	9.25	9.25	10.50	13.25

Others	9.25	9.25	9.25	10.75	11.00
Average Lending Rate (1)	9.71	9.71	9.71	10.52	13.06
Loan Amount (2)	7525.00	9663.60	12692.90	14894.70	16847.10
Correlation Coefficient (r_{12})	0.784553				
Coefficient of Determination (r_{12}^2)	0.615524				
t- statistics	t- cal = 2.1915			Insignificant	
	t- tab = 3.182				
S.D.(†)	1.297416				

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

(Note: Calculation is shown in appendix II)

Table 4.9 shows the lending interest rate, average lending interest rate, correlation coefficient, coefficient of determination, t-value and standard deviation of BOK during different FYs. The interest rate of BOK is also in increasing trend. The table shows that the maximum interest rate is 14.00% in FY2010 and minimum rate is 7.25% in FY 2008. Generally the productive sector loan rate (like commercial loan, industrial loan, priority sector loan, working capital rate and so on) declines (except working capital rises in 2010). On other hand non productive sector loan (like overdraft, loan against government bond, BG/CG rate and so on) rises in year 2009 and 2010. For example during the last five FYs rises of hire purchase rate was by 4% during 2006 to 2010. In the same manner, the rising magnitude for export credit was by 5.25% during different fiscal years. Overdraft remains constant during different fiscal years except rises by 2.75% in the year 2010. Loan against Govt bond rises to 5.25%. Industrial loan and commercial loan is 0% from the year 2009. Thus, we can say that there is the fluctuation of interest rate in these non productive sectors. But there is rise of interest rate for the productive deprive sectors and others. According to theory, in order to induce the investment in the country or expansion of trade,

the productive sector loan should be available at cheaper rate. But the figure shows that these sectors loan were somewhat costlier than other non productive loan.

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

Figure 4.14 *Average lending rate of BOK during different FYs*

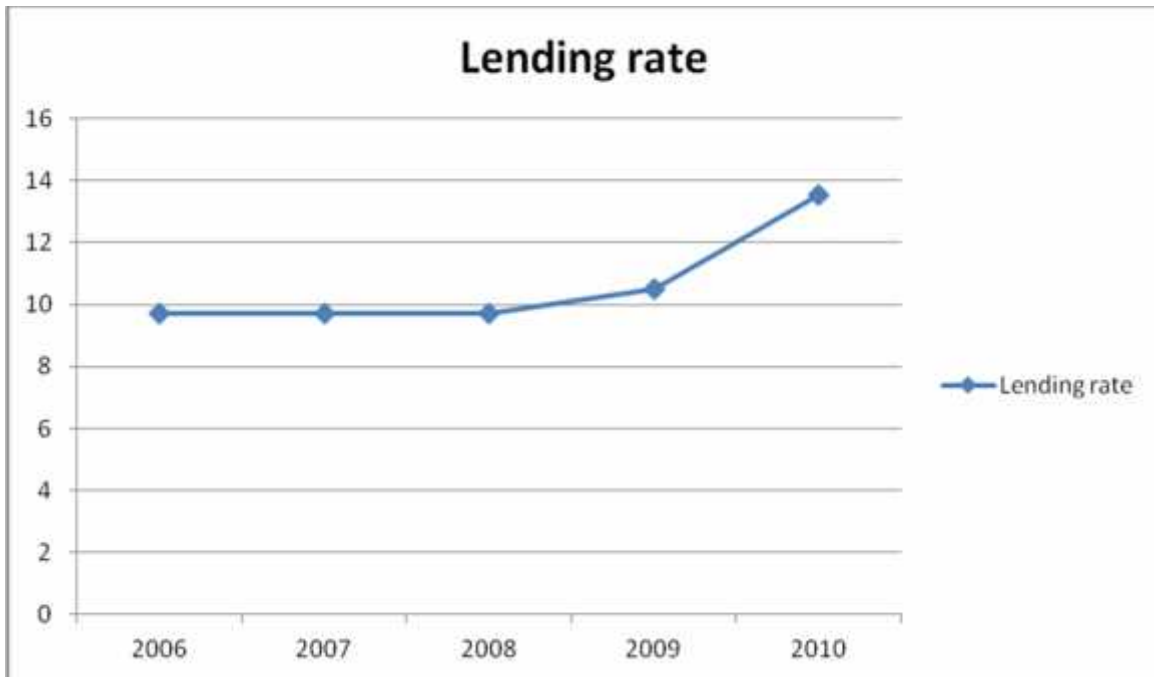
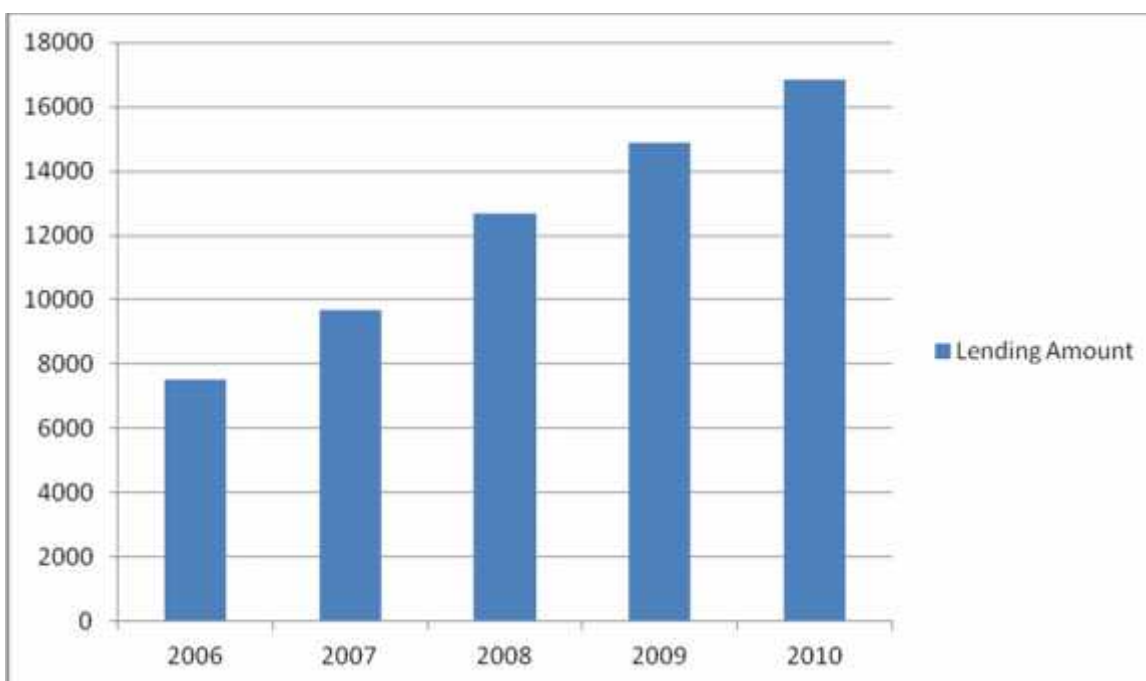


Figure 4.15 Lending Amount of BOK during different FYs



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

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

From table 4.9, the correlation coefficient between lending rate and lending amount (r_{12}) is 0.784553. This positive correlation indicates that there is positive relationship between lending interest rate and

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

4.4 Analysis of relation between Deposit Rate and Lending Rate

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

4.4.1 NABIL Bank Limited

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

Years	Deposit Rate	Lending Rate
2006	3.20	9.50
2007	2.78	8.62
2008	5.07	8.71
2009	5.20	10.41

