CHAPTER- I

INTRODUCTION

1.1 Background of the Study

Financial intermediation is essential for economic development. Some authors have provided the evidence of a causal link between the degree of financial intermediation and subsequent economic growth (Levine and Zervos, 1998:62). Researches show that the efficacy of financial intermediation can affect economic growth. Crucially, financial intermediation affects the net return to savings and the gross return to investment. The spread between these two returns mirrors bank interest margins, in addition to transaction costs and taxes borne directly by savers and investors. Thus bank interest spreads could be interpreted as an indicator of the efficiency of the banking system. It plays a fundamental role as it reflects the efficiency of credit allocation process and the profitability of the bank.

As financial intermediary, banks play a crucial role in the operation of most economy. It mobilizes the funds from one sector of the economy to another thus facilitating the balanced economic development. The effectiveness of the banking system in channeling funds from surplus to deficit sectors is often gauged by examining the spread between lending and deposit rates and by assessing the degree of operational efficiency of the banking industry (Taci and Zampieri, 1998:112). However, high degree of interest margins involves a trade-off. On the one hand, high margins are associated with a low degree of efficiency and non-competitive market conditions. On the other hand, high margins may be a reflection of inadequate regulatory banking environment and a high degree of information irregularity. In such circumstances, high margins would be indicative of high risk

premium. If, in this type of environment, competition increases, it might induce gambling behavior by banks, causing financial instability (Hellman, Murdock, and Stiglitz, 2000:98). Beck, Demirguc-Kunt and Levine (2003), conclude that highly concentrated banking systems are less likely to suffer from crises. Therefore, in less developed economies like Nepal, relatively high bank margins may be necessary, at least temporarily, to sustain bank operation and avoid financial instability.

In banking research, the determinants of net interest margins (bank spreads) are empirically well explored. Results strongly suggest that net interest margin determinants vary across countries and among regions of the world. For instance, studies on banking systems of developed countries show that net interest margins have significant positive relationships with a bank's level of capital, loan loss provisions, reserve requirements, implicit interest payments, and interest rate volatility (Ho and Saunders, 1981:12; Saunders and Schumacher, 2000:18). These results are considered benchmarks because banks in developed countries operate in mature financial systems. On the other hand, a study of Latin American bank spreads rarely confined and even contradicted some of the benchmark results (Brock and Suarez, 2000:321). For example, loan losses and bank capital were shown to have significant negative relationships with bank spreads in some Latin American countries. These anomalous findings were partly explained by distortions caused by inadequate regulatory systems that allow weak banks to continue operating, unreliable financial reporting practices that result in misstated bank capital, and extensive government guarantees that encourage excessive risk taking among banks.

In Southeast Asia, little is known about the determinants of its banks' net interest margins. Since banks are the major source of financing in this region, the level of net interest margins is an important policy variable for it indicates how efficiently banks perform their intermediary roles of collecting savings and allocating funds. Curiously, and although in varying degrees, the

banking industries of Southeast Asia exhibit similarities in market openness, regulatory stance, extent of government intervention, lending practices and the influence of macroeconomic policy.

In Nepalese context, bank interest rates, both on deposits and loan, are determined in two ways: Legislative determined, and Market determined. Before the economic liberalization, Nepal Rastra Bank used to determine the interest rate for all commercial bank. But after the liberalization, it is deregulated. It is now determined by the commercial banks through market forces. At present, interest rate on saving account ranges from as low as 2 percent to as high as 6.5 percent. Similarly, interest rate on loan and advances ranges from 6 percent to 11 percent. This shows varying level of spread among banks. There are many determinants on such a wide range of difference in interest rates offered by various commercial banks. This study is devoted to exploring the major determinants of bank's net interest margin and its impact on the bank's profitability.

1.2. Statement of the Problem

A substantial body of literature has explored various determinants of interest margin including (1) market structure of the industry, (2) bank-specific factors, (3) macroeconomic variables, and (4) financial regulations. The industrial organization literature predicts that an oligopolistic market structure may result in higher spreads (Samuel and Valderrama, 2006), though the empirical evidence on this count is mixed. Hannan and Liang (1993) and Bajras, Steiner, and Salazar (1999), among others, suggest that industry concentration may lead to higher interest margin. However, Classes, and Laeven (2004) argue that a better measure of competition is contestability, peroxide by Panzer and Rosse (1987) measure the bank behavioral response. Other on other hand, the one of the pioneer studies, Ho and Saunders (1981) found that bank's interest margin depends on four factors: (i) the degree of bank's management risk aversion, (ii) market structure of the industry, (iii) average size of bank's transactions, and

(iv) the variance of interest rates. The authors also make the point that a number of imperfections and regulatory restrictions have an impact on the spread. Though there are these findings in the context of developed capital market, no such studies exists in context of Nepal. Thus, attempt has been made to study the functioning of Nepalese commercial banks especially in the area of bank's profitability. Studies carried out in international context, found different factors that affect the bank's net interest margin. Hence, this study attempts to find whether those factors are relevant in the context of Nepalese commercial banks. This study basically deals with the following issues:

1. What relationship exists between bank's net interest margin and its profitability?
2. What are the key determining factors of net interest margin?
3. What factors play role in the determination of bank's interest spread?
4. How are bank interest rates determined?
5. 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 interest rates and its effect on the profitability. Besides, the specific objectives of this study are as follows:

1. To study and analyze the determinants of bank net interest margin.
2. To examine the relationship between net interest margin and its determinants.
3. To evaluate the effects of net interest margin on bank's profitability.

4. To determine the role of net interest margin in the performance of commercial banks and suggestion on the basis of study findings.

1.4 Significance of the Study

Banks are the financial intermediaries that pool scattered money through its various deposit schemes and invest it in various sectors of the economy. In this way, it channeling fund from surplus sectors to deficit sector of the economy. The role of financial institutions in the development of economy is crucial. As such, the success and failure of bank affect the economic growth of a nation. There have been considerable studies on most of the area of banking. However, the area of interest margin is relatively under researched. Being net margin a dominant factor in determining the profitability, it has to be studied properly.

The study of bank interest margin helps to explore its determinants and the effects of spread on the profitability. The other significance can be mentioned as:

1. Net interest margin, NIM is the primary source of banks income.
2. The interest rates structure determines the amount of capital that can be formed through the deposit.
3. Net interest margin is reflected by the degree of risk aversion of the banks.
4. The competitive structure of the banking market.

5. Interest rate risk i.e. the more volatile the money market rates, the higher the reinvestment and refinancing risk, which in turn results in higher NIM.
6. Credit risk has significant positive relationship with interest rate on loan and advances.
7. The bank's operating cost also affects the NIM. Higher the operating costs, higher NIM a bank has to or may charge.
8. The size of bank operation also affects the NIM.

1.5 Limitation of the Study

This study based on financial data obtained from the various volumes of Nepal Rastra Bank's Annual Reports, annual reports of sample companies. Thus, it possesses all the inherent limitation of financial data. Due to the limited scope of the study, the sample data confined only 17 commercial banks covering period of mid-July 2004 to mid-July 2008. The study used descriptive analysis, correlation analysis, and multivariate regression analysis only.

1.6 Organization of The Study

The whole study area will be divided into five different parts:

Chapter 1: Introduction

Chapter 2: Review of Literature

Chapter 3: Research Methodology

Chapter 4: Data Presentation and Analysis

Chapter 5: Summary, Conclusion, & Recommendation.

The first chapter consists of background of the study, statement of the problem, objective of the study, and organization of the study.

The second chapter consists of literature review. This chapter is subdivided into various sections viz. theoretical framework, Macro concept of the stock market, historical background of the Nepalese stock market details of the stock issue and principle steps in issue of shares and review of past research work.

The Third chapter includes research methodology chapter will present the methodology adopted for the research. It comprises research design nature and source of data, data collection and analysis process employed and limitation of the study.

The fourth chapter focuses on the data presentation and analysis. This is the main and key chapter of the research study.

The last chapter five will explain summary, conclusions and recommendations.

CHAPTER -II

REVIEW OF LITERATURE

This chapter deals with the theoretical framework and empirical evidences on determinants of bank interest margin. In the first section, the conceptual framework is presented. The related empirical studies are reviewed and the concluding remark is presented at the end.

2.1 Conceptual Framework

Bank's success depends on its ability to generate larger net interest margin. The net interest margin, which is the difference between interest income and interest expenses, mirrors the profitability of banks especially when the banks emphasize on traditional deposit and lending businesses. The size of such margin serves as an indicator of efficiency in the financial sector because it reflects the costs of intermediation that the bank incurs. Interest margins are thus one of the key determinants of bank profit. The interest margin, in turn, depends on the pure spread (i.e. difference between lending and borrowing rates). The real interest rates are one of the significant positive contributors to profits of banks (Jiang et al, 2003:192). The bank's net interest margins have become increasingly sensitive to interest rate volatility as a result of the increasing reliance of banks on interest sensitive short-term liabilities as well as greater emphasis on loans in bank's asset portfolios (Olhson et al, 1980: 66).

The interest margin of bank's is affected by mainly two factors: lending rate and borrowing rate. The net difference between these two rates is called Net Interest Margin (NIM hereafter). NIM is the measure of the difference between interest income

generated by banks by their lending and interest paid on borrowings (for example, deposits). It is expressed as net interest income (interest earned minus interest on borrowing funds) as a percentage of earning assets (any asset, such as a loan, that generates interest income). NIM is similar to net interest spread which 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 NIM, as banks may need to keep a certain amount of assets in non-interest bearing assets (such as cash balance held at branches for customers or liquid reserves as determined by banking regulators).

The NIM of banks basically depends on the rate charged by the bank on its loan and paid to the depositor. Other things remaining the same, higher the interest rate charged on loan and lower the interest rate paid on deposits, the greater the amount of NIM. As such, banks might try to lower the deposit rate and increase the loan rate. However, in the competitive market, such strategy would be quite harmful to the bank. In the worst case, bank might loose its depositors and it will not be able to mobilize its deposit. Hence, banks have to consider a number of factors in determining such rates.

Determinants of Net Interest Margin

The factors the affect the lending and borrowing rate vary among countries, regions and banks. Ho and Saunders (1981) model views banks as risk-averse intermediaries between lenders and borrowers. In this process, banks are exposed to competitive pressures and interest rate risk which determine their interest rate margins. The original model has been extended to include different kinds of loans/deposits (Allen, 1988) and the volatility of money market interest rates (McShane and Sharpe, 1985), credit risk (Angbazo, 1997) and operating costs (Maudos and Fernandez de Guevara, 2004)

The theoretical model of Maudos and Fernandez de Guevara (2004) lists the following determinants of a bank's NIM ad their predicted directions of influence:

- A bank's degree of risk aversion: The higher the risk aversion, the higher the NIM.
- The competitive structure of the banking market: The lower competition, the higher the NIM.
- Interest rate risks: The more volatile money market rates, the higher reinvestment and refinancing risks, which in turn results in higher NIM for risk-averse agents.
- Credit risks: The higher credit risks, the higher the NIM.
- The interaction between credit and interest rate risks: Higher interest rate risks will ceteris paribus increase the default probability of loan.
- Bank's operating costs: The higher the operating costs, the higher the NIM a bank has to or may charge.
- The average size of bank operations: The higher the average size of operations, the higher the risk concentrated in single customers and the higher the NIM a risk-averse agent demands.

Similarly, the study of Brock and Rojas-Suarez (2000) suggests nonperforming loans, capital ratio, operating costs, liquidity, and time as the determinants of bank interest spread.

Ho and Saunders (1981), one of the pioneer studies, found bank interest margin as a function of two factors: bank-specific variables, and macro economic factors. The bank-specific factors include non-performing loans, operating costs, the capital asset ratio, and time dummies whereas the macro economic factors include market structure.

The study of Demirguc-Kuct and Harry Huizinga (1998) shows that differences in interest margins and bank profitability reflect a variety of determinants: bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and several underlying legal and institutional indicators. Controlling for differences in bank activity, leverage, and the macroeconomic environment, it can be found that a larger bank asset to GDP ratio and a lower market concentration ratio lead to lower margins and profits.

In the most recent study, Barry Williams (2007) explored 12 different variables that determine the net interest margin of banks. Those variables include market power, operating cost, managerial risk aversion, interest rate volatility, credit risk, interaction between credit risk and interest rate risk, size of bank operation, implied interest/implied payments, cost of bank reserve/implied taxes, management quality, liquidity risk, and control variables.

2.2 Review of Related Studies

The review of empirical works is classified into three categories: (1) studies conducted prior to 1990, (2) studies conducted during 1991 to 2000, and (3) studies conducted during 2001 to 2008.

2.2.1 Review of Empirical Works Prior to 1990

Allen (1988), in extension of HO and Saunders model, demonstrates the proposition that pure interest spreads may be reduced when cross-elasticity of demand between bank products are considered. The resulting diversification benefits emanate from the interdependence of demands across bank services and products – a type of portfolio effect. Control over relative rate spreads

across product types, and the resulting ability to manipulate the arrival of transactions demands, enables the financial intermediary to maintain a more active role in managing its inventory risk exposure.

Ho and Saunders (1981) measure bank interest margins for banks that act as risk-averse dealers when providing immediacy of transactions services to bank customers. The banks receive deposit funds at random intervals and, subsequently, utilize these funds to satisfy stochastically received loan request. The pure spread between loan and deposit rates is compensation for bank inventory risk rising from uncertainty about the (random) arrival of loan and deposit transaction requests. Ho and Saunders computed interest margins for financial intermediaries that offer homogeneous loans and deposits, (What they refer to here as single product intermediaries). In their model, the size of the spread was found to be a function of four variables: the degree of managerial risk aversion, average transactions size, competition within the bank's market, and the variability of interest rates. The model implied that liability and asset structures had to be analyzed together since they were directly interrelated thought transactions uncertainty.

Ho and Saunders advocate a two-step procedure to explain the determinants of bank interest spreads in panel data samples. In the first-step, a regression for the bank interest margin is run against a set of bank-specific variables such as non-performing loans, operating costs, the capital asset ratio, etc. Plus time dummies. The time dummy coefficients of such regressions are interpreted as being a measure of the "Pure" component of a country's bank spread. In the second-step, the constant terms are regressed against variables reflecting macroeconomic factors. For this second step, the inclusion of a constant term aims at capturing the influence of factors such as market structure or risk-aversion coefficient, which reflect neither bank-specific observed characteristic nor macroeconomic elements.

Table 2.1
Summary of Major studies prior to 1990

Empirical Works	Major findings
Linda Allen (1988)	The pure spread may be reduced when cross-elasticity of demand between bank products are considered.
Ho and Saunders (1981)	The size of spread was found to be a function of four variables: the degree of managerial risk aversion, average transaction size, competition within the bank's market, and the variability of interest rates.

2.2.2 Review of Empirical Works During 1991 to 2000

Hakan Berument (1999) analyzed the Turkish Treasury interest rate behavior within the Fisher hypothesis framework for the period from 1988:11 to 1998:6. Consistent with the hypothesis, empirical evidence indicates that the interest rates increase with expected inflation. After the risk is controlled, the paper suggests that interest rates increase less than expected inflation; that is,

real interest rates decrease with higher inflation. Moreover, inflation risk increase interest rates and decreases the maturity of government debt. This is evidence that lenders prefer shorter maturity in order to hedge themselves in a setting where the debt burden on the budget is on the rise. This may also indicate that both the interest rates and maturity of the debt are used as policy tools by the Treasury rather than as state variables.

IN a comprehensive study, Demirguc-Kunt and Huizinga (1999) investigate the determinants of bank interest margins using bank-level data for 80 countries in the years 1988-1995. The set of regressors include several variables accounting for bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and underlying legal and institutional indicators. The variables accounting for bank characteristics and macroeconomic factors are fo special interest since they are close to the ones included in the regression estimated in their paper. Demirguc-Kunt and Huizinga report that the bank interest margin is positively influenced by the ratio of equity to lagged total assets, by the ratio of loans to total assets, by a foreign ownership dummy, by bank size as measued by total bank assets, by the ratio of overhead costs to toal assets, by inflation rate, and by the short-term market interest rate in real terms. The ratio of non-interest earning assets to total assets, on the other hand, is negatively related to the bank interest margin. All the mentioned variables are highly statistically. Output growth, by contrast, does not seem to have any impact on bank spread. Another branch of the literature is concerned with the adjustments of bank interest rates to the market interest rate. These studies show that, in the long run, one cannot reject the hypothesis that bank interest rates follow the market interest rate in a one-to-one basis, i.e. that there is full adjustment to changes in the market interest rate. In the short-run, though, the departures of bank interest rates from the market interest rate are relevant and there is some evidence that adjustments towards the long run equilibrium are asymmetric, i.e. the adjustment varies according to whether one observes positive or negative unbalances. There is some

evidence of price rigidity in local deposit markets with decreases in deposit interest rates being more likely than increase in these rates in the face of changes in the market interest rate [Hannan and Berger (1991)]. One reason for such behavior is market concentration: banks in concentrated markets were found to exacerbate the asymmetric adjustments [Neumark and Sharpe (1992)].

