Impact of Bank Specific and Macroeconomic Variables on Performance of Nepalese Commercial Banks

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The study examines the impact of bank specific variables and macroeconomic variables on the performance of commercial banks of Nepal over the period of 2011 to 2016. The dependent variable is bank performance which has been specified in terms of ROA while the independent variables are bank specific (default risk, cost per loan assets and capital adequacy ratio), and macroeconomic variables (annual growth of gross domestic product, exchange rate and inflation). To test the impact of importance of bank specific and macro-economic variables on bank performance regression models have been estimated. This study concludes that the commercial banks profitability in Nepal is mainly influenced by cost per loan assets. The macroeconomic variables are not significant and hence there is no evidence that external forces have impact over bank performance.

1. Introduction

Banks, as financial institutions, play a vital role for bringing financial stability and economic growth through their expected contribution by mobilizing financial resources across the economy (Masood & Ashraf, 2012). The study reveal, that both bank level and macro level factors are importantly determine the profitability of the banking system of a country. Performance of the bank is mostly measured by their earnings and how their profitability. Profitability is simply the difference between total revenue and total cost. Thus, the factors that affect the commercial bank profitability would be those that affect the bank's revenue and the costs. Hence, the impact of the internal and external determinants of commercial bank profitability is analyzed with a view to show their impact on bank's revenue and costs. This study focuses on the dependent variable namely bank profitability. This is followed by the internal determinants of commercial bank profitability (Pradhan & Shrestha, 2016).

There are various factors that affect the profitability of banking sector in any economy. Most studies divide the determinants of commercial banks performance into two categories, namely internal and external factors (Khrawish, 2011). The profitability became one of the challenges faced by the commercial banks to strengthen their financial positions in order to meet the risks associated with openness and globalization. A profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. The determinants of profitability are well observed and explored, as it is increasingly important to strengthen the foundations of domestic financial system as a way to buildup flexibility for capital flow volatility. The profitability of commercial banks is affected by Managerial (internal) and Environmental (external) factors. Managerial factors are affected by management decisions and goals to be achieved by the management of the

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bank; such as capital ratio, credit risk, productivity growth and size of the bank performance. Environmental factors are affected by external forces such as financial market structure, trade interdependence, economic growth, inflation, market interest rates and ownership structure (Almumani, 2013).

In this connection, the main research question in this study as follow: Do bank specific and macroeconomic variables have an impact on the performance of Nepalese commercial banks?

A thorough review of the Nepalese literature indicates that only a study has been undertaken on impact of bank specific and macroeconomic variable on the performance in the context of Nepalese commercial banks. One of the studies was done by Pradhan and Shrestha (2016) "impact of bank specific variables and macroeconomic variables on the performance of commercial banks of Nepal". The dependent variable in bank performance which has been specified in terms of ROA, ROE and NIM while the independent variables are capital adequacy ratio, asset quality, management efficiency, liquidity management, employee expenses, other operating expenses, credit risk, growth of gross domestic product and inflation. To test the impact of bank specific and macroeconomic variables on bank performance regression models have been estimated. Similarly the study has considered three performance indicators. This study has been taken a single performance indicator return on total assets and except capital adequacy ratio for banks specific variables other bank specific variables has been introduced. In macroeconomic variables, this study has been introduced another one exchange rate.

In general, the literature on banks profitability has emphasized greatly on ROA as the best measure of profitability as it makes an assessment of the efficiency and effectiveness of the bank management in transforming assets into profits (Obamuyi, 2013). The finding of this study has emphasized that the commercial banks profitability in Nepal is mainly influenced by cost per loan assets. The macroeconomic variables are not significant and hence there is no evidence that external forces have impact over bank performance.

In this context, the purpose of this study is to analyze the impact of bank specific and macroeconomic variables on the performance of commercial banks of Nepal. Specially, it examines the performance of commercial banks through the internal and environmental variables of default risk, cost per loan assets, capital adequacy ratio and annual growth of gross domestic product, exchange rate and inflation. The remainder of this study is organized as follows. Section two has explains about reviews of literature, Section three the methodology and model, and section four analysis of results and section five conclusion.

2. Review of Literature

The study was conducted in many countries around the world to examine the impact of bank specific variables and macroeconomic indicators on profitability. Most of the studies consider internal factors (i.e., bank's specific characteristics) and external factors (i.e., financial industry and economic environment).

Bennaceur and Goaied (2008) have examined the impact of bank specific variables and macroeconomic indicators and financial structure's effect on banking sector's profitability in

Tunisia from 1980 to 2000 period. It was concluded Capital adequacy ratio had positive effect on profitability and there was a negative impact of size on profitability. There was no impact of macroeconomic indicators on bank's profitability in Tunisia. The development in the stock market had positive impact on profitability, since Tunisian banks had extended their earnings through the revenues, earned from the intermediation and the management of portfolio of stock market .It was found that private banks performed better as compared to state owned banks. There was a negative impact of partial interest rate liberalization on interest margin and positive impact of complete interest rate liberalization of banks in Tunisia.

Alpera and Anbarb (2011) have examined the bank-specific and macroeconomic determinants of the banks' profitability in Turkey over the time period from 2002 to 2010. The bank profitability is measured 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. With regard to macroeconomic variables, only the real interest rate affects the performance of banks positively. 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 can lead to higher bank profitability.

