

Original Article

Impact of Capital Adequacy and Bank Operational Efficiency on Profitability of Nepalese Commercial Bank

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Abstract - This paper examines the impact of capital adequacy and bank operational efficiency on the profitability of Nepalese commercial banks. Descriptive and fixed effect regression was used to analyze the data. The study is conducted using panel data of 9 commercial banks operated in Nepal with 90 observations for the period 2007/08 to 2016/17. The dependent variable is the return on the asset while the independent variables are capital adequacy ratio, operation efficiency, loan to deposit, bank size, and equity ratio. The study revealed that CAR and OEOI have negative significant relation whereas, EQR has a positive significant relationship with the profitability of the sampled commercial bank.

Keywords - Profitability, Commercial bank, Capital Adequacy, Operational Efficiency.

I. INTRODUCTION

The banking sector plays a significant role in the development of any country's economy. It acts as a bridge between people with money and those who need it. It collects deposits by providing certain interest and mobilizes it to the productive sector or those who need funds by charging a certain interest rate higher than the interest provided on deposit. As per the Banking and Financial institution Act (2017), commercial banks are classified as 'A' class banks in Nepal on the basis of their nature of work and capital requirement. In Nepal, a major proportion of the financial sector's total assets are held by commercial banks. They even play a crucial role in the economic development of a nation (Tuladhar, 2017). In addition, the stock market has been dominated by the banks which cover 75% out of the total 194 listed companies (Neupane, 2019).

Profitability can be defined as the ability to generate revenues in excess of its expenses by making the best use of its available resources. In other words, this is a capability of generating profits from its operations. Bank profitability refers to the difference between the profit amount gained from the assets and the expense of the liabilities. Profitability is driven by the ability of a bank in generating sufficient earnings or in lowering operational costs, implying being more efficient (Neupane, 2019). It is a measure of a firm's efficiency, which represents the ability of a bank to

generate revenue in excess of cost, in relation to the bank's capital base. It acts as important information in economic decision makings and has been always used by investors, managers, and financial analyzers as a guide of dividend payment, a tool for measuring management efficiency, and an instrument for predicting and evaluating decision makings (Rijal, 2019).

A key part of bank regulation is to make sure that firms operating in the industry are prudently managed. The aim is to protect the firms themselves, their customers, the government, and the economy by establishing rules to make sure that these institutions hold enough capital to ensure the continuation of a safe and efficient market and able to withstand any foreseeable problems (Baral, 2016). Today, every bank is struggling to attract more and more customers towards it, so that it can make its name in the banking industry and gets fame by their operations and working so that their customer's loyalty can be enhanced towards them and they can be able to use this in their future policies. The entire banks and banking groups are ready to do what their customers are demand from them in order to retain them. In the present situation, just offering different facilities is not just enough, banks need to improve their quality and even gain adequate profit.

The paper is organized as follows. Section 2 presents the review of literature, followed by the study variable and hypothesis in section 3. The fourth section involves research methodology. Section 5 includes data analysis and interpretation. Finally, Section 6 has a summary and conclusion.

This study aims at examining the effect of capital adequacy and operating efficiency in the performance of commercial banks of Nepal.

II. LITERATURE REVIEW

Pradhan and Shrestha (2016) conduct a study on 17 commercial banks of Nepal for the period 2006 to 2013 and identified that banks operating efficiency, loan to deposit, total deposit to total assets, loan loss provision to total equity have a significantly positive impact on the financial performance of Nepalese commercial bank whereas, total capital ratio has a



negative impact on the financial performance of Nepalese commercial banks. Chalise (2019) using fixed-effect regression revealed that total capital adequacy has a negative insignificant impact on the bank performance (ROA) whereas debt-equity ratio and bank size have a positive insignificant impact on bank performance and equity ratio has a positive significant impact on the Performance of Nepalese commercial bank.

Baral (2016) conducted a study on 20 commercial banks from the fiscal year 2006/07 to 2012/13 leading to a total of 160 observations and revealed that hat size, operational efficiency, and return on assets have a positive relationship with the capital adequacy ratio which implies that higher the size, operational efficiency and return on assets, higher would be the capital adequacy ratio. The result also shows that customer deposits and loans and advances have a negative relation with both the capital adequacy ratio. It indicates that the higher the customer deposits and loans and advances, the lower would be the capital adequacy ratio.

Neupane (2019) using the pooling method taking a sample of 8 banks from 2011 to 2017 revealed that bank size and operational efficiency (OEOI) had a significant negative relation with ROA whereas, loans to deposit had a negative and insignificant relationship. Setiawan and Hermanto (2017) took the sample of 25 banks in Indonesia from 2008 to 2013, identified that CAR had positive significant relation and OEOI had negative significant relation with bank profitability. Buchory, (2015) conducted a study in Indonesia and concluded that loan to deposit ratio (LDR) has a negative effect but no significant effect on the return on assets (ROA); operating expenses to operating income (OEOI) has negative and significant effects on the return on assets (ROA).

