

EFFECT OF CREDIT RISK MANAGEMENT ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN NEPAL

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ABSTRACT: *The main purpose of this study is to investigate the effect of credit risk on the financial performance of commercial banks in Nepal. The balance panel data of ten commercial banks with 160 observations for the period of 2001 to 2016 have been used for the analysis. The regression results revealed that capital adequacy ratio (CAR), non-performing loan ratio (NPLR), and management quality ratio (MQR) have significant relationship with the financial performance (ROA) of the commercial banks in Nepal. Similarly, credit to deposit ratio (CDR) and risk sensitivity (RS) have no significant impact on the financial performance of the commercial banks in Nepal.*

KEY WORD: return on asset, capital adequacy ratio, non-performing loan ratio, management, and quality ratio, credit to deposit ratio and risk sensitivity.

INTRODUCTION

Bank failure is a problem in different countries (Lall, 2014). Risk may be defined as a probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action (Bizuayehu, 2015). Credit risks are not only argued to affect financial performance of loans but they also have far reaching implications (Kibor, 2015). Similarly, credit risk is the king of all risks (Asfaw & Veni, 2015). Credit risk is one of the most vital risks for banks. Credit risk arises from non-performance by a borrower. It may arise from either an inability or an unwillingness to perform in the pre-commitment contracted manner (Bizuayehu, 2015). The banks are inevitably exposed to credit risk because they grant credit facilities as they accept the deposits (Muriithi *et al.* 2016). Hence, business without any types of risks is not a business. Risk is inherent in banking business or any form of business. Banks and financial institutions are exposed to variety of risks among them credit risk is more severe than other risks.

Banking sector is regarded as the backbone of an economy, without proper banking channels the total business environment would be adversely affected. In addition, the modern banking was placed in a very complex and intricate environment so its smooth functioning was very crucial for the growth of the country (Singh, 2015). The purpose of each banking institution is to operate profitably in order to maintain its stability and improve in growth. Loans are the dominant asset at most banks, generate the largest share of operating income, and represents the bank's greatest risk exposure (Magnifique, 2013). Financial risk is inherent in every commercial bank, but commercial banks that embed the right

financial risk management strategies into business planning and financial performance management are more likely to achieve their strategic and operational objectives (Muteti, 2014).

A company's financial statements can be regarded as the output of a model of the firm, a model designed by the management, the company's accountants and tax authorities. Different companies used different models, meaning that they treat similar event in different ways. One reason this is possible because generally accepted accounting principles (GAAP) allow a certain degree of latitude in how to account for various events. In practice, shortcut procedures are often used. Many analysts focus on reported accounting figures, even though such numbers may not adequately reflect true economic values. In addition, simple measures are often used to assess complex relationship. For example, some analyst attempt to estimate probability that short-term creditors will be paid in full and on time by examining the ratio of liquid assets to the amount of short term debt. Similarly, the probability that interest will be paid to bond holders in timely fashion may be estimated by examining the ratio of earnings before interest and taxes to periodic amount of such interest payments. Often the value of a firm's common stock is estimated by examining the ratio of earnings after taxes to book value of equity. The main aim of every banking institution is to operate profitably in order to maintain stability and improve in growth and expansion. To ensure that the growth in the banking sector does not jeopardize its stability, risk management is crucial (Oludhe, 2011).

Risk management is a systematic method of identifying, analyzing, assessing, rating, monitoring, controlling and communicating risks associated with any bank's activity, function or process to avoid or minimize losses and maximize opportunities. It should address methodically all the risks surrounding the organizations' activities past, present and in particular, future (Stavroura, 2009). Credit risk is accessed through analyzing the financial performance of commercial banks in an attempt to mitigate impacts arising from credit defaults. The financial health of the commercial banks depends on the possession of good credit risk management dynamics. Commercial banks may have a keen awareness of the need to identification, measurement, monitoring and controlling credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred (Bhattarai, 2016).

Credit risk in banks may also arise due to internal weaknesses in any financial institutions such as management inefficiency. Management deficiency affects liquidity causing an increase in nonperforming loans (Mwaurah, 2013). In addition, the non-performing loan (NPL) in the balance sheet of a financial institution represents the ratio of aggregate non-performing loans and the total gross loan. Banks performance with regards to credit risk depends on various internal and external factors. Internal factors are bank specific determinants and the external factors are the determinants related to economic environment (Naceur and Omran, 2011) as cited in (Mwaurah, 2013). Proper credit management is a precondition for any financial institutions' stability and continuing profitability, albeit deteriorating credit quality is the most frequent cause of poor financial performance of the financial institutions (Gatuhu, 2013).

This study will focus on the financial performance of the commercial banks in Nepal. Recent literatures have narrow focus. How to define research problem is undoubtedly a difficult and challenging job. Whatever, Sekaran (1991) has defined research problem as "any situation where a gap exists between the actual and the desired ideal state". The previous studies about measuring financial performance of

commercial banks have gained special attention during the last decade, for instance, various banking journals have devoted special issues. There were a lot of grievances over the performance of the commercial banks. Poor credit risk management is the primary cause of the bank failure

The power of financial institutions to create money is of great importance in business operations. Commercial banks are especially the major financial intermediaries in any country and they are the major providers of credits to the households, and corporate sectors. They deal with both retail and corporate customers and have well diversified deposit and lending and generally offer a full range of financial services to their clients (Magnifique, 2013).