Sufian and Kamarudin (2012) have identified bank specific characteristics and macroeconomic determinants of profitability in the Bangladesh's banking sector over the years 2000 to 2010. The study uses relevant data from a sample of 31 commercial banks in Bangladesh. The determinants are identified using multiple regression analysis. The generalised least squares method has been applied consisting of fixed effect model rather than random effect model and tested by Hausman test. The results bring out five bank specific determinants that are important in influencing profitability: capitalisation, non-traditional activities, liquidity, management quality, and size of the bank. Besides, three macroeconomic determinants significantly influence profitability including growth in GDP, inflation and concentration.

Kanwal, and Nadeem (2013) have analyzed the vital contribution of the commercial banks to economic progress of Pakistan, this study investigates the impact of macroeconomic variables on profitability of public limited commercial banks in Pakistan for years 2001-2011. Pooled Ordinary Least Square (POLS) method is used to examine the effect of 3 major external factors; inflation rate, real gross domestic product (GDP) and real interest rate on profitability indicators; return on assets (ROA), return on equity (ROE) and equity multiplier (EM) ratios in 3 separate models. The empirical findings indicate a strong positive relationship of real interest rate with ROA, ROE and EM. Secondly, real GDP is found to have an insignificant positive effect on ROA, but an insignificant negative impact on ROE and EM. Inflation rate on the other hand, has a negative link with all 3 profitability measures. Overall, the selected macroeconomic factors are found to have a negligible impact on earnings of commercial banks.

Bilal, Saeed, Gull and Akram (2013) have identified the influence of bank specific and macroeconomic factors on profitability of commercial banks in Pakistan over the period of

2007 to 2011. Return on assets and return on equity are used as dependent variable. Deposit to assets, bank size, capital ratio, net interest margin and nonperforming loans to total advances are utilized as bank specific measures. Inflation, real gross domestic product and industry production growth rate are macroeconomic factors. By employing descriptive statistics, correlation and regression analysis researcher conclude that bank size, net interest margin, and industry production growth rate has positive and significant impact on the ROA and ROE. Nonperforming loans to total advances and inflation have negative significant impact on Return on assets while real gross domestic product has positive impact on ROA. Capital ratio has positive significant impact on ROE.

Abdullah, Parvez, and Ayreen (2014) have examined the bank-specific, industry-specific and macroeconomic determinants of 26 DSE listed bank's profitability in Bangladesh during 2008 to 2011. Bank profitability is calculated by return on assets (ROA) and Net interest Margin (NIM) as a function of bank-specific, industry-specific and macroeconomic determinants. The empirical results show that the profitability of the Bangladesh banking sector is determined by bank size, higher cost efficiency, capitalization, higher concentration, regardless of whether ROA or NIM is used as the dependent variable. Credit risk and ROA have a negative relation, whereas the relationship with NIM is positive. Inflation is significantly related to NIM but not with ROA, and labor productivity and nontraditional activity have a positive effect on ROA only.

Osamwonyi and Michael (2014) have examined that due to the immense contribution of commercial banks to the economic development in Nigeria, this research investigate the impact of macroeconomic variables on profitability of banks in Nigeria from 1990-2013. Pooled Ordinary least method is used to determine the effect of three major factors; gross domestic product (GDP), interest rate (INTR) and inflation (INFR) on return on equity (ROE) which proxies' profitability. The findings from the empirical point of view show a positive relationship of gross domestic product (GDP) with return on equity (ROE). Interest rate and inflation rate have a negative relationship with return on equity (ROE). Gross domestic product have a significant positive effect on Return on equity(ROE) while interest rate has a significant negative effect on return on equity(ROE) but inflation is not significant at all levels of significance.

Zhang and Daly (2014) have demonstrated in the last decade the Chinese government owned banks have undergone a privatization program resulting in considerable changes in ownership of Chinese banks. The study examines the impact of bank-specific, macroeconomic, financial, and globalization variables on the performance of Chinese banking from 2004 to 2010. The results suggest that banks with lower credit risk, which are well capitalized, tend to be more profitable, while banks with higher expense preferences exert a negative impact on bank performance. The macroeconomic variables suggest that China's financial services tend to grow along with economic growth. Our results also suggest that greater economic integration through increased trade and capital flows coincides with an increase in bank profitability. Likewise, social globalization and political globalization seem to exert positive effects on the profitability of Chinese banks.

Simiyu and Ngile (2015) have based on vital contribution of the commercial banks to economic progression Kenya, this study endeavors to investigate the effect of macroeconomic variables on financial profitability of listed commercial banks in the Nairobi

Securities Exchange (NSE) for years 2001 to 2012. Panel data analysis using Fixed Effects model was applied on the data to examine the effects of three major macroeconomic variables which included: Gross Domestic Product (GDP), Exchange rates, and interest rates on profitability of the listed commercial banks. The study findings indicated that real GDP growth rate had positive but insignificant effect to profitability of commercial banks as measured through Return on Assets (ROA). Further, real interest rates had a significant negative influence on profitability of listed commercial banks in Kenya. While the exchange rate had a positive significant effect on the profitability of listed commercial banks on Nairobi Securities Exchange.