Rengasamy (2014) conducted a study on eight different banks of Malaysia and revealed that there was a positive and non-significant impact of loan to deposit ratio in bank profitability indicated by ROA in five different banks whereas among rest two, one had a negative and non-significant impact and other had a positive and significant impact. Rijal (2019) took the sample of 8 commercial banks of Nepal covering the period from 2011 to 2017 and revealed that the credit to deposit ratio had a significant and positive return on assets.

Bhattarai (2016) examined the effect of credit risk on the performance of Nepalese commercial banks using the pooled data of 14 commercial banks for the period 2010 to 2015 revealed that CAR had a positive insignificant relation and bank size had a positive and significant relation with bank profitability. Here, profitability was measured using ROA.

Singh and Sharma (2018) conducted a study on twenty-six public sector banks of India, identified that there is a significant and positive relationship between return on assets and capital adequacy ratio (CAR). Poudel (2012) analyzed the financial report of 31 banks for the period 2001-2011, concluded that the capital adequacy ratio has an inverse impact on banks' financial performance.

III. STUDY VARIABLE AND HYPOTHESIS

The dependent variables and independent variables used in this study are as follows:

Dependent Variable

Return on assets (ROA)

Return on Assets is the yield or return on total assets invested in the operations of an organization. It measures organization profitability, equal to a fiscal year's earnings divided by its total assets expressed as a percentage. Investors usually look for banks with a higher return on assets. In this study, the bank performance is only measured by return on assets (Chalise, 2019). For banks with similar risk profiles, ROA is a useful static for comparing bank profitability as it avoids distortions produced by differences in financial leverage (Sinkey and Joseph, 1992). It is more suitable for comparing the banks in the same industry than other measures of performance. Thus, return on assets (ROA) is chosen as the performance measure for this study.

Independent Variables

Capital adequacy ratio (CAR)

The capital adequacy ratio is the ratio that determines the bank's capacity to meet the time liabilities and other risks such as credit risk, operational risk, etc. In the simplest formulation, a bank's capital is the cushion for potential losses and protects the bank's depositors and other lenders. It is expressed as a percentage of a bank's risk-weighted credit exposures (Pradhan and Shrestha, 2016). It is a measurement of a bank's available capital expressed as a percentage of a bank's risk-weighted credit exposures. Is used to protect depositors and promote the stability and efficiency of financial systems around the world (Hayes, 2019). It is expected to have a positive relationship with banks profitability ($\beta_1 > 0$).

H_1 : *The capital adequacy ratio has a significant and positive effect on bank performance.*

Equity ratio (EQR)

It shows how much of a company's assets are funded by shareholder equity. The ratio reveals how much a company depends on debt and how financially stable it may be in the long run (Kenton, 2019). It is the investment leverage or solvency ratio that measures the number of assets that are financed by owners' investments by comparing the total equity in the company to the total assets. In general, higher equity

ratios are typically favorable for companies (Chalise, 2019). It is expected to have a positive relationship with banks profitability ($\beta_2 > 0$).

H₂: *The equity ratio had a significant and positive effect on bank performance.*

Bank size (BS)

Bank size is generally used to capture potential economies or diseconomies of scale in the banking sector (Bhattarai, 2016). Larger banks tend to be more active in markets, have a greater product, and have better possibilities for diversification (Lehar, 2005). The natural logarithm of total assets of the banks is used as a proxy for bank size. It is expected to have a positive relationship with banks profitability ($\beta_3 > 0$).

H₃: *Bank size has a significant and positive effect on bank performance.*

Loan to deposit ratio (LD)

Also termed as a credit to deposit ratio measures the bank's capability to fulfill its financial obligations through deposits (Rijal, 2019). Higher the ratio higher would be the risk for banks as banks' reserve

will decline by advancing more loans however lower the ratio indicates that banks may not be earning much (Murphy, 2019). It is expected to have a positive relationship with banks profitability ($\beta_4 > 0$).

H₄: *The loan to deposit ratio had a significant and positive effect on bank performance.*

Operation efficiency (OE)

It is the ability of a bank to minimize or manage its expenses in a way to produce output without hampering the quality. Thus, theoretically, a bank that can manage its expenses efficiently and effectively is expected to be more profitable. The total operating income to total operating expense ratio is considered as the proxy of a bank's operational efficiency (Pradhan and Shrestha, 2016). A high operational efficiency ratio reflects a bank's ability to effectively manage its operating expenses and thus is likely to affect profitability positively (Hassan, 2002). It is expected to have a positive relationship with banks profitability ($\beta_5 > 0$).