The health of the financial sector is a major concern of policy, especially in developing economies where failure in financial intermediation can disturb the economic growth and retards the development processes (Das & Ghosh, 2007). Furthermore, it has been proved that the major economic upheavals are the result of banking crisis (Ameur, 2016). The economic development and financial growth of a country is critically dependent on the financial performance and strength of its banking sector (Shukla, 2015). The banking sectors serve as the backbone for the economic development of any country (Ahsan, 2016). The growth and financial stability of the country depends on the financial soundness of its banking sector (Altman *et al.*, 2014). Sound financial health of the banks is the guarantee not only to their depositors but is equally significant for the shareholders, employees, and the economy as a whole (Mohiuddin, 2014).

Risk management issues in the banking sector do not only have greater impact on bank performance but also on national economic growth and general business development. The bank's motivation for risk management comes from those risks which can lead to underperformance (Adeusi *et al.*, 2014). Credit risk management is indeed a very difficult and complex task in the financial industry because of the unpredictable nature of the macroeconomic factors coupled with the various microeconomic variables which are peculiar to the banking industry or specific to a particular bank (Garr, 2013). Credit risk refers to the risk that a borrower will default on any type of debt by failing to make required payments. The risk is primarily to the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs. The loss may be complete or partial and can arise in a number of circumstances (Muriithi, 2014). Similarly, financial performance of commercial banks is the measure of the level commercial banks profit or loses within a specified time period. Various measures have been used to measure the financial performance of commercial banks.

Credit risk management is one of the most essential functions of the bank in the modern banking system. The risk is inherent in all aspect of banking business operations. Credit business is a one of the major parts of the bank (Kattel, 2016). Thus, credit risk measurement is a preventive approach to reducing the default rate in the overall credit exposure of the banks. Banks are exposed to different types of risks, which affect the performance and activity of these banks, since the primary goal of the banking management is to maximize the shareholders' wealth, so in achieving this goal banks' manager should assess the cash flows and the assumed risks as a result of directing its financial resources in different areas of utilization (Alshatti, 2015).

Risk Management is a main strategy used by the companies in order to minimize business risks, avoid adverse outcomes and assure their development and success as organization in their field. Risk Management strategy is an everyday process of identifying, evaluating, operating and monitoring risks

and aim to immune the company from the potential hazards (Stavroula, 2009). Credit risk management in banks has become more important not only because of the financial crisis that the industry is experiencing currently, but also a crucial concept which determine banks' survival, growth and profitability (Abiola and Olausi, 2014). Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms (BCBS, 1999). Credit remains the primary source of revenue for the banks and financial institutions. "Risks in financial services are larger in scope and scale than ever before" (Djan *et al*, 2015).

Banking sector is an important sector which supports economic development in any country. Financial institution plays an important role in accelerating development of the country. It occupies a vital role in the national, economical and development framework. Due to collections of capitals through savings from citizens; makes investment in different enterprises, mobilizes the funds. In other words, banking industries are helping hands in reducing poverty, raising employment opportunities and thereby developing the society and the country as a whole.

Credit risk plays a crucial role on the bank's profitability as the large portion of the bank's revenue accrues from loans and advances from which interests is earned (Bhattarai, 2016). For this purpose, the Nepalese commercial banks will be chosen for the research study to examine the financial performance of those selected banks by using CAMEL approach. This is an industry with a long history, giving the possibility to look at changes over the past decades. There are plenty of actors in the industry which gives us the opportunity to investigate the industry dynamics.

Credit risk is considered as the most important of all risks. It is referred to the customers' inability or unwillingness to serve their debts, and constitutes a major source of loss not only on banks' profitability but also on the initial asset; the loss could be as much partial as total of any amount lent to the counterparty. Not performing the obligations of a contract is usually appeared to loans, swaps, options, and during settlement. Securities firms are faced with credit risk whenever they enter into a loan agreement, an OTC contract, or extended credit (Stavroula, 2009).

The CAMELS stands for Capital adequacy, Asset quality, Management quality, Earnings and Liquidity, Risk Sensitivity. CAMELS approach is a useful tool to examine and evaluate the safety and soundness of commercial banks and help to mitigate the potential risks which may lead to bank failures in Nepal. It as a tool is very effective, efficient and accurate to be used as a performance evaluate in banking industries and to anticipate the future and relative risk. CAMELS ratios are calculated in order to focus on financial performance. In this study some important ratios are chosen and calculated to evaluate bank's performance. Data which is used in this study is gathered from annual financial reports of commercial banks of Nepal. Then data is compared with other bank's ratios and reports. Certainly, the trends of calculations and relevant figures show important points for managers and also, CAMELS rating can be an efficient tool to manage and control and decide in management accounting view. This study has attempted to answer the question: What is the impact of credit risk management on the financial performance of commercial banks in Nepal?