Noman, Chowdhury, Chowdhury, Kabir, and Pervin (2015) have designed to investigate bank specific and macroeconomic determinants of profitability considering 299 observations of 35 banks in Bangladesh during 2003 to 2013. The investigation process considers all types of local Bangladeshi banks, OLS fixed effect and two step system GMM model. The results report that credit risk, cost efficiency, GDP growth and real interest rate effects profitability negatively; and capital adequacy, liquidity, size, inflation and stock market turnover effect profitability positively. The results further find that both development banks and private commercial banks are more profitable than public commercial banks in Bangladesh. Furthermore, the study finds that ROAA is most preferred measure of profitability. The study formulates some significant policy implications for improving the profitability of the banking sector of Bangladesh.

Yakubu (2016) has examined the influence of bank-specific and macroeconomic factors on commercial banks profitability in Ghana. The study employed the ordinary least square regression model to analyse the data obtained from the annual financial statements of five commercial banks from 2010 to 2015. The empirical results suggest that bank size, liquidity, capital adequacy, asset management, expense management, and real interest rate are positively related to profitability. GDP growth and inflation rate on the other hand, are related negatively to profitability. However, only bank size, liquidity, and expense management have a significant effect on commercial banks profitability. It can be observed that commercial banks profitability in Ghana is largely determined by bank-specific factors, whereas macroeconomic factors have an insignificant impact on banks profitability for the period considered. Therefore, it is crucial for management of commercial banks in Ghana to efficiently manage the factors that contribute to their profitability in order to enhance superior performance.

Pradhan and Shrestha (2016) have examined the impact of bank specific variables and macroeconomic variables on the performance of commercial banks of Nepal. The dependent variable is bank performance which has been specified in terms of ROA, ROE and NIM while the independent variables are capital adequacy ratio, asset quality, management efficiency, liquidity management, employee expenses, other operating expenses, credit risk, growth of gross domestic product and inflation. To test the impact of importance of bank specific and macro-economic variables on bank performance regression models have been estimated. The study reveals that management efficiency has a very strong and positive relationship with bank performance in Nepal. The macroeconomic variables are not significant and hence there is no evidence that external forces have impact over bank performance. The study showed that all the bank specific factors are found to be significant factors affecting the bank performance.

Kamandea, Zablonb and Ariembac (2016) have asserted that determine the effects of bank specific factors on the financial performance of commercial banks in Kenya for a period of 5 years, starting from the year 2011 to 2015. The dependent variable under investigation was return on assets (ROA). The independent variables were capital adequacy, asset quality, management efficiency, earnings ability and liquidity. The specific objectives of this research were to determine the effects of capital adequacy on the financial performance of commercial banks in Kenya, evaluate the effects of asset quality on the financial performance of commercial banks in Kenya, determine the impact of management efficiency on the financial performance of commercial banks in Kenya, determine the impact of earnings ability on the financial performance of commercial banks in Kenya and evaluate the effects of liquidity on the financial performance of commercial banks in Kenya. The choice of this five-year period was based on the explosive growth of the banking sector in the country and the availability of complete data for that period. The study concentrated on the bank specific factors that affect the banks' financial performance. In this research, the scope was all the 11 banks listed in the Nairobi securities exchange.

Bhattarai (2017) has investigated the effect of credit risk on the profitability of commercial banks in Nepal over the period of 8 years (2009 to 2016). Panel data of six commercial banks were analyzed using pooled OLS model, fixed effects model and random effect model. The results from the estimated regression models show that default risk is significantly positively associated with banks' profitability. However, capital adequacy ratio is found significantly negatively associated to profitability. The effect of cost per loan assets seems minimal in explaining the variation of commercial banks' profitability. Thus, this study concludes that credit risk indicators like: default risk and capital adequacy ratio have significant impact on the profitability of commercial banks in Nepal.

Combey and Togbenou (2017) have investigated short-run and long-run relationship between three main macroeconomic indicators (gross domestic product growth, real effective exchange rate, and inflation) and banking sector profitability (measured by return on assets and return on equity) in Togo, from 2006 to 2015, by using Pool Mean Group estimator. Results show that, in the short-run, banks' return on assets and return on equity are not related to macroeconomic variables. But banks' return on assets is determined positively by bank capital to assets ratio and bank size while banks' return on equity is affected negatively by bank capital to assets ratio. However, in the long-run, real gross domestic product growth and real effective exchange rate affect negatively and statistically significant banks' return on assets, while inflation rate has no effect. Concerning bank's return on equity, in the long-run, results suggest that real gross domestic product growth, real effective exchange rate, and inflation affect negatively bank's return on equity. These results imply that to stabilize bank profitability and make Togolese banking sector more resilient, policymakers and banking sector managers must, among others, try to improve real gross domestic product growth, real effective exchange rate, and inflation volatility anticipation.

Abobakr (2018) has explained the elements that affect banks' profitability in the Egyptian banking sector during the period from 2006 to 2015. The study uses unbalanced panel annual data for 26 working banks in the Egyptian market. Generalized methods of moments (GMM) estimators are applied to define the most affected factors. Return on assets (ROE) and the return on equity (ROA) have been used as measurements of bank profitability. The

findings of the study reveal that high profitability are associated with large bank size, large capital ratio and large operating income, while lower profitability is associated with higher non-interest income. As macroeconomic variables do affect profitability significantly, the researcher suggests that macroeconomic strategies that encourage low inflation and sustain growth rate, enhances loans expansion, boost banks' profitability.