Barajas et al. (1999) documents significant effect of financial liberalization on bank interest spreads for the Colombian case. Although the overall spread has not reduced with the financial liberalization measures undertook in the early 1990s, the relevance of the different factors behind bank spreads was affected by such measures. IN a single equation specification, the bank lending rate is regressed against the ratio of the deposit rate to (one minus) the reserve ratio, a scale variable represented by the volume of total loans, wages, and a measure of loan quality given by the percentage of nonperforming loans. A test for market power is performed with the results showing that the banking sector in Colombia was imperfect before the liberalization but that a competitive industry describes the data well in the post-liberalization period. Another change linked with the liberalization process was an increase in the coefficient of loan quality after the liberalization. The authors notice that "this change could signal a heightened awareness on the part of bank managers regarding credit risk, and/or it could reflect an improved reporting of nonperforming loans" (p.212). A negative sign found for the scale variable indicates that economies of scale are prevalent for both periods.

The regression results are then used to decompose the bank intermediation spread into four factors: financial taxation (reserve requirements and forced investments), operating costs, market power, and loan quality. For the pre-liberalization period, operating costs made up about 38% of bank spread while market power, financial taxation and loan quality accounted for 36%,

22% and 4% of the spread, respectively. For the post-liberalization period, the impact of market power is set equal to zero to be consistent with the regression results. Loan quality now accounts for 29% of the spread while operating costs and financial taxation were responsible for, respectively, 45% and 26% of the spread.

Randall (1998) documents that for the Eastern Caribbean countries, unlike the evidence gathered above, the impact of loan loss provisioning has been to reduce bank interest margin rather than to increase it once the tendency of banks to under provision in the case of government loans is accounted for. Like in other coutries, operating expenses seem to have a large impact on bank spreads in the Eastern Caribbean region. Over the sample period, the ratio of operating expenses to total asset explains 23% of the estimated spread.

Angbazo (1997) studies the determinants of bank net interest margins for a sample of US banks using annual data for 1989-1993. The empirical model for the net interest margin is postulated to be a function of the following variables: default risk, interest rate risk, an interaction between default and interest risk, liquidity risk, leverage, implicit interest payments, opportunity cost of non-interest bearing reserves, management efficiency, and a dummy for states with branch restriction. The results for the pooled sample suggest that the proxies for default risk (ratio of net loan charge-offs to total loans), the opportunity cost of non-interest bearing reserves, leverage (ratio of core capital to total assets), and management efficiency (ratio of earning assets to total assets) are all statistically significant and positively related to bank interest margins. The ratio of liquid assets to total liabilities, a proxy for low liquidity risk, is inversely related to the bank interest margin. The other variables were not significant in statistical terms. Some recent contributions have made use of more structural models based on profit maximization

assumptions for banks operating in imperfect markets to develop empirical equations to understand the behavior of bank interest rates.

Wong (1997) explores the determinants of optimal bank interest margins based on a simple fNIM-theoretical model under multiple sources of uncertainty and risk aversion.

The model demonstrates how cost, regulation, credit risk and interest rate risk conditions jointly determine the optimal bank interest margin decision. He found that the bank interest margin is positively related to the bank's market power, to the operating costs, to the degree of credit risk, and to the degree of interest rate risk. An increase in the bank's equity capital has a negative effect on the spread when the bank faces little interest rate risk. The effect of risking interebank market rate on the spread is ambiguous and depends on the net position of the bank in the interbank market.

Cottarelli and Kourelis (1994) apply a two-step approach to investigate the resons for the stickiness of bank lending rates for a sample of countries. In the first step, the impact multipliers of changes in the market interest rate are calculated for each country in the sample. IN the second step, such impact multipliers are regressed against a large set of explanatory variables controlling for cross-country differences in the competition within the banking system, in the extent of money market development and openness of the economy, in the banking system ownership, and in the degree of development of the financial system. Of interest are the results that the impact multiplier is higher for countries where inflation is higher and where the banking systems are not dominated by public banks.

Table 2.2

Summary of Major Studies During 1991 to 2000

Empirical Works	Major Findings
Hakan Berument (1999)	) The key determinant of interest margin is interest rates which increase with expected inflation.
Demirguc-Kunt and Huizinga (1999)	) The major determinants of NIM include several variables accounting for bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and underlying legal and institutional indicators.) Bank interest margin is positively influenced by the ratio of equity to lagged total assets, by the ratio of loans to total assets, by a foreign ownership dummy, by bank size, by the ratio of overhead costs to total assets, by inflation rate, and by the short-term interest rate.) The ratio of non-interest earning assets to total assets is negatively related to the bank interest margin.
Barajas et al. (1999)	) The major determinants of NIM include four factors: financial taxation (reserve requirements and forced investments), operating costs, market power, and loan quality.
Randall (1998)	) The impact of loan loss provisioning has been to reduce bank interest margin rather than to increase it once the tendency of banks to under provision in the case of government loans is accounted for.) The ratio of operating expenses to total asset explains 23% of the estimated spread.
Angbazo (1997)	) The net interest margin is a function of default risk, interest rate risk, an interaction between default and interest risk, liquidity risk, leverage, implicit interest payments, opportunity cost of non-interest bearing reserves, management efficiency, and a dummy for states with branch restrictions.

	• The default risk, opportunity cost of non-interest bearing reserves, leverage, and management efficiency are all statistically significant and positively related to bank interest margin.
Wong (1997)	• The bank interest margin is positively related to the bank's market power, to the operating costs, the degree of credit risk, and to the degree of interest rate risk. • An increase in bank's equity capital has a negative effect on the spread when the bank faces little interest rate risk. • The effect of rising interbank market rate on the spread is ambiguous and depends on the net position of the bank in the interbank market.
Cottarelli and Kourelis (1994)	• Of interest are the results of the impact multiplier is higher for countries where inflation is higher and where banking systems are not dominated by public banks.

2.2.3 Review of Empirical Works During 2001 to 2008

Khawaja, Idrees (2007) study examined the determinants of interest spread in Pakistan using panel data of 29 banks. The results show that inelasticity of deposit supply is a major determinant of interest spread whereas industry concentration has no significant influence on interest spread. One reason for inelasticity of deposits supply to the banks is the absence of alternate options for the savers. The on-going merger wave in the banking industry will further limit the options for the savers. Given the adverse implications of banking mergers for a competitive environment, it is argued to maintain a reasonably competitive environment, merger proposals may be subjected to review by an antitrust authority with the central bank retaining the veto over the merger approval.

Applying the seminal Ho-Saunders model (1981) to a multi-output framework, Santiago Carbo Valverde and Francisco Rodriguez Fernandez (2005) showed that the relationship between bank margins and market power varies significantly across

bank specializations. In this context, European bank are a better laboratory than US banks, since they have generally enjoyed a more flexible regulatory environment in which to provide a wider range of services. Using accounting margins and New Empirical Industrial Organization margins, they find that market power increases as output becomes more diversified towards non-traditional activities in European banking.

In a study, Estrada Dairo et al. (2005) analyzed the determinants of interest margins in the Colombian financial system. Based on the model by Ho and Saunders (1981), interest margins are modeled as a function of the pure spread and bank-specific institutional imperfections using quarterly data for the period 1994:IV – 2005:III. Additionally, the pure spread is estimated as a function of market power and interest rate volatility. Results indicate that interest margins are mainly affected by credit institutions' inefficiency and to a lesser extent by credit risk exposure and market power. This implies that public policies should be oriented towards creating the necessary market conditions for banks to enhance their efficiency.

Liebeg, David and Schwaiger, Markus S. (2005) found that bank interest rate margins have been declining in most EU Member States over the last decade. Drawing on a unique sample of supervisory data for the Australian banking system from 1996 to 2005, they investigated the determinants of bank interest rate margins. The main factors driving the reduction of Australian banks' interest rate margin are decreasing operating costs, the growing importance of foreign currency lending combined with a rising share of non-interest revenues as well as increasing competition. In contrast to findings in the literature they document a positive effect of relationship banking on margins, with the erosion of relationship banking being another reason for the decline in interest margins.

Mahamudu et al. (2005) examined the determination of interest rate spreads in Ghana using two approaches based on an income statement and balance sheet analysis and an econometric model. It concludes that the existence of major structural impediments, such as the market concentration, and the degree of contestability among banking institutions, among others, prevent the financial system from reaching its full level of efficiency. The market share variable is very influential in explaining spreads in Ghana and reflects the lack price competition in the banking industry. The results also show the effect of cross subsidization between interest and non-interest income. High operating cost, nonperforming loans and the existence of liquidity reserves, also contribute to the wide spreads, even though the influence of the latter is not as large as the of operating costs and market share.

In a study, Nicholas Cheang (2005) found that profits of Macao banks have remained positive for more than a decade. Primarily, interest margin, defined as the difference between incomes from loans and costs of deposits, it the key determinant of the profitability of the local banking industry. Meanwhile, it is expected that interest rate movements will influence interest incomes from loans and interest payments to depositors, and hence the growth of interest margin. They examined this relationship. Their results indicate that the US Fed funds rate and interest margin of Macao banks appear to move in the same direction, assuming that the interest rates on both loans and deposits are altered by the same magnitude. Thus the rising interest rates would support the growth of interest margin as well as the profitability of Macao's banking sector.

Sophie Claeysyand Rudi Vander Vennet (2004) investigated the determinants of bank interest margins in Central and Eastern European countries (CEEC). They assessed to what extent the relatively high bank margins in transition economies can be attributed to a low degree of efficiency and non-competitive market conditions, or to changes in the regulatory banking environment. They provide a systematic comparative analysis of the determinants of interest margins of CEEC banks versus

banks operating in Western European economies. Their main findings are that concentration, operational efficiency, capital adequacy and risk behavior are important determinants of margins in both West and East. Institutional reform first shifts risk behavior and increases margins before competition effects push margins down.

Joaquin Maudos and Juan Fernandez de Guevara (2004) study analyses the interest margin in the principal European banking sectors (Germany, France, the United Kingdom, Italy and Spain) in the period 1993-2000 using a panel of 15,888 observations, identifying the fundamental elements affecting this margin. Their starting point is the methodology developed in the original study by Ho and Saunders and later extensions, but widened to take banks' operating costs explicitly into account. Also, unlike the usual practice in the literature, a direct measure of the degree of competition (Lerner index) in the different markets is used. The results show that the fall of margins in the European banking system is compatible with a relaxation of the competitive conditions (increase in market power and concentration), as this effect has been counteracted by a reduction of interest rate risk, credit risk, and operating costs.

Doliente, Jude S. (2003) investigated the determinants of net interest margins (NIM) of banks in four Southeast Asian countries. They used the dealer model (Ho and Saunder, 1981) and run a two-step regression. Results of the first regression indicate and the region's NIM are partially explained by bank-specific factors namely operating expenses, capital, loan quality, collateral and liquid assets. Second step regression results show that while NIM manifest sensitivity to changes in short-term interest rates, they are still largely explained by the non-competitive structure of the region's banking systems. Finally, they found evidene that the NIM declined after 1997b thus reflecting the profit squeeze experienced by the region's banks due to extensive loan defaults in the aftermath of the Asian currency and banking crises.

Guru et al. (2002) attempt to identify the determinants of successful deposit banks in order to provide practical guides for improved profitability performance of these institutions. The study is based on a sample of seventeen Malaysian commercial banks over the 1986-1995 periods. The profitability determinants were divided in two main categories, namely the internal determinants (liquidity, capital adequacy and expenses management) and the external determinants (ownership, fNIM siz and external economic conditions). The findings of this study revealed that efficient expenses management was one of the most significant in explaining high bank profitability. Among the macro indicators, high interest ratio was associated with low profitability and inflation was found to have a positive effect on bank performance.

Naceur, Samy Ben and Goaised, Mohamed (2002) investigated the impact of banks' characteristics, financial structure and macroeconomic indicators on banks' net interest margins and profitability in the Tunisian banking industry for the 1980-2000 period. First, individual bank characteristics explain 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. Second, the paper finds that the inflation has a positive impact on banks' net interest margin while economic growth has no incidence Third, turning to financial structure and its impact on banks' interest margin and profitability; they find that 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. We have found that the disintermediation of the Tunisian financial system is favorable to the banking sector profitability.

Robinson, Johan W. (2002) found that the absolute size of banking spreads in Jamaica is an outcome of the factors that have defined the economic environment. Several elements of the macroeconomic environment have improved markedly since 1997 while the banking sector itself has been undergoing extensive restructuring.

In this regard, there are macroeconomic policy elements and microeconomic factors. Low inflation is a key element in the minimization of banking spreads. Low and stable inflation puts a floor on deposit rates, limits the mark-up factor on the real return on assets that banks target and raises transaction costs. Inflation has also been an important factor in the behaviour of the organized labour force and which has linked the pay scales in the industry to periods of inflated profits in the sector. The continuation of low and predictable inflation will therefore be crucial to the integrity of contracts. Exchange rate stability is consistent with a low inflation milieu and has a similar dampening effect on interest rates and spreads.

The case reserve requirement has been ascribed too large a role in explaining the high interest margins in Jamaica. The analysis shows that even if reserve requirements were abolished, the direct impact on current loan rates of about 22% would be no more than 2 percentage points. This limits the role of reserve policy in influencing loan rates over the medium term.

Despite the wide spreads, however measured, and however justified by perception of risk, much of the margin in Jamaican operations is consumed by the size of the operating expenses. Average staff costs at 3.8% of assets, is almost twice that of US counterparts. Other operating costs which include security, premises, depreciation and advertising are also proportionately higher than the benchmark. Banks have therefore managed to operate profitable on account of the relatively high yield on risk-free investments in Government securities.

Ben Naceur and Goaied (2001) investigate the determinants of the Tunisian banks' performances during the period 1980-1995. They indicates that the best performing banks are those who have struggled to improve labour and capital productivity, those who have maintained a high level of deposit accounts relative to their assets and finally, those who have been able to reinforce their equity.

Brock and Rojas-Suarez (2000) apply the two-step procedure for a sample of five Latin American countries (Argentina, Bolivia, Colombia, Chile, and Peru). For each country, the first-stage regressions for the bank interest spread include variables controlling for nonperforming loans, capital ratio, operating costs, a measure of liquidity (the ratio of short term assets to total deposits) and time dummies. The coefficients on the time dummies are estimates of the "pure" spread. Their results show positive coefficients for capital ratio (statistically significant for Bolivia and Colombia), cost ratio (statistically significant for Argentina and Bolivia), and the liquidity ratio (Statistically significant for Bolivia, Colombia, and Peru). As for the effects of nonperforming loans, the evidence is mixed. Apart from Colombia, where the coefficient for nonperforming loans is positive and statistically significant, for the other countries the coefficient is negative (Statistically significant for Argentina and Peru). The authors explain these findings as "a result of inadequate provisioning for loan losses: higher non-performing loans would reduce banks' income, thereby lowering the spread in the absence of adequate loan loss reserves" (p. 130). The result for Argentina is striking given the opposite findings reported by Catao (1998).

In the second stage, Brock and Rojas-Suarez (2000) run a regression for the measure of "pure" bank spreads on macroeconomic variables reflecting interest rate volatility, inflation rate and GDP growth rate. Their results show that interest rate volatility

increases bank spread in Bolivia and Chile; the same happens with inflation in Colombia, Chile and Peru. For the other cases, the coefficients are not statistically significant. On balance, bank spreads in Bolivia are explained by micro variables, while bank spreads in Chile and Colombia are accounted for by both macro and micro factors. As for Argentina and Peru, there is still a large fraction of the spread that cannot be explained by any of the above factors.

In addition to the studies concerning Latin American countries, Saunders and Schumachr (2000) apply Ho and Saunders two step method to a sample of banks of seven OECD countries (namely Germany, Spain, France, Great Britain, Italy, United States and Switzerland). The purpose of the authors is to decompose the determinants of bank net interest margins into regulatory, market structure and risk premium components. Among the three control variables used in the first step, the one with the major impact is the implicit interest rate, a fee proxy. That is, for almost all countries, banks have to increase margins to finance implicit interest payments. Besides that, the coefficients for the opportunity cost of reserves were positive and significant in most countries and years. At last, bank capital ratios were also in general significant and positive. The intercepts of these first step regressions can be understood as the common pure spread across all banks in a single country at the same time. The authors then ran a cross-country second step regression, in which the dependent variable was the estimated pure spreads from the first step. This second stage is supposed to measure the sensitivity of the margins with respect to market structure and interest rate volatility. The results showed that, first, the more segmented and restricted the system is, the higher the spreads are, probably due to the monopoly power, and, second, that the volatility of interest rate has also a significant impact on the margins. These findings suggest that the pure spreads are sensitive to both market structure and volatility effects and also that the effects are quite heterogeneous across countries.