The main purpose of the study is to analyze the effect of credit risk management on the financial performance of commercial banks in Nepal. This study has used Return on Assets (ROA) as performance of commercial banks. The predictors of performance are Capital Adequacy Ratio, Non-

Performing Loan Ratio, Management Quality Ratio, Credit to Deposit Ratio and Risk Sensitivity. It is hoped that the finding of the study will be applied to commercial banks in Nepal. The remainder of this study is structured as follows: Section two theoretical framework, section three describes research methodology, and final section analysis the results and conclusions.

THEORETICAL FRAMEWORK

The major studies related to the issue effect of credit risk management on the financial performance of commercial banks have been reviewed as follows. Baral (2005) has examined that the financial health of the joint venture banks in the CAMEL framework and found the health of joint venture banks is better than that of the other commercial banks. In addition to this, the perusal of indicators of different components of CAMEL have indicated that the financial health of joint venture banks is not so strong to manage the possible large scale shocks to their balance sheet and their health is fair.

Kithinji (2010) has found that the bulk of the profits of commercial banks is not influenced by the amount of credit and nonperforming loans suggesting that other variables other than credit and nonperforming loans impact on profits. Commercial banks that are keen on making high profits should concentrate on other factors other than focusing more on amount of credit and nonperforming loans. Kargi (2011) has evaluated the impact of credit risk on the profitability of Nigerian banks. The findings revealed that banks profitability is inversely influenced by the levels of loans and advances, nonperforming loans and deposits thereby exposing to great risk of illiquidity and financial distress. Furthermore, weak credit risk management decreases the profitability, affects the quality of its assets and increase loan losses and nonperforming loan which may eventually lead to financial distress.

Oludhe (2011) has concluded that capital adequacy, asset quality, management efficiency and liquidity have weak relationship with financial performance of banks in Kenya. Earnings have a strong relationship with financial performance. This is because earnings as proxies by return on assets determine the ability of a bank to increase capital (through retained earnings), absorb loan losses, support the future growth of assets, and provide a return to investors.

Kolapo *et al.* (2012) have showed that the effect of credit risk on bank performance measured by return on assets of the banks is cross sectional invariant. A 100 percent increase in the nonperforming loan decreases return on assets i.e. profitability by about 6.2 percent, a 100 increase in loan loss provision also decreases profitability by about 0.65 percent whereas a 100 percent increase in total loan and advances increases profitability by about 9.6 percent.

Fredrick (2012) has concluded that credit risk management by use of CAMEL indicators has a strong impact on the financial performance of the commercial banks in Kenya. The study reveals that capital adequacy, asset quality, management efficiency and liquidity have weak relationship while earnings have strong relationship with the financial performance of the banks. This study has concluded that CAMEL model can be used as a proxy for credit risk management of the commercial banks in Kenya. Poudel (2012) has shown that default rate, cost per loan assets and capital adequacy ratio have an inverse impact of the bank's financial performance whereas default rate is the most predictor of the bank's financial performance.

Kaaya and Pastory (2013) have found that the credit risk indicators have produced negative correlation which indicates the higher the credit risk the lower the bank performance. Credit risk is not a bad

situation as it is related to bank return, from empirical theory it has been stated that the higher the risk the higher the bank return due to the bank ability to increase portfolio, but the bank need to balance and foresee the return. With these the bank need to maintain substantial amount of capital reserve to absorb credit risk in event of failure, moreover the bank need to enhance lending criteria, portfolio grading and credit mitigation techniques to reduce chance of default. Abdelrahim (2013) has concluded that liquidity has significant strong positive impact on the effectiveness of credit risk management. Bank size has significant strong negative impact on effectiveness of credit risk management. Capital adequacy, asset quality, management soundness and earning have insignificant impact on effectiveness of credit risk management of Saudi Banks. Essendi (2013) has argued that capital adequacy, management quality, earnings and liquidity were found to have positive coefficients in relation to loan allocations while asset quality was found to have a negative coefficient.

Abiola and Olausi (2014) have analyzed the impact of credit risk management on the commercial banks performance in Nigeria. The panel regression model was employed for the estimation of the model. In this model, Return on Equity (ROE) and Return on Asset (ROA) were used as the performance indicators whereas Non-Performing Loans (NPL) and Capital Adequacy Ratio (CAR) as credit risk management indicators of the commercial banks. The findings have revealed that credit risk management has a significant impact on the performance of the banks in Nigeria. Furthermore, the results have shown that the sampled have poor credit risk management practices; hence the high levels of the non-performing loans in their loans portfolios. Despite the high levels of the NPLs, their profit levels keep rising as an indication of the transfer of the loan losses to other customers in the form of large interest margins.

Kodithuwakku (2015) has analyzed the impact of credit risk management on the performance of the commercial banks in Sri Lanka by using both primary and secondary data. The study has suggested that all the independent variables except loan provision and total loan have negative impact on profitability. The non-performing loan, loan provision and loan provision to non-performing loans of the banks are significantly negatively related with ROA. The results of the study verify the objectives that better credit risk management results in better bank performances. The banks should ensure that they deploy a well-established credit risk management policy framework.