The literature review has been support to the presents study. The present study has been formulated the conceptual framework emphasized further.

Conceptual Framework

In recent years, some policies have been reformed to improve banks performance and some measures have been taken to minimize on the negative effects of lending in Nepalese commercial banks context. Moreover, policy makers have focused on mergers of commercial banks to increase capital requirements and lessened the competition. Despite the some policies measures undertaken to reduce credit risk in the banking sector in Nepal, there is still increasing trend of loan defaults and nonperforming loans of Nepalese commercial banks. Thus there is the need of such study impact of bank specific and macroeconomic variables on bank performance in Nepalese context.

With the literature review a conceptual framework for this study is developed by exploring the relationship between the dependent variable (return on assets) and bank specific (default risk, cost per loan assets and capital adequacy ratio) and macroeconomic (annual growth of gross domestic product, exchange rate and inflation) are independent variables. It is demonstrated in Figure 1.

Figure 1: Conceptual Framework
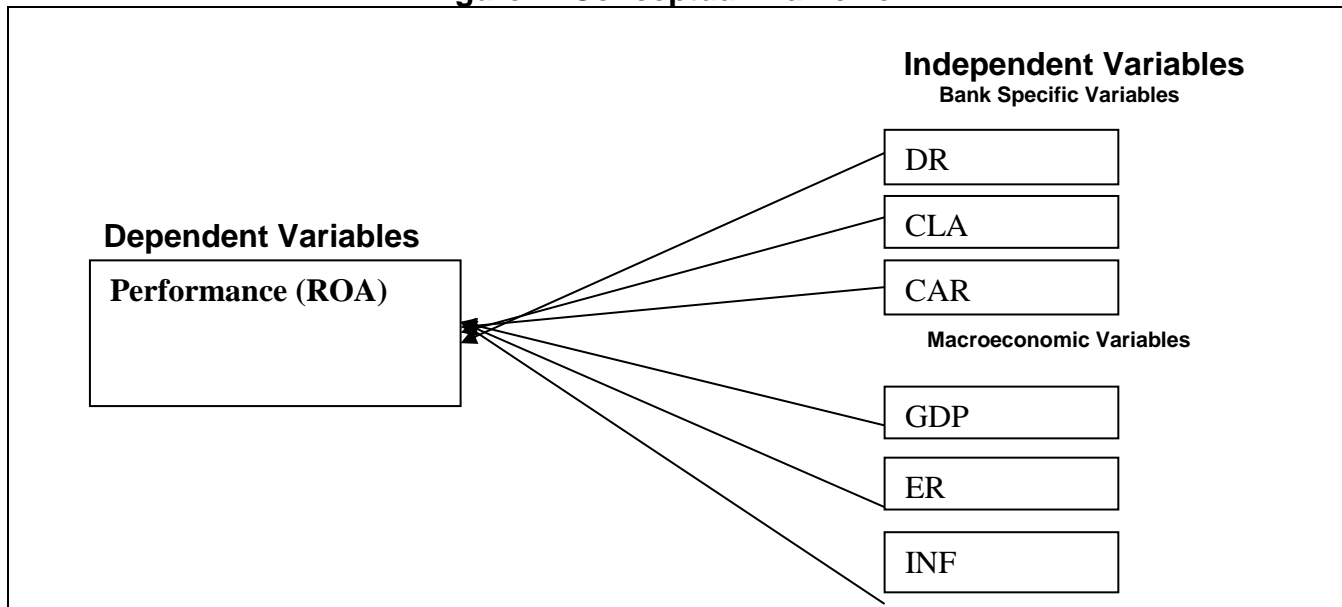
Source: Conceptual Framework Developed by Researcher (2018)

Variables and Hypothesis

In this study return on assets is taken as dependent variable and bank specific (default risk, cost per loan assets and capital adequacy ratio) and macroeconomic (annual growth of gross domestic product, exchange rate and inflation) as independent variables.

Dependent Variables

Return on Assets (ROA)

Return on assets gives a sign of the capital strength of the banking industry, which will depend on the industry; banks that require large initial investment will generally have lower return on assets (Appa, 1996). In this study, profitability is computed as net income divided by total assets. Return on assets is generally considered as a good indicator to evaluate the profitability of the assets of a bank in comparison to other banks in the banking industry. It is hypothesized that profitability of commercial bank is influenced by the bank specific variables like: default risk, cost per loan assets and capital adequacy ratio and macroeconomic variables: annual growth of gross domestic product, exchange rate and inflation.