2010	8.08	13.28
Correlation Coefficient (r_{12})	0.8725	
Coefficient of Determination (r_{12}^2)	0.76125	
t- statistics	t- cal = 3.19 t- tab = 3.182	Significant

(Note: Calculation is shown in appendix III)

Figure 4.16 Relationships between Deposit Rate and Lending Rate of NABIL

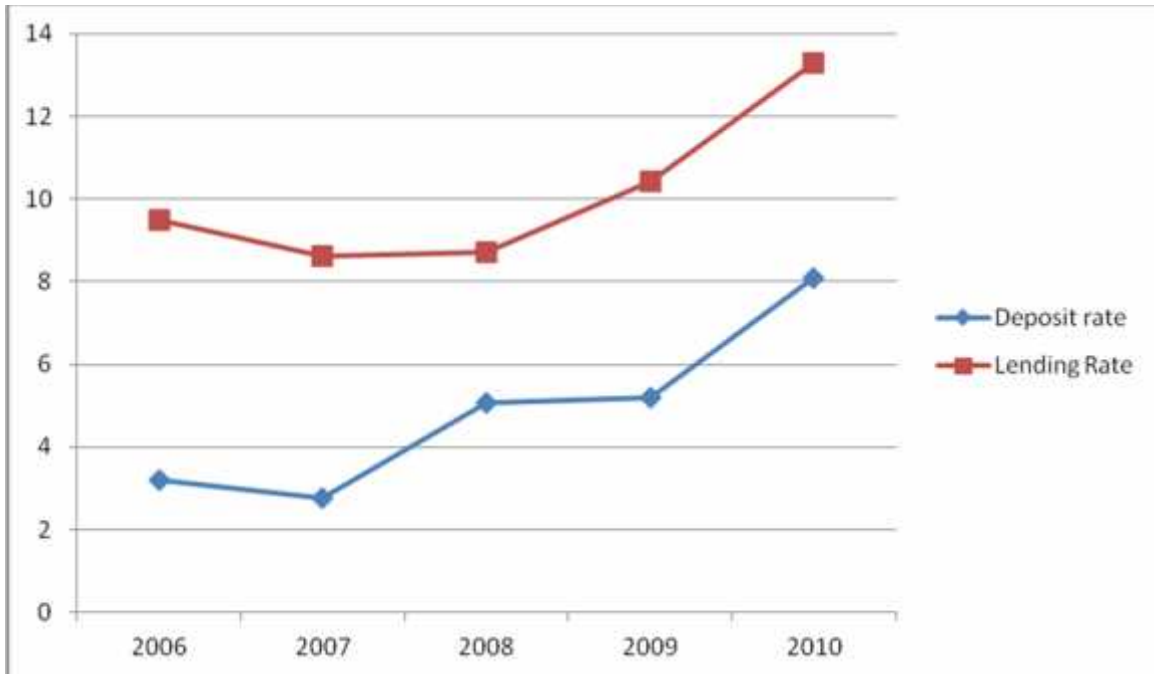


Table no. 4.10 shows the trend of interest rate on both deposit and lending of NABIL. The lending interest rate and deposit interest rate shows decreasing and then increasing trend during five fiscal years. The correlation coefficient between two variables (r_{12}) is 0.8725, the positive sign indicates that there is positive relationship between deposit interest rate and lending interest rate. The coefficient of determination (r_{12}^2) is 0.76125 which indicates that the variation in dependent variable is explained up to 76.12% by independent variable and remaining 23.88% is due to the effect of other variables in the economy. Similarly, the calculated t-value between the two variables is 3.19 which is more than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom ($t_{tab} = 3.182$). Hence, it is significant and null hypothesis (H_0) is rejected i.e. (H_1) is accepted which means there is positive relationship between deposit interest rate and lending interest rate of NABIL.

4.4.2 Nepal Investment Bank Ltd. (NIBL)

Table 4.11 Relationship between Interest Rate on Deposit and Lending of NIBL

Years	Deposit Rate	Lending Rate

2006	2.64	8.92
2007	2.64	9.04
2008	3.14	9.95
2009	3.14	9.11
2010	3.14	9.11
Correlation Coefficient (r_{12})	0.5448	
Coefficient of Determination (r_{12}^2)	0.2968	
t- statistics	t- cal = 1.12 t- tab = 3.182	Insignificant

(Note: Calculation is shown in appendix III)

Figure 4.17 Relationships between Interest Rate on Deposit and Lending of NIBL

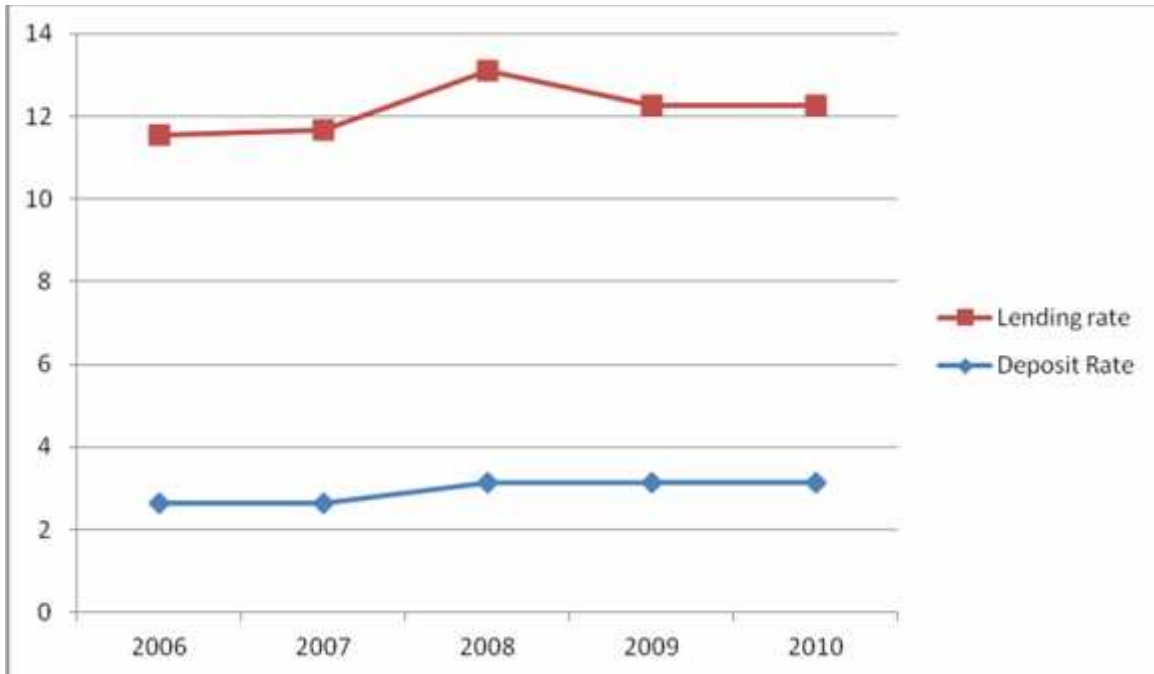


Table 4.11 shows the trend of interest rate on both deposit and lending of NIBL. The trend of deposit interest rate is fluctuation during five fiscal years and lending rate is in increasing trend. Lending rate steeply rises in the year of 2008 and remains constant up to fifth year. The deposit rate is decrease in the second year and increase in third year and then remains constant up to fifth year. The correlation coefficient between two variables (r_{12}) is 0.5448. The positive sign indicates that there is positive relationship between deposit interest rate and lending interest rate. Both the deposit interest rate and lending interest rate are in increasing trend. The coefficient of determination (r_{12}^2) is 0.2968 which indicates that the variation in dependent variable is explained by 29.68% by independent variable and remaining 70.32% is due to the effect of other variables in the economy. But, the calculated t-value between the two variables is 1.12 which is less than the tabulated t-value at 5% level of significance for two tails at (5-2) degree of freedom (t-tab = 3.182). Hence, it is insignificant and null hypothesis (H_0) is accepted which means there is a no relationship between deposit interest rate and lending interest rate of NIBL.