Tarsila et al. (2000) study found that the behavior of bank interest spreads in Brazil reveal two stylized facts. First, a remarkable fall in the average rates since early 1999. Second, a strong and persistent dispersion of rates exist across banks. Such stylized fact suggest that both the time series and the cross section dimensions are important elements to understand the trend of the bank interest spread in the country. They used panel data techniques to uncover the main determinants of the bank interest spreads in Brazil. A question that they aimed to address is whether macro or microeconomic factors are the most relevant ones affecting the behavior of such rates. A two-step approach due to Ho and Saunders (1981) is employed to measure the relative relevance of the micro and the macro elements. The roles played by the inflation rate, interest rate volatility, economic activity (all macroeconomic factors) and CAMEL – type indicators (microeconomic factors) are highlighted. The results suggest that macroeconomic variables are the most relevant factors to explain the behavior of bank interest spread in Brazil.

Table 2.3

Summary of major studies during 2001 to 2008

Empirical Works	Major findings
Khawaja (2007)	) Inelasticity of deposit supply is a major determinant of interest spread whereas industry concentration has no significant influence of interest spread.
Santiago and Francisco (2005)	) The relationship between bank margins and market power varies significantly across bank specializations.
Estrada Dario et al. (2005)	) Interest margins are function of pure spread and bank specific institutional imperfections.
Liebeg, David and	) The main factors driving the reduction of Australian banks'

Schwaiger, Markus S. (2005)	interest rate margin are decreasing operating costs and growing importance of foreign currency lending combined with a rising share of non-interest revenues and competition.
Mahamudu et al. (2005)	) The market share variable is very influential in explaining spreads in Ghana and reflects the lack price competition in the banking industry.) High operating costs, non-performing loans and the existence of liquidity reserves also contribute to the wide spreads.
Nicholas Cheang (2005)	) Interest margin is the key determinant of the profitability of local banking industry.
Sophie Claeysyand Rudi Vander Vennet (2004)	) Major findings are the concentration, operational efficiency; capital adequacy and risk behavior are important determinants of margins in both West and East.
Joaquin Maudos and Juan Fernandez de Guevara (2004)	) Results show that the fall of margins in European banking system is compatible with a relaxation of the competitive conditions (increase in market power and concentration), as this effect has been counteracted by a reduction of interest rate risk, credit risk, and operating costs.
Doliente, Jude S. (2003)	) Results of first regression (suggested by Ho and Saunder, 1981) indicate that the region's net interest margin are partially explained by bank-specific factors namely operating expenses,

	capital, loan quality, collateral and liquid assets.
Guru et al. (2002)	) The profitability determinants were divided into two main categories, namely the internal determinants (liquidity, capital adequacy, and expenses management) and the external determinants (ownership, NIM size and external economic conditions).) The efficient expense management was one of the most significant in explaining high bank profitability.
Naceur, Samy Ben and Goaised, Mohamed (2002)	) High net interest margin and profitability tend to be associated with banks that hold a relatively high amount of capital, and with large overheads.) Inflation has a positive impact on banks' net interest margin while economic growth has no incidence.) Stock market development has a positive effect on bank profitability.
Robinson, John W. (2002)	) Macroeconomic policy elements and microeconomic factors are major determinants of NIM.) Low inflation is a key element in the minimization of banking spread.) Size of operating expenses also affects NIM.
Ben Naceur and	) The best performing banks are those who have struggled to

Goaied (2001)	improve labour and capital productively, those who have maintained a high level of deposit accounts relative to their assets and finally, those who have been able to reinforce their equity.
Brock and Rojas-Suarez (2000)	⎩ The bank interest spread includes variables controlling for nonperforming loans, capital ratio, operating costs, a measure of liquidity and time dummies. ⎩ Macro economic variables reflecting interest rate volatility, inflation rate and GDP growth rate are major determinants of bank spread.
Saunders and Schumacher (2000)	⎩ Implicit interest rate, opportunity cost of reserve, and bank capital ratios were significant and positive. ⎩ Pure spreads are sensitive to market structure and volatility effects.
Tarsila et al. (2000)	⎩ Macro economic variables are the most relevant factors to explain the behavior of bank interest spread in Brazil.

2.3 Concluding Remarks

From the review of related empirical studies, it is found that bank's net interest margin is a key factor of bank's profit which depends on various other factors. Those factors can be categorized into three groups namely, macroeconomic factors, industry factors, bank-specific factors. The macroeconomic factors includes inflation, cash reserve ratio, capital ratio, interest rate risk

etc. The industry factors include market structure, level of competition, etc. The bank-specific factors include operating costs, credit risk, managerial risk aversion, average size of bank's operation, amount of non-performing loan etc. However, the factors and their effect vary across countries as banking systems around the world differ widely in size and operation. Across countries, 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. In addition to these macroeconomic factors, the bank-specific variables influence in determining the interest margin.

CHAPTER- III

RESEARCH METHODOLOGY

3.1 Research Design

This study is a descriptive and analytical research based on both primary and secondary data. In the descriptive part of the study, various facts on interest margin are collected and presented whereas in the analytical part, the effect of various variables on interest margin is analyzed.

3.2 Nature and Sources of Data

This study has used both primary and secondary data for the purpose of determining the variables that affect the net interest margin of commercial banks.

3.2.1 Secondary Data: The secondary data consists of financial data of 17 commercial banks during the sample period of mid-July 2004 to mid-July 2008 converging period of 5 years. Data are collected from NRB's the annual reports "Banking and Financial Statistics" and web sites of commercial banks.

3.2.2 Primary Data: The primary data generated through the opinions of finance executives through questionnaire. The questionnaire includes both close-end and open-end questions. The respondents are asked to give their ideas on the questions using 5-point likert scale for determining variables. Out of total 50 questionnaires, 35 useable questionnaires are obtained.

3.3 Selection of Sample Banks

The Nepalese Financial sector is composed of banking sector and non-banking sector. Banking sector comprises Nepal Rastra Bank (NRB) and commercial banks. The non-banking sector includes development banks, finance companies, micro-credit development banks, co-operative financial institutions, non-government organizations (NGOs) performing limited banking activities and other financial institutions such as insurance companies, employee's provident fund, citizen investment trust, postal saving offices and Nepal stock exchange. The following is the details of financial institutions which are licensed by NRB up to mid-july 2007.

Table 3.1

Population Status of Nepalese Commercial Banks

Year	1980	1985	1990	1995	2000	2005	2006	2007	2008
No. of Commercial Bank	2	3	5	10	13	17	18	23	25

Source: Baking and Financial Statistics, NRB

The number of commercial banks has been increasing over the years. Prior to 1995 there where less than 10 banks. However, after 1995 the rate of increase in commercial banks has increased tremendously. Since, the sample period of this study is 2003 mid-july-2008 mid-July, out of total 20 commercial banks, 17 banks have been chosen. All of the sample banks and fiancé companies' 5 years data are used. The following is the list of sample banks.

Table 3.2

List of Sample Commercial Banks

SN	Commercial Banks
1	Nepal Bank Ltd.
2	Rastriya Banijya Bank
3	NABIL Bank Ltd.
4	Nepal Investment Bank Ltd.
5	Standard Chartered Bank Nepal Ltd.
6	Himalayan Bank Ltd.
7	Nepal SBI Bank Ltd.
8	Nepal Bangladesh Bank Ltd.
9	Everest Bank Ltd.
10	Bank of Kathmandu Ltd.
11	Nepal Credit and Commerce Bank Ltd.
12	Lumbini Bank Ltd.
13	Nepal Industrial & Commercial Bank Ltd.
14	Machhapuchhre Bank Ltd.
15	Kumari Bank Ltd.
16	Laxmi Bank Ltd.
17	Siddhartha Bank Ltd.

3.4 Data Analysis Tools

The study attempted to show how the net interest margin of financial institutions is determined. The type of determinants and the degree of their influence on interest margin is also found out. Based on the priori hypothesis, the following model is estimated:

$NIM_{it} = \alpha_0 + \beta X_{it} + e_{it}$

Where NIM_{it} is net interest margin defined as the difference between interest earned on average assets and interest paid on average liabilities, ($\alpha_{0,\ \beta)}$ is a vector of parameters, e_{it} is a stochastic error term, and X_u is a vector of explanatory variables that includes all above 11 factors. The extended model is:

$NIM_{it} = CONST + \beta 1SPREAD + \beta 2POW + \beta 3OC + \beta 4AVER + \beta 5IRISK + \beta 6CRISK + \beta 7SIZE + \beta 8CBRES + \beta 9MQ + \beta 10LIQR + \beta 11NPL + \epsilon t$

The dependent variable, NIM is the net interest margin divided by total earning assets.

The independent variables are specified as:

SPREAD = Pure Interest Spread

POW = Market Power

OC = Operating cost

AVER = Managerial Risk Aversion

IRISK = Interest Rate Risk

CRISK = Credit Risk

SIZE = Size of Bank's Operation

CBRES = Cost of Bank Reserve

MQ = Managerial Quality

LIQR = Liquidity Risk

NPL = Non-performing loans of banks

The above model assumes the following priori hypothesis:

Table 3.3

Priori Hypothesis of the Study

S.N.	Variables	Priori Hypothesis
1	Pure Interest Spread	Positive
2	Market Power	Positive
3	Operating Costs	Negative

4	Managerial Risk Aversion	Positive
5	Interest Rate Volatility	Negative
6	Credit Risk	Positive
7	Size of Bank Operations	Positive
8	Cost of Bank Reserve	Negative
9	Management Quality	Positive
10	Liquidity Risk	Negative
11	Non-performing Loan	Negative

3.5 Selection of Variables

The following is the explanatory variables that affect the net interest margin of the commercial banks.

1. Net Interest Margin: Empirically, the net interest margin is the net interest income in relation to total assets. The determinants of net interest margin are proxied empirically by the following variables.
2. Pure Interest Spread: One primary factor that determines the net interest margin is the interest spread. Higher the difference between the deposit rate and lending rate, higher will be the bank's net interest margin.
3. Market Power: The role of market power in setting bank interest margins has been demonstrated by both McShane and Sharpe (1995) and Maudos and Guevara (2004), both theoretically and empirically. The bank market share is

determined as a percent of total bank assets. It would be expected, as previously found by McShane and Sharpe (1885), that bank NIMs have a positive relationship with bank market share.

4. Operating Costs: Operating costs will be measured as non-interest expenses divided by total assets.
5. Managerial Risk Aversion: The managerial risk aversion will be measured as capital ratio (shareholders funds/total assets) and capital adequacy ratio according to the provision of NRB. It would be expected that higher levels of capital result in higher NIMs.
6. Interest Rate Volatility: The changes in money market rate significantly affect the net interest margin of banks. In this study, the interest rate risks are captured by the standard deviation of 91-day weighted average Treasury bill rate.
7. Credit Risk: Credit risk will be measured using the balance of the general provision for doubtful debt account divided by loans, advances and other receivables before write-offs for bad debts and provisions. Loans and advances are used as the denominator for this measure as it provides a direct measure of the size of the loan book. It is possible that two banks with similar levels of loan loss provisions have different levels of lending, and potentially different levels of loan quality. Specifying the loan quality measure in this manner controls for this possibility. It would be expected that increased levels of observed bank default risk would result in higher net interest margins.
8. Size of Bank Operations: The Maudos and Guevara (2004) model indicates that the average size of banking activity impacts positively upon net interest margins. This result is derived under the assumption that the operating costs of a bank are a positive function of the average quantity of deposits and loans. The average size of bank operation is measured by the amount of customer loan.
9. Bank Reserve: Costly regulations imposed upon banks include requiring banks to hold funds on reserve with the central bank. These reserves typically earn a rate of return below the general market rate, and so impose an

opportunity cost upon the bank. A profit-maximizing bank would be expected to recoup this opportunity cost via increasing its net interest margin. Reserve requirements will be measured as the required regulatory deposits with the Nepal Rastra Bank divided by liabilities excluding shareholders' funds. Given that these required deposits have evolved over the study period, it will be possible to determine the impact of this variation upon net interest margins. It would be expected that there would be a positive relationship between these regulatory costs (or implied taxes) and NIMs.

10. Management Quality: It would be expected that banks with higher quality management would be able to offer a profitable optimization of the bank's portfolio while also minimizing operating costs. This study will measure management quality as the cost-to-income ratio, thus measuring the operating costs borne to generate one rupee of gross income. It would be expected that this measure would have an inverse relationship with bank net interest margins.
11. Liquidity Risk: The necessity to maintain certain portion of bank's deposits in the form of liquid assets affects its liquidity. High liquidity ratio, whether self-imposed or the result of regulations, inflicts a cost upon banks as they have to give up the opportunity of investing these funds in alternate high yielding assets, like loans.

As bank holdings of liquid assets increase so too the liquidity risk premium in bank interest margins declines (Angbazo, 1997). Liquidity risk will be measured by two alternative measures: the first measure will be cash holdings divided by liabilities. Alternatively, liquidity risk will be measured using the central bank definition of liquid assets divided by total liabilities excluding shareholders funds. This second definition is notes, coin, balances with the

Reserve Bank (excluding required deposits), Treasury notes, Commonwealth Government Securities and other Government Securities divided by total liabilities excluding shareholder's funds

12. Non-performing Loan: Non-performing loans are one of the major factors that affect the net interest margin of bank. NPL is the ratio of provisions for bad and doubtful debts to earnings assets. NPLs negatively affect the spread. This variable also captures the credit risk. Higher the credit risk, higher the spread is likely to be. The reason is that the equity holders demand risk adjusted returns. To put it more simply given a targeted spread, the actual spread varies positively with NPLs, because what the bank fails to recover from the not-so-good borrower it attempts to recover from the good ones, thereby raising the spread.

Table 3.4

Definitions of Key terms

Variables	Method of calculation
Net interest margin	(Interest income-interest expense) total assets
Pure Interest Spread	Average loan rate-average deposit rate
Market Power	Total assets aggregate total assets of all banks
Operating Costs	Non-interest expenses Total assets
Managerial Risk Aversion (Capital Ratio)	Shareholders' equity Total assets
Interest Rate Volatility	Std. Deviation of daily short-term money market rates
Credit Risk	Total general provision for doubtful debt Total of loan, advances, and other receivables
Size of Bank Operations	Amount of total customer loan No. of branches
Bank Reserve	Capital reserve with NRB Total liabilities
Management Quality	Total costs Total income

Liquidity Risk	Liquid funds Total liabilities
Non-performing loan	Provision for bad & doubtful debt Loan and advances

CHAPTER- IV

PRESENTATION AND ANALYSIS OF DATA

This section of the study contains the analysis of secondary and primary data. In this first section, the financial data of the commercial banks are presented and analyzed using various statistical tools and technique. In the second section, the primary data are presented and analyzed.

4.1 Aggregate Statistics of Commercial Banks

In the process of secondary data analysis, various financial data are collected from the NRB bulletin, banks' web sites, and annual reports. The following is the descriptive statistics of those data. The aggregate statistics of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.1

Aggregate Statistics of Commercial Banks During 2004 to 2008

This table contains the aggregate data of all sample commercial banks for the period 2004 mid-July to 2008 mid-July. The first row of each item contains the Value (in million Rs.) whereas the second row contains the percentage increase or decrease from previous year.

	2004	2005	2006	2007	2008
1. Capital Fund	20,031.00	-1,474.30	-9,088.10	-7,461.47	6,901.70
	-	-107.36	516.43	-17.90	-192.50
2. Borrowing	11,650.90	13,102.90	16,217.60	21,830.26	26,703.67
	-	12.46	23.77	34.61	22.32
3. Deposits	228,736.40	258,742.30	284,115.20	327,925.28	391,152.60
	-	13.12	9.81	15.42	19.28
4. Other Liabilities	96,632.60	117,061.30	183,080.30	162,664.30	157,719.20
	-	21.14	56.40	-10.61	-3.63
5. Liquid Fund	43,782.00	53,448.80	45,792.50	47,728.06	58,064.15
	-	22.08	-14.32	4.23	21.66
6. Investment	51,457.90	55,903.10	66,499.10	88,959.57	101,888.18
	-	8.64	18.95	33.78	14.53
7. Loans and Advances	165,119.10	184,389.10	209,053.70	230,424.74	291,605.76
	-	11.67	13.38	10.22	26.55
8. Other Assets	96,691.90	93,691.20	152,979.70	138,864.08	130,919.04
	-	-3.10	63.28	-9.24	-5.71
9. Total Assets/Liab.	357,050.90	387,432.20	474,325.90	505,958047	582,477.30
	-	8.51	22.43	6067	15.12

Source: Banking and Financial Statistics, NRB

The data shows that the asset/liabilities of commercial banks include capital fund, borrowing, deposits, other liabilities, liquid fund, investments, loan and advances, and other assets. The total deposit for all sample banks is highest followed by loan and advances.

