

CHAPTER - I

INTRODUCTION

1.1 Background of the Study

The level of development of any country is reflected by the development of financial sector of that country. Therefore, development of financial sector reflects the whole economy of the country. The financial sector is a vast field, which comprises of banks, co-operatives, insurance companies, financial companies, stock exchange, foreign exchange market, mutual funds etc. These institutions facilitate and improve the distribution of funds, money, and capital by providing services like payment mechanism, security trading, transmutations, risk diversification and portfolio management. Further, these institution mobilize saving and make investment in different types of enterprises of the national economy that consequently help in reducing poverty, raising employment opportunities and thereby developing the society and country as a whole. Removal of financial institution from a modern economy is beyond imagination in the current context. Without them the economy will be drag behind to the period of barter system, where no intermediary, no financial assets, no liability of any kind and hence, no financial institution existed. Even in the least developed economies some forms of transfer of financial resources occur, an economy without financial liabilities there would be no means whereby the ultimate savers could be matched with ultimate investors.

The Wave of rising expectation and ambition of people in the present context of society, realized the need for socio-economic development in the nation building process. The government felt to impart a dynamic role and charge the public sector with greater responsibility in fulfilling national goals and objectives. With this realization the government mushroomed into a number of establishments like agriculture, industry, commerce, public works, transport, and other sectors. In this circumstance, banking was seen as major industry to uplift the economic conditions of public, and country and the world as well. Therefore the government was forced to adopt a liberal economic policy regarding operation of banks. About the financial liberalization process it and said that "the interest rate deregulation curtailment or elimination of directed credits, lifting entry

and exit barriers for financial intermediaries, restructuring of banking system and institution for regulatory and supervisory mechanism is some of the key components of such liberalization". This led to the influx of commercial banks in Nepal.

In spite of these services, economists have expressed diverse opinions on the effectiveness of financial institutions in promoting or facilitating economic development. One group led by J. Schumer among those who studied the relation between the growth of financial institution and economic development regarded financial institution as one of the two key agents, the other being entrepreneurship. Another group led by John G. Gurley did not consider it as highly essential to the growth process. In between these two, lies the opinion of some others like Rondo Camron who says the true importance of financial institutions lies somewhere between these two extremes. These opinions do differ in the order of merit to the role of financial institution in the process of economic development but they never ignored its significance.

Financial institution occupies an important place in a nation's economy. A financial institution is indispensable in a modern society. It plays a pivotal role in the economy development of a country and forms the core of the money market in an advance country. It has played an immensely valuable role in the economic life of every country big or small. The special interest of economist in the activities of financial institution is due to the monetary nature of the deposit liabilities of the institution.

To sum up, bank is a formal financial institution, which receives money, which is pays back by honoring cheque. The main objective of financial institution is to collect scattered saving and to supply to the needy person or organization.

The modern financial system of the world falls in five categories as recommended by R. S. Sayers.

- ❖ Central Bank
- ❖ Commercial Banks
- ❖ Finance Companies

- ❖ Insurance Companies
- ❖ Other Financial Institutions.

Financial institution collects funds mainly from deposits (time and saving deposits) which are ultimately used as a part of capital investment in country. Thus the problem of inadequate of capital formulation is some how wipe out by collecting more deposits from the savers (households, business and government). More precisely personal saving is the part of disposable income, which is not consumed. Saving equals income minus expenditure. The people having more income save more than the people having less income do. In general, household saves more than that of business and government. For household, saving equals to current income minus current expenditure. For business sector savings include current earnings retained inside business firms after payment of taxes, stockholder's dividend and other expenses. Government saving arise where there is a surplus of current revenue over expenditure. To induce more saving, financial institution can play a vital role by providing attractive interest rate and offer a different scheme. The people of the least developed countries are not much concerned about saving as most parts of earnings are spent in hand to mouth consumption. Even if some people are able to save their money, they show their interest to invest such surplus funds on non-productive sectors like gold, land, vehicles and so on. Banks and financial companies, as intermediaries, can attract savers to save more by providing them attractive interest rate and accept the deposit. Banks provides loan to borrowers who are in need of money from the money accumulated in the form of deposit and capital of bank while granting loan. Bank charges a certain percentage of interest to the borrower and borrower has to pay that interest for using banks money. Interest on loan also varies according to the nature of loan, whether loan is of short term or long term. An appropriate interest rate structure greatly affects the collection of deposits, mobilization of saving (only in productive sector) and profit position of any financial institution, which in turn, affects the economic upliftment of the whole country.

1.2 Statement of the Problem

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

In same manner, market interest rate is the sum of real rate plus inflation premium. But this may or may not occur in real practice. So this study is going to identify: Is there any positive relation of interest rate and inflation as per theory? Similarly, high interest rate is stimulus for high savings (deposits) but this may not the case in real world as people use to deposit more even in less interest rate due to security, convenience and other reasons. Thus through this thesis, it is going to discover: what is the relation of deposit and interest rate? Or Does substitution effect is truly applicable in Nepalese context.

More specifically, this study seeks to solve the answer for following questions.

- 1) Does *substitution effect* is practical in the context of Nepal or not? In other words what is the effect of high interest rate on savings (deposits)?
- 2) Are borrowers of Nepalese market sensitive to the interest rate of credit? Alternately, what is the relationship between interest rate and borrowing amount?
- 3) What is the magnitude of correlation between interest rate and inflation? In other words, does inflation has high positive or negative relation with interest rate in Nepalese context?

- 4) What is the position of interest rate spread and loan and advance ratio in Nepalese context?

1.3 Objective of the Study

- I.** To explore the relation of interest rate with deposit amounts (existence of substitution effect) in Nepalese market.
- II.** To examine the sensitivity of interest rate to the investment (borrowing).
- III.** To examine relationship of interest rate with inflation in Nepalese market.

1.4 Significance of the Study

Interest rates send price signals to borrowers, lenders, savers and investor. For example, higher interest rates generally bring forth a greater volume of savings and stimulate the lending of funds. Lower rates of interest on the other hand, tend to dampen the flow of savings and reduce lending activity but increases the demand for loan. Higher interest rates tend to reduce the volume of borrowing and capital investment and lower rates stimulate borrowing and investment spending (Rose:1997). Hence economic growth depends upon circulation of money and financial system facilitates it.

Similarly inflation is also another important factors in the financial market. All countries in the world have some magnitude of inflation. While this study is being conducted, the existing inflation rate in our country is around 8% and to be estimated around 9% for this current year. According to Irving fisher, inflation rate is added to real rate of return to determine the market interest rate. So higher the inflation, higher will be the interest rate. But in real world, the aforementioned theory may not come true, especially for developing country like Nepal because, most of the theories of financial markets are determined by the studies which had been conducted on developed countries like USA, Great Britain and so on. So it is quite necessary to develop some ideas about the interest rate and its impact upon deposits, credit and inflation in the Nepalese context. By doing so, more knowledge can be achieved about the true pictures of Nepalese market. This study is also considered to be useful to various parties such as further researchers, students, teachers, financial institutions, general individuals etc.

1.5 Limitation of the Study

As a master degree thesis this study certainly has limitation. This study is limited by followings:

- 1) Only one factors -interest rate- is taken for the study. Impact of other aspects (factors) besides interest has not been studied.
- 2) Stipulated time and resources also may have existed as limitation of this study.
- 3) Reliability of this study depends upon the accuracy of published data and the genuineness of respondent.
- 4) The samples have been drawn at random for convenience, so there may exit some sampling error. And the sample size may not be sufficient to generalize the findings.
- 5) This study covers only seven fiscal years.
- 6) The sample are taken only from commercial banks, other financial intermediaries are not included in the study.

1.6 Organization of the Study

The study has been divided into five chapters to make study more systematic.

Chapter I. Introduction

The first chapter includes background, statement of problems, objectives and organization of study.

Chapter II. Review of Literature

The second chapter includes the conceptual framework, and reviews the issues related to the study.

Chapter III. Research Methodology

The third chapter is concerned with the research methodology consisting of research design, sources of data, population & sample, financial & statistical variables etc.

Chapter IV. Presentation and Analysis of Data

The fourth chapter presents the presentation and analysis of result of financial performance of selected finance companies.

Chapter V. Summary, Findings, Conclusion and Recommendation

The fifth and final chapter consists summary of findings, conclusion and recommendation and various suggestions for the improvement of future performance of the company.

CHAPTER - II

REVIEW OF LITERATURE

A literature review is an essential part of all studies. It is a way to discover what other researchers have covered and left in the area. A critical review of the literature helps the researcher to develop a thorough understanding and insight into previous research works that relates to the present study. It is also a way to avoid investigation problems that have already been definitely answered. Thus a literature review is the process of locating, obtaining, reading and evaluating the research literature in the area of the student's interest (Wolf & Pant: 2005). The purpose of literature review is to find out what research studies have been conducted in one's chosen field of study and what remains to do. The primary purpose of literature review is to learn not to accumulate.

2.1 Theoretical Review

2.1.1 Meaning of Interest:

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

2.1.2 Theories of Interest:

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

To uncover these basic rate-determination forces, however, we must make a simplifying assumption. We assume in this chapter that there is one fundamental interest rate in the economy known as the pure or real rate of interest which is the component of all interest rates. The closest approximation to this pure rate in the real world is the market yield on the government bonds minus inflation. The rate of interest on Treasury bond is called risk free rate of interest which consists of real rate of interest plus premium for inflation. It is a rate of return presenting no risk of financial loss to the investor and representing the opportunity cost of holding idle cash, because the investor can always invest in no risk bonds and earn this minimum rate of return. Once pure rate of interest is determined, all other interest rates may be determined from it by examining the expected future inflation and special characteristics of the securities issued by individual borrowers. For example, only the government can borrow at risk-free interest rate; other borrowers pay higher rates that due to the greater risk of loss attached to their securities. Difference in liquidity, marketability and maturities are other important factors causing interest rate to differ from the pure or risk free rates (Rose:1997).

In this study mainly four theories of interest are reviewed. They are:

THE CLASSICAL THEORIES OF INTEREST RATES (Ibid)

This is one of the oldest theories concerning the determinants of pure or risk-free interest rate. It was propounded during the 18th and 19th century by a number of British economists and elaborated by Irving Fisher in 1930. The classical theory argues that the rate of interest is determined by two forces: 1) the supply of savings, derived mainly from households and 2) the demand for investments capital coming mainly from the business sector.

Saving by Households:

Generally most of the saving in modern industrialized economies is carried out by individual and families. For these households, saving is simply abstinence from consumption spending. Current savings, therefore, are equal to the difference between current income and current consumption expenditures. In making the decision on the timing and amount of saving to be done, households typically consider several factors:

the size of current and long-term income, the desired savings target, and the desired proportion of income to be set aside in the form of savings (i.e. the propensity to save). Generally, the volume of household savings rises with income. Higher-income families and individuals tend to save more and consume less relative to their total income than families with lower incomes.

Although income levels probably dominate saving decisions, interest rate also plays an important role. Interest rates affect an individual's choice between saving and current consumption. The classical theory of interest assumes that individual have a definite time preference for current over future consumption. A rational individual, it is assumed, will always prefer current enjoyment of goods and services over future enjoyment. Therefore, the only way to encourage an individual or family to consume less now and save more is to offer a higher rate of interest on current savings. If more were saving in the current period at a higher rate of return, future consumption and future enjoyment would be increased. The classical theory considers the payment of interest as a reward for waiting the postponement of current consumption in favor of greater future consumption. Higher interest rate increase the attractiveness of saving (and future consumption) for some quantity of current consumption. This so-called substitution effect calls for a positive relationship between interest rates and the volume of savings. Higher interest rates bring forth a greater current volume of savings. If the rate of interest in the financial markets rises from 5 to 10 percent, the volume of current savings by households is assumed to increase from \$ 100 to \$200 billion (Ibid p.p.193).

Saving by Business Firms:

Not only households, but also businesses save and direct a portion of their savings into the financial markets to purchase securities and make loans. Most businesses hold savings balances in the form of retained earnings (as reflected in their equity or net worth accounts). In fact, the increase in retained earnings reported by business each year is a key measure of the volume of current business saving. And these retained earnings supply most of the money for annual investment spending by business firms. The volume of business saving depends on two key factors: the level of business profits and the dividend policies of corporations. These two factors are summarized in the retention

ratio, the ratio of retained earnings to net income after taxes. This ratio indicates the proportion of business profits retained in the business for investment purposes rather than paid out as dividends to the owners. The critical element in determining the amount of business savings is then the level of business profits. If profits are expected to rise, business will be able to draw more heavily on earnings retained in the firm and less heavily on the money and capital markets for funds. The result is a reduction in the demand for credit and a tendency toward lower interest rates. On the other hand, when profits falls but firms do not cut back on their investment plans, they are forced to make heavier use of the money and capital markets for investment funds. The demand for credit rises and interest rates may rise as well. Although the principal determinant of business saving is profits, interest rates also play a role in the decision of what proportion of current operating costs and long-term investment expenditures should be financed internally and what proportion externally. Higher interest rates in the money and capital markets typically encourage firms to use internally generated funds more heavily in financing projects. Conversely, lower interest rates encourage greater use of external funds from the money and capital markets.

Saving by Government

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

The demand for investment funds:

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

able fund have inverse relationship. At low rates of interest, more investment projects become economically viable.

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

According to the classical economists, the interest rates in the financial markets were determined by the interplay of the supply of saving and the demand for investment. Specifically, the equilibrium rate of interest is determined at the point where the quantity of savings supplied to the market is exactly equal to the quantity of funds demanded for investment. To support this in figure no 2-3 this occurs at point E where the equilibrium rate of interest is i_E and the equilibrium quantity of capital funds traded in the financial markets is Q_E .

The market rate of interest moves towards its equilibrium level. However, supply and demand forces change so fast that the interest rate rarely has an opportunity to settle in at a specific equilibrium level. At any given time, the rate is probably above or below its true equilibrium level but moving towards that equilibrium. If the market rate is temporarily above equilibrium, the volume of savings exceeds the demand for investment capital creating an excess supply of savings. Savers will offer their fund at lower and lower rates until the market interest rate approaches equilibrium. Similarly, if the market rate is temporarily below equilibrium, investment demand exceeds the quantity of savings available. Business firm will bid up interest rate until it approaches the level at which the quantity saved equals to quantity of funds demanded for investment purpose.

THE LONABLE FUND THEORY:

In this theory, the main theme is the supply and demand for loanable funds (i.e. lending & borrowing) determines the interest rate. 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 rates (i.e. borrowing and lending). In addition, the loanable fund theory is a short-run, partial equilibrium explanation in which some factor or factors produce a change in the interest rate, but there is no analysis of the long-run impact of this change in the interest rate on the level of employment, income, and

production of the resulting impact of changes in employment, income and production on the interest rate. Rather, the loanable fund theory focuses on the factors that underlay the supply and demand schedules for loanable funds and on their interaction.

Supply of Loanable Funds:

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

Saving:

Saving refers to the postponement of current consumption. The decision to save is the decision to forgo current consumption in order to have a larger quantity of consumption in the future (Cooper & Donald:1983). Individual or household 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 savings supplied by individuals is principally determined by the level of income and it is influenced to a lesser degree by the level of interest rates. Business saving refers to the net income after taxes of the firm, less any cash dividends i.e. retained earnings. There is little reason to believe that the volume of saving at business firm is strongly influenced by the level of interest rates. For governments, the volume of saving is defined as the difference between revenues and expenditures such that saving exists when revenues exceed expenditures (a budget surplus).

