DETERMINANTS OF NET INTEREST MARGIN IN COMMERCIAL BANKS

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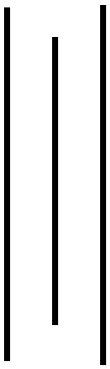

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RECOMMENDATION

This is to certify that the Thesis

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

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DECLARATION

I hereby declare that the work reported in this thesis entitled **"DETERMINANTS OF NET INTEREST MARGIN IN COMMERCIAL BANKS**" submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the Degree of Master of Business Studies (MBS) under the supervision of Associate Prof. **Ruchila Pandey** and **Kamal Adhikari** of Shanker Dev Campus.

……

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Saroj Acharya

Researcher

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ABBREVIATIONS

BOK	:	Bank of Kathmandu
HBL	:	Himalayan Bank Limited
I_D	:	Interest Rate on Deposits
I_{LAO}	:	Interest Rate on Loan and Advances, and Other
Inf.	:	Inflation
NABIL	:	Nabil Bank Limited
NIM	:	Net Interest Margin
NPAT	:	Net Profit after Tax
NRB	:	Nepal Rastra Bank
P.E.	:	Probable Error
r	:	Coefficient of Correlation
SBI	:	Nepal SBI Bank Limited
SCBNL	:	Standard Chartered Bank Nepal Limited
TA	:	Total Assets

CHAPTER – I
INTRODUCTION

1.2 Background of the Study

As financial intermediaries, banks play a crucial role in the operation of most economies. The efficacy of financial intermediation affects economic growth. Crucially, financial intermediation affects the net return to savings, and the gross return for investment. The spread between these two returns mirrors the bank interest margins, in addition to transaction costs and taxes borne directly by savers and investors. This suggests that bank interest margin can be interpreted as an indicator of the efficiency of the banking system. Thus, the recognition of the determinants of net interest margin is a crux for the success of the bank.

A major component of the profit in banking is, still, originated from the interest spread. As a consequence the net interest margin is an important concept in the banking industry for analysis and management. Attention to the net interest margin and sensitivity grows with strong competition, which narrows interest spreads, and by external economic conditions, such as interest rates volatility which may cause bank earnings to become more volatile. The interest margin will persist as an important source of income as a consequence of the cost of information, the preferences for liquidity of investors and lenders, the benefits of professional management and the guarantees offered by banks and banking supervisors to the public.

Generally, high interest margins are taken to be unfavorable because they lead to disintermediation. Low deposit rates represent unattractive returns for maintaining deposit accounts hence discouraging savings. High loan rates, on the other hand, make the cost of funds increasingly prohibitive to potential users thereby inhibiting investment activity. Nevertheless, while high net interest margins have usually been associated with inefficiency, they may also

contribute in the strengthening of a country's banking system. This happens when profits earned from high spreads are being channeled by banks to their capital bases.

On the other hand, very low spreads cannot always be taken positively especially in liberalized but inadequately regulated environments where certain mechanisms ensuring the closure of or intervention in poorly capitalized or unstable banks are absent. If weak banks are allowed to continue operating, there is the likelihood that they will adopt the strategy of offering lower loan rates to gain additional market share or to grow out of their troubles.

Thus, a bank should target to achieve an optimal interest margin for the long run success. For such, it is essential to know the determinants of the interest margin and ensure that the bank is robust enough to tackle the negative impact of both the very high and very low interest margin impacts. The study is also concerned with the determining the determinants of interest margin of the Nepalese Commercial banks and the impact of it on the profitability.

1.2 Statement of the Problem

The trend of opening new banks has been growing in each year. The financial institution of Nepal is the major firm which buttressed the economy and thus is attempting to robust such economy. However, the profitability earned by these banks is not consistent within the recent periods. Greater the amount achieved by the bank in the form of interest income, major source of income, it is assumed that the bank earns high profit. But it should be considered that the interest expenses paid does not increase extremely. Thus, to ameliorate the banking financial performance, along with the increase in profitability, a bank needs to have sound balance between interest income and interest expenses, which ultimately demands optimum interest margin. Consequently, the interest margin of the bank is affected by the various internal and external indicators.

The increase competition in banking industry has strengthened the bargaining power of both the borrower and depositor on the interest rate. This situation has gradually debilitated the banking financial strength. Further, such competition has provoked bank from not meeting the directives issued by NRB in most cases. Further the banks not having sound loan recovery policy are suffering from the increased non-performing assets, which may even jeopardize the existence of such bank. Besides these, the ineffectiveness of the bank to control the increasing overhead expenses has also diminished the required interest margin. There are various factors that are worsening the interest margin ratio of the bank. Hence, it is wise to recognize such determinants of net interest margin and pre-secured from the aggravation made by such determinants.

Hence, to trace out the determinants of net interest margin, to evaluate the impact of net interest margin (NIM) on bank's profitability, and to find out the ways to heal up the banks' suffering from not having optimum net interest margin, the following research questions have been raised out;

a. What relationship exists between bank's net interest margin and its profitability?
b. What are the key determinants of net interest margin?
c. What factors play role in the determination of bank's interest spread?
d. How are bank interest rate margin determined?
e. Are there consistencies in results obtained from secondary data analysis?

1.3 Objectives of the Study

The major objective of this study is to examine the determinants of bank's net interest margin and its effect on the profitability. Besides these, the specific objectives of the study are;

a. To study and analyze the net interest margin and the determinants of NIM.
b. To evaluate the efficiency of bank in generating interest income through mobilizing total assets.

c. To examine the relationship between net interest margin and its determinants.
d. To analyze the effects of net interest margin on banks' profitability.

1.4 Significance of the Study

To success in the long run, the bank needs to have sound net interest margin, since interest income is the major source of income of the bank and interest expense is the major expenses of the bank. The study concentrates on the determinants that affect the profitability of the bank and the overall financial performance. Thus, this study is primarily important to the management of the company to have sound synchronization between interest income and interest expenses.

Further, the study will be equally germane to the borrower of the bank, since the borrower needs to have information of the interest that will be charged on them, and the interest recovery policy of the bank. In addition, the study will be significant to the deposit holders of the bank, because the prime objective of the deposit holders is to gain interest income from their deposit. Finally, the study will be important to the general public and potential investors to examine the financial performance of the bank.

1.5 Limitations of the Study

The study has following major limitation;

a. The study will mainly concentrate on the major determinants of the bank's net interest margin, and thus does not embrace the other financial aspects.
b. The study covers only five fiscal year periods, i.e. from the fiscal year 2004/05 to 2008/09, which may not truly represent the performance of the bank in regard to interest margin.

c. The secondary data of the bank depends totally upon the reliability of the annual reports of the bank, and the primary data fully depends upon the responses obtained through questionnaire.
d. The study covers only five banks, namely SCBNL, NABIL, HBL, BOK & SBI, which may not truly reflect the total population of the banking industry.

1.6 Organization of the Study

For the convenience, the study has been organized mainly into five main chapters;

Chapter –I: Introduction

The first chapter incorporates the background of the study, statement of the problem, objectives of the study, significance of the study and limitations of the study.

Chapter –II: Review of Literature

The second chapter reviews the conceptual framework related to the net interest margin, review of journals and articles, review of thesis, and the research gap ascertained.

Chapter –III: Research Methodology

The third chapter presents the research design to be adopted, population and sample, source of data, and data analysis tools.

Chapter-IV: Data Presentation and Analysis

The collected data from both the secondary and primary sources are tabulated in this section and the analyses have been made. At the end, the chapter presents major findings of the study.

Chapter – V: Summary, Conclusion and Recommendations

The last chapter presents the summary of the whole study, and thus presents conclusion made by reviewing the data analysis. Finally, the study presents recommendations, which might be crucial for the enhancement of the selected banks.

Besides these chapters, the study presents Bibliography and Appendix at the end of the study.

CHAPTER-II
REVIEW OF LITERATURE

This part of the study deals with making theoretical framework. So, it incorporates the review of concepts, review of journals and articles and review of thesis.

2.1 Conceptual Review

The conceptual review includes concept related to interest rate, interest rate risk, interest margin, and its determinants.

2.1.1 Interest Rate

"An interest rate is the rate at which interest is paid by a borrower for the use of money that they borrow from a lender. For example, a small company borrows capital from a bank to buy new assets for their business, and in return the lender receives interest at a predetermined interest rate for deferring the use of funds and instead lending it to the borrower. Interest rates are fundamental to a capitalist society. Interest rates are normally expressed as a percentage rate over the period of one year. Interest rates targets are also a vital tool of monetary policy and are taken into account when dealing with variables like investment, inflation, and unemployment." *(Afanasieff, Lhacer & Nakane; 2002: 43)*

"A more accurate definition of interest is that it is the price of credit, rather than the price of money. Credit is simply borrowed money. If money is borrowed, it must have been lent by somebody else. Expanding the definition of interest is the price of credit, it could be stated as interest is the price of borrowed money paid by the borrower to the lender." *Gischer & Juttner; 2003: 370)*

"It is important to note that there is a difference between the payment of interest and the repayment of the original amount of money borrowed. The amount borrowed is often referred to as the "principal amount", or simply as the principal. If one borrows a sum of money, the lender is entitled to expect two things. Firstly, one will expect repayment of the amount borrowed over an agreed period of time. Secondly, one will expect interest payments on the amount outstanding (still borrowed) during the period of the loan. Repayment of principal amounts borrowed, and interest on those principal amounts are two entirely different things." *(Saunders & Schumacher; 2000: 818)*

2.1.1.1 Interest Rate: A Key to Bank Profit

"The expectation for interest rate movements has important implications for banks' profits. Because the bulk of a bank's income is derived from net interest income (the interest income received on loans, minus the interest expense for borrowed funds), interest rates largely determine how profitable a bank can be. Net interest margin (a bank's net interest income divided by its average assets) is a common measure of a bank's ability to generate profits from its loans. A bank's net interest margin widens or narrows depending on the direction of interest rate movements, the mix of funding sources underlying loans, and the time period until expiration (or duration) of the investment portfolio." *(Martinez & Mody; 2004: 25)*

Unless structured to take advantage of rising rates, falling interest rates have a positive effect on banks for several reasons. One is that net interest margins can expand, at least in the short-term. This is because banks are still earning a higher-than-market yield on loans to customers, while the cost of funds declines more quickly in response to the new, lower rates.

"An interest rate decline also enhances the value of a bank's fixed-rate investment portfolio, since a bond with a higher stated interest rate becomes more valuable as prevailing rates drop. In addition, an environment of

declining rates often stimulates loan demand and reduces delinquency rates, because the cost of credit declines, Of course, not all banks are affected equally by rate decreases. Banks that rely more heavily on borrowed funds than on customer deposits to fund loan growth typically reap greater benefits." *(Angbazo; 1997: 60)*

"Fluctuations in interest rates, while important, don't have an absolute influence over the net interest margins of banks, primarily because banks can adjust in time to such fluctuations. In theory, banks can match the maturities of their assets (loans and investments) and liabilities (deposits and borrowings) so that rates earned and rates paid move more or less in tandem and net interest margins remain relatively stable. In practice, however, banks can and does deviate from a perfectly balanced position which results in risk taking with the objective of earning a reward." *(Barajas, Steiner & Salazar; 1999: 201)*

2.1.1.2 Reasons for Interest Rate Change

"There are various reasons for interest rate change. However, the following are considered as the major reasons for such change;

- **Political short-term gain:** Lowering interest rates can give the economy a short-run boost. Under normal conditions, most economists think a cut in interest rates will only give a short term gain in economic activity that will soon be offset by inflation. The quick boost can influence elections. Most economists advocate independent central banks to limit the influence of politics on interest rates.
- **Deferred consumption:** When money is loaned the lender delays spending the money on consumption goods. Since according to time preference theory people prefer goods now to goods later, in a free market there will be a positive interest rate.
- **Inflationary expectations:** Most economies generally exhibit inflation, meaning a given amount of money buys fewer goods in the future than it will now. The borrower needs to compensate the lender for this.

- **Alternative investments:** The lender has a choice between using his money in different investments. If he chooses one, he forgoes the returns from all the others. Different investments effectively compete for funds.
- **Risks of investment:** There is always a risk that the borrower will go bankrupt, abscond, or otherwise default on the loan. This means that a lender generally charges a risk premium to ensure that, across his investments, he is compensated for those that fail.
- **Liquidity preference:** People prefer to have their resources available in a form that can immediately be exchanged, rather than a form that takes time or money to realize.
- **Taxes:** Because some of the gains from interest may be subject to taxes, the lender may insist on a higher rate to make up for this loss." *(Maudos & Guevara; 2004: 263-264)*

2.1.1.3 Interest Rate Levels

"Funds are allocated among borrowers by interest rate: firms with the most profitable investment opportunities are willing and able to pay the most for capital, so they trend to attract it away from less efficient firms or from those whose products are not in demand. Of course, our economy is not completely free in the sense of being influenced only by market forces, thus, the government has agencies that help designated individuals or groups obtain credit favorable terms among those eligible for this kind of assistance are small businesses, certain minorities, and firms willing to build plants in areas with high unemployment. Still, most capital in the use economy is allocated through the price system." *(Hancock; 2007: 42)*

2.1.1.4 Market for Credit

"Over many hundreds, possibly even thousands of years, sophisticated markets for the borrowing and lending of money have evolved. They all work on the basis that certain parties have a surplus of funds available from time to time, and are willing to lend the surpluses to those who have less money than they

need for specific purposes within a period of time. Interest is paid by borrowers to lenders at a given rate." *(Haynes; 1989: 103)*

"Borrowers require credit for different purposes and for different lengths of time. A borrower may, for instance, require a very large sum of money to buy a home, and only have the means to pay it back slowly over a long period of time (e.g. 20 years). At the other end of the scale, a borrower may require funds for a far shorter period, perhaps only until his or her next pay-day. Similarly, potential lenders may have varying amounts of money that they are willing to lend to others for varying amounts of time. A given individual may have many thousands or millions that he is willing to lend to others for long periods of time. Others will have far less surplus funds available for loan for shorter periods – for example, immediately after pay-day, salary and wage earners will usually have more funds than they need to spend immediately, and that surplus of funds will gradually be run down over the period to the next pay-day." *(Montes-Negret & Papi; 1996: 86)*

Sophisticated financial markets have evolved to attempt to match the surplus funds of lenders with the fund requirements of borrowers. Amongst these financial institutions, banks are certainly the key players in the market for money, or credit market. Collectively, they take on the role of borrowers when they accept deposits from individual members of the public, or businesses, or even other banks. As borrowers, banks pay interest to those lenders who deposit funds with them.

"Banks also actively look for borrowers in the household, business and government sectors of the economy, in order to lend those parties the funds which they, the banks, have managed to attract from their own lenders. In return, the banks receive interest payments from borrowers who have accepted credit from them. Banks are therefore the intermediary used by holders of surplus funds to reach potential borrowers who need more funds than they have

available. To perform their functions, banks need to pay for staff, whose skills will range from the very highest, scarcest and highly paid, to the very lowest level of skills. They also have to pay for business premises, equipment such as computers, automatic teller machines, telephone services, and many costs of doing business that are common throughout the business world. These business costs, plus any profit that may be made, have to be covered from one of two sources." *(Randall; 1998: 83-84)*

"Firstly, the bank could charge a given amount every time it performs a particular service, or set of services. While such charges may produce revenue for the retail commercial banks, which have very large numbers of customers, they would not produce anything of significance for the many wholesale banks in the system. Even if the commercial banks were to earn all their revenue from financial service charges, they would have to be four times higher than they are at the moment, which would hit hardest at the smallest of their clients. In all probability, so many clients would be knocked out of the commercial banks by the high financial service charges that the factor of four mentioned here would probably not be enough, and the factor would have to increase even further, enduring services too expensive for an even greater number of clients. Funding banks' revenue line through financial service charges is not a practical proposition." *(Randall; 1998: 85)*

"Instead, banks create revenue to pay for their costs and to make profit in exactly the same way that all other business institutions create income. They simply charge more for the credit that they sell than for the credit which they buy. The price of credit (i.e. the interest rate) which banks extend is higher than the price which they are prepared to pay for the credit extended to them by the holders of surplus funds. Banks' lending rates are higher than their borrowing rates. The difference, also known as the bank margin, pays for the expenses of running the bank, and creates profit as long as revenue exceeds expenditure. The diagrams below illustrate the concept of the bank margin in simplistic

terms using the 3 month deposit rate and prime lending rate. These examples should not be confused with net interest margins (NIM) actually earned by banks." *(Randall; 1998: 85)*

2.1.1.5 The Determinants of Market Interest Rates

In general, the quoted (or nominal) interest rate on a debt security, is composed of a real risk-free rate of interest, k*, plus several premiums that reflect inflation, the riskiness of the security and the security's marketability. This relationship can be expressed as follows;

Quoted Interest Rate = k = k*+IP + DRP+ LP +MRP

K= the quoted, nominal, rate of interest on a given security. There are many different securities; hence many different quoted interest rates.
K*= the real risk free rate of interest

IP=Inflation Premium

A premium for expected inflation that investors add to the real risk-free rate of return.

DRP= Default Risk Premium

The difference between the interest rate on a treasury bond and a corporate bond of equal maturity and marketability.

LP=Liquidity, or Marketability, Premium

A premium added to the rate on a security if the security if the security cannot be converted to cash on short notice and at close to the original cost.

MRP=Maturity Risk Premium

A premium that reflects interest rate risk; bonds with longer maturities have greater interest rate risk.