Gizaw *et al.* (2015) have conducted their study and the data were analyzed by using descriptive statics and panel data regression model. The results revealed that non-performing loan, loan loss provision and capital adequacy have a significant impact on the profitability of the commercial banks in Ethiopia. Mutua (2015) has found that there was a significant relationship between bank performance (in terms of return on asset) and credit risk management (in terms of risk identification, monitoring and credit sanctions. Better credit risk management results in better bank performance. Thus, it is of crucial importance that banks practice prudent credit risk management and safeguarding the assets of the banks and protect the investors' interests.

Singh (2015) has stated that there was a significant relationship between bank performance (in terms of return on asset) and credit risk management (in terms of non-performing asset). The study also revealed banks with higher profit potentials could better absorb credit losses whenever they cropped up and therefore recorded better performances of the commercial banks in India. Furthermore, the

study showed that there was a direct but inverse relationship between return on asset (ROA) and the ratio of non-performing asset (NPA).

Rundassa and Batra (2016) have used LOGROA and LOGROE as the dependent variables measure financial performance and capital adequacy ratio, asset quality, management soundness, earnings and liquidity ratio used as independent variables measure of credit risk management of the commercial banks. The finding uncovered that capital adequacy ratio and asset quality is insignificant to the impact of LOGROA while management soundness, earnings and liquidity are significant. Furthermore, capital adequacy ratio, asset quality and earnings are significant to impact LOGROE whereas management soundness and liquidity are significant.

Bhattarai (2016) has conducted research and examined the effect of credit risk on performance of Nepalese commercial banks. The descriptive and causal comparative research designs have been adopted for the study. The pooled data of 14 commercial banks for the period 2010 to 2015 have been analyzed using the regression model. The results revealed that non-performing loan ratio has negative effect on profitability of the commercial banks while cost per loan assets has positive effect on profitability. In addition to credit risk indicators, bank size has positive effect on profitability. Capital adequacy ratio and cash reserve are not considered as the influencing variables on profitability of the banks. The study has concluded that there is significant relationship between profitability and credit risk indicators of the selected commercial banks in Nepal. Nepalese commercial banks have poor credit risk management and hence the banks need to follow prudent credit risk management and safeguarding the assets of the banks and protect the interests of the stakeholders.

Almekhlafi *et al.* (2016) have conducted study and the regression results revealed that non-performing loans erode banks' profitability, problem loans are very costly to recover and the whole efforts amount to throwing good money after bad. When some banks management and regulatory controls have led to deterioration of assets quality, high loan recovery cost associated to high risk exposure. Bad loan syndrome, poor risk management mechanisms may affect the liquidity and general operations of banks in Yemen. This is evidenced by the negative relationship between non-performing loans and profitability.

Iheanyi and Sotonye (2017) have accessed the performance of banks in Nigeria using CAMEL rating approach in which 19 years' data were collected and analyzed through ordinary least square. The regression model results have shown that capital adequacy, management efficiency, Earning and liquidity have no significant impact on the profitability of the banks. However, assets quality has a negative impact on that profitability of the Nigerian banks.

Harelimana (2017) has evaluated that the determinants of risk management in Unguka Bank Ltd are credit risk, operational risk, and interest rate and liquidity risk are the determinants of risk management. The results show that Ungula Bank Ltd is profitable during the covered period because the standard ratio of return on asset is 1% may factors are the cause of that profitability but the quality service is the main cause of the increase of its profitability. The researcher also found out that there is a very strong relationship between risk management and financial performance. The findings of the study were relevant due, use of risk management, are critical factors for financial performance as measured by ROA, ROE and Net income marginal. It concluded that the interactions use of risk management of the

factors create an impetus for financial performance as measured by ROA, ROE and Net income marginal.

Nwude and Okeke (2018) have investigated the impact of credit risk management on the performance of deposit money banks in Nigeria using five banks that had highest asset base. Ex-post facto research design was adopted using dataset for the period 2000–2014 collated from the annual reports and financial statement of the selected deposit money banks. Three hypotheses were proposed and tested using ordinary least square regression model. The findings reveal that credit risk management had a positive and significant impact on total loans and advances, the return on asset and return on equity of the deposit money banks. The study recommended that bank managers need to put more efforts to control the non-performing loan by critically evaluating borrowers' ability to pay back. The regulator should strengthen its monitoring capacity in this regard.

Oduro, Asiedu and Gamali Gadzo (2019) have identified the factors that determine the level of bank credit risk and further estimates the effects of bank credit risk on corporate financial performance using financial data from banks on the Ghana Stock Exchange over a 15-year period from 2003 to 2017. Using the method of 2SLS, it was observed variables such as capital adequacy, operating efficiency, profitability, and net interest margin are inversely related to credit risk. Conversely, bank size and financing gap tend to relate positively with credit risk. Also, annualised changes in inflation tend to positively affect credit risk. Again, it was observed that, increase in bank credit risk negatively affects corporate financial performance which is consistent with Basel accord. Thus, for banks to survive in their industry, critical attention needs to be paid to management of its credit risk exposure.