New Money:

Although the volume of saving is the principal source of loanable funds in financial markets, the supply of the loanable funds may be increased through the creation of new money beyond the amount made possible by current saving. The amount of new money created is determined jointly by the actions of the commercial banking system and the central bank. Commercial banks use any excess reserves to make loans and purchase

securities and create money (demand deposits) through the credit creation process. However, the ability of commercial bank to create money is limited by the central bank through the use of its monetary policy tools like open-market operations, reserve requirement changes, and discount rate changes.

There is little evidence that either the central bank or commercial banks are substantially influenced in the money creation process by the level of interest rates. The principal factor that determines the volume of new money created by the banking system is the amount of reserves, and the principal factors that determines the amount of reserve is central bank monetary policy. Neither of these factors should be directly influenced by the level of interest rates.

In summary, the 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 by either an increase in the desire to save by business, households or governments or by the creation of more new money by commercial banking system. Conversely, the supply of loanable funds may fall because of a reduction in the desire to save or a reduction in the amount of new money created.

The Demand for Loanable Fund:

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

Consumer Demand:

Domestic consumers demand loanable funds to purchase a wide variety of goods and service on credit. Recent research indicates that consumers are not particularly responsive to the rate of interest when they seek credit but focus instead principally on the non price terms of a loan, such as the down payment, maturity and size or installment payments. This implies that consumer demand for credit is relatively inelastic with respect to the rate of interest. Certainly a rise in interest rate leads to some reduction in the quantity of consumer demand for loanable fund (particularly when home mortgage credit is involved) whereas a decline in interest rates stimulates some additional consumer

borrowing. However, along the consumer's relatively inelastic demand schedule, a substantial change in the rate of interest must occur before the quantity of consumer demand for funds changes significantly.

Domestic Business Demand:

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

Government Demand:

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

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.

The Equilibrium Rate of Interest in the Loanable Funds Theory:

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 dis-hoarding 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.

THE LIQUIDITY PREFERENCE THEORY OF INTEREST RATE:

The loanable funds approach to interest rate determination focuses on supply and demand for loanable fund. An alternative approach the liquidity preference view focuses instead on the supply and demand for money. It is assumed that individuals inherently prefer money among all financial assets since money can be used to make payments and is thus the most liquid assets. Wealth holders are persuaded to hold financial assets other than money only because these non-money assets offer an interest return greater than between the yields by money. Further, the greater the spread between the yields on non money financial assets and money, less the demand for money holdings and greater the demand for other financial assets and vice versa.

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 figure no 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 individuals 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 equal the supply of cash.

THE RATIONAL EXPECTATION THEORY:

This theory is new to the financial market so it is in still development stage. The main theme of this theory is that “money and capital markets are highly efficient institutions in digesting new information affecting interest rates and security prices”(Rose:1997). This theory assumes that equilibrium interest rate depends upon the change in investor’s expectation regarding future security prices and return. Investor’s decision towards the borrowing and lending funds come from the availability of new information. When new information appears about investment, saving or the money supply, investors begin immediately to translate that new information into decision to borrow and lend funds. So rapid is the process of the market digesting new information that security prices and interest rates presumably impound the new data from virtually the moment they appear. In the absence of new information, next period’s interest rate will be equal to current periods interest rate. In other words, the knowledge of past interest rate will not be a reliable forecast of future interest rate. In a perfect efficient market it is impossible to win excess returns continuously by trading on publicly available information.

The important assumptions and conclusions of the rational expectation theory are that (Ibid p.p.211) 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) no unexploited opportunities for profit can be found in the securities’ markets 5) transaction and storage costs for securities are negligible and information costs are small relative to the value of securities traded and 6) expectation concerning future security prices and interest rates are formed rationally and efficiently.

If the money and capital markets are highly efficient in the way we have described, this implies that interest rates will always be at or very near their equilibrium levels. Any deviation from equilibrium rate dictated by demand and supply forces 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 momentary. If market participants were expecting increased demand for credit (with supply unchanged), an unexpected announcement of reduced credit demand implies lower interest rates in the future. Similarly, a market expectation of less credit demand in the future (with supply unchanged) when confronted with an unexpected announcement of higher credit demand, implies that interest rate will rise.

2.1.3. Functions of Interest rate in the economy:

The interest rate has opposite relation with the value of financial assets. It means that if the interest rate increases, the value of assets decreases and vice versa. This concept is very useful for the valuation of the investable securities. Besides this there are some important functions that interest plays in the economy (Ibid p.p.193).

- ❖ It helps guarantee that current savings will flow into investment to promote economic growth.
- ❖ It rations the available supply of credit, generally providing loanable funds to those investment projects with the highest expected returns.
- ❖ It brings into balance the supply of money with the public's demand for money.
- ❖ It is also important tool of government policy to stimulate or discourage saving and investment through its influence on the volume of saving and investment. If the economy is growing too slowly and unemployment is rising, the government can use its policy tools to lower interest rates in order to stimulate borrowing and investment. On the other hand, an economy experiencing rapid inflation has traditionally called for a government policy of higher interest rates to slow both borrowing and spending.

2.1.4 Change in interest & its effect upon value of an asset:

The price of the security and its yield (rate of interest) has inverse relationship. It means that a rise in yield implies a decline in price; conversely, a fall in yield is associated with a rise in the security's price.

The investing funds in financing assets can be viewed from two different perspectives, the borrowing and lending of money or the buying and selling of securities. Similarly the equilibrium rate of interest from the lending of funds can be determined by the interaction of the supply of loanable funds and the demand for loanable funds. Demanders of loanable funds (borrowers) supply securities to the financial marketplace and suppliers of loanable funds (lenders) demand securities as an investment. Therefore, the equilibrium rate of return or yield on a security and the equilibrium price of that security are determined at one and the same instant and are simply different aspects of the same phenomenon, the borrowing and lending of loanable funds.

2.1.5 Factors influencing the difference in interest rates:

Though it is assumed deposit increases as interest increases but interest rate is affected by numerous factors. In real world, different financial institution quotes different interest rate. It means that the same types of instrument carries different interest rate so there is presence of interest spread. For this difference there are numbers of factors influencing the difference in interest rates (Thygeson:1993).

1) Credit of Default Risk:

Credit or default risk involves the potential that a saver will receive less principal and interest on the financial claim that the contract specifies. Default risk is related to the probability that some or all of the initial investment will not be returned. The degree of default risk is closely related to the financial

condition of the company (Cheney & Moses). Credit risk requires making estimates of the potential for loss. This probability is then converted into an interest rate premium, the credit or default risk premium and added to the saver's required nominal yield. Typically, the securities issued by the government, (esp. T-bills), are considered to be credit risk free.

2) Marketability Risk:

Marketability is the capability of being sold quickly at low transaction cost (Kohn:1999). Marketability risk deals with the degree of difficulty in being able to convert a financial

claim into cash at its most recent transaction price or very close to it. Savers who purchase investments with poor marketability expect to be compensated for the lack of marketability. This represents an additional interest spread and is referred to as the marketability or liquidity risk premium.

3) Call or prepayment Risk:

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

4) Servicing cost:

Some financial claims are difficult to service. This means that the process of collecting interest and principal payments providing accurate records or monitoring the ongoing credit position of the borrowing involves considerable operating costs. Lenders must be compensated for the servicing costs. This cost is included in the interest rate charged and is referred to as the servicing cost (Thygeson: 1993).

5) Exchange Rate Risk:

As our financial markets have become more global, there has been a significant growth in the borrowing and investing in foreign denominated financial claims. A Nepalese company establishing a manufacturing facility in Belgium might be inclined to issue bonds denominated in Belgium francs rather than Nepali Rupees. Investors also have available to them many investments that are denominated in foreign currencies. This transaction involves exchange rate risk. This risk relates to the potential that the rate of

exchange between the domestic currency and foreign denominated currency will change as a result of any number of factors. The primary risk for the borrower is that the value of the domestic currency. This results in an unexpected cost on the international loan. Since the loan would have to be repaid in the foreign currency that has risen in value relative to the domestic currency. This potential change in currency values must be reflected in computing the cost of borrowing.

6) Taxability:

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

2.2.1 Concept of Deposit:

Deposit is a sum of money lodged with a bank, discount house or other financial institution (Shrestha & Bhandari). Deposit is nothing more than the assets of an individual which is given to the bank for safe-keeping with an obligation to get something (interest) from it. To a bank these deposits are liabilities. Commercial bank Act 2031 (1974) defines “Deposits” as the amount deposited in a current, savings or fixed accounts of a bank or financial institution (Bhandari:2003). The deposits are subject to withdrawals by means of cheques or on a short notice by customers. There are several restrictions on these deposits, regarding the amount of deposit, number of withdrawal etc. They are used more as investments and hence they earn some interest. The rate of interest varies depending on the nature of the deposits. The bank attracts deposits from customers by offering different rates of interest and different kinds of facilities. Though the bank plays an important role in influencing the customer to part with his funds and open deposit accounts with it, it is ultimately the customer who decides whether s/he should deposit his surplus funds in current deposit a/c, saving deposits or fixed/time deposit a/c. Bank deposits arise in two ways. When the banker receives cash, it credits the customer’s account, it is known as a primary or a simple deposit. People deposit cash in the banking system and thereby convert one form of money, cash, into another form, bank money.

They prefer to keep their money in deposit accounts and issue cheques against them to their creditors. Deposits also arise when customers are granted accommodation in the form of loans. When a bank grants a loan to a customer it doesn't usually pay cash but simply credits the customers account with the amount of loan. Of course, there is nothing that prevents the borrower from withdrawing the entire amount of borrowing in cash but quite often s/he retains the amount with the bank in a deposit.

2.2.2 Types of Deposit

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

Current Deposit:

A current deposit is a running account with amounts being paid into and drawn out of the account continuously. These accounts are also called demand deposits or demand liabilities since the banker is under an obligation to pay money in such deposits on demand. The account never becomes time barred, because the limitation does not run until a demand is made by the customer on the bank for the payment of deposit. These accounts are generally opened by business houses, public institutions, corporate bodies and other organization whose banking transactions are numerous and frequent. As these deposits are payable on demand, banker is obliged to keep larger cash reserves than are needed in the case of fixed and savings deposits. This type of account is just a facility offered by the bank to its customers. So such deposit doesn't yield any interest return.

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

Saving Deposit:

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

Fixed Deposit:

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

In England these deposits are repayable subject to a period of notice and hence known as time deposit or time liabilities means that these are withdraw able subject to a period of notice and not on demand (Radhaswamy & VasuDevan: 1979). Fixed deposit receipt is not transferable by endorsement and certainly not negotiable. However the debt covered by the fixed deposit receipts can be assigned. Bank generally gives loans up to 90% of

the deposit against the security of the deposit. For this bank charge some interest higher than the interest allowed on the deposit.

2.2.3 Importance of Deposit:

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

2.3.1 Concept of Lending (Credit):

Another important function of commercial bank is to provide different types of loans or credit. The word 'credit' means 'trusting'. In credit transaction the lender (or banks) must have confidence in the borrower that s/he will be able to repay the money. In credit transactions, the creditor turns over to the debtor to repay an equivalent amount usually money in future plus as 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) Loans and advances, b) Overdrafts c) cash credit d) discounting of bills and so on (Shrestha & Bhandari). But besides this, the other forms of credit are: Bills of Exchange, cheques, Drafts, Promissory Note, Letter of Credit (LC), Travelers' cheque, Treasury Bills (T-Bills), Book Credit e.t.c.

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

2.3.2 Factors affecting the volume of Lending:

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

1) Credit (Lending) Rate:

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

2) 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.

3) 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.

4) Pace of Financial Development:

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

5) Basic Infrastructure:

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

6) Political Condition:

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

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

2.4.1 Concept of Inflation:

Inflation in common sense is increment in general or average price level in the whole economy. It means that it is the increase in general price level, not the increase in individual prices. Inflation is not a temporary fluctuation in price but it is a sustained and appreciable increase in price (Joshi:2056). Due to the increase in general level in price, the value of purchasing power of money declines as there is an inverse relationship between the general level of price and value of money. According to Economist Crowther "Inflation means a state in which the value of money is falling i.e. prices are increasing." Inflation is a general rise in prices across the economy. This is distinct from a rise in the price of a particular good or service. Individual prices rise and fall all the time in a market economy, reflecting consumer choices and preferences, and changing costs. If the price of one item - say a particular model of car - increases because demand for it is high, we do not think of this as inflation. Inflation occurs when most prices are rising by some degree across the whole economy (www.bankofengland.co.uk).

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

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

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

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

2.4.2 Inflation and Interest Rates:

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

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

The Nominal and Real Interest rates:

Before exploring the relationship between inflation and interest rates, several key terms must be understood. In this connection one should be familiar with nominal rate and real rate of interest. The nominal rate is published or quoted interest rate on a security or loan. These rates are the actual rates that are used to transact with the customers. In other words, “nominal rate of return are money rates of return that are not adjusted for the effect of inflation” (Francis). For example an announcement in the financial press that major commercial banks have raised their prime lending rate to 10 percent per annum indicates what nominal interest rate is now being quoted by banks to their best customers (Rose:1997). Similarly, the real interest rate is the return to the lender or investor measured in terms of its actual purchasing power. In a period of inflation, of course, the real rate will be lower than the nominal rate. An investment’s real rate of interest during some period is calculated by removing the rate of inflation from the nominal return i.e. by using following equation:

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

Where

rr = real rate of return

r = nominal rate of return

q = inflation rate

The Fisher Effect:

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

$$\begin{array}{ccccccc} \text{Nominal interest} & = & \text{Expected real} & + & \text{Inflation Premium} & + & (\text{Expected real} \times \text{Inflation} \\ & & \text{rate} & & & & \text{Premium}) \\ & & & & & & \\ & & \text{rate} & & & & \text{rate} \end{array}$$

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

$$\begin{array}{ccc} \text{Nominal Interest} & = & \text{Expected real} + \text{Inflation Premium} \\ & & \text{Rate} \quad \quad \quad \text{rate} \end{array}$$

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

If this view, known today as the Fisher effect, is correct, it suggests a method of judging the direction of future interest rate changes. To the extent that a rise in the actual rate of inflation causes investors to expect greater inflation in the future, higher nominal interest rates will soon result. Conversely, a decline in the actual rate of inflation may cause

investors to revise downward their expectations of future inflation, leading to lower nominal rates. This will happen because, in an efficient market, investors will be compensated for the risk of expected changes in the purchasing power of their money.

The Harrod-Keynes Effect of Inflation:

There is another view about inflation-interest rate relationship propounded originally by British economist Sir Roy Harrod. This view conflict with that of Fisher's effect. It is based upon the Keynesian liquidity preference theory of interest rate. Harrod argues that the real rate will be affected by inflation but the nominal rate need not be. Following the liquidity preference theory, the nominal interest rate is determined by the demand for and supply of money. Therefore unless inflation affects either the demand for and supply of money, the nominal rate must remain unchanged regardless of what happens to inflationary expectations. According to this principle, Harrod argues that a rise in inflationary expectations will lower the real rate of interest. In liquidity preference theory, the real rate measures the inflation-adjusted return on bonds. However, conventional bonds, like money, are not a hedge against inflation, because their rate of return is fixed by contract. Therefore, a rise in the expected rate of inflation lowers investors' expected real return from holding bonds. If the nominal rate of return on bonds remains unchanged, the expected real rate must be squeezed by expectations of rising prices.

