

# CHAPTER- I

## INTRODUCTION

### 1.1 Background of the Study

The net interest margin is an indicator of operational efficiency in banks that is considered an important and a vital instrument for evaluating managerial effectiveness and efficiency in utilizing their resources and controlling their expenses. The interest of the supervisory authorities and bankers in the operational efficiency of banks is attributed to several reasons of which the most important is that efficiency measures signal the success or the failure of banks, and capacity of banks in continuing their core role in the national economy of providing liquidity and financing needs to finance various economic activities that in turn enhance economic growth.

Several studies show that higher NIMs are barrier to investment which inversely affect the economic growth, especially in developing countries. This vital impact of NIM on the macro economy made several countries to explore the components and structure of NIM and their effect on the banking sectors. Studies suggest various opinions on higher NIM. However, some studies revealed that higher NIM resulting from low interest rate on deposit and high interest on loan will discourage saving and increase the cost of borrowing for potential borrower hence, decrease the investment. On the other hand, low NIM usually mark deeper and more developed financial markets, hence encourage investment activities and support economic growth. At the same time, low NIM cannot be considered a positive indicator sometimes, especially, when the systems are free and insufficient supervision systems as the mechanisms that regulate the intervention of the central bank in any bank that suffers from financial problems will be most likely absent. In other words, if a weak bank is allowed to continue its business and operations, it might adopt strategies that are based on offering low interest rates on loans to get bigger market share. Obeid and Adeinat (2017).

The establishment of Nepal Bank Limited in 1937 A.D. marked the beginning of formal banking sector in Nepal. Since then, the banking industry has undergone significant changes in terms of size, functions, and role in the economy. In the late 1980s, financial liberalization policies were introduced in Nepal in order to spur the country's economic growth. Foreign investments poured in soon after, which led to establishment of several joint venture banks. Likewise, a large number of domestic investors also started investing in the banking industry.

Banks and financial institutions (BFIs) proliferated. By the end of fiscal year 2011, there were 218 BFIs in Nepal. However, after halting of new licenses, introduction of merger and acquisition policies, and mandatory requirement to increase paid up capital, some consolidation has taken place in the banking industry resulting in decline in number of BFIs. As on mid-July 2017, there are a total of 149 BFIs in operation. There are 28 Class A Commercial banks, 40 Class B Development banks, 28 Class C Finance companies and 53 Class D Microfinance financial institutions. Although the number of BFIs decreased from 179 to 149 in FY 2016/17, the total number of branches increased from 4,272 to 5,068. Besides, 14 saving and credit co-operatives and 25 NGOs are also in operation with the license for limited banking operations. Bank Supervision Report (NRB, 2017).

Nepalese banking sector plays a crucial role in the economy due to its dominant position in the financial system. Most transfer of funds between the deficit and surplus sectors take place through banking channel since other forms of financial intermediation are not well developed. A number of large projects are being financed through bank loans. Likewise, banks' role is essential for import and export of goods from and to other countries. Further, with technological advancement, more and more people are adopting plastic cards, internet banking services, and mobile banking services to perform financial transactions.

Previously, 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.

## **1.2. Statement of the Problem**

The main contribution of the study is that it analyzes the determinants after the political insurgency and conflict. Further, only 5 years of observation were taken for the study including 17 banks as sample. While, this study investigates the determinants of NIM of the commercial banks operating in Nepal from mid-July 2007 to mid-July 2017 through studying and analyzing the effect of internal and external factors on the NIM. The internal factors refer to bank-specific factors, whereas external factors are represented by macroeconomic variables.

## **1.3 Objectives of the Study**

The study aims to investigate the determinants of net interest margin of commercial banks operating in Nepal. Besides this, the specific objectives of this study are as follows:

- a) To analyze the trend of net interest margin and its determinants (bank-specific and macroeconomic variables).
- b) To analyze the effects of bank-specific and macroeconomic variables on NIM.

#### **1.4 Significance of the Study**

In general, this study aims to investigate the effect of explanatory variables on NIM in the commercial banks in Nepal. Beside, to suggest recommendation that will helps bank managers, policy maker, bank supervisors and regulator to frame policies aimed at maintaining the growth momentum of banking sector in the country. It even helps bank managers in different ways, by focusing on the key factors of net interest margins in the banking industry, it may be helpful in order to develop new deposit and loan business, for supervision and staff motivation and thereby increase performance of bank in terms of NIM. At last, the study will be helpful for researchers in the area, using the limitations of this study as stepping stone, to further investigate the factors affecting the NIM and forward their suggestions to the potential beneficiaries.

#### **1.5 Limitations of the Study**

This study based on financial data obtained from the NRB, Annual Report and Annual Bank Supervision Report. While analyzing the data only bank specific and macroeconomic variable were considered while other factors remains constant. It may even possesses all the inherent limitation of financial data.

#### **1.6 Organization of The Study**

The whole study area is divided into five different parts. The contents of each of the following are briefly mentioned as follows:

The first chapter is the introductory chapter. It includes major issues to be dealt with including background of the study, statement of problem, objectives of the study, significance of the study, limitations of the study and the organization of the study.

The second chapter is the literature review. This chapter deals with the review of related studies and different aspects of the topics “Determinants of Net Interest Margin of Commercial Banks in Nepalare. In the first section, the international studies are presented while in second section the national studies were reviewed.

The third chapter is the research methodology. This chapter present the methodology adopted for the research. It comprises research design, nature and source of data, Study period cover, population, tools and method of data analysis, correlation and regression analysis employed in the study.

The fourth chapter is the data presentation and analysis. This chapter contains the analysis of secondary data. The financial data of the commercial banks and economics variables are presented and analyzed using various statistical tools and technique.

The last chapter comprises major finding and conclusion of present study and to suggest necessary recommendations

## **CHAPTER -II**

### **REVIEW OF LITERATURE**

During the review of the literature, the study comes across with few literatures which explicitly study NIM drivers of commercial banks operating in Nepal. Thus most of the literature that was revealed for the purpose of this study, were studies done elsewhere apart from Nepal. Indeed there is an extensive body of literature that seeks to identify the determinants of NIM. Some studies focus on, understanding banks NIM in a particular country, while others concentrate their studies on a panel of countries. No matter whether

it is a single country or a panel of countries study, the determinants of banks efficiency can be divided into two main categories, namely internal and external factors.