2.1.2 Interest Rate Risk

"Interest rate exposure is generally described as the risk of a reduction in a projected or anticipated measure of net interest income (target measure) resulting from changes in market interest rates. Yet from a practical perspective such a definition is somewhat flawed, as the use of an anticipated (or projected) measure of net interest income is fraught with risks. Any inappropriate assumption in the projection phase will produce an inaccurate target measure and, consequently, result in an inaccurate assessment of interest rate risk." *(Levine, Loayza & Beck; 2000: 42)*

"In a more useful way, interest rate exposure could be defined as the risk that the amount of net interest income obtainable at unchanged interest rates may not be attained given an adverse change in market interest rates. Conversely, banks stand to benefit from an 'interest rate opportunity' should favorable changes in market interest rates drive up net interest income. Using a 'zero line' thus makes it possible to rate the risks and opportunities that arise from changes in market interest rates. Another key factor in the equation is the target measure to be used for evaluating the credit institution's performance." *(Fuentes & Maquieria; 2000: 71)*

"Interest rate risk is the exposure of a bank's financial condition to adverse movements in interest rates. Changes in interest rates affect a bank's earnings by changing its net interest income and the level of other interest sensitive income and operating expenses. Changes in interest rates also affect the underlying value of the bank's assets, liabilities, and off-balance-sheet (OBS) instruments because the economic value of future cash flows (and in some cases, the cash flows themselves) changes when interest rates change." *(Jappelli & Pagano, 2002: 230-231)*

2.1.2.1 Sources of Interest Rate Risk

Among the various sources of interest rate risk, the following sources are considered to be crucial.

a) Repricing Risk: "As financial intermediaries, banks encounter interest rate risk in several ways. The primary and most often discussed form of interest rate risk arises from timing differences in the maturity (for fixed rate) and repricing (for floating rate) of bank assets, liabilities and off-balance-sheet (OBS) positions. While such repricing mismatches are fundamental to the business of banking, they can expose a bank's income and underlying economic value to unanticipated fluctuations as interest rates vary. For instance, a bank that funded a long-term fixed rate loan with a short-term deposit could face a decline in both the future income arising from the position and its underlying value if interest rates increase. These declines arise because the cash flows on the loan are fixed over its lifetime, while the interest paid on the funding is variable, and increases after the short-term deposit matures." *(Gelos; 2006: 32)*

b) Yield curve risk: "Repricing mismatches can also expose a bank to changes in the slope and shape of the yield curve. Yield curve risk arises when unanticipated shifts of the yield curve have adverse effects on a bank's income or underlying economic value. For instance, the underlying economic value of a long position in 10-year government bonds hedged by a short position in 5-year government notes could decline sharply if the yield curve steepens, even if the position is hedged against parallel movements in the yield curve." *(Gelos; 2006: 33)*

c) Basis risk: "Another important source of interest rate risk (commonly referred to as basis risk) arises from imperfect correlation in the adjustment of the rates earned and paid on different instruments with otherwise similar repricing characteristics. When interest rates change, these differences can give rise to unexpected changes in the cash flows and earnings spread between

assets, liabilities and OBS instruments of similar maturities or repricing frequencies. For example, a strategy of funding a one year loan that reprices monthly based on the one month U.S. Treasury Bill rate, with a one-year deposit that reprices monthly based on one month Libor, exposes the institution to the risk that the spread between the two index rates may change unexpectedly." *(Gelos; 2006: 34)*

d) Optionality: "An additional and increasingly important source of interest rate risk arises from the options embedded in many bank assets, liabilities and OBS portfolios. Formally, an option provides the holder the right, but not the obligation, to buy, sell, or in some manner alter the cash flow of an instrument or financial contract. Options may be stand alone instruments such as exchange-traded options and over-the-counter (OTC) contracts, or they may be embedded within otherwise standard instruments. While banks use exchange-traded and OTC-options in both trading and non-trading accounts, instruments with embedded options are generally most important in non-trading activities. They include various types of bonds and notes with call or put provisions, loans which give borrowers the right to prepay balances, and various types of non-maturity deposit instruments which give depositors the right to withdraw funds at any time, often without any penalties. If not adequately managed, the asymmetrical payoff characteristics of instruments with optionality features can pose significant risk particularly to those who sell them, since the options held, both explicit and embedded, are generally exercised to the advantage of the holder and the disadvantage of the seller. Moreover, an increasing array of options can involve significant leverage which can magnify the influences (both negative and positive) of option positions on the financial condition of the firm." *(Gelos; 2006: 35-36)*

2.1.2.2 Effects of Interest Rate Risk

As the discussion above suggests, changes in interest rates can have adverse effects both on a bank's earnings and its economic value. This has given rise to

two separate, but complementary, perspectives for assessing a bank's interest rate risk exposure.

a) Earnings Perspective: "In the earnings perspective, the focus of analysis is the impact of changes in interest rates on accrual or reported earnings. This is the traditional approach to interest rate risk assessment taken by many banks. Variation in earnings is an important focal point for interest rate risk analysis because reduced earnings or outright losses can threaten the financial stability of an institution by undermining its capital adequacy and by reducing market confidence." *(Chirwa & Mlachila; 2004: 110)*

"In this regard, the component of earnings that has traditionally received the most attention is net interest income (i.e. the difference between total interest income and total interest expense). This focus reflects both the importance of net interest income in banks' overall earnings and its direct and easily understood link to changes in interest rates. However, as banks have expanded increasingly into activities that generate fee-based and other non-interest income, a broader focus on overall net income - incorporating both interest and non-interest income and expenses - has become more common. The non-interest income arising from many activities, such as loan servicing and various asset securitization programs, can be highly sensitive to market interest rates. For example, some banks provide the servicing and loan administration function for mortgage loan pools in return for a fee based on the volume of assets it administers. When interest rates fall, the servicing bank may experience a decline in its fee income as the underlying mortgages prepay. In addition, even traditional sources of non-interest income such as transaction processing fees are becoming more interest rate sensitive. This increased sensitivity has led both bank management and supervisors to take a broader view of the potential effects of changes in market interest rates on bank earnings and to factor these broader effects into their estimated earnings under different interest rate environments." *(Chirwa & Mlachila; 2004: 111)*

b) Economic Value Perspective: "Variation in market interest rates can also affect the economic value of a bank's assets, liabilities and OBS positions. Thus, the sensitivity of a bank's economic value to fluctuations in interest rates is a particularly important consideration of shareholders, management and supervisors alike. The economic value of an instrument represents an assessment of the present value of its expected net cash flows, discounted to reflect market rates. By extension, the economic value of a bank can be viewed as the present value of bank's expected net cash flows, defined as the expected cash flows on assets minus the expected cash flows on liabilities plus the expected net cash flows on OBS positions. In this sense, the economic value perspective reflects one view of the sensitivity of the net worth of the bank to fluctuations in interest rates." *(Chirwa & Mlachila; 2004: 112)*

Since the economic value perspective considers the potential impact of interest rate changes on the present value of all future cash flows, it provides a more comprehensive view of the potential long-term effects of changes in interest rates than is offered by the earnings perspective. This comprehensive view is important since changes in near-term earnings – the typical focus of the earnings perspective - may not provide an accurate indication of the impact of interest rate movements on the bank's overall positions.

c) Embedded Losses: "The earnings and economic value perspectives discussed thus far focus on how future changes in interest rates may affect a bank's financial performance. When evaluating the level of interest rate risk it is willing and able to assume, a bank should also consider the impact that past interest rates may have on future performance. In particular, instruments that are not marked to market may already contain embedded gains or losses due to past rate movements. These gains or losses may be reflected over time in the bank's earnings. For example, a long term fixed rate loan entered into when interest rates were low and refunded more recently with liabilities bearing a

higher rate of interest will, over its remaining life, represent a drain on the bank's resources." *(Chirwa & Mlachila; 2004: 114)*

2.1.3 Net Interest Margin

"Net interest margin (NIM) is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin of non-financial companies. It is usually expressed as a percentage of what the financial institution earns on loans in a time period and other assets minus the interest paid on borrowed funds divided by the average amount of the assets on which it earned income in that time period (the average earning assets)." *(Hanson & Rocha; 1986: 31)*

"Net interest margin is similar to net interest spread; net interest spread expresses the nominal average difference between borrowing and lending rates, without compensating for the fact that the amount of earning assets and borrowed funds may be different. Net interest spread is generally higher than net interest margin, as banks may need to keep a certain amount of assets in non-interest bearing assets (such as cash balances held at branches for customers or liquid reserves as determined by banking regulators)." *(Estrada & Orozco; 2006: 52)*

"The difference between yield on earning assets (YEA) and rate paid on funds (RPF) is the net interest margin, which can also be calculated by dividing tax-equivalent net interest income by average earning assets. A widening net interest margin is a sign of successful management of assets and liabilities, while a narrowing net interest margin indicates a profit squeeze. A NIM of less than 3% is generally considered low, and more than 6% is very high. This range, however, should be used only as a rough guideline, because net interest margin can vary with the particular business mix of individual banks as well as

the specific economic conditions of the country concerned." *(Claeys & Rudi Vennet; 2008: 199)*

2.1.3.1 Determinants of Net Interest Margin

The starting point for analyzing the determinants of the net interest margin is the model of Ho and Saunders (1981). Different versions of the model have been estimated for the specific case of the United States in Ho and Saunders (1981), Allen (1988) and Angbazo (1997); and for a sample of seven OCDE countries (six European ones plus the United States) in Saunders and Schumacher (2000).

In these models, a bank is viewed as a risk-averse dealer in the credit market, acting as an intermediary between demanders and suppliers of funds. The planning horizon is single periods during which the bank sets interest rates at the beginning of the period, before any deposits or loans are made remain constant for the whole period. The banks, who are risk averse and have to deal with demands for loans, and offers of deposits, that reach them asymmetrically in time, must set interest rates on loans (*rL*) and deposits (*rD*) optimally so as to minimize the risk deriving from the uncertainty of interest rates in the money markets to which they have to resort in the event of excessive demand for loans or insufficient supply of deposits. For this, they set their interest rates as a margin relative to the interest rate of the money market (*r*), i.e.:

$$r_D = r - a \qquad (1)$$
$$L_r = r + b$$

a and *b* being the margins relative to the money market interest rate set by the banks for deposits and loans, respectively. Hence the unit margin or spread *s* can be expressed as follows:

$$S = r_L - r_D = a + b \qquad (2)$$

The intuition of the model is as follows. Let us suppose that a new deposit reaches the bank before any new demand for loans. In this event, the bank will temporarily invest the funds received in the money market at an interest rate *r*, assuming a risk of reinvestment at the end of the period if money market interest rates fall.

Similarly, if a new demand for loans reaches the bank before any new deposit, the bank will obtain the funds in the money market, and will therefore face a risk of refinancing if interest rates rise. Furthermore, the return of loans is uncertain because of the probability that some of them will not be repaid, i.e. due to the credit risk. Consequently the bank will apply a margin to loans (*b*) and deposits (*a*) that will compensate for both the interest rate and credit risk.

The initial wealth of the bank is determined by the difference between its assets – loans *(L)* and net money market assets *(M)*- and its liabilities – deposits *(D)*:

$$W_0 = L_0 - D_0 + M_0 = I_0 + M_0 \qquad (3)$$

L_o-D_o being the net credit inventory (I_0).

The criticism by Lerner (1981) of the original model of Ho and Saunders (1981) is taken up incorporating into the model the productive nature of the banking firm by including the production costs associated with the process of intermediation between deposits and loans. Thus, the operating costs of a banking firm are assumed to be a function of the deposits captured (*C(D)*) and the loans made (*C(L)*), so that the costs of the net credit inventory can be expressed as *C(I)=C(L)-C(D).*

With all these assumptions, the final wealth of the bank will be:

$$\begin{aligned} W_T &= (1+r_I+Z_I)I_o + M_o\,(1+r+Z_M) - C\,(I_o) \\ &= I_o + I_o r_I + I_o Z_I + M_o + M_o r + Z_M M_o - C\,(I_o) \qquad (4) \\ &= W_o\,(1+r_w) + I_o Z_I + M_o Z_M - C\,(I_o) \end{aligned}$$

Where,

$r_I = \frac{r_L\ L_o - r_D\ D_o}{I_o}$ is the average profitability of the net credit inventory,

$r_w = r_I\ \frac{I_o}{W_o} + \ r\frac{M_o}{W_o}$ is the average profitability of the bank's initial wealth,

$Z_I = Z_L\ \frac{L_o}{I_o} + Z_D\ \frac{D_o}{I_o} = Z_P\ \frac{L_o}{I_o}$ is the average risk of the net credit inventory. Z_M and Z_L reflect the uncertainty faced by the banks, which is of two kinds: interest rate risk, distributed as a random variable Z_M - $N(0,\sigma^2 M)$, and credit risk – the profitability of the loan is uncertain and is distributed as a random variable Z_L-$N(0,\ \sigma^2\ L)$. In order to take into account the interaction between credit risk and interest rate risk the joint distribution of the two disturbances is assumed to be bivariate normal with non-null covariance (σ_{LM}).

Banks maximizes expected utility. The bank's utility function is approximated using the Taylor expansion around the expected level of wealth
($W = E\ (W)$):

$$EU\ (W) = U(W\ ) + U'\ (W\ )\ E(\ W - W\ ) + \tfrac{1}{2}\ U''\ (W)\ E\ (W - W)^2 \qquad (5)$$

where it is assumed that the bank's utility function is continuous doubly differentiable with $U' > 0$ and $U'' < 0$ and therefore that the bank is risk averse.

When a new deposit D is made, remunerated at a rate r_D, the bank, if it does not grant an additional credit, will invest the funds thus captured in the money market, obtaining a return $(r+Z_M)D$. Bearing in mind that $W - \bar{W} = L_o Z_L + M_o Z_M$ and given the existence of operating costs in the capture of deposits $C(D)$, substituting the new value of the final wealth in (5), the increase in expected utility associated with the new deposit would be:

$$\Delta\ EU\ (W_D) = EU\ (W_T) - \ EU\ (W)$$

$$= U'\bar{W}[aD - C\ (D)] + \frac{1}{2}\ U"\ (\bar{W})[(aD - C\ (D))^2 + (D + 2\ M_o)\ D\sigma_M^2 \quad + 2\ L_o\ D\sigma_{LM}$$

Similarly, if a new request for credit is made for which there is also a cost of production *C(L)*, the increase in expected utility would be:

$$\Delta EU\ (W_L) = EU\ (W_T) - EU\ (W)$$
$$= U'\bar{W}[bL - C\ (L)] + \frac{1}{2}\ U"\ (\bar{W})[(bL - C\ (L))^2 + (L + 2\ L_o)\ L\sigma_L^2 \quad + (L -$$
$$2\ M_o)L\ \sigma_M^2 + 2\ (M_o - L_o - L)\ L\sigma_{LM} \qquad (7)$$

As in the other models we assume that credits and deposits are made randomly according to a Poisson process, the probability of granting a credit or capturing a deposit being a decreasing function of the margins applied by the bank:

$$Pr_D = \alpha_D - \beta_D a \qquad (8)$$
$$Pr_L = \alpha_L - \beta_L b$$

The problem of maximization is therefore as follows:

$$Max_{a,b} EU\ (\Delta W) = (\alpha_D - \beta_D a)\Delta EU\ (W_D) + (\alpha_L - \beta_L b)\ \Delta EU\ (W_L) \quad (9)$$

The first order conditions with respect to *a* and *b* are:

$$a = \frac{1}{2}\frac{\alpha_D}{\beta_D} + \frac{C\ (D)}{D} - \frac{1}{4}\frac{U"(\bar{W})}{U'(\bar{W})}[(D + 2M_o)\alpha_M^2 + 2\ L_O\sigma_{LM}]$$
$$b = \frac{1}{2}\frac{\alpha_L}{\beta_L} + \frac{C\ (L)}{L} - \frac{1}{4}\frac{U"(\bar{W})}{U'(\bar{W})}[(L + 2L_o)\alpha_L^2 + (L - 2M_o)\alpha_M^2 + 2\ (M_o - L_O -$$
$$L)\sigma_{LM} \qquad (10)$$

so the optimal interest margin *s* is equal to:

$$s = (a + b) = \frac{1}{2}\{\frac{\alpha_D}{\beta_D} + \frac{\alpha_L}{\beta_L}\} + \frac{1}{2}(\frac{C\ (L)}{L} + \frac{C\ (D)}{D}) - \frac{1}{4}\frac{U"(\bar{W})}{U'(\bar{W})}[(L + 2L_o)\alpha_L^2 + (L + D)\sigma_M^2 +$$
$$2\ (M_O - L)\sigma_{LM}] \quad (11)$$

Therefore, according to the theoretical model used, the determinants of the interest margin are as follows:

a) The Competitive Structure of the Markets: "This depends on the elasticity of the demand for loans and the supply of deposits (β), such that the less elastic the demand for credit (or supply of deposits), the less will be the value of β, and the bank will be able to apply high margins if it exercises

monopoly power. Consequently, the ratio α/β proxies the possible monopoly profits implicit in bank margins." *(Carbo-Valverde & Rodriguez-Fernandez; 2007: 210)*

b) Average Operating Costs: "The extension of the model realized in this paper yield the inclusion of an additional term, the average operating costs, in the explanatory equation of the interest margin. Consequently, firms that incur high unit costs will logically need to work with higher margins to enable them to cover their higher operating costs. Observe that, even in the absence of market power and of any kind of risk, a positive margin will be necessary in order to cover operating costs." *(Carbo-Valverde & Rodriguez-Fernandez; 2007: 211)*

c) Risk Aversion: "Risk aversion expressed by the coefficient of absolute risk aversion, $-U''(W)/U'(W)$, where on the assumption that the bank is risk averse, $U''(W)<0$, the former expression is greater than zero. Obviously, the more risk-averse banks will charge higher margins." *(Carbo-Valverde & Rodriguez-Fernandez; 2007: 211)*

d) The Volatility of Money Market Interest Rates (σ^2_M): "The more volatile they are, the greater will be the market risk, and it will therefore be necessary to operate with higher margins, as the banks will require a higher premium at the margin." *(Carbo-Valverde & Rodriguez-Fernandez; 2007: 212)*

e) The Credit Risk, captured by the variable σ^2_L: "The greater the uncertainty or the volatility of the return expected on the loans granted (risk of default), the greater will be the margin with which the bank works." *(Carbo-Valverde & Rodriguez-Fernandez; 2007: 212)*

f) The Covariance or Interaction between Interest Rate Risk and Credit Risk σ_{LM}.

g) The Average Size of the Credit and Deposit Operations undertaken by the bank (captured by the term $L+D$) and the total volume of credits ($L+2L_0$). The model predicts that the unit margins are an increasing function of the average size of operations. The justification is that, for a given value of credit risk and of market risk, an operation of greater size would mean a greater potential loss, so the bank will require a greater margin. Likewise, the potential loss will be greater for those banks in which the volume of credits granted is greater.