4.4.3 Bank of Kathmandu (BOK)

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

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

(Note: Calculation is shown in appendix III)

Figure 4.18 Relationships between Interest Rate on Deposit and Lending of BOK

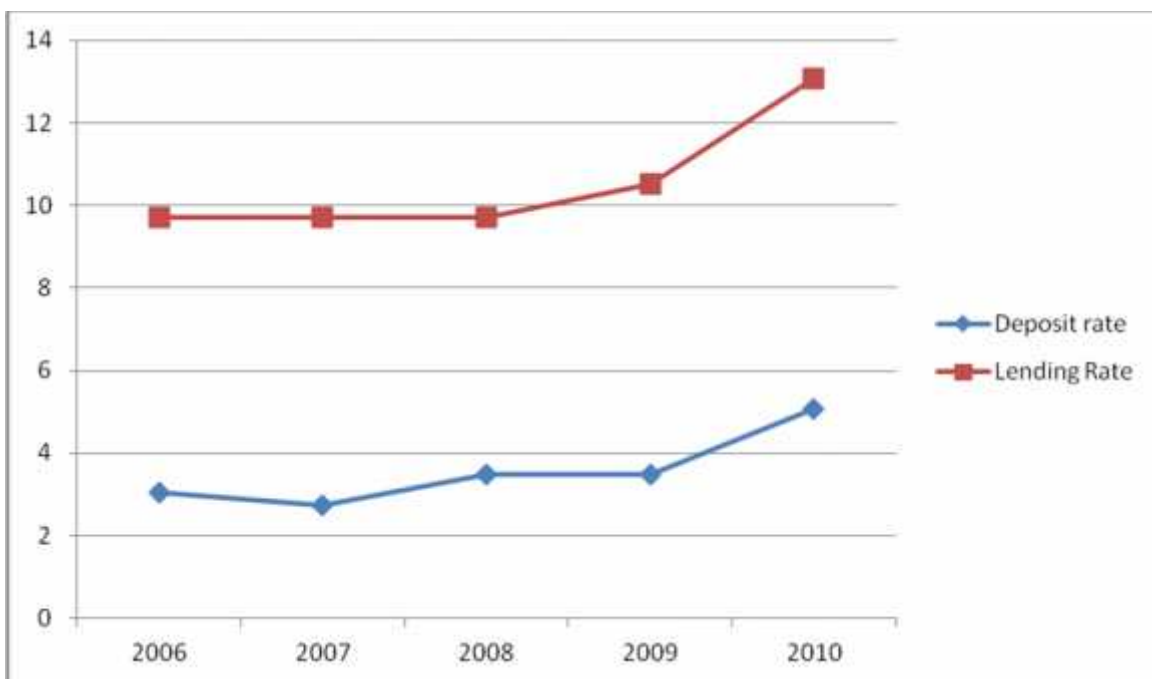


Table 4.11 shows the trend of interest rate on both deposit and lending of BOK. The interest rate on lending is in increasing trend during five fiscal years where as the interest rate on deposit is fluctuating every year decreasing in the second year, increasing again in the third year and remains constant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

2) degree of freedom ($t\text{-tab} = 3.182$). Hence, it is significant and null hypothesis (H_0) is rejected and Alternative hypothesis (H_1) is accepted which means there is a relationship between deposit interest rate and lending interest rate of BOK.

4.5 Major Findings

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

- ❖ The interest rate on both deposit and lending of all sample banks are found to be in fluctuating (generally constant in saving deposit and slightly increasing in fixed deposit) trend. But, on the contrary to this, deposit amount and lending amount is increasing every year.
- ❖ The saving deposit amount and saving interest rate have positive relationship of all sample banks (except BOK). The value of correlation coefficient between saving deposit rate and saving deposit amount of sample banks under study is found as 0.431192, 0, -0.810354 for NABIL, NIBL and BOK respectively. These values show that there is Positive relationship except BOK. That means if one variable increases, other variable Increase and vice versa but in case of BOK, eventhough there is slightly fall in saving interest but good amount of money is following in saving account. This case is against the theory of substitution effect.

From the analysis of coefficient of determination for deposit amount ranging from 0.18592 to 0.67059, it is found that the 18.59% to 67.66% of total variation in deposit amount of sample banks is explained by the deposit rate (independent variable) and remaining percentage are due to the effect of other factors in the economy. It shows that banks are getting money from other factors like size, goodwill etc.

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

- ❖ Analysis of fixed deposit amount and fixed interest rate shows positive relationship for NABIL, NIBL and BOK. The correlation coefficient is found as 0.9659, 0.515524, 0.436852, for NABIL, NIBL and BOK. According to correlation coefficient, there is substitution effect. This shows that the people depositing more money in fixed deposit are affected by yield rate on fixed deposit.

From the analysis of coefficient of determination for fixed deposit ranging from 0.436825 to 0.9330, it is found that the 43.68% to 93.30% of total variable in fixed deposit amount of sample banks is explained by the deposit rate (independent variable) and remaining percentage are due to the effect of other factors in the economy.

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

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

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

- ❖ The correlation coefficient between deposit rate and lending rate is 0.76125, 0.2968, and 0.911324 for NABIL, NIBL and BOK respectively. This indicates that there is positive relationship

between deposit rate and lending rate. So, the increase in one variable causes increase in another variable.

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

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

In this chapter, I am presenting the briefing of the whole study, which will be presented in three parts namely; summary, conclusion and recommendation. So this is the gist of the whole study in which I can obtain the study in a summarized form. When a study is completed, we should summarize and conclude in specific form, as revision of all parts of the study is presented in the summary. In this chapter, summary and conclusion made after analyzing and interpreting the necessary data regarding structure of interest rates and its impact on deposit and lending of selected commercial banks. Finally required steps that should be taken by commercial banks are presented as suggestions in the recommendation.

5.1 Summary

Economic development covers the development of all sectors of the Nation. In order to gear up development process, high and sustainable economic growth is necessary. Banking development helps to develop the whole sector of the country. Commercial banks are one of the vital aspects of this sector, which deals in the process of channelizing the available resources in the needed sectors. It is the intermediary between the deficit and surplus of financial resources. In order to mobilize the limited capital, the government of Nepal adopted the liberalization policy. As a result up to now 33 commercial banks (Sanima Bank...Recently upgraded), 78 development banks, 18 micro credit development banks, 79 financial companies, more than 5000 saving and co-operatives and 45 financial NGOs are established within the financial system of Nepal which is hoped to contribute for economic development by playing important role in the financial system of the country. Financial institution act as an intermediary between the individual who lend and who borrow. These institutions accept deposits and in turn lend it to people who are in need of financial resources. These institutions make the flow of fund easier. It pools the fund scattered in the economy and mobilizes them to the productive sector. As focus on the above explanation the study has covered on the study of interest rates regarding its impact on deposit and lending by five years data and mainly concerns the below issues:

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

Though there are various factors in the economy that affects the volume of deposit and lending, interest rate is one of the major factor that affect deposit and lending amount. With the major objective of showing relationship between deposit rate and deposit amount i.e. substitution effect, lending rate and lending amount, this study is undertaken. The study is conducted to identify whether some of the theories of finance and economics are applicable or not in the Nepalese financial markets. The major theories are substitution effect, fisher effect and inverse relationship between interest rate and lending amount. For this purpose, brief introduction about Nepalese economy, interest rate, sample organizations, statement of problem, and significance of the study, objectives of the study, research hypothesis and limitation of study are made in the first chapter of this dissertation.