This chapter deals with the review of related studies and different aspects of the topics "Determinants of Net Interest Margin of Commercial banks in Nepal". In the first section, the international studies is presented while in second section the national study is reviewed.

## **2.1 International Studies**

Agori (n.d.) investigated the effect of bank-specific, industry-specific and macroeconomic determinants, as well as the regulatory environment on the net interest margin (NIM) in the banking sectors of the South Eastern European countries over the period 1998-2007. Additionally to the standard determinants employed in the literature, such a study provides a unique natural experiment to examine the effect of the extensive banking sector reform that took place during the examined period. Using both static and dynamic frameworks and advanced market structure measures, the empirical analysis reveals that net interest margin is affected by bank-specific determinants like equity capital, risk and bank size. The regulatory framework plays a crucial role as well as the presence of foreign-owned institutions. However, as financial systems develop and the reform process ends, both the current and future rates of economic growth are likely to have an enhanced impact on bank margins.

Ho and Saunders (1981) measured 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 through transactions uncertainty.

They 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.

Cottarelli and Kourelis (1994) applied a two-step approach to investigate the reasons 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.

Angbazo (1997) studied 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.

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.

Randall (1998) documented 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 countries, 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.

Berument (1999) analyzed the Turkish Treasury interest rate behavior within the Fisher hypothesis framework for the period from 1988 to 1998. 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 Kunt and Huizinga (1999), investigated the determinants of bank interest margins using bank-level data for 80 countries in the year's from 1988 to 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 of special interest since they are close to the ones included in the regression estimated in their paper. They found 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 measured by total bank assets, by the ratio of overhead costs to total 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. One reason for such behavior is market concentration: banks in concentrated markets were found to exacerbate the asymmetric adjustments.

Barajas et al., (1999) have documented 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 undertaken 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". 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 percent of bank spread while market power, financial taxation and loan quality accounted for 36 percent, 22 percent and 4 percent 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 percent of the spread while operating costs and financial taxation were responsible for, respectively, 45 percent and 26 percent of the spread.

Tarsila et al., (2000) 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.

Brock and Suarez (2000) applied 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. The result for Argentina is striking given the opposite findings reported by Catao (1998).

In addition to the studies concerning Latin American countries, Saunders and Schumacher (2000) applied 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.

In the second stage, Brock and 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.

Naceur and Goaid (2001) investigated the determinants of the Tunisian banks' performances during the period 1980-1995. They indicate that the best performing banks are those who have struggled to improve labor 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.

Robinson (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.

Guru et al., (2002) attempted 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.

Moore and Craigwell (2002) investigated the determinants of high interest rate spreads across Caribbean territories for the post financial liberalization period of the 1990's. They confirmed that high spreads were induced by diseconomies of scale resulting from short-term expansion of loan portfolios. Operating costs, credit risk and fee income, responding to improved economic activity, were also identified as useful determinants in interest rate

spreads. To induce a narrowing of spreads, they recommended less restrictive banking sector regulations and strategies to increase competition among Caribbean financial intermediaries. The study cautioned the use of monetary policy as evidence pointed to increased likelihood of wider spreads among banks endowed with some degree of market power.

Maudos and Guevara (2004) employed a direct measure of market power along with operating costs, market and credit risks, size and regulatory costs to determine the factors explaining net interest margin in the European Union (EU). Using data from 1993 to 2000 within a fixed effects GLS model, they showed that while market concentration increased the NIM, it declined amidst lower operating costs as well as credit and interest rate risk.

Claeys and 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.

Applying the seminal Ho-Saunders model (1981) to a multi-output framework, Santiago and Francisco (2005) showed that the relationship between bank margins and market power varies significantly across bank specializations. In this context, European banks 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.

Estrada 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 from 1994 to 2005. 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.

Bawumia 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 operating costs and market share.

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, is 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.

Liebeg and Schwaiger (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.

Khawaja and Din (2007) have 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.

Fungacova and Poghosyan (2008) studied the factors that affect NIM in the banks operating in Russia focusing on the banks' ownership structure using data covering the period from 1999 to 2007. The studies found that the bank ownership structure is an important determinant of NIM. For example, the impact of risk aversion, credit risk and the size of operations varies by the type of bank owners (public sector, domestic private sector or foreign private sector). Further, the study shows positive and statistically significant relationships between NIM and operational expenses whereas negative and statistically significant relation with liquidity for the three bank ownership categories. However, there was no effect of market share on NIM.

Horvath (2009) examined the determinants of net interest margins of Czech banks by employing a bank-level database at quarterly frequency from 2000 to 2006 by using dealership model introduced by Ho & Saunders, (1981) to evaluate the determinants of interest margin in the Czech Republic. The results suggest that more efficient banks exhibit lower margin and there was no evidence that banks with lower margin compensate themselves with higher fees. Price stability contributes to low margin and higher capital adequacy is associated with the low margin, contributing to banking stability.



Furthermore, Alper and Anbar (2011) studied bank-specific and macroeconomic determinants of the bank's profitability in Turkey over the time period from 2002 to 2010). They represented bank profitability by return on assets (ROA) and return on equity (ROE) as a function of bank-specific and macroeconomic determinants. Using a balanced panel data set, the results show that asset size and non-interest income have a positive and significant effect on bank profitability. However, size of credit portfolio and loans under follow-up have a negative and significant impact on bank profitability. These results suggest that banks can improve their profitability through increasing bank size and non-interest income, decreasing credit/asset ratio. In addition, higher real interest rate (macroeconomic variable) could lead to higher bank profitability.

Tarus et al., (2012) investigated the determinants of net interest margin of commercial banks in Kenya using secondary data. We apply pooled and fixed effects regression to a panel of 44 Kenyan banks that covers the period 2000-2009. We find that operating expense has a positive and significant impact on net interest margin of the commercial banks in Kenya. Credit risk tends to be positively associated with net interest margin. We found that the higher the inflation the larger the net interest margin. Similarly, economic growth and market concentration influences net interest margin negatively. A negative concentration effect found in the Kenya market may be occasioned by the high concentration of foreign banks which exhibit lower interest margins. Therefore, a market characterized by foreign banks has lower interest margin because of superior management or production technologies.

