

The Role of Financial Ratios in Predicting Return on Equity of Commercial Banks

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Abstract

The explanatory power of the bank specific financial ratios on return on equity of the joint venture commercial banks operated in Nepal has been examined by using the database of 15 years from 2005/06 to 2019/20. The descriptive and correlational research design have been adopted for the study. The explanatory financial ratios used for the study includes capital adequacy, non-performing loan to total loan, net interest to total assets ratio, deposit to total assets ratio, and investment to total assets ratio. Statistical tools such as descriptive statistics, correlation analysis, and the regression analysis have been used as the major tools of data analysis. The results revealed that capital adequacy ratio, net interest to assets ratio and investment to assets ratio have the significant positive impact on commercial banks profitability. In contrast, non-performing loan to total loan has the significant negative impact on banks' profitability whereas, deposit to total assets ratio has no significant impact on commercial banks' profitability.

Key Words: *financial ratios, return on equity, deposit to assets ratio, investment to total assets ratio, capital adequacy ratio, net interest to assets ratio, investment to assets ratio.*

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General Background

Financial institutions play the important role in mobilizing the funds in the money market. Commercial banks as a financial intermediaries perform key financial functions in economies such as providing a payment mechanism, matching supply and demand in financial markets, dealing with complex financial instruments and markets, providing markets transparency, performing risk transfer and risk management functions. Therefore, as a financial intermediary, banks play a crucial role in the operation of economies. A proper functioning of banking system facilitates an efficient payments system, enhances savings/investments and thereby contributes for a rapid economic growth (Weersainghe & Perera, 2013). The soundness of the banks to a larger extent depends on the financial performance which indicates the strength and weakness of a particular bank (Makkar & Singh, 2013) and the financial performance is determined by the profitability earned by the banks.

The bank specific determinants of bank profitability may be different to individual bank. The reasons behind this may be because of the difference in managerial decisions. The empirical studies conducted around the globe suggested that the various factors that effect on bank's profitability. Hijazi and Shah

(2004); Awan, Rashid, and Rehman (2011) examined a significant negative relationship between debts to assets ratio and the bank's profitability. On the other hand, Anuar et.al. (2011) examined that deposit to total assets have a significant positive effect on profitability. Loan to total assets and equity to total assets ratios have also significant positive impact on profitability. Level of profitability attained would depend on the variation of its determinants over time. The determinants of profitability are empirically well-explored, although the definition of profitability varies among studies. Bourke (1989) examined a significant positive relation between capital adequacy and profitability confirming that the higher the capital ratio, the higher the profitability in a bank. Berger (1995) and Anghazo (1997) concluded that banks which are well-capitalized are more profitable than the others in the USA. Abreu and Mendes (2001) documented a positive relationship between the loan ratio and profitability. Bashir and Hassan (2003) and Staikouras and Wood (2004) showed that a higher loan ratio actually impacts profits negatively. Disregarding the profitability measures, most of the banking studies have noticed that the capital ratio, loan-loss provisions and expense control are important factors in achieving high profitability (Bearle & Means, 2014).

The relationship between the bank performance and its determinants has been extensively studied around the globe, however, very few studies have tried to investigate this relationship in Nepali banking industry. Bhattarai (2017) examined that non-performing loan ratio has negative effect on overall bank profitability (ROA) whereas, non-performing loan ratio has positive effect on shareholders' return (ROE). Moreover, the results show that bank size has significant positive effect on bank profitability (ROA, ROE). However, cost per loan has significant positive association only with overall bank profitability (ROA). Unlikely, gross domestic product growth rate has significant positive effect only on shareholders' return (ROE). Poudel (2018) examined that credit risk has the significant negative impact on profitability of commercial banks in Nepal. In addition, solvency ratio, interest spread rate, and inflation have the insignificant negative impact on profitability. In contrast, capital adequacy ratio, total assets, and GDP growth have the significant positive impact on profitability of commercial banks in Nepal. Finally, inter-bank interest rate has insignificant positive impact on profitability. Neupane (2020) concluded that the profitability of Nepali commercial banks measured by return on assets is significantly influenced by the external factors. Among external factors, industry specific factors have high degree of impact on return on assets whereas macroeconomic variables have quite a weak degree but significant impact on profitability of Nepali commercial banks as measured by return on assets. Further, the profitability measured by net interest margin (NIM) is significantly influenced only by capital adequacy, absolute number of branches and annual inflation rate.