Gadzo, Kportorgbi and Gatsi (2019) have assessed the effect of credit and operational risk on the financial performance of universal banks in the context of the structural equation model (SEM). Data were collected from all the 24 universal banks in Ghana without missing variables and using the PLS-SEM, the results showed that credit risk influences financial performance negatively contrary to the empirical study but in line with the information asymmetry tenant of the lemon theory. It was also found that operational risk influences the financial performance of the universal banks in Ghana negatively. Furthermore, the study indicated that bank specific variables measured by (asset quality, bank leverage, cost to income ratio and liquidity) significantly influence credit risk, operational risk as well as the financial performance of the universal banks positively. We recommend that banks be encouraged to cut-down their lending rates in other to decrease credit risk and subsequently boost profitability. Regarding operational risk, banks should reduce leverage and have their portfolio more concentrated on liquid investment income so as to boost profitability.

CONCEPTUAL FRAMEWORK

The literatures review show that various researches have been done on the impact of credit risk on the financial performance of the commercial banks. But very few researches have done in Nepal. In addition, there are no direct researches in this area and there are also the rooms for the further improvements, investigation and research in this aspect. The most important criteria for determining the appropriateness of financial institutions to act as a financial intermediary are its solvency, profitability, and liquidity. In this respect, since 1988, the Basel Committee on Banking Supervision (BCBS) of the Bank of International Settlements (BIS) has recommended using Capital adequacy,

Assets quality, Management Quality, Earnings, Liquidity and Sensitivity to market risk (CAMELS) as criteria for assessing any bank and financial institutions.

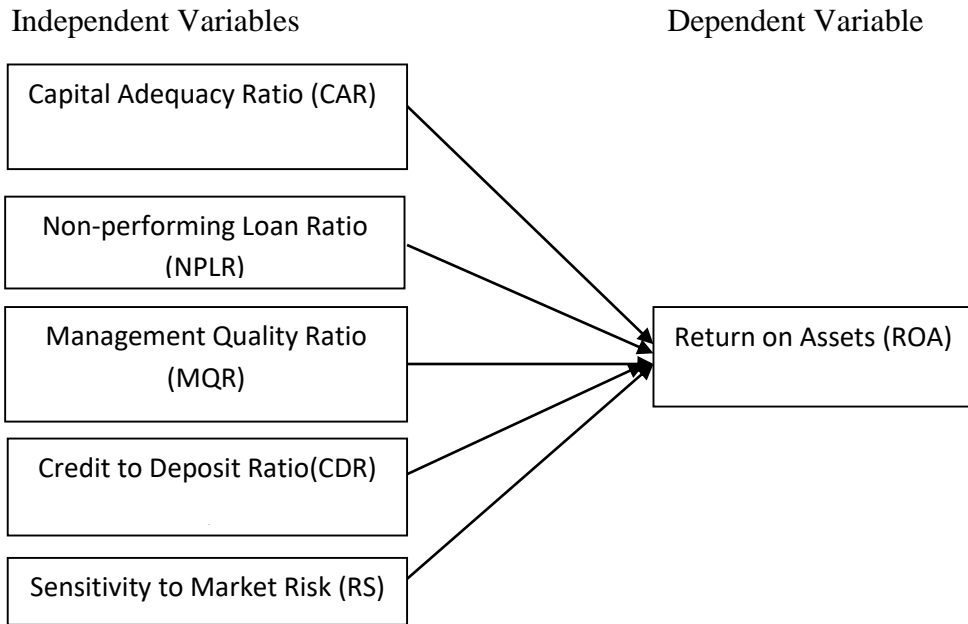


Fig.2.1 Conceptual Framework of the Study Developed by Researcher (2019)

RESEARCH METHODOLOGY

The study used a sample of 10 out of 28 commercial banks to be analyzed for the period 2001-2016 classified according to their asset base. The period of study was chosen relevant to the period under which banking sector experienced tremendous growth, challenging and competitive environment. Similarly, the period of study was chosen recent enough to ensure data was readily available and reliable for the study. The convenience sampling method was used in choosing the banks for the study. Moreover, in selecting the 10 commercial banks for the study, due care is given to include banks such as: joint venture, domestic, best performer, average performer and comparatively week performer in the sample. The banks selected for the study are: Bank of Kathmandu Ltd., Everest Bank Ltd., Nabil Bank Ltd., Nepal Investment Bank Ltd., Nepal Bank Ltd., Rastriya Banijya Bank Ltd., Siddhartha Bank Ltd., Kumari Bank Ltd., Himalayan Bank Ltd., and Standard Chartered Bank Nepal Ltd. The selected commercial banks appear fairly represent the study population. The population of this study constitutes the "A" class commercial banks in Nepal which are listed in the Nepalese Stock Exchange. Data were sourced from the annual reports of the banks in the sample.

The research instrument used in this study is the CAMELS model which is the recent innovation in the area of financial performance evaluation of commercial banks in Nepal. This study has adopted descriptive and causal comparative research design. The impact of credit risk management on the financial performance of commercial banks using balance panel data. Data analysis was done using the SPSS-21 software.