Dumicic and Ridzak (2012) analyzed the main determinants of the net interest margin of banks operating in Central and Eastern European (CEE) countries in the period from 1999 to 2010. They used the Arellano and Bover (1995) system GMM estimator which is robust to endogeneity problems and allows for the inclusion of a lagged dependent variable together with fixed effects to control for unobserved heterogeneity.

The results reveals several main drivers of decline in net interest margins in CEE in the pre-crisis period. Prior to 2008 the net interest margins declined primarily due to strong capital inflows, a stable macroeconomic environment (low inflation and low short term interest rates) and a fall in the share of nonperforming loans in the balance sheets of the banks. On the other hand, the economic boom (relatively high GDP growth rates) and rising government debt allowed banks to charge somewhat higher margins due to high demand for credit. In the crisis period, rapidly increasing government debt and the associated increase in macroeconomic risks together with declining capital inflows were propping up

margins while other factors such as low demand (due to weak economic performance), higher capitalization and significantly increased share of non-performing loans pressured banks' margins down.

Awdeh and Hamadi (2012) analyzed the determinants of commercial bank interest margins in Lebanon using bank-specific, industry specific, monetary policy, and macroeconomic variables for the period 1996 to 2009. The empirical results indicate that interest rate margins are shaped differently between domestic and foreign banks. For instance, domestic bank size, liquidity, efficiency, and to a lower extent, capitalization and credit risk, have a negative impact on interest margins. The same impact was captured by concentration, dollarization, and to a lower extent, by economic growth. On the other hand, the growth rate of deposits, lending, inflation, central bank discount rate, national saving, domestic investment, and to a lower degree, the interbank rate, all have a positive impact on net interest margins. For foreign banks, we found that size, liquidity, capitalization, and credit risk, do not show a significant impact. Another interesting remark is that the host market macroeconomic conditions, industry characteristics, central bank discount rate, and interbank rate, have much weaker impact for foreign bank interest margins.

Nassar et al., (2014) investigated the determinants of Net Interest Margins in Honduras by employing a cost function model developed by Klein (1971) and Monti (1972). The assessment utilized quarterly panel data over the period of 1998 to 2013 and employed an OLS based Panel Corrected Standard Error (PCSE) regression model. The study find that operating costs are the most important drivers of banks' net interest margins. They also find that competition among banks has led to higher concentration and that funding by parent banks positively impacts foreign banks' net interest margins. Together, these results suggest that banks, particularly foreign banks, are under pressure to consolidate and reduce operating costs in order to offer competitive interest margins. We conclude that further structural reforms and consolidation may lower banks' net interest margins.

Kumari (2014) analyzed the determinants of NIMs of domestic banks of Sri Lanka for the period of January 2002 to March 2011 based on the model developed by Ho and Saunders and its extensions using panel regression. Sri Lankan banks are inward looking in setting NIMs as operating costs, credit risk, risk aversion, non-interest income and capital adequacy requirements are determinants. Market competition, other regulations on banks, risk arising from the volatility of market prices and macroeconomic variables do not have a significant impact on the determination of NIMs.

Raharjo et al., (2014) analyzed the determinant factors of commercial banks' interest margin in Indonesia, both internal factors (bank specific factors) and external factors. Internal factors are selected under this study consists of several aspects such as growth of the bank's assets, profitability, efficiency, capital adequacy, liquidity, and risk, meanwhile external factors are market power, inflation, and interest rates. Several variables have been used in previous studies to be used as a proxy. The study applied fixed effects on a panel data regression model to a panel of Indonesian commercial banks that covers the period from 2008 to 2012. The results show consistent findings from previous studies. The net interest margin of Indonesian commercial banks are affected by the entire internal variables on a different level of significance, meanwhile inflation is the only external factors that effects on interest margins significantly at 5% level.

Khanh and Tra (2015) studied the determinants of net interest margin (NIM) of commercial banks in Vietnam during the recession period. We employ secondary data collected from published audited consolidated financial reports of Vietnamese commercial banks from 2008, the year marking the outbreak of the global financial crisis, to the end of 2012. Altogether, the data constitute 175 panel-data observations. The regression using the ordinary least squares method yields the result that operating expense, management quality, risk aversion, and inflation rate have a positive effect on NIM, while the banking sector's market concentration affects NIM negatively. Afterwards, some policy implications are derived from those findings to mitigate and put NIM under control, so that the efficiency of the financial intermediary system can be developed.

Leykun (2016) analyzed the factors affecting the commercial bank of Ethiopia's (CBE's) net interest margins during 2005 to 2014, a period characterized by increasing the bank's net interest margin. The pooled ordinary multiple regression models are used to estimate the results without compromising the classical linear regression assumptions. In line with findings in the previous literature, this paper finds that capital adequacy (risk aversion), credit risk, operating costs, degree of competition (Lerner index) and deposit growth rate are the most important drivers of CBE's net interest margins. Almost all variables in the model indicates a positive and highly significant association ship with net interest margins, and are found to be the most important bank specific factors that determine the net interest margin of the bank, CBE. The results of the study also suggests that high concentration led to lower competition, and thereby increase the net interest margins of banks, especially the dominant bank like CBE in case of Ethiopia. All in all, the results suggests that there has to be a measure to be taken by the sector to reduce the banks

concentration ratio, operating costs, risk premium on credits, and increase the level of capital to offer competitive interest margins and fairly shared growth rates in deposits among others. In doing so, this paper concludes that further structural reforms and merger or consolidation enter alia may lower CBE's net interest margins and share the market potentially fairly to other private banks operating in the industry.