Previous studies mainly focused on identifying the factors affecting bank's profitability such as liquidity, leverage, risk and profitability of the bank. However, this study aims to identify the impact of core financial ratios relating to bank characteristics on profitability of the joint venture commercial banks operated in Nepal. The analysis examined that capital adequacy ratio, net interest to assets ratio, and investment to assets ratio have the significant positive impact on commercial banks profitability. In contrast, non-performing loan to total loan has the significant negative impact on banks' profitability whereas, deposit to total assets ratio has no significant impact on commercial banks' profitability.

The following section summarizes the overall research methodology used in the study. Section three describes the results derived from the analysis. Finally, section four summarizes the conclusions of the study.

Research Methodology

This study adopted descriptive and correlational research design based on secondary data set of 60 observations during the fiscal year 2005/06 to 2019/20 from the joint venture commercial banks operated in Nepali financial market. Descriptive research design is used to describe the past phenomenon of the bank specific financial ratios used in the study. Similarly, correlational research design is used to ascertain the direction and magnitude of the observed relationship between profitability and bank specific financial ratios. All the data are collected from the annual reports of the sample banks. Total 28 commercial banks are presently operating in Nepali financial market including 6 joint venture banks. Out of them 6 joint venture banks, 4 joint venture banks are selected as sample for the study.

All the data are collected from the annual financial reports of concerned sample banks. The data analysis is made by using statistical software SPSS-26. The statistical tools used for the data analysis consists of descriptive statistics, correlation analysis, and regression analysis. The statistical significance of the results has been tested by using adjusted R2, t-test, and F-test. To analyze the bank specific determinants in predicting banks' profitability, different financial ratios are used. Through the ratio analysis the relationship among the two financial figures can be measured.

The Model

Ordinary Least Square (OLS) is used as the major tool for the data analysis in determining the predictive power of bank specific financial ratios on profitability. The model used for the analysis is explained as follows:

$$Y_{it} = \beta_1 + \beta' \square_{it} + \varepsilon_{it} \quad (1)$$

Where,

Y_{it} = Represents the explained variable used for the study for bank i and time t .

β_1 = The constant term assumed to be constant over the time.

β' = The coefficients of all explanatory variables.

\square_{it} = Represents the vector of independent variables

ε = The error terms which are not covered by the model.

This model can be presented in detail with the corresponding variables used for the study as follows:

$$ROE_{it} = \beta_1 + \beta_2 CAR_{it} + \beta_3 NPL_{it} + \beta_4 NIAR_{it} + \beta_5 DAR_{it} + \beta_6 IAR_{it} + \varepsilon_{it} \quad (2)$$

The detail definitions of the explained and explanatory variables along with the expected relationship have been explained in detail in following section.

Return on Equity (ROE)

The explained variable used for the study is return on equity (ROE). It is the most commonly used measure of profitability in accounting and finance literature. ROE measures the rate of return to the holders of the common stock on their net worth. More specifically, return on equity signifies how good the company is in generating returns on the investment made by the common stock holders. Mathematically, ROE is the ratio between earning earned by the company and the shareholders' equity. Symbolically:

$$ROE = \text{Net Income} / \text{Shareholders Fund} \quad (3)$$

Capital Adequacy Ratio (CAR)

Capital adequacy ratio is the measure of financial strength of the commercial banks. it is also a measure of ability to absorb the financial risk that may be incurred in the commercial banks. Thus, it is the pre-requisites of protection against the financial distress. In financial term, it is the ratio between capital funds to risk weighted assets is termed as capital adequacy ratio. Symbolically:

$$CAR = \text{Capital Fund} / \text{Risk Weighted Assets}. \quad (4)$$

Bourke (1989) examined a significant positive relation between capital adequacy and profitability confirming that the higher the capital ratio, the higher the profitability in a bank. Berger (1995) and Anghazo (1997) concluded that banks which are well-capitalized are more profitable than the others in the USA. Ramadhanti, Marlina, and Hidayati (2019) examined that the CAR has a significant positive effect on commercial bank's

profitability. Therefore, the hypothesis for the study is as follows:

Hypothesis (H₁): CAR has the significant positive impact on profitability.

Non-Performing Loan Ratio (NPL)

Non-performing loan is also known as the credit risk represents the chances of losing investment or routine receivable instalments. More specifically, credit risk is the ratio between total amount of nonperforming loan and total loan. Symbolically:

$$\text{NPL} = \text{Non-performing Loan} / \text{Total Loan} \quad (5)$$

Noman *et al.* (2015) confirmed a significant negative effect of non-performing loan (credit risk) on profitability. In Addition, Poudel (2018) examined that the NPL has the significant negative impact on profitability of commercial banks in Nepal. Therefore, the hypothesis for the study is as follows:

Hypothesis (H₂): NPL has the significant negative impact on bank's profitability.