In second chapter, theoretical review as well as review of previous research has been made. Different views about interest, function of interest, theories of interest, types of interest, factors affecting interest rate and so on are reviewed. Of the theories of interest, the main four theories - The Classical Theory, Liquidity Preference Theory, Loanable Fund Theory and Rational Expectation Theory are reviewed. Similarly, the factor affecting interest rate like credit or default risk, liquidity risk, marketability risk, call or prepayment risk, servicing cost, exchange rate risk, taxability are explained. Similarly, factors affecting the volume of credit like credit risk, rate of return, investment opportunity and so on are explained. Similarly, the term structure of interest rate are:- Pure Expectation Theory, The Liquidity Premium View of the Yield Curve, The Segmented-Markets or Hedging-Pressure Argument, Preferred Habitat Theory explains in this chapter.

Research design used is mainly analytical. Out of the total financial system 3 commercial banks are chosen for sample purpose. The study is mainly based on secondary data used for the

analysis. These all are made on third chapter. Secondary data are collected from NRB's economic reports and annual reports of related banks.

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

5.2 Conclusion

It is also found that lending interest rate of the productive sector loan such as commercial loan, industrial loan, trade credit, working capital loan were decreased or increase less in comparison to increase in the non productive sector loan. After presentation and data analysis of relevant data of sample commercial banks under study, using various analytical tools, some major findings of this study as evaluated and found in analysis are summarized as follows:-

1. According to the theory, there is positive relationship between deposits rate and deposit amount. But the analysis of substitution effect for both fixed and saving deposit shows that substitution effect do no exist for all sample banks. It may be due to the increase in liquidity position of people as well as commercial banks. As people have less investment opportunity, they put their money in banks and other financial institution rather than to hold. This may be due to the fact that, in the last five FYs, people accumulated most of their funds on saving and fixed accounts though they don't get appropriate interest on it. As well as banks are providing high interest on fixed deposit due to the crises of liquidity from last 3 years in banks. It may be just because of unavailability of other reliable place of investment, political instability and feeling of insecurity among people.

The depositors place interest rate's role as secondary in their decision for keeping deposit in the banks. Absence of better investment opportunities, expectation of inflationary pressures and the associated safety, liquidity and profitability, what ever are their respective roles, must have been the factors responsible for increase in volume of deposit despite downscaling introduced in interest rates during the review period. This might have produced negatives relationship between interest rates and deposits.

2. From the study, it is found that the interest rate of saving deposit is decreasing and remains constant whereas on other hand saving deposit amount is increasing in every fiscal year. Therefore, there is a positive relationship between deposit interest rate and deposit amount of all sample banks as proved by positive correlation coefficient of all banks except BOK.
3. In case of fixed deposit, all the sample banks have positive correlation coefficient between interest rate and deposit indicating positive relation between fixed deposit interest rate and deposit amount. But as per t-test the relation is significant in case of NABIL and insignificant in case of NIBL and BOK. Hence, there is no relation between fixed deposit interest rate and fixed deposit amount. Thus the decrease or increase in deposit is not due to change in interest rate but due to other factors. Therefore, it is concluded that for fixed deposit also, there is no substitution effect at all. Hence, in case of fixed deposit also, the conclusion is not in line with the theory. Fixed depositors are not motivated by interest rate but by the safety of investment, guarantee of return, easy liquidity offered by the banks. Interest rate is not the key factor in mobilizing fixed deposit.
4. According to theory, there is negative relationship between lending rate and lending amount. The study found that all the sample banks have positive relationship between lending rate and lending amount. But among them, NABIL has strong relationship as required by theory. The increment in loanable fund for NABIL is due to not increase in lending rate because of other factor as this relationship is proved statistically insignificant. As well as NIBL and BOK increase in lending amount is not due to the increase in lending rate but may be due to other factor, as it lowers t-calculated value than tabulated value for BOK and highest t- calculated value than tabulated value for NIBL which indicated insignificant relationship between variables under study. So it can be concluded that the lending interest rate is also an important factor for expansion or contraction of lending amount.

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

5.3 Recommendation

Base on the above conclusion following suggestions can be recommended to the related banks and concerned parties.

1. The financial institutions like Commercial banks are suggested to quote higher interest rate on deposit because it helps to generate more capital from depositors which are needed for the development of the country. It also helps general public to catch-up with the inflation. Money gets invested in unproductive sector like gold and real estate business due to low interest rate in bank. Hence, banks in Nepal had to face huge liquidity crisis in the recent past years due to the investment in unproductive sector as well as black money marketing. In consequence of which, we could see hopping rise in interest rate of banks for deposit collections.
 2. From the research, we found that spread rate is still high so commercial banks are suggested to lower down the rate which ultimately helps in the mobilization of fund.
 3. NRB has suggested in providing clear cut policies related to interest rates on both deposit and lending rate.
- ❖ Commercial banks are suggested to charge higher rate in unproductive sectors and lower rate in productive sectors. So that scarce deposit collected from public goes to productive sector which ultimately enhances GDP and productivity of the country and provides safety to the deposits as well as help to grow the financial and economical sectors. On the contrary if

deposit gets invested in unproductive sector, it does not generate any productive return and ultimately collapses rendering losses to banks and depositors as well. Productive sector implies trade, commerce, industry, hydropower, tourism and cultural sectors. Unproductive sector implies consumer loans, hire purchase loans, personal loans, pledge loans and those sectors which do not create wealth and do not add to GDP of the country.

- ❖ Commercial banks should emphasize on the repayment on loan and provide incentive to borrowers to encourage paying loan. Good repayment of loans is the strength of commercial banks.
- ❖ The financial institutions are suggested to include the inflation premium as far as possible while fixing the interest rates. If the inflation rate is not considered and real rate come out to be negative then depositors may withdraw their money and utilize it on non-productive sectors.
- ❖ Investment should be higher yield oriented. For this they have to invest their fund in sector with higher return as well as introduce competitive customer oriented schemes. It will increase the profit position of commercial banks.
- ❖ Commercial banks should formulate and implement a client oriented service policy while fixing deposit rates and lending rates. It helps the banks to face the cutthroat competition very boldly.
- ❖ Although the belief is that high interest rates tend to avoid capital flights to India and other third country, yet the actual fact is that increase in interest rate of government securities has compelled banks to raise interest rate on deposits and there by making lending to productive sectors costly. Thus, it is advisable to lower interest on government securities enjoying tax advantage so that there will be better effect on deposit and lending rates

BIBLIOGRAPHY

BOOKS:

- Bajracharya S.M, B.R, (2008,), *Corporate Financial Management*, Kathmandu: Buddha Academic Publishers and Distributors.
- Bajracharya, B.C, (2059B.S), *Business Statistics and Mathematics*, Kathmandu: M.K. Publishers and Distributors
- Bhandari, D. R, (2003A.D), *Banking and Insurance Principle and Practice*, Kathmandu: Aayush Publication
- Chaudhary A.K(2064B.S),*Statistical Method*,Khanal Books and stationary
- Clement, M.O and et al, (1967), *Theoretical Issues in International Economic*, London: Constable and Company Ltd.
- Dahal, B & Dahal, S. (Dec. 2002), *A hand book of Banking*, Kathmandu: Asmita Books and stationary.
- Goulb, S.S, (1994), *Effect of Exchange rate volatility on Trade*, IMF Washington D.C: IMF Staff paper, Vol.35
- Joshi, S, (2056), *Micro and Macro Economic Analysis*, Kathmandu: Taleju Pustak Bitarak.
- Kothari, C.R., (1994), *Research Methodology, Methods and Techniques*, New Delhi: Vikash Publication House Pvt. Ltd.
- Levi, M.D, (1996), *Macro economic*, New Delhi: Mc Graw-Hill India.Dwivedi, D N, (2006), *Marco Economics: Theory and Policy*, New Delhi: Tata McGraw-Hill Publishing Co. Ltd.
- Madura, (2007), *International Financial Management*, New Delhi: West Publishing Company India.
- Mustafi, C.K., (1998), *Operations Research Methods and Practice*, Third Editions, New Delhi: New Age International Ltd.
- Ojha, J.C (1965), '*Banking and Modern Currency in Nepal*', Kathmandu Education Enterprise, 2nd Ed. 1965
- Pandey, I.M, (1999), *Financial Management*, New Delhi: Vikash Publishing House (P) Ltd.
- Peter S. R, (1997), *Money and Capital Markets*, Chicago: Irwin McGraw-Hill Publishing Co. Ltd.

- Peter S. R (2003), *Money and Capital Markets*, Chicago: Irwin McGraw-Hill Publishing Co. Ltd.
- S. Kerry C& D. R. F (1986), *The Financial Marketplace*, Lakewood: Addison-Wesley Publishing Co. Ltd.
- Shapiro, S.C, (1999), *Multinational Financial Management*, New York: John Wiley and Sons Inc.
- Shrestha, M. K. and Bhandari, D.B., (2007), *Financial Markets and Institutions*, Kathmandu: Asmita Books Publishers and Distributors Pvt. Ltd.
- Sigdel S and others, (2065), *Financial Institutions and Markets*, Kathmandu: Ashish Books and Stationary.
- Staphit A .B, Gautam.H, Joshi P. R, Dangol P. M, (2007), *Statistical Methods*, Kathmandu: Buddha Academic Publishers and Distributors
- Thapa, K, (2065), *Financial Institutions and Markets*, Kathmandu: Asmita Books Publishers and Distributors Pvt. Ltd.
- Wolff H. K. and Pant P.R., (2002), *Social Science Research and Thesis Writing*, Kathmandu: Buddha Academic Publishers and Distributors Pvt. Ltd.

DISSERATIONS:

- Bhatta, S, (2004), *Interest Rate and its effect on Deposit and Lending*, and unpublished MBS thesis submitted to Tribhuvan University, Kathmandu.
- Kshetry, K .K, (1980), *Interest Rate Structure and Its Relation with Deposits*, Inflation and Credit in Nepal, an unpolished M.A. thesis submitted to Tribhuvan University, Kathmandu.
- Parajuli, S, (2005), *Interest Rate and Its Relation with Deposit, Lending and Inflation in Nepal*, an unpolished MBS thesis submitted to Tribhuvan University, Kathmandu
- Rajbhandary, N. B., (1978) *Interest Rate Structure of Commercial Banks in Nepal*, an unpolished MBS thesis submitted to Tribhuvan University, Kathmandu

ANNUAL REPORTS:

Annual Reports of NABIL, NIBL and BOK (Sample Banks).

Nepal Rastra Bank- *Banking and Financial Statistic* - July 2006, 2007, 2008, 2009 and 2010.

Nepal Rastra Bank- *Economic Report 2006, 2007, 2008, 2009 and 2010.*

APPENDIX

APPENDIX - I

4.1 Calculation of Mean and Standard Deviation of NABIL Bank.

Whole Mean \bar{X}	$\sum fX$	$\sum fX^2$
3.20	-1.66	2.7556
2.78	-2.08	4.3264
5.07	0.21	0.0441
5.20	0.34	0.1156
8.08	3.47	12.0409
$\bar{X} = 24.33$		$\sum fX^2 = 19.2826$

Where,

Fixed Deposit Mean = Total Fixed Deposit / n

Whole Mean (\bar{X}) = Total Deposit / n

$$\text{Mean } (\bar{X}) = \frac{\sum fX}{n} = \frac{24.33}{5} = 4.86\%$$

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

$$\text{Standard Deviation } (s) = \sqrt{\frac{\sum fX^2}{n} - (\bar{X})^2} = \sqrt{19.2826/5 - (4.86)^2} = 1.963\%$$

Standard Deviation of interest rate on deposit of NABIL Bank is found to be 1.963%.

4.2 Calculation of Correlation Coefficient, Coefficient of Determination and t- S Statistics of NABIL Bank.

For Saving Deposit:

Years	Rate (x_1)	Deposit(x_2)	$\sum fX_1$	$\sum fX_2$	$\sum fX_1^2$	$\sum fX_2^2$	$\sum fX_1X_2$
2006	2.00	8770.80	-0.2	-3133.634	626.7268	0.04	9819662.046
2007	2.00	10187.40	-0.2	-1717.034	343.4068	0.04	2948205.757
2008	2.00	12159.97	-0.2	255.536	-51.1072	0.04	-65298.6473
2009	2.00	14620.40	-0.2	2715.966	-543.1932	0.04	-7376471.31
2010	3.00	13783.60	0.8	1879.166	1503.332	0.64	3531264.85
	$\bar{X}_1 =$ 11	$\bar{X}_2 =$ 59522.17			= 1879.166	= 0.8	= 23740902.6

$$\text{Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{11}{5} = 2.2 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{59522.17}{5} = 11904.434\%$$

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

$$= \frac{f_{X_1 Z \bar{X}_1} f_{X_2 Z \bar{X}_2}}{\sqrt{f_{X_1 Z \bar{X}_1}} \sqrt{f_{X_2 Z \bar{X}_2}}} = \frac{1879.166}{\sqrt{0.8} \sqrt{237409.62}} = 0.431192$$

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

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

$$\text{t- Statistics } (t) = r \frac{\sqrt{n Z_2}}{\sqrt{1 - r^2}} = 0.4311929 \frac{\sqrt{5 Z_2}}{\sqrt{1 - 0.1859273}} = 0.827752$$

For Fixed Deposit:

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1 Z \bar{X}_1}$	$f_{X_1 Z \bar{X}_1}$	$f_{X_2 Z \bar{X}_2}$	$f_{X_2 Z \bar{X}_2}$	$f_{X_1 Z \bar{X}_1}$ $f_{X_2 Z \bar{X}_2}$
2006	3.20	3450.20	-1.66	2.7556	-5024.052	25241098.50	8339.92632
2007	2.78	5435.20	-2.08	4.3264	-3039.052	9235837.06	6321.22816
2008	5.07	8464.09	-0.064	0.00496	-10.162	103.26624	0.650368
2009	5.20	8310.70	0.21	0.00441	-163.552	26749.2567	-34.34592
2010	8.08	14711.07	3.22	10.370	6236.818	388897898.77	20082.55
	X_1 =24.33	X_2 =42371.26		= 17.467		=73401686.85	= 34710.00893

$$\text{Again, Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{24.33}{5} = 4.86 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{42371.26}{5} = 8474.252$$

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

$$= \frac{\frac{\sum f_{X_1} Z_{X_1} \sum f_{X_2} Z_{X_2}}{\sqrt{\sum f_{X_1} Z_{X_1}^2} \sqrt{\sum f_{X_2} Z_{X_2}^2}}}{\frac{34710.00893}{\sqrt{17.467} \sqrt{73401686.85}}} = 0.9693$$

Hence, Correlation coefficient between fixed interest rate and fixed deposit amount of Nabil bank is found to be 0.9693.