Addai et al., (2016) investigated the factors that cause such high NIM among MFIs in Ghana in order to offer policy recommendations on how to curb this menace. STATA and Microsoft Excel statistical tools were employed in analyzing a 10-year panel data from 20 MFIs. The independent variables were categorized into two: MFI specific and macro-specific variables. Glaring in this study is a statistically significant negative effect of inflation, non-interest earning assets, operating expenses, number of female borrowers on NIM and a significant positive impact of size, years of operation and ownership structure on NIM among MFIs in Ghana. This study concludes that high interest margins observed within the Ghanaian microfinance industry are mainly due to a combination of macroeconomic and firm specific factors which need to be given much attention in dealing with high NIM among MFIs in Ghana. Apparently, policy recommendations have been given in this study to specifically deal with the sources of high NIM among MFIs in Ghana.

Obeid and Adeinat (2017) analyzed the net interest margin (NIM) in the commercial banks operating in Jordan using the data on annual frequency for 19 commercial banks covering the study period from 2005 to 2015 (panel data). Econometric models were built and analyzed using testing both fixed effects model and random effects model. The Hausman test was used to get the optimal model. The study showed that the NIM is affected by several internal and external factors. The study showed that there is an indirect effect of monetary policy instruments on NIM through their effect on inflation rate. The testing showed that the effect of these instruments on the inflation rate was statistically significant, which in turn affected the NIM; the effect was statistically significant. The results revealed that external factors had bigger effect on the NIM than the internal factors.

Robinson (2017) paper explored the factors determining net interest margins (NIM), an indicator of efficiency within the banking sector, while investigating its influence on non-interest income (NII). To achieve this, a system based dynamic generalized method of moment's approach was used to account for the simultaneous relation between the NIM, deduced from the theoretical construct of a profit maximizing agent subject to a managerial cost function; and the NII, founded in empirics. The assessment considered the influence of bank-specific, macroeconomic as well as institutional and regulatory factors as key

determinants. The paper also explored asymmetric patterns associated with commercial bank classification and foreign ownership and provides evidence that a lower NIM is induced by enhanced operating cost efficiencies, improved liquidity conditions, and greater variation in the interest and exchange rates. Furthermore, banks use NII to augment profitability and mitigate the impact of increased tax burden. Key policy recommendations include initiatives to expanded use of technology and agent banking model to lower operating costs as well as enhanced information sharing and communication to increase competition and reduce information asymmetry.

Hijazeen (2017) analyzed the determinants of NIM for panel data of thirteen Jordanian commercial banks during the period from 1995 to 2015. The study has applied Ho & Saunders, (1981) and the extension proposed by Maudos & De Guevara, (2004) using the econometric methods of OLS, fixed and random effects models. The study found that bank specific characteristics explain, to a greater extent, the dynamics of NIM at commercial banks. Macroeconomic factor, represented by the CPI had a low capacity in explaining NIM variations. Also, the results indicated that the deregulation process and the enhancement of the regulatory frameworks have contributed in the adherence to market powers. Moreover, quality of management has an impact on NIM through decreasing incurred costs. The results did not find evidence to support the belief that foreign ownership has enhanced the institutional quality of bank.

## **2.2 Nepalese Studies**

Bhandari (2008) analyzed the determinants of NIM operating in Nepal. The study is based on seventeen commercial banks with the five years financial data covering the period from mid-July 2003 to mid-July 2007. The data was generated by the pooled cross-sectional observation by taking 17 sampled 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 sample were removed because their net interest margin was significantly low compared to other commercial banks. These two government-owned banks have not been performing well for the past many years. After eliminating these banks the study found significant relation with operating costs, managerial risk aversion, interest rate risk, management quality, liquidity, and NPL. And the spread, market power, credit risk, and size of operation was not found significant. 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 was done by taking the natural logarithm of the empirical variables. 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.

### **2.3 Research Gap**

In Nepalese context, there have been very few studies that tried to focus on the net interest margins. Only one author Bhandari (2008) has analyzed the determinants of net interest margin of commercial banks and that was also a decade ago. During the study there was political insurgency and poor law and order by which banks concentrate their operation only in urban areas. Following, the end of the long decade conflict and restoration of peace in the country, it was expected that the banks will operate in full efficiency. So, the study analyzed the determinants of net interest margin of commercial banks after the long decade political insurgency. The earlier research used very few sample which may not define the whole population and the observation period was of only 5 years covering the period from mid-July 2003 to mid-July 2018. Further, this study also incorporate macroeconomics variable as explanatory variables which was not included in previous study.

## **CHAPTER- III**

### **RESEARCH METHODOLOGY**

#### **3.1 Research Design**

In this study, descriptive as well as analytical research designed has been included for the study. In the descriptive part of the study, various facts on interest margin and explanatory variables are collected and presented whereas in the analytical part, the effect of various variables on interest margin is analyzed through regression model. For analytical purpose the annual reports of NRB and Consolidated financial statement of commercial banks were collected.

#### **3.2 Nature and Sources of Data**

This study is mainly based on secondary data. Thus, this study only used secondary data for the purpose of determining the effects of variables on the net interest margin of commercial banks.

**3.2.1 Secondary Data:** The secondary data consist of consolidated financial statement of commercial banks over the study period from mid-July 2007 to mid-July 2017. Data are collected from NRB's: Annual Report and Bank Supervision Report.

**3.3 Study Period Cover:** This study investigates the determinants of NIM of the commercial banks operating in Nepal by covering the study period from mid-July 2007 to mid-July 2017.

**3.4 Population:** The study is based on the census data of 28 commercial banks which are operating in Nepal during the study period. The data and information were collected from mid-July 2007 to mid-July 2017.

### **3.5 Tools and Methods of Data Analysis:**

The study used tables, figures, percentage, ratios, average, correlation, multicollinearity, regression, Coefficient of determination, Adjusted coefficient determination, p-value and F-Statistic for the data analysis.

### **3.6 Model Specification:**

For the study, 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 loans and interest paid on deposits to total assets,  $(\alpha_0, \beta)$  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 factors. The extended model is:

$$NIM_{it} = \alpha_0 + \beta_1 GD_{it} + \beta_2 STA_{it} + \beta_3 LAR_{it} + \beta_4 CIR_{it} + \beta_5 RGDP_{it} + \beta_6 INF_{it} + e_{it}$$

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

The independent variables are specified as:

GD = Growth in Deposits

CIR = Cost to Income Ratio (Operating Cost)

LAR = Loan and advances to Total Assets Ratio

RGDP = Real GDP

INF = Inflation

### 3.7 Variables Specification

#### 3.7.1 Dependent Variable

Net Interest Margin is the dependent variables of the study. It equals the difference between credit interest rates (on loans) and debit interest rates (on deposits) divided by total assets. This method of measurement was adopted frequently in the relevant literature (Shami et al., 2015; Raharjo et al., 2014; Hamadi and Awdeh, 2012).

