

# **INTERNAL AND EXTERNAL VARIABLES AND PROFITABILITY OF COMMERCIAL BANKS IN NEPAL**

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## **Abstract**

This study has examined the effect of internal and external variables on profitability of commercial banks in Nepal. The descriptive and causal comparative research designs have been adopted for the study. The pooled data of 13 commercial banks for the period 2014/15 to 2021/22 have been analyzed using regression model. The regression results revealed that bank size, credit to deposit ratio and inflation has significant negative effect on bank profitability whereas capital adequacy ratio has significant but positive effect on bank profitability. In addition, real gross domestic product has insignificant and negative effect on bank profitability. This study concludes that the commercial banks profitability in Nepal is mainly influenced by capital adequacy ratio. It means that capital helps take on more risky loans to increase profits.

## **1. INTRODUCTION**

All country's banking industry is crucial to its overall economic success, and Nepal is no different. Commercial banks play a crucial role in economic growth because they help direct resources from the surplus sector to the deficit sector. The financial system of a nation is heavily dependent on its banking system; hence the profitability of that sector is crucial (Ali et al., 2011). Without being profitable, banks cannot operate which not only enables them to pay for costs and losses but also rewards investors and depositors. Thus, it is crucial to research the variables that affect banks' profitability (Riaz & Mehar, 2013).

Managerial (internal) and Environmental (external) variables have an impact on the profitability of commercial banks. Managerial elements, such as capital ratio, credit risk, productivity growth, and size of the bank performance, are influenced by management decisions and objectives to be met by the management of

the bank. External elements such as financial market structure, trade interdependence, economic development, inflation, market interest rates, and ownership structure have an impact on environmental factors (Almumani, 2013).

In this connection, the main research question in this study as follow: Do internal and external variables have an impact on the profitability of Nepalese commercial banks?

In this context, the purpose of this study is to analyze the impact of bank internal and external variables on the profitability of commercial banks in Nepal. It specifically looks at the commercial banks' profitability through internal and external factors such capital adequacy ratio, credit to deposit ratio, bank size, and yearly increase in the gross domestic product and inflation. The rest of this study is divided into the following sections. The literature reviews in Part two are explained, as are the technique and model in Section three, the results analysis in Section four, and the summary and conclusion in Section five.

## **2. LITERATURE REVIEW**

The study looked at the effects of macroeconomic indicators and bank-specific factors on profitability across various nations. The majority of studies take into account both internal (such as a bank's unique qualities) and external (such as the financial sector and economic environment) elements.

Guru et al. (1999) looked at the profitability of 17 commercial banks in Malaysia between 1986 and 1995. They used both macro and micro factors to quantify profitability, including ownership, business size, and the state of the national economy, as well as micro variables like liquidity, capital adequacy, and managerial costs. According to the study, inflation and managerial costs have a substantial impact on the profitability of Malaysian commercial banking sectors.

Bennaceur and Goaid (2008) looked at the effects of bank-specific factors, macroeconomic indicators, and the financial structure on the banking sector's profitability in Tunisia between 1980 and 2000. Conclusion: Profitability benefited from a high capital adequacy ratio, but profitability suffered from size. In Tunisia, the profitability of banks was unaffected by macroeconomic factors.

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. The empirical findings indicate that real GDP is found to have an insignificant positive effect on ROA, Inflation rate on the other hand, has a negative link with ROA.

Pradhan and Shrestha (2016) have examined the impact of bank internal variables and external variables on the performance of commercial banks in Nepal. According to the study, management effectiveness and bank performance in Nepal are strongly correlated. There is no indication that external influences have an impact on bank performance since the macroeconomic variables are not statistically significant.