$$\text{Coefficient of Determination } (r_{45})^2 = 0.9395$$

$$\text{t- Statistics } (t) = 0.9693 \frac{\sqrt{5 Z^2}}{\sqrt{1 - 0.9395}} = 17.75$$

4.3 Calculation of Mean and Standard Deviation of NIBL.

Whole Mean fX^A	$fX Z \bar{X}^A$	$fX Z \bar{X}^A$
2.64	-0.30	0.09
2.64	-0.30	0.09
3.14	0.20	0.04
3.14	0.20	0.04
3.14	0.20	0.04
$X = 14.70$		$fX Z \bar{X}^A = 0.3$

Where,

Fixed Deposit Mean = Total Fixed Deposit / n

Whole Mean (X) = Total Deposit / n

$$\text{Mean } (\bar{X}) = \frac{X}{n} = \frac{14.70}{5} = 2.94 \%$$

The average interest rate on deposit of NIBL is 2.94 %.

$$\text{Standard Deviation } (s) = \sqrt{\frac{\sum fX Z \bar{X}^A}{n}} = \sqrt{\frac{0.3}{5}} = 0.2550\%$$

Standard Deviation of interest rate on deposit of NIBL is found to be 0.25011%.

4.4 Calculation of Correlation Coefficient, Coefficient of Determination and t-Statistics of NIBL.

For Saving Deposit:

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1} Z_{\bar{X}_1} A$	$f_{X_1} Z_{\bar{X}_1} A$	$f_{X_2} Z_{\bar{X}_2} A$	$f_{X_2} Z_{\bar{X}_2} A$	$f_{X_1} Z_{\bar{X}_1} A$ $f_{X_2} Z_{\bar{X}_2} A$
2006	2.50	10642.20	0	0	-1237.608	1531673.562	0
2007	2.50	10742.20	0	0	-1137.608	1294151.962	0
2008	2.50	13688.80	0	0	1808.992	3272452.056	0
2009	2.50	10542.20	0	0	-1337.608	1789195.162	0
2010	2.50	13783.64	0	0	1903.832	3624576.284	0
	X_1 =12.50	X_2 =59399.04		= 0.05		= 11512049.03	= 0

$$\text{Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{12.50}{5} = 2.5 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{59399.04}{5} = 11879.808$$

$$\text{Karl Person's Correlation Coefficient } (r_{23}) = \frac{f_{X_1} Z_{\bar{X}_1} A f_{X_2} Z_{\bar{X}_2} A}{\sqrt{f_{X_1} Z_{\bar{X}_1} A} \sqrt{f_{X_2} Z_{\bar{X}_2} A}}$$

$$\frac{0}{\sqrt{0.05} \sqrt{40967067.75}} = 0$$

Therefore Correlation coefficient between saving interest rate and saving deposit amount of NIBL is found to be 0.

$$\text{Coefficient of Determination } (r_{23})^2 = 0$$

$$\text{t- Statistics } (t) = r \frac{\sqrt{n Z^2}}{\sqrt{1 - r^2}} = 0$$

For Fixed Deposit:

Years	Rate (x ₁)	Deposit (x ₂)	$f_{X_1} Z_{\bar{X}_1}$	$f_{X_1} Z_{\bar{X}_1}^2$	$f_{X_2} Z_{\bar{X}_2}$	$f_{X_2} Z_{\bar{X}_2}^2$	$\frac{f_{X_1} Z_{\bar{X}_1} f_{X_2} Z_{\bar{X}_2}}{f_{X_1} Z_{\bar{X}_1}^2 f_{X_2} Z_{\bar{X}_2}^2}$
2006	2.67	7510.80	-0.348	0.121104	-1329.15	1766639.723	462.5442
2007	2.67	7516.80	-0.348	0.121104	-1323.15	1750725.923	460.4562
2008	3.25	7944.20	0.232	0.053824	-895.75	802368.0625	-207.814
2009	3.25	6516.90	0.232	0.053824	-2323.05	5396561.03	-538.9476
2010	3.25	14711.07	0.232	0.053824	5871.12	34470050.05	1362.09984
	\bar{X}_1 =15.09	\bar{X}_2 =44199.77		= 0.40368		= 44186344.80	= 3031.862

Again, Mean (\bar{X}_1) $X = \frac{X_1}{n} = \frac{15.09}{5} = 3.018 \%$

Mean (\bar{X}_2) $X = \frac{X_2}{n} = \frac{44199.77}{5} = 8839.950$

Karl Person's Correlation Coefficient (r₄₅) =
$$\frac{f_{X_1} Z_{\bar{X}_1} f_{X_2} Z_{\bar{X}_2}}{\sqrt{f_{X_1} Z_{\bar{X}_1}^2} \sqrt{f_{X_2} Z_{\bar{X}_2}^2}}$$

$\frac{3031.862}{\sqrt{0.40368} \sqrt{44186344.80}} = 0.718$

Therefore Correlation coefficient between fixed interest rate and fixed deposit amount of NIBL is found to be 0.718.

Coefficient of Determination (r₄₅)² = 0.515524

t- Statistics (t) = 0.718 $\frac{\sqrt{5} Z_2}{\sqrt{1 - 0.515524}} = 1.7867$

4.5 Calculation of Mean and Standard Deviation of BOK.

Whole Mean f_{X_1}	$f_{X_1} Z_{\bar{X}_1}$	$f_{X_1} Z_{\bar{X}_1}^2$
3.05	-0.5	0.25
2.72	-0.83	0.6889
3.469	-0.081	0.006561
3.469	-0.081	0.006561
3.469	-0.081	0.006561

$X = 17.778$		$fX Z \bar{X} \dot{A} = 03.262422$
--------------	--	------------------------------------

Where,

Fixed Deposit Mean = Total Fixed Deposit / n

Whole Mean (X) = Total Deposit / n

$$\text{Mean } (\bar{X}) X = \frac{X}{n} = \frac{17.778}{5} = 3.55 \%$$

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

$$\text{Standard Deviation } (\sigma) = \sqrt{fX Z \bar{X} \dot{A} / n} = \sqrt{3.262422/5} = 0.8077650$$

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

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

For Saving Deposit:

Years	Rate (x ₁)	Deposit(x ₂)	$fX_1 Z \bar{X}_1 \dot{A}$	$fX_1 Z \bar{X}_1 \dot{A}$	$fX_2 Z \bar{X}_2 \dot{A}$	$fX_2 Z \bar{X}_2 \dot{A}$	$fX_1 Z \bar{X}_1 \dot{A}$ $fX_2 Z \bar{X}_2 \dot{A}$
2006	2.50	4582.00	0.2	0.04	-1555.5	2419580.25	-311.1
2007	2.25	5526.80	-0.05	0.0025	-610.7	372954.49	30.535
2008	2.25	6595.20	-0.05	0.0025	457.7	209489.29	-22.885
2009	2.25	7260.30	-0.05	0.0025	1122.8	1260679.84	-56.14
2010	2.25	6723.20	-0.05	0.0025	586	343396	-29.3
	X_1 =11.5	X_2 =30687.5		= 0.05		= 4606099.87	= - 388.89

$$\text{Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{11.5}{5} = 2.3 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{30687.5}{5} = 6137.5\%$$

$$\text{Karl Person's Correlation Coefficient } (r_{23}) = \frac{fX_1 Z \bar{X}_1 \dot{A} fX_2 Z \bar{X}_2 \dot{A}}{\sqrt{fX_1 Z \bar{X}_1 \dot{A}} \sqrt{fX_2 Z \bar{X}_2 \dot{A}}}$$

$$\frac{Z388.89}{\sqrt{0.05}\sqrt{4606099.87}} \quad -0.810354$$

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

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

$$\mathbf{t\text{- Statistics}} (t) = r \frac{\sqrt{n Z2}}{\sqrt{1 Zr^2}} \quad -0.810354 \frac{\sqrt{5 Z2}}{\sqrt{1 Z0.656673}} \quad -2.3954$$