Net Interest to Assets Ratio (NIAR)

Net interest to assets ratio shows the earning efficiency of the bank. Mathematically, it is the ratio between net interest earning by the bank and the investment in total assets. Symbolically:

$$\text{NIAR} = \text{Net Interest Income} / \text{Total Assets} \quad (6)$$

Anbar and Alper (2011) examined that higher real interest can lead to higher profitability of the bank. Similarly, Puspitasari *et.al.* (2021) identified that NIM is positively related to ROA. Based on these empirical evidences, the hypothesis purposed for the study is as follows:

Hypothesis (H₃): NIAR has the significant positive impact on bank's profitability

Deposit to Assets Ratio (DAR)

Long-term deposits are the major sources of funds for long term investments which generates income for banking and financial institutions. Deposit to assets ratio is the ratio between long term deposit to total assets. Symbolically:

$$\text{DAR} = \text{Long Term Deposit} / \text{Total Assets} \quad (6)$$

Shah and Khan (2017) examined that deposit to assets ratio has the significant positive influence on bank's profitability. Therefore, the research hypothesis for the study is as follows:

Hypothesis (H₄): DAR has the significant positive impact on bank's profitability.

Investment to Assets Ratio (IAR)

Investment activity is one of the major activities of the banking and financial institutions through which banks generate incomes. IAR is the ratio between long-term investment and the total assets. Symbolically:

$$\text{IAR} = \text{Long Term Investment} / \text{Total Asset} \quad (6)$$

Islam *et.al.* (2017) suggested that diversified banking activities including the investment activities made banks more profitable. Based on the empirical suggestion, the hypothesis for the study is as follows:

Hypothesis (H₅): IAR has the significant positive impact on bank's profitability.

Variables Description

Table – 1 summarizes the operational definition of the variables used for the study along with the expected signs. ‘+’ indicates the variables will have the significant positive impact on bank’s profitability. ‘-’ indicates that the variable will have the significant negative impact on bank’s profitability.

SN	Variables Used	Definition	Expected Signs
1	Return on Equity (ROE)	Net profit/Shareholders’ equity	
2	Capital Adequacy Ratio (CAR)	Shareholders’ Equity / Risk Weight Assets	+
3	NPL Ratio (NPL)	Nonperforming loan / Total Loan	-
4	Net Interest to Assets Ratio (NIAR)	Net Interest Income/ Total assets	+
5	Deposit Ratio (DAR)	Long Term Deposit/Total Assets	+
6	Investment to Asset Ratio (IAR)	Long Term Investment/Total Asset	+

Table – 1 shows the operational definition of the explained and explanatory variables along with expected relationship with the dependent variable. The explained variable used for the study is profitability measured in term of return on equity (ROE). The explanatory variables are capital adequacy ratio, non-performing loan, net interest to assets ratio, deposit ratio, and investment ratio. Among the explanatory variables it is expected that only the non-performing loan will have the significant negative impact on commercial bank’s profitability commercial banks operated in Nepali money market.

Results

This section of the study consists the analysis of secondary data using different statistical tools such as descriptive analysis, correlation analysis and the regression analysis.

Descriptive Statistics

The descriptive statistics of variables used in the study for sample banks during the period 2005/06 to 2019/20 are summarized in table – 2. The descriptive statistics include mean, median, standard deviation, minimum and maximum values of the variables

Table 2

Descriptive Statistics of the Variables

Table– 2 shows descriptive statistics of the variables used for the study from all 60 observations for the period 2005/06 to 2019/20. ROE is the return on equity. CAR is capital adequacy ratio, NPL is the non-performing loan to total loan. NIAR is the net interest to total assets ratio. DAR is the long-term deposit to total assets ratio. IAR is the long-term investment to total assets ratio. The measures used for the analysis is minimum and maximum values with the mean and standard deviation of the variables. The values presented in the table are in percentage. n represents the number of observations.