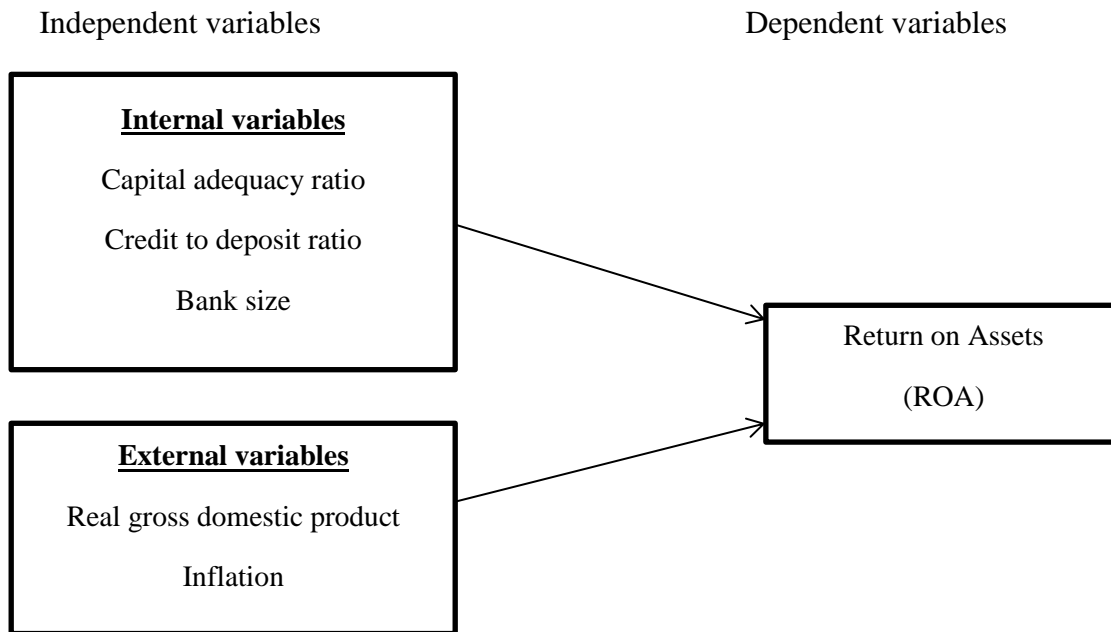
Yeasin (2022) examined that non-performing Loans (NPL) and Capital Adequacy Ratio (CAR) had a negative and statistically significant impact on the financial performance of commercial banks. On the other hand, the credit to deposit ratio (CDR) had a favorable and statistically significant impact on the financial performance of commercial banks.

### **3. RESEARCH METHODOLOGY**

This study examines the effect of internal and external variables on the profitability of commercial banks in Nepal over the period of 8 years (2014/15-2021/22). The reason behind choosing the latest eight year period is to include the a fresh data in the analysis and as the data are from pooling of cross-sectional and time series, thus it seems sufficient to generate data for the analysis. This study has adopted descriptive and causal comparative research design. Size, Capital Adequacy Ratio (CAR), Credit to Deposit Ratio (CDR), Size, real Gross domestic product (RGDP) and inflation are the independent variables in this study, while Return on Asset (ROA) is the dependent variable.

There are altogether 26 commercial banks as per the annual report of Nepal Rastra Bank (2022). Therefore, population of this study is all 26 commercial banks of Nepal. Out of them, 104 observations from 13 commercial banks whose five fiscal year i.e. FY 2014/15 to FY2021/22 has been taken as sample for the same purpose. The banks selected for the study are: Citizens Bank International Ltd., Everest Bank Ltd., Himalayan Bank, Kumari Bank, Nepal Bank, Nepal Investment Bank, Nepal SBI Bank, NMB Bank, Laxmi bank, Prime Bank, Siddhartha Bank, Sunrise Bank limited and Standard Chartered Bank. Judgmental sampling method is used in choosing the banks for the study. The required data are retrieved from the annual report of respective banks

## Research Framework



Note: Research Framework

## The Model

$$ROA = \alpha + \beta_1 CAR + \beta_2 CDR + \beta_3 LNSize + \beta_4 RGDP + \beta_5 INF + e$$

Where, ROA = Return on assets, CAR = Capital adequacy ratio, CDR = Credit to deposit ratio, LN SIZE= Natural Logarithm of Size (total assets), RGDP = Real Gross domestic product, INT = Interest, INF = inflation

## Return on Assets (ROA)

Depending on the business, return on assets is a measure of the financial stability of the banking sector; banks with high initial investment requirements will often have lower return on assets (Appa, 1996). The ratio of a company's net income to its total assets is called return on assets. It evaluates the management of the bank's capacity to produce profits out of limited resources. The greater ROA, the more effectively the bank is managed. Return on assets is sometimes seen as a good indicator of how valuable a bank's assets are in

comparison to those of other banks in the banking industry. As it shows how well a bank's assets are managed to generate profits, ROA is a valuable metric for evaluating a bank manager's performance.