#### 3.7.2 Independent Variables

The independent variables are classified into two categories: Bank specific determinants and external determinants.

**3.7.2.1 Bank-specific Factors:** These variables are the internal variables which are under the control of Management. These include:

**a) GD:** GD is the rate of change in the clients' deposits. The relationship of this variable with NIM might be direct or inverse. The decline in clients' deposits might lead to a decline in bank's liquidity that then leads to an increase in interest rates on deposits to attract new clients and/or an increase in interest rates on loans because of the decline in bank's liquidity. The net impact on NIM depends on which of these two effects dominate the other.

**b) CIR:** Cost (expenses) to income ratio: Despite the fact that the high CIR might lead the bank to include it in the NIM and hence increasing the margin, some studies like Hamadi and Awdeh (2012) found that there is a positive relationship between this variable and the NIM. The study attributed this positive relationship to the fact that the banks that have higher operational efficiency relatively will be able to cut interest rates on loans and/or increase interest rates on deposits since such types of banks that have a high operational efficiency targets to enhance its competitiveness in the market.

**c) LAR:** Loan and advances to asset ratio. The 2014 financial stability report issued by the Central of Jordan indicated that the expansion of lending lead to increase in NIM. Several studies showed that the relationship between this ratio and NIM is positive.

**3.7.2.2 External Determinants:** Macroeconomics variables were considered as external determinants. These are the external environment which are beyond the control of Management. These include:

- a) **RGDP:** Demirguç-Kunt & Huizinga (1999) and Demirguç-Kunt et al., (2004) suggested that GDP per capita serves as a general indicator of economic development by reflecting differences in banking technology and the mix of banking opportunities. Also, an increase in GDP per capita could be expected to increase bank's income as a result of more lending and lower default rates (Brock and Suarez (2000) and Claey's and Vander Venet (2007). In contrast, low GDP per capita weakens the debt servicing capacity of domestic borrowers and contributes to an increase of credit risk. In a similar vein, Carbo and Rodriguez (2007) suggest a negative relationship between GDP growth and bank margins. However, Drakos (2002) asserts that the relationship between growth and margins is ambiguous, depending on whether the aggregate demand for dealership services is an increasing function of GDP growth or not.
- b) **INF:** Inflation rate (National consumer's price index). It measures the general price level. High inflation rates are generally associated with high loan interest rates and, therefore, higher margins. However, high inflation may also be viewed as a proxy for poor macroeconomic performance and stability, which makes the accurate assessment of credit and market risks more difficult. If inflation is not anticipated and banks are sluggish in adjusting their interest rates, then there is a possibility that bank costs may increase faster than bank revenues and hence adversely affect bank margins (Demirgüç-Kunt and Huizinga (1999), Brock and Suarez (2000) and Sologoub (2006). Finally, Martinez Peria and Mody (2004) find a negative impact of inflation in Latin-American banks' margins, suggesting that bank costs do not respond immediately.

## **CHAPTER- IV**

### **DATA PRESENTATION AND ANALYSIS**

This section of the study contains the analysis of secondary data. The financial data of the commercial banks and economics variables are presented and analyzed using various statistical tools and technique.

#### **4.1 Aggregate Statistics of Commercial Banks**

In the process of secondary data analysis, various financial data and macroeconomic variables are collected from Bank Supervision Reports and Annual Reports of NRB. The following is the descriptive statistics of those data. The aggregate statistics of commercial banks for the study period from mid-July 2007 to mid-July 2017 is presented in following Table.

**Table 4.1**

#### **Aggregate Statistics of Commercial Banks**

Sources: Annual and Bank Supervision Reports, NRB

in Rs. Million

Years	Deposits	Total Assets	Interest Income	Interest Expenses	Others Operating Expenses	Employee Expenses	Total Operating Income	Loan and Advances
2006	262,353	-	-	-	-	-	-	-
2007	341179	374790	23649	10086	3064	4845	17826	206430
2008	432772	482890	28017	12282	3604	6207	21321	281372
2009	564143	657677	39604	17814	4816	8323	29034	380218
2010	630832	747132	56677	28596	5975	10468	35625	447820
2011	687567	823124	74380	42788	7417	10426	39738	511539
2012	867902	1012764	84731	52199	8894	11404	42720	603056
2013	1020787	1199929	89332	75372	10228	13342	55959	736105
2014	1204281	1387888	95868	49269	11523	15925	61073	873858
2015	1462964	1676683	101429	48693	12842	17477	69384	1069564
2016	1764368	2057853	113147	47878	13447	19148	84801	1356033
2017	2092585	2476973	161564	80653	16168	22474	104785	1694265

The Table 4.1 shows the consolidated financials of commercial banks which include total assets, total deposits, interest income, interest expenses, total operating income, employee expenses, total operating expenses and loan and advances.

## 4.2 Descriptive Statistics of NIM and its Explanatory Variables

The descriptive statistics of all commercial banks for the study period from mid-July 2007 to mid-July 2017 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 11 years mean, standard deviation, minimum and maximum Value of all empirical variables.

**Table 4.2**

### **Descriptive Statistics of NIM and its Explanatory Variables**

Variables	Mean	Standard Deviation	Minimum	Maximum
NIM	3.42	0.25	3.14	3.84
GD	0.21	0.07	0.08	0.3
CIR	0.44	0.03	0.37	0.47
LAR	0.61	0.038	0.55	0.68
RGDP	0.044	0.019	0.006	0.079
INF	0.088	0.023	0.045	0.132

Sources: Annual Reports and Bank Supervision Reports, NRB

This Table shows the descriptive analysis of the study variables of commercial banks from mid-July 2007 to mid-July 2017 which is shown in Table 4.2. These are important implications that can be concluded from the Table. Loan ratio of the commercial banks operating in Nepal for the period (2007-2017) averaged to 61.4% (i.e., the formed 61.4% of total assets). Moreover, the ratio of change in deposits was 21 % on average during the study period. The cost to income ratio averaged 44% during the study period. Finally, the growth rate of real GDP and inflation during the study period approximated 4% and 8.8% respectively.

