



Effect of credit risk on the performance of Nepalese development banks

Sanju Gaire

School of Management, Lumbini Banijya Campus, Tribhuvan University, Butwal, Province 5, Nepal

Abstract

This paper examines the effect of credit risk on the performance of sample from ten different development banks in Nepal using yearly data over the period of 2014/15 AD. to 2018/19 A.D. The empirical study is done through Regression model and Correlation Analysis to examine the effect on performance of Development Banks in Nepal. The result of the study reveals that there is a negative correlation between Capital Adequacy Ratio (CAR) and Cash Reserve Ratio (CRR), with Return on Assets (ROA) whereas there is weak positive correlation between Non-Performing Loan Ratio (NPLR) and Total Operating Expenses to Total Assets Ratio (TOTA), with Return on Assets (ROA). From the regression analysis, it can be concluded that Capital Adequacy Ratio (CAR), Non-Performing Loan Ratio (NPLR) and Total Operating Expenses to Total Assets Ratio (TOTA) are insignificant variable. However, the Capital Adequacy Ratio (CAR) was found to be significant with the Return on Assets (ROA). Key-words: Return on Assets, Cash Reserve Ratio, Capital Adequacy Ratio, Non-Performing Loan Ratio, Total Operation to Total Assets, Banking

Keywords: Nepalese, Banks, examines, correlation

1. Introduction

The means of financing for most of the businesses are banking sector. Banks operate at environment where there is high risk due to various external and internal operational factors. One of the major risks that Banks encounter is credit risk.

Credit risk is the probability that lender may not receive the amount (principal and interest) from a borrower as per the contractual obligation. Credit risk is impossible to predict but when a lender sense that there is chances of default than way of mitigating risk is higher coupon rate as reward.

Effective terms and condition is necessary to make credit lending safe. banks one of the major source of income is interest earned from the credit so if the credit risk will be higher source of income will be fluctuating which hampers on the bank profitability. Banks when fail to make good management, strong policies, appropriate law, level of liquidity, higher capital, consistent interest rate, strong underwriting loan, systematic practices of lending than bank might face the problem of default of loan which increases credit risk. Banks plays the role of breezing the gap between deficit and surplus money holder. Surplus money-holder's deposits money in bank and take interest on its behalf and deficit take money in term of loan and payback interest and banks work as an intermediary. While in these activities bank might face different type of risk which incidental or directly affect the profitability.

Financial performance and its analysis help to access the credit risk. Development banks always try to mitigate the effect of credit risk and decrease the default. Good credit risk management has a role in the control of credit default, development banks are aware about the credit risk and its consequences. so they have a proper mechanism of need identification, measurement, monitor and control also ensure that they are having adequate capital, which works as backup for the compensation of the risk.

Regulators always focus on high level of capital so that Banks can withstand risks. Capital and risks are interrelated with each other. Riskier projects must have enough capital to absorb possible risks. There are various technique to mitigate risks like risk avoidance, risk acceptance, risk control and risk transfer. To mitigate and overcome such credit risk, internationally a committee was formed in 1988 namely BASEL committee in banking supervision (BCBS) international committee by governors of ten, G-10 central banks. BCBS has formed banking norms BASEL I, II and III.

BASEL I was focused on defining classified capital to be held by banks in relation to the risk that they face and also, designated capital as tier 1 or tier 2 according to its loss absorbing characteristics. Some improvements were made on BASEL II like incorporating three complementary pillars that are minimum capital requirements, supervisory review of capital adequacy and market discipline of framework. BASEL I and II was unable to absorb the shock during the worldwide major economic downturn which began in 2008. To make lending system more protective and secured, and to overcome from vulnerable position, the strong risk absorbing mechanism was formed in BASEL III. Risk coverage of capital framework increased. And, capital conversion buffer and counter cycle buffer was taken as a macro prudential norm to protect banking sector and excess credit growth (BASEL Committee on Banking Supervision, 2010a).

According to the NRB directives, Banks have to classify their loans depending upon the duration of period in debt servicing i.e. performing and non-performing loans. Under performing loan, loan or advances which have not overdue or which are overdue by one month fall under past loan. Loan and advances which are overdue by a period from one to maximum three months fall under watchlist.