### **Capital adequacy ratio (CAR)**

The capital adequacy ratio calculates a bank's capital as a proportion of its risk-weighted credit exposure. Commercial banks in Nepal must have a capital adequacy ratio over 10% in accordance with NRB guidelines. Enough capital strengthens the bank, improving its solvency, capacity to absorb credit losses, and ability to fend off insolvency. According to Bhattarai (2017), the capital adequacy ratio has a considerable, unfavorable impact on bank profitability.

### **Credit to deposit ratio (CDR)**

The ratio of total loans to total deposits is known as the credit to deposit ratio. This ratio gauges how well management can use assets to make loans, which leads to high profitability. Liquidity of a bank is determined by dividing the total amount of loans dispersed by the total number of deposits received. Yeasin (2022) shown that the financial performance was positively and statistically significantly impacted.

### **Bank Size**

The natural logarithm of the total assets is used to measure firm size. Even though Smirlock (1985) argued that economies of scale benefits from growing bank size, extremely large banks may become operationally inefficient due to bureaucratic complexity and "too big to fail" reasons (Pasiouras et. al., 2007).

### **Real Gross domestic product (RGDP)**

Real GDP is the amount of completed products and services produced in the economy over a certain period of time. Stock prices and future RGDP growth are related. It is likely that changes in knowledge on the RGDP's course will have an impact on profitability. The central bank of Nepal's proxy for RGDP, which is published, is used as the study's source of data to calculate the real GDP. Simiyu and Ngile (2015) discovered that the rate of real GDP growth has a somewhat beneficial impact on the profitability of commercial banks as

assessed by Return on Assets (ROA). The relationship between the macroeconomic factors' GDP growth rate and bank performance was not significant (Pradhan and Shrestha, 2016).

## **Inflation**

A steady rise in the average price of goods and services over an extended period of time is referred to as inflation. Each unit of cash may purchase fewer products and services as the price level rises. Variations in bank profitability are influenced by a nation's level of inflation (Ravell, 1979). According to Sufian (2009), inflation has a favorable impact on bank profit efficiency. The performance of Nepal's commercial banks was not significantly impacted by macroeconomic variables like inflation rate (Pradhan and Shrestha, 2016).

## **Hypotheses**

$H_1$ : There is significant impact of capital adequacy ratio on return on assets

$H_2$ : Credit to deposit ratio has a significant impact on return on assets.

$H_3$ : Bank size has a significant impact on return on assets

$H_4$ : There is significant impact of Real Gross domestic product on return on assets

$H_5$ : There is significant impact of Inflation on return on assets

## **4. Presentation and Analysis of data**

### **Descriptive statistics**

This shows descriptive statistics - mean, standard deviation, minimum and maximum values for the variables associated with 13 sample banks for the period 2014/15 to 2021/22. ROA refers to return on assets, CAR refers to Capital adequacy ratio, CDR refers to Credit to deposit ratio, RGDP refers to real gross domestic product, INF refers to inflation, INT refers to interest, N is the number of observations.

Table 1: *Descriptive data summary of variables*

Variables	N	Minimum	Maximum	Mean	Std. Deviation
ROA	104	0.7	2.25	1.5280	0.3390
CAR	104	7.8	23.68	13.8968	2.2904
CDR	104	48.92	98.1	83.7410	9.0063
LN Size	104	1.2256	12.68	11.5828	0.5275
RGDP	104	-3.4	7.5	3.2	3.5409
INF	104	3.63	8.79	6.2037	1.8486

Source: Author's computation from E-views 12 SV, 2022

It can be seen that the sample commercial banks had a positive mean of return on assets (ROA) of 1.528 with a standard deviation of 0.339 for the fiscal year 2014/15-2021/22. Moreover, there is a less variation in the values (minimum = 0.7 and maximum = 2.25) of ROA. Among the explanatory variables, The CAR ratio of selected banks ranges from a minimum of 7.8 to 23.68 with an average of 13.89 percent and standard deviation of 2.29. The CDR ranges in value from 48.92 to 98.1 with an average of 83.74. With a minimum bank size of 1.22 percent and a high of 12.68 percent, the average bank size is 11.58 percent.