2.4.3 Tools to measure Inflation:

There is no completely satisfactory way to summarize the price changes that have occurred over a given time period for the large number of goods and services available in the country. Nevertheless, the government has attempted to do so by measuring the cost of specific mix of major items (a basket of goods, consisting of specified quantities and qualities of various items of food, clothing, housing and health care products bought by the average urban household (Francis) at various point of time. The "overall" price level computed for this representative combination of items is termed as cost-of-living index. The percentage change in this index over a given time period can be viewed as a measure of the inflation that took place from the beginning of the period to the end of the period (Sharpe, Alexxander & Bailey: 2003).

Similarly most governments compute a number of alternative price indices in order provide a wider choice for analysis. Nevertheless, many people tend to focus on one index as an indicator of the price level .Generally, in most of the countries, Consumer price Index, CPI, is used as this tools to calculate the inflation rate. The percentage change in the CPI over time measures the rate of inflation, as shown below in equation. The inflation rate is denoted by q.

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

Where CPI_1 = Consumer price index of period 1

CPI_0 = Consumer price index of period 0

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

2.4.4 Interest Rate Spread

Interest spread is the difference between weighted average rate of interest and lending on interest earning on assets and weighted average rate of interest an interest paying liabilities. It can be calculated as follows:

Interest rate spread = interest income/earning assets-interest expenses/interest paying liabilities.

2.3 Review of Unpublished Thesis:

In the preparation of this thesis, there are some research papers and thesis related with this thesis which contribute some ideas and help in the presentation of this study regarding to this thesis. These are very few thesis submitted to the libraries of Tribhuvan University and its wing colleges on the same topics, and its wing colleges on the same topics. But beside this, there are some other theses which are related to this study to some intent. The review and the extract from them are presented in this section.

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

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

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

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

Finally in his conclusion, he found that deposit depends upon numerous factors besides income, inflation and interest rates. If other variables are kept constant, the institutional interest rate is the important explanatory variable to influence the volume of deposit in Nepal. It means that, at the time of disseminators study, i.e. during 1980s, increase in the deposit interest rates increases the volume of deposit. Similarly the relationship with income and inflation could not come significant. According to him, the fixation of attractive interest rates on deposits has been responsible for the substantial growth in the volume of deposits in recent years. In the same manner for inflation, he has concluded:

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

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

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

- Deposit rates of all sample banks under study are in decreasing trend; meaning that every year deposit rates of sample banks under study have decreased.
- Lending rates of all sample banks under study are also in decreasing trend; means that every year lending rates of sample banks under study have decreased.
- 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 conclude that 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 she concluded that lending rate is the most important determinant of loan and advances of all commercial banks. This makes clear that borrower's seem more interest conscious.

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

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

A study made on the topics “*Determinants of Interest Rates in Nepalese Financial Markets*” (Pokharel:2004), by **Mr. Jhabindra Pokharel** also give some ideas about the interest rates in Nepalese markets. Though, this thesis tried to identify the factors that shape the interest rates in Nepalese markets, it also tried to explore the relationship between the interest rate, deposits, credit rates and inflation. Among different objectives, some objectives that match to this study are:

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

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

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

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

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

Narendra Bahadur Rajbhandary, conducted a study on “*The Interest Rate Structure of Commercial Banks in Nepal*” (Rajbhandary:1987). The objective of his study was to

show the relation of interest rate with saving and fixed deposits; with loans and advances and with interest earning (i.e. interest received on loan minus interest paid on deposits.)

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

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

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

interest rate on loan to luxurious goods as in unproductive sectors and a lower rate on productive and small scale industries.

Deepak Raj Bhandari, in his study entitled “*The Impact of Interest Rate Structure on Investment Portfolio of Commercial Banks of Nepal*” (Bhandari: 1998) has concluded followings:

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

Another Study conducted by **Neeta Dangol** on the “*Impact of Interest Rate on Financial Performance of Commercial Banks*” (Dangol: 2003) concludes:

- i) Most of the commercial banks contradict the general financial theories.
- ii) The relation between amount of deposits and interest rate on deposit, in general concept, must be positive. But deposits are increasing despite the decrease in the general level of interest. The result of such phenomenon is that there are fewer investment opportunities for the banking sectors as well as general investors.

- iii) The relation between total amount of loan and the lending rate is negative and significant. However, the change in the total amount of loan flow is not proportionate with the change in the lending rate.
- iv) Correlation between interest rate and inflation is not significant.
- v) Not only interest rate is responsible to shape the profitability of banks but also the operating efficiency also has major influence on it.

Madhu Ram Neupane, carried out a study entitled “*Interest Rate Structure and Its Influence on Deposit and Lending of Joint Venture Banks in Nepal*” (Neupane: 2008). He has shown the influence of interest rate on deposit and lending in Nepalese Joint Venture Banks. The conclusion drawn by Mr. Neupane is:

- The interest rate of all sample banks are found to be in decreasing trends
- Analysis of sample banks shows that interest rates on lending are far higher than deposit rates.
- Analysis of samples banks concludes that interest rate on deposit is to be found so low which does not attract the depositor.
- Lending interest rate of sample banks have decreased every year which provide better opportunities for the borrowers’ investor.
- Sample Banks under study show weak on mobilization of collected deposit.

CHAPTER - III

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a systematic way to solve the research problem. In other words, research methodology describes the methods and process applied in the entire aspect of the study. Research methodology refers to the various sequential steps (along with a rationale of each step) to be adopted by a researcher in studying a problem with certain objectives in view (Kothari: 1994). Thus the overall approach to the research is presented in this chapter. This chapter consists of research design, sample size and selection process, data collection procedure and data processing techniques and tools.

3.2 Research Design

A research design is the specification of methods and procedures for acquiring the information needed. It is the overall operational pattern or framework for the project that stipulates what information is to be collected, from which sources and by what procedures (Paul & Donald). Thus a research design is a plan for the collection and analysis of data. For research there exist different types of research design like; Historical research, Descriptive research, Case study research, Field study research, analytical research, True experimental research and so on. This study is mainly concerned with historical research. If applicable, sometime descriptive and analytical approach may also be used. But generally, to show the relationship of interest rate with deposit amount, lending (credit) amount and inflation rate, past historical data are used. The relevant and needed data has been collected from various publications of different commercial banks and Nepal Rastra Bank.

3.3 Population and Samples:

The term “population” or universe for research means the universe of research study in which the research is based (Wolf & Pant: 2000). Since the research topic is about interest rate, all the lending and depository institutions of Nepal are the members of population study. The population for the study comprises 25 commercial banks, 58 development

banks, 78 finance companies, 12 micro credit development bank, 16 saving and credit co-operatives (limited banking) licensed by NRB, one employee provident fund and other 46 non-government financial organizations (NGOs) Licensed by NRB (NRB website). Due to the time and resources factors, it is not possible to study all of them regarding the study topic. Therefore samplings are done selecting from population. Among the population only 3 Joint venture banks are chosen as sample. For selecting the samples, simple random sampling method is used here among different methods. Organization under study are as follows, whose general introduction and major objectives are presented in chapter one.

- NABIL Bank Limited
- Himalayan Bank Limited
- Everest Bank Limited

3.4 Nature and Source of Data:

For this study, mainly secondary data are used. These secondary data are collected mainly from published sources like annual report, prospectus, balance sheet, newspaper, journal, Internet and other sources. Besides this in some case, if needed, primary data can also be used. They can be collected through direct interview and observation. Secondary data published on annual reports of concerning organizations, like interest rate as well as amount and their organizational profiles are collected through personal visit of respective organization as well as from their web sites. Some secondary data like source and use of funds of respective bank, comparative study, and inflation rates are collected from Nepal Rastra Bank.

3.5 Data Processing and Presentation:

The information or data obtained from the different sources are in raw form. From that information, direct presentation is not possible. So it is necessary to process data and converts it into required form. After then only, the data are presented for this study. This process is called data processing. For this study, only required data are taken from the secondary source (bank's publication) and presented in this study. For presentation, different tables are used. Similarly, in some case graphical presentation is also made. For

reference, the photocopies of raw data are attached in the last portion of this thesis. So far as the computation is concerned, it has been done with the help of scientific calculator and computer software program.

3.6 Data Analysis Tools:

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

3.6.1 Statistical Tools

Arithmetic Mean:

It is the sum of all the observations divided by the number of observations. In such a case all the items are equally important (Pant & Chaudhary:1999). As arithmetic mean is most common and popular tools for data analysis, here in this study also, arithmetic mean is used. It is computed by using following formula:

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

$$\sum X = \text{Sum of all the Variable X}$$

$$n = \text{Variables involved}$$

Standard Deviation:

The standard deviation is the best tools to study fluctuation in any data. It is usually denoted by the letter sigma (σ). Karl Pearson suggested it as a widely used measure of dispersion and is defined as the positive square root of their arithmetic mean of squares of the deviation of the given observations from their arithmetic mean of a set of value (Gupta: 2000). It can be computed by using following formula.

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

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

Coefficient of Correlation:

By this statistical tool, the degree of relationship between two variables is identified. In other words, this tool is used to describe the degree to which one variable is linearly related to other variables. Two or more variables are said to be correlated if change in the value of one variable appears to be linked with the change in the other variables. The correlation analysis refers to the closeness of the relationship between the variables (Sharma & Chaudhary: 2002). Correlation may be positive or negative and ranges from -1 to +1. Simple correlation between interest rate and deposit amount, interest rate and credit or lending amount and interest rate (both deposit rate and lending rate) and inflation is computed in this thesis. For example, let's say that the correlation between interest rate and inflation is positive. It indicates that when inflation increases, interest rate also increases in the same direction and vice versa. For our study following reference is used (Panta & Chaudhary: 2013).

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

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

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

Alternately,

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

Where,

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

n = Total number of observations.

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

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

Where r₁₂ = correlation coefficient between variables one and two.

r₂₃ = correlation coefficient between variables two and three.

r₁₃ = correlation coefficient between variables one and three.

Multiple correlation is used for the measure of degree of association between one variable and a group of other variables as the independent variable. It lies between 0 and 1. The closer it is to '1', the better the linear relationship between the variables. The closer it is to '0', the worse is the linear relationship (Gupta:2000).

Coefficient of Multiple Determination:

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

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

t-test for significance of sample correlation coefficient:

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

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

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

The $(1 - \alpha) \%$ confidence limits for estimating population correlation coefficient (ρ) are given by

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

3.6.2 Financial Tools

Financial tools are used to examine the strength and weakness of performance. In this study, financial tools like interest rate spread and ratios have been used. Ratio is the mathematical relationship between two accounting figures. Ratio analysis is used to compare a firm's financial performance and status so that of other firm's or to it overtime. The qualitative judgment regarding financial performance of firm can be done with the help of ratio analysis. Therefore only those ratios have been covered in this study as required by the study.

Loan and advance to total deposit ratio;

This ratio is calculated to find out how successfully the banks are utilizing their total deposit on loan and advances for profit generating purpose. A ratio helps us showing the relationship between loans and advances which are granted and the total deposit collected by bank. A high ratio indicates better mobilization of collected deposit and vice versa. It should be noted that too high ratio may not be better from liquidity point of view. This ratio is calculated by dividing loan and advances by total deposits. This can be stated as below:

$$\text{Loan and advance to total deposit ratio} = \text{Loan and advance} / \text{Total deposits}$$

Interest rate spread

Interest rate spread is a difference between interest rate on lending and interest rate on deposit. Generally banks charge more interest rate on lending than they provide interest rate on deposits. Interest rate spread is calculated as follows:

Interest rate spread = Interest rate on lending – Interest rate on deposit

Higher spread shows the banks charge high rate for the borrowers than they provide for depositors.

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

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

For our simplicity, in this thesis, presentation analysis and interpretation of data are made according to the nature. In other words, at first relationship of deposit and interest rate of all 3 sample banks are analyzed. After then, the relationship between interest rate and credit (lending) amount is made. Lastly the relationship between interest rate and inflation is presented. While analyzing, different statistical tools like correlation coefficient, coefficient of determination, t-statistics for significance are employed.

PRESENTATION AND ANALYSIS OF SECONDARY DATA

Secondary type of data is used to analyze about deposit amount, lending amount and interest rate.

4.2 Analysis of Deposit and Interest Rate:

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

4.2.1 NABIL Bank Limited (NABIL)

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

Table no 4.1:

Interest rate structure on deposit of NABIL as on Mid-July

| Deposit | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|------|------|------|------|------|------|------|
| Savings | 4 | 2.75 | 2.75 | 2.25 | 3 | 2 | 2 |
| Fixed | | | | | | | |
| 7 Days | - | - | - | - | - | - | - |
| 14 Days | 2.25 | 2 | 2 | 1.75 | 2.5 | 2.5 | 1.75 |
| 1 Months | 3 | 2.75 | 2.5 | 2.25 | 3 | 3 | 2 |
| 2 Months | - | - | - | - | - | - | - |
| 3 Months | 4 | 3.25 | 3 | 2.5 | 3.25 | 3.25 | 4 |
| 6 Months | 4.5 | 3.75 | 3.5 | 2.75 | 3.5 | 3.5 | 4.5 |

| | | | | | | | |
|---------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Years | 5.5 | 4.5 | 4 | 3.25 | 4 | 4 | 5 |
| 2Yrs/Above | - | - | 4.5 | 4 | 4 | 4.25 | 5.5 |
| Whole Mean | 3.88 | 3.36 | 3.18 | 2.68 | 3.32 | 3.21 | 3.54 |
| Fixed Deposit Mean | 3.85 | 3.46 | 3.25 | 2.75 | 3.38 | 3.42 | 3.79 |
| Std. Deviation | 0.34% | | | | | | |

Source: Banking and Financial Statistics, No: 39-47, NRB

Table no 4-1 shows the deposit interest rate of NABIL in 7 different FYs. For this study 2002 is taken as initial year & 2008 as final year. The table portrays the interest rate that were prevailed in the Nepalese financial markets during last past 7 FYs. The data shows the decreasing tendency of interest rate. The interest rate on saving deposit in the beginning year was 4% and decreased to 2% in 2008. In same manner, the bank used to quote the interest rate of fixed deposit in different short term period like 7 days, 14 days, 1 months, 2 months, 3 months and so on. For the graph purpose, in this study the average of 7 days to 3 months is taken to make the figure clearer. For other periods also the fixed deposit rate was in decreasing trend. Similarly if average of fixed deposits of different period is taken, then the results in almost similar with “Whole average”. It means the average interest rate for fixed deposit only was 3.85%, 3.46%, 3.25%, 2.75%, 3.38%, 3.42% and 3.79% respectively for the year 2002, 2003, 2004, 2005, 2006, 2007 and 2008. The average figures also show the decreasing tendency in interest rate from 2002 to 2005 but then others show increasing tendency. All the above described matters can be shown on figure 4-1 as follows.