### 4.3 Trend of NIM and its Explanatory Variables

**4.3.1 Trend of NIM:** 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 commercial banks for the study period from mid-July 2007 to mid-July 2017 is as follows:

**Table 4.3**

**NIM of Commercial Banks During 2007 to 2017**

S.No	Fiscal Years	Interest Income	Interest Expenses	Total Assets	NIM
1	2006-2007	23649	10086	374790	3.62
2	2007-2008	28017	12282	482890	3.26

3	2008-2009	39604	17814	657677	3.31
4	2009-2010	56677	28596	747132	3.76
5	2010-2011	74380	42788	823124	3.84
6	2011-2012	84731	52199	1012764	3.21
7	2012-2013	89332	45372	1199929	3.66
8	2013-2014	95868	49269	1387888	3.36
9	2014-2015	101429	48693	1676683	3.14
10	2015-2016	113147	47878	2057853	3.17
11	2016-2017	161564	80653	2476973	3.27

Source: Bank Supervision Reports, NRB

This Table contains the net interest margin of commercial banks over the study period from mid-July 2007 to mid-July 2017. The maximum NIM was found in FY 2010 with NIM of 3.84 % and the minimum was found in FY 2015 with NIM of 3.14%.

**Figure 4.1**

**NIM of Commercial Banks During 2007 to 2017.**

Source: Bank Supervision Reports, NRB

The figure shows the trend of NIM from FY 2007 to FY 2017. The NIM seems to be in fluctuating trend. During the study the NIM ranges from 3% to 4%. The highest NIM was

found in FY 2011 with NIM of 3.84% while the lowest was found in FY 2015 with NIM of 3.17%.

**3.3.2 Trend of GD:** Deposits are the key factor which directly or inversely affect the net interest margin. GD is calculated as total deposits of current year minus total deposits of previous year and divided by deposits of previous year. The GD of commercial banks over the study period from mid-July 2007 to mid-July 2017 is as follows:

**Table: 4.4**

**GD of Commercial Banks During 2007 to 2017**

S.No	Fiscal Years	Deposits	GD
1	2005-2006	262353	-
2	2006-2007	341179	30.04
3	2007-2008	432772	26.85
4	2008-2009	564143	30.36
5	2009-2010	630832	11.82
6	2010-2011	687567	8.99
7	2011-2012	867902	26.23
8	2012-2013	1020787	17.61
9	2013-2014	1204281	17.97
10	2014-2015	1462964	21.48
11	2015-2016	1764368	20.6
12	2016-2017	2092585	18.6

Source: Bank Supervision Reports, NRB

This Table shows the growth in deposits of commercial banks over the study period from FY 2007 to FY 2017. The Maximum GD was found in FY 2009 with GD of 30.36 % and the minimum was found in FY 2011 with only a GD of 8.99%.

**Figure: 4.2**

**GD of Commercial Banks During 2007 to 2017**

Source: Bank Supervision Reports, NRB

The figure shows the decreasing fluctuating trend of GD over the study period from FY 2007 to FY 2017. The growth rate was lowest in FY 2011 with growth of only 8.99% whereas the highest growth rate was in FY 2007 with a growth rate of 30.36%.

**3.3.3 Trend of CIR:** It is calculated as cost to income ratio. The CIR of commercial banks over the study period from 2007 to 2017 is as follows:

**Table: 4.5**

**CIR of Commercial Banks During 2007 to 2017**

S.No	Fiscal Years	Others Operating Expenses	Employee Expenses	Total Operating Income	CIR
1	2006-2007	3064	4845	17826	44.37
2	2007-2008	3604	6207	21321	46.01
3	2008-2009	4816	8323	29034	45.25
4	2009-2010	5975	10468	35625	46.15
5	2010-2011	7417	10426	39738	44.9
6	2011-2012	8894	11404	42720	47.51

7	2012-2013	10228	13342	55959	42.1
8	2013-2014	11523	15925	61073	44.94
9	2014-2015	12842	17477	69384	43.7
10	2015-2016	13447	19148	84801	38.44
11	2016-2017	16168	22474	101785	37.96

Source: Bank Supervision Reports, NRB

This Table shows the cost to income ratio of commercial bank over the study period from mid-July 2007 to mid-July 2017. The maximum CIR was found in FY 2012 with CIR of 47.51 % and the minimum was found in FY 2017 with CIR of 37.96 %.

**Figure: 4.3**

**CIR of Commercial Banks During 2007 to 2017**

Source: Bank Supervision Reports, NRB

The figure shows the trend of CIR of commercial banks over the study period from mid-July 2007 to mid-July 2017. During the study period, the highest CIR was 48% in FY 2012 where the lowest was 37 % in FY 2017. CIR was in decreasing trend since mid- July 2014. During mid- July 2014 CIR was 45% then decrease to 44% in mid- July 2015 and again decrease to 38 % in mid-July 2016. Now, it has decreased to 37% in FY 2017.

**3.3.4 Trend of LAR:** It is calculated as loan and advances to asset ratio. The LAR of commercial banks over the study period from mid-July 2007 to mid-July 2017 is as follows:

**Table: 4.6**  
**LAR of Commercial Banks During 2007 to 2017**

S.No	Fiscal Years	Loan and Advances	Total Assets	LAR
1	2006-2007	206430	374790	0.55
2	2007-2008	281372	482890	0.58
3	2008-2009	380218	657677	0.58
4	2009-2010	447820	747132	0.6
5	2010-2011	511539	823124	0.62
6	2011-2012	603056	1012764	0.59
7	2012-2013	736105	1199929	0.61
8	2013-2014	873858	1387888	0.63
9	2014-2015	1069564	1676683	0.64
10	2015-2016	1356033	2057853	0.66
11	2016-2017	1694265	2476973	0.68

Source: Bank Supervision Reports, NRB

This Table shows the LAR of commercial banks over the study period from mid-July 2007 to mid-July 2017. The maximum LAR was found in FY 2017 with CIR of 68% where minimum was found in FY 2007 with LAR of 55%.