The GDP ranges from -3.4 at the lowest end to 7.5 at the highest, with a mean of 3.2. With an average of 6.20 and a standard deviation of 1.84, inflation varies from a low of 3.63 to a maximum of 8.79.

### Normality Test

Table 2: *Normality Test of variables*

Normality Test	P-Value	Decision
Jarque-Bera Test	0.4313	Residuals are normally distributed.

Source: Author's computation from E-views 12 SV, 2022

Here, Jarque- Bera Test is used to check the normal distribution of data. The probability of the Jarque-Bera  $0.4313 > 0.050$  proved that data are normally distributed.

## Correlation analysis

In order to comprehend the link between two different variables better, a strong correlation research is conducted. The correlation coefficient uses a number that ranges from -1 to +1. The more it implies about the connection, the closer it is near +1 or -1. A number that is nearer to 0 denotes a less strong association in either direction. No association between the provided variables is presumed when the value is 0. The relationship is inverse if there is a negative sign, and direct if there is a positive sign. Although it suggests a cause-and-effect link, it is not necessary.

Table 3: *Correlation Matrix of Variables*

Correlation Probability	ROA	CAR	CDR	LN SIZE	RGDP	INF
ROA	1. -----					
CAR	0.1550 (0.1160)	1				
CDR	-0.0873 (0.3778)	-0.2818 (0.0037)**	1			
LN SIZE	-0.0565 (0.5689)	0.1314 (0.1836)	0.1210 (0.2210)	1 --		
RGDP	-0.0256 (0.7958)	0.1564 (0.1128)	0.2130 (0.0299)*	0.0397 (0.6884)	1 -	
INF	-0.1007 (0.3090)	-0.1703 (0.0837)	-0.2581 (0.0081)**	-0.4393 (0.0000)**	-0.0749 (0.4494)	1 -

Source:

\*\*. Correlation is significant at the 0.01 level (2-tailed), \*. Correlation is significant at the 0.05 level (2-tailed); the number in parenthesis indicates the p value.

This presents the bivariate Pearson correlation coefficients between profitability and bank specific and macroeconomic variables. The correlation coefficients are based on the data from 13 sample banks for the period 2014/15 to 2021/22. ROA refers to return on assets, CAR refers to Capital adequacy ratio, CDR refers to Credit to deposit ratio and RGDP refers to real gross domestic product. The result shows that there is positive relationship of return on assets with capital adequacy ratio which indicates that higher the capital



adequacy ratio, higher would be the return on assets. Similarly credit to deposit ratio, size, real gross domestic product and inflation rate have negative relationship with return on assets which shows that an increase in the credit to deposit, size, real gross domestic product and inflation leads to a decrease in the return on assets.

### Breusch Pagan test

Here, the regression is run to use the Breusch-Pagan test for making the decision on which method is applicable to use according to the value of the data. The purpose of regression analysis is to predict and estimate the effect of the independent variables on the dependent variable.

Table 4: *Breusch-Pagan Langrange Multiplier Test*

	Cross Section	Time	Both
Breusch Pagan	16.9782	23.3314	40.3096
Prob.	(0.0000)	(0.4137)	(0.0000)

Source: Author's computation from E-views 12 SV, 2022

Breusch-Pagan Langrange Multiplier test is used to select a suitable model for Panel data analysis.

The test has the following hypothesis:-

H0: Pooled OLS method is better than Fixed Effect and Random Effect Model.

H1: Pooled OLS method is not better than Fixed Effect and Random Effect Model.

Here, the p-value is 0 which is less than 0.05. So, Null hypothesis is rejected. It means that Pooled OLS method is not better than Fixed Effect and Random Effect Model.

## Hausman Test

Table 5: *Hausman Test*

Test Summary	Chi Sq. Statistic	Chi Sq. d. f	Prob.
Cross section random	0.0000	5	1

Source: Author's computation from E-views 12 SV, 2022

The p-value of this test is 1 which is more than 0.05; hence, null hypothesis is accepted. This concludes that random effect model is appropriate for the study.