The graph 4-1 reveals that, previous period interest rates are on declining trend. It means from 2002 to 2005 interest rates are on declining trend but others are on inclining trend. Saving interest rate falls every year except 2006 and remain constant from the period 2007 to 2008. But for fixed deposit, interest rate remains constant from the period 2006 to 2007 for 7 days – 3 months, 6 months, 1 year and 2yrs/above. The fixed interest rate declined by some percentage for 2002 to 2006. Then slightly inclined by some percentage

for remaining years except the interest rate of 7days in 2008 which was slightly decreased.

Figure No 4-1:

Interest Rate of NABIL on Deposits during Different FY

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

Table No 4-2:

Relationship between Interest Rate and Deposit amount of NABIL

| Year (1) | Saving Deposit Interest Rate (2) | Saving Deposits Amounts (3) | Fixed Deposit Interest Rate(4) | Fixed Deposit Amounts (5) | | |
|------------------------------------|---|--------------------------------|---|------------------------------|-----------------|---------------|
| 2002 | 4 | 4889 | 3.85 | 2446.8 | | |
| 2003 | 2.75 | 5237.4 | 3.46 | 2252.6 | | |
| 2004 | 2.75 | 5994.1 | 3.25 | 2310.6 | | |
| 2005 | 2.25 | 7026.4 | 2.75 | 2078.6 | | |
| 2006 | 3 | 8770.8 | 3.38 | 3450.2 | | |
| 2007 | 2 | 10187.4 | 3.42 | 5435.2 | | |
| 2008 | 2 | 12160 | 3.79 | 8464.1 | | |
| Correlation | $r_{23} = -0.7044$ | | $r_{45} = 0.4792$ | | | |
| Coefficient of determination | $r^2_{23} = 0.4962$ | | $r^2_{45} = 0.2296$ | | | |
| t-statistic | t-cal= 2.219 | t-tab= 2.571 | Insignificant | t-cal= 1.221 | t-tab= 2.571 | Insignificant |

Source: Banking and Financial Statistics, No: 39-47, NRB

The table 4-2 shows the total amount of fixed deposit and saving deposits and the interest rates offered on such deposits by NABIL on seven fiscal years starting from FY 2002 to FY 2008. The table portrays that the both interest rate has been decreased by greater magnitude. Deposit amount has been increased during the study period. It means they move in opposite direction i.e. decrease in interest rate increases the amount of deposit and vice versa. Therefore they should have negative relationship. It can be quantified by calculating correlation coefficient between them. This relationship can also be shown in graph as shown in figures 4-2 and 4-3.

Figure No: 4-2

Deposit Amount of NABIL during different FY

Figure No:4- 3 Interest Rates of NABIL on Saving and Fix Deposit

According to table no 4-2, the interest rate on saving deposit has been decreased from 4% to 2% during 7 FYs. The declining tendency is little. In same period the deposit amount was Rs 4889 millions but this amount increases to Rs. 12160 millions.

Similarly, for fixed deposit the table 4-2 shows that total amount of fixed deposit and interest rate on fixed deposit offered by NABIL on seven consequent FY started from 2002 to FY 2008. The table reveals that average fixed interest rate has been decreased during FY 2002 to 2005 and increased during FY 2005 to 2008. At the FY 2002 the average interest rate was 3.85% on fixed deposit but later on FY 2002 to 2005 this interest rate started to decrease and it started to increase and at 2008 it remained at 3.79. On effect of this decline, the amount of fixed deposit also declined, the amount of fixed deposit also started to decrease in some respect. The table shows that up to the FY 2004, there is no effect on fixed deposit amount by the declination of interest rate but after the FY 2004, decrease in interest rate also decreases the fixed deposit amount. In this regards, the substitution effect holds true in the case of fixed deposit.

To verify the above trend, it is necessary to calculate the correlation coefficient and t-statistics. If correlation coefficient is calculated for saving deposit and deposit amount, then it is $(r_{23}) = -0.7044$. This high negative correlation coefficient indicates that they

have inverse relationship among each other. Decrease in interest rate is followed by an increase in saving deposit amount and vice-versa. This shows that the substitution effect in case of NABIL for saving account is not applicable. The coefficient of determination between these two variables is $r^2_{23} = 0.4962$, which means that total variation in dependent variable (saving deposit amount) has been explained by independent variable (interest rate) to the extent of 49.62% and remaining is the effect of other factors. The t-value for testing the significance of the correlation coefficient between variables is -2.219 ($t' = 2.219$). Since the tabulated t-value at 5% level of significance for 5 degree of freedom ($t_{\text{tab}} = 2.571$) is greater than calculated value ($t_{\text{cal}} = 2.219$), the correlation coefficient is insignificant.

As a result null hypothesis is accepted i.e. there is insignificant relation between two variables or the variables are not correlated.

In the same manner, the correlation coefficient between interest rate on fixed deposit and fixed deposit amount (r_{45}) is 0.4792. This means that these two variables are moderately co-correlated when interest rate on fixed deposit decreases (increases) the deposit amount also decreases (increases). This is exactly the matter what the theory (substitution effects) says. The coefficient of determination between these two variables is $r^2_{45} = 0.2296$, which means 22.96% of total variables in dependent variables (deposit unit) is explained by the independent variable (deposit rate) & remaining is due to the effect of other factors. Similarly test of significance of correlation coefficient between deposit rate and deposit amount gives the value of $t = 1.2208$. The tabulated value at 5% significant level with d.f. 5 is 2.571 (i.e. $t_{\text{tab}} = 2.571$). Here $t_{\text{cal}} < t_{\text{tab}}$ so H_0 is accepted i.e. there is no significant relation between two variables. Though the correlation coefficient indicates that the both variables have moderate level of relationship but the t-statistics clarifies that their relationship is not so significant.

4.2.2 Himalayan Bank Limited (HBL):

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

Table no 4-3:**Interest rate structure on deposit of HBL as on Mid-July**

| Deposit | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Savings | 4 | 4 | 4 | 3.75 | 3.75 | 2 | 2 |
| Fixed | | | | | | | |
| 7 Days | - | - | - | - | - | - | - |
| 14 Days | 2.3 | 2.3 | 2.3 | 2.5 | 2.5 | 1.75 | 1.75 |
| 1 Months | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 2 | 2 |
| 2 Months | - | - | - | - | - | - | - |
| 3 Months | 4 | 4 | 4 | 3.75 | 3.75 | 2.5 | 2.5 |
| 6 Months | 4.25 | 4.25 | 4.25 | 4 | 4 | 3 | 3 |
| 1 Years | 5.5 | 5.5 | 5.5 | 5.25 | 5.25 | 3.75 | 3.75 |
| Above 2Yrs | - | 6 | 6 | 5.75 | 5.75 | 3.75 | 4 |
| Whole Mean | 3.89 | 4.19 | 4.19 | 4.04 | 4.04 | 2.68 | 2.71 |
| Fixed Deposit Mean | 3.87 | 4.23 | 4.23 | 4.09 | 4.09 | 2.79 | 2.83 |
| Std. Deviation | 0.63% | | | | | | |

Source: Banking and Financial Statistics, No: 39-47, NRB

From table 4-3 it is clear that the interest rate on deposit of HBL is in both increasing and decreasing trend. The whole average interest rate is 3.89% in 2002 but it was 4.19%, 4.19%, 4.04%, 4.04%, 2.68% and 2.71% in FY 2003, 2004, 2005, 2006, 2007 and 2008 respectively. It shows that the average interest rate is in increasing trend during FY 2002 to 2003 and it remains constant at 2004 and decreased at 2005 and constant at 2006, then again decreased at 2007 then slightly increased at 2008. Similarly the average fixed deposit rate is 3.87%, 4.23%, 4.23%, 1.09%, 4.09%, 2.79% and 2.83% in FY 2002, 2003,

2004, 2005, 2006, 2007 and 2008 respectively. It shows same trend of average interest rate. This phenomenon can be portrayed in the graph as figure no 4-10.

Figure No 4-4:

Interest Rate of HBL on Deposits during Different FY

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

Table No 4-4:

Relationship between Interest Rate and Deposit amount of HBL

| Year (1) | Saving Deposit Interest Rate (2) | Saving Deposits Amounts (3) | Fixed Deposit Interest Rate(4) | Fixed Deposit Amounts (5) |
|-------------|---|--------------------------------|-----------------------------------|------------------------------|
| 2002 | 4 | 9102.8 | 3.87 | 6044.9 |
| 2003 | 4 | 10840.8 | 4.23 | 5880.7 |
| 2004 | 4 | 11719.7 | 4.23 | 6043.7 |
| 2005 | 3.75 | 12852.8 | 4.09 | 6364.3 |
| 2006 | 3.75 | 14582.4 | 4.09 | 6350.2 |

| | | | | | | |
|------------------------------|---------------------|-----------------|---------------------|-----------------|-----------------|---------------|
| 2007 | 2 | 15784.7 | 2.79 | 8201.1 | | |
| 2008 | 2 | 17935 | 2.83 | 6423.9 | | |
| Correlation | $r_{23} = -0.8573$ | | $r_{45} = -0.7354$ | | | |
| Coefficient of determination | $r^2_{23} = 0.7350$ | | $r^2_{45} = 0.5407$ | | | |
| t-statistic | t-cal= 3.724 | t-tab= 2.571 | Significant | t-cal= 2.427 | t-tab= 2.571 | Insignificant |

Source: Banking and Financial Statistics, No: 39-47, NRB

The table 4-4 shows the amount of saving deposit and its interest rate as well as amount of fixed deposit and its interest rate for seven fiscal year. The table indicates that, in one hand deposit rates are declining where as in other hand deposit amount is increasing in each fiscal year. This suggests that interest rate and deposit amount may have negative relationship, i.e. when one variable is found to be increased, other variable is found to be decreased and vice versa. This situation can be revealed in graph as figure no 4-5 in following ways:

Figure No 4-5: Deposit Amount of HBL during different FY

The graph 4-5 shows saving deposit amount is continuously rising each year but fixed deposit amount is seems to grow each year with some fluctuation. It means that there is rise and fall for fixed deposit amount. Similarly the interest rate of fixed deposit and saving deposit can also be shown on figure 4-6 as:

Figure No 4-6:
Interest Rates of HBL on Saving and Fix Deposit

To quantify the exact relationship between interest rate and deposit amount, it is necessary to calculate the co-relation coefficient. The correlation coefficient of saving deposit amount and its interest rate is -0.8573. It means that these two variables have very high negative relationship. Though the two variables don't have direct relationship but correlation coefficient tells that increase in one variable result the decrease in other variables. The correlation coefficient for saving deposit rate and amount is -0.8573 ($r_{23} = -0.8573$), which is very high negative correlation. The case is similar to fixed deposit also. The correlation coefficient for fixed deposit rate and amount is -0.7354 ($r_{23} = -0.7354$), which is also very high negative correlation. Therefore for both saving and fixed deposit, the case is against the substitution effect. The coefficient of determination of correlation coefficient of saving deposit is 0.735 ($r^2_{23} = 0.735$) which indicates that the relation between deposit and interest rate is tied up to the level of 73.5% and remaining other percentage by other factors. In same manner for fixed deposit the value of coefficient of determination is 0.5407.

The value of t-statistics for saving deposit and saving interest is found to be -3.724 ($t_{cal} = 3.724$). The tabulated value for this condition at 5% level of significance with 5 degree of freedom is 2.571. It means that in this case t-calculated is greater than t-

tabulated. So alternative hypothesis is accepted, which means that there is significant correlation between saving deposit and interest rate. Similarly for fixed deposit, the calculated value for t is -2.426 (t-cal = 2.426). This value is less than t-tabulated. So in this case the magnitude of correlation coefficient is not significant. It means H_0 hypothesis is accepted.

Thus in the case of saving deposit it is clear that there is no substitution effect & fixed deposit, there is substitution effect in the context of HBL.

4.2.3 Everest Bank Limited (EBL)

The general structure of deposit interest rate of Everest Bank Limited (EBL) is show below on the table.

Table no 4-5:

Interest rate structure on deposit of EBL as on Mid-July

| Deposit | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|----------------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| Savings | 5.25 | 5.25 | 5.25 | 4.5 | 3.25 | 3.25 | 3 |
| Fixed | | | | | | | |
| 7 Days | - | - | - | - | - | - | - |
| 14 Days | 3 | 3.5 | 3.5 | 3 | 2.25 | - | - |
| 1 Months | 4 | 4.25 | 4.25 | 3.5 | 2.25 | - | 2.75 |
| 2 Months | - | - | - | - | - | - | 2.75 |
| 3 Months | 4.5 | 4.75 | 4.75 | 4 | 2.5 | 3 | 3 |
| 6 Months | 5.5 | 5.25 | 5.25 | 5 | 3 | 3.5 | 3.5 |
| 1 Years | 6.25 | 6 | 6 | 5.5 | 3.5 | 4 | 4 |
| Above 2Yrs | 6.75 | 6.25 | 6.25 | 6 | 4 | 4.5 | 4.5 |
| Whole Mean | 5.04 | 5.04 | 5.04 | 4.5 | 2.96 | 3.65 | 3.36 |
| Fixed Deposit | 5 | 5 | 5 | 4.5 | 2.92 | 3.75 | 3.42 |

| | | | | | | | |
|-----------------------|-------|--|--|--|--|--|--|
| Mean | | | | | | | |
| Std. Deviation | 0.82% | | | | | | |

Source: Banking and Financial Statistics, No: 39-47, NRB

The table 4-5 portrays the interest rate of EBL on saving deposit and fixed deposits. The interest rate on deposit is fluctuated, means both on increasing and decreasing trend. But the tendency towards decrement is similar to HBL because interest rates remain increase, constant and decrease during the various FYs. In the seven years fiscal periods, the interest rate is fluctuate. This can be shown clearly if average of all interest rate is taken. The average interest rate for whole (both fixed and saving) account is 5.04%, 5.04%, 5.04%, 4.5%, 2.96%, 3.65% & 3.36% for the year 2002, 2003, 2004, 2005, 2006, 2007 & 2008 respectively. This tendency can be exhibited in the pictorial form as in figure no 4-7 as follows.

Figure No 4-7: Interest Rate of EBL on Deposits during Different FY

The figure 4-7 shows that the interest rate is on constant for previous first three fiscal year periods, slowly decreasing in 2005, highly decreasing in 2006 and then on increasing trend.

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

Table No 4-6:

Relationship between Interest Rate and Deposit amount of EBL

| Year (1) | Saving Deposit Interest Rate (2) | Saving Deposits Amounts (3) | Fixed Deposit Interest Rate(4) | Fixed Deposit Amounts (5) | | |
|-----------------|---|--------------------------------|-----------------------------------|---------------------------------|-----------------|-------------|
| 2002 | 5.25 | 1733.3 | 5 | 2694.6 | | |
| 2003 | 5.25 | 2758 | 5 | 2803.4 | | |
| 2004 | 5.25 | 3730.7 | 5 | 2914.1 | | |
| 2005 | 4.5 | 4806.9 | 4.5 | 3444.5 | | |
| 2006 | 3.25 | 6929.2 | 2.92 | 4298.2 | | |
| 2007 | 3.25 | 9018 | 3.75 | 5658.7 | | |
| 2008 | 3 | 11883.9 | 3.42 | 6598 | | |
| R | $r_{23} = -0.9304$ | | $r_{45} = -0.7802$ | | | |
| R ² | $r^2_{23} = 0.8656$ | | $r^2_{45} = 0.6087$ | | | |
| t- statistic | t-cal= 5.675 | t-tab= 2.571 | Significant | t-cal= 2.789 | t-tab= 2.571 | Significant |

Source: Banking and Financial Statistics, No: 39-47, NRB

The table 4-6 also shows both deposit amount are in increasing trend though the interest rate of both of them is in declining trend. It means interest rate and deposit amount have inverse relationship. But to find exact quantity of inverse relationship it is necessary to compute the correlation coefficient. Prior to this it is helpful if the data are presented on graph no 4-8.