The Model

The regression model used in this study assumes that the relationship between each independent variable; CAR, NPLR, MQR, CDR and risk sensitivity and the dependent variable; ROA. The model used in this study would be stated as;

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPLR_{it} + \beta_3 MQR_{it} + \beta_4 CDR_{it} + \beta_5 RS_{it} + e_{it}$$

Where,

ROA_{it} = Return on Assets of individual bank on time t period

CAR_{it} = Capital Adequacy Ratio of individual bank on time t period

$NPLR_{it}$ = Non-performing Loan Ratio of individual bank on time t period

MQR_{it} = Management Quality Ratio of individual bank on time t period

CDR_{it} = Credit Deposit Ratio of individual bank on time t period

RS_{it} = Risk Sensitivity of individual bank on time t period

β_0 = constant,

e_{it} = error term,

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are coefficients

Variables and Hypotheses

Dependent Variable

Return on Assets (ROA)

Return on Assets is the ratio of net income and total assets of any institutions. It measures the efficiency of the banks management in generating profits out of its scarce resources. The more the amount of ROA the better the efficiency of the bank management, (Gizaw, *et al*, 2015). Return on assets ratio is important profitability ratio because it measures the efficiency with which the company is managing its investment in asset and using them to generate profit (Harelimana, 2017). A basic measure of bank profitability that corrects the size of the bank is the return on assets (*ROA*), which divides the net income of the bank by the amount of its assets. *ROA* is a useful measure of how well a bank manager is doing on the job because it indicates how well a bank's assets are being used to generate profits (Chowdhury, 2013). Furthermore, return on total assets measures the profitability of the total assets available to the business. It measures earnings in all investments provided by owners and creditors.

Independent Variables

Capital Adequacy

Capital adequacy is the capital expected to maintain balance with the risks exposure of the financial institution such as credit risk, market risk and operational risk, in order to absorb the potential losses and protect the financial institution's debt holder. "Capital Adequacy Ratio (CAR) is also an independent variable and is chosen because it is the core measure of a bank's financial strength from a regulator's point of view. Capital adequacy ratio consists of the types of financial capital considered as the most reliable and liquid, primarily shareholders' equity. Bank with good Capital Adequacy Ratio have good profitability. With good capital requirement, commercial banks are able to absorb loans that have gone bad (Abiola & Olausi, 2014)". In addition to these, a bank with a strong capital adequacy is also able to absorb possible loan losses and hence avoids bank run, insolvency and failure.

Capital adequacy ratio is a measure of the amount of bank's capital expressed as a percentage of its risk weighted exposure. It consists of the types of financial capital considered the most reliable, primarily shareholders' equity. Theoretically, banks with good capital adequacy ratio have a good profitability. A bank with a strong capital adequacy is also able to absorb possible loan losses and thus avoids bank run, insolvency and failure (Bhattarai, 2016).

H₁: Capital adequacy ratio has positive and significant related to bank performance.

Asset Quality

Frost (2004) has argued that the asset quality indicators highlight the use of non-performing loans ratios (NPLs) which are the proxy of asset quality, and the allowance or provision to loan losses reserve. As defined in usual classification system, loans include five categories: standard, special mention, substandard, doubtful and loss. According to Grier (2007), "poor asset quality is the major cause of most bank failures". The greatest risk facing a bank is the risk of loan losses derived from the outstanding loans (Chowdhury, 2013). NPL to Total Loans Ratio shows the direct relationship between volume of NPL and Total Loans. It indicates the portion of NPL in loan portfolio. A relatively lower ratio indicates a better quality of the loan portfolio.

Kargi (2011) and Kodithuwakku (2015) found an adverse impact of non-performing loans on the profitability. However, Kithinji (2010) asserted that the bulk of the profits of commercial banks are not influenced by the amount of non-performing loans. Although there are conflicting evidences on this issue, in view of the theory and majority of the empirical literature, a negative relationship is expected between non-performing loan and banks performance. NPL has negative and statistically significant impact on the financial performance of the commercial banks in Nepal (Bhattarai, 2016). Non-performing loans ratio reflects the bank's credit quality and is considered as an indicator of credit risk management. NPLR, in particular, indicates how commercial banks manage their credit risk in Nepal because it defines the proportion of non-performing loan in relation to total loan.

H₂: Non-Performing Loan Ratio (NPLR) has negative and significant related to bank performance.

Management Quality

Management soundness is a qualitative variable that expresses the control of board of directors over the resources of the bank to protect shareholders interest. It is measured by the ratio of total operating income to total assets.

H₃: Total Operating income to Total Assets as a measure of Management Quality Ratio (MQR) has positive and significant related to bank performance.

Liquidity

The credit to deposit ratio (CDR) is a major tool to examine the liquidity of a bank and measures the ratio of fund that a bank has utilized in credit out of the deposit total collected. Higher the CDR more the effectiveness of the bank to utilize the fund it collected (Jha & Hui, 2012). This ratio measures the ability of the management to use the assets in offering loans which ultimately creates high profitability (Ibrahim, 2014). This ratio helps us showing the relationship between loans and advances which are granted and the total deposited collected by the bank. A high ratio indicates better mobilization of

collected deposit and vice-versa. It should be noted that too high ratio may not be better from liquidity point of view. This ratio is calculated dividing loan and advances by total deposits.