**Figure: 4.4**  
**LAR of Commercial Banks During 2007 to 2017**

Source: Bank Supervision Reports, NRB

The figure shows the increasing trend of loan and advances to total assets. The Maximum LAR was found in FY 2017 with LAR of 68% where the minimum LAR was 55% in FY 2007.

**3.3.5 Trend of RGDP:** The growth rate of real GDP reflect the economic conditions. The RGDP from mid-July 2007 to mid-July 2017 is as follows:

**Table: 4.7**

**RGDP During 2007 to 2017**

<b>S.No.</b>	<b>Fiscal Years</b>	<b>RGDP</b>
1	2006-2007	3.2
2	2007-2008	6.1
3	2008-2009	4.9
4	2009-2010	4.6
5	2010-2011	3.48
6	2011-2012	4.8
7	2012-2013	3.9
8	2013-2014	6
9	2014-2015	2.7
10	2015-2016	0.6

11	2016-2017	7.9
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Source: Annual Reports, NRB

This Table shows the RGDP from FY 2007 to FY 2017. The maximum RGDP was found in FY 2017 with RGDP of 7.9% where the minimum was found in FY 2016 with RGDP of only 0.6%.

**Figure: 4.5**

**RGDP During 2007 to 2017**

Source: Annual Reports, NRB

The figure shows the trend of change in Real GDP from mid-July 2007 to mid-July 2017. The trend is in fluctuating manner. The highest GDP was found in FY 2017 with RGDP of 7.9% and the lowest RGDP was found in FY 2016 with RGDP of only 0.6%.

**3.3.6 Trend of INF:** It measures the general price level. The INF from mid-July 2007 to mid-July 2017 is as follows:

**Table: 4.8**

**INF During 2007 to 2017**

S.No.	Fiscal Years	INF
1	2006-2007	6.4
2	2007-2008	7.7
3	2008-2009	13.2
4	2009-2010	10.5
5	2010-2011	9.6
6	2011-2012	8.3
7	2012-2013	9.9
8	2013-2014	9.1

9	2014-2015	7.2
10	2015-2016	9.9
11	2016-2017	4.5

Sources: Annual Reports, NRB

This Table shows the INF from mid-July 2007 to mid-July 2017. The maximum INF was found in FY 2009 with INF of 7.9% where the minimum was found in FY 2017 with INF of 4.5%.

**Figure: 4.6**

**INF during 2007 to 2017**

Source: Annual Reports, NRB

The figure shows the trend of INF from FY 2007 to FY 2017 which is in fluctuating trend. The highest INF recorded in FY 2009 with INF of 13.2. From FY 2009 to FY 2012 INF has decreased to 8.3% then it again rise in FY 2013 with INF of 9.9% and the INF has decreased to 4.5% in FY 2017 which is lowest INF during the study period.

**4.4 Correlation Analysis**

Regarding the correlation matrix that includes the correlation coefficients among all the variables in the study, it is shown in Table 4.10. The strength of the relationship among study independent variables is used to examine the presence of the problem of multicollinearity. This problem is considered severe in case the correlation coefficient between two explanatory variables exceeded 0.80. The correlation matrix shows the partial correlation between the 5 independent variables: growth in deposits, operating cost, Loan and advances, growth in real GDP and inflation.

**Table 4.9**

**Correlation Matrix of Explanatory Variables**

This table shows the correlation matrix of all explanatory variables excluding SIZ as explanatory variable.

	NIM	GD	CIR	RGDP	INF	LAR
NIM	1					
GD	-0.55063	1				
CIR	0.004615	0.224336603	1			
RGDP	-0.00303	0.037558553	0.084466	1		
INF	0.225574	-0.080188662	0.051447	-0.33277	1	
LAR	-0.32505	-0.508078307	-0.59201	0.07513	-0.28037	1

As shown in Table 4.9, all of the explanatory variables are weakly correlated. Since the correlation coefficient between explanatory variables doesn't exceed 0.80 we can conclude that there is not existence of multicollinearity among the explanatory variables.

### 4.3 Regression Analysis

The results of multiple linear regression analysis is presented in Table 4.10. The tables contain the coefficients, t-Value, p-Value,  $R^2$ , Adjusted  $R^2$ , Multiple  $R^2$  of the 5 independent variables. The regression analysis was done on data of commercial banks covering the period of mid-July 2007 to mid-July 20017. The dependent variable is net Interest margin and the independent variables are growth in deposit, operating cost, assets, loan, growth in real GDP and inflation. For the study, following model is estimated:

$$NIMit = 0.97 - 0.039GDit - .0125CIRit - 0.079 LARit + .0016 RGDPit - 0.013INFit$$

**Table 4.10**  
**Regression Analysis**

Variables	Coefficient	t-value	p-value
Constant	0.097526	10.45534	0.000138
GD	-0.03924	-7.8566	0.000536
CIR	-0.01252	-3.25017	0.022692
LAR	-0.07936	-6.89284	0.000984
RGDP	0.016383	1.034564	0.348293
INF	-0.01387	-0.9941	0.365818
Multiple R: 0.97, $R^2$ :0.94, Adj. $R^2$ :0.88, n:11, , Sig. F: 0.004			

This Table shows the statistical results of the regression analysis. The results shows that the coefficient of determination ( $R^2$ ) is 94 % and adjusted  $R^2$  is 88%. The number of observation of the study is 11 and the p- value for overall F- test is 0.004. Similarly, individual t-test of GD, CIR, LAR, RGDP, INF are 0.0005, 0.022, 0.0009, 0.34 and 0.36 respectively.