The assumptions made in deriving the interest margin from the theoretical model set out provide a margin that could be called "pure". Obviously, in practice there exist other variables that explain the interest margin, capturing the influence of aspects - institutional, regulatory, etc. – which potentially distort the pure margin and are difficult to incorporate into the theoretical model. Specifically, the additional variables considered in the literature are:

h) The Payment of Implicit Interest: The bank, instead of remunerating deposits explicitly by paying an interest rate, offers various "free" banking services.

i) The Opportunity Cost of Keeping Reserves: "The maintenance of bank reserves remunerated at an interest rate below that of the market involves costs whose magnitude will depend on the volume of reserves and on their opportunity cost. The sign is expected to be positive, as the greater the volume of liquid reserves, the greater the opportunity costs, so a greater interest margin is needed." *(Carbo-Valverde & Rodriguez-Fernandez; 2007: 215)*

j) The Quality of Management: "Good management implies selecting highly profitable assets and low-cost liabilities, so a positive relationship is to be

expected between the quality of management and the interest margin." *(Carbo-Valverde & Rodriguez-Fernandez; 2007: 215)*

2.2 Review of Journals and Articles

Hanweck & Ryu (2005), in their article, "*The Sensitivity of Bank Net Interest Margins and Profitability to Credit, Interest-Rate, and Term-Structure Shocks Across Bank Product Specializations",* have stated that net interest margins for commercial banks in different bank groups, defined in terms of the product-line specialization and asset size of each bank at the end of each quarter, usually respond in a predictable yet dissimilar way to unanticipated shocks. These differences likely reflect a significant variation in asset composition (in terms of repricing frequencies and credit risks) and business model across these groups. The results of cross-section time series random effects regression estimation that show that quarterly changes in net interest are sensitive to credit, interest-rate, and term-structure shocks for most bank groups, but with varying degrees.

The size of the coefficient for variables that proxy these shocks, as well as the speed of changes in net interest margins in response to term-structure shocks, vary widely across these groups. In general, large and more diversified banks seem to be vulnerable to credit shocks but less sensitive to interest-rate or term-structure shocks. In comparison, credit card specialists are not sensitive to increased short-term interest-rate volatility or a change in the shape of the yield curve. As hypothesized, the greater the proportion of net short-term assets and non maturing deposits a bank holds, the more positive the effect of an increase in short-term interest rates on net interest margins.

Demirgüç-Kunt & Huizinga (2006), in their article, "*Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence",* have stated that foreign ownership is associated with higher interest margins and bank profitability, especially in developing countries. Similarly,

several institutional factors, such as indices of credit rights, law and order and corruption, and differences in financial structure, have more pronounced effects on interest margins and bank profitability in developing countries than in developed countries. These results may reflect the relatively closed nature of banking markets in developing countries.

Reserves also have a more pronounced impact on margins and profitability in developing countries than in developed countries. This result may simply reflect the relatively high opportunity cost of holding reserves in poorer and more inflationary countries. The corporate income tax appears to be passed on fully to bank customers, in developing and developed countries alike. This finding is consistent with the notion that bank stock investors require net-of-company-tax returns independent of the level of company taxation. It also implies that the corporate income tax on banks is likely to distort the underlying saving and investment decisions, with possibly negative implications for economic growth. These considerations have to weigh heavily in considering the merits of the corporate income tax on banks as part of the overall tax system.

Further, government regulations, such as the design of deposit insurance schemes, have an impact on bank margins. It would be interesting to analyze this issue further by taking into account differences in design features. We intend to return to these issues in future work.

Naceur & Goaied (2007), in their article, *"The Determinants of Commercial Bank Interest Margin and Profitability: Evidence from Tunisia",* have stated that banks' characteristics, financial structure and macroeconomic indicators have impact on banks' net interest margins and profitability in the Tunisian banking industry. First, individual bank characteristics explain a substantial part of the within-country variation in bank interest margins and net profitability. High net interest margin and profitability tend to be associated

with banks that hold a relatively high amount of capital, and with large overheads. Other important internal determinants of banks' interest margins bank loans, which have a positive and significant impact. The size has mostly negative and significant coefficients on the net interest margins. This latter result may simply reflect scale inefficiencies.

Second, the macro-economic indicators such as growth rates have no incidence on banks' interest margins and profitability where as inflation impacts positively banks' spreads Third, turning to financial structure and its impact on banks' interest margin and profitability, concentration is less beneficial to the Tunisian commercial banks than competition. Stock market development has a positive effect on bank profitability. This reflects the complementarities between bank and stock market growth. Eventually, the disintermediation of the Tunisian financial system is favorable to the banking sector profitability.

Zhou and Wong (2008), in their article, *"The Determinants of Net Interest Margins of Commercial Banks in Mainland China"*, have stated that the net interest margin of China's commercial banks declines over time. This paper further identifies those factors that directly affect the interest margin. The evidence in this paper shows that the degree of market concentration in China's banking market has declined consistently over time. This could be due to an increase in the number of banks in China and their increased attention to business expansion.

However, compared with the EU community's banking market, China's banking market is less competitive. In the sample period, the activities of foreign banks were highly restricted. However, because of the WTO agreement, the banking market of mainland China was completely open to foreign banks at the end of 2006. It has ended up with narrower interest margins and worsened profitability for China's commercial banks. If China's commercial banks do not improve their efficiency and management quality, the

banking stability of mainland China will be at great risk. In addition to improving management quality and efficiency, China's banks should be encouraged to expand their business lines. Such action will strengthen the profitability of China's commercial banks, diversify their business risk, and reduce their tremendous reliance on traditional credit business, which will become less lucrative in the future.

Kalluci (2009), in her article, *"Determinants of Net Interest Margin in the Albanian Banking System",* has stated that the banking system is the most important element of the Albanian financial system, whose assets account for 97 per cent of the financial system assets. For Albania, banks function as the main players in channeling funds from lenders to borrowers, therefore it is important that their intermediation role provides higher welfare for the society, possibly at lower costs. This study was inspired upon this context, aiming to identify the factors that impact the net interest margin for the Albanian banking system and wishing that it will contribute in the written literature dealing with this issue, since it represents the first attempt for the case of Albania.

Different stakeholders, but especially the policy-makers, are interested in the establishment and functioning of stabilized and efficient banking systems. Stability requires adequate profits, while the economic efficiency requires margins at acceptable levels, applied from banks. The results derived from the analysis of factors that impact the net interest margin may be useful for the compilation of specific measures of economic policies.

Williams & Rajaguru (2010), in their article, *"The Chicken or the Egg? The Trade-off between Bank Non Interest Income and Net Interest Margins",* have stated that there is a systematic relationship between decreases in Australian bank net interest income and increases in non interest income. Further, increases in non interest income pre-dates reductions in net interest margin income. This suggests that Australian banks pre-positioned their revenue

streams for the impact of falling margin income by increasing their non interest income. It is also found that the increases in non interest income are of a smaller magnitude than the decreases in net interest income. This indicates that bank consumers as a whole have been made better off by this process as increases in non interest income are smaller than reductions in margin income, thus producing a wealth transfer in favor of bank customers overall.

However, the currently available data does not allow analysis of non interest income from intermediation services versus non interest income from other financial services such as funds management, trading financial instruments and underwriting (particularly for the foreign banks). Thus, it cannot be concluded that the same consumer groups are being affected by this relationship. It may be the case that the increases in non interest income observed in this study reflects a strategic effort by the Australian bank to counteract the impact of falling interest margins by diversifying their income sources away from traditional intermediation toward other revenue sources such as funds management. The evidence of this study is that this process began before falls in margin income were statistically significant; suggesting that banks actively re-focused their revenue streams toward non interest income prior to falling margin income.

Dietrich, Wanzenried & Cole (2010), in their article, *"Why Are Net-Interest Margins Across Countries So Different?",* have stated that net interest margins vary widely across countries, particularly between developing and developed countries. The main contributions of the study are as follows. First, the study tests the importance of new governance variables, such as the creditors rights index, the efficiency of enforcement and the importance of information sharing, and add what determines net interest margins. Second, the sample has been split into developing and developed countries in order to provide new evidence on whether, and if so, why determinants of the net interest margins differ across these two groups of countries.

Finally, a time period up through 2009, to provide empirical evidence on the determinants of net interest margins across countries based on the more recent historical experience. This seems even more important in view of the recent economic developments and, in particular, in view of the recent the financial crisis, which is likely to have a massive impact on net interest margins. Namely, factors like information about the existence of a deposit insurance or information about the regulatory quality and the control of corruption are expected to provide additional insights. Furthermore, a regression analysis on bank- instead of country-level might allow analyzing additional banking specific factors such as bank size, capital structure, and ownership.

Chortareas, Garza-García & Girardone (2010), in their article, *"What Affects Net Interest Margins of Latin American Banks?"* have stated that the financial liberalization process in Latin America brought about changes in the structure of the banking sector and triggered the elimination of various restrictions including foreign capital entry barriers, interest rate ceilings and floors, and credit rationing. While this wave of changes was expected to reduce interest rate margin (NIMs), these latter remain excessively and persistently high. As a consequence credit availability to the private sector remains limited. Moreover, the recent financial crisis and the subsequent liquidity shortage may further exacerbate this situation.

The study shows that the concentration index and the market share have little or no influence on interest rate margins. On the contrary, the study uncovers evidence suggesting that greater X-efficiency and competitive market structures are important determinants in lowering spreads. Moreover, the degree of capitalization increases spreads, while economic growth contributes to their reduction. The main implications of the study are that policies aimed at controlling banks' interest rate margins should focus on improving economic

conditions and on motivating banks to operate in a more efficient way by encouraging greater competition.

Claeys and Vennet (2010), in their article, *"Determinants of Bank Interest Margins in Central and Eastern Europe: A Comparison with the West",* have stated that interest margins are not so much determined by bank market structure is probably a reflection of the rapid development of bank lending in the accession economies and increased competition following the entry of foreign banks. The presence of foreign banks effectively reduces bank interest margins, irrespective of the fact that foreign banks have by now acquired relatively large market shares. Higher operational efficiency is reflected in lower bank interest margins in both Western European bank markets and accession countries, but not (yet) in the non-accession bank markets. Hence, the efficient-structure hypothesis is only corroborated in the more developed bank markets. The source of the negative relationship between efficiency and interest margins differs, however.

Capital turns out to be an important determinant of bank margins, both in Western European countries and in the CEEC. Banks in transition economies need to maintain relatively high capital adequacy levels to ensure stability and inspire depositor trust. The pricing of lending risk plays an important role in explaining interest margins, but the effect again differs across the groups of countries considered. More lending results in wider margins and reflects the banks' ability to integrate risk considerations in their loan pricing behavior.

2.3 Review of Thesis

Chaudhary (2006), in her thesis, *"Interest Rate and Its Effect on Deposit and Lending"*, has the following major objectives;

a. To present and analyse the interest rate structure of various commercial banks at different time period.

b. To examine the influence of interest rate on deposit and lending amount of Commercial Banks.
c. To recommend appropriate suggestions base on the analysis of the data to concern authority.

The major findings of the study are;

a. Deposit Rate of all sample banks under study are in decreasing trend. Meaning that every year deposit Rates of Sample banks under study have decreased.
b. Lending Rates of all sample banks under study are also in decrease trend, means that every year lending rates of sample banks under study have decreased.
c. Analysis shows that interest rates on lending are for higher than deposit rates of sample banks.

Rijal (2007), in his thesis, *"Interest Rate Structure and its Relation with Deposit, Inflation and Credits in Nepal",* has the following major objectives;

a. To examine and analyze the position of interest rate and loan and advance ratio of commercial banks.
b. To analyze the effect of NRB direction in interest.

c. To explore the problems and to suggest for further improvement on the basic of finding of the study.

The major findings of the study are;

a. Deposit is affected through the factors of income, inflation and interest Rate.
b. Most of the banks have not truly implemented the directives of NRB relating to the interest rate.
c. External Environment, such as political changes, changes in the Governor, so on, affects the collection of interest.

Bohara (2008), in his thesis, "*The Interest Rate Structure of Commercial Banks in Nepal",* has the following major objectives;

a. To present a concrete picture of the interest Rate and other economic variable like deposit, inflation and credit flow in Nepal.
b. To Analyze the impact and implementation the policy of interest Rate of Nepal Rastra Bank
c. To provide suggestions and recommendations for improvement in the rate structure in Nepal.

The major findings of the study are;

a. Deposits are positively and significantly correlated with the interest rate. There is significant correlation between the saving deposits and the rate of interest.
b. Negative correlation between loans and interest rate means that loans decrease higher interest Rate and Vice-versa.
c. The net interest earning is dependent upon interest conveyed.

Bhandari (2008), entitled "*A Study on Impact of Interest Rate Structure on Investment Portfolio of Commercial Banks*" has the following major objectives;

a. To cast a glance of the historical background of interest rate structure of commercial banks, policies, decision and strategies regarding it and their impact.
b. To access the impact of interest rate structure of commercial banks on their investment portfolio by analyzing their deposits, loans/advance, interest spread, investment and bills purchased and discounted.

The major findings of the study are;

a. The interest rate is important for amount of deposit collection of the commercial banks, and thus the interest rate decreases with the deposit rate.

b. The depositors are very conscious. They increase their deposit, if higher deposits interest rate is offered.
c. Most of the commercial banks of Nepal do not have satisfactory level of net interest margin, which means that interest received and interest paid are not synchronized well enough.

Pokharel (2009) in his thesis, *"Determinants of Interest Rate in Nepalese Financial Market",* has the following major objectives;

a. To show the relationship between the liquidity position and interest rate on deposit and lending.
b. To find out the effect of maturity period and other economic factors on the interest offered by finance companies.
c. To show the effect of foreign employment and remittance income to the interest rate.

The major findings of the study are;

a. The correlation confection between interest rate on deposit and amount of deposit is highly negative.
b. Lending rate and lending amount co-relation coefficient is found to be negative.
c. Interest rate on deposit and inflation rat e is little positive.
d. The relationship of interest rate on lending with risk free rate is both positive and negative.

2.4 Research Gap

All of the above thesis reviewed have concentrated on the interest rate structure of the bank, and tried to ascertain the determinants of interest rate of the banks. However, no one has attempted to quest the determinants of net interest margin and delineated the net interest margin situation in commercial banks. For long run sustainability, the bank needs to have sound net interest margin. The difference between interest rate on loan and advances, and deposit should not

be extremely wide. To examine such fact, and fulfill the gap, the present study has been conducted which will enlighten on net interest margin of the selected banks and the determinants of net interest margin.

CHAPTER - III

RESEARCH METHODOLOGY

3.1 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In this study, historical as well as descriptive research design is adopted.

The research is based on recent historical data. It deals with the net interest margin and its determinants on the basis of available information. In this study, historical as well as descriptive research design is adopted. To find out the determinants of net interest margin, historical research design is adopted along with correlation and regression analysis.

3.2 Population and Sample

Currently 27 commercial banks are operating throughout the country. However, the analysis of all these banks on the ground of net interest margin and its determinants is almost impossible. Thus, for the study only five commercial banks, namely Standard Chartered Bank Nepal Limited (SCBNL), NABIL Bank Limited (NABIL), Himalayan Bank Limited (HBL), Bank of Kathmandu Limited (BOK), and Nepal SBI Bank Limited (SBI), is selected.

3.3 Sources of Data

The study is based on secondary data as well as primary data. Secondary data have been collected by using the annual reports of the banks, circulars and directives of NRB, brochures and websites of concerned sampled banks and so on. While primary data have been collected by conducting questionnaire. For the primary data analysis, a questionnaire containing 10 questions has been prepared and distributed to 15 borrowers, 15 depositors and 15 employees of the banks.

3.4 Data Collection Procedure

The data are collected from secondary source as well as primary source. To collect secondary data, the researchers visited Campus Library of NCC, TU Central Library, SDC Library, Public Youth Campus Library, SEBO/N, Library and Nepal Rastra Bank's Library, and official websites of the banks. For the collection of the primary data, the questionnaire approach was adopted. The questionnaire was carried out with different borrowers, depositors and employees of the sampled banks.

3.5 Period Covered

The necessary data and information have been collected from various sources covering a period of five years, i.e., 2004/2005 to 2008/09.

3.6 Tools for Analysis

Financial and statistical tools are the main tools to be used in the analysis of the data, which are explained separately.

3.6.1 Financial Tools

The major financial tools that have been utilized to meet the objectives of the study are;

A) Weighted Interest Rate on Loan & Advances and Other Investments

The interest has preponderance on the earning of the bank. Mainly the interest income arises from loan and advances disbursement and the investment in bond and debentures. The weighted interest rate on loan and advances, and other investments represents the earning capacity of the bank.

$$\text{Weighted Interest Rate on Loan \& } Adv. and\ Investment = \frac{\text{Interest Income on Loan \& } Adv. + Interest\ Income\ on\ Investment}{\text{Loan and Advances} + \text{Investment}}$$

B) Weighted Interest Rate on Deposit

Deposit is the main source of fund for the bank. The depositors deposit their savings to earn interest. An appropriate interest rate for deposits is desirable for the bank to entice the depositors. Under this, the interest rate allocated on different deposit accounts has been measured.

$$\text{Weighted Interest Rate on Deposits} = \frac{\text{Interest Income on Different Deposits Accounts}}{\text{Total Deposit Collection}}$$

C) Net Interest Margin

NIM is the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders. The NIM should be neither too high nor too low. It is calculated by using the following formula;

$$\text{NIM} = \frac{\text{Interest Income Earned} - \text{Interest Payment Made}}{\text{Interest Earning Assets}}$$

D) Net Interest to Total Assets

It measures the efficiency of the bank in generating net interest by effectively mobilizing the assets. Higher the ratio is considered favorable and delineates the total assets has been mobilized in productive sector.

$$\text{Net Interest to Total Assets} = \frac{\text{Net Interest}}{\text{Total Assets}}$$

3.6.2 Statistical Tools

In this study, the following statistical tools have been extensively used;

A) Arithmetic Mean

"Arithmetic mean is the number which is obtained by adding the various numbers of all the items of a series and dividing the total by the number of items. Arithmetic mean is a useful tool in statistical analysis.