Net Interest Margin and its explanatory variables

The descriptive stati stics of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is depicted in the following table. In this table, net interest margin is the dependent variable whereas all other variables are the independent variables. The table contains 5 years mean, standard deviation, minimum and maximum Value of all empirical variables.

Table 4.2

Descriptive Statistics of Net Interest Margin and explanatory variables

This table contains the descriptive statistics of sample commercial banks for the sample period mid-July 2004 mid-July 2008. The net interest margin is calculated by net interest divided by total assets. Market power is the ratio of bank's asset with aggregate banks' total assets. Operating cost is ratio between bank's non-interest expenses to total assets. Managerial risk aversion is the net worth to total asset. Interest rate volatility is the average standard deviation of 90-day T-bill rate. Credit risk is measured by provision for doubtful debt divided by total loan and advances. Cost of bank reserve is the ratio of cash deposit in NRB to total deposits. Management quality is the ratio between total cost and total income. Liquidity measure is the ratio between liquid fund and total liabilities. Non-performing loan is the provision for bad & doubtful debt divided by total loan and advances. The data are expressed in percentage.

	Mean	Std. Deviation	Minimum	Maximum
1. Net Interest Margin	2.50	0.82	0.45	3.94

2. Pure Interest Spread	4.01	1.16	2.15	6.10
3. Market Power	5.33	5.42	0.94	21.04
4. Operating Cost	1.42	0.40	0.20	1.93
5. Management risk aversion	-5.22	8.47	-20.58	17.62
6. Interest rate risk	2.83	0.43	2.42	3.48
7. Credit Risk	10.78	13.37	1.76	46.45
8. Size of Operation	74.93	18.60	37.50	116.64
9. Bank Reserve	6.83	2.38	3.62	13.70
10. Management Quality	74.43	11.60	51.25	93.66
11. Liquidity Measure	9.84	2.51	6.62	16.81
12. NPLs	11.29	14.37	0.53	48.51

Among all variables, the mean Value of the managerial risk aversion is negative. It is due to the two banks: Nepal Bank Ltd. and Rastriya Banijya Bank which had negative net worth during 2006, 2007 and 2008.

Net Interest Margin

The net interest margin is the net earning to the banks. It is calculated as net interest income divided by total assets. The net interest margin of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.3

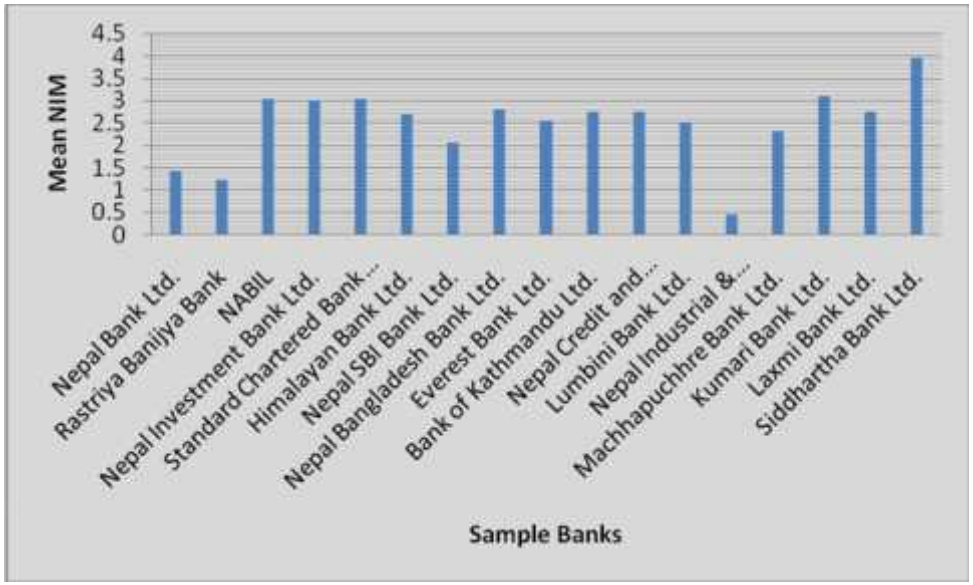
Net Interest Margin of Sample Banks During 2004 to 2008

This table contains the net interest margin of sample banks over the sample period mid –July 2004 to mid-July 2008. The net interest margin is the dependent variable for the study. It is calculated as net interest income divided by total assets. The net interest margin is calculated by total interest income minus total interest expenses divided by total assets.

S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	0.64	1.27	1.89	1.18	2.23
2	Rastriya Banijya Bank	0.67	0.76	1.76	0.73	2.25
3	NABIL	2.35	3.63	4.24	1.74	3.24
4	Nepal Investment Bank Ltd.	4.67	2.92	3.01	1.34	3.08
5	Standard Chartered Bank Ltd.	3.63	3.13	3.53	1.62	3.34
6	Himalayan Bank Ltd.	3.06	3.05	2.93	1.47	2.91
7	Nepal SBI Bank Ltd.	2.03	1.96	2.43	1.20	2.72
8	Nepal Bangladesh Bank Ltd.	3.71	3.17	2.77	0.54	3.85
9	Everest Bank Ltd.	2.21	3.48	2.80	1.46	2.75
10	Bank of Kathmandu Ltd.	3.45	2.87	2.65	1.58	3.21
11	Nepal Credit and Commerce Bank Ltd.	3.97	3.03	3.62	0.91	2.17
12	Lumbini Bank Ltd.	2.96	2.57	3.19	1.08	2.75
13	Nepal Industrial & Commercial Bank Ltd.	0.67	0.28	0.56	0.20	0.53
14	Machhapuchhre Bank Ltd.	4.25	2.72	0.88	1.07	2.71
15	Kumari Bank Ltd.	5.23	2.67	3.21	1.16	3.24
16	Laxmi Bank Ltd.	5.86	2.38	2.44	0.88	2.16
17	Siddhartha Bank Ltd.	8.00	3.48	3.64	1.31	3.28

Figure No. 4.1

Mean NIM of Sample Banks during 2004-2008



The average net interest margin during 2004-2008 is highest for Siddhartha Bank followed by Kumari Bank whereas it is lowest for Nepal Industrial and Commercial Bank.

Pure Interest Spread

The average pure interest of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.4

Pure Interest Spread of Sample Banks during 2004-2008

This table contains the pure interest spread of sample banks over the sample period mid-July 2004 to mid-July 2008. The pure interest spread is calculated as average loan rate minus average deposit rate. The average loan and deposit rates are calculated by taking simple average.

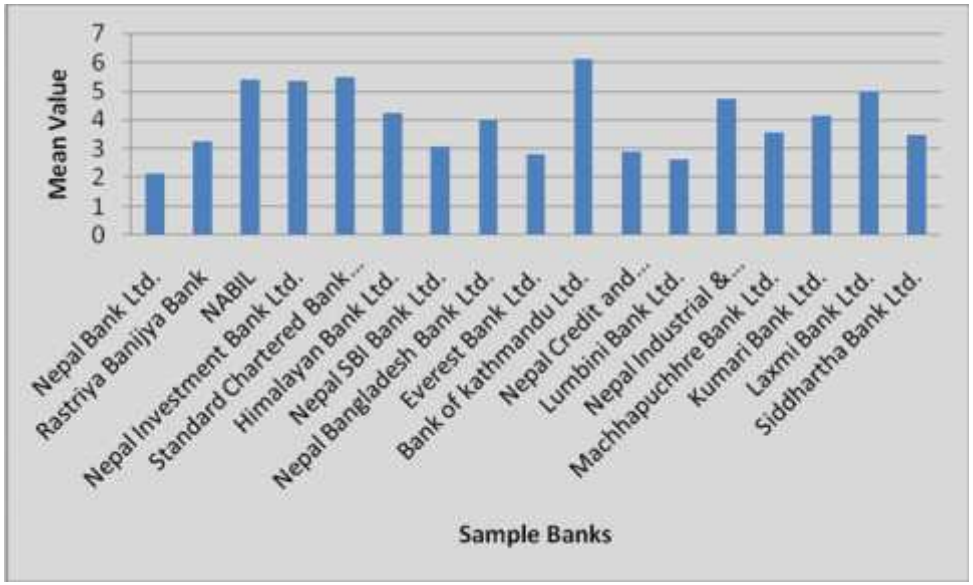
S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	0.25	2.50	2.50	2.63	2.88
2	Rastriya Banijya Bank	1.89	3.73	3.63	3.63	3.50
3	NABIL	4.13	5.88	5.75	5.38	5.75
4	Nepal Investment Bank Ltd.	2.88	2.88	6.88	7.13	7.00
5	Standard Chartered Bank Ltd.	5.38	6.00	6.00	5.00	5.00
6	Himalayan Bank Ltd.	3.73	3.60	4.88	4.25	4.63
7	Nepal SBI Bank Ltd.	2.88	3.13	3.13	3.13	3.13
8	Nepal Bangladesh Bank Ltd.	3.00	3.00	5.50	3.00	5.50
9	Everest Bank Ltd.	2.75	2.75	3.63	2.50	2.50
10	Bank of kathmandu Ltd.	6.00	6.63	5.38	6.63	5.88
11	Nepal Credit and Commerce Bank Ltd.	3.00	3.00	2.98	2.80	2.80
12	Lumbini Bank Ltd.	1.88	2.88	2.75	2.88	2.75
13	Nepal Industrial & Commercial Bank Ltd.	6.38	6.88	3.00	3.63	3.63

14	Machhapuchhre Bank Ltd.	3.25	6.13	3.38	2.75	2.25
15	Kumari Bank Ltd.	3.00	3.75	6.63	3.63	3.63
16	Laxmi Bank Ltd.	2.25	6.50	5.63	5.13	5.38
17	Siddhartha Bank Ltd.	3.25	3.95	3.75	3.25	3.25

The average pure interest spread of all sample banks is about 4.01%. The standard deviation of 1.16% shows that there is not much variance in interest spread among the sample banks. Nepal Bank Ltd. has the lowest spread (2.15%) whereas Bank of Kathmandu has the highest spread (6.10%).

Figure No. 4.2

Mean Interest Spread of Sample Banks during 2004-2008



Market Power

The role of market power in setting bank interest margins has been demonstrated by both McShane and Sharpe (1995) and Maudos and Guevara (2004), both theoretically and empirically. This study will apply a narrow definition of market power and consider bank market share as a percent of total Nepalese bank assets. It would be expected, as previously found by McShane and Sharpe (1995), that bank NIMs have a positive relationship with bank market power as measured by bank share. The market power of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.5

Market Power of Sample Banks during 2004-2008

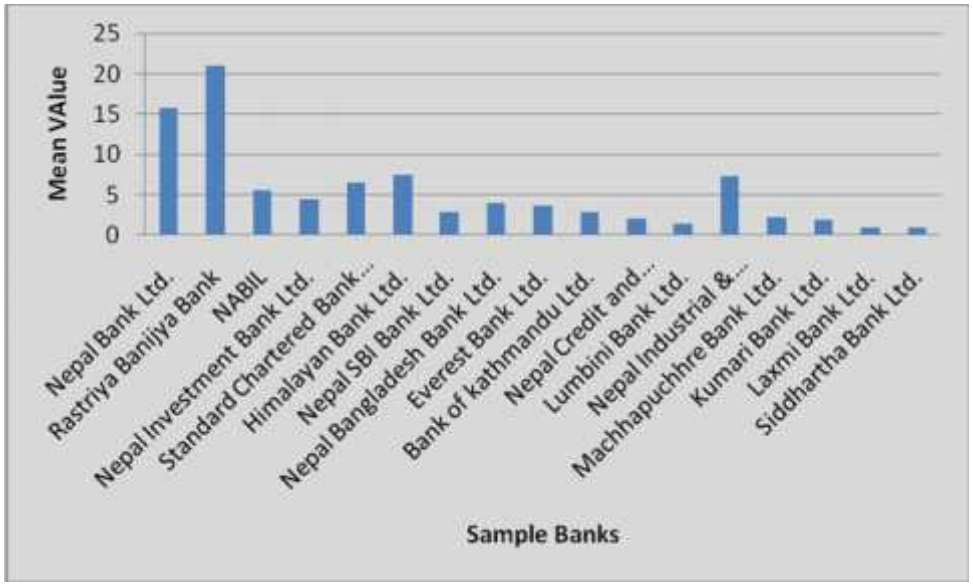
This table shows the market power of sample banks over the sample period of mid-July 2004 mid-July 2008. It is calculated as bank's assets to aggregate banks' asset.

S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	21.71	18.85	15.96	12.63	9.72
2	Rastriya Banijya Bank	26.87	23.78	19.89	19.47	15.20
3	NABIL	5.98	5.37	4.55	5.63	6.05
4	Nepal Investment Bank Ltd.	2.98	3.99	4.07	5.13	5.82
5	Standard Chartered Bank Ltd.	7.30	7.20	5.57	6.25	6.10
6	Himalayan Bank Ltd.	8.09	7.87	7.12	7.25	7.06
7	Nepal SBI Bank Ltd.	2.62	2.63	2.60	3.20	3.14
8	Nepal Bangladesh Bank Ltd.	4.23	4.68	3.80	3.90	2.91
9	Everest Bank Ltd.	2.70	2.93	3.68	3.90	4.76
10	Bank of kathmandu Ltd.	2.61	2.93	2.51	2.95	3.06
11	Nepal Credit and Commerce Bank Ltd.	1.84	2.24	2.12	2.02	1.80
12	Lumbini Bank Ltd.	1.20	1.41	1.32	1.57	1.45
13	Nepal Industrial & Commercial Bank Ltd.	1.39	1.81	9.90	11.48	12.02

14	Machhapuchhre Bank Ltd.	0.80	1.03	4.95	2.16	2.28
15	Kumari Bank Ltd.	1.00	1.69	1.88	2.19	2.51
16	Laxmi Bank Ltd.	0.36	0.77	0.96	1.29	1.79
17	Siddhartha Bank Ltd.	0.29	0.58	0.78	1.14	1.92

Figure 4.3

Mean Value for Market Power of Sample Banks During 2004-2008



The market power of banks is measured by the percentage of bank's assets with total bank's assets. The average market power of the banks is 5.33%. The standard deviation of 5.42% indicates that there is a wider difference among the sample banks. Among the sample banks, Rastriya Banijya Bank has the highest market power (21.04%) whereas Siddhartha Bank has the lowest market power (0.94%).

Operating Cost

Operating cost is the important factor which adversely affects the net interest margin. Operating cost will be measured as non-interest expenses divided by total assets. The average operating cost of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.6

Operating Cost of Sample Banks during 2004-2008

This table shows the operating costs of sample banks over the sample period of mid-July 2004, mid-July 2008. It is calculated as bank's total operating costs divided by total assets.

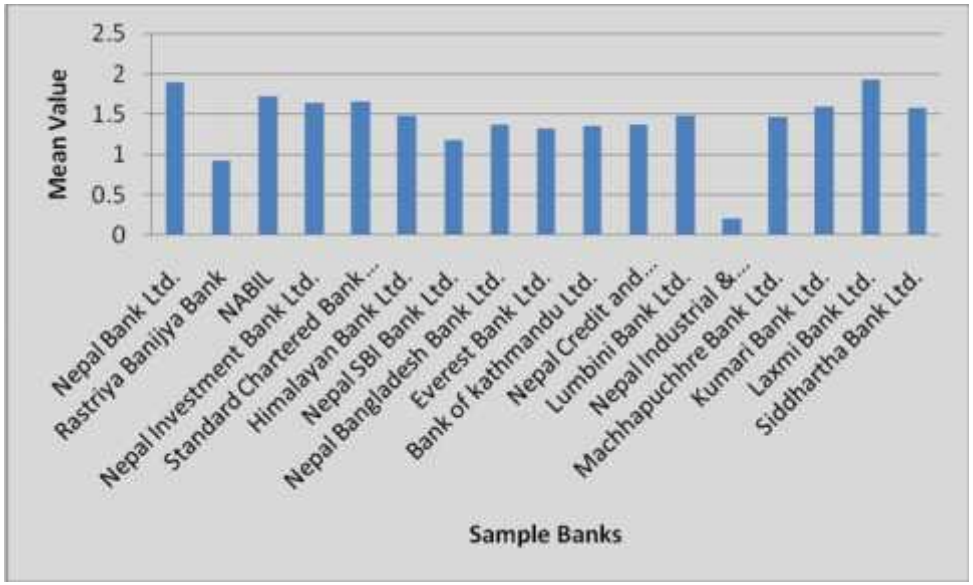
S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	0.88	2.64	1.80	1.93	2.21
2	Rastriya Banijya Bank	0.00	0.44	1.27	1.26	1.68
3	NABIL	1.93	1.72	1.92	1.65	1.38
4	Nepal Investment Bank Ltd.	1.87	1.82	1.74	1.40	1.39
5	Standard Chartered Bank Ltd.	1.97	1.69	1.74	1.42	1.48
6	Himalayan Bank Ltd.	1.18	1.38	1.40	1.65	1.76
7	Nepal SBI Bank Ltd.	1.31	1.23	1.17	1.07	1.13
8	Nepal Bangladesh Bank Ltd.	1.23	1.20	1.74	1.23	1.48
9	Everest Bank Ltd.	1.54	1.52	1.17	1.25	1.10
10	Bank of kathmandu Ltd.	1.69	1.28	1.07	1.37	1.37
11	Nepal Credit and Commerce Bank Ltd.	1.27	1.32	1.33	1.36	1.53
12	Lumbini Bank Ltd.	0.49	1.77	1.65	1.69	1.81
13	Nepal Industrial & Commercial Bank Ltd.	0.22	0.15	0.22	0.21	0.20

14	Machhapuchhre Bank Ltd.	2.11	1.99	0.43	1.40	1.43
15	Kumari Bank Ltd.	2.00	1.48	1.48	1.56	1.44
16	Laxmi Bank Ltd.	2.77	2.10	1.87	1.62	1.28
17	Siddhartha Bank Ltd.	2.08	1.84	1.60	1.40	0.96

The average operating cost of sample banks is 1.42% of total assets. The standard deviation of 0.40% indicates that the operating cost of more or less uniform among the sample bank. Among all banks, Rastriya Banijya Bank has the highest amount of operating cost (21.04%) whereas Siddhartha Bank has the lowest amount of operating cost (0.94%).