Variables	n	Minimum	Maximum	Mean	SD
Return on Equity (ROE) (%)	60	8.14	39.59	21.15	8.197
Capital Adequacy Ratio (CAR) (%)	60	3.00	30.00	13.53	5.331
NPL Ratio (NPL) (%)	60	0.23	7.00	0.87	1.193
Net Interest to Assets Ratio (NIAR) (%)	60	0.21	9.00	4.88	2.470
Deposit to Assets Ratio (DAR) (%)	60	20.00	99.00	70.85	24.763
Investment to Assets Ratio (IAR) (%)	60	2.55	39.98	19.39	10.049

Table – 2 shows the descriptive statistics of the variables used for the study. The descriptive statistics includes minimum, maximum, mean, and standard deviation. Return on equity (ROE) ranges from minimum 8.14% to maximum 39.59% with mean 21.15%, and standard deviation. ROE does not vary greatly across the

bank because the standard deviation is about 8.197%. Average of capital adequacy ratio is 13.53% and minimum and maximum values area 3% and 30% respectively and standard deviation is 5.331%. The average non-performing loan ratio is 0.87% ranging from minimum 0.23% to maximum 7% with standard deviation 1.193%. Similarly, maximum and minimum values of net interest income to assets ratio are 9.00% and 0.21% respectively with mean 4.88% and standard deviation 2.470%. Likewise, maximum and minimum values of deposit to assets ratio are 99.0% and 20.0% respectively with mean 70.85% and standard deviation 24.763%. Finally, investment to assets ratio ranges from minimum 2.55% to maximum 39.98% with mean 19.39% and standard deviation 10.049%.

Correlations Analysis

The correlation analysis is generally used to describe the degree to which one variable is related to another. It helps to determine whether a positive or a negative relationship exists between the dependent and independent variables. The positive correlation indicates that increase in value of one variable leads to increase in value of other variable, and the negative correlation indicates that increase in value of one variable led to decrease in value of the other variable.

The correlation coefficient lies between +1 and -1. The +1 coefficient indicates that the variables are perfectly positively correlated and -1 coefficient indicates that the variables are perfectly negatively correlated. And, if the correlation coefficient is 0, it means that the variables are not related to each other. The numbers indicate in table – 3 are the degree of correlation between the variables.

Table 3

Correlation Analysis

Table – 3 presents the correlation coefficients of different financial ratios on banks’ profitability associated with 60 observations for the period 2005/06 to 2019/20. ROE is the return on equity. CAR is capital adequacy ratio, NPL is the non-performing loan to total loan. NIAR is the net interest to total assets ratio. DAR is the long-term deposit to total assets ratio. IAR is the long-term investment to total assets ratio.

	Correlation Coefficients					
	ROE	CAR	NPL	NIAR	DAR	IAR
Return on Equity (ROE)	1					
Capital Adequacy Ratio (CAR)	.311*	1				
NPL Ratio (NPL)	-.507**	0.156	1			
Net Interest to Assets Ratio (NIAR)	0.182*	-0.144	0.137	1		
Deposit to Assets Ratio (DAR)	0.023	-0.051	-0.024	-0.111	1	
Investment to Assets Ratio (IAR)	.319*	.423**	0.104	-.729**	-0.072	1

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

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

Table – 3 shows that the correlation coefficients between independent and dependent variables. The correlation coefficients of CAR (0.311*), NIAR (0.182*), and IAR (0.319*) on return on equity are positive and statistically significant at 5% level of significance. The significant positive correlation coefficients further confirm that CAR, NIAR, and IAR have positive relationship with banks’ profitability. More clearly, the higher the capital adequacy ratio, net interest to assets ratio, and investment to assets ratio, the higher would be the return on equity.

In contrast, correlation coefficient between non-performing loan ratio and return on equity is negative (-0.507**) and statistically significant at 1% level of significance. The significant negative correlation coefficient further reveals that nonperforming loan ratio has the negative relationship with return on equity. More specifically, the higher the nonperforming loan, the lower would be the return on equity.

On the other hand, the correlation coefficients between deposit to assets ratio and return is positive (0.023)

and statistically insignificant. The insignificant correlation coefficient suggests that deposit to assets ratio has insignificant impact on banks profitability.

Regression Analysis

Multiple regression analysis has been conducted to find the predictive power of the financial ratios in predicting profitability of the commercial banks in Nepal. Also, the robustness of the relationship between the variables obtained from the correlation analysis is checked. Table – 4 shows the regression results of explanatory variables on explained variable.

Table 4
Regression Analysis

Table – 4 presents the regression results of different financial ratios on banks’ profitability associated with 60 observations for the period 2005/06 to 2019/20. ROE is the return on equity. CAR is capital adequacy ratio, NPL is the non-performing loan to total loan. NIAR is the net interest to total assets ratio. DAR is the long-term deposit to total assets ratio. IAR is the long-term investment to total assets ratio.

$$ROE_{it} = \beta_1 + \beta_2 CAR_{it} + \beta_3 NPL_{it} + \beta_4 NIAR_{it} + \beta_5 DAR_{it} + \beta_6 IAR_{it} + \epsilon_{it}$$