Non-performing loans consist of sub-standard loan which are overdue by a period from three months to maximum period of six months. Loan and advances which are overdue by a period from six months, to a maximum period of one-year falls under doubtful loans. Loans and advances which are overdue from more than one year come under blacklist. The provisions for performing loan are- past loan 1%, watch list- 5%, and for non-performing loan substandard 25%, doubtful- 50% and loss 100% (Nepal Rastra Bank, 2013) [9].

2. Literature Review

In this section, a brief review of the literature will be outlined on the impact on profitability of development banks in Nepal. Furthermore, the variables will have to be defined and consequently, the relationship between dependent variable- Return on Assets (ROA) and independent variable- Non-Performing Loan Ratio (NPLR), Total Operating Expenses to Total Assets Ratio (TOTA), Capital Adequacy Ratio (CAR) and Cash Reserve Ratio (CRR) will be established on the basis of past literature.

Dependent variable

Return on Assets: This dependent variable is used for the investigation of profitability of development banks in Nepal. In literature, it was found that Return on Assets (ROA) is used to measure profitability. It measures the company’s ability to effectively utilize its assets and generate income. It is one of the major indicators for analysis to the investor regarding the

2.1. Theoretical Framework

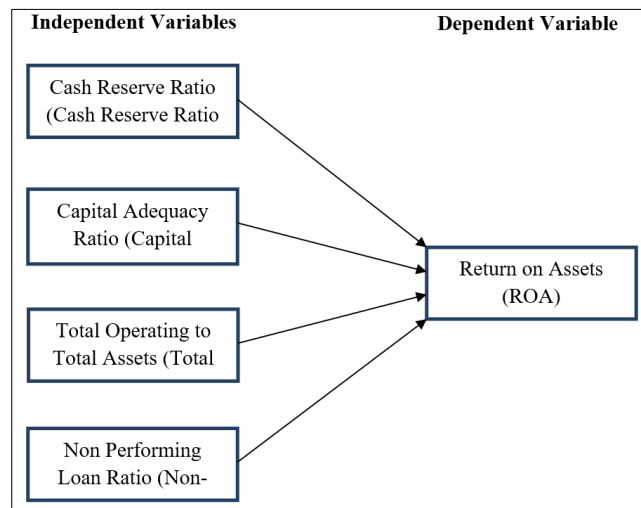


Fig 1: Theoretical Framework

Theoretical Framework is a base on which the study is conducted. It acts as a blueprint or roadmap of the study on which the overall research is based upon. The foundation shows the relationship between dependent and independent variables. In this study, Return on Assets (ROA) is the dependent variable where Non-Performing Loan Ratio (NPLR), Cash Reserve Ratio (CRR), Capital Adequacy Ratio (CAR) and Total Operating Expenses to Total Assets Ratio (TOTA), function as independent variables. On the basis of various journal articles, the theoretical models are established.

company’s financial position. It can be calculated as net income divided by total assets.

Independent Variable

Non-Performing Loan Ratio (Non-Performing Loan Ratio (NPLR)): Generally non-performing specifies the credit risk. It is the ratio of non-performing loans to total loans (Brigham & Ehrhardt, 2013) [3]. When a borrower fails to fulfill its obligation on the payment of loan provided by development banks, then the income generating capacity of the bank decreases which affects net income and hence the effect is shown in Return on Assets (ROA).

Capital Adequacy Ratio (Capital Adequacy Ratio (CAR)): Financial strength of development bank is measured by Capital Adequacy Ratio (CAR). It reflects the bank’s capacity to take risk and fulfill its credit exposure. It is the ratio of the capital fund to risk weighted assets. It also reflects the bank’s capacity to handle the losses (Brigham & Ehrhardt, 2013) [3].

Cash Reserve Ratio (Cash Reserve Ratio (CRR)): It is the cash amount which the bank should hold as a reserve at the Central bank. It might change as per the policy of the Central Bank (Brigham & Ehrhardt, 2013) [3].