Figure No. 4.4

Average Operating Cost of Sample Banks during 2004-2008



Managerial Risk Aversion

In the study, the managerial risk aversion will be measured by bank's capital ratio (shareholders fund/total asset). It would be expected that higher levels of capital result in higher NIM. The managerial risk aversion of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.7

Managerial Risk Aversion of Sample Banks during 2004-2008

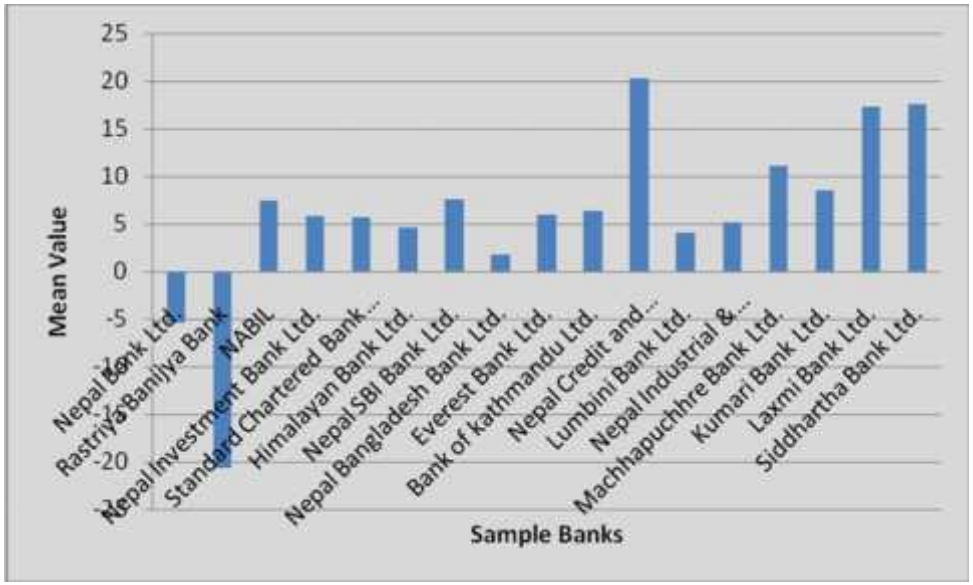
This table shows the managerial risk aversion as indicated by capital ratio of sample banks over the sample period of 2004-2008. It is calculated as shareholders' equity divided by total assets to aggregate banks' asset. Figures are expressed in ratio.

S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	2.18	1.66	-15.86	-18.60	3.82
2	Rastriya Banijya Bank	1.90	-29.50	-26.36	-24.65	-24.65
3	NABIL	6.27	9.89	7.96	6.87	6.32
4	Nepal Investment Bank Ltd.	6.12	5.46	7.42	5.26	4.80
5	Standard Chartered Bank Ltd.	5.02	6.25	5.62	5.88	5.86
6	Himalayan Bank Ltd.	3.00	5.37	4.56	4.96	5.10
7	Nepal SBI Bank Ltd.	7.29	9.22	6.49	8.15	6.43
8	Nepal Bangladesh Bank Ltd.	4.82	6.53	6.68	1.40	-10.94
9	Everest Bank Ltd.	7.12	6.69	6.51	4.98	4.13
10	Bank of kathmandu Ltd.	6.53	7.37	6.35	5.69	5.60
11	Nepal Credit and Commerce Bank Ltd.	9.06	12.36	80.36	3.02	-3.50

12	Lumbini Bank Ltd.	10.42	7.49	9.78	1.58	-8.72
13	Nepal Industrial & Commercial Bank Ltd.	12.39	9.09	1.53	1.37	1.30
14	Machhapuchhre Bank Ltd.	20.00	15.53	2.73	8.67	8.31
15	Kumari Bank Ltd.	11.37	8.75	7.27	8.17	7.00
16	Laxmi Bank Ltd.	29.67	20.98	15.57	11.22	9.08
17	Siddhartha Bank Ltd.	39.98	17.91	11.81	10.98	7.45

Figure No. 4.5

Average Managerial Risk Aversion of Sample Banks during 2004-2008



The average managerial risk aversion of all sample banks is negative (-5.22%). It is due to the two sample banks: Nepal Bank Ltd. (-5.36%) and Rastriya Banijya Bank (-20.58%). It is highest for Siddhartha Bank (17.62%) followed by Laxmi Bank (17.30%) whereas it is lowest for Rastriya Banijya Bank (-20.58).

Interest Rate Risk

One of the major factors that affect the bank's NIM is interest rate risk. The risk is created when bank's reinvestment risk changes due to changes in the money market rates of especially the t-bill rate. The interest rate risk during the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.8

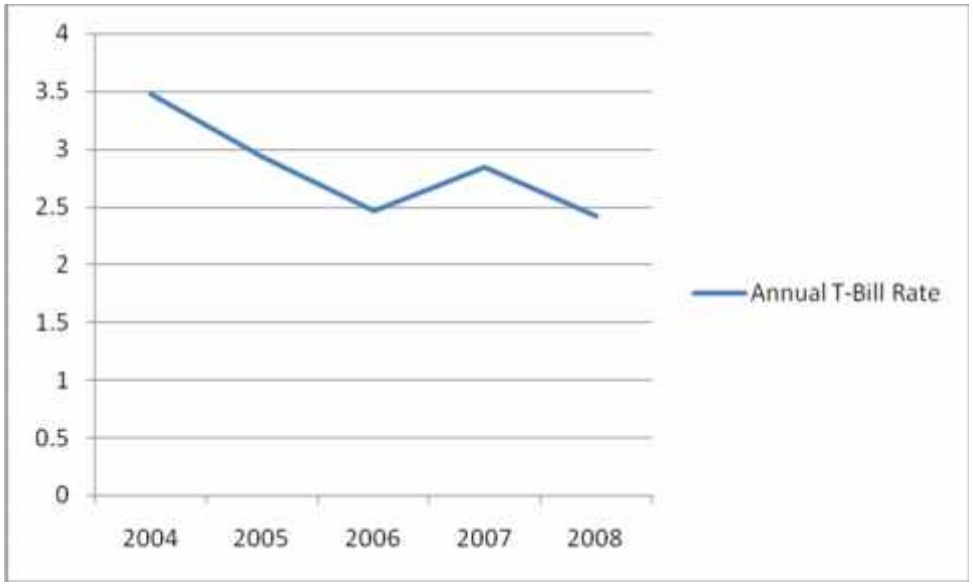
Interest Rate Risk of Sample Banks

This table shows the average change in 91-day weighted average Treasury bill rate. Figures are expressed in percentage.

Fiscal Year	Annual T-Bill Rate
2004	3.48
2005	2.93
2006	2.46
2007	2.84
2008	2.42

Figure No. 4.6

Annual T-Bill Rate during 2004-2008



The average interest rate risk as measured by 91-day T-bill rate is 2.83%. It has declined over the sample period. The standard deviation is 0.43%. The interest rate risk is highest during 2004 whereas it is lowest during 2008. The figure shows a gradual decline in the fluctuation in T-bill rate indicating less interest rate risk.

Credit Risk

Credit risk is measured using the general provision for doubtful debt divided by total loan and advances. It would be expected that increased level of bank's credit risk would result in higher net interest margin. The credit risk of all sample banks for the sample period of mid-July 2003 to mid-July 2007 is as follows:

Table 4.9

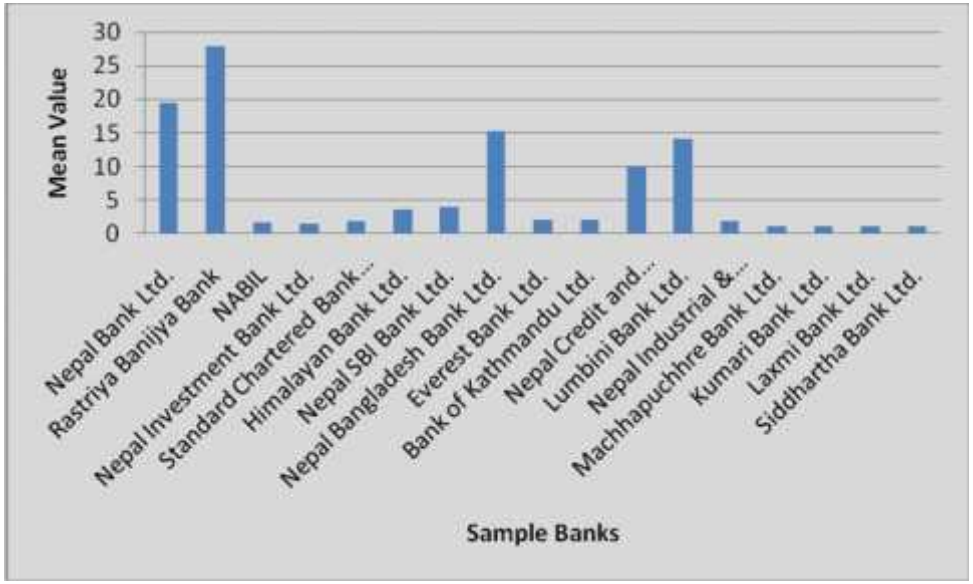
Credit Risk of the Sample Banks during 2003-2007

This table shows the credit risk of sample banks over the sample period of mid-July 2004 mid-July 2008. It is calculated as total provision for doubtful debt divided by total loan and advances. Figures are expressed in percentage.

S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	0.00	0.00	52.99	26.84	17.76
2	Rastriya Banijya Bank	0.00	0.00	53.17	50.60	35.56
3	NABIL	0.00	0.00	3.54	2.71	2.28
4	Nepal Investment Bank Ltd.	0.00	0.00	2.49	2.88	2.53
5	Standard Chartered Bank Ltd.	0.00	0.00	3.38	3.04	2.73
6	Himalayan Bank Ltd.	0.00	0.00	7.08	6.63	4.30
7	Nepal SBI Bank Ltd.	0.00	0.00	6.00	7.61	5.98
8	Nepal Bangladesh Bank Ltd.	0.00	0.00	13.55	18.78	43.76
9	Everest Bank Ltd.	0.00	0.00	4.01	3.52	2.98
10	Bank of Kathmandu Ltd.	0.00	0.00	4.37	3.14	2.96
11	Nepal Credit and Commerce Bank Ltd.	0.00	0.00	9.86	11.73	27.67
12	Lumbini Bank Ltd.	0.00	0.00	16.92	32.24	21.51
13	Nepal Industrial & Commercial Bank Ltd.	0.00	0.00	3.57	3.56	2.81
14	Machhapuchhre Bank Ltd.	0.00	0.00	1.33	1.28	3.15
15	Kumari Bank Ltd.	0.00	0.00	2.61	1.88	1.48
16	Laxmi Bank Ltd.	0.00	0.00	2.24	1.63	1.41
17	Siddhartha Bank Ltd.	0.00	0.00	2.37	1.91	1.57

Figure No. 4.7

Credit Risk of Sample Banks During 2004-2008



The data relating to provision for doubtful debt is not provided in the NRB annual report for the year 2004 and 2005. As such, the Credit Risk for these two periods could not be calculated. The average credit risk of all sample banks is 10.78%. The standard deviation of 13.37% indicates the there is wider variabtion among the credit risk of all sample banks. Among all banks, the credit risk of Rastriya Banijya Bank is the highest (46.45%) following by Nepal Bank Ltd (32.53%). It is lowest for Laxmi Bank Ltd (1.76).

Size of Bank Operation

The size of bank operation is measured by the average amount of loan and advances. The size of bank operation of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.10

Size of Sample Banks' Operation during 2004-2008

This table shows the average size of banks' operation over the sample period of 2004-2008. It is measured by total loan and advances dividend by total deposits of the banks. It is expressed in percentage.

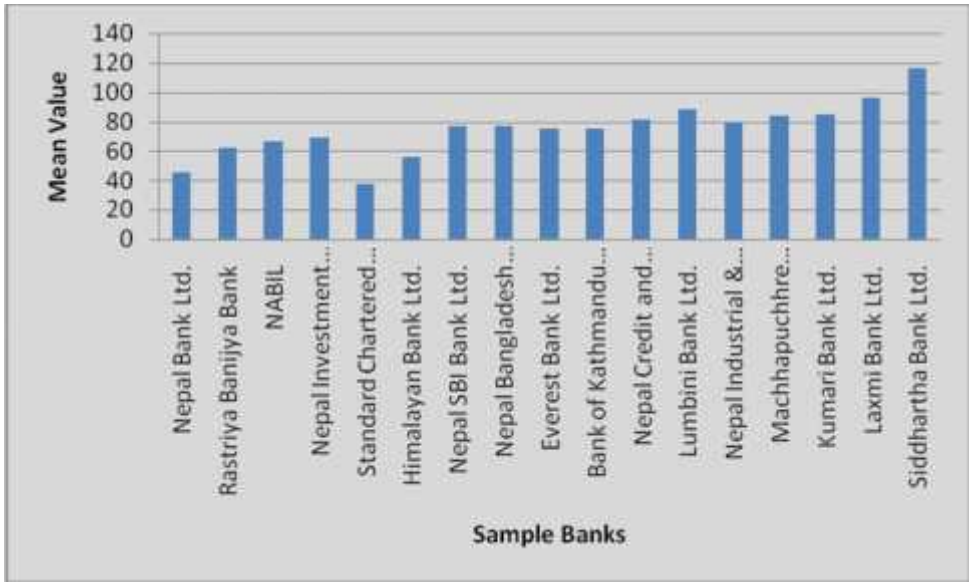
S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	54.92	52.66	50.24	34.36	34.55
2	Rastriya Banijya Bank	71.15	65.77	65.80	58.78	50.24
3	NABIL	59.51	61.25	75.95	67.30	67.08
4	Nepal Investment Bank Ltd.	74.12	61.29	72.22	68.72	71.39
5	Standard Chartered Bank Ltd.	32.14	31.48	42.46	38.63	42.77
6	Himalayan Bank Ltd.	51.87	57.47	53.34	58.65	59.09
7	Nepal SBI Bank Ltd.	72.99	75.93	76.56	74.27	86.04

8	Nepal Bangladesh Bank Ltd.	79.29	78.42	72.08	69.24	87.73
9	Everest Bank Ltd.	75.15	75.85	78.38	73.35	73.62
10	Bank of Kathmandu Ltd.	79.64	78.51	68.96	72.15	78.19
11	Nepal Credit and Commerce Bank Ltd.	77.36	74.13	89.51	88.17	78.21
12	Lumbini Bank Ltd.	88.75	84.90	94.72	90.15	81.97
13	Nepal Industrial & Commercial Bank Ltd.	80.40	72.46	78.41	78.52	90.46
14	Machhapuchhre Bank Ltd.	84.00	92.27	90.42	76.44	76.85
15	Kumari Bank Ltd.	85.33	77.01	88.02	88.69	85.33
16	Laxmi Bank Ltd.	110.44	100.99	89.81	96.17	85.76
17	Siddhartha Bank Ltd.	160.62	121.42	107.03	98.75	95.39

The size of bank operation is measured by total loans by total deposits. The average size of bank operation is 74.93%. The standard deviation is 18.60% which indicates that there a wider variation among the sample banks. Standard Chartered Bank has the lowest size of operation (37.50% whereas Siddhartha Bank has the highest size of operation (116.64%).