The most popular and widely used measure of representing the entire data by one value is what most laymen call an average and what the statisticians call the arithmetic mean." *(Gupta; 2000: 180)*

Formula,

$$\overline{X} = \frac{\sum X}{N}$$

Where,

$\overline{X}$ = Arithmetic Mean

$\sum X$ = Sum of elements

N = Number of observation

B) Standard Deviation

"The standard deviation measures the absolute dispersion, the greater the standard deviation the greater will be the magnitude of the deviation means a high degree of uniformity of the observation as well as homogeneity of a series and a large standard deviation means just the opposite. Standard deviation is extremely useful in judging the representativeness of the mean." *(Gupta; 2000: 283)*

Formula,

$$\sigma = \sqrt{\frac{\sum (X - \overline{X})^2}{N}}$$

Where,

$\frac{\sum (X - \overline{X})^2}{N}$ = variance

C) Coefficient of Variation

Coefficient of variation is the relative measure of dispersion. Coefficient of variation is the percentage variation in means standard deviation being considered as the total variation from the mean.

Coefficient of variations (C.V) = $\frac{\sigma}{\bar{X}} \times 100$

D) Correlation Coefficient

It is a useful statistical tool for measuring the intensity of the magnitude of linear relationship between two variables. The most important method of measuring the correlation between the two variables is "Karl person's coefficient of correlation. "If the values of the variables are directly proportional then the correlation is said to be positive. On the other hand, if the values of the variables are inversely proportional, then the correlation is said to be negative. The correlation coefficient always remains within the limit of +1 to -1. The correlation coefficients (r) between two variables X and Y can be obtained by using following formula." *(Gupta; 2002: 541)*

Formula,

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{N\sum X^2 - (\sum X)^2}\sqrt{N\sum Y^2 - (\sum Y)^2}}$$

Where,

r = The correlation coefficient between two variables of X and Y

Proprieties:

a) It lies between -1 and +1
b) If r = +1, then there is perfect positive correlation.

c) If r = -1, then there is perfect negative correlation.

d) If r = 0, then there is no correlation.

e) If r = 0.7 to 0.99 (or- 0.7 to -0.99) then there is high degree positive or negative correlation.

E) Probable Error

The probable error denoted by P.E. is used to measure the reliability and test of significance of correlation coefficient. Significance of relationship has been tested by using the probable error (P.E.) and it is denoted by the following model:

$$\text{Probable Error (P. E.)} = 0.6745\text{X}\frac{1-\text{r}^2}{\sqrt{\text{n}}}$$

Where, r = the value of correlation coefficient

n = number of pairs of observations

if r < P.E., it is insignificant, i.e. there is no evidence of correlation

if r > 6 P.E., it is significant

if P.E. < r < 6 P.E., nothing can be concluded

F) Regression Lines

The regression line is the line, which gives the best estimate of one variable for any given value of the other variable. In case of two variables X and Y, we will have two regression lines i.e. lines is called the regression equation and also estimating equations. Since there are two regression lines, there are two regression equations.

Regression equation of Y on X

The regression equation is expressed as;

$$y = a + bx$$

We shall get the normal equation for estimating “a” and “b” as.

$$\sum X = Na + b \sum Y$$

$$\sum XY = a\sum Y + b \sum Y^2$$

Where,

X = the value of independent variable

Y = the value of dependent variable

a = Y-intercept

b = slope of the trend line/coefficient of regression

N = number of pairs of observations.

$$a = Y- b X$$

CHAPTER – IV

DATA PRESENTATION AND ANALYSIS

4.1 Secondary Data Analysis

Under this part of the study, the data related to clarify the net interest margin of the selected banks and the relationship of NIM with various determinants has been tested using statistical tools.

4.1.1 Weighted Interest Rate on Loan & Advances and Other Investments

The earning of the bank is generally dominated by the interest received by the bank in disbursed loan and advances and other investment. The weighted interest rate on loan and advances and other investment is the average interest rate charged by bank in certain year, and thus influences the NIM of bank. The weighted interest rate charged by the selected banks is presented in the Table 4.1.

Table 4.1

Weighted Interest Rate on Loan & Advances and Other Investments

FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	4.96	6.65	5.38	6.47	7.18
2005/06	5.57	6.95	6.36	6.70	6.87
2006/07	5.66	6.65	6.22	6.81	6.61
2007/08	5.78	6.63	5.73	7.13	6.69
2008/09	5.61	7.38	6.95	7.84	6.86
Mean	**5.52**	**6.85**	**6.13**	**6.99**	**6.84**
S.D.	**0.29**	**0.29**	**0.54**	**0.48**	**0.20**
C.V.%	**5.20**	**4.23**	**8.81**	**6.80**	**2.87**

(Source: Appendix-II)

The Table 4.1 presents the interest rate on credit and other investments. The table shows that that the interest rate on loan and advances of SCBNL has increased for the first four years, i.e. from 4.96% in the fiscal year 2004/05 to

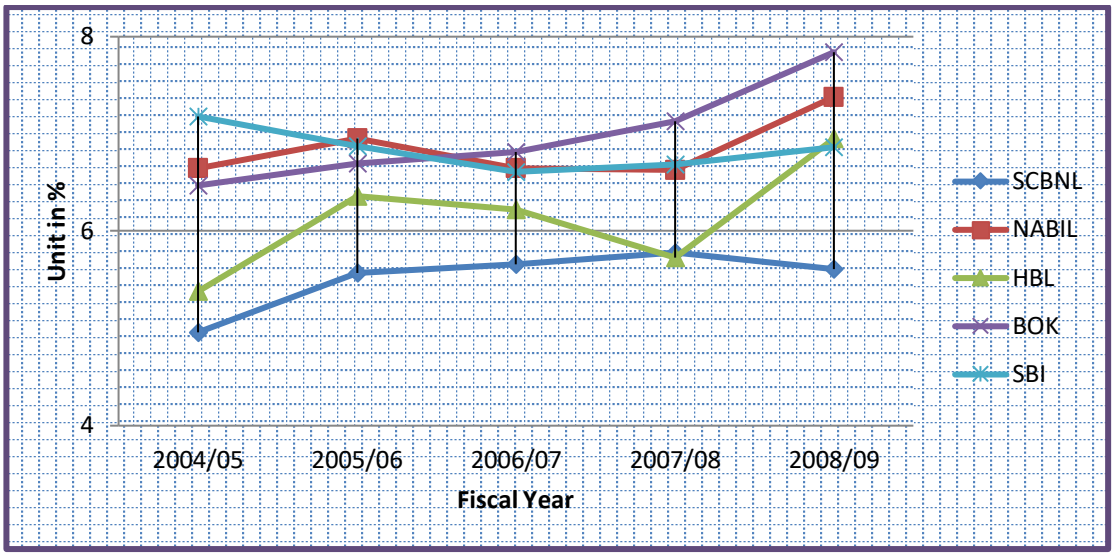
5.78% in the fiscal year 2007/08, and then has decreased to 5.61% in the fiscal year 2008/09. In average, the interest rate of SCBNL for the five year periods is 5.52% and the rate has fluctuated by only 5.20% showing consistency. Unlike in SCBNL, the interest rate in NABIL has fluctuated during the periods and thus has ranged from 6.63% in the fiscal year 2007/08 to 7.38% in the fiscal year 2008/09. In average, the interest rate in credit and other investments of NABIL is 6.85% with 4.23% fluctuation, indicating high uniformity.

Alike in NABIL, the interest rate in HBL has fluctuated during the periods and thus is highest, 6.95%, in the fiscal year 2008/09 and lowest, 5.38%, in the fiscal year 2004/05. In average, HBL has collected 6.13% interest rate from loan and advances and other investments, and the variation in such rate is 8.81%. In contrast to other banks, the interest rate in BOK has followed gradual inclination during the periods, and thus has reached to 7.84% in the fiscal year 2008/09 from 6.47% in the fiscal year 2004/05. In average, the interest charged by BOK is 6.99% with the variation of 6.80%. Similarly, the interest rate of SBI has decreased for the first three years, and then has increased in the last two years. SBI has charged highest 7.18% interest rate in the fiscal year 2004/05 and lowest 6.61% interest rate in the fiscal year 2006/07. In average, the interest rate on loan and advances and other investments of SBI is 6.84% with 2.87% variation.

Comparing the five banks on the basis of average interest rate charged on loan and advances and other investments, it is clear that the weighted interest rate on BOK is highest and the weighted interest rate of SCBNL is lowest than that in other banks. Thus, if other things remain constant, the lowest interest rate of SCBNL might affectionate the borrower toward it.

Figure 4.1

Weighted Interest Rate on Loan & Advances and Other Investments



4.1.2 Weighted Interest Rate on Deposit

The depositors deposit their savings in bank with the hope of getting appropriate interest amount. The interest rate provided by the bank should be fascinating enough to attract the customers toward it, and thus to increase the fund. The weighted interest rate on deposit of the bank should be appropriate to have optimal NIM.

Table 4.2

Weighted Interest Rate on Deposit

FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	1.26	1.64	2.19	2.79	3.43
2005/06	1.47	2.05	2.48	3.33	3.54
2006/07	1.71	2.50	2.65	2.77	3.60
2007/08	1.77	2.69	2.58	2.78	3.58
2008/09	1.63	3.22	2.78	3.12	4.02
Mean	**1.57**	**2.42**	**2.54**	**2.96**	**3.63**
S.D.	**0.18**	**0.54**	**0.20**	**0.23**	**0.20**
C.V.%	**11.73**	**22.36**	**7.83**	**7.71**	**5.55**

(Source: Appendix-II)

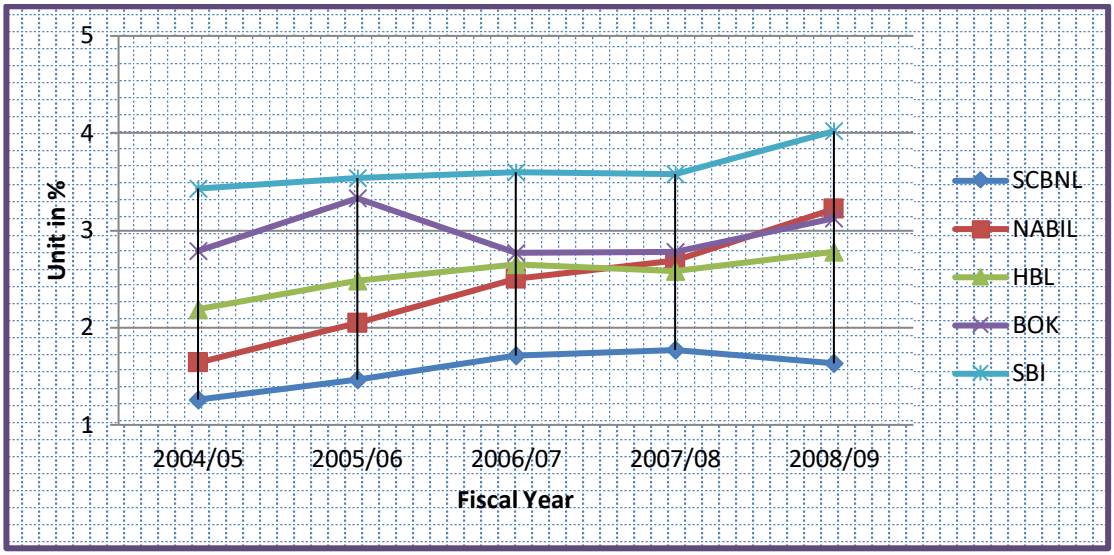
The Table 4.2 depicts the average cost on deposits of the banks. Clearly, the interest rate on deposit provided by SCBNL has increased for the first four years and then has decreased in the last fiscal year. The trend in cost of deposits is reminiscent to the trend of interest rate on loan and advances and other investments. This indicates a good synchronization between the two different interest rates. Whatever may be the pattern, the interest rate on deposit of SCBNL has ranged from 1.26% in the fiscal year 2004/05 to 1.77% in the fiscal year 2007/08, and in average the bank has provided 1.57% interest rate on deposit with the variation of 11.73%. Likewise to attract the deposit holders, NABIL has increased the weighted interest rate on deposit in each year, and thus the interest rate has increased from 1.64% in the fiscal year 2004/05 to 3.22% in the fiscal year 2008/09. In average, NABIL has provided 2.42% interest rate in deposits and the variation in such rate is 22.32%, indicating inconsistency.

Except in the fiscal year 2007/08, the interest rate on deposit provided by HBL is also found to be in increasing trend. The weighted interest rate on deposit of HBL is highest, 2.78%, in the fiscal year 2008/09 and is lowest, 2.19%, in the fiscal year 2004/05. In average, the interest rate provided by HBL to its deposit holders within the five year period is 2.54%, with the variation of 7.83%. However in BOK, the weighted interest rate on deposit is not in regular trend, and thus has ranged from 2.77% in the fiscal year 2006/07 to 3.33% in the fiscal year 2005/06. In average, the bank has provided 2.96% weighted interest rate on deposit with 7.71% of variation. Alike in HBL, the weighted interest rate of SBI is also found to be increasing trend except in the fiscal year 2007/08. The interest rate on deposit of the bank has ranged from 3.43% in the fiscal year 2004/05 to 4.02% in the fiscal year 2008/09. In average, the weighted interest rate on deposit of the bank is 3.63% with the variation of 5.55%.

Comparing the five banks, it can be assumed that for deposit holders the weighted interest rate on deposit of SBI will be most fascinating than that of other banks, since the weighted interest rate on deposit of SBI is highest and also most consistent.

Figure 4.2

Weighted Interest Rate on Deposit



4.1.3 Net Interest Margin

Net interest margin has been the major concern of each bank. Higher NIM depresses the borrowers and depositors of the bank and thus decreases the investment opportunity and fund of the bank. While lower NIM decreases the sustainability of the bank by creating hurdle to meet the operating expenses. Thus the bank needs to have optimal net interest margin. The NIM of the selected banks within the five consecutive periods has been presented in the Table 4.3.

Table 4.3

Net Interest Margin

FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	3.70	5.01	3.19	3.68	3.75
2005/06	4.10	4.90	3.88	3.37	3.33
2006/07	3.95	4.15	3.57	4.04	3.01
2007/08	4.01	3.94	3.15	4.35	3.11
2008/09	3.98	4.16	4.15	4.72	2.84
Mean	**3.95**	**4.43**	**3.59**	**4.03**	**3.21**
S.D.	**0.13**	**0.44**	**0.39**	**0.48**	**0.31**
C.V.%	**3.39**	**9.83**	**10.81**	**11.78**	**9.79**

(Source: Appendix-II)

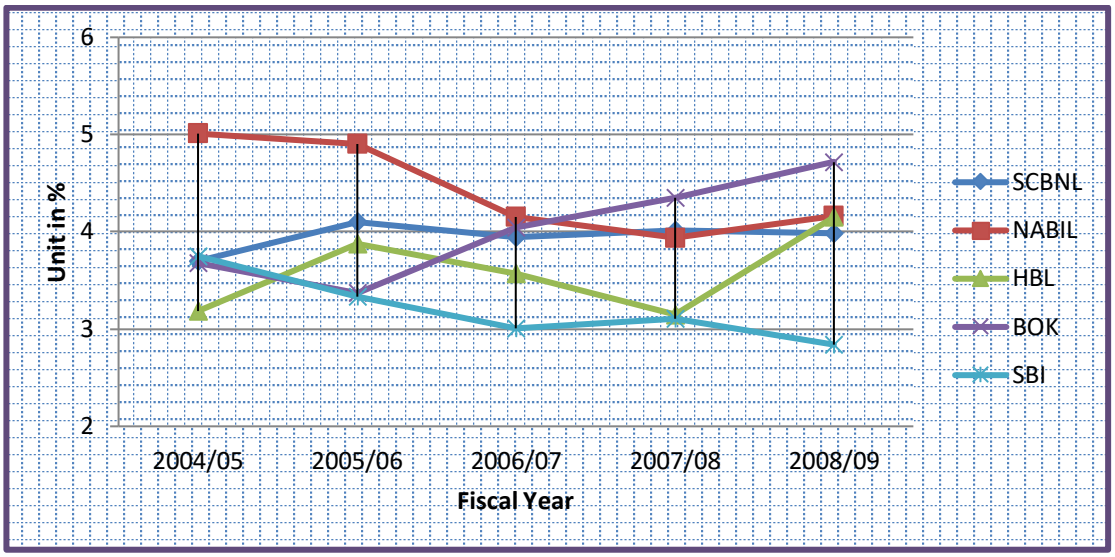
Analyzing the Table 4.3, it has been found that the net interest margin of SCBNL has been in irregular trend. The NIM of SCBNL has ranged from 3.70% in the fiscal year 2004/05 to 4.10% in the fiscal year 2005/06. This indicates that rate of increase/decrease in interest income rate is not similar to the rate of increase/decrease in interest expenses rate. In average, the NIM of SCBNL is 3.95% with the variation of 3.39%. Likewise, the NIM of NABIL has decreased for the first four fiscal years and thus has ranged from 5.01% in the fiscal year 2004/05 to 3.94% in the fiscal year 2007/08. In average, NABIL has maintained 4.43% NIM with the variation of 9.83% in such margin.

Similarly, the NIM of HBL is also in fluctuating trend and thus is highest, 4.15%, in the fiscal year 2008/09 and lowest, 3.19%, in the fiscal year 2004/05. In average, the NIM of the bank is 3.59% and the variation in the margin is 10.81%. Further, the NIM of BOK has ranged from 3.35% in the fiscal year 2007/08 to 4.72% in the fiscal year 2008/09, and the average NIM for the five year periods is 4.03% with the fluctuation by 11.78%. Also, the NIM of SBI has been highest, 3.75%, in the fiscal year 2004/05 and has been lowest, 2.84%, in the fiscal year 2008/09. In average, SBI has maintained 3.21% of net interest margin with the variation of 9.79%, indicating quite uniformity.

Comparing five banks, NABIL has remained most successful to keep highest NIM, while SBI has remained least successful. Since, SBI has provided highest weighted interest rate on deposit, the situation of having least NIM in SBI is palpable. Although, BOK has charged highest weighted interest rate on loan and advances and other investment, the weighted interest rate on deposit has also increased greatly and thus the bank cannot have highest NIM.