Regarding the variables used in the models, the analysis results were as follows:

a) Bank-specific variables: The statistical results showed that there exist a negative and statistically significant effect of the clients' deposits (liquidity) on the NIM. This shows that the banks raise the interest rates on deposits in case these declined. Consequently, the NIM declines. To compensate for the increase in the interest rate on deposits, the banks raise the interest rates on loans. This raising of the interest rates increase the NIM more the higher loans to deposits ratio (the increase in the interest rates on loans may exceed the increase in the interest rates on paid on deposits, therefore the NIM may increase). Regarding the cost (expenses) to income (CIR) ratio, the results showed that there exists a statistically significant negative relationship between this ratio and NIM. The higher the CIR ratio, the lower the NIM. This relationship could be positive, this will be the case if banks pass the additional cost or expenses to their clients either by raising the interest rates on loans or by cutting the interest rates on deposits or both. The results showed that there is a negative and statistically significant relationship between assets and the NIM. Finally, with regard to loan and advances to assets ratio, the results showed that there exists a statistically significant negative relationship between this ratio and NIM. An interpretation for this is that banks that have high demand for loans, have pricing power that allows them to charge higher rates to loans. Another possible explanation is that those banks have access to large amounts of cheap deposits (i.e. they pay lower rates to deposits), which allows them to expand their lending.

b) Macroeconomic variables: Regarding the macroeconomic variables, the results showed that there exists a positive but insignificant relation between the growth rate of real GDP and the NIM. This finding suggests that banks are not adequately pricing intrinsic risks of projects and so are not allocating resources efficiently Rajan and Zingales (1998). Regarding inflation, the model showed that there exists a negative but statistically insignificant relationship between inflation and NIM.

## **CHAPTER-V**

### **MAJOR FINDING, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Major Finding**

The area of net interest margins is relatively new 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. The study analyzed the determinants of net interest margin of commercial banks operating in Nepal over the study period from mid-July 2007 to mid-July 2017. Further, this study also analyzed the trend of NIM and its explanatory variables. In analyzing its determinants bank- specific factors and macroeconomic variables were taken into consideration while others remain constant. Those basic explanatory variables includes GD, STA, CIR, LAR, RGDP and INF.

This study mainly aims at finding the factors that determines the 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 on various factors.

Regarding the components of the NIM and its determining factors, the literature indicated that there are several determinants that vary by country. Almost all the researcher have

incorporate internal and external factors for analyzing the determinants of NIM whether the study is done in a single country or a panel of countries. And the results of the study is also not uniform. For example, some studies stated that the determinants are bank-specific factors while other studies pointed that the industry-specific factors, especially monetary policy instruments, are more important. Nevertheless, some other studies inserted that the macroeconomic variables are of the most important determinants of the NIM, especially in the developing countries. Thus, this study tries to determine the factors that affect the NIM in the commercial banks operating in Nepal.

After analyzing the trend of NIM and its explanatory variables the study suggest that the trend of NIM is fluctuating. The highest NIM was found in FY 2011 with NIM of 3.83% while the lowest was recorded in FY 2015 with NIM of 3.17%.The growth rate on deposits is in decreasing trend. The GD was lowest in FY 2011 with growth of only 9% whereas the highest growth rate was in FY 2009 with a growth rate of 30.3% which also showing the fluctuating trend. The trend of LAR is in increasing trend. The maximum LTA was found in FY 2017 with 68% where the minimum LTA was found in FY 2007 with 55%. The trend of RGDP is in fluctuating manner. The lowest RGDP was found in FY 2016 is only 0.06 which was lowest during the study period. Finally, the trend of INF is also fluctuating. The highest INF recorded in FY 2009 with INF of 13.2. INF has decreased to 4.5% in FY 2017 which is lowest INF during the study period.

In this study, a regression model is set for the analysis where net interest margin is the dependent variable and GD, CIR, LAR, RGDP and INF are the independent variables. The number of observation is 11 for the study. From the regression analysis the result shows  $R^2$  is 94 % which indicate that 94 % of variability of NIM is explained by the entire set of independent which were considered in the study. The Adj.  $R^2$  value is 88% and multiple R is 97%. The p - value for overall F-test is 0.004 which indicate that the regression model is significant in defining the NIM. Among the variables, the statistical results showed that there is a negative and statistically significant effect of the GD, CIR and LAR with individual t- test value of 0.0005, 0.022 and 0.0009 respectively which indicate useful linear relation between these variables and NIM. The effect of client's deposits is highest with a coefficient of – 0.039 whereas the effect of cost of operation is lowest with a coefficient of – 0.012. The variable loan has a coefficient of - 0.079. Regarding the macroeconomic variables, the results showed that there exists a positive but insignificant relation between the growth rate of real GDP and inflation with NIM with individual t-test value of 0.34 and 0.36 respectively. The variable RGDP and INF has a coefficient of 0.016 and -0.138 respectively.

## 5.2 Conclusion

The role of commercial banks is considered to be the key to economic growth especially in developing countries as it lubricates the economy. As Commercial banks constitute a major chunk of total assets and total deposits in the banking system in Nepal, this study analyzed the determinants of bank net interest margin for commercial banks operating in Nepal over the study period from 2007 and 2017. Both the bank-specific variables CIR and GD are in decreasing trend. While comparing GD with loan and advances, the growth rate in loan and advances exceed GD which indicate liquidity problem in the commercial banks. While analyzing the trend of macroeconomic variables the trend of RGDP is fluctuating but has increased in FY 2017 and the trend of INF is also fluctuating but has decreased in FY 2017. Further, the study have implemented two sets of variables reflecting bank-specific factors and macroeconomics factors for determining the determinants of NIM. The empirical results of this paper shows that the NIM is only affected by bank-specific factors showing a negative and significant relation with net interest margin. Whereas the effect of macroeconomic variables on net interest margin is insignificant.

## 5.3 Recommendations

Accordingly, this study came out with the following recommendations:

- a) In order to improve banking sector efficiency in Nepal, it is recommended that significant focus be given to reducing operating costs among banks. Strategies to lower operating costs must be internally driven. These may include centralization of banking services with greater reliance on technology based banking facilities with emphasis on reducing labor and professional costs. Also, as the banking sector modernize and reduced the need for brick and mortar operations, banks should consider expanding the use of agent banking models to reduce operating costs while meeting client transaction needs.
- b) Due to lack of government expenditure on development activities which results in adverse effect on banking sectors. Thus, government should increase its expenditure on development activities.
- c) As compare to loan and advances the deposits collection is not adequate which are hampering the liquidity position of the commercial banks. Thus bank should adopt necessary strategy to attract new deposition.

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