Figure No. 4.8

Average Size of Bank Operation during 2004-2008



Capital Reserve

The capital reserve is the percentage of total bank deposit to be maintained by the bank as cash reserve. The banks' capital reserve of all sample banks during period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.11

Capital Reserve of Sample Banks during 2004-2008

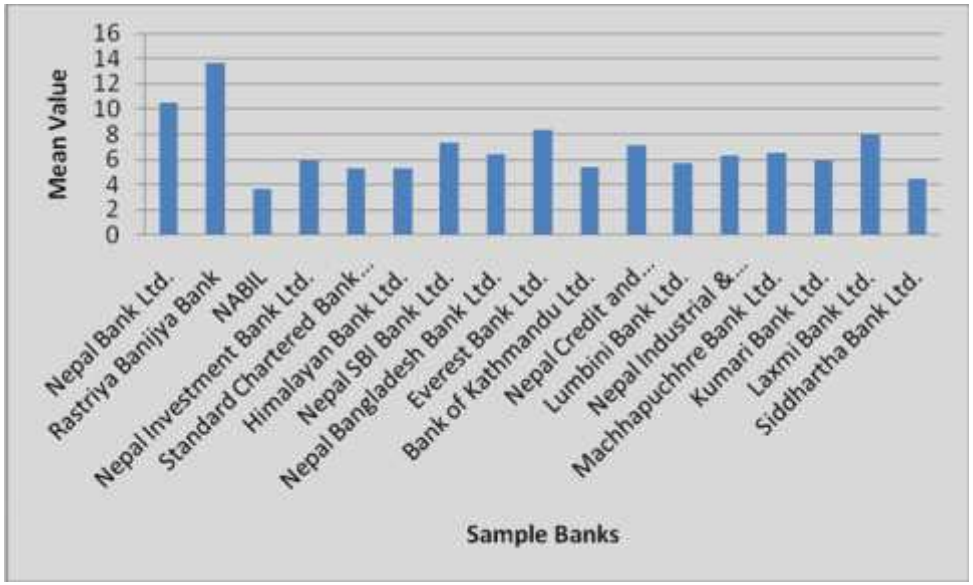
This table shows the average capital reserve maintained in Nepal Rastra Bank as percentage of total deposit over the sample period of 2004-2008. It is measured by balance at NRB dividend by total deposit. Figures are expressed in percentage.

S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	7.27	10.43	10.92	10.45	13.21
2	Rastriya Banijya Bank	15.05	21.94	11.01	13.04	7.47
3	NABIL	6.64	4.30	0.74	1.65	4.77
4	Nepal Investment Bank Ltd.	5.68	4.56	5.47	8.06	5.64
5	Standard Chartered Bank Ltd.	6.08	7.25	3.58	3.25	6.55
6	Himalayan Bank Ltd.	5.38	7.13	5.69	4.13	4.24
7	Nepal SBI Bank Ltd.	13.68	8.00	4.51	5.80	4.86
8	Nepal Bangladesh Bank Ltd.	4.84	6.28	6.17	8.53	6.48
9	Everest Bank Ltd.	10.83	5.48	7.67	8.26	9.67
10	Bank of Kathmandu Ltd.	5.87	5.78	4.67	3.35	7.15
11	Nepal Credit and Commerce Bank Ltd.	8.46	9.24	6.65	7.22	3.92
12	Lumbini Bank Ltd.	6.27	8.60	5.26	3.73	4.66
13	Nepal Industrial & Commercial Bank	5.57	3.99	13.33	5.14	3.56

	Ltd.					
14	Machhapuchhre Bank Ltd.	5.00	4.96	8.29	6.20	8.29
15	Kumari Bank Ltd.	8.91	10.89	3.51	2.68	3.64
16	Laxmi Bank Ltd.	11.58	13.22	8.42	2.98	4.25
17	Siddhartha Bank Ltd.	10.88	2.74	1.85	1.25	5.75

Figure No. 4.9

Capital Reserve Ratio of Sample Banks during 2004-2008



The average bank reserve of all sample banks is 6.83%. The standard deviation is 2.38% which indicates lesser variability among the sample banks. It is highest for Rastriya Bank Ltd. (13.70%) followed by Nepal Bank Ltd (10.45%). It is lowest for NABIL Bank Ltd (3.62%). This shows that there is a wide variation on capital reserve among commercial banks.

Management Quality

The management quality is the ability of the banks to control or reduce the total cost in comparison to total income. The management quality of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.12

Management Quality of Sample Banks during 2004-2008

This table shows the management quality over the sample period of mid-July 2004 mid-July 2008. It is measured as total cost divided by total income. The total cost includes interest and non-interest expenses, operation and non-operating cost whereas the total income includes interest and all other incomes. Figures are expressed in percentage.

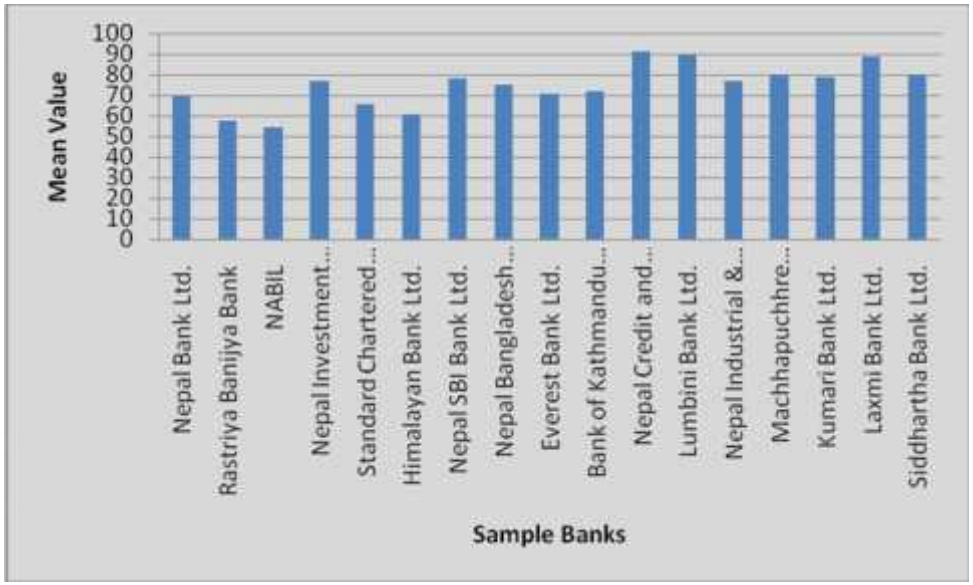
S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	61.47	100.00	66.37	35.00	84.61
2	Rastriya Banijya Bank	0.00	81.65	90.61	54.85	58.91
3	NABIL	58.79	54.59	45.71	45.89	66.85
4	Nepal Investment Bank Ltd.	79.41	82.76	76.06	73.63	73.46
5	Standard Chartered Bank Ltd.	68.68	64.82	65.67	62.43	65.64
6	Himalayan Bank Ltd.	56.22	54.39	56.16	74.08	62.49
7	Nepal SBI Bank Ltd.	73.63	73.22	99.23	83.29	61.96
8	Nepal Bangladesh Bank Ltd.	76.19	86.94	91.81	64.03	55.83
9	Everest Bank Ltd.	76.52	65.55	68.21	64.44	78.10
10	Bank of Kathmandu Ltd.	81.40	71.46	71.78	62.77	73.16

11	Nepal Credit and Commerce Bank Ltd.	80.00	80.94	86.04	94.41	114.89
12	Lumbini Bank Ltd.	74.64	100.00	100.00	100.00	72.61
13	Nepal Industrial & Commercial Bank Ltd.	63.69	91.27	78.75	77.07	73.23
14	Machhapuchhre Bank Ltd.	84.69	81.51	72.06	74.13	88.56
15	Kumari Bank Ltd.	83.45	79.26	83.40	77.10	69.85
16	Laxmi Bank Ltd.	92.73	87.17	85.22	89.57	87.86
17	Siddhartha Bank Ltd.	100.00	71.94	81.71	70.97	73.83

The ability of management to control its total cost indicates the management quality. The average management quality of all sample banks is 74.73%. The standard deviation is 11.60% which indicates variation of management quality among the sample banks. NABIL Bank shows highest degree of management quality (cost/income ratio of 51.25%) whereas Nepal Credit & Commerce Bank has the lowest degree of management quality (cost/income ratio of 91.26%) followed by Lumbini Bank (cost/income ratio of 89.45%).

Figure No. 4.10

Management Quality of Sample Banks During 2004-2008



Liquidity

The liquidity is the amount a bank maintains as cash or liquid assets. The liquidity of all sample banks for the sample period of mid-July 2004 to mid-July 2008 is as follows:

Table 4.13

Liquidity of sample Banks during 2004-2008

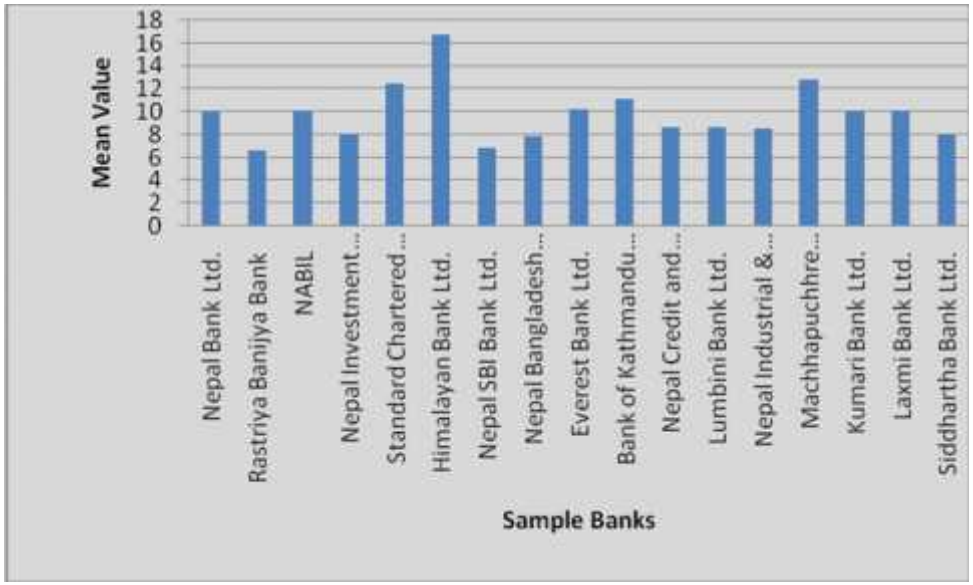
This table shows the liquidity measure of sample banks over the sample period of mid-July 2004 mid-July 2008. It is calculated as total liquid fund divided by total liabilities. Figures are expressed in percentage.

S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	8.99	10.23	8.13	9.07	13.82
2	Rastriya Banijya Bank	0.10	10.23	7.69	8.13	6.96
3	NABIL	0.24	23.84	8.25	11.00	7.24
4	Nepal Investment Bank Ltd.	0.11	9.48	8.86	11.52	10.48
5	Standard Chartered Bank Ltd.	0.15	18.50	16.27	13.25	14.54
6	Himalayan Bank Ltd.	0.35	34.02	30.25	9.23	10.21
7	Nepal SBI Bank Ltd.	0.18	9.56	4.73	7.36	12.52
8	Nepal Bangladesh Bank Ltd.	0.07	10.02	10.28	10.94	7.82
9	Everest Bank Ltd.	0.15	9.35	14.90	10.59	15.99
10	Bank of Kathmandu Ltd.	0.09	12.46	15.25	16.76	11.25
11	Nepal Credit and Commerce Bank Ltd.	0.15	15.35	9.04	9.66	9.16
12	Lumbini Bank Ltd.	0.14	15.38	9.67	6.83	11.03
13	Nepal Industrial & Commercial Bank	0.09	8.02	15.79	11.15	7.84

	Ltd.					
14	Machhapuchhre Bank Ltd.	0.22	18.97	12.50	18.31	14.10
15	Kumari Bank Ltd.	0.11	20.41	7.29	9.59	12.74
16	Laxmi Bank Ltd.	0.22	23.69	16.16	4.67	6.08
17	Siddhartha Bank Ltd.	0.18	15.37	6.14	8.50	10.01

Figure No. 4.11

Liquidity of Sample Banks during 2004-2008



The average liquidity ratio of all sample banks is 9.84%. The standard deviation is 2.51% which indicates that there is lesser variation among sample banks. Among all sample banks, Rastriya Banijya Bank has the lowest degree of liquidity (6.62%) whereas Himalayan Bank has the highest degree of liquidity ratio (16.81%).

Non Performing Loans

The non-performing loan status of banks is calculated as the ratio of provision for bad and doubtful debts to earning assets. It would be expected that the non-performing loan would affect the net interest margin negatively. The non-performing loans all sample banks for the sample period of mid-July 2008 is as follows:

Table 4.14

Non-Performing Loan of Sample Banks during 2004-2008

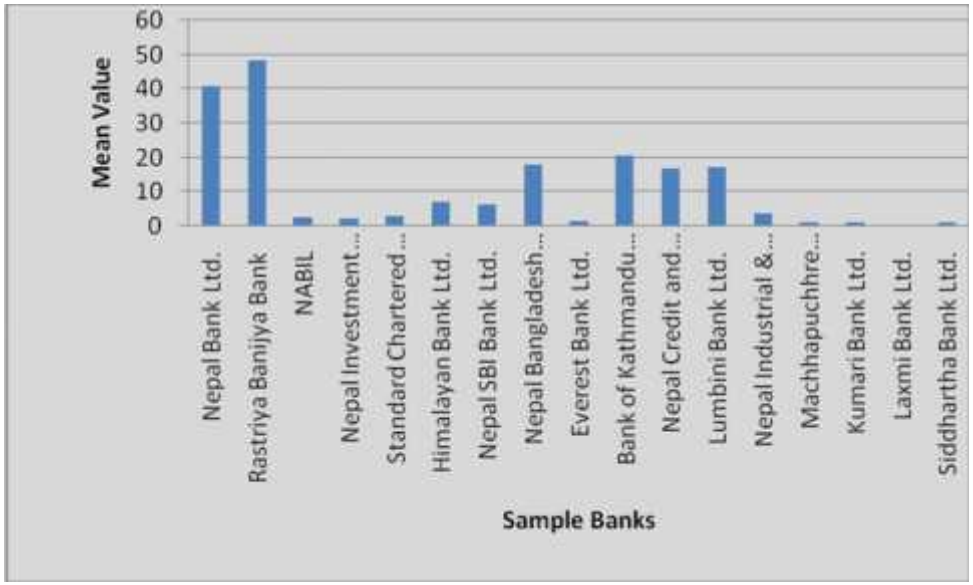
This table shows the NPL status of sample banks over the sample period of mid-July 2004 mid-July 2008. It is calculated as provision for bad & doubtful debt divided by total loan & advances. Figures are expressed in percentage.

S.N.	Banks	2004	2005	2006	2007	2008
1	Nepal Bank Ltd.	60.47	53.74	49.64	25.11	14.60
2	Rastriya Banijya Bank	60.15	57.64	52.99	45.34	26.43
3	NABIL	5.54	3.35	1.32	1.25	1.12
4	Nepal Investment Bank Ltd.	1.98	2.47	2.69	2.30	2.12
5	Standard Chartered Bank Ltd.	4.13	3.77	2.69	2.12	1.83
6	Himalayan Bank Ltd.	10.08	8.88	7.44	6.14	3.53
7	Nepal SBI Bank Ltd.	11.71	6.25	6.54	6.32	0.46
8	Nepal Bangladesh Bank Ltd.	12.73	10.81	19.04	12.27	35.13
9	Everest Bank Ltd.	2.20	1.72	1.63	1.20	0.76
10	Bank of Kathmandu Ltd.	87.13	6.66	4.99	2.52	2.20

11	Nepal Credit and Commerce Bank Ltd.	20.63	12.72	8.64	11.09	30.63
12	Lumbini Bank Ltd.	11.57	7.36	15.23	31.97	19.85
13	Nepal Industrial & Commercial Bank Ltd.	6.66	3.92	3.78	2.60	1.10
14	Machhapuchhre Bank Ltd.	2.08	0.98	0.39	0.28	1.12
15	Kumari Bank Ltd.	1.70	0.76	0.95	0.90	0.73
16	Laxmi Bank Ltd.	0.00	0.00	1.63	0.65	0.35
17	Siddhartha Bank Ltd.	0.00	1.61	2.58	1.34	0.34

Figure No.4.12

NPL of Sample Banks During 2004-2008



The average non-performing loan of all sample banks is 11.29%. The standard deviation is 14.37% which indicates that there is wide variation among sample banks. Rastriya Banijya Bank has the highest amount of NPL (48.51%) followed by Nepal Bank (40.71%). Laxmi Bank has the lowest amount of NPL (0.53%).