Regression Coefficients							
Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.103	0.388		-2.844	0.006		
CAR	0.177	0.082	0.235	2.16	0.035	0.761	1.315
NPL	-12.045	1.873	-0.647	-6.43	0.000	0.887	1.127
NIAR	8.308	3.643	0.354	2.28	0.027	0.373	2.68
DAR	0.063	0.062	0.099	1.005	0.320	0.932	1.073
IAR	11.671	3.519	0.552	3.317	0.002	0.325	3.082

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	7.124	5	1.425	11.462	0.000
Residual	6.713	54	0.124		
Total	13.837	59			

Model Summary				
R	R ²	Adjusted R ²	Std. Error of the Estimate	DW
0.718	0.515	0.470	0.353	2.170

Table – 4 shows the results obtained from the regression analysis used for the study. The significance of the overall model is tested by the ANOVA where F test (F = 11.462) is significant (P = 0.000) at 1% significance level. Similarly, the overall goodness of fit of the model is tested by using adjusted R². The adjusted R² (0.470) reveals that around 47% variation on return on equity is explained by the explanatory variables used in the model in Nepali banking sector. The statistics further reveal that VIF for all the independent variables are less than 10 suggesting that there is no any issue of multicollinearity among the independent variables. The regression coefficient of CAR (0.177) on return on equity is positive and statistically significant (0.035) at 5% level of significance. The significant positive coefficients further reveal that capital adequacy ratio has the significant positive impact on return on equity. More clearly, the higher the capital adequacy ratio, the higher would be the profitability can be achieved in Nepali commercial banks. This finding supports the large body of existing empirical evidences such as Bourke (1989), Berger (1995), Anghazo (1997),

Poudel (2018), and Ramadhanti, Marlina, and Hidayati (2019). Based on the findings and discussions, there are sufficient evidences in favour of the research hypothesis that capital adequacy ratio has the significant positive impact on banks' profitability.

In contrast, the regression coefficient of non-performing loan ratio (-12.045) is negative and statistically significant (0.000) at 1% level of significance. The negative and significant regression coefficient further confirmed that non-performing loan ratio has the significant negative impact on return on equity. It means, the higher the non-performing loan, the lower would be the banks' profitability. This finding supports the existing empirical results of Noman *et al.* (2015), Bhattarai (2017), and Poudel (2018). Therefore, the research hypothesis that the non-performing loan has the significant negative impact on commercial bank's profitability can't be rejected.

Regarding the variable net interest to assets ratio has the significant (0.027) positive regression coefficient (8.308). The significant positive regression coefficient suggests that net interest to assets ratio has the significant positive impact on return on equity. More specifically, the higher the net interest to assets ratio, the higher would be the banks' profitability can be achieved in Nepali commercial banks. This finding is in favour of the findings of Anbar and Alper (2011) and Puspitasari *et al.* (2021). Therefore, we have sufficient evidences in favour of research hypothesis that net interest to assets has the significant positive impact on banks' profitability.

Similarly, the regression coefficient (11.671) of investment to assets ratio is also positive and statistically significant (0.002) at 1% significance level. The significant positive beta coefficient of investment to assets ratio has the significant positive impact on return on equity. It means, the higher the investment to assets ratio, the higher would be the banks profitability among the Nepali commercial banks. This finding supports the findings of Islam *et al.* (2017). Hence, there is sufficient evidences in favour of hypothesis that investment to assets ratio has the significant positive impact on banks profitability.

The regression coefficient (0.063) of deposit to assets ratio on return on equity is insignificant (0.320) at 5% level of significant. The insignificant regression coefficient of deposit to assets ratio has the insignificant impact on banks' profitability in Nepali commercial banks. This finding also contradicts with the finding of Shah and Khan (2017). Therefore, there is no sufficient evidence in favour of research hypothesis that deposit to assets ratio has the significant positive impact on banks' profitability.

Conclusion

This study examined the determinants of return on equity of joint venture commercial bank in Nepal. The data have been collected for the period of 15 years from 2005/06 to 2019/20. The descriptive and correlational research design have been adopted for the study. The explanatory variables used for the study includes capital adequacy, non-performing loan to total loan, net interest to total assets ratio, deposit to total assets ratio, and investment to total assets ratio. Statistical tools such as descriptive statistics, correlation analysis, and regression analysis have been used as the major tools of data analysis. The results revealed that capital adequacy ratio, net interest to assets ratio and investment to assets ratio have the significant positive impact on commercial banks profitability. In contrast, non-performing loan to total loan has the significant negative impact on banks' profitability whereas, deposit to total assets ratio has no significant impact on commercial banks' profitability.

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