Figure No 4-8:

Deposit Amount of EBL during different FY

The graph shows that EBL collected more funds on fixed deposit than saving deposits in last seven FYs except 2002 & 2003. But this case was opposite in other banks. Similarly the relationship of saving interest rate and deposit interest rate can be shown on figure no 4-9 as follow.

Figure No 4-9:

Interest Rates on Saving and Fixed Deposit of EBL

If the excel sheet is used to compute the correlation coefficient, then the value for correlation between saving deposit and interest rate is -0.9304 ($r_{23} = -0.9304$). This is high degree of negative correlation. It means that during the last seven fiscal years, there was sharp increase in saving deposit amount even though there was decline in saving interest rates. The coefficient of determination $r^2_{23} = 0.8656$. Similarly the calculated value for t is 5.675 for saving account. The value of tabulated t at 5 d.f. and 5% level of significance is only 2.571. So for saving account $t\text{-cal} > t\text{-tab}$, and hence

alternative hypothesis is accepted. It means that there is significant relationship between two variables (deposit amount and interest rate).

In same manner for fixed deposit, the value of correlation coefficient is $r_{45} = -0.7802$, which indicates that the two variables have very high negative relationship. In other words, when increment occurs on one variable occur then there occur decrement on other variables. The coefficient of determination $r^2_{24} = 0.6087$. To identify the significance or insignificance of this correlation, it is necessary to calculate the value of t-statistics. The calculated value of t is 2.789. Similarly the tabulated value for t is 2.571, which is less than calculated t. As a result null hypothesis is rejected and alternate hypothesis is accepted. It means that the correlation coefficient is highly significant. Thus from the both study it reveals that substitution effect is not applicable for EBL.

4.3 Analysis of Lending and Interest Rate:

This is second area of the analysis where mainly the relationship between lending interest rate and its effect upon lending amount is measured. Generally, when there is higher interest rate (esp. lending or credit rate) in the economy, people normally borrow lesser amount than the period when lending interest rate is low. According to theory, when there is low lending rate, then there should be higher amount of borrowing. Higher amount of borrowing indicates higher investment in the country or higher transaction in trade. This is necessary for the growth of the economy. So this study tries to explore the relationship between lending rate and lending amount in Nepalese context.

4.3.1 NABIL Bank Limited (NABIL):

The sector where NABIL grant its credit during last seven FYs and their corresponding interest rate, average interest rate and lending amount are presented in the table 4-7 below.

Table 4-7:

Lending Rate of NABIL on Different Sectors during Seven FYs.

| Sector | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---------------|--------------|---------------|--------------|--------------|--------------|--------------|
| Overdraft | - | - | - | - | - | - | - |
| Export Credit | 11.25 | 11 | 11 | 11 | 11 | 10.5 | 10.5 |
| Import LC | 11.5 | 11 | 11 | 11 | 11 | 10.5 | 10.5 |
| HMG Bond | 8 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| BG/CG | 9.5 | 9 | 9 | 9 | 9 | 7.5 | 7.5 |
| Other Guarantee | 10.5 | 10 | 10 | 10 | 10 | 8.5 | 8.5 |
| Industrial Loan | - | - | - | - | - | - | - |
| Commercial Loan | - | - | - | - | - | - | - |
| Priority Sector Loan | 13.5 | 13 | 13 | 12 | 12 | 11 | 11 |
| Poorer Sector Loan | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| Term Loan | 13.25 | 13 | 13 | 13 | 13 | 12 | 12 |
| Working Capital | 12.5 | 12 | 12 | 12 | 12 | 11.5 | 11.5 |
| Hire Purchase | 13 | 12 | 12 | 12 | 12 | 12 | 12 |
| Others | 13.5 | 13 | 13 | 13 | 13 | 12 | 12 |
| Average Int. Rate(1) | 11.41 | 10.95 | 11 | 10.91 | 10.86 | 10.18 | 10.18 |
| Lending Amount(2) | 7072 | 7996.9 | 8635.1 | 11078 | 13021.3 | 15657.1 | 21514.6 |
| Correlation (r_{12}) | -0.9024 | | | | | | |
| Coefficient of determination (r_{12}^2) | 0.8143 | | | | | | |
| t-statistics | t-cal = 4.683 | | t-tab = 2.571 | | Significant. | | |

| | |
|-----------------------|-------|
| Std. Deviation | 0.42% |
|-----------------------|-------|

Source: Banking and Financial Statistics, No: 39-47, NRB

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

According to table 4-7 it shows that interest rate on lending on different area are in declining stage. The table shows that the maximum interest rate is 13.5% in FY 2002 and, minimum rate is 7.5% on FY 2008. This shows that the interest rate was decline drastically during the seven FYs periods. Generally the productive sector loan rate (like commercial loan, industrial loan, priority sector loan, working capital rate and so on) decline less in magnitude than non-productive sector loan like overdraft, loan against government bond, BG/CG rate and so on. According to theory, in order to induce the investment in the country or expansion of trade, the productive sector loan should be available at cheaper rate. But the figure shows that these sectors loan were some what costlier than other non productive loan.

If the average of each fiscal year is taken, then it shows average lending interest rate was 11.41% (2002), 10.95% (2003), 11% (2004), 10.91% (2005), 10.86% (2006), 10.18% (2007) and 10.18% (2008). The standard deviation for average interest rate was 0.42, which shows the deviation from mean return. The average rate is also in decreasing trend except in the period of 2004. The decreasing tendency was not smooth. It means the rate declined each year with different rate. In preceding year the declination was quite fast where as the declining tendency was little in later year. This concludes that interest rate on lending is also in decreasing tendency for past few years. With harmony to interest rate, the lending amount of NABIL is also seen to be in decreasing tendency but with some fluctuation. These can also be present in figure no 4-10 and 4-11.

Figure no 4-10:

Lending Amount Of NABIL During Different FYs.

Figure no 4-11:

Average Lending Rate of NABIL during Different FYs

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

From table 4-7 the correlation coefficient (simple correlation) between lending rate and lending amount (r_{12}) is -0.9024. According to our classification, this negative correlation is “moderate degree” correlation. In this case it is clear that interest rate on lending & lending amount has inverse relationship. It means they move in opposite direction i.e. increase in lending rate result decrease in total lending amount. This situation matches with the actual theory. According to the theoretical concept of lending rate and lending amount, people prefer or use more money when the market interest rate is low in the market. So the case is true for NABIL also. The simple determination of correlation

coefficient (r_{12}^2) is 0.8143. When total lending amount is taken as dependent variable and lending rate as independent variables, then 81.43% of total variation in dependent variable is explained by lending rate and remaining percentage is due to the effect of other variables in the economy. Test of significance of correlation coefficient between lending rate and lending amount also verify the fact. The calculated value of t-statistics is 4.683 (t-cal = 4.683). This value is greater than tabulated value, t-tab = 2.571 with level of significance 5% and d.f. 5. In this condition, alternative hypothesis is accepted and H_0 is rejected. It means that there is highly significant correlation between the two variables. In other words their relation is significant. That is the inverse relation shown by two variables lending amount and lending rate is strong. The increase in demand of lending amount is due to the decrease in lending rate. Therefore, according to t- statistics the lending rate is also another strong as well as important factor that shape the lending amount. In conclusion, the inverse relationship between lending rate and lending amount is exactly applicable for NABIL in accordance with theory.

4.3.2 Himalayan Bank Limited (HBL):

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

Table 4-8:

Lending Rate HBL on Different Sectors during Seven FYs.

| Sector | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|-----------------|-------|-------|-------|-------|-------|------|------|
| Overdraft | 13.75 | 13.25 | 13.25 | 12 | 12 | 10 | 10 |
| Export Credit | 9.5 | 9.5 | 9.5 | 8.75 | 8.75 | 8.75 | 8.75 |
| Import LC | 12.75 | 12.25 | 12.25 | 11.75 | 11.75 | 9.5 | 9.5 |
| HMG Bond | 8 | 8 | 8 | 6 | 6 | 6.5 | 6.5 |
| BG/CG | 10.5 | 10.5 | 10.5 | 9.25 | 9.25 | 8 | 8 |
| Other Guarantee | 10.5 | 10.5 | 10.5 | - | - | - | - |
| Industrial Loan | 13.5 | 13 | 13 | 12.75 | 12.75 | - | - |

| | | | | | | | |
|--|----------------|----------------|----------------|--------------|----------------|--------------|----------------|
| Commercial Loan | 13.75 | 13.25 | 13.25 | 12.5 | 12.5 | - | - |
| Priority Sector Loan | 13 | 13 | 13 | 12.25 | 12.25 | 10 | 10 |
| Poorer Sector Loan | 8.5 | 8.5 | 8.5 | 8.25 | 8.25 | 8.25 | 8.25 |
| Term Loan | 13.5 | 13 | 13 | 11.75 | 11.75 | 10.5 | 10.5 |
| Working Capital | 13.25 | 13 | 13 | - | - | - | - |
| Hire Purchase | 13 | 13 | 13 | 11.5 | 11.5 | 9 | 9 |
| Others | 16.25 | 15.75 | 15.75 | 13.5 | 13.5 | 12 | 12 |
| Average Int. Rate(1) | 12.13 | 11.89 | 11.89 | 10.85 | 10.85 | 9.25 | 9.25 |
| Lending Amount(2) | 9673.5 | 10894.2 | 13081.7 | 13245 | 15515.7 | 17672 | 19985.2 |
| Correlation (r_{12}) | -0.2184 | | | | | | |
| Coefficient of determination(r_{12}^2) | 0.0477 | | | | | | |
| t-statistics | t-cal = 0.5004 | t-tab = 2.571 | Insignificant. | | | | |
| Std. Deviation | 1.13% | | | | | | |

Source: Banking and Financial Statistics, No: 39-47, NRB

The table 4-8 shows the interest rate of HBL on lending on seven fiscal years granted in different sectors. HBL lending rate was somewhat more than NABIL. The maximum interest rate quoted by the HBL during seven FYs was 16.25% on “other” categories. The interest rate of HBL is also in decreasing trend. But the decreasing magnitude is high. The average interest rate was 12.12, 11.89, 11.89, 10.85, 10.85, 9.25 and 9.25 in 2002, 2003, 2004, 2005, 2006, 2007 and 2008 respectively. Conversely, the lending amount of HBL is seen to be in increasing trend. With compare to 2002 lending, lending of 2008 is two times more. So it can be said that lending of HBL was expanded rapidly within that

seven fiscal periods. These phenomenon shows that lending interest rate and lending amount have inverse relationship.

To quantify this relationship, it is necessary to calculate correlation coefficient and t-statistics. But prior to this it is fruitful if the trend of lending interest rate and lending amount is shown in the figure as in figure no 4-12.

Figure no 4-12:

Lending Amount Of HBL During Different FYs.

Figure no 4-13: Average Lending Rate of HBL during Different FY

The figure 4-13 shows that interest rate of lending falls slowly up to FY 2004. It falls from average 12.13% to average 11.89%. But after FY 2004, the falling speed was high.

It falls from average 11.89 to 10.85. Then it remains constant in 2006. Again it falls rapidly, from average 10.85 to 9.25. Then again it remains constant in 2008.

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

The correlation coefficient of HBL between lending amount and lending rate is -0.2184 ($r_{12} = -0.2184$). It is low degree negative correlation. It indicates that increment in one variable result the decrement in other variables or vice versa. In this case decrease in lending interest rate increases the lending amount. People preferred more credit from the HBL when bank reduced the lending interest rate. This is similar with the saying of theory. Similarly the coefficient of determination between two variable (r^2_{12}) = 0.0477. It means that the relationship between dependent variable and independent variable is defined up to the extent of 4.77%. In other words, the increase in lending amount by decrease in interest rate is defined up to the extent of 4.77% where as remaining percentage is due to other factors.

Similarly the t-statistics for HBL is 0.5004 (i.e. t-cal = 0.5004). The tabulated value at 5% level of significance with 5 d.f. is 2.571. Comparing the t-tab and t-cal, it is clear that t-cal < t-tab, so null hypothesis is accepted and alternative hypothesis is rejected. It means that the relation shown by correlation coefficient is highly insignificant. Though the correlation coefficient shows that these two variables have moderate level of correlation but t-statistic verify that their relation is insignificant. In conclusion the inverse relationship between lending rate and lending amount is not exactly applicable for HBL. So it is clear that the increase in lending amount is not significantly due to decrease in lending interest rate.

4.3.3 Everest Bank Limited (EBL):

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

Table 4-9:

Lending Rate EBL on Different Sectors during Seven FYs.

| Sector | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|----------------|---------------|---------------|---------------|----------------|----------------|----------------|
| Overdraft | 13.5 | 12.5 | 12.5 | 11.5 | 11 | 11 | 11 |
| Export Credit | 10.5 | 10 | 10 | 8.5 | 8 | 8 | 8 |
| Import LC | 11.75 | 11.75 | 11.75 | 10 | 10 | 10 | 10 |
| HMG Bond | 8 | 8 | 8 | 6.5 | 6 | 6 | 6 |
| BG/CG | 11 | 10.5 | 10.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| Other Guarantee | - | - | - | - | - | - | - |
| Industrial Loan | 13.5 | 13 | 13 | 12 | 11 | 11 | 11 |
| Commercial Loan | 13.5 | 12.5 | 12.5 | 11.5 | 11 | 11 | 11 |
| Priority Sector Loan | 13.5 | 13 | 13 | 12 | - | - | - |
| Poorer Sector Loan | 11 | 11 | 11 | 11 | 10 | 10 | 10 |
| Term Loan | 13.5 | 13.5 | 13.5 | 12 | 11 | 11 | 11 |
| Working Capital | 13.5 | 12.5 | 12.5 | 10.5 | 11 | 11 | 11 |
| Hire Purchase | 13.5 | 13 | 13 | 12 | 7 | 10.5 | 10.5 |
| Others | 13.5 | 13.5 | 13.5 | 12 | 11 | 11 | 11 |
| Average Int. Rate(1) | 12.33 | 11.9 | 11.9 | 10.62 | 9.63 | 9.92 | 9.92 |
| Lending Amount(2) | 3696.6 | 5030.9 | 6116.6 | 7914.4 | 10124.2 | 14059.2 | 18814.3 |
| Correlation (r_{12}) | -0.8174 | | | | | | |
| Coefficient of determination (r_{12}^2) | 0.6681 | | | | | | |

| | | | |
|-----------------------|---------------|---------------|--------------|
| t-statistics | t-cal = 3.173 | t-tab = 2.571 | Significant. |
| Std. Deviation | 1.02% | | |

Source: Banking and Financial Statistics, No: 39-47, NRB

The table 4-9 shows the lending interest rate structure of EBL on seven FYs on different sectors. From table it is clear that the interest rates of EBL are in falling stage. During the first phase of FY the interest rate fell slowly. But in later year the falling speed was high. This phenomenon can be seen clearly with the study of average interest rate. The average interest rate for FY 2002, 2003, 2004, 2005, 2006, 2007 and 2008 are 12.33%, 11.9%, 11.9%, 10.62%, 9.63%, 9.92% and 9.92% respectively. The average interest rate shows that the interest fell low percentage gap during the first phase and later on fell with high gap. In this bank also, lending interest of non productive loan falls more than lending interest of productive sector loan. In same manner, for lending amount, the lending amount of EBL increased each year. During the last FY the lending amount rises by 6 times. This is very significant figures among these aforementioned sample banks. This shows that the lending amount and interest have negative relationship. The figure for changing trend of interest rate and lending amount is given on figure no 4-14 and figure no 4-15.