4.2 Correlation Analysis

The correlation matrix shows the partial correlation between the 11 independent variables: Spread, market power, operating cost, managerial risk aversion, interest rate risk, credit risk, size of operation, capital reserve, management quality, liquidity, and non-performing loan. The correlation matrix shows that the highest correlation (-0.685) between managerial risk aversion and

credit risk. It indicates that there aren't variables which have higher degree of correlation. As such, it seems that there is no multicollinearity problem.

Table 4.15

Correlation Matrix of Explanatory Variables

This table shows the covariance matrix of all explanatory variables. The first row shows the explanatory variables as indicated by 1,2,….11. 1 denotes Spread, 2 denotes Market Power, 3 denotes Operating Cost, 4 denotes Managerial Risk Aversion, 5 denotes Interest Rate Risk, 6 denotes Credit Risk, 7 denotes size of Operation, 8 denotes Capital Reserve, 9 denotes Management Quality, 10 denotes Liquidity, and 11 denotes Non-performing Loan.

	1	2	3	4	5	6	7	8	9	10	11
1. Spread	1										
2.Market Power	-.230**	1									
3. Operating Cost	.069	-.261**	1								
4. Managerial Risk Aversion	.130	-.676*	.239**	1							
5. Interest Rate Risk	-.219**	.009	.046	.294*	1						
6. Credit Risk	-.146	.347*	.096	-.685*	-.352*	1					
7.Size of Operation	-.089	-.501*	-.013	.538*	.069	-.184	1				
8. Capital Reserve	-.315*	.495*	-.091	-.294*	.211	.157	-.105	1			

9. Management Quality	-.082	-.424*	.236**	.264**	-.090	-.019	.410*	-.018	1		
10. Liquidity	.220**	-.011	.030	-.024	-.501*	-.033	-.185	-.019	-.085	1	
11. NPL	-.249**	.654*	-.074	-.571*	.163	.476*	-.225**	.411*	-.097	-.215**	1

* Correlation is significant at the 0.01 level (2-tailed).

** Correlation is significant at the 0.05 level (2-tailed).

4.3 Regression Analysis

The results or output multiple linear regression analysis is presented in Table 4.15, 4.16 and Table 4.17. In Table 4.15, the regression results of data covering 17 commercial banks for the period of 5 years are presented. The Table 4.16 contains the regression results of data covering 17 commercial banks covering period of 5 years. Both tables contain the coefficients, t-Value, p-Value of the 11 independent variables, R^2, Adjusted R^2, and DW test result.

Table 4.16

Regression Results (Model 1)

This table shows the results of regression analysis. The regression analysis was done on data from 17 commercial banks covering sample period of mid-July 2004-2008. The dependent variable is Net Interest Margin. Independent variables are market power, operating cost, managerial risk aversion, interest rate risk, credit risk, size of bank operation, capital reserve, management quality, liquidity, and non-performing loans.

$$NIMit = 2.288 + 0.009SPREAD - 0.046POW + 1.301OC + 0.029AVER - 0.409IRISK - 0.008CRISK + 0.011SIZE + 0.052CRES - 0.016MQ - 0.04LIQR - 0.002NPL$$

$R^2 = 0.492$ Adjusted $R^2 = 0.415$ DW = 1.412

Dependent Variable: Net Interest Margin (NIM)

	Coefficient	**t-Value**	**p-Value**
(Constant)	2.288	1.188	.239
Spread	.009	.114	.910
Market Power	-.046	-1.212	.229
Operating Cost	1.301*	5.070	.000
Managerial Risk Aversion	.029	1.186	.239
Interest Rate Risk	-.409	-.908	.367
Credit Risk	-.008	-.508	.613
Size of Operation	.011	1.362	.177
Capital Reserve	.052	1.285	.203
Management Quality	-.016***	-1.887	.063
Liquidity	-.040*	-1.889	.063
NPL	.002	.227	.821

* Coefficient is significant at the 0.01 level (2-tailed).

** Coefficient is significant at the 0.05 level (2-tailed).

*** Coefficient is significant at the 0.10 level (2-tailed).

The result regression analysis shows that though the model is significant, the explanatory power of the model is very low (R^2 = 0.492). Similarly, the coefficient of only three variables: operating cost, management quality, and liquidity are significant. The coefficient of all other explanatory variables are insignificant. The DW Value of 1.4212 indicates the presence of autocorrelation present data. This could be because of two sample banks NBL and RBB whose net interest margin is significantly low compared to other commercial banks. These two government-owned banks have not been performing well

for the past many years. The inclusion of these banks might affect the analysis. As such, in the subsequent analysis, these banks are removed.

Table 4.17

Regression Results (Model 2)

This table shows the results of regression analysis. The regression analysis was done on data from 15 commercial banks covering sample period of mid-July 2004-2008. The dependent variable is Net Interest Margin. Independent variables are market power, operating cost, managerial risk aversion, interest rate risk, credit risk, size of bank operation, capital reserve, management quality, liquidity, and non-performing loans.

$NIMit = 4.723 – 0.119SPREAD + 0.032POW + 0.467OC + 0.081AVER – 0.939IRISK – 0.014CRISK + 0.004SIZE + 0.061CRES – 0.027MQ – 0.051LIQR + 0.023NPL$

$R^2 = 0.536$ Adjusted $R^2 = 0.455$ DW = 1.484

Dependent Variable: Net Interest Margin (NIM)

	Coefficient	**t-Value**	**p-Value**
(Constant)	4.723	2.003	.049
Spread	-.119	-1.311	.195
Market Power	0.32	.517	.607
Operating Cost	1.467*	4.876	.000
Managerial Risk Aversion	.081**	2.213	.031
Interest Rate Risk	-.939***	-1.950	.056
Credit Risk	-.014	-.587	.0560
Size of Operation	.004	.390	.698

Capital Reserve	.061	1.274	.207
Management Quality	-.027**	-2.345	.022
Liquidity	-.051**	-2.387	.020
NPL	.023***	1.880	.065

* Coefficient is significant at the 0.01 level (2-tailed).

** Coefficient is significant at the 0.05 level (2-tailed).

*** Coefficient is significant at the 0.10 level (2-tailed).

The second model is still significant. However, the explanatory power of the model (R2 = 0.536) has slightly improved. The coefficients of variables: operating costs, managerial risk aversion, interest rate risk, management quality, liquidity, and NPL are significant. The coefficients of variables: spread, market power, credit risk, and size of operation are not significant. The DW test (1.484) still shows the presence of autocorrelation in the data. In conclusion, the model does not seem to explain the factors that determine the net interest margin of the bank. As such, the further regression analysis is done taking the natural logarithm of the empirical variables. Log model is often used to measure the changes in dependent variable with respect to small changes in independent variables.

Table 4.18

Regression Results (Model 3)

This table shows the results of regression analysis. The regression analysis was done on data from 15 commercial banks covering sample period of mid-July 2004-2008. The dependent variable is Net Interest Margin. Independent variable are market power, operating cost, managerial risk aversion, interest rate risk, credit risk, size of bank operation, capital reserve, management quality, liquidity, and non-performing loans.

NIMit = 8.418 – 0.321 InSPREAD + 0.023InPOW + 0.795InOC + 0.311InAVER – 4.425InIRISK – 0.338InCRISK – 0.002InSIZE + 0.146InCRES – 0.754InMQ – 0.205InLIQR + 0.179InNPL

R2 = 0.832 Adjusted R2 = 0.802 DW = 1.754

Dependent Variable: Net Interest Margin

	Coefficient	**t-Value**	**Sig.**
(Constant)	8.418*	3.955	.000
Spread	-.321*	-2.695	.009
Market Power	.023	.185	.854
Operating Cost	.795*	10.711	.000
Managerial Risk Aversion	.311*	2.641	.010
Interest Rate Risk	-4.425*	-7.654	.000
Credit Risk	-.338*	-5.296	.000

Size of Operation	-.002	-.011	.991
Capital Reserve	.146***	1.913	.060
Management Quality	-.754*	-2.643	.010
Liquidity	-.205*	-6.517	.000
NPL	.179*	4.545	.000

* Coefficient is significant at the 0.01 level (2-tailed).

** Coefficient is significant at the 0.05 level (2-tailed).

*** Coefficient is significant at the 0.10 level (2-tailed).

After taking the natural logarithm of all 12 empirical variables, the explanatory power of the model has improved quite a lot (R2 = 0.832). The regression results show that the coefficient for spread, operating cost, managerial risk aversion, interest rate risk, credit risk, management quality, capital reserve, liquidity, and NPL are significant. The results showed that the coefficients of market power and size of operation are not significant. The DW Value of 1.754 indicates the presence of autocorrelation. However, the degree of autocorrelation has decreased. As such, this study continues to use regression analysis.

The implications of multivariate regression model are as follows:

- The coefficient of spread is -0.321 which indicates that net interest is a negative function of pure interest spread. The result is not consistent with the priori hypothesis. However, it supports the findings of Estrada Dairo et at. (2005).
- The coefficient of market power is very low (0.023) indicating very weak effect on the net interest margin. The relationship is consistent with the prior hypothesis indicating that net interest margin is a positive function of market power. It suggests that the net interest margin of larger banks is greater. However, the coefficient is not significant.

The result supports the findings of Barajas et al. (1999) and Wong (1997). However, it does not support the findings of McShane and Sharpe (1985).

- The coefficient of operating cost (0.795) is highly significant and indicates that net interest margin is a positive function of operating costs. It suggests that banks having greater operating costs tend to have greater net interest margin. This result is not consistent with the priori hypothesis. This result supports the findings of John W. Robinson (2002), Barajas et al. (1999), Wong (1997), and Barry Williams (2007).
- The coefficient of managerial risk Aversion (0.311) indicates that net interest margin is a positive function of managerial risk aversion. The result is consistent with the priori hypothesis. This result supports the findings of Barry Williams (2007) but does not support that of Ho and Saunder (1981).
- The coefficient of interest rate risk (-4.425) is highly significant and indicates net interest margin is a negative function of interest rate risk. The result is consistent with the priori hypothesis and supports the findings of Barry Williams (2007), Angbazo (1997), and Wong (1997) but it does not support the findings of Ho and Saunder (1981).
- The coefficient for Credit Risk (-0.338) is highly significant and indicates net interest margin is a negative function of credit risk. The relation with NIM is not consistent with the priori hypothesis. However, it supports the findings of Barajas et al. (1999) and Wong (1997).
- The coefficient of size of operation (-0.002) indicates almost no effect on net interest margin. Similarly, the coefficient is not significant even at 10% level of significance. Hence, the result shows the size of banks' operation is not a relevant factor in determining net interest margin. This result supports the findings of Ho and Saunder (1981).
- The coefficient of capital reserve (0.146) is significant at 10% level of significance. The positive relation is not consistent with the priori hypothesis. This result supports the findings of Saunders and Schumacher (2000).

- The coefficient of management quality (-0.754) is significant and indicates that net interest margin is a negative function of management quality with is not consistent with the priori hypothesis. The result does not support the findings of Barry William (2007).
- The coefficient of Liquidity (-0.205) is highly significant and indicates that net interest margin is a negative function of liquidity. The result is consistent with the priori hypothesis and supports the findings of Angbazo (1997).
- The coefficient of non-performing loan (0.179) indicates that net interest margin is a positive function of non-performing loan. However, the relation is not consistent with the priori hypothesis. The results support the findings of Brock and Rojas-Suarez (2000).

Table 4.19

Summary of Comparison of Results with the Findings of Previous Studies

Variables	Priori Hypothesis	Study Finding	Supports	Does not Support
1. Spread	Positive	Negative	Estrada Dairo et al. (2005)	
2. Market Power	Positive	Positive	Barajas et al. (1999) Wong (1997)	McShanae and Sharpe (1985)
3. Operating Cost	Negative	Positive	John W. Robinson (2002) Barajas et al. (1999) Wong (1997) Barry Williams (2007)	
4. Managerial Risk Aversion	Positive	Positive	Barry Williams (2007)	Ho and Saunder (1981)
5. Interest Rate Risk	Negative	Negative	Barry Williams	Ho and Saunder

			(2007) Angbazo (1997) Wong (1997)	(1981)
6. Credit Risk	Positive	Negative	Barajas et al. (1999) Wong (1997)	
7. Size of Bank Operations	Positive	Positive	Ho and Saunder (1981)	
8. Capital Reserve	Negative	Positive	Saunders and Schumacher (2000)	
9. Management Quality	Positive	Negative		Barry Williams (2007)
10. Liquidity Risk	Negative	Negative	Angbazo (1997)	
11. Non-performing Loan	Negative	Positive	Brock and Rojas-Suarez (2000)	

This study found that net interest margin is a positive function of market power, operating costs, managerial risk aversion, size of bank operation, capital reserve, and non-performing loan whereas it is a negative function of pure interest spread, interest rate risk, credit risk, managerial quality, and liquidity.

The findings on market power, managerial risk aversion, interest rate risk, size of bank operation, and liquidity risk are consistent with priori hypothesis. The findings on spread, operating costs, credit risk, capital reserve, management quality, and non-performing loan are not consistent with the priori hypothesis.

4.4 Bank's Profitability and Net Interest Margin

Theoretically, bank's profitability depends mainly on its ability to generate net interest margin. Other things remaining the same, higher the net interest margin of bank, higher will be its profitability. As such, the regression of profitability on net interest margin is run and the result follows:

Table 4.20

Regression of Profitability on Net Interest Margin

This table shows the results of regression analysis. The regression analysis was done on data from 15 commercial banks covering sample period of mid-July 2003-2007. The dependent variable is Profitability and the independent variable is net interest margin.

Profitability = 4.874 + 0.104InNIM

R2 = 0.003 Adjusted R2 = -0.011

	Coefficient	t-Value	p-Value
(Constant)	4.874	19.226	0.000
NIM	0.104	0.430	0.668

The regression result shows that the model is not significant (R2 = 0.003). The coefficient of NIM is not significant even at 10% level of significance. Thus, it is concluded that the profitability of the bank basically does not depend on net interest margin. It may depend on other factors such as non-interest earning and non-interest expenses.

4.5 Analysis of Primary Data

The basic source of primary data is the questionnaire survey. For which, 50 questionnaires where distributed to respondents of various categories such as manager, assistant manager, department head etc. Out of total 50questionnaires 31 usable questionnaires were collected with a response rate of 66%. Out of total 31 respondents, 12 respondents are managers and 8 respondents are assistant managers. The majority of respondents are from commercial banks. Out of total respondents 15 respondents are from commercial banks. The respondents have experience of more than 10 years. This increases the quality and validity of the response results.

Competitive Structure of Banks' Interest Rate

One of the key determinants of bank's net interest margin is the interest rate. There is a wide variation in the interest rate among commercial banks. The primary data shows that at present the bank's interest rate structure is very competitive. Bank's interest rate is determined through the market forces.

Revision of Bank Interest Rate

Nepalese banking market is quite uncertain. The competition among the existing banks and threat of new entrants push banks to revise their interest rate frequently. Interest rate has been the key factor used in the bank's promotion. In the current situation, banks are offering deposit rate as low as 2% and as high as 6.5% in deposit whereas the lending rate ranges between 7-14%. The study found that most of the banks revise their interest rate structure annually. It indicates the level of competition among the banks.

Interest Rate and Size of Bank Operation

As interest rate is one of the key factors that determine the deposit and lending, there seems to be a positive relation between the interest rate and size of bank operation. From the study, it was found that interest rates affect the size of banking operation.

Net Interest Margin and Bank's Profitability

One of the determinants of bank's profitability is the ability of bank to make interest earning over interest expense or net interest margin. Other things remaining the same, higher the net interest margin, higher5 will be the net profit of banks. From the study, it was found that bank's profitability largely depends on the interest margin. However, this result is not consistent with the empirical analysis which shows weaker correlation between the profitability and net interest margin. The result suggests that bank's profitability is affected by other variables as well besides net interest margin.

Factors affecting Deposit and Lending Rates

Prior to economic Liberalization, interest rates are determined by NRB. But after the liberalization, bank's interest rates are determined by the market. In market economy, the dominant factors that affect the rates are demand and supply. Besides, major determinants include bank-specific factors, market factors, and legislative factor the determines the deposit and lending rates. Sixty-five percent respondents believed that market determines the deposit and lending rates of bank. However, 35 percent believed that both bank-specific and market factor play significant role in the determination of such rates. The result indicates a strong effect of market factor on determination of bank's interest rates. As such, the study can be extended to include various market factors like inflation, government tax policy, level of competition etc.

Determinants of Net Interest Margin

From the primary data, it was found that the bank's net interest margin is affected by bank-specific, industry and macroeconomic variables. Among these variables, industry variables have the dominant effects followed by the bank specific variables. Macroeconomic variables have least effects.