Independent Variables

Bank Specific Variables

Default risk (DR)

Default rate is the term for a practice in the financial services industry for a particular lender to change the terms of a loan from the normal terms to the default terms that is, the terms and rates given to those who have missed payments on loan. Default risk is a ratio that measures the proportion of non-performing loans as against the total loans for a period. It gives an assessment of the total borrowers default on the conditions of loans and advances for a given period. It simply measures the efficiency of the loan portfolio management for a given bank within a given period (Appa, 1996; Ahmed et al., 1998; Kolapo et al., 2012). In this respect, Kurawa and Garba (2014), Alshatti (2015) have found significant positive relationship between default risk and profitability. However, Poudel (2012), Kaaya and Pastory (2013) and Djan, Stephen, Bawuah, Halidu and Kuutol (2015) found significant negative association between non-performing loan (default risk) and profitability of commercial banks. Likely, Kodithuwakku (2015) has also asserted that nonperforming loans and provisions have an adverse impact on the profitability. Bhattarai (2017) has found that default risk was significant positive with profitability. In line with majority of past empirical evidences, a negative relationship is expected between default risk and bank profitability.

H1: Default risk has a significant and negative impact on bank performance.

Capital adequacy ratio (CAR)

Capital Adequacy Ratio is a measure of the amount of bank's capital expressed as a percentage of its risk weighted credit exposure. Capital adequacy ratio is calculated dividing capital fund by risk weighted assets. As per the NRB guideline, commercial banks in Nepal must maintain the capital adequacy ratio above 10 percent. Capital adequacy increases the strength of the bank which improves the solvency of the bank and capacity to absorb the loan loss and protect bank from bankruptcy. Alshatti (2015) has asserted that capital

adequacy ratio don't affect the profitability of Jordanian commercial Banks. However, Poudel (2012) found significant negative association between capital adequacy ratio and bank performance in Nepalese context. Likely, Djan, Stephen, Bawuah, Halidu and Kuutol (2015) also found that capital adequacy ratio have an inverse impact on banks' performance. Bhattarai (2017) has found that capital adequacy ratio was significant and negative effect on bank profitability. In this scenario, a negative relationship is expected between capital adequacy ratio and bank profitability.

H2: **Capital adequacy ratio** *has a significant and negative impact on bank performance.*

Cost per loan assets (CLA)

Cost per loan asset is the average cost per loan advanced to customer in monetary term. Purpose of this is to indicate efficiency in distributing loans to customers. Cost per loan assets is calculated dividing total operating costs by total amount of loans advanced to customers. Cost per loan assets points out efficiency in distributing loans to customers (Appa, 1996; Ahmed et al., 1998; & Kolapo et al., 2012). Banks that are efficient in managing their expenses (costs), holding other factors constant, earn high profits. Therefore, it is expected that cost per loan assets and bank performance are negatively associated. This may not always be true because in cases where there are high expenditures due to a lot of businesses done, the bank can still increase the returns. However, the empirical studies show the mixed results on this issue. In Nepalese context, Paudel (2012) has found negative but statistically insignificant association between cost per loan assets (CLA) and bank performance (ROA). Kurawa and Garba (2014) have found significant positive association between cost per loan advanced and profitability. However, Djan, Stephen, Bawuah, Halidu and Kuutol (2015) also found that Cost per loan advanced has an inverse impact on banks' performance. Bhattarai (2017) has found that cost per loan assets was insignificant and negative effect on bank profitability. In view of theoretical perspective and empirical evidences, a negative relationship is expected between cost per loan assets and bank profitability.

H3: Cost per loan assets has a significant and negative impact on bank performance.

Macroeconomics Variables

GDP Growth Rate
Sufian and Kamarudin (2012) have found that GDP significantly influences profitability. However, Bilal, Saeed, Gull and Akram (2013) have found that real gross domestic product has positive impact on ROA. Simiyu and Ngile (2015) have found that real GDP growth rate had positive but insignificant effect to profitability of commercial banks as measured through Return on Assets (ROA). The macroeconomic variables GDP growth rate was not significant with performance of banks (Pradhan and Shrestha, 2016). This study used the annual GDP growth as a proxy for GDP. GDP growth is expected to have a positive relationship with profitability.

H4: Gross domestic product has significant and positive impact on bank performance.

Exchange Rate
Simiyu and Ngile (2015) have found that the exchange rate had a positive significant effect on the profitability of listed commercial banks on Nairobi Securities Exchange. Isaac (2015) indicates that unit increases in exchange rate is driven by an increase in profit after tax and equally shows that there is a significant relationship between exchange rate management and performance of financial institutions, most especially banks. Moreover, Aburime (2009) suggests that the exchange rate regimes are significant macroeconomic determinants of banks' profitability in Nigeria from 1980 to 2006. Osuagwu (2014) that found exchange rate is significant as a determinant of bank profitability through return on equity and non-interest margin, but not significant to return on asset as a measure of profitability in Nigeria.

H5: Exchange Rate has significant and positive impact on bank performance.

Inflation Rate
Inflation rate in a country contributes to the variations of bank profitability (Ravell, 1979). According to Rasiah (2010), central banks on their effort to control inflation, tend to increase the lending rate which impacts on bank profitability. Inflation and profitability may relate positively or negatively (Perry, 1992). Abreu and Mandes (2001) and Sufian and Chong (2008) suggested that inflation is negatively related to banks' profitability, implying that the higher inflation will contribute to the lower profit. However, Sufian (2009) found that the inflation has positive effects on bank's profit efficiency. Perry (1992) suggested that the effects of inflation on bank performance depend on whether the inflation is anticipated or unanticipated. Osamwonyi and Michael (2014) have found that inflation is not significant at all levels of significance with profitability. The macroeconomic variables inflation rate was not significant with performance of commercial banks in Nepal (Pradhan and Shrestha, 2016).