For Fixed Deposit:

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1} Z \bar{X}_1 \hat{A}$	$f_{X_1} Z \bar{X}_1 \hat{A}$	$f_{X_2} Z \bar{X}_2 \hat{A}$	$f_{X_2} Z \bar{X}_2 \hat{A}$	$f_{X_1} Z \bar{X}_1 \hat{A}$ $f_{X_2} Z \bar{X}_2 \hat{A}$
2006	3.13	2709.80	-0.604	0.364816	-1351.86	1827525.46	816.52344
2007	2.79	3037.20	-0.944	0.891136	-1024.46	1049518.292	967.09024
2008	3.64	3703.10	-0.094	0.008836	-358.56	128565.2736	33.70464
2009	3.64	4474.60	-0.094	0.008836	412.94	170519.4436	-38.81636
2010	3.64	6383.60	1.736	3.013696	2321.94	5391405.364	4030.88784
	X_1 =18.67	X_2 =20308.3		= 4.28732		= 18013203.83	= 5809.3898

$$\text{Again, Mean } (\bar{X}_1) X \frac{X_1}{n} \quad \frac{18.67}{5} \quad 3.734 \%$$

$$\text{Mean } (\bar{X}_2) X \frac{X_2}{n} \quad \frac{20308.3}{5}$$

$$= 4061.66 \%$$

$$\mathbf{Karl Person's Correlation Coefficient} (r_{45}) = \frac{f_{X_1} Z \bar{X}_1 \hat{A} f_{X_2} Z \bar{X}_2 \hat{A}}{\sqrt{f_{X_1} Z \bar{X}_1 \hat{A}} \sqrt{f_{X_2} Z \bar{X}_2 \hat{A}}}$$

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

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

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

$$\mathbf{t\text{-Statistics}} (t) = 0.990260 \frac{\sqrt{5 Z^2}}{\sqrt{1 Z 0.436850}} \quad 1.5255$$

APPENDIX – II

4.7 Calculation of Correlation Coefficient, Coefficient of Determination t- Statistics and Standard Deviation of Nabil Bank(Lending).

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1} Z_{\bar{X}_1} \Delta$	$f_{X_1} Z_{\bar{X}_1} \Delta$	$f_{X_2} Z_{\bar{X}_2} \Delta$	$f_{X_2} Z_{\bar{X}_2} \Delta$	$\frac{f_{X_1} Z_{\bar{X}_1} \Delta}{f_{X_2} Z_{\bar{X}_2} \Delta}$
2006	9.5	13021.00	-0.604	0.364816	-9161.424	83931689.71	5533.500
2007	8.62	15657.10	-1.484	2.202256	-6525.324	42579853.3	9683.5808
2008	8.71	21514.63	-1.394	1.943236	-667.794	445948.8264	930.904836
2009	10.41	27816.56	0.306	0.093636	5634.136	31743488.47	1724.0456
2010	13.28	32902.83	3.176	10.086976	10720.406	114927104.8	34048.0094
	X_1 =50.52	X_2 =110912.12		= 14.69092		= 273628085.1	= 51920.04064

Where,

Average lending rate = Total lending rate / n

$$\text{Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{50.52}{5} = 10.104 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{110912.12}{5} = 22182.424\%$$

$$\text{Karl Person's Correlation Coefficient } (r_{12}) = \frac{\frac{f_{X_1} Z_{\bar{X}_1} \Delta \cdot f_{X_2} Z_{\bar{X}_2} \Delta}{\sqrt{f_{X_1} Z_{\bar{X}_1} \Delta} \sqrt{f_{X_2} Z_{\bar{X}_2} \Delta}}}{\frac{51920.04064}{\sqrt{14.69092} \sqrt{273628085.1}}} = 0.8188984$$

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

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

$$\text{t- Statistics } (t) = r \frac{\sqrt{n Z_2}}{\sqrt{1 Z r^2}} = 0.8188984 \frac{\sqrt{5 Z_2}}{\sqrt{1 Z 0.670595}} = 2.47129$$

$$\text{Standard Deviation } (\sigma) = \sqrt{f_{X_1} Z_{\bar{X}_1} \Delta / n}$$

$$= \text{i.e.}, \sqrt{\frac{\sum f_{X_1} Z_{X_1}^2}{n}} = \sqrt{14.69092/5} = 1.714113\%$$

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

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1} Z_{X_1}$	$f_{X_1} Z_{X_1}^2$	$f_{X_2} Z_{X_2}$	$f_{X_2} Z_{X_2}^2$	$\frac{f_{X_1} Z_{X_1}}{f_{X_2} Z_{X_2}}$
2006	8.92	16577.70	-0.3	0.09	-5740.12	32948977.61	1722.036
2007	9.04	17482.00	-0.18	0.0324	-4835.82	23385155.07	870.4476
2008	9.95	27145.50	0.73	0.5329	4827.68	23306494.18	3524.2064
2009	9.11	17481.10	-0.11	0.0121	-4836.72	23393860.36	532.0392
2010	9.11	32902.80	-0.11	0.0121	10584.98	112041801.6	-1164.3478
	\bar{X}_1 =46.13	\bar{X}_2 =111589.10		= 0.6795		= 215076288.8	= 5484.3822

Average lending rate = Total lending rate / n

$$\text{Mean } (\bar{X}_1) = \frac{\sum X_1}{n} = \frac{46.13}{5} = 9.22 \%$$

$$\text{Mean } (\bar{X}_2) = \frac{\sum X_2}{n} = \frac{111589.10}{5} = 22317.82$$

$$\text{Standard Deviation } (s) = \sqrt{\frac{\sum f_{X_1} Z_{X_1}^2}{n}}$$

$$= \text{i.e.}, \sqrt{\frac{\sum f_{X_1} Z_{X_1}^2}{n}} = \sqrt{0.6795/5} = 0.136$$

$$\text{Karl Person's Correlation Coefficient } (r_{12}) = \frac{\sum f_{X_1} Z_{X_1} f_{X_2} Z_{X_2}}{\sqrt{\sum f_{X_1} Z_{X_1}^2} \sqrt{\sum f_{X_2} Z_{X_2}^2}}$$

$$= \frac{5484.3822}{\sqrt{0.6795} \sqrt{215076288.8}} = 0.4536$$

Therefore Correlation coefficient between lending rate and loan (lending) amount of NIBL is found to be 0.4536.

$$\text{Coefficient of Determination } (r_{23})^2 = 0.20575$$

$$\text{t- Statistics (t)} = r \frac{\sqrt{n Z_2}}{\sqrt{1 Z r^2}} = 0.4536 \frac{\sqrt{5 Z_2}}{\sqrt{1 Z 0.20575}} = 0.8815$$

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

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1} Z \bar{X}_1 A$	$f_{X_1} Z \bar{X}_1 A$	$f_{X_2} Z \bar{X}_2 A$	$f_{X_2} Z \bar{X}_2 A$	$f_{X_1} Z \bar{X}_1 A$ $f_{X_2} Z \bar{X}_2 A$
2006	9.71	7525.00	-0.832	0.692224	-4799.66	23036736.12	3993.31712
2007	9.71	9663.60	-0.832	0.692224	-2661.06	7081240.324	2214.00192
2008	9.71	12692.90	-0.832	0.692224	368.24	135600.6976	-306.37568
2009	10.52	14894.70	-0.022	0.000484	2570.04	6605105.602	-56.54088
2010	13.06	16847.10	2.518	6.340324	4522.44	20452463.55	11387.50392
	X_1 =52.71	X_2 =61623.3		= 8.41748		= 57311146.29	= 17231.9064