Table 4.21

Respondents' Views on Major Factors Determining Net Interest margin

Variables		Rank		
		1	2	3
Bank-Specific	Freq.	12	14	6
	%	38	45	19
Industry	Freq.	17	17	0
	%	55	55	0
Macroeconomic	Freq.	2	0	25
	%	7	0	81
Total		31	31	31

From the study, it is found that bank-specific variables or industry variables are the primary factors that affect the net interest margin of bank significantly. The result indicates that the net interest margin is a function of bank-specific and industry variables.

Respondents' view on different aspect of Net Interest Margin

Table 4.22

Respondents' Opinions on Different Statements

S. N.	Statement	Agree	Neither agree nor disagree	Disagree	No response	Total
1	Net Interest margin is the major factor of bank's profitability.	31				31
2	Interest spread affects NIM positively.	28	3			31
3	Larger banks dominate in determining the interest rate.	11	8	12		31
4	Larger banks offer lower interest rate on deposit and charge higher rate on loan than do smaller banks.	14	3	14		31
5	The bank's degree of risk aversion increases the interest margin.	13	16	2		31
6	The changes in treasury bill rate affects the bank's interest spread resulting in change in NIM.	11	16	4		31
7	Increasing in bank's reserve and liquidity decreases NIM.	20	11	0		31
8	The increase non-performing loan status of bank decreases the NIM.	17	8	3	3	31
9	Banks, whose operating cost is high, are forced to increase the interest spread.	11	9	8	3	31
10	The bank loss borne by the inflation is passed on to the customers.	6	12	11	2	31

Majority of the respondents agreed upon the following statements:

- Net interest margin is the major factor of bank's profitability.
- Interest spread affects net interest margin positively.
- Increase in bank's reserve and liquidity decrease net interest margin.
- Increase in non-performing loan status of bank decreases the net interest margin.

Ranking of Determinants of Net Interest Margin

The study found that interest spread influence the NIM of the bank most following by the non-performing loan. This result is not consistent with the empirical analysis, in which, interest spread and non-performing loan has little effect on net interest margin. Similarly, variables like operating cost, interest rate risk, credit risk, and liquidity has strong effect on net interest margin. However, respondents have rated these variables as less important. According to them, managerial risk aversion has the least influence on net interest margin whereas in the empirical analysis the variable is significant at 1% level of significance. Therefore, the result of primary data analysis is more or less not consistent the empirical analysis. As such, the reliability of opinion survey is questionable.

Table 4.23

Respondents' Views on determinants of Net Interest Margin

S.N	Determinants of Net Interest	Low				High	Mean	Rank

	Margin	1	2	3	4	5		
1	Interest Spread	0	0	5	12	14	4.29	1
2	Market Power	4	2	5	11	9	3.61	3
3	Operating Costs	3	3	11	14	0	3.16	8
4	Managerial risk aversion	3	5	23	0	0	2.65	11
5	Interest rate volatility	0	6	11	11	3	3.35	6
6	Credit risk	0	5	11	11	4	3.45	5
7	Size of bank operation	5	3	9	9	5	3.19	7
8	Cost of bank reserve	3	9	5	11	3	3.06	9
9	Management quality	0	5	11	10	5	3.48	4
10	Liquidity	3	8	5	14	1	3.06	9
11	Non-performing loan status	2	4	6	11	9	3.77	2

Other factors that influence the Net Interest Margin

Besides the above mentioned factors, the respondents have pointed out the following factors that play important role in the determination of bank's net interest margin.

1. Market Competition
2. Inflation
3. Monetary Policy
4. Cost of funds
5. Marketing
6. Recovery of interest receivables
7. Financial Policy of neighboring country

8. NRB regulations
9. Investment policy of bank
10. Capital adequacy of bank
11. Investment environment
12. Government policy

Among the variables, most of them belong to macro economic factors. It indicates that bank's profitability and net interest margin is largely affect by macro economic factors.

As such, banks should study the behavior of macro economic variable in order to maximize their net interest margin and profitability.

4.6 Major Findings

The analysis of secondary data shows that bank's profitability depends on the ability of banks to generate the net interest margin. However, the lower coefficient of NIM shows that the degree of effect the net interest margin can make on profitability is weaker. On the other hand, the net interest margin of the banks depends on many factors. Some of these factors include pure interest spread, market power, operating cost, managerial risk aversion, interest rate risk, credit risk, size of operation, capital reserve, management quality, liquidity, and non-performing loan. Among these factors, the net interest margin is a positive function of market power, operating costs, managerial risk aversion, capital reserve, and non-performing loan and is a negative function of interest spread, interest rate risk, credit risk, size of operation, management quality and liquidity. Among all factor, effect of interest rate risk is highest followed by operating cost and management quality. However, the relationship between

operating cost and net interest margin is positive indicating that with increase in operating cost, bank's net interest margin increases. The relationship between management quality and net interest margin is negative indicating that when management quality is improved the net interest margin of bank decreases. This result is questionable. Size of operation has the least effect on the net interest margin. It indicates that net interest margin almost does not increase with size of bank's operation.

From the analysis of primary data, it was found that results vary among the respondents. The most influencing variables include bank's pure interest spread, non-performing status, and market power as they are ranked first, second, and third. Variables like bank reserve, liquidity, managerial risk aversion have less influence on net interest margin of the bank. Beside these variables, respondents believe that other macro economic variables like market competition, NRB regulation, government fiscal policy, investment environment, inflation etc. play dominant role in the determination of bank's NIM.

CHAPTER-V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The area of interest margins is relatively new area relative to the importance of bank interest income as a component of total bank income. In Nepalese context, there have been very few studies that tried to focus on the interest margins. This study extends the existing literature relating to the net interest margins across a number of dimensions. This study basically follows the methodology adopted by Barry Williams (2007) study.

This study mainly aims at finding the factors that determines and net interest margin of commercial banks. Banks are mainly a risk-averse dealer which accept public deposits and lends it to the individuals and businesses. The benefit of such financial intermediation is the excess of interest income over interest expenses, called net interest margin (NIM). Higher the difference, higher will be the net return to the bank. However, the net interest margin of banks depends heavily on various factors. Based on the theoretical model of Maudos and Fernandez (2004) which has later been extended by Barry Williams (2007), various 11 variables are identified. Those basic explanatory variables include pure interest spread, market power of banks, operating costs, managerial risk aversion, interest rate volatility, credit risk, size of bank operation, bank reserve, management quality, liquidity, and non-performing loan.

The study is based on seventeen commercial banks with the five years financial data covering period of mid-July 2004 to mid-July 2008. The data are generated by the pooled cross-sectional observation of these 17 selected banks. Initially, the total observation was 85. However, the two banks Nepal Bank Ltd. And Rastriya Banijya Bank were removed resulting into 75 observations. These two banks have been performing very weak proving them exceptional case. Their net interest margin was consistently very low. The inclusion of the banks produced low R2. As such, they have been taken in order to improve the model. The data were free from the problem of multicollinearity. The results show the presence of autocorrelation. The major findings of this study are summarized below:

In this study, net interest margin is the dependent variable and interest spread, market power, operating cost, managerial risk aversion, interest rate risk, credit risk, size of operation, capital reserve, management quality, liquidity, and non-performing loan are the independent variables. Among these variables, the effect of interest rate risk is highest (-4.425) whereas the effect of size of operation is lowest (-0.002). The variables like interest spread (-0.312), interest rate risk (-4.425), credit risk (-0.338), size of operation (-0.002), management quality (-0.754), and liquidity (-0.205) have negative effect on net interest margin whereas variables like market power (0.023), operating cost (0.795), managerial risk aversion (0.311), capital reserve (0.146), and non-performing loan (0.179) have positive effect on net interest margin. The coefficients of two variables: market power and size of operation are not significant.

5.2 Conclusion

The study found that net interest margin of commercial banks is a positive function of market power, operating cost, managerial risk aversion, capital reserve, and non-performing loan whereas it is a negative function of spread, interest rate risk, credit risk,

size of operation, management quality, and liquidity. Similarly, bank's profitability does not mainly depend on net interest margin.

5.3 Recommendations

Based on the findings of this study, the following recommendations have been forwarded:

- Since factors like interest rate risk, credit risk, and liquidity are the important determinants and have strong negative relationship, changes in these factors adversely affect the banks' net interest margin. The interest rate risk can be safeguarded by hedging them. The credit risk can be reduced by improving the loan provision, procedure, and policy. Regarding the liquidity, banks seemed to improve their liquid asset management. As there is an inverse relation between liquidity and profitability, banks should maintain trade-off between liquidity and profitability.
- Since net interest margin of banks is the primary factor that affects banks earning, banks should try to improve their interest margin. It can be improved either by increasing interest earning on loan or decreasing interest expenses on deposit.
- The study findings show that pure interest spread seems less important factor in determining the net interest margin. As such, banks should give less emphasis in increasing the spread. In a competitive economy, increase in spread might have adverse affect on the banks' market.
- Factors like market power and size of operation have almost no effect on the determination of net interest margin. As such, banks should give less importance to them.

- The non-performing loan status of Nepalese bank is not encouraging. Most banks have NPL beyond the tolerable limit. Hence, banks should give more emphasis on loan management to increase good debts and reduce bad debts.

BIBLIOGRAPHY

Allen, L. (1988). **The Determinants of Bank Interest Margins: A Not**e. Journal of Financial and Quantitative Analysis.

Angbazo, L. (1997). **Commercial Bank Net Interest Margins: Default Risk, Interest-Rate Risk and Off-Balance sheet banking.** Journal of Banking and Finance .

Barajas, A.,R. Steiner, and N. Salazar (1999). **Interest Spreads in Banking in Colombia 1974-96**. IMF Staff Papers.

Brock Phil and Franken, Helmut (2002). **Bank Interest Margins Meet Interest Rate Spreads:** How Good is Balance Sheet Data for Analyzing the Cost of Financial Intermediation.

Brock, P. and L. Rojas-Suarez (2000). **Understanding the Behavior of Bank Spreads in Latin America**, Journal of Development Economics .

Brock, Philip L., Suarez, Liliana R. (2000). **Understanding the Behavior of Bank Spreads in Latin America,** Journal of Development Economics.

Cottarelli, C., and A. Kourelis (1994). **Financial Structure, Bank Lending Rates and the Transmission Mechanism of Monetary Policy**, IMF Staff Papers.

Demirg Aunt, Asli, Laeven, Luc, Levine, Ross, (2004). **Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation**, Journal of Money, Credit and Banking.

Demirguc-Kunt, Asly and Huizinga, Harry (2003). **Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence,** The world Bank Economic Review.

Dennis, S., I. Sharpe, and A-B. Sim. (1998). **Implicit Deposit Insurance and Deposit Guarantees: Characteristics of Australian Risk Premier**. Journal of Accounting and Finance .

Doliente, Jude S.(2003) **Determinants of Bank Interest Margins of Southeast Asia**.

Hellman, Thomas F., Murdock Kevin C. and Stiglitz, Joseph E.(2000). **Liberalization, Moral Hazard in Banking and Prudential Regulation: Are Capital Requirements Enough?** The American Economic Review.

Ho, Thomas S. Y., Saunders, Anthony(1981). **The Determinants of Dank Interest Margins: Theory and Empirical Evidence**, Journal of Financial and Quantitative Analysis .

Lerner, E.M. (1981). **Discussion the Determinants of Banks Interest Margins: Theory and Empirical Evidence,** Journal of Financial and Quantitative Analysis .

Levine, Ross, Zervos, Sara (1998). **Stock Markets, Banks, and Economic Growth,** American Economic Review .

Liebeg, David and Schwaiger, Markus S. (2006). **Determinants of Interest Rate Margins of Austrian Banks,** Journal of Banking and Finance.

Maudos, J. and J. Fernandez de Guevara. 2004. **Factors Explaining the Interest Margin in the Banking Sectors of the European Union,** Journal of Banking and Finance 28:2259-2281.

Mc Shane, R. and I. Sharpe. (1985). **A Time Series/Cross Section Analysis of the Determinants of Australian Trading Bank Loan/Deposit Interest Margins: 1962-1981,** Journal of Baking and Finance .

Parkinson, M. (1980). **The Extreme Value Method for Estimating the Variance of the Rate of Return,** Journal of Business.

Saunders, A. and L. Schumacher. (2000). **The Determinants of Bank Interest Margins: An International Study,** Journal of International Money and Finance.

Tarsila et al. (2000), **The Determinant of Bank Interest Spread in Brazil,** Journal of Banking and Finance.

Terry, C. and R. Trayler. (2004). **Too big to fail: The Australian Perspective,** Too Big to Fail, ed. B. Gup. Praeger, Westport, CT.

Wong, K.P., (1997). On **the Determinants of Bank Interest Margins Under Credit and Interest Rate Risks,** Journal of Banking and finance.

Zarruck, E., (1989), **Bank Margin with Uncertain Deposit Level and Risk Aversion,** journal of Banking and Finance.

ABBREVIATIONS

BOK	Bank of Kathmandu
EBL	Everest Bank Ltd.
HBL	Himalayan Bank Ltd.
KMBL	Kumari Bank Ltd.
LAXMI	Laxmi Bank Ltd.
LBL	Lumbini Bank Ltd.
MPBL	Machhapuchhre Bank Ltd.
NABIL	Nepal Arab Bank Ltd.
NBBL	Nepal Bangladesh Bank Ltd.
NBL	Nepal Bank Ltd.
NCCB	Nepal Credit and Commerce Bank Ltd.
NIB	Nepal Investment Bank
NICB	Nepal Industrial and Commercial Bank Ltd.
NIM	Net Interest Margin
NPL	Non-performing loan
NRB	Nepal Rastra Bank

NSBIB	Nepal SBI Bank Ltd.
RBB	Rastriya Banijya Bank
SCBL	Standard Chartered Bank Ltd.
SDBL	Siddhartha Bank Ltd.

Appendices

A Survey Questionnaire on
Determinants of Net Interest Margins of Nepalese Commercial Banks

Dear sir/Madam**,**

This questionnaire is based on a study on determinants of interest margin of banks. Net Interest Margin, NIM is the difference between interest income and interest expenses which is affected by various factors. Regarding this, please give your opinion about the factors and forces that affect the net interest margin of banks.

The views expressed in the study will be treated as strictly confidential and not referred to anybody about your opinion whatsoever.

Name of respondents (Optional) :_____

Name of bank : _____

I. Respondent Profile:

a) Your Position or level in the company :……..

b) Would you classify your company as a:

- Commercial Bank [ ]
- Development Bank [ ]
- Finance Company [ ]
- Cooperative Associations [ ]
- Other [ ]

c) Experience:……..years

II. General Questions

1. What is the range of interest rate on deposit and on loan in your bank/finance company?

Deposit rate …… to ……..

Loan rate …… to ……..

2. Are the rates of your bank competitive compared to others?

   a) Yes b) No

3. How often the interest rates are changed?

   a) Annually b) 1-5 years c) 5-10 years

4. Which factor(s) determines the deposit and lending rate of your bank?

   a) Bank-specific factor b) Market factor c) Legislative factor

5. Do changes in interest rates affect the size of bank's operation (i.e. increase or decrease in deposits and loans)?

   a) Yes b) No

6. Does interest spread affect the bank's profitability?

   a) Yes b) No

7. In your opinion, which of the following variables affect the net interest margin? Please rank the following variables in order of their importance.

1. Bank-specific variables (like operating costs) [ ]
2. Industry variables (like level of competition) [ ]
3. Macroeconomic variables (like inflation)

8. Please indicate if you agree or disagree with the following statements:

S.N	Statement	Agree	Neither agree nor disagree	Disagree
1	Net interest margin is the major factor of bank's profitability.			
2	Interest spread is affects NIM positively.			
3	Larger banks dominate in determining the interest rate.			
4	Larger banks offer lower interest rate on deposit and charge higher rate on loan than do smaller banks.			
5	The bank's degree of risk aversion increases the interest margin.			
6	The changes in treasury bill rate affects the bank's interest spread resulting in change in NIM			
7	Increase in bank's reserve and liquidity decrease NIM.			
8	The increase non-performing loan status of bank decreases the NIM.			
9	Banks, whose operating cost is high, are forced to increase the interest spread.			
10	The bank loss borne by the inflation is passed on to the customers.			

9. Please indicate whether the following factors affect the net interest margin and if so, its importance.

S.N.	Determinants of Net Interest Margin, NIM	Low				High
		1	2	3	4	5
1	Interest Spread					
2	Market Power					
3	Operating costs					
4	Managerial risk aversion					
5	Interest rate volatility					
6	Credit risk					
7	Size of bank operation					
8	Cost of bank reserve					
9	Management quality					
10	Liquidity					
11	Non-performing loan status					

10. What are the other factors that influence the net interest margin?

1. ……
2. ……
3. ……
4. ……
5. ……

Once again, I would like to thank you for providing me your valuable information and time. Your cooperation is highly appreciated

Researcher
Sujit Rajbahak, Nepal Commerce Campus