H6: Inflation rate has significant and negatively impact on bank performance.

The selected study variables, their definition, basis of measurement and priori expected sign have been depicted in Table 2.

Table 2: **Summary of the Variables**

Variable	Description	Measurement	Expected Sign
ROA	Return on assets	Net profit/Total assets	
DR	Default Rate	Non Performing Loans/ Total Loan	-
CLA	Cost Per Loan Assets	Total Operating Cost/ Total amount of Loans	-
CAR	Capital Adequacy Ratio	Capital fund/ Risk Weighted Assets	-
GDP	Real GDP	Annual Real Gross Domestic Product Growth Rate	+
ER	Exchange Rate	Rupees Exchange Rate with US Dollar	+
INF	Inflation Rate	Annual Customer Price Inflation Rate	-

3. The Methodology and Model

The secondary data have been obtained from the publications and websites of Nepal Rastra Bank (NRB), Ministry of Finance (MoF) and concerned banks. The collected data were then converted into balanced panel data. Panel data are data where the same observation is followed over time (like in time series) and where there are many observations (like in cross-

sectional data). In this sense, panel data combine the features of both time-series and cross-sectional data and methods. Panel data set have several advantages over the usual cross-sectional or time series data (Hsiao, 2005 and Plasmans, 2006). Panel data are more efficient with respect to random sampling and ease of identification, reduce collinearity among explanatory variables and are better for aggregation as the aggregation may vary over time (Plasmans, 2006). Similarly, Hsiao (2005) has indicated that an important advantage of panel data is that it allows for control for the impact of omitted variables, and contains information on the inter-temporal dynamics. Wei and Liu (2001) argue that panel data takes into account the effects of individual heterogeneity. Thus, this study has used panel data due to the advantage that it has. It helps to study the behavior of each bank over time and across space (Baltagi, 2005; Gujarati, 2003). Panel data also increases efficiency of the econometric estimators.

A sample of 17 commercial banks has been taken out of 28 commercial banks. Moreover, in selecting the banks for the study, due care has been given to include banks such as: Government Banks, joint venture, domestic, best performer, average performer and comparatively week performer in the sample.

In this study, convenience sampling technique has been used to select the banks as sample. *Convenience sampling* involves choosing respondents or organization as sample at the *convenience* of the researcher. Convenience sampling is a type of non-probability sampling that involves the sample being drawn from that part of the population that is close to hand. However, using convenience sampling collected samples may not represent the population of interest and therefore there may be a source of bias. Although, there are some limitations, convenience sampling can be used by almost anyone and has been around for generations. One of the reasons that it is most often used is due to the numerous advantages it provides. This method is extremely speedy, easy, readily available, and cost effective, causing it to be an attractive option to most researchers (Gary, 1990). In view of speedy collection and cost effective, this study has adopted convenience sampling technique in order to select the banks as sample. The reason behind choosing of the latest five year from 2011 to 2016 period is to include a fresh data in the analysis. This study has adopted descriptive and causal comparative research design. Table 1 shows the number of commercial banks selected for the study along with study period and number of observations.

Table 1: Number of commercial banks selected for the study along with study period and number of observations.

Banks	Total	Name of Banks	Study Period	Observation
Public Banks	2	Nepal Bank Limited	2011/2012 - 2015/2016	5
		Rastriya Banijya Bank Limited.	2011/2012 - 2015/2016	5
Joint Venture Banks	6	Standard Chartered Bank Limited	2011/2012 - 2015/2016	5
		Himalayan Bank Limited	2011/2012 - 2015/2016	5
		Nepal SBI Bank Limited	2011/2012 - 2015/2016	5
		Nepal Bangladesh Bank Limited	2011/2012 - 2015/2016	5
		Everest Bank Limited	2011/2012 - 2015/2016	5
		Nepal Bangaladesh Bank	2011/2012 - 2015/2016	5
Private Banks	9	Nabil Bank Limited	2011/2012 - 2015/2016	5
		Nepal Investment Bank Limited	2011/2012 - 2015/2016	5
		Sanima Bank Limited	2011/2012 - 2015/2016	5
		Sunrise Bank Limited	2011/2012 - 2015/2016	5
		NICASIA Bank Limited	2011/2012 - 2015/2016	5
		Prime Bank Limited	2011/2012 - 2015/2016	5
		Machhapuchhre Bank Limited	2011/2012 - 2015/2016	5
		Kumari Bank Limited	2011/2012 - 2015/2016	5
		Laxmi Bank Limited	2011/2012 - 2015/2016	5
Total Banks	17			85

The Model

From the result of literature review of the studied of Poudel (2012), Pradhan and Shrestha (2016) and Bhattarai (2017) in Nepalese context and Kaaya and Pastory (2013) and Djan, Stephen, Bawuah, Halidu and Kuutol (2015) and Yakubu (2016) in foreign studies have been chosen independent variables to examine the performance of commercial banks. The study has followed the literature to selection of the dependent and independent variables. It deals with the impact of default risk, cost per loan assets, capital adequacy ratio, annual growth of gross domestic product, exchange rate and inflation on return on asset. The model employed in this study is given as:

$$ROA_{it} = \beta_0 + \beta_1\ DR_{it} + \beta_2\ CLA_{it} + \beta_3\ CAR_{it} + \beta_4\ GDP_{it} + \beta_5\ ER_{it} + \beta_6\ INF_{it} + \varepsilon_{it}$$