Figure no 4-14:Lending Amount Of EBL During Different FYs.

Figure no 4-15:

Average Lending Rate of EBL during Different FY

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

The correlation coefficient of EBL between lending amount and lending rate is -0.8174 ($r_{12} = -0.8174$). It is high degree negative correlation. It indicates that increment in one variable result the decrement in other variables or vice versa. Similarly the coefficient of determination between two variable ($r^2_{12} = 0.6681$). It means that the relationship between dependent variable and independent variable is defined up to the extent of 66.81%. The remaining percentage is due to other factors.

Similarly the calculate value for t is 3.1727 (i.e. $t\text{-cal} = 3.1727$). The tabulated value of t-statistics at 5% level of significance with 5d.f. is 2.571. Comparing the t-tab and t-cal, it is clear that $t\text{-cal} > t\text{-tab}$, so alternative hypothesis is accepted and null hypothesis is rejected. It means that the relation shown by correlation coefficient is highly significant. That is the inverse relation shown by two variables – lending rate & lending amount – is strong. In conclusion the inverse relation of EBL on two variables is accordance with theory.

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

Another variable that affects the interest rate in the economy is the inflation. In general condition, inflation and interest rate have positive effect. It means that, when inflation increases in the economy, the interest rate also increases. On this ground, different theory

has been propounded like Fisher effect, Harrod-Keynes effect and so on. This all phenomenon have been already explained in the chapter two. To measure the actual relationship, the prevailing situation of each bank is going to observe.

4.4.1 NABIL Bank Limited (NABIL):

The interest rate on deposit, interest rate on lending of NABIL and inflation of the country during the seven FYs were tabulated on table 4-10.

Table no 4-10:

Inflation Rate and Interest Rate of NABIL

| Fiscal Year | CPI (1) | Inflation (2) % | Deposit Rate(3) | Lending Rate (4) |
|-----------------------------------|------------------------------------|----------------------------|------------------------------|-------------------------|
| 2002 | 142.1 | 2.9 | 3.88 | 11.41 |
| 2003 | 148.9 | 4.8 | 3.36 | 10.95 |
| 2004 | 154.8 | 4.0 | 3.18 | 11.00 |
| 2005 | 161.8 | 4.5 | 2.68 | 10.91 |
| 2006 | 174.7 | 8.0 | 3.32 | 10.86 |
| 2007 | 185.9 | 6.4 | 3.21 | 10.18 |
| 2008 | 200.2 | 7.7 | 3.54 | 10.18 |
| Correlation coefficient. r_{23} | | -0.0591 | Coefficient of Determination | 0.0035 |
| Correlation coefficient. r_{24} | | -0.7424 | Coefficient of Determination | 0.5511 |
| t-statistics | t-cal (Deposit) =0.1324 | t-tab = 2.571 | Insignificant | |
| | t-cal (Lending) =2.478 | t-tab = 2.571 | Insignificant | |

Source: NRB, Research Department

Note: The average interest rate of deposit and lending is taken from “Whole Mean” and “average lending rate” respectively. (For this case, values are taken from table 4-1 and table 4-7)

From table 4-10 it is clear that the inflation rate during the last seven FYs was in fluctuating trend. Though it seems to increase but it has some variation. The inclining inflation, the interest rate of both lending and deposit are seems to be declining. The relationship among these three elements can be portrayed in the figure no 4-16 as follows.

From figure no 4-16, it is clear that during the FY 2002 the inflation rate, 2.9%, was less than deposit interest rate, 3.88%. This inflation rate increases to 4.8% during 2003 and decreases to 4% during 2004, then after increase up to 2006 to 8% again decreases to 6.4% during 2007 & now increases to 7.7% during 2008. These all indicates that the actual earning or real rate or return for the deposit holder was negative. In those periods, when inflation rate exceed the deposit rate, the deposit holder loosed their income rather than earn. But for the case of lending rate, it was very much higher than the inflation rate. So bankers don't lose their income as compare to deposit holder. Due to this the interest spread between the deposit and lending was very high during the first part of the seven FYs. During all FYs, depositor's real return was negative because inflation rate was higher than average deposit rate except in 2002. In 2002, depositor's real return was positive because average deposit rate was higher than inflation rate. During all FYs, lending rate was higher than inflation rate.

Figure No 4-16:

Inflation Rate, Deposit Rate and Lending Rate of NABIL

If correlation coefficient of between deposit and inflation is taken, the value of r is -0.0591 i.e. $r_{23} = -0.0591$. It is negative correlation. It indicates that increment in one variable result the decrement in other variables or vice versa. Similarly the coefficient of determination between two variable (r^2_{23}) = 0.0035. It means that the relationship between dependent variable and independent variable is defined up to the extent of 0.35%. The remaining percentage is due to other factors.

In order to verify the strong ness or weakness of relationship, calculation of t-statistics is necessary. The calculated value of t for given correlation coefficient is 0.1324. The tabulated value for it with 5% level of significance with 5d.f. is 2.571. Here in this case tabulated value of t is greater than calculated value of t . In such case, alternative hypothesis is accepted which means that the correlation coefficient between deposit and inflation is not significance. In other words, the deposit rate of NABIL is not correlated with the inflation rate and movement in inflation rate does not affect the interest rate on deposit significantly.

In same manner, the correlation between lending rate and inflation is found to be -0.7424. ($r_{24} = -0.7424$). This is also moderate level correlation. It means the two variables move in same direction but not in similar manner. Their movement is weak. In order to verify the significance of correlation coefficient, t-statistic is calculated. The calculated value of

t is 2.478 and tabulated value is 2.571. Here the case is similar with deposit. It means that, whatever the correlation coefficient reveals for the relationship of two variables, but the two variables are not significantly correlated.

This concludes that fisher effect is not practically applicable for NABIL.

4.4.2 Himalayan Bank Limited (HBL):

The interest rate on deposit, interest rate on lending of HBL and inflation of the country during the seven FYs were tabulated on table 4-11.

The table 4-11 shows that the interest rate of deposit was fallen below the inflation rate on FY 2003, 2006, 2007 and 2008. At FY 2005, the depositor gets the interest rate nearly equal to the inflation rate. It means that during these periods, the depositor's actual earning position didn't increase. Except FY 2002 & 2002, the depositor's real return was negative because inflation rate was higher than average deposit rate. Similarly, it is also seen that the lending rate was higher than inflation rate in every FY. But in FY 2008, the inflation rate and lending rate was nearly equal. This situation protects the lender but hurt the borrower. Because nominal rate(market rate) is computed by adding inflation premium to real rate of return. So when inflation rate is greater than market rate then real rate is negative.

Table no 4-11:

Inflation Rate and Interest Rate of HBL

| Fiscal Year | CPI (1) | Inflation (2) % | Deposit Rate(3) | Lending Rate (4) |
|--------------------|----------------|----------------------------|------------------------|-------------------------|
| 2002 | 142.1 | 2.9 | 3.89 | 12.13 |
| 2003 | 148.9 | 4.8 | 4.19 | 11.89 |
| 2004 | 154.8 | 4 | 4.19 | 11.89 |
| 2005 | 161.8 | 4.5 | 4.04 | 10.85 |

| | | | | |
|-----------------------------------|---|----------------------|------------------------------|---------------|
| 2006 | 174.7 | 8 | 4.04 | 10.85 |
| 2007 | 185.9 | 6.4 | 2.68 | 9.25 |
| 2008 | 200.2 | 7.7 | 2.71 | 9.25 |
| Correlation coefficient. r_{23} | | -0.5291 | Coefficient of Determination | 0.2799 |
| Correlation coefficient. r_{24} | | -0.7481 | Coefficient of Determination | 0.5596 |
| t-statistics | t-cal (Deposit) =1.394 | t-tab = 2.571 | Insignificant | |
| | t-cal (Lending) =3.333 | t-tab = 2.571 | Significant | |

Source: NRB, Research Department

The same phenomenon can be expressed by the help of graph 4-17.

Figure No 4-17:

Inflation Rate, Deposit Rate and Lending Rate of HBL

The correlation coefficient between interest rate on deposit an inflation rate, r_{23} is -0.5291 which means that these two variables are negatively correlated. An increment in inflation brings decrement in interest rate on deposit and vice-versa. The coefficient of determination $r_{23}^2 = 0.2779$ means that of the total variation in dependent variable

(deposit interest rate); only 27.79% has been explained by the variation in independent variable (inflation rate). Similarly the t-value for testing the significance of the correlation coefficient is 1.394 which is less than the tabulated t-value for the 5 degree of freedom at 5 percent level of significance, 2.571. Since the calculated value is less than the tabulated value the correlation coefficient is not significant which means that interest rate on deposit of HBL is not correlated with the inflation rate and movement in inflation rates doesn't affect the interest rate on deposit significantly.

Similarly the relationship of interest rate on lending of HBL with inflation has also been examined. The coefficient of correlation between inflation and interest rate on lending, r_{24} is -0.7481 which shows that the variables are negatively correlated. Movement in inflation rate leads movement in interest rate on lending in different direction. The t-value for testing the significance of correlation coefficient is 3.333. Since the calculated t-value is greater than the tabulated t-value for 5 degree of freedom at 5 percent level of significance 2.57, the variables are correlated significantly. This means that the lending rate of HBL is significantly correlated with the inflation rate.

4.4.3 Everest Bank Limited (EBL):

The inflation rate during the last seven fiscal years, deposit rate of and lending rate of EBL are tabulated in table no 4-12.

The table shows the structure of inflation, deposit rate and lending rate. During the seven FYs, inflation rate exceed the deposit rate only on the FY 2006, 2007 and 2008 where inflation rate was 8%, 6.4% and 7.7% and deposit rate was 2.96%, 3.65% and 3.36% respectively. Besides these, in other FYs the deposit rate of EBL exceeded the inflation rate. Similarly for lending rate, in all years, interest rate of lending exceeds the inflation rate. If the value of the table 4-12 is plotted in the graph then it will be seen like figure no 4-18.

Table no 4-12:

Inflation Rate and Interest Rate of EBL

| Fiscal Year | CPI (1) | Inflation (2) % | Deposit Rate(3) | Lending Rate (4) |
|-----------------------------------|-------------------------------|----------------------------|------------------------------|-------------------------|
| 2002 | 142.1 | 2.9 | 5.04 | 12.33 |
| 2003 | 148.9 | 4.8 | 5.04 | 11.9 |
| 2004 | 154.8 | 4 | 5.04 | 11.9 |
| 2005 | 161.8 | 4.5 | 4.5 | 10.62 |
| 2006 | 174.7 | 8 | 2.96 | 9.63 |
| 2007 | 185.9 | 6.4 | 3.65 | 9.92 |
| 2008 | 200.2 | 7.7 | 3.36 | 9.92 |
| Correlation coefficient. r_{23} | | -0.9621 | Coefficient of Determination | 0.9257 |
| Correlation coefficient. r_{24} | | -0.9053 | Coefficient of Determination | 0.8196 |
| t-statistics | t-cal (Deposit) =7.892 | | t-tab = 2.571 | Significant |
| | t-cal (Lending) =4.766 | | t-tab = 2.571 | Significant |

Source: NRB, Research Department

Figure No 4-18:

Inflation Rate, Deposit Rate and Lending Rate of EBL

The correlation coefficient between interest rate on deposit and inflation rate, r_{23} is -0.9621 which shows that there is negative correlation between these two variables. When inflation increases, the interest rate on deposit offered by EBL decreases. The coefficient of determination, r^2_{23} is 0.9257 means that, of the total variation in dependent variable (interest rate on deposit) is explained by the variation in independent variable (inflation rate) to the extent of 92.57% and other variables are responsible for remaining variation. The value of t for testing the significance of the correlation coefficient is 7.892 which is greater than the table value. Since the calculated value is greater than the tabulated value at 5d.f. and 5% level of significance, 2.571, the variables are highly significantly correlated. It is statistically significant. So we can say that change in inflation has significant impact on interest rate on deposit of EBL.

In same manner the correlation coefficient between inflation and interest rate on deposit r_{24} is -0.9053 shows that the relationship is negative. Increase in inflation causes decrease in interest rate on lending. But in similar manner the t-value for testing significance of correlation coefficient (t-cal 4.766) is greater than the tabulated value at 5 d.f and 5% level of significance (t-tab = 2.571). As the calculated value is greater than the tabulated value, the correlation coefficient is significant which means that the variables, interest rate on lending and inflation rate, are correlated.

4.5 Analysis the position of interest rate spread and loan and advance ratios

Interest rate spread is a different between interest rate on lending and interest rate on deposit. Generally banks charge more interest rate on lending than they provide interest on deposit. Similarly loan and advance to total deposit helps us showing the relationship between loans and advances which are granted and the total deposit collected by the bank and also find out how successfully the banks are utilizing their total deposits on loan and advance for profit generating purpose.

4.5.1 NABIL Bank Limited (NABIL)

Position of interest spread and loan and advance ratios of NABIL is given in table 4-13.

Table no 4-13:

Position of Interest rate spread and loan and advance ratios of NABIL

| Year | Interest rate on deposit (X_1) | Deposit amount in Million Rs (X_2) | Interest rate on lending (X_3) | Loan Amount in million Rs (X_4) | Interest rate spread ($X_3 - X_1$) | Loan & advance ratios ($X_4 \div X_1$) |
|------|---------------------------------------|---|---------------------------------------|--|---|---|
| 2002 | 3.38 | 15370.6 | 11.41 | 7072 | 5.53 | 0.46 |
| 2003 | 3.36 | 13437.7 | 10.95 | 7996.9 | 7.59 | 0.595 |
| 2004 | 3.18 | 14098 | 11 | 8635.1 | 7.82 | 0.613 |
| 2005 | 2.68 | 14586.8 | 10.91 | 11078 | 8.23 | 0.759 |
| 2006 | 3.32 | 19348.4 | 10.86 | 13021.3 | 7.54 | 0.673 |
| 2007 | 3.21 | 23342.4 | 10.18 | 15657.1 | 6.97 | 0.671 |
| 2008 | 3.54 | 31915 | 10.18 | 21514.6 | 6.64 | 0.674 |

The above table 4-13 shows a clear picture of interest rate on deposits and lending, deposit amount and lending amount for seven FYs of NABIL as well interest rate spread and total loan & advance ratios. The average spread rate during the period is 5.53, 7.59, 7.82, 8.23, 7.54, 6.97&6.64% in FYs 2002, 2003, 2004, 2005, 2006, 2007 & 2008 respectively. The interest rate spread shows how greater rate charge by NABIL for lending than deposit rate.