H₅: *Operation efficiency had a significant and positive effect on bank performance.*

Table 1: Variables definition, measurement, and expected sign

S. No	Abbreviation	Description	Measurement	Expected sign
1	CAR	Capital adequacy ratio	Tier 1 capital + Tier 2 capital/ Risk weighted Assets	+
2	EQR	Equity ratio	Total equity/Total assets	+
3	BS	Bank size	Natural logarithm of total assets	+
4	LD	Loan to deposit ratio	Loan/Total deposit	+
5	OHIO	Operation Efficiency	Operating income/Operating expense	+

Source: (Pradhan and Shrestha, 2016), (Chalise, 2019).

IV. RESEARCH METHODOLOGY

Sample Selection

Out of a total of 28 commercial banks operating in Nepal, 9 were selected as a sample for the study. Nabil Bank Limited, Standard Chartered Bank Nepal, Nepal State Bank of India, Nepal Investment Bank Limited, Himalayan Bank Limited, Agricultural Development Bank, Everest Bank Limited, Laxmi Bank Limited, and Prime Commercial Bank Limited has been selected as sample bank. All together data of ten fiscal years from 2007/08 to 2016/17 had been examined to study the impact of capital adequacy and operation efficiency in the profitability of sampled commercial banks of Nepal.

Research Design

Descriptive and causal-comparative research design had been adopted in the study to identify the impact of capital adequacy and operation efficiency in the profitability of sampled commercial banks of Nepal.

Sources of Information

This study is based on secondary sources of data from the 9 commercial banks of Nepal with the period of 2007/08 to 2016/17. Data are obtained from the banking and financial statistics of Nepal Rastra Bank and annual reports of respective banks taken as samples.

V. DATA ANALYSIS AND INTERPRETATION

This section deals with the various issues and analyzed the impact of capital adequacy, operation efficiency, and loan deposit ratio on the profitability of Nepalese commercial banks. It includes descriptive statistics of variables, Hausman test, regression analysis. Data analysis was done by using E-views software.

Descriptive Statistics

Table 2 shows the descriptive statistics which includes a minimum value, maximum value, mean

value, and standard deviations with 9 sample commercial banks for the study period of 2007/08 to 2016/17 that makes a total of 90 observations. In this

table, ROA is the dependent variable whereas CAR, EQR, BS, LD, and OEOI are independent variables.

Table 2: Descriptive Statistics

	ROA	CAR	EQR	BS	LD	OEOI
Scale	Percentage	Percentage	Percentage	Natural logarithm	Percentage	Percentage
Mean	1.897444	12.75744	9.909214	24.67178	76.33367	37.35882
Median	1.905000	11.85000	9.144557	24.75000	76.76000	35.38930
Maximum	3.99000	21.08000	22.26397	25.75000	121.99	78.11235
Minimum	-0.5000	10.43000	3.564652	22.75000	45.35000	20.67225
Std. Dev	0.722862	2.356253	3.401402	22.77000	14.71332	12.31823
Observation	90	90	90	90	90	90

Source: Annual report of sample banks and results are drawn from E-views 10

Table 2, shows that the average value of the bank performance (ROA) is 1.897444% indicating that during the period 2008-2017, on average, the total assets of sample commercial banks in Nepal generate a 1.897444% return. The standard deviation of the ROA is 0.722862%, which shows the lack of substantial variation.

The minimum capital adequacy ratio is 10.43% that is slightly higher than the regulatory requirement of 10% which signifies the compliance of regulatory requirements by Nepal Rastra Bank's Directives 2015 and Basel II requirements. OEOI ranges from 78.11235% to 20.67225%. The maximum,

minimum, and average value of EQR is 22.26397%, 3.564652%, and 9.909214% respectively. The maximum value of LD is 121.9%, which signifies that the bank had landed more than its deposit for which it might have borrowed from an external source or used equity for lending.

Hausman Test for Selection of Regression Model

Hypothesis setting for test:

Null Hypothesis (H_0): Random effect model is appropriate.

Alternative Hypothesis (H_1): Fixed effect model is appropriate.

Table 3: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. df	Prob.
Cross section random	36.312240	5	0.0000

Source: E-views 10 SV

Result: Since the value of p is less than 0.05, there is no evidence to accept null-hypothesis. It signifies that the random effect model is not appropriate for our study. Therefore, the fixed-effect model is used instead of the random effect model. Fixed effect model is used to analyze panel data if the objective is to analyze the impact of variables that vary over time (Torres-Reyna, 2007). In this model, although the intercept may differ across banks, it does not vary over time that is it is time-invariant (Tuladhar, 2017).