Figure 4.3

Net Interest Margin



4.1.4 Net Interest to Total Assets Ratio

This ratio measures the efficiency of the bank in generating net interest from effectively mobilizing the total assets in investment. Higher the ratio is considered better and vice versa. The net interest to total assets ratio of the banks for the five consecutive periods is presented in the Table 4.4.

Table 4.4

Net Interest to Total Assets Ratio

FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	3.69	4.84	3.23	3.71	3.09
2005/06	3.44	4.27	3.32	3.34	2.87
2006/07	3.49	3.79	3.01	3.29	3.01
2007/08	3.36	3.29	3.15	3.48	3.00
2008/09	3.31	3.75	3.58	3.83	2.06
Mean	**3.46**	**3.99**	**3.26**	**3.53**	**2.81**
S.D.	**0.13**	**0.53**	**0.19**	**0.21**	**0.38**
C.V.%	**3.86**	**13.21**	**5.86**	**5.90**	**13.60**

(Source: Appendix-II)

The above table shows that the net interest to total assets of the selected banks is in fluctuating trend. The net interest to total assets ratio of SCBNL has ranged from 3.69% in the fiscal year 2004/05 to 3.31% in the fiscal year 2008/09. In average, SCBNL has generated Rs. 3.46 net interest income from Rs. 100 investment in total assets, and the fluctuation on such income is 3.86%. Similarly, the ratio in NABIL has diminished for the first four years, and thus has ranged from 4.84% in the fiscal year 2004/05 to 3.29% in the fiscal year 2007/08. In average, the net interest to total assets of the bank is 3.99% and the variation in such ratio is 13.21%.

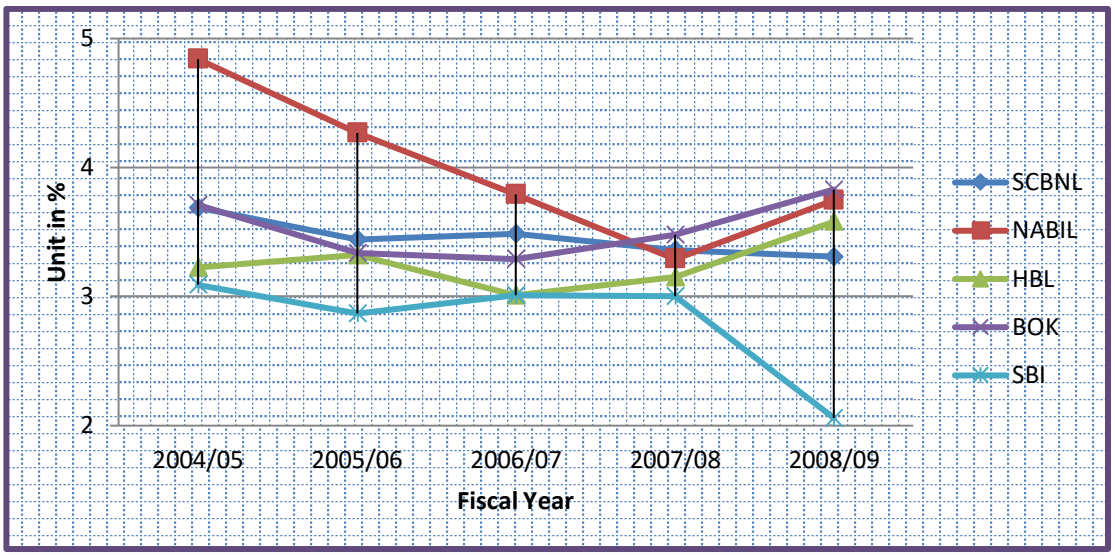
Likewise, the ratio in HBL is highest, 3.58%, in the fiscal year 2008/09 and lowest, 3.01%, in the fiscal year 2006/07. In average, HBL generated 3.26% of the total assets as net interest income and the variation on such ratio is 5.86%. Also, the net interest to total assets of BOK has ranged from 3.29% in the fiscal year 2006/07 to 3.83% in the fiscal year 2008/09, and in average the ratio is 3.53% with 5.90% fluctuation. Finally, the ratio in SBI is highest, 3.09%, in the fiscal year 2004/05 and is lowest, 2.06%, in the fiscal year 2008/09. This seems that the efficiency of bank in mobilizing the total assets to generate net interest

is debilitating. In average, SBI has generated 2.81% of the total assets as net interest income with the fluctuation of 13.60%.

On the basis of net interest to total assets ratio, it can be concluded that NABIL is most efficient and SBI is worst efficient in mobilizing the total assets in generating the net interest.

Figure 4.4

Net Interest to Total Assets Ratio



4.1.5 Statistical Analysis

Under this section of the study, the relationship of NIM with the its determinants, the impact of NIM on net profit of the bank, and the trend value of NIM and its determinants have been evaluated.

4.1.5.1 Correlation and Regression Analysis

The correlation and regression analysis has been done to evaluate the effect of the determinants on NIM and the cause of NIM to change the value of net profit of the bank.

4.1.5.1.1 NIM and Inflation

Inflation is considered as one of the macro economic determinant of NIM of the bank. Inflation of the nation requires banks to have high NIM. To test this fact, the relationship between them has been test, assuming NIM as the dependent variable on inflation.

Table 4.5

Correlation and Regression Analysis between NIM & Inflation

Bank	r	r^2	P.E.	6 P.E.	Remarks	Regression
SCBNL	0.4953	0.2453	0.2277	1.3660	Insignificant	NIM = 3.78 + 0.02 Inf.
NABIL	-0.4425	0.1958	0.2426	1.4555	Insignificant	NIM = 4.93 - 0.06 Inf.
HBL	0.7970	0.6353	0.1100	0.6601	Significant	NIM = 2.79 + 0.10 Inf.
BOK	0.6887	0.4744	0.1586	0.9514	Insignificant	NIM = 3.18 + 0.11 Inf.
SBI	-0.7537	0.5680	0.1303	0.7818	Insignificant	NIM = 3.82 – 0.08 Inf.

(Source: Appendix-III)

The above table shows the relationship between the net interest margin with its one determinant, inflation. The table depicts that net interest margin has positive relationship with country's inflation in three selected banks, SCBNL, HBL and BOK, and negative relationship with inflation in remaining banks, NABIL and SBI. The correlation coefficient between NIM and inflation in SCBNL is 0.4953, in NABIL is -0.4425, in HBL is 0.7970, in BOK is 0.6887 and in SBI is -0.7537. Further, the regression line of NIM on inflation indicates that with per percent increase/decrease leads to 0.02% increase/decrease in SCBNL, 0.06% decrease/increase in NABIL, 0.10% increase/decrease in HBL, 0.11% increase/decrease in BOK and 0.08% decrease/increase in SBI.

However, except in HBL, the value of 'r' is lower than the 6 P.E. This indicates that the relationship between NIM and inflation in SCBNL, NABIL, BOK and SBI is not statistically significant and thus change in inflation rate may not drive change in NIM in same direction. But in HBL, change in inflation rate changes the NIM, since the relationship between these two variables is

statistically significant. Thus, in most of the banks observed, it has been found that inflation individually does not have strong influence on NIM.

4.1.5.1.2 NIM & Weighted Interest rate on Loan & Advances and other Investment

NIM is the difference between the interest rate charged on the loan and advances and other investment and the interest provided to the depositors. To measure whether weighted interest rate on loan and advances and other investment has impact on changing the NIM, the correlation analysis and regression analysis have been computed.

Table 4.6

Correlation and Regression Analysis between NIM & Weighted Interest rate on Loan & Advances and other Investment

Bank	r	r^2	P.E.	6 P.E.	Remarks	Regression
SCBNL	0.8640	0.7465	0.0765	0.4587	Significant	NIM = 1.73 + 0.40 I_{LAO}
NABIL	-0.0766	0.0059	0.2999	1.7992	Insignificant	NIM = 5.22 - 0.12 I_{LAO}
HBL	0.9560	0.9139	0.0260	0.1558	Significant	NIM = -0.62 + 0.69 I_{LAO}
BOK	0.8853	0.7838	0.0652	0.3914	Significant	NIM = -2.18 + 0.89 I_{LAO}
SBI	0.7823	0.6119	0.1171	0.7023	Significant	NIM = -5.36 + 1.25 I_{LAO}

(Source: Appendix-III)

Analyzing the above table, it has been found that, except in NABIL, NIM has positive relationship with the weighted average interest rate on loan and advances and other investment of the bank. The correlation coefficient between these two variables is 0.8640 in SCBNL, -0.0766 in NABIL, 0.9560 in HBL, 0.8853 in BOK and 0.7823 in SBI. Similarly, the coefficient of determination indicates that 74.65%, 0.59%, 91.39%, 78.38% and 61.19% variation in NIM of SCBNL, NABIL, HBL, BOK and SBI respectively is caused by change in the interest rate on loan and advances and other investment.

Also, the regression line implies that with 1% increase in such interest rated leads to 0.40% increase in NIM of SCBNL, 0.12% decrease in NIM of NABIL,

0.69% increase in NIM of HBL, 0.89% increase in NIM of BOK and 1.25% increase in NIM of SBI. Further, except in NABIL, the relationship between these two variables in other selected banks has been to be statistically significant, as the value of 'r' in these banks is greater than the 6 P.E. of the respective banks. Thus, it can be assumed that certainly interest rate on loan and advances and other investment is one of the major determinants of NIM.

4.1.5.1.3 NIM & Weighted Interest rate on Deposit

The NIM is the function of the weighted interest rate on deposit and weighted interest rate on loan and advances and other investment. To measure the relationship of NIM with weighted interest rate on deposit, the NIM is assumed to be the dependent variable on the weighted interest rate on deposit.

Table 4.7

Correlation and Regression Analysis between NIM & Weighted Interest rate on Deposit

Bank	r	r^2	P.E.	6 P.E.	Remarks	Regression
SCBNL	0.6198	0.3841	0.1858	1.1146	Insignificant	NIM = 3.24 + 0.45 I_D
NABIL	-0.8458	0.7154	0.0858	0.5151	Significant	NIM = 6.08 – 0.68 I_D
HBL	0.6158	0.3792	0.1873	1.1236	Insignificant	NIM = 0.54 + 1.20 I_D
BOK	-0.2461	0.0606	0.2834	1.7002	Insignificant	NIM = 5.55 – 0.51 I_D
SBI	-0.7958	0.6334	0.1106	0.6635	Significant	NIM = 7.71 – 1.24 I_D

(Source: Appendix-III)

The above table shows that NIM has positive relationship in SCBNL and HBL, and negative relationship in NABIL, BOK and SBI with weighted interest rate on deposit. The correlation coefficient between these two variables in SCBNL is 0.6198, which is lower than 6 P.E. and thus is insignificant, in NABIL is -0.8458, whose absolute value is higher than 6 P.E. and thus is significant, in HBL is 0.6158, which is lower than 6 P.E. and thus is insignificant, in BOK is -0.2464, whose absolute value is lower than 6 P.E. and thus is insignificant, and in SBI is -0.7958, whose absolute value is higher than 6 P.E. and thus is significant.

Similarly, the regression line of NIM on weighted interest rate on deposit indicates that with 1% change in the interest rate of deposit causes 0.45% increase in NIM of SCBNL, 0.68% decrease in NIM of NABIL, 1.20% increase in NIM of HBL, 0.51% decrease in NIM of BOK and 1.24% decrease in NIM of SBI. Among these five banks, the impact of interest rate of deposit on NIM seems to be higher on SBI.

4.1.5.1.4 NPAT and NIM

Higher NIM results higher NPAT. Thus, the bank always attempts to have high NIM. However, the bank should have to consider the interest of depositors and borrowers and thus try to have optimal NIM. To evaluate the relationship between NIM and NPAT, NPAT is assumed to be the dependent variable on NIM.

Table 4.8

Correlation and Regression Analysis between NPAT and NIM

Bank	r	r^2	P.E.	6 P.E.	Remarks	Regression
SCBNL	0.4693	0.2202	0.2352	1.4113	Insignificant	NPAT = -1552.77 + 582.30 NIM
NABIL	-0.6429	0.4133	0.1770	1.0618	Insignificant	NPAT = 1841.84 – 252.81 NIM
HBL	0.4949	0.2450	0.2278	1.3665	Insignificant	NPAT = -170.56 + 195.04 NIM
BOK	0.9216	0.8493	0.0455	0.2728	Significant	NPAT = -606.94 + 221.34 NIM
SBI	-0.9677	0.9364	0.0192	0.1151	Significant	NPAT = 1147.64 – 295.81 NIM

(Source: Appendix-III)

Analyzing the relationship between net profit after tax and net interest margin, it has been observed that NPAT has positive relationship with NIM in three banks, SCBNL, HBL and BOK, and negative relationship with NIM in two banks, NABIL and SBI. The calculated correlation coefficient between these two variables is 0.4693 in SCBNL, -0.6429 in NABIL, 0.4949 in HBL, 0.9216 in in BOK and -0.9677 in SBI.

Also, the regression line of NPAT on NIM indicates that with 1% increase in NIM leads to Rs. 582.30 increase in NPAT of SCBNL, Rs. 252.81 millions decrease in NPAT of NABIL, Rs. 195.04 millions increase in NPAT of HBL,

Rs. 221.34 millions increase in NPAT of BOK and Rs. 295.81 millions decrease in NPAT of SBI. However the probable error test clarifies that the relationship between NPAT and NIM is statistically significant only in BOK and SBI. Thus, it can be inferred that NIM is not the sole determinant to influence the profit of the bank.

4.1.5.2 Trend Analysis

Under this statistical analysis, the trend value of NIM, its determinants and the NPAT of the bank for the fiscal year 2009/10 and 2011/12 is determined to have clear picture about the financial health of the bank in future.

4.1.5.2.1 Trend Analysis of NIM

Let the dependent variable NIM be denoted by *Y* and the independent variable time be denoted by *X*, then the trend value of NIM of the selected banks and the regression line of NIM on time have been presented in the below table.

Table 4.9

Trend Analysis of NIM

FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	3.70	5.01	3.19	3.68	3.75
2005/06	4.10	4.90	3.88	3.37	3.33
2006/07	3.95	4.15	3.57	4.04	3.01
2007/08	4.01	3.94	3.15	4.35	3.11
2008/09	3.98	4.16	4.15	4.72	2.84
2009/10	**4.09**	**3.63**	**3.95**	**4.95**	**2.60**
2010/11	**4.14**	**3.37**	**4.06**	**5.26**	**2.39**
Regression	**Y = 3.81 + 0.05 X**	**Y = 5.23 -0.27 X**	**Y = 3.23 + 0.12 X**	**Y = 3.11 + 0.31 X**	**Y = 3.82 - 0.20 X**

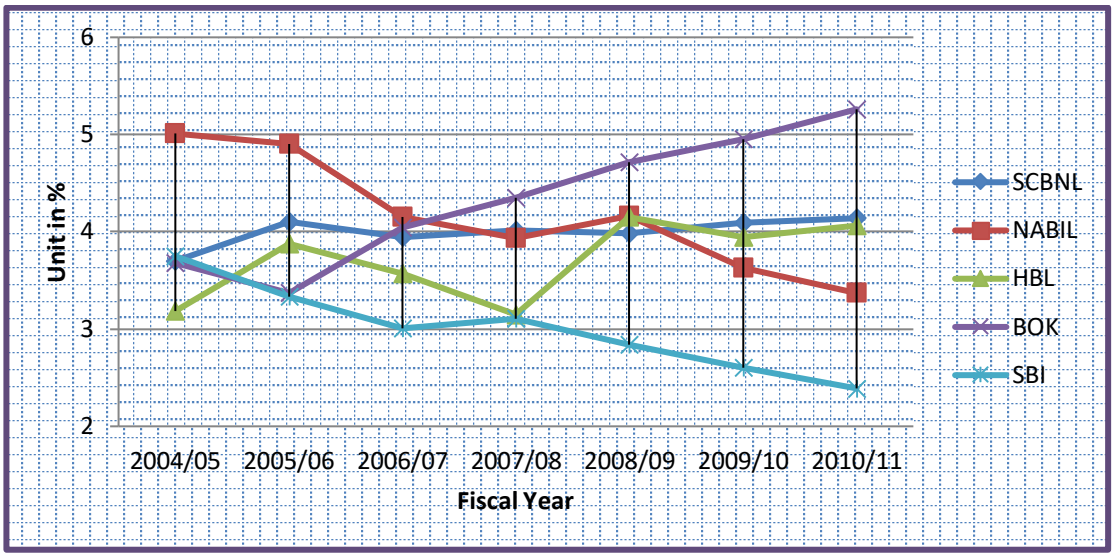
(Source: Appendix-IV)

While predicting the value of NIM for the upcoming two fiscal years, it has been found that the estimated value of NIM for the fiscal year 2009/10 will be 4.09% in SCBNL, 3.63% in NABIL, 3.95% in HBL, 4.95% in BOK and 2.60%

in SBI. Similarly, the NIM for the fiscal year 2010/11 will be 4.14% in SCBNL, 3.37% in NABIL, 4.06% in HBL, 5.26% in BOK and 2.39% in SBI. The NIM has direct relationship with lapse of time in SCBNL, HBL and BOK, and inverse relationship with lapse of time in NABIL and SBI. Thus, NIM increases by 0.05% in SCBNL, 0.12% in HBL and 0.31% in BOK per year and decreases by 0.27% in NABIL and 0.20% in SBI per year, if other things remain constant.

Figure 4.5

Trend Analysis of NIM



4.1.5.2.2 Trend Analysis of Weighted Interest Rate on Loan & Advances and Other Investment

To evaluate the trend value of weighted interest that the selected bank will charge on loan and advances and other investment for the fiscal year 2009/10 and 2010/11, the weighted interest rate on loan and advances and other investment has been considered the dependent variable on time period.