From the calculation of loan and advance to total deposit ratios shows that NABIL was able to utilized 46%, 59.5%, 61.3%, 75.9%, 67.3%, 67.1% and 67.4% of total deposited fund on loan and advance for profit generating purpose in FYs 2002, 2003, 2004, 2005, 2006, 2007 and 2008 respectively. Generally greater loan and advance to total deposit ratio implies the better utilization of total deposit fund and vice versa. But from above table, NABIL has not able to better utilized total deposit fund in FYs 2002 and 2003 as compare to other FYs. The table 4-13 can be clarified by the figure 4-19 and 4-20.

Figure No 4-19:

Relationship between deposit rate and lending rate of NABIL

Figure No 4-20:

Deposit amount and loan amount of NABIL during different FYs.

4.5.2 Himalayan Bank Limited (HBL)

Position of interest spread and loan and advance ratios of HBL is given in table 4-14.

Table no 4-14:

Position of Interest rate spread and loan and advance ratios of HBL

| Year | Interest rate on deposit (X_1) | Deposit amount in Million Rs (X_2) | Interest rate on lending (X_3) | Loan Amount in million Rs (X_4) | Interest rate spread ($X_3 - X_1$) | Loan & advance ratios ($X_4 \div X_1$) |
|------|---------------------------------------|---|---------------------------------------|--|---|---|
| 2002 | 3.89 | 18595.2 | 12.13 | 9673.5 | 8.24 | 0.52 |
| 2003 | 4.19 | 21002.8 | 11.89 | 10894.2 | 7.7 | 0.519 |
| 2004 | 4.19 | 22760.9 | 11.89 | 13081.7 | 7.7 | 0.575 |
| 2005 | 4.04 | 24831.1 | 10.85 | 13245 | 6.81 | 0.533 |

| | | | | | | |
|------|------|---------|-------|---------|------|-------|
| 2006 | 4.04 | 26456.2 | 10.85 | 15515.7 | 6.81 | 0.586 |
| 2007 | 2.68 | 29905.8 | 9.25 | 17672 | 6.39 | 0.591 |
| 2008 | 2.71 | 31805.3 | 9.25 | 19985.2 | 6.54 | 0.628 |

The above table 4-14 shows a clear picture of interest rate on deposits and lending, deposit amount and lending amount for seven FYs of HBL as well interest rate spread and total loan & advance ratios. The average spread rate during the period is 8.24, 7.7, 7.7, 6.81, 6.81, 6.39 & 6.54% in FYs 2002, 2003, 2004, 2005, 2006, 2007 & 2008 respectively. The interest rate spread shows how greater rate charge by HBL for lending than deposit rate.

From the calculation of loan and advance to total deposit ratios shows that HBL was able to utilized 52%, 51.9%, 57.5%, 53.3%, 58.6%, 59.1% and 62.8% of total deposited fund on loan and advance for profit generating purpose in FYs 2002, 2003, 2004, 2005, 2006, 2007 and 2008 respectively. Generally greater loan and advance to total deposit ratio implies the better utilization of total deposit fund and vice versa. But from above table, HBL has able to better utilized total deposit fund. The table 4-14 can be clarified by the figure 4-21 and 4-22.

Figure No 4-21:

Relationship between deposit rate and lending rate of HBL

Figure No 4-22:

Deposit amount and loan amount of HBL during different FYs.

4.5.3 Everest Bank Limited (EBL)

Position of interest spread and loan and advance ratios of EBL is given in table 4-15.

Table no 4-15:

Position of Interest rate spread and loan and advance ratios of EBL

| Year | Interest rate on deposit (X ₁) | Deposit amount in Million Rs (X ₂) | Interest rate on lending (X ₃) | Loan Amount in million Rs (X ₄) | Interest rate spread (X ₃ - X ₁) | Loan & advance ratios (X ₄ ÷ X ₁) |
|------|--|--|--|---|---|--|
| 2002 | 5.04 | 5461.1 | 12.33 | 3969.6 | 7.29 | 0.727 |
| 2003 | 5.04 | 6694.9 | 11.9 | 5030.9 | 6.86 | 0.751 |
| 2004 | 5.04 | 8064 | 11.9 | 6116.6 | 6.86 | 0.759 |
| 2005 | 4.5 | 10097.8 | 10.62 | 7914.4 | 6.12 | 0.784 |
| 2006 | 2.96 | 13802.5 | 9.63 | 10124.2 | 6.67 | 0.734 |

| | | | | | | |
|------|------|---------|------|---------|------|-------|
| 2007 | 3.65 | 19097.7 | 9.92 | 14059.2 | 6.27 | 0.736 |
| 2008 | 3.36 | 23976.3 | 9.92 | 18814.3 | 6.56 | 0.785 |

The above table 4-15 shows a clear picture of interest rate on deposits and lending, deposit amount and lending amount for seven FYs of EBL as well interest rate spread and total loan & advance ratios. The average spread rate during the period is 7.29, 6.86, 6.86, 6.12, 6.67, 6.27 & 6.56 % in FYs 2002, 2003, 2004, 2005, 2006, 2007 & 2008 respectively. The interest rate spread shows how greater rate charge by EBL for lending than deposit rate.

From the calculation of loan and advance to total deposit ratios shows that EBL was able to utilized 72.7%, 75.1%, 75.9%, 78.4%, 73.4%, 73.6% and 78.5% of total deposited fund on loan and advance for profit generating purpose in FYs 2002, 2003, 2004, 2005, 2006, 2007 and 2008 respectively. Generally greater loan and advance to total deposit ratio implies the better utilization of total deposit fund and vice versa. From above table, EBL has able to better utilized total deposit fund in all FYs. The table 4-15 can be clarified by the figure 4-23 and 4-24.

Figure No 4-23:

Relationship between deposit rate and lending rate of EBL

Figure No 4-24:

Deposit amount and loan amount of EBL during different FYs.

4.6 Major Findings:

This study is conducted to identify the practical applicability of some of the theories in the context of Nepal that are taught on the University and colleges. With this motive, this study is mainly focused on three objectives. First one is to determine the actual situation of substitution effect in the context of Nepalese financial markets. Similarly, next objective is to determine the relationship between lending rate and corresponding lending amount. And lastly, the next objective is to explore the actual relationship of inflation rate and interest rate.

After presentation and analysis of relevant data of sample banks under study using various analytical tools the three major findings are obtained. They are:

- The analysis of substitution effect for both fixed and saving deposit shows that substitution effect does not work for EBL and saving deposit of HBL. This means that, people are oriented to deposit more amounts even if the interest rates on deposit are falling every year. The increasing deposit amount clarifies this fact. And rest of them NABIL both fixed and saving and fixed deposit of HBL have accordance with theory.
- According to theory, lending interest rate and lending amount should have inverse relationship. From this study, it is found that all sample banks except HBL have

strong relationship as required by theory. The increment in demand of loanable fund for NABIL and EBL is due to the decline in lending rate because they have high value of t-statistics. But for HBL, increase in lending amount is not due to the decrease in lending rate but due to other factors, as it has lower t-calculated value than tabulated value.

- For fixed and saving deposits, it is found that NABIL and HBL have not correlation with inflation rate. Similarly, t-test values are insignificant. This shows that deposit rate and inflation rate are not related significantly though the Fisher theory suggest there should be positive relationship but for fixed and saving deposits of EBL has relationship as required by Fisher's theory. The case is same for lending rate and Inflation rate too except HBL. Lending and inflation of HBL has relationship as required by theory.

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter is last part of the research study which includes all the briefing of the whole study. So it is the important chapter for the research because this chapter is the extracts of all the previously discussed chapters. This chapter consists of mainly three parts: Summary, conclusion and recommendation. In summary part, revision or summary of all four chapters is made. In conclusion part, the result from the research is summed up and in recommendation part, suggestion and recommendation is made based on the result and experience of thesis. Recommendation is made for improving the present situation to the concerned parties as well as for further research.

5.1 Summary

Natural resources of the country Nepal remains unused and unutilized due to the lack of financing and technical know-how. In order to mobilize the limited capital, the government of Nepal adopted the liberalization policy. As result up to now 25 commercial banks, 58 development banks, 12 micro credit development banks, 78 finance companies, 16 saving and co-operatives (Limited Banking) licensed by NRB and 44 non government organization (NGOs) licensed by NRB are established within the financial system of Nepal. Financial system is hoped to develop the economy and help to raise the living standard of the people. Financial intermediaries mobilize the fund by collecting the scattered resources from the savers (household, business or government) and provide the collected funds to the users or investors (i.e. lending collected amount from depositors to borrower). The intermediaries of financial systems sustain by lending the fund on higher interest rate and paying the deposit holder a little interest. It means that such organization survive by making profit through a large interest spread on deposit and lending. The decision made to charge and provide interest on lending and deposit affects the profit position of the organization. Depositors are generally attracted by offering the higher interest rates. Similarly high credit rates de-motivate the investors as a result investment in the country shrinks down. Though there are various factors in the economy that affects the deposit amount and lending amount; interest rate is one of the

major factor that affect deposit and lending amount. With the major objective of showing relationship between deposit rate and deposit amount i.e. substitution effect, lending rate and lending amount, inflation and interest rate, this study is undertaken.

After the liberal policy adopted by the government, NRB slowly loosen the rigid ness to fixed the interest rate that financial intermediaries charge and offer. But time to time, NRB use to issue directives regarding overall performance of the financial institutions. Therefore, in past few years back, banks and other financial institutions get freedom to quote the interest rate on lending and deposit. This creates the competition in the Nepalese economy. In this sense, this study is conducted to identify whether some of the theories of finance and economics are applicable or not in the Nepalese financial markets. These major theories are like substitution effect, fisher effect and inverse relationship between interest rate and lending amount. For this purpose brief introduction about Nepalese economy, interest rate, sample organizations, statement of problem, significance of the study, research hypothesis, and so on are made in the first chapter of this dissertation.

In second chapter, theoretical review as well as review of previous research has been made. Different views about interest, function of interest, theories of interest, factors affecting interest rate and so on are reviewed on that chapter. On the theories of interest, mainly four theories- The Classical Theory, Liquidity Preference Theory, Loanable Fund Theory and Rational Expectancies Theory - are reviewed. Similarly the factor affecting interest rate like default risk, marketability risk, exchange rate risk and so on are explained. Similarly, the in order to identity the relationship of interest rate and inflation, Fisher effect, Harrod-Keynes effect are also studied on the second chapter.

Research design used is mainly analytical. Out of the total financial system, three joint venture banks are chosen for sample purpose; mainly secondary data are used for the analysis. These all are made on third chapter. Lastly on fourth chapter, collected data are presented in tabular and graphic form and analyzed using various statistical tools like mean, standard deviation, correlation coefficient and t-statistics.

5.2 Conclusion

From the presentation and analysis of data; using different financial tools the major findings can be tabulated as follows:

Table No 5-1:

Unified (Integrated) results of all data analysis.

| Particulars | | NABIL | HBL | EBL |
|--|--------------------------------------|--------------|------------|------------|
| Substitution Effect (Deposit and Interest Rate) | r (Saving rate & Deposit Amount) | -0.7044 | -0.8573 | -0.9304 |
| | r (Fixed rate and Deposit Amount) | 0.4792 | -0.7354 | -0.7802 |
| | t-cal (Saving rate & Deposit Amount) | 2.219 | 3.724 | 5.675 |
| | t-cal (Fixed rate & Deposit Amount) | 1.221 | 2.427 | 2.789 |
| Lending and Interest | r (lending) | -0.9024 | -0.2184 | -0.8174 |
| | t-cal (lending) | 4.683 | 0.5004 | 3.173 |
| Inflation and Interest Rate. (Fisher Effects.) | r (inflation & deposit) | -0.0591 | -0.5291 | -0.9621 |
| | r (inflation & lending) | -0.7424 | -0.7481 | -0.9053 |
| | t-cal (inflation & deposit) | 0.1324 | 1.394 | 7.892 |
| | t-cal (inflation & lending) | 2.478 | 3.333 | 4.766 |

- The interest rates on both deposit and lending of all sample banks are found to be in fluctuating trend. But contrary to this, deposit amount and lending amount is increasing every year.
- The saving deposit amount and saving interest rate have negative relationship ranging from -0.7044 to -0.9304. It means that they have highly inverse relationship, if one variable increases, other variable decreases and vice-versa.

This case is against the theory of substitution effect. This may be due to the fact that, in last seven FYs, people accumulated most of their funds on saving accounts though they don't get appropriate interest on it. It may be just because of unavailability of other acceptable investment opportunity, in which a separate study can be made. Similarly, the convenience of using saving accounts provokes the investor to deposit more on saving account. Similarly the excess supply of saving deposit reduces the interest rate of saving account.

- To clarify the above conclusion, the t-statistic of negative correlation between saving deposit amount and saving interest rate is significant except NABIL. It means that they have strong negative relationship. Therefore it is concluded that for saving deposit, there is no substitution effect.
- Analysis of fixed deposit amount and fixed interest rate shows negative relationship except NABIL. The correlation coefficient for NABIL is 0.4792. According to correlation coefficient, the substitution effects occur for NABIL in case of fixed deposit that means fixed rate decrease/increase when interest rate on fixed deposit decrease/increase. But for other two banks – HBL and EBL – the correlation coefficient is negative meaning people deposit more money even if the bank offer the lower yield rate on fixed deposit.
- The correlation coefficient of NABIL for fixed deposit amount and fixed deposit interest rate is positive, the t-statistics clarify that their relationship is not strong. The calculated value of t is found to be less than the tabulated value of t, so t-test indicates that there is no significant relationship between those two variables. Thus the decrease in deposit is not due to the decrease in interest rate but due to the other reasons. Therefore it is concluded that for fixed deposit also, there is no substitution effect at all.
- One of the variables that affect the demand of fund (lending activity) is lending interest rate. Theoretically, there is negative relationship between lending interest rate and lending amount. In this study for the three sample banks, it is found that all sample banks have negative correlation between these two variables. By using correlation tools, it can be inferred that all sample banks inverse relationship as suggest by theory.

- The t-test for correlation coefficient of each sample banks for negative relationship between lending interest rate and lending amount shows that the t value for HBL is insignificant which means that their relationship is not strong i.e. not significant relationship. So Increase in lending amount is not due to the decrease in lending interest rate but due to the other reason. But for other banks the t value is significant meaning that the one of the factor to increase the lending amount is decline in interest rates. So it can be concluded that lending interest rate is also an important factor for expansion or contraction of lending amount.
- The relationship between interest rate on deposit and inflation rate is positive. It ranges from -0.0591 to -0.9621. The correlation coefficient for EBL is statistically significant but correlation coefficient of other sample banks is statistically insignificant. According to Fisher effect, there should be positive correlation between these two variables but the interest rate in Nepalese financial market is affected by inflation rate to some extent only.
- The correlation between interest rate on lending and inflation rate is found to be negative. The correlation coefficient among sample banks lies between -0.7424 to -0.9053. For NABIL, the correlation coefficients are insignificant because its value lies below the tabulated value of t. So it can be said that lending interest rate in Nepalese financial market is affected by inflation only to some extent even though the theory says to exist a positive relationship. The relationship between Inflation and lending of HBL and EBL has accordance with theory.
- The real rate of return is found to be negative in some years. The negative real return indicates that depositor, instead of earning money, they lose their money in real sense, if they deposit in the bank paying certain percentage of interest. This is due to deposit interest rate lower than inflation rate. This condition hurts the depositors.
- During the study period, it is found that, there exist the high spread between deposit interest rate and lending interest rate. In the beginning of the seven FY this spread was large but on later years, the spread declined to some extent. That may be due to competitive financial environment and less availability of investment opportunity.