Model

The estimated Fixed OLS regression of CAR, OEOI and LD on banks profitability (ROA) is written as follows:

$$ROA = \beta_0 + \beta_1 * CAR + \beta_2 * \ln(BS) + \beta_3 * LD + \beta_4 * OEOI + \beta_5 * EQR + e_t$$

Where,

ROA = Return on Assets
CAR = Capital adequacy ratio

BS = Natural log of Bank size
LD = Loan deposit ratio
OEOI = Operation Efficiency
EQR = Equity ratio
 e_t = Error term
 β_0 = The intercept (constant)
 $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = The slope which represents the degree with which bank performance changes as the independent variable changes by one unit variable.

Regression Analysis

In this Section, the regression model is applied to explain the relationship between bank performance (ROA) and explanatory variables (CAR, BS, LD, OEOI, EQR). The regression results are obtained based on a Fixed effect model using panel data of sample with the help of E-views 10. This table shows regression results based on the panel data of 9

commercial banks with 90 observations for the fiscal year 2007/08 to 2016/17.

Table 4: Regression output

Dependent Variable: ROA
Method: Panel Least Squares
Date: 08/27/19 Time: 18:12
Sample: 2008 2017
Periods included: 10
Cross-sections included: 9
Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.996906	2.556291	0.389981	0.6976
CAR	-0.132044	0.039409	-3.350653	0.0013
BS	0.105683	0.096504	1.095105	0.2769
LD	0.007874	0.007471	1.053933	0.2953
OEOI	-0.042505	0.008713	-4.878273	0.0000
EQR	0.097345	0.039459	2.466996	0.0159

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.786328	Mean dependent var	1.897444
Adjusted R-squared	0.749779	S.D. dependent var	0.722862
S.E. of regression	0.361591	Akaike info criterion	0.945428
Sum squared resid	9.936840	Schwarz criterion	1.334287
Log likelihood	-28.54424	Hannan-Quinn criter.	1.102239
F-statistic	21.51426	Durbin-Watson stat	1.413194
Prob(F-statistic)	0.000000		

Source: Annual report of sample banks and results are drawn from E-views 10

From the result in Table 4, Adjusted R Square value 0.749779 in the above table suggests that 74.9779% of the variation in ROA is explained by the explanatory variables CAR, BS, LD, OEOI, and EQR. The P-value of the F-statistic is 0.0000 which implies that the model is fairly fitted well statistically. The coefficient of intercept C is 0.996906, which means the average value of return on assets is 0.996906 if there is no effect of independent variables. Further, Durbin- Watson statistics value is greater than adjusted R^2 , which means that the error term is independent and is free of autocorrelation.

Among five explanatory variables taken in the study, CAR had a negative significant impact on banks' profitability. It means that as CAR increases, bank profitability will decline. This was inconsistent with previous finding Pradhan and Shrestha (2016); Poudel (2012). The finding of this study does not support the hypothesis that the capital adequacy ratio has a positive significant effect on bank performance.

OEOI had negative insignificant significant relation with bank profitability. It means that as OEOI increase, bank profitability will decline. The result is

contrary to the findings of Pradhan and Shrestha (2016). However, this result is similar to the findings of Neupane (2019); Buchory 2015; and Setiawan and Hermanto (2017). The finding of this study does not support the hypothesis that the capital adequacy ratio has a positive significant effect on bank performance.

EQR had a positive significant impact on bank profitability. It means that as EQR increase, bank profitability will also increase. This finding is similar to the finding of Chalise (2019) and also supports the hypothesis that EQR had a positive significant impact on bank profitability.

The coefficients of BS and LD had an insignificant positive relation with bank profitability. It means that they cannot explain the variation in bank profitability.

VI. SUMMARY AND CONCLUSION

The study is conducted using the sample of 9 commercial banks operating in the Nepali banking sector with 90 observations for the period from 2007/08 to 2016/17. Based on the Hausman Test

Fixed effect model was identified as the most appropriate model for study.

The main aim of this study was to determine the impact of CAR, LD, and OEOI on bank profitability. A descriptive and fixed-effect model was used for the analysis of data. In descriptive statistics, it was identified sampled bank had followed the CAR regulatory requirement by Nepal Rastra Bank's Directives 2015 and Basel II requirements.

Using the fixed effect model it was revealed that profitability has a negative significant relation with CAR and OEOI. It means that with an increase in these two variables, the profitability of sampled banks declines. On the other hand, positive significant relation with EQR indicates that as EQR increases profitability also increases.

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