H₄: Credit Deposit Ratio (CDR) has negative and significant related to bank performance.

Risk Sensitivity

Risk Sensitivity measures the risk sensitive liabilities and risk sensitive assets. It can also depict market risk as sensitivity to market risk. Grading have been done ranging from 1-point score to 5 point. 5 point is the worst ranking or grading for measuring the risk sensitive assets and risk sensitive liabilities of the selected banks. 1 point or 2 point refer to the better risk management strategies by the management of the commercial banks in Nepal.

H₅: Risk Sensitivity (RS) has negative and significant related to bank performance.

Summary of Variables

Expected sign is a statistical technique which shows the relationship between two variables. The positive expected sign means that one variable increase, the other variable will also increase while negative expected sign means that when one variable increase, the other variable will be decrease.

Table 1: Summary of Variables

Variables	Measurement	Expected Sign
ROA	Return on Assets (ROA) is the ratio between net profits to Total Assets of the bank.	NA
CAR	Capital adequacy ratio (CAR) is the proportion of a bank's own equity in relation to its risk exposures.	+
NPLR	Non-Performing Loan Ratio (NPLR) is the percentage of non-performing loans to total loans and advances.	-
CDR	Credit to Deposit Ratio is a ratio between total loans and total deposits. This ratio measures the ability of the management to use the assets in offering loans which ultimately creates high profitability.	-
MQR	Total Operating Income to Total Assets as a measure of management quality.	+
RS	Risk Sensitivity measures the risk sensitive liabilities and risk sensitive assets. Further, it can also depict market risk as sensitivity to market risk.	-

RESULT AND CONCLUSION

Descriptive Statistics

The summary of the descriptive statistics for all variables used in the study is presented in Table 2. The table reports single bank financial performance indicator is return on assets (ROA) and five credit risk indicators which are the capital adequacy ratio (CAR), non-performing loan ratio (NPLR), management quality as measured by total operating income to total assets (MQR), credit to deposit ratio (CDR) and risk sensitivity. The result shows that the average value of the bank performance

(ROA) is 1.399 percent indicating that during the period 2001 to 2016, on average, the total assets of sample commercial banks in Nepal generate 1.399 percent return. The standard deviation of the ROA is 2.953 percent, which shows the substantial variation in returns of the banks.

The minimum capital adequacy ratio is -55.540 percent that is very lower than regulatory requirement of 10 percent. There might be the issue of non-compliance of sample banks regarding Nepal Rastra Bank's Directives 2016 and Basel III requirements. This is due to heavy negative figures of Nepal Bank Limited and Rastriya Banijya Bank Limited.

Table 2: Descriptive Statistics (N=160)

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	-15.720	16.190	1.399	2.953
CAR	-55.540	133.800	6.511	18.500
NPLR	0.000	60.470	7.240	13.618
MQR	0.000	6.950	4.346	1.203
CDR	0.000	160.600	68.965	20.166
RS	1.000	5.000	2.081	0.911

Sources: Annual Report of Sample Banks and Results are Drawn from SPSS - 21

Table 2 shows that the number of observations per each variable is equal. This may be explained by the balanced nature of the panel data used in the analysis. Table 2 additionally shows that on average the overall mean return on assets, capital fund to risk weighted exposure ratio, loan loss provision, management efficiency ratio, and credit to deposit ratio were 1.399, 6.511, 7.240, 4.346, and 68.965 percent respectively. Therefore, over the period the banks were positively profitable, adequately capitalized and experienced some relatively high levels of deterioration in asset quality during the study period.

Correlation Analysis

The correlation analysis involves the measurement of the degree of strength of the relationship between the dependent variable and the independent variables. In an effort to analyze the nature of the correlation between the dependent and the independent variables and also to ascertain whether or not multi collinearity exists as a result of the correlation among variables, Pearson correlation analysis have been computed. The correlation matrix that is shown in above Table 3 provides some insights into the independent variables that are significantly correlated to the dependent variable ROA. The results indicate that bank performance (ROA) is significantly negatively correlated with non-performing loan ratio. The result implies that as the value of non-performing loan ratio increases, the performance of banks will decrease.

Financial performance of the banks (ROA) is significantly positively correlated with management quality ratio which implies that as the value of total operating income increases, the performance of banks will also increase. As expected there is negative relationship between credit to deposit ratio and bank performance (ROA). The result reveals that as CDR commercial bank increases, the performance of the bank will decrease. However, there is negative and insignificant correlation between return on assets and risk sensitivity which indicates that the relationship is weak.