- 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 lesser in magnitude in comparison to the non productive sector loan

5.3 Recommendations

To fulfill the objectives of this study, related data and ideas are collected from different sources. These data are presented; analyzed and interpreted then conclusions are made. Based on the analysis, interpretation & conclusions, certain recommendation can be made here so that the concerned authorities, future researchers, academicians, bankers can get some insights on the present conditions on above topics. It is considered that this research will fruitful for them to improve the present condition as well as for further research. The major recommendations after this study are:

- ❖ Interest rate on deposit is too low in Nepal. Joint Venture Banks are suggested to increase the interest rate on deposit as far as possible so that the depositors are attracted which helps to generate more capital for the development of the economy. Though this situation reduces their profit opportunities, but it will enhance the economic condition of the country in the long run.
- ❖ The high spread between deposit interest rate and lending interest rate is another factor to be considered. Higher spread merely increases the profit figures of the banks but at the same time it reduces the deposit collection and investment in the country. So the financial institutions are suggested to reduce the interest spread as minimum as possible.
- ❖ Liquidity crises occurred due to low interest rate on deposit as well as high interest rate on lending. As the central bank of the country, NRB has power to specify the range or spread between lending rate and deposit rate. So NRB takes increasing interest rate on deposit policy. So NRB is suggested to strictly apply this policy to financial institutions and regularly monitoring so that the problem of higher gap between two interest rates in the country will be solved.
- ❖ As the key to success for any organization and for good financial system in the country capital and investment is essential, this is possible only by proper

decision making of interest. So all the joint venture banks are suffused to set proper and practical interest rate policy.

- ❖ Though the interest rate in free market is determined by the interplay of demand and supply, the concerned parties who fixed the interest rates are suggested to include the inflation premium as far as possible while fixing the interest rates. If the rate of inflation is not considered & real rate comes out to be negative then depositors may withdraw their money and utilize it on non-productive sectors.
- ❖ While reducing the lending rate, it is suggested to reduce more on productive sectors than non-productive sectors. If not possible then bankers can reduce the rate of all sectors proportionately.
- ❖ Lending institutions are suggested to invest on new areas as well as to introduce competitive customer oriented schemes on lending and borrowing so that more lending and borrowing can be promoted and over liquidity problem may be solved.
- ❖ As NRB's publications are the major sources of collecting the secondary data and information regarding this topic from the experience, it is suggested that NRB should pay special attention to publish detail information on timely manner. The untimely publication of the bulletins handicaps the research workers and students
- ❖ Sample institutions are also suggested to include their interest rate structure in their annual report as well as kindly requested for the co-operation and sincere support to the research students.

BIBLIOGRAPHY

Books

Bhandari, D. R. (2003). *Principle and Practices of Banking and Insurance*. Kathmandu: Asia Publications.

Cheney, J. M. & Moses, E. A. (2003). *Fundamental of Investment*. New York: West Publishing Company

Cooper, S. K. and Fraser, R. D. (1983). *The Financial Marketplace*. California: Addison-Wesley Publishing Company.

Francis, J. C. (2003). *Investment Analysis and Management*. Post Graduate Publications, Eleventh Edition

Gupta, S.C. (2002). *Fundamental of Statistics*. Bombay: Himalayan Publishing House.

Gupta, S.P. (2002), *Statistical Methods*. Educational Publisher, Sultan Chand and Son's: New Delhi

Wolf, H. K. and Pant P.R. (2005). *Social Science research and Thesis writing*. Kathmandu: Buddha Academic publishing and distributors.

Joshi, P.R. (2001). *Research Methodology*. Kathmandu: Buddha Academic Publishers and Distributors Pvt. Ltd

Joshi, S. (2056). *Micro & Macro Economic Analysis*. Katmandu: Taleju Prakashan.

Kohn, M. (1999). *Financial Institutions & Markets*. New York: Tata McGraw Hill Publishing Co. Ltd.

Kothari, C. R., (1994). *Research Methodology, Methods and Techniques*. New Delhi: Vikash Publication House Pvt. Ltd.

Pant, G. D. & Chaudhary, A.K. (1999). *Business Statistics and Mathematics*. Kathmandu: Bhandupuran Prakashan.

Pant, P. R. (2003). *Business Environment in Nepal*. Kathmandu: Buddha Academic Publishers and Distributors Pvt. Ltd.

Radhaswamy, M. and VasuDevan S.V. (1979). *Text Book of Banking*. New Delhi: S.Chand & Company Ltd.

Rose, P. S. (2003). *Money and Capital Markets, Financial Institution and Instruments in a Global Marketplace*. Chicago: Irwin.

Samuelson, P A. & Nordhus, W. D. (2003). *Economics*. New Delhi: Tata Mc Graw Hill Publishing company Limited.

Sharma, P. K. and Chaudhary, A.K (2058). *Statistical Methods*. Kathmandu: Khanal Books Prakashan.

Sharma, P. K. and Silwal D. P. (2058). *Text Book of Business Mathematics and Statistics*. Katmandu: Taleju Prakashan.

Sharpe, W.F., Alexander, G. J., and Bailey, J.V. (2003). *Investments*. New Delhi: Prentice Hall of India Private Limited.

Shrestha, M. K. and Bhandari D. B. (2004). *Financial Markets and Institutions*. Kathmandu: Asmita Books Publishers and Distributors.

Shrestha, S. and Silwal, D. P. (2059). *Statistical Methods in Management*. Katmandu: Taleju Prakashan

Thygerson, K. J. (1992). *Financial Institutions and Capital Markets*. New York: Harper Collings College Publisher.

Vaidhya, S. (2003). *Financial Market and Institutions*. Kathmandu: Taleju Prakashan.

Van H. and Francis, J.C. (1998). *Financial Management and Policy*. New Delhi: Prentice Hall of India Pvt. Ltd.

Weston, J. F. and Copeland, J.E. (1992). *Managerial Finance*. Chicago: The Dryden Press.

Wolff, H.K. and Pant, P.R. (2005) *Social Science Research & Thesis Writing*. Kathmandu: Buddha Academy & Distributors.

Dissertations

Bhandary, D. R. (1978). *“The Impact of Interest Rate Structure on Investment Portfolio of Commercial Banks in Nepal”*. an unpublished MBA thesis, Tribhuvan University

Bhatta, S. (2004). *“Interest Rate and its effect on Deposit and Lending”*. an unpublished M.B.S thesis, T.U.

Dangol, N. (2003). *“The Impact of Interest Rate on Financial Performance of Commercial Banks”*. an unpublished MBS thesis, Tribhuvan University

Kshetry, K. K. (1980). *“Interest Rate Structure and Its Relation with Deposits Inflation and Credit in Nepal”*. An Unpublished M.A thesis, Tribhuvan University

Neupane, M. R. (2008). *“Interest Rate Structure and Its Influence on Deposit and Lending of Joint Venture Banks in Nepal”*. an unpublished MBS thesis, Tribhuvan University

Pokharel, J. (2004). *“Determinants of Interest Rates in Nepalese Financial Markets”*, an unpublished MBS thesis, T.U.

Rajbhandary, N. B. (1978). *“The Interest Rate Structure of Commercial Banks in Nepal”* an unpublished M.A thesis, T.U.

Shrestha, S. K. (1979). *“Interest Rate and its Impact upon Resource Mobilization and Utilization”*. an unpublished M.A thesis, T.U.

Journals, Reports and Articles

Everest Bank Limited, 2007/08. *“Annual Report”*

Himalayan Bank Limited, 2006/07. *“Annual Report”*

Nabil Bank Limited, 2007/08. *“Annual Report”*

Nepal Rastra Bank, 2002 to 2008. *“Banking and Financial Statistics”* No.39 to 47, Mid-July, Kathmandu

Nepal Rastra Bank, 2008/09. *“Current Microeconomic Situation”*. Kathmandu

Nepal Rastra Bank, 2065/065. *“Monetary Policy”*. Kathmandu

Nepal Rastra Bank. 2008. *“Quarterly Economic Bulletin”*. Volume XXXXII, Mid-April, Number III, Kathmandu

Websites

www.bankofengland.co.uk

www.everestbank.com

www.himalayanbank.com

www.nabilbank.com

www.nrb.org.np

ANNEX

Calculation of Average Interest Rate on Deposit of NABIL

| Deposit | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Savings | 4% | 2.75% | 2.75% | 2.25% | 3% | 2% | 2% |
| Fixed | | | | | | | |
| 7 Days | - | - | - | - | - | - | - |
| 14 Days | 2.25 | 2 | 2 | 1.75 | 2.5 | 2.5 | 1.75 |
| 1 Months | 3 | 2.75 | 2.5 | 2.25 | 3 | 3 | 2 |
| 3 Months | 4 | 3.25 | 3 | 2.5 | 3.25 | 3.25 | 4 |
| 6 Months | 4.5 | 3.75 | 3.5 | 2.75 | 3.5 | 3.5 | 4.5 |
| 1 Years | 5.5 | 4.25 | 4 | 3.25 | 4 | 4 | 5 |
| Above 2Yrs | - | 4.75 | 4.5 | 4 | 4 | 4.25 | 5.5 |
| Whole Mean | 3.88 | 3.36 | 3.18 | 2.68 | 3.32 | 3.21 | 3.54 |
| Fixed Deposit Mean | 3.85 | 3.46 | 3.25 | 2.75 | 3.38 | 3.42 | 3.79 |
| Std. Deviation | 0.34% | | | | | | |

$$\text{Mean } (\bar{X}) = \frac{\sum X}{n} = \frac{\sum (3.88 + 3.36 + 3.18 + 2.68 + 3.32 + 3.21 + 3.54)}{7} = 3.31$$

$$\text{Whole Mean} = \frac{\sum (4 + 2.25 + 3 + 4 + 4.5 + 5.5)}{6} = 3.88\%$$

$$\text{Fixed Deposit Mean} = \frac{\sum (2.25 + 3 + 4 + 4.5 + 5.5)}{5} = 3.85\% \text{ and so on.}$$

Calculation of Standard Deviation:

$$S.D(u) = \sqrt{\frac{1}{n} \sum (X - \bar{X})^2} = \sqrt{\frac{0.8042}{7}} = 0.34$$

Standard Deviation for NABIL

| Year | Average Interest(X) | $(X - \bar{X})$ | $(X - \bar{X})^2$ |
|------|---------------------|-----------------|-------------------|
| 2002 | 3.88 | 0.57 | 3.45 |
| 2003 | 3.36 | 0.05 | 0.65 |

| | | | |
|------|------------------|-------|--------------------------------|
| 2004 | 3.18 | -0.13 | 0.129 |
| 2005 | 2.68 | -0.63 | 0.313 |
| 2006 | 3.32 | 0.01 | 0.193 |
| 2007 | 3.21 | -0.10 | 0.547 |
| 2008 | 3.54 | 0.23 | 5.72 |
| | $\sum X = 23.17$ | | $\sum(X - \bar{X})^2 = 0.8042$ |

Credit of NABIL

| Sector | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|----------------------|-------|------|------|------|------|------|------|
| Overdraft | - | - | - | - | - | - | - |
| Export Credit | 11.25 | 11 | 11 | 11 | 11 | 10.5 | 10.5 |
| Import LC | 11.5 | 11 | 11 | 11 | 11 | 10.5 | 10.5 |
| HMG Bond | 8 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| BG/CG | 9.5 | 9 | 9 | 9 | 9 | 7.5 | 7.5 |
| Other Guarantee | 10.5 | 10 | 10 | 10 | 10 | 8.5 | 8.5 |
| Industrial Loan | - | - | - | - | - | - | - |
| Commercial Loan | - | - | - | - | - | - | - |
| Priority Sector Loan | 13.5 | 13 | 13 | 12 | 12 | 11 | 11 |
| Poorer Sector Loan | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| Term Loan | 13.25 | 13 | 13 | 13 | 13 | 12 | 12 |
| Working Capital | 12.5 | 12 | 12 | 12 | 12 | 11.5 | 11.5 |
| Hire Purchase | 13 | 12 | 12 | 12 | 12 | 12 | 12 |
| Others | 13.5 | 13 | 13 | 13 | 13 | 12 | 12 |

| | | | | | | | | |
|--|--------------|--------------|--------------|---------------|--------------|--------------|--------------|--------------|
| Average Rate(1) | Int. | 11.41 | 10.95 | 11 | 10.91 | 10.86 | 10.18 | 10.18 |
| Lending Amount(2) | | 7072 | 7996.9 | 8635.1 | 11078 | 13021.3 | 15657.1 | 21514.6 |
| Correlation (r ₁₂) | -0.9024 | | | | | | | |
| Coefficient of determination (r ₁₂ ²) | 0.8143 | | | | | | | |
| t-statistics | t-cal = 4683 | | | t-tab = 2.571 | | Significant. | | |
| Std. Deviation | 0.42% | | | | | | | |

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

| Year | Lending Rate ₁ | Lending Amt X ₂ | X ₁ X ₂ | X ₁ ² | X ₂ ² |
|------|---------------------------|----------------------------|-------------------------------|-----------------------------|-----------------------------|
| 2002 | 11.41 | 7072.00 | 80691.52 | 130.19 | 50013184.00 |
| 2003 | 10.95 | 7996.90 | 87566.06 | 119.90 | 63950409.61 |
| 2004 | 11.00 | 8635.00 | 94985.00 | 121.00 | 74563225.00 |
| 2005 | 10.91 | 11078.00 | 120860.98 | 119.03 | 122722084.00 |
| 2006 | 10.86 | 13021.30 | 141411.32 | 117.94 | 169554253.69 |
| 2007 | 10.18 | 15657.10 | 159389.28 | 103.63 | 245144780.41 |
| 2008 | 10.18 | 21514.60 | 219018.63 | 103.63 | 462878013.16 |
| Sum | 75.49 | 84974.90 | 903922.79 | 815.32 | 1188825949.87 |

$$r = \frac{7 \times 903922.79 - 75.49 \times 84974.90}{\sqrt{7 \times 815.32 - (75.49)^2} \sqrt{7 \times 1188825949.87 - (84974.90)^2}} = -0.9024$$

Calculation t-statistics for hypothesis test:

Formula to compute t-calculation

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

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

$$t = \frac{-0.9024}{\sqrt{1 - (-0.9024)^2}} \times \sqrt{7 - 2}$$

$$= -4.683$$

$$/ t\text{-cal}/ = 4.683$$

Note: In this dissertation calculation are made by using both calculator (formula) and excel worksheet. So, for all case, every calculation are not shown here.