Where:

ROA_{it} = Return on assets of ith bank for the time period t
CAR_{it} = Capital adequacy ratio of ith bank for the time period t
$NPLR_{it}$ = Non-performing loan ratio of ith bank for the time period t
CLA_{it} = Cost per loan assets of ith bank for the time period t
GDP_{it} = Gross Domestic Product for time period t
ER_{it} = Exchange Rate with US Dollar for time period t
INF_{it} = Inflation Rate for time period t
β_0 = The intercept (constant)
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5\ \beta_6,$ = The slope which represents the degree with which bank performance changes as the independent variable changes by one unit variable.
ε_{it} = error component

4. Analysis of Results

Descriptive Statistics

The descriptive statistics of the variables used in the study have been presented in Table 3.The result shows that the minimum and maximum profitability (ROA) of Nepalese sample commercial banks during the sample period are 0.16 percent and 4.01percent respectively. The average profitability (ROA) is 1.68 percent, which indicates the weak performance of Nepalese commercial banks.

Table 3: Descriptive Statistics of Selected Variable of Sample Banks

Variables	N	Minimum	Maximum	Mean	Std. Deviation
ROA	85	.16	4.01	1.68	.71
DR	85	.02	7.27	1.98	1.62
CLA	85	4.26	16.27	8.56	2.69
CAR	85	-9.77	20.74	11.15	3.91
GDP	85	.01	5.72	3.41	1.94
ER	85	81.02	106.35	94.61	9.04
INF	85	7.20	9.90	8.88	1.03

Source: Annual Reports of Sample Banks and Results are drawn from SPSS - 21

The average default risk (DR) is 1.9 percent, which shows that default risk is not so severe in Nepalese commercial banks. The key indicator of efficiency in loan management is the ratio of operating costs to loan and advances. The results of operating costs to loan and advances ranged from 4.26 percent in the most efficient to 16.27 percent at the other extreme. The average operating cost to loan and advances is 8.56 percent which shows that cost per loan advanced is so high in Nepalese context. Cost per loan assets is found high volatile as compared to the other study variables used in the current study which is evident from high standard deviation of the cost per loan advanced variable, which is 2.69 percent. Capital adequacy ratio has the minimum value of -9.77 percent to a maximum of 20.74 percent with the average of 11.15 percent. Capital adequacy ratio is found high volatile during sample period. Annual gross domestic growth rate ranges from minimum 0.01 percent to maximum 5.72 percent leading to average value of 3.41 percent. The average exchange rate is Rs 94.61 with US Dollar. The ranges from minimum Rs 81.02 to Rs 106.35 recorded in the study period. Similarly, inflation has the minimum-recorded value of 7.20 percent to maximum 9.90 percent with the average inflation of 8.88 percent.

Correlation Analysis
The Pearson's correlation coefficients among study variables are shown in Table 4. The results of the correlation coefficients of variables indicate that profitability is negatively associated with default risk, cost per loan assets and annual gross domestic growth rate.

Table 4: Pearson's Correlation Matrix for Dependent and Independent Variables

Variables	ROA	DR	CLA	CAR	GDP	ER	INF
ROA	1						
DR	-.203	1					
CLA	-.376**	.499**	1				
CAR	.183	-.693**	-.466**	1			
GDP	-.127	.280**	.572**	-.138	1		
ER	.122	-.223*	-.791**	.162	-.603**	1	
INF	.138	-.056	-.117	.039	-.258*	.123	1

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Source: Annual Reports of Sample Banks and Results are drawn from SPSS – 21

This implies that the bank profitability (ROA) tends to move in the opposite direction as with default risk, cost per loan advanced and annual gross domestic growth rate. However, capital adequacy ratio, exchange rate and annual inflation rate is positively associated to profitability. Moreover, the correlation matrix of the variables presented Table 3 reveal that all correlations coefficients among the independent variables are less than 0.70, implying the absence of multicollinearity. Thus, there is no evidence of presence of multicollinearity among the independent variables.

Regression Analysis

The regression of bank specific and macro-economic specific variables on bank performance has been analyzed by defining bank performance in terms of return on assets. The regression of bank specific variables and macroeconomic variable on the return on asset is shown in Table 5. The table indicates that the beta coefficient for default risk, annual gross domestic growth rate and annual inflation rate shows the positive relationship with profitability. The result shows that higher the default risk, annual gross domestic growth rate and annual inflation rate higher would be the return on assets. The beta coefficients are negative for cost per loan assets, capital adequacy ratio and exchange rate.