Table 4.10

Trend Analysis of Weighted Interest Rate on Loan & Advances and Other Investment

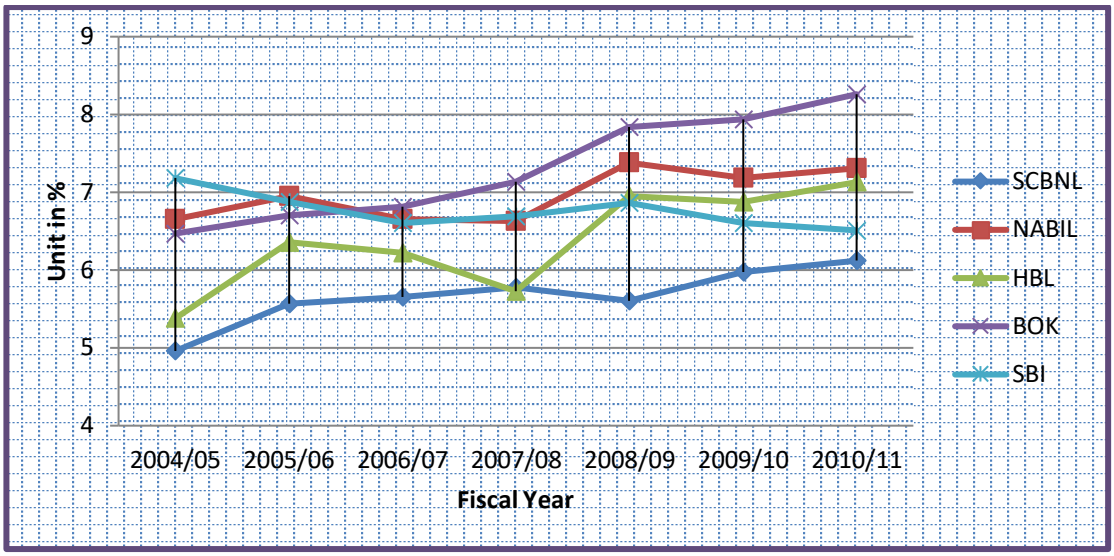
FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	4.96	6.65	5.38	6.47	7.18
2005/06	5.57	6.95	6.36	6.70	6.87
2006/07	5.66	6.65	6.22	6.81	6.61
2007/08	5.78	6.63	5.73	7.13	6.69
2008/09	5.61	7.38	6.95	7.84	6.86
2009/10	**5.97**	**7.19**	**6.88**	**7.94**	**6.60**
2010/11	**6.12**	**7.31**	**7.13**	**8.26**	**6.51**
Regression	**Y = 5.06 + 0.15 X**	**Y = 6.51 + 0.11 X**	**Y = 5.38 + 0.25 X**	**Y = 6.04 + 0.32 X**	**Y = 7.09 - 0.08 X**

(Source: Appendix-IV)

The above table shows that weighted interest rate on loan and advances and other investment has positive relation with the time in all of the banks except in SBI. The interest increases by 0.15% in SCBNL, 0.11% in NABIL, 0.25% in HBL and 0.32% in BOK, and decreases by 0.08% in SBI per year, if the other variable remains constant. Thus, the estimated value of weighted interest rate on loan and advances and other investment in the fiscal year 2009/10 will be 5.97% for SCBNL, 7.19% in NABIL, 6.88% in HBL, 7.94% in BOK and 6.60% in SBI. Similarly, the estimated weighted interest rate on loan and advances and other investment in the fiscal year 2010/11 will be 6.12% for SCBNL, 7.31% for NABIL, 7.13% for HBL, 8.26% for BOK and 6.51% for SBI.

Figure 4.6

Trend Analysis of Weighted Interest Rate on Loan & Advances and Other Investment



4.1.5.2.3 Trend Analysis of Weighted Interest Rate on Deposit

Under this, the weighted interest rate on deposit provided by the bank has been assumed to be dependent variable (Y) on the time period (X) to predict the interest rate for the forthcoming two fiscal years.

Table 4.11

Trend Analysis of Weighted Interest Rate on Deposit

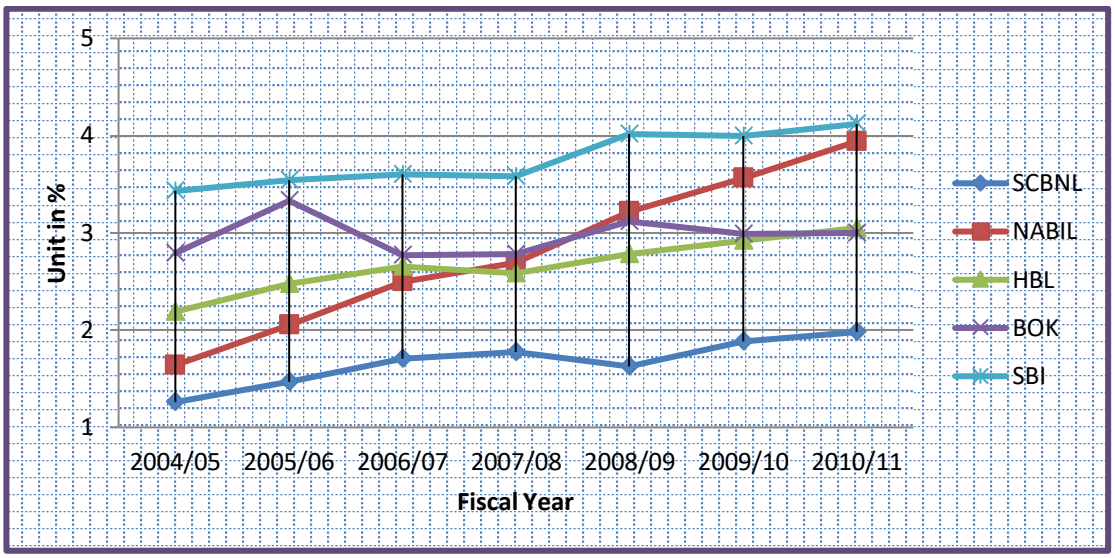
FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	1.26	1.64	2.19	2.79	3.43
2005/06	1.47	2.05	2.48	3.33	3.54
2006/07	1.71	2.50	2.65	2.77	3.60
2007/08	1.77	2.69	2.58	2.78	3.58
2008/09	1.63	3.22	2.78	3.12	4.02
2009/10	**1.88**	**3.56**	**2.92**	**2.99**	**4.00**
2010/11	**1.98**	**3.94**	**3.05**	**3.00**	**4.12**
Regression	**Y = 1.26 + 0.10 X**	**Y = 1.28 + 0.38 X**	**Y = 2.15 + 0.13 X**	**Y = 2.93 + 0.01 X**	**Y = 3.27 + 0.12 X**

(Source: Appendix-IV)

Interpreting the above table, it has been evaluated that the weighted interest rate on deposit of the bank has positive relationship with the time, and thus such interest rate increase by 0.10% annually in SCBNL, 0.38% annually in NABIL, 0.13% annually in HBL, 0.01% annually in BOK and 0.12% annually in SBI, if other variables remain stable. It can be inferred that deposit holders are going to be benefited by such increment. For the fiscal year 2009/10, the weighted interest rate on deposit of SCBNIL will be 1.88%, of NABIL will be 3.56%, of HBL will be 2.92%, of BOK will be 2.99%, and of SBI will be 4.00%. Similarly, the estimated interest rate for the fiscal year 2010/11 of SCBNL will be 1.98%, of NABIL will be 3.94%, of HBL will be 3.05%, of BOK will be 3.00% and of SBI will be 4.12%. It can be inferred that the weighted interest rate of SBI will be most alluring to the deposit holders.

Figure 4.7

Trend Analysis of Weighted Interest Rate on Deposit



4.1.5.2.4 Trend Analysis of NPAT

To examine the profitability of the bank in the fiscal year 2009/10 and 2010/11, the NPAT has been considered as the dependent variable on the time. The estimated value of NPAT for the forthcoming two fiscal years have been presented in the below table.

Table 4.12

Trend Analysis of NPAT

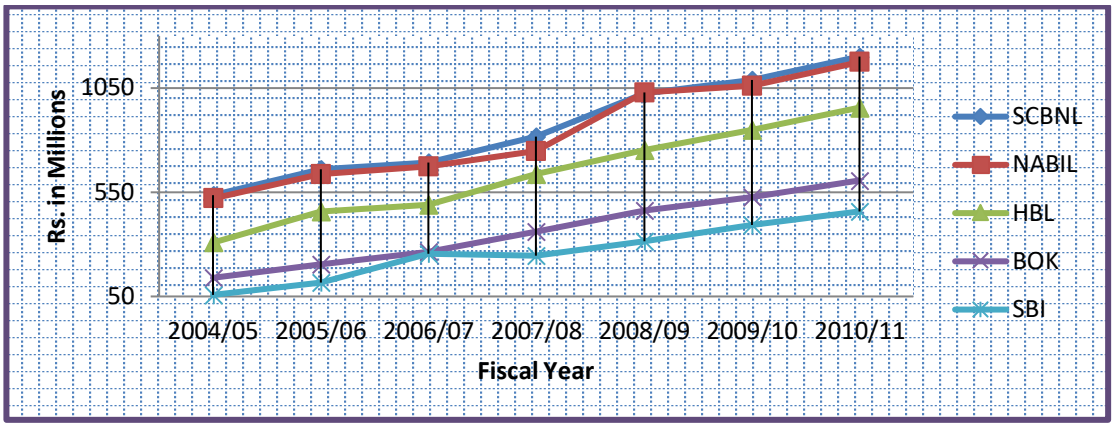
FY	SCBNL	NABIL	HBL	BOK	SBI
2004/05	536.24	520.11	308.28	139.53	57.39
2005/06	658.76	635.26	457.46	202.44	117.00
2006/07	691.67	673.96	491.82	262.39	254.91
2007/08	818.92	746.47	635.87	361.50	247.77
2008/09	1025.11	1031.05	752.83	461.73	316.37
2009/10	**1087.51**	**1061.30**	**849.51**	**526.56**	**393.31**
2010/11	**1201.30**	**1174.61**	**956.26**	**606.90**	**458.11**
Regression	**Y = 404.77 + 113.79 X**	**Y = 381.44 + 113.31 X**	**Y = 209 + 106.75 X**	**Y = 44.48 + 80.35 X**	**Y = 4.07 + 64.87 X**

(Source: Appendix-IV)

Analyzing the above table indicates that the net profit of each observed bank continues to increase in the forthcoming year. However, the rate of increment in SCBNL is highest. In each fiscal year, the NPAT of SCBNL rises by Rs. 113.79 millions, NABIL rises by Rs. 113.31 millions, HBL increases by Rs. 106.75 millions, BOK increases by Rs. 80.35 millions and SBI increases by Rs. 64.87 millions, if other variables remain uniform. Thus, in the fiscal year 2009/10, the net profit of SCBNL will be Rs. 1087.51 millions, of NABIL will be Rs. 1061.30 millions, of HBL will be Rs. 849.51 millions, of BOK will be Rs. 526.56 millions and of SBI will be Rs. 393.31 millions. Similarly, the net profit in the fiscal year 2010/11 will be Rs. 1201.30 millions, Rs. 1174.61 millions, Rs. 956.26 millions, Rs. 606.90 millions and Rs. 458.11 millions in the SCBNL, NABIL, HBL, BOK and SBI respectively.

Figure 4.8

Trend Analysis of NPAT



4.2 Primary Data Analysis

The primary data has been collected mainly to examine the relationship of net interest margin with its determinants, and to discuss the effect of net interest margin in the overall performance of the bank. For the primary data analysis, a questionnaire containing 10 questions has been prepared and distributed to 15 borrowers, 15 depositors and 15 employees of the banks.

4.2.1 Concentration of Management for Optimal NIM

Optimal net interest margin is the requirement of each bank to have sound management and lucrative profit. To examine the major concentration that the management of the bank should pay to have optimal NIM, the respondents are asked on this issue.

Table 4.13

Concentration of Management for Optimal NIM

Response	**Borrower**	**Depositor**	**Employee**	**Total**	
				No.	**%**
External Environment	3	3	2	8	18
Internal Environment	5	6	3	14	31
Both of Above	7	6	10	23	51
Total	**15**	**15**	**15**	**45**	**100**

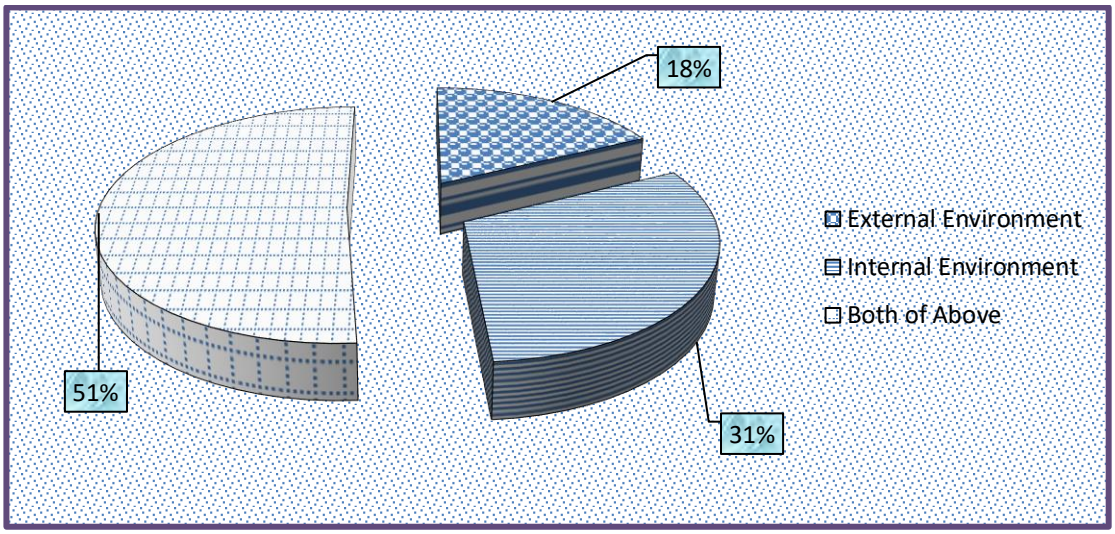
(Source: Opinion Survey, 2010)

The table shows that the majority of the borrowers, 7 out of 15, have pointed out that management should pay more concern on the challenges of both the environment, external and internal, to have sound net interest margin. Similarly, the majority of the employees, 10 out of 15, have also supported this view. While, the majority of the depositors, 6 out of 15, have supported this opinion, along with equal numbers have also affirmed internal environment to be the major concern of management. However, only 5 out of 15 of borrowers and 3 out of 15 of employees have given second preference to the sole internal environment. Finally, 3 borrowers, 3 depositors and 2 employees have urged that management should pay more concern to the hurdles of external environment in having optimal net interest margin.

Considering the overall majority, and the majority of each segment of respondents, it can be inferred that the management should pay concern to the challenges of both the internal and external environment for having sound NIM, since 23 out of 45, 51% of the total respondents have supported this view. However, only 31% of the respondents, 14 out of 45, have chosen internal environment, and only 18% of the respondents, 8 out of 45, have pointed external environment to be the major concern.

Figure 4.9

Concentration of Management for Optimal NIM



4.2.2 Major Internal Determinant of NIM

To investigate which of the internal environment determinants of NIM is crucial for influencing the NIM, the respondents are requested to express their opinions. The opinions thus obtained are presented in the table below.

Table 4.14

Major Internal Determinant of NIM

Response	**Borrower**	**Depositor**	**Employee**	**Total**	
				No.	**%**
Int. Rate on Loan & Adv. and other investment	5	4	1	10	22
Interest rate on deposit	4	6	1	11	24
Operating Expenses	1	2	2	5	11
Net Profit Targeted	3	2	5	10	22
Risk Aversion Attitude	2	1	4	7	16
Good Management	0	0	2	2	4
Total	**15**	**15**	**15**	**45**	**100**

(Source: Opinion Survey, 2010)

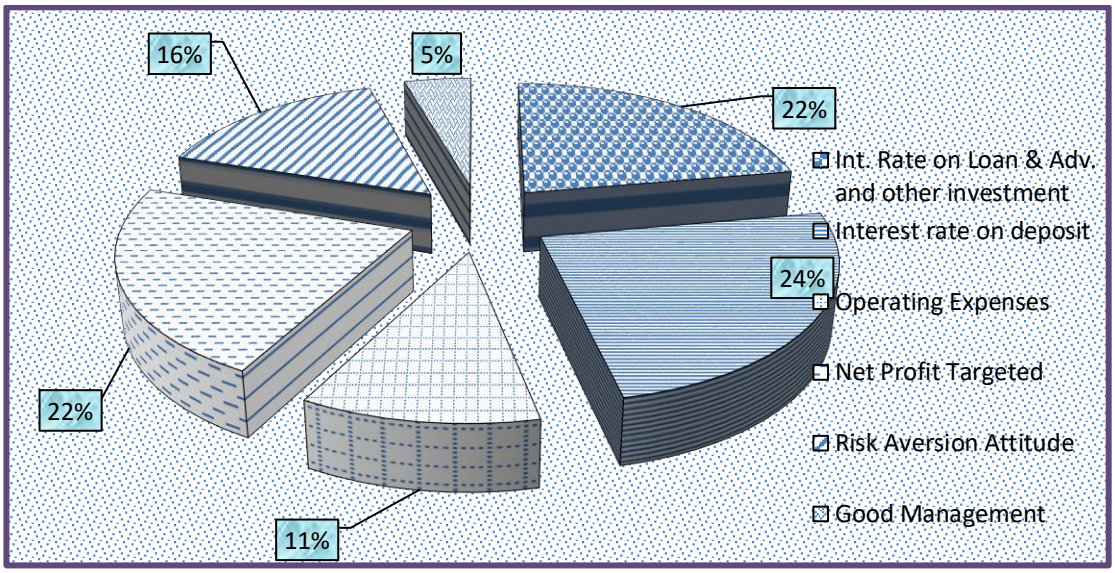
The above table depicts that the majority of the borrowers, 5 out of 15, have pointed that interest rate on loan and advances and other investment of the bank is the major internal determinant of net interest margin. While 4 borrowers have suggested that interest rate on deposit, 2 borrowers have pointed net profit targeted by the bank, 2 have chosen risk aversion attitude of the bank, and 1 has implied level of operating expenses of the bank is the major internal determinant of NIM. Similarly, the majority of the depositors, 6 out of 15, have chosen interest rate provided by the bank to depositors is the major internal determinant of NIM. However, 4 depositors, 2 depositors, 2 depositors and 1 depositor have implied interest rate on loan and advances and other investment, operating expenses of the bank, targeted net profit of the bank, and risk aversion attitude of the bank respectively is the major internal determinant of banks' NIM.