Table 3: Pearson's Correlation Coefficient Matrix

	ROA	CAR	NPLR	MQR	CDR	RS
ROA	1					
CAR	.146	1				
NPLR	-.522**	-.617**	1			
MQR	.495**	.217**	-.445**	1		
CDR	-.026	.436**	-.217**	.120	1	
RS	-.361**	-.406**	.594**	-.316**	-.162*	1

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

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

Sources: Results are drawn from SPSS 18

There is negative correlation between ROA and NPLR, CDR and Risk sensitivity. There is positive relation between ROA and CAR. There is also positive relation between ROA and MQR. The correlation matrix of the variables presented Table 3 reveals that all correlations coefficients among the independent variables are less than 0.7, implying the absence of multicollinearity. Thus, there is no evidence of presence of multicollinearity among the independent variables.

Regression Analysis

Table 4 indicates that the value of R-square was 0.4078, which means that 40.78 percent of the total variation in the value of ROA was due to the effect of the independent variables. The adjusted R-square was 0.3885 which shows that on an adjusted basis, the independent variables were collectively 38.85 percent related to the dependent variable ROA.

Table 4: Regression Result of Credit Risk Management on Performance

	Coefficients	Std. Error	t	Sig.	Collinearity Statistics	
					Tolerance	VIF
(Constant)	.464	1.165	.398	.691		
CAR	-.035	.014	-2.507	.013	.517	1.936
NPLR	-.107	.021	-5.160	.000	.421	2.373
MQR	.762	.171	4.447	.000	.788	1.268
CDR	-.013	.010	-1.272	.205	.802	1.247
RS	-.235	.251	-.937	.350	.641	1.560

No of observations: 160, R² = 0.408, Adjusted R² = 0.389, F-value = 21.210, F (sig)= 0.000

Source: Annual report of sample companies and results are drawn from SPSS-21

The result indicates that capital adequacy ratio is negative but statistically significant. The sign of the coefficient is as unusual because theoretically capital adequacy ratio was expected to have a positive relationship with a performance of the commercial banks. However, the finding of this study supports the hypothesis that capital adequacy ratio has a significant effect on financial performance of the commercial banks in Nepal. The result is contrary to the findings of Bhattarai (2016).

As expected, there is a strong negative association between non-performing loans and financial performance of commercial banks. The result is similar to the findings of Kargi (2011); Kodithuwakku (2015); and Bhattarai (2016) where they found negative association between non-performing loans and banks performance. The result is contrary to the findings of Li and Zou (2014) and Alshatti (2015) who found the positive effect of non-performing /gross loans ratio on the financial performance of banks. The result indicates that, management efficiency ratio has positive and statistically significant. The sign of the coefficient is as usual because theoretically management efficiency ratio was expected to have a positive relationship with a performance of the commercial banks. Finding of this study has supported the hypothesis that management efficiency ratio has a significant effect on financial performance of the commercial banks in Nepal. Risk sensitivity coefficient exerts negative effect on the financial performance of the commercial banks.

SUMMARY AND CONCLUSION

The commercial banks are guided by the objective of earning high profit. There seems to be a competition among the banks to increase their balance sheet size. Thus, there is a common observation that the total loan size of almost all banks are rapidly increasing. Also to commensurate the increase on assets (due to increase in loans and advances) these banks are found to have increased the deposit base. The increase in loans and advances is definitely a good thing, but these banks should have a very good credit control standards and risk monitoring system in place. Further, banks should be quite careful towards maintenance of good asset portfolio. Else, these loans could easily get into problem and ultimately affect the bank in the form of increased non-performing loan.

Credit risk management should be at the center of banks operations in order to maintain financial stability. Credit risk management includes the system process and control which a company has in place to ensure the efficient collection of customer payment and the risk of no-payment. To achieve the goal of owners' wealth maximization, banks should manage their assets, liabilities and capital efficiently. In doing this, credit policy should set out the bank's lending philosophy, specific procedures and means of monitoring the lending activity (Shakya, 2017).

The main purpose of this study is to investigate the impact of credit risk on the financial performance of commercial banks in Nepal. The financial performance in terms of return on assets selected as dependent variables. The capital adequacy ratio, non-performing loan asset, management efficiency, liquidity and risk sensitive are taken as independent variables. The balance panel data of ten commercial banks with 160 observations for the period of 2001 to 2016 have been used for the analysis. The regression results indicate the existence of the relationship between the dependent and independent variables hence has the ability to predict the influence of credit risks on the profitability of the commercial banks in Nepal. The model is well fitted with 41 percent ability to influence the financial performance of the commercial banks in Nepal. The regression model revealed that NPLR has negative and statistically significant impact on financial performance of the commercial banks in Nepal. Capital adequacy ratio and management efficiency ratio have negative and statistically significant impact on the financial performance of the commercial banks in Nepal. The study concluded that the CAR, NPLR, and MQR have significant relationship with the financial performance (ROA) of the commercial banks in Nepal. Similarly, CDR and RS have no significant impact on the financial performance of the commercial banks in Nepal. The study also suggests that the further study can be done on the impact of

credit risk management by the use of CAMELS indicators on the financial performance of other bank and financial institutions like micro finance institutions, development banks, finance companies etc. The study recommends that it is fundamental for Nepalese commercial banks to practice scientific credit risk management, improve their efficacy in credit analysis and loan management to secure as much as possible their assets, and minimize the high incidence of non-performing loans and their negative effects on financial performance.

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