## Regression analysis

The regression of bank-specific and macroeconomic variables on return on assets is presented as:

This shows regression analysis result of variables of non-performing loans. The study of the regression model used in this study  $ROA = \alpha + \beta_1 CAR + \beta_2 CDR + \beta_3 LNSize + \beta_4 RGDP + \beta_5 INF + e$

To compare the results of fixed effect and random effect approaches, the Hausman specification test is used to select the suitable model for equation. The Hausman test read as chi-square statistic value with p value (1) more than 0.05, this suggests that the random effect approach is suitable. Thus, random effect approach is used for this equation.

Table 6: *Panel regression results of Nonperforming loan (NPL)*

Variable	Coefficient	Std. Error	T Statistics	Prob.
C	3.9053	0.9364	4.1703	0.0001
CAR	0.0586	0.0173	3.3890	0.0011
CDR	-0.0126	0.0062	-2.0086	0.0477
LN SIZE	-0.1611	0.0804	-2.0023	0.0484
RGDP	-0.0022	0.0085	-0.2647	0.7918
INF	-0.0424	0.0182	-2.3335	0.0220

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**Model Summary**


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R-squared	0.4095	Adjusted R-squared	0.2928
F-statistic	3.5094		
Prob (F-statistic)	0.0000	Durbin-Watson stat	1.9391

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Source: Author's computation from E-views 12 SV, 2022

For 104 observations, 13 commercial banks from 2014-2021, as illustrated in the profitability, among the explanatory factors: Credit to deposit ratio, size and inflation is found to have statistically significant and negative effect on ROA, whereas Capital adequacy ratio is found to be statistically positive significant effect on ROA. Similarly real gross domestic product ratio is found to be statistically insignificant effect on ROA.

The null form of the test is  $DW > R^2$ , which states that the Durbin-Watson result should not be greater than the R-squared figure. As seen in the analysis results,  $DW = 1.93$  and  $R^2 = 0.41$ , rejecting the null hypothesis, indicating that the regression estimate result is valid. R-squared for the regression is 0.41 which implies that the variables in the current study can explain 41 percent of the variations in the ROA can be explained by explanatory variables and remaining 59 percent of variations of the ROA under investigation can be explained by other factors not included in the model. Furthermore, regarding the statistical significance of the model it's P value=0.0000 is less than 5% level, indicating that the estimated model has a high statistical significance, which increases the model's reliability and validity.

### Summary of Hypotheses

The effect of independent variables on the dependent variable has been analyzed, and the results of hypothesis testing have been determined. They are summarized and illustrated below:

Table 7: *Summary of hypotheses*

Hypothesis	Market price per share	
	P value	Remarks
<b>Firm Specific Variables</b>		
$H_1$ : There is significant impact of capital adequacy ratio on return on assets	0.0011	accept
$H_2$ : Credit to deposit ratio has a significant impact on return on assets.	0.0477	accept
$H_3$ : Bank size has a significant impact on return on assets	0.0484	accept
<b>Macroeconomics Variables</b>		
$H_4$ : There is significant impact of Real Gross domestic Product on return on assets	0.7918	reject
$H_5$ : There is significant impact of Inflation on return on assets	0.0220	accept

Source: Authors' Own Calculation

## 5. Summary and Conclusion

Profitability is an important criterion to measure the performance of banks, especially in the changing environment of banking. The simple definition of profitability is the difference between total revenue and total cost. The variables that affect banks' income and expenses are those that have an impact on commercial banks' profitability. In order to demonstrate how internal and external factors affect bank income and expenses, the influence of these factors on commercial banks' profitability is examined.

The study reveals that bank specific variables affect the profitability more. The capital adequacy ratio are found to be determining factor of profitability with positive significant relationship while Credit to deposit ratio, size and inflation is negative significant with the profitability while macroeconomics variables like real gross domestic product does not significantly affect the profitability. Thus, the study concludes capital adequacy ratio account most in determining profitability for banks of Nepalese commercial banks. It shows that capital helps take on more risky loans to increase profits.

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