Table 5: Regression Result of Bank specific and Macroeconomic Variables on Performance of Nepalese Commercial Banks

$$ROA_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 CLA_{it} + \beta_3 CAR_{it} + \beta_4 GDP_{it} + \beta_5 ER_{it} + \beta_6 INF_{it} + \varepsilon_{it}$$

Variables	B	Std. Error	T	Sig.	Collinearity Statistics	
					Tolerance	VIF
(Constant)	6.970	1.929	3.613	.001		
DR	.011	.063	.172	.864	.459	2.180
CLA	-.234	.053	-4.405	.000	.234	4.267
CAR	-.022	.026	-.859	.393	.460	2.176
GDP	.026	.048	.557	.579	.561	1.783
ER	-.041	.014	-2.914	.005	.292	3.428
INF	.085	.069	1.222	.225	.931	1.074
No of Observations: 85, R Square:0.251, Adjusted R Square: 0.194, F value:4.361 , Probability: 0.001, DW: 1.146						

Source: Annual Reports of Sample Banks and Results are drawn from SPSS - 21

The result shows that higher the cost per loan assets, capital adequacy ratio and exchange rate lower would be the return on assets. The result shows that the cost per loan asset is found to be significant at less than 1 percent level of significance. The result is as per priori

expectation. However, the empirical studies show the mixed results on this issue. In Nepalese context, Paudel (2012) has found negative but statistically insignificant association between cost per loan assets (CLA) and bank performance (ROA). Kurawa and Garba (2014) have found significant positive association between cost per loan advanced and profitability. However, Djan, Stephen, Bawuah, Halidu and Kuutol (2015) also found that Cost per loan advanced has an inverse impact on banks' performance. Bhattarai (2017) has found that cost per loan assets was insignificant and negative effect on bank profitability. Similarly, the result shows that exchange rate negative is found to be significant at 1 percent level of significance. The result is with the contrary previous studies (Simiyu and Ngile, 2015 and Isaac, 2015). Simiyu and Ngile (2015) have found that the exchange rate had a positive significant effect on the profitability of listed commercial banks on Nairobi Securities Exchange. Isaac (2015) indicates that unit increases in exchange rate is driven by an increase in profit after tax and equally shows that there is a significant relationship between exchange rate management and performance of financial institutions, most especially banks. Table 6 depicts the expected sign, actual sign, significance level, hypothesis, and similar empirical studies.

Table 6: Relation between Bank Specific and Macroeconomic Variables on Performance of Nepalese Commercial Banks

Variables	Hypothesis	Results	Significance Level/ Non Significance	Hypothesis Accepted/ Rejected	Empirical Studies (Similar to the Study)
Banks Specifics					
DR	-	+	Non Sig.	Rejected (H$_1$)	Bhattarai (2017)
CLA	-	-	Non Sig.	Rejected (H$_2$)	Poudel (2012), Djan, Stephen,Bawuah, Halidu and Kuutol (2015) & Bhattarai (2017)
CAR	-	-	**	Accepted(H$_3$)	Pradhan and Shrestha (2016)
Macroeconomics					
GDP	+	+	Non Sig.	Accepted(H$_4$)	Pradhan and Shrestha (2016)
ER	+	-	**	Rejected (H$_5$)	Simiyu and Ngile (2015)&Isaac (2015)
INF	-	+	Non Sig.	Rejected (H$_6$)	Pradhan and Shrestha (2016)

**. Significant at the 0.01 level (2tailed).   *. Significant at the 0.05 level (2-tailed).

5. Conclusions

This study has examined the impact of bank specific and macro-economic specific variables on banks performance has been analyzed by defining bank performance in terms of return on assets. The descriptive and causal comparative research designs have been adopted for the study. The panel data of 17 commercial banks over the period of 5 years (2009 to 2016) have been collected from the annual reports of the banks in the sample. Pooled OLS model have been used to assess the impact of bank specific and macro-economic specific variables on the profitability of commercial banks.

The estimated regression models reveal that cost per loan assets is significantly negatively associated with banks' profitability. However, exchange rate is found significantly negatively associated to profitability. This study concludes that the commercial banks profitability in Nepal is mainly influenced by cost per loan assets. The study conducted that more than macroeconomic variables, bank specific factors are more responsible on the performance of Nepalese commercial banks.

The finding of this study is important for implication of policy of commercial banks in Nepal. The commercial banks should strictly follow the prevailing NRB Directive as well as Basel III Accord while managing credit risk. Compliance with the Basel III Accord means a sound approach to tackling credit risk and this ultimately improves bank performance.

The study has been limited in different ways. The study is based on secondary data available on annual reports on websites of respective banks and ministry of finance for macroeconomic variables. In this study only selected tools and techniques are used. The study covers only five years period, i.e. from 2011 to 2016. The accuracy of secondary data absolutely relies on the annual report of sample banks. There are several determining factors of performance of commercial banks. The study has carried out only one dependent variables return on assets (ROA). The ROE, NIM and EPS for future scope of the study to select dependent variables along with this study independent Variables. However, bank specific (DR, CLA and CAR) and macroeconomic (GDP, ER and INF) factors have been considered in this study. Future study will be done on ROE along with ROA to see the robustness of the results for bank performance.

Thus, this study hopes to be useful for academicians as a source of knowledge for further research. The study is concentrated on bank specific and macroeconomic factors to determinants of performance of commercial banks. Thus, further study should be carried out on the topic to point out the other factors that enhance mitigation of the bank specific and macroeconomic to improve performance of Nepalese commercial banks.

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