Likewise, the majority of the employees, 5 out of 15, have stated that the net profit targeted by the bank is the major internal determinant. Also, 4 employees, 2 employees, 2 employees, 1 employee and 1 employee have implied that risk aversion attitude, operating expenses, good management, interest rate on loan and advances and other investment, and interest rate on deposit of the bank is the major internal determinant of NIM. Rather mixed responses have been collected on this question, since the majority of each category of respondents has pointed out different answer option.

Considering the overall majority, it can be concluded that interest rate on deposit is the major internal determinant of the bank's NIM, since 24% of the total respondents, highest, 11 out of 45, have supported to this view. Next to this option, the interest rate on loan and advances and other investment, and the targeted net profit of the bank is crucial internal determinant of NIM, since 22% each, 10 out of 45, have chosen these options. Likewise, 16% of the total respondents, 7 out of 45, have selected risk aversion attitude, 11% of the respondents, 5 out of 45, have chosen operating expenses, and only 4% of the respondents, 2 out of 46, have selected good management as the major internal determinant.

Figure 4.10

Major Internal Determinant of NIM



4.2.3 Major External Determinant of NIM

Various external environment determinants affect the NIM of the bank. To examine which of the external determinant is crux for having optimal NIM, the respondents are asked to present their views. The opinions collected from them are tabulated in the below table.

Table 4.15

Major External Determinant of NIM

Response	**Borrower**	**Depositor**	**Employee**	**Total**	
				No.	**%**
Increasing Competition	4	5	4	13	29
Inflation Rate	2	0	1	3	7
NRB Rules	1	1	2	4	9
Bargaining Power	5	5	4	14	31
Market & Credit Risk	3	4	4	11	24
Total	**15**	**15**	**15**	**45**	**100**

(Source: Opinion Survey, 2010)

The above table shows that the majority of the respondents, 14 out of 45, 31%, have opined that the increased bargaining power on borrower and depositors on the interest rate is the major external determinant of the NIM. While, 29% of the respondents, 13 out of 45, have stated that increasing competition on the market is the major external determinant of NIM. Similarly, 24% of the respondents, 11 out of 45, have opined market and credit risk, 9% of the respondents, 4 out of 45, have pointed out NRB rules and regulations, and 7% of the respondents, 3 out of 45, have stated inflation rate of the country as the major external determinant of NIM.

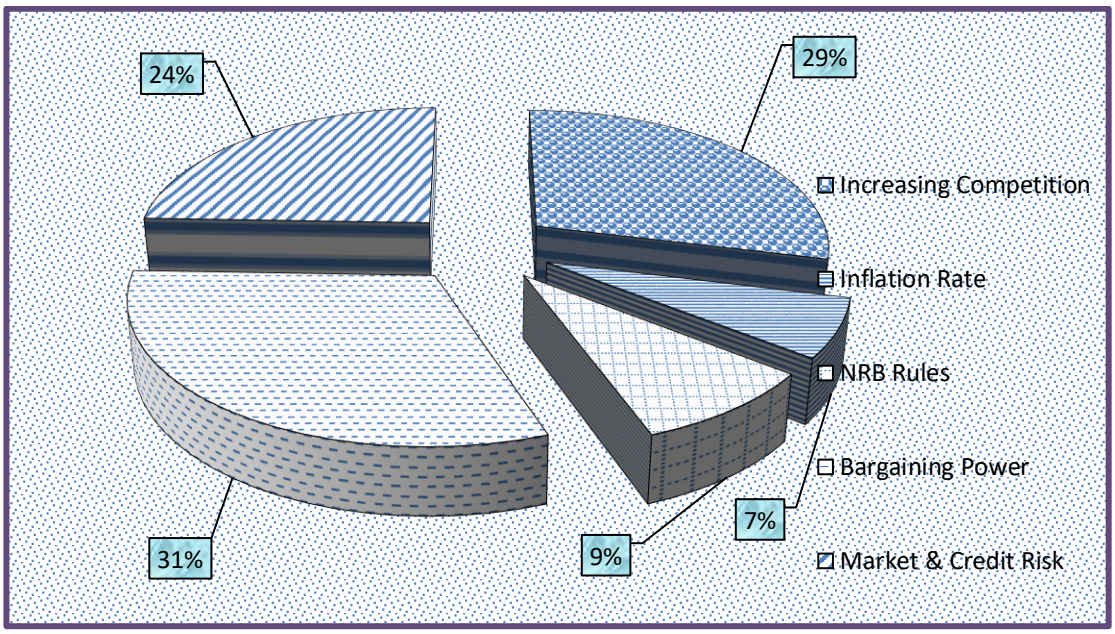
Analyzing each group of respondents, it has been found that the majority of the borrowers, 5 out of 15, have favored bargaining power as the major external determinant. While only 4 borrowers, 3 borrowers, 2 borrowers and 1 borrower have opined increased competition, market and credit risk, inflation rate and NRB rules and regulations respectively as the major determinant. Similarly, 5

depositors have said bargaining power, 5 depositors have pointed out increased competition, 4 depositors have affirmed market and credit risk and 1 depositor has egged on NRB rules as the major external determinant. Likewise, equal numbers of employees, 4, have explicated bargaining power, increased competition, and market and credit risk as the major determinant. While 2 employees have said NRB rules and regulations and 1 employee has pointed out inflation rate of the economy as the major influencer of NIM.

Considering the overall majority, it can be concluded that increasing bargaining power on depositors and borrowers is the major external influencer of NIM. However, the effect of increased competition and increase market and credit risk on NIM should not be ignored.

Figure 4.11

Major External Determinant of NIM



4.2.4 Impact of NIM on Profitability

The profitability of the bank depends on the NIM. Generally, higher NIM indicates higher profitability and vice versa, but higher NIM reduces the banks investment and fund. To examine to what extent the profitability of the bank is affected by NIM, the respondents are requested to present their opinions.

Table 4.16

Impact of NIM on Profitability

Response	Borrower	Depositor	Employee	Total	
				No.	%
High	8	10	8	26	58
Moderate	4	3	7	14	31
Low	3	2	0	5	11
Total	**15**	**15**	**15**	**45**	**100**

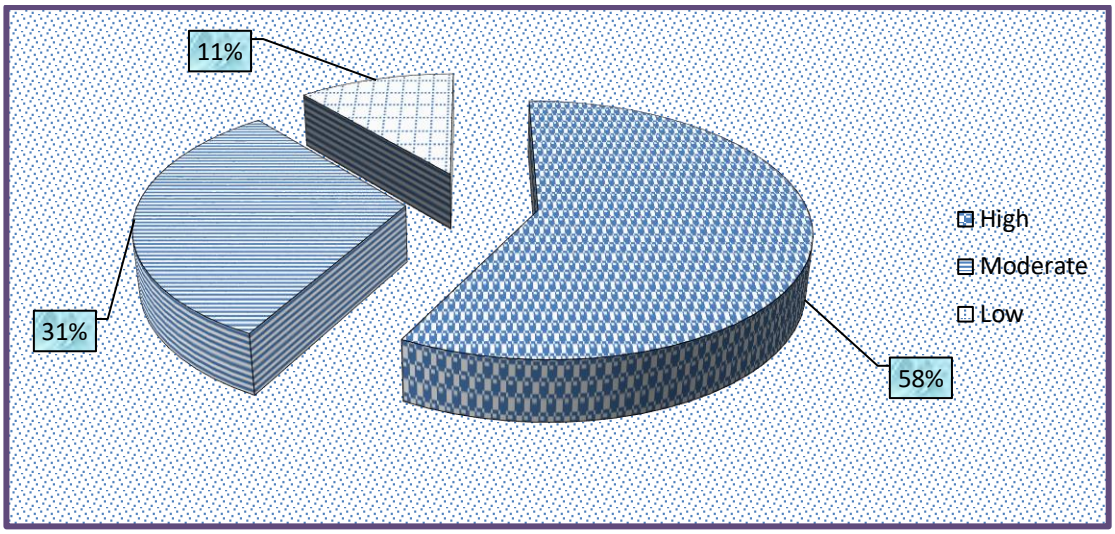
(Source: Opinion Survey, 2010)

The above table delineates that the majority of the borrowers, 8 out of 15, depositors, 10 out of 15, and employees, 8 out of 15, have strongly affirmed that NIM has high influence on the profitability of the bank. While 4 borrowers, 3 depositors, and 7 employees have said that NIM has moderate effect on the profitability. Likewise, 3 borrowers, 2 depositors and nil employees have stated low effect of NIM on bank's profit.

Certainly the majority of the total respondents, 58% (26 out of 45), have opined that NIM has strong influence on the profitability of the bank. While 31% of the respondents, 14 out of 45, have affirmed moderate influence of NIM, and 11% of the respondents, 5 out of 45, have stated low effect of NIM of profit. Thus, considering the overall majority and the majority of each category of respondents, it is clarified that NIM has robust effect on profitability of the banks. Hence bank needs to have optimal NIM to have sound profit, because higher NIM depresses depositors and borrower which reduces the banks investment and ultimately profit, and lower NIM also reduces the bank's profit.

Figure 4.12

Impact of NIM on Profitability



4.2.5 Role of Inflation to Effect NIM

Generally, it is considered that the inflation rate of the nation influences the requirement of NIM of the bank. To inquire the role of inflation in changing the NIM, the respondents are asked to view their opinions.

Table 4.17

Role of Inflation to Effect NIM

Response	**Borrower**	**Depositor**	**Employee**	**Total**	
				No.	**%**
High	2	1	0	3	7
Medium	7	10	12	29	64
Low	6	4	3	13	29
Total	**15**	**15**	**15**	**45**	**100**

(Source: Opinion Survey, 2010)

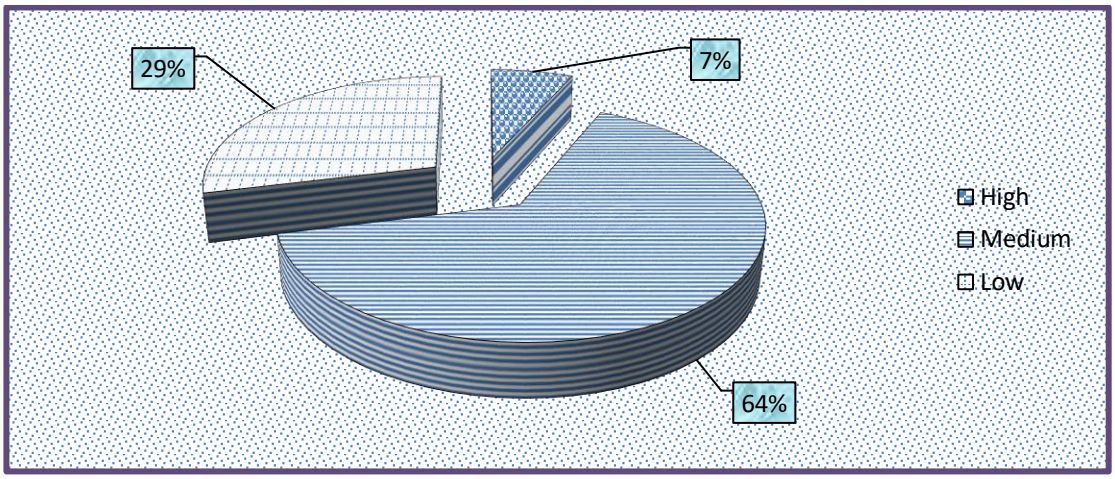
The above table measures the opinion of the respondents on the effect of inflation on NIM. The table shows that the majority of each category of respondents, 7 out of 15 borrowers, 10 out of 15 depositors, and 12 out of 15 employees, and the majority of the overall respondents, 64% (29 out of 45), have stated that the inflation rate of the country has medium effect on the NIM of the bank. However, 6 borrowers, 4 depositors, 3 employees, and 29% of the

total respondents (13 out of 45) have stated low impact of inflation rate on NIM. Similarly, 2 borrowers, 1 depositor, nil employee, and 7% of the total respondents (3 out of 45) have opined high effect of inflation rate on NIM.

Hence, considering the overall majority and the majority of each category of the respondents, it can be concluded that the inflation rate of the nation have medium impact on the NIM of the bank.

Figure 4.13

Role of Inflation to Effect NIM



4.2.6 Impact of Weighted Interest Rate on loan and Advances on NIM

To measure the degree of effect of the weighted interest rate on loan and advances and other investment on NIM, the respondents are asked to express their opinions. The opinions thus collected are presented in the table below.

Table 4.18

Impact of Weighted Interest Rate on loan and Advances on NIM

Response	**Borrower**	**Depositor**	**Employee**	**Total**	
				No.	**%**
Absolute	5	4	5	14	31
Middle	8	10	9	27	60
Low	2	1	1	4	9
Total	**15**	**15**	**15**	**45**	**100**

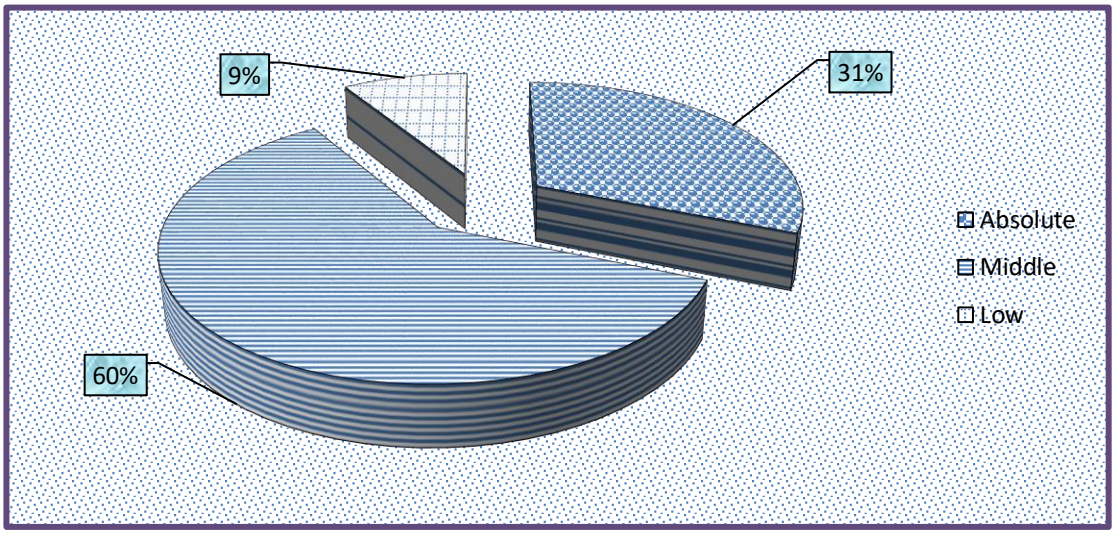
(Source: Opinion Survey, 2010)

The above table depicts that the majority of the borrowers, 8 out of 15, depositors, 10 out of 15, employees, 9 out of 15, and the total respondents, 27 out of 45 (60%), have stated that the weighted interest rate on loan and advances and other investment has middle impact on the net interest margin. Similarly, 5 borrowers, 4 depositors, 5 employees, and 31% of the total respondents (14 out of 45) have affirmed that the weighted interest rate on loan and advances and other investment on NIM has absolute effect. Likewise, 2 borrowers, 1 depositor, 1 employee and 9 % of the total respondents (4 out of 45) have opined that such interest rate has low effect on NIM.

Considering the overall majority and the majority of each category, it can be assumed that the weighted interest rate on loan and advances and other investment has moderate effect on changing the NIM of banks.

Figure 4.14

Impact of Weighted Interest Rate on loan and Advances on NIM



4.2.7 Appropriate Range of NIM

As per the banking norms, generally the NIM falling between 3% - 8% is considered better for the financial performance of the bank. To examine the appropriate range of NIM, the respondents are asked to present their views.

Table 4.19

Appropriate Range of NIM

Response	Borrower	Depositor	Employee	Total	
				No.	%
Below 3% - 8%	6	4	3	13	29
Precisely 3% - 8%	7	6	10	23	51
Above 3% - 8%	2	5	2	9	20
Total	**15**	**15**	**15**	**45**	**100**

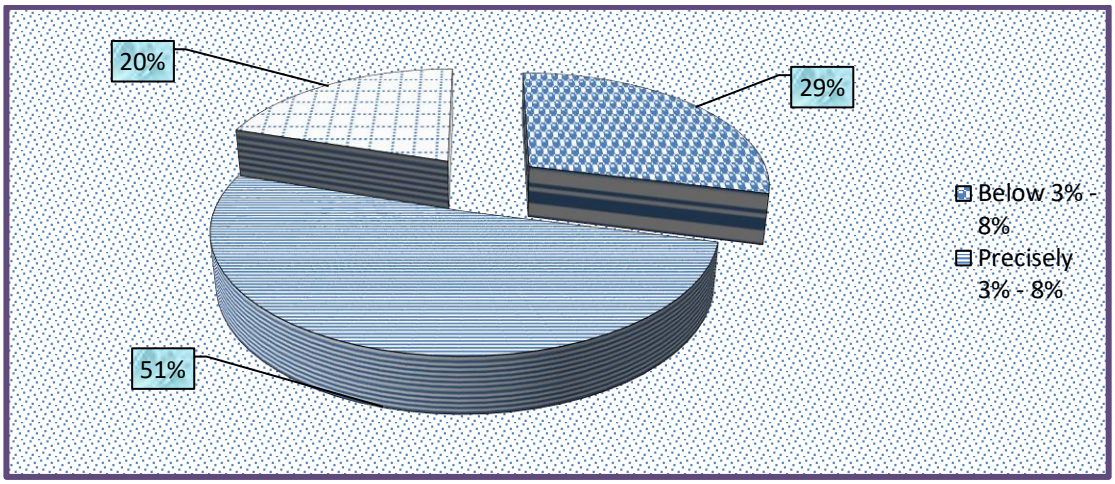
(Source: Opinion Survey, 2010)

The above table presents that the majority of the total respondents, 51% (23 out of 45), the majority of the borrowers, 7 out of 15, the majority of the depositors, 6 out of 15, and the majority of the employees, 10 out of 15, have stated that the bank should attempt to keep the net interest margin exactly between 3% to 8% of the international banking norms. Similarly, 6 borrowers, 4 depositors, 3 employees and 29% of the total respondents (13 out of 45) have stated that the appropriate range of NIM should be below 3% to 8%, which will be beneficial to the borrower while lending by bank and thus may increase the investment of the bank. In contrast, 2 borrowers, 5 depositors, 2 employees, and 20% of the total respondents (9 out of 45) have affirmed that the NIM should be above the range of 3% to 8%, which will be beneficial to the depositors, and thus increases the fund of the banks.