Average lending rate = Total lending rate / n

$$\text{Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{52.71}{5} = 10.542 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{61623.3}{5} = 12324.66\%$$

$$\text{Karl Person's Correlation Coefficient } (r_{12}) = \frac{f_{X_1} Z \bar{X}_1 A f_{X_2} Z \bar{X}_2 A}{\sqrt{f_{X_1} Z \bar{X}_1 A} \sqrt{f_{X_2} Z \bar{X}_2 A}} = \frac{17231.9064}{\sqrt{841748} \sqrt{57311146.29}} = 0.7845539$$

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

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

$$\text{t- Statistics (t)} = r \frac{\sqrt{n Z_2}}{\sqrt{1 Z r^2}} = 0.784553 \frac{\sqrt{5 Z_2}}{\sqrt{1 Z 0.615524}} = 2.1915$$

$$\text{Standard Deviation } (\dagger) = \sqrt{f_X Z \bar{X} A / n}$$

$$= \text{i.e., } \sqrt{\frac{\sum f_{X_1 Z_{X_1}}}{n}} = \sqrt{8.41748/5} = 1.29749 \%$$

APPENDIX – III

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

Years	Rate (x ₁)	Deposit(x ₂)	$\frac{f_{X_1 Z_{X_1}}}{\sum f_{X_1 Z_{X_1}}}$	$\frac{f_{X_1 Z_{X_1}}}{\sum f_{X_1 Z_{X_1}}}$	$\frac{f_{X_2 Z_{X_2}}}{\sum f_{X_2 Z_{X_2}}}$	$\frac{f_{X_2 Z_{X_2}}}{\sum f_{X_2 Z_{X_2}}}$	$\frac{f_{X_1 Z_{X_1}}}{\sum f_{X_2 Z_{X_2}}}$
2006	3.20	9.5	-1.66	2.72916	-0.604	0.364816	1.00264
2007	2.78	8.62	-2.08	4.5864	-1.484	2.202256	3.08672
2008	5.07	8.71	0.21	0.0441	-1.394	1.943236	-0.29274
2009	5.20	10.41	0.34	0.1156	0.306	0.093636	0.10404
2010	8.08	13.28	3.22	10.3684	3.176	10.086976	10.22672
	\bar{X}_1 =24.33	\bar{X}_2 =50.52		= 17.84436		= 14.69092	= 14.12738

$$\text{Mean } (\bar{X}_1) = \frac{\sum X_1}{n} = \frac{24.33}{5} = 4.86 \%$$

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

$$= 10.104\%$$

$$\text{Karl Person's Correlation Coefficient } (r_{12}) = \frac{\sum \frac{f_{X_1 Z_{X_1}}}{\sum f_{X_1 Z_{X_1}}} \frac{f_{X_2 Z_{X_2}}}{\sum f_{X_2 Z_{X_2}}}}{\sqrt{\frac{\sum f_{X_1 Z_{X_1}}}{\sum f_{X_1 Z_{X_1}}} \frac{\sum f_{X_2 Z_{X_2}}}{\sum f_{X_2 Z_{X_2}}}}}$$

$$\frac{14.12738}{\sqrt{17.84436} \sqrt{14.69092}} = 0.8725$$

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

$$\text{Coefficient of Determination } (r_{23})^2 = 0.76125$$

$$\mathbf{t\text{-Statistics}} (t) = r \frac{\sqrt{n Z_2}}{\sqrt{1 Z r^2}} = 0.8725 \frac{\sqrt{5 Z_2}}{\sqrt{1 Z 0.76125}} = 3.19$$

4.11 Calculation of Correlation Coefficient, Coefficient of Determination t- Statistics of NIBL.

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1 Z \bar{X}_1 A}$	$f_{X_1 Z \bar{X}_1 A}$	$f_{X_2 Z \bar{X}_2 A}$	$f_{X_2 Z \bar{X}_2 A}$	$\frac{f_{X_1 Z \bar{X}_1 A} f_{X_2 Z \bar{X}_2 A}}{f_{X_1 Z \bar{X}_1 A} f_{X_2 Z \bar{X}_2 A}}$
2006	2.64	8.92	-0.3	0.09	-0.3	0.09	0.09
2007	2.64	9.04	-0.3	0.09	-0.18	0.0324	0.054
2008	3.14	9.95	0.20	0.04	0.73	0.5329	0.146
2009	3.14	9.11	0.20	0.04	-0.11	0.0121	-0.022
2010	3.14	9.11	0.20	0.04	-0.11	0.0121	-0.022
	X_1 =14.70	X_2 =46.13		= 0.30		= 0.6795	= 0.246

$$\text{Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{14.70}{5} = 2.94 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{46.13}{5} = 9.22\%$$

$$\mathbf{Karl\ Person's\ Correlation\ Coefficient} (r_{12}) = \frac{f_{X_1 Z \bar{X}_1 A} f_{X_2 Z \bar{X}_2 A}}{\sqrt{f_{X_1 Z \bar{X}_1 A}} \sqrt{f_{X_2 Z \bar{X}_2 A}}} = \frac{0.246}{\sqrt{0.30} \sqrt{0.6795}} = 0.5448$$

Therefore Correlation coefficient between deposit rate and lending rate of NIBL is found to be 0.688258.

$$\mathbf{Coefficient\ of\ Determination} (r_{23})^2 = 0.2968$$

$$\mathbf{t\text{-Statistics}} (t) = r \frac{\sqrt{n Z_2}}{\sqrt{1 Z r^2}} = 0.5448 \frac{\sqrt{5 Z_2}}{\sqrt{1 Z 0.2968}} = 1.12$$

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

Years	Rate (x ₁)	Deposit(x ₂)	$f_{X_1 Z \bar{X}_1 A}$	$f_{X_1 Z \bar{X}_1 A}$	$f_{X_2 Z \bar{X}_2 A}$	$f_{X_2 Z \bar{X}_2 A}$	$\frac{f_{X_1 Z \bar{X}_1 A}}{f_{X_2 Z \bar{X}_2 A}}$
2006	3.05	9.71	-0.506	0.256036	-0.832	0.692224	0.420992
2007	2.72	9.71	-0.836	0.698896	-0.832	0.692224	0.695552
2008	3.47	9.71	-0.086	0.007396	-0.832	0.692224	0.071552
2009	3.47	10.52	-0.086	0.007396	-0.022	0.000484	0.001892
2010	5.07	13.06	1.514	2.292196	2.518	6.340324	3.812252
	X_1 =17.78	X_2 =52.71		= 3.26192		= 8.41748	= 5.00224

$$\text{Mean } (\bar{X}_1) X = \frac{X_1}{n} = \frac{17.78}{5} = 3.556 \%$$

$$\text{Mean } (\bar{X}_2) X = \frac{X_2}{n} = \frac{52.71}{5} = 10.542 \%$$

$$\mathbf{Karl\ Person's\ Correlation\ Coefficient} (r_{12}) = \frac{f_{X_1 Z \bar{X}_1 A} f_{X_2 Z \bar{X}_2 A}}{\sqrt{f_{X_1 Z \bar{X}_1 A}} \sqrt{f_{X_2 Z \bar{X}_2 A}}} = \frac{5.00224}{\sqrt{3.26192} \sqrt{8.41748}} = 0.954633$$

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

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

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