However considering the overall majority and the majority of each category of respondents, it can be concluded that the international banking norm of the range of exactly 3% to 8% for NIM should also be followed by the Nepalese banking system for having optimum NIM.

Figure 4.15

Appropriate Range of NIM



4.2.8 Necessity of Specified Rate for NIM by NRB

NRB has not directed any specified rate for NIM to the commercial banks of Nepal. The banks are free to charge any interest rate to the borrowers and to provide any interest rate to the depositors. The tough competition has seemed to control both the interest rates. To collect the views on the necessity of specified interest rate from NRB regarding NIM, the respondents are asked on this matter.

Table 4.20

Necessity of Specified Rate for NIM by NRB

Response	Borrower	Depositor	Employee	Total	
				No.	%
Yes	12	10	7	29	64
No	1	2	6	9	20
Don't Know	2	3	2	7	16
Total	**15**	**15**	**15**	**45**	**100**

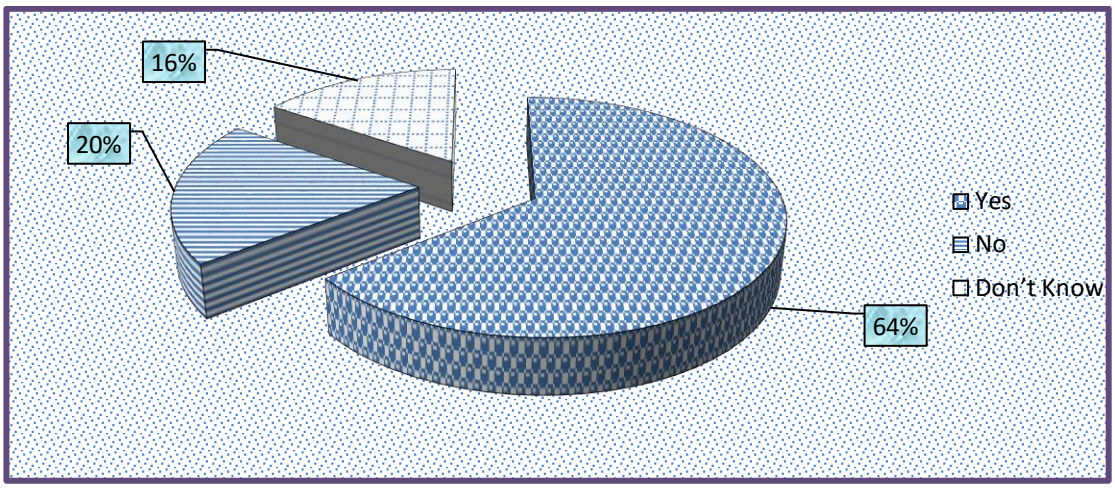
(Source: Opinion Survey, 2010)

The above table depicts that the majority of each category of respondents, 12 borrowers, 10 depositors, 6 employees, and the majority of total respondents, 28 out of 45 (64%) have stated that there should be specified rate for NIM by NRB. However, 1 borrower, 2 depositors, 6 employees, and 20% of the total

respondents (9 out of 45) have affirmed that there should not be specified rate for NIM by NRB. Finally, 2 borrowers, 3 depositors, 2 employees and 16% of the total respondents have stated that they have no idea on this matter. Thus, gazing the overall majority and the majority of each category, it can be assumed that the performance of the bank will be more ameliorated, if NRB specifies the maximum rate of NIM.

Figure 4.16

Necessity of Specified Rate for NIM by NRB



4.2.9 Scarcity of Liquidity and NIM

In present context, the banking industry of Nepal is facing the dearth of liquidity. To avoid this, the bank has practiced to provide high interest rate on deposits and to charge high interest rate on lending. To evaluate whether such practice affects the NIM of bank, the respondents are asked on this issue.

Table 4.21

Scarcity of Liquidity and NIM

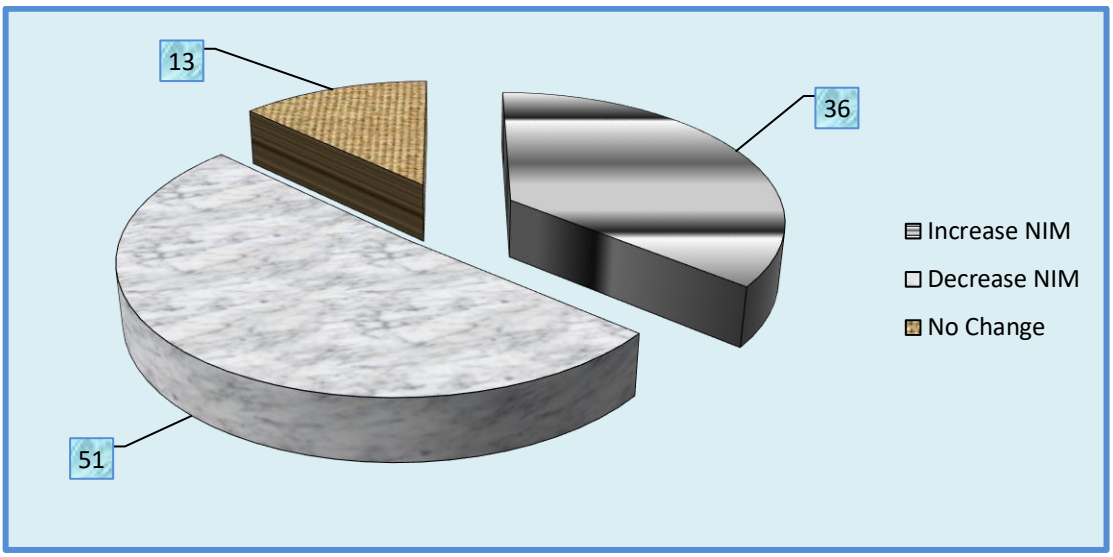
Response	**Borrower**	**Depositor**	**Employee**	**Total**	
				No.	**%**
Increase NIM	6	6	4	16	36
Decrease NIM	6	8	9	23	51
No Change	3	1	2	6	13
Total	**15**	**15**	**15**	**45**	**100**

(Source: Opinion Survey, 2010)

The table clarifies that the practice of high interest rate on both the deposit and lending due to the scarcity of liquidity most decreases the NIM of the bank. About 51% of the total respondents, 23 out of 45, have avowed this view. Further, the majority of each category, 6 out of 15 borrowers, 8 out of 15 depositors, and 9 out of 15 employees, have stated this opinion. Similarly, 36% of the total respondents have stated that the scarcity of liquidity eventually increases the NIM of the bank. To buttress this statement, 6 out of 15 borrowers, 6 out of 15 depositors, and 4 out of 15 employees, have affirmed this view. Finally, 13% of the total respondents; 3 borrowers, 1 depositor and 2 employees, have stated that there will be no effect of the scarcity of liquidity. Considering the overall majority, it can be concluded that categorically the scarcity of liquidity decreases the NIM of the bank.

Figure 4.17

Scarcity of Liquidity and NIM



4.2.10 Effect of Increased Competition

Banking industry is facing the tough competition in this period, which has ultimately reduces the deposits and lending of the bank. To measure the effects of increased competition on the NIM, the respondents are asked on this matter.

Table 4.22

Effect of Increased Competition

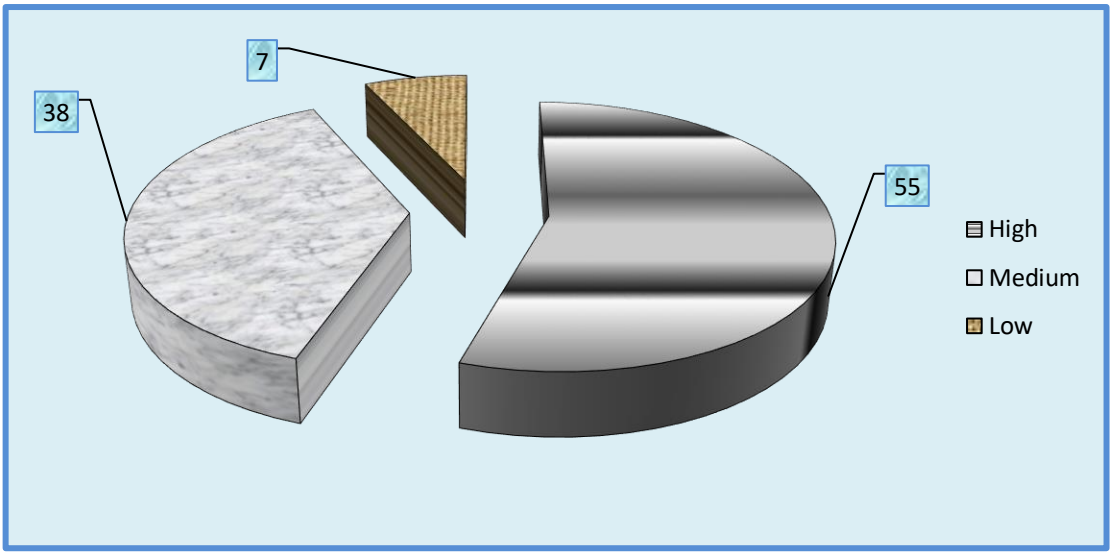
Response	Borrower	Depositor	Employee	Total	
				No.	%
High	10	7	8	25	55
Medium	4	6	7	17	38
Low	1	2	0	3	7
Total	**15**	**15**	**15**	**45**	**100**

(Source: Opinion Survey, 2010)

The table delineates that the majority of the respondents are in the view that the increased competition in bank has high effect to change the NIM. 55% of the total respondents; 10 borrowers, 7 depositors, and 8 employees, have asserted this view. While, 38% of the total respondents, i.e. 4 borrowers, 6 depositors and 7 employees have stated that increased competition has moderate effect on NIM. Finally, 7% of the total respondents; 1 borrower, 2 depositors, and 0 employees, have stated that the tough competition has low effect in NIM. Considering the overall majority and the majority of each category, it can be concluded that certainly the increased competition has high effect to change the NIM of commercial banks.

Figure 4.18

Scarcity of Liquidity and NIM



4.3 Major Findings of the Study

On the basis of the analysis done on the previous section of this chapter, the following major findings of the study are drawn;

Findings From Secondary Data Analysis

- The weighted interest rate on loan and advances and other investment of BOK is highest and the weighted interest rate of SCBNL is lowest than that in other banks. The average weighted interest rate on loan and advances and other investment of SCBNL, NABIL, HBL, BOK and SBI is 5.52%, 6.85%, 6.13%, 6.99% and 6.84% respectively.
- The weighted interest rate provided on deposit by SBI is highest and that of SCBNL is lowest. The average weighted interest rate on deposit of SCBNL, NABIL, HBL, BOK and SBI is 1.57%, 2.42%, 2.54%, 2.96% and 3.63% respectively.
- The average NIM of BOK is highest and SBI is lowest. The average NIM of SCBNL is 3.95%, NABIL is 4.43%, HBL is 3.59%, BOK is 4.03% and SBI is 3.21%.
- NABIL mobilized most efficiently the total assets than other banks in generating interest income. The net interest to total assets of SCBNL, NABIL, HBL, BOK and SBI is 3.46%, 3.99%, 3.26%, 3.53% and 2.81% respectively.
- Only HBL has significant relationship between NIM and inflation. The correlation between NIM and inflation of SCBNL is 0.4953, NABIL is -0.4425, HBL is 0.7970, BOK is 0.6887 and SBI is -0.7537.
- The relationship between NIM and weighted net interest on loan and advances and other investment in NABIL is insignificant. However, in other remaining banks the relationship is statistically significant.
- Except in NABIL and SBI, there is significant relationship between NIM and weighted interest rate on deposit in SCBNL, HBL and BOK. Similarly, only in BOK and SBI, there is significant relationship between NIM and NPAT.

- The pace of growth of NIM in future is highest in BOK. In the fiscal year 2010/11, the trend value of NIM will be 4.14% in SCBNL, 3.37% in NABIL, 4.06% in HBL, 5.26% in BOK and 2.39% in SBI.
- Likewise, the pace of growth in weighted interest rate on loan and advances and other investment will be greater in BOK and the pace of growth in weighted interest rate on deposit will be greater in NABIL. Finally, the net profit of SCBNL will be greater than other banks in future.

Findings From Primary Data Analysis

- 51% of the respondents have stated that the management of the bank should pay concentration on both internal and external environment determinants to have optimal NIM.
- The majority of the respondents, 24%, have said that interest rate on deposit is the major internal determinant of NIM. Similarly, 31% of the respondents have affirmed that the increasing bargaining power in borrower and depositor is the major external determinant of NIM.
- 58% of the respondents have said that NIM has high effect on the profitability. Likewise, 64% of the respondents have said that the inflation rate has medium effect in NIM.
- 60% of the respondents have stated that the weighted interest rate on loan and advances and other investment of the bank has medium influence on NIM. And 51% of the respondents have said that the NIM of the bank should be within the range of 3% to 8%. Finally, 64% of the respondents have opined the necessity of the specified rate by NRB for NIM.
- Eventually, the scarcity of the liquidity decreases the NIM of the bank. 51% of the total respondents have stated this view. And, 55% of the respondents have affirmed that the increased banking competition has high effect on NIM.

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Procuring a margin between average lending and average deposit interest rate in the banking system in any economy is not unusual. In fact, such a margin constitutes an incentive for a bank to continue to remain in the industry. The magnitude of the spread, however, varies across the world. It is actually inverse to the degree of efficiency of the financial sector, which is an offshoot of a competitive environment. The nature and efficiency of the financial sectors have been found to be the major reasons behind differences in net interest margin in countries across the world. In economies with weak financial sectors, the intermediation costs which are involved in deposit mobilization and channeling them into productive uses, are much larger. They have been found to be responsible for high interest margin.

Banking systems around the world differ widely in size and operation. Commercial banks have to deal with different macroeconomic environments, different explicit and implicit tax policies, deposit insurance regimes, financial market conditions, and legal and institutional realities. Using a comprehensive bank-level data, the study analyses how bank characteristics and the overall banking environment affect the functioning of banks, as reflected in interest margins and bank profitability.

Excess liquidity, reflecting poor investment climate and scarcity of bankable

projects, has been identified to be responsible for high interest margin. In the absence of any secondary market for government bonds and other securities, coupled with an undeveloped stock market, the public is left with no option but to keep their savings as bank deposits. Because of surplus funds, deposit mobilization does not require any serious effort on the part of the banks. Consequently, deposit interest rates have remained low. Although lending rates in Nepal was low, reflecting the deteriorating investment climate, the change in the margin has not been sizeable. However, the interest rate on both the deposits and lending rates have increases considerably within the recent periods, as a result the net interest margin have also changed. Besides these two interest rates, the other determinants have also affected the net interest margin of the nation. To determine such determinants and the effect of net interest margin on profitability of the bank, the present study has been conducted.

For the study, only five commercial banks have been selected randomly as sample banks. Both primary and secondary data have been analyzed to depict the true picture of determinants of net interest margin. Further, the prediction of net interest margin and the profitability of the banks have been done in the study.

5.2 Conclusion

On the basis of the study, it can be concluded that the BOK charges highest weighted interest rate on loan and advances, and other investment than in other banks. While, such charges is lowest in SCBNL in comparison to other banks. Thus, it can be inferred that the borrowers are more fascinated by the interest rate policy of SCBNL than in other banks. Similarly, the interest rate

provided by SBI in deposits is highest, while that in SCBNL is lowest. On the basis of this statement, it can be concluded that SBI will be more successful to capture the market for deposits. Moreover, the average NIM of BOK is highest and SBI is lowest. This indicates that BOK has adopted highest profitable concept, while the policy of SBI entices both the depositors and borrowers, which eventually decreases the profit of the bank. NABIL mobilized most efficiently the total assets than other banks in generating interest income.

Only in HBL, the relationship between NIM and inflation is statistically significant, which implies that NIM increases with the increase in inflation rate in HBL. Further, in most of the banks, the increase in interest rate on loan and advances and other investment, and increase in interest rate on total deposit increase the NIM of the bank. Eventually, the net profit of the bank increases with the increase in NIM.

Both the internal and external determinants are responsible for the change in NIM. In addition, the interest rate on deposit is the major internal determinant of NIM, and the increasing bargaining power in borrower and depositor is the major external determinant of NIM. Moreover, the NIM has extensively high effect on the profitability. Further, inflation rate and the interest rate on loan and advances, and other investment have moderate effect on NIM. Eventually, scarcity of liquidity and high competition has adverse effect on NIM of the bank.

5.3 Recommendations

For the enhancement of banking operation, and for having sound net interest

margin, the following recommendations have been made;

- The bank should charge neither too high interest rate on loan and advances, and other investment, and should pay nor too low interest on deposits. This situation discourages both the borrowers and depositors.
- NRB should set a standard net interest margin to direct the banks for having sound interest rate. In addition, each bank should have effective policy makers to enforce the interest rates.
- The bank should be well prepared from having the unnecessary changes in NIM due to both internal and external determinants.
- The bank should have sound liquidity and capital to prevent the banks from changing the Net Interest Margin.
- The interest rate charged on loan and advances and paid on deposits should cope with the external determinants such as inflation, per capita income and GDP growth.
- It is suggested to all the banks to quote one consistence rate. Because the lending rate of some banks on same department are find to be different. These types of consistence may bring miss- conception towards the related organization.
- For NRB, it is suggested to give serious attention to public overall information uniformly. NRB also have to pay attention on the publication of bulletins and other publication in a uniform time.
- In order to promote more lending and to promote more borrowing, lending institution are suggested to invest on the new areas as well as to introduce competitive customer oriented schemes. It also helps in solving liquidity problems.

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