Total Operating Expenses to Total Assets (Total Operating Expenses to Total Assets Ratio (TOTA)): A firm’s competency is measured by its ability to efficiently carry out operations in relation to assets on hold. The higher the Total Operating Expenses to Total Assets Ratio (TOTA), the less efficient the firm is and vice-versa. (Liu & Tripe, 2003) [7]

The theoretical model:

$$Y = a + \beta_0 CRR + \beta_1 NPLR + \beta_2 TOTA + E$$

Where,

Y - is the measure of the bank’s performance shown by Return on Assets (ROA) where the data consists of yearly observations taken from respective banks’ annual reports.

CRR- is the Cash Reserve Ratio.

NPLR- is Non-Performing Loan Ratio

TOTA- is Total Operating Expenses to Total Assets Ratio

CAR- is the Capital Adequacy Ratio

a. is the constant or intercept

E- is the error term

2.2 Empirical Framework

Empirical research is conducted using empirical evidence to investigate the impact of one variable on another variable.

2.2.1 Empirical evidence on the impact of Capital Adequacy Ratio (CAR) and Non-Performing Loan Ratio (NPLR) on profitability

(Islam, Alam, & Hoshain, 2019) ^[6] analyzed the implication of credit risk management of 23 commercial banks listed on Dhaka Stock Exchange over the period of 2006 till 2015. The author found that the capital adequacy ratio has a significant positive relation with bank performance measured by return on assets.

(Ali & Dhiman, 2019) ^[1] in Journal of Commerce and Accounting Research has investigated the impact of credit risk management on profitability of public sector commercial banks in India. The study conducted between 2010-2017 reveals that the independent variable which is credit risk is measured by Non-Performing Loan Ratio (NPLR), and Capital Adequacy Ratio (CAR) where profitability which is a dependent variable is measured by Return on Assets (ROA) shows that Return on Assets (ROA) has significant influence on public sector banks in India due to changes in independent variables. The panel regression was applied for the data analysis purpose.

(Isanzu Stanley, 2017) ^[5] has analyzed the impact of credit risk on the financial performance of giant banks. During the period of seven years, from 2008 to 2014 Non-Performing Loan Ratio (NPLR) and Capital Adequacy Ratio (CAR) as independent variables were used to represent the credit risk and the dependent variable financial performance measured by Return on Assets (ROA). The author concluded that all the credit risk management indicators have a significant impact on the financial performance on Chinese Banks.

2.2.2 Empirical evidence on the impact of Cash Reserve Ratio (CRR) on profitability

(Lodhi, 2015) has examined the relationship between cash reserve ratio and bank profitability with respect to Return on Assets (ROA) was described between the period 2005 and 2015. The result from correlation followed by regression analysis reveals that there is a significant relationship between independent variable i.e. Cash Reserve Ratio (CRR) and dependent variable i.e. bank's profitability measured by Return on Assets (ROA).

2.2.3 Empirical evidence on the impact of Total Operating Expenses to Total Assets Ratio (TOTA) on profitability

(Buchory, 2015) highlights that an increase in operating expenses and operating income leads to increase in company profitability measured by Return on Assets (ROA). The study analyzed the effect of credit risk and operating efficiency on Bank's profitability using multiple linear regressions, hypothesis testing T-test and F-test.

3. Research Design and Methodology

3.1. Research Design

This study uses analytic and descriptive analysis methods. Variables used in the study are Non-Performing Loan Ratio (NPLR), Total Operating Expenses to Total Assets Ratio (TOTA), Capital Adequacy Ratio (CAR) and Cash Reserve Ratio (CRR) where Return on Assets (ROA) is a dependent variable and Non-Performing Loan Ratio (NPLR), Total Operating Expenses to Total Assets Ratio (TOTA), Capital Adequacy Ratio (CAR) and Cash Reserve Ratio (CRR) are independent variables.

3.2 Nature and Source of Data

The study is based on the secondary data. The study is based on the yearly data which has been sourced from the annual report of the respective development banks. Study incorporates the time period of fiscal year 2014/15 A.D. till 2018/19 A.D.

3.3 Methodology

3.3.1. Descriptive Statistics

The basic quality of data in a study is explained by descriptive statistics, summarized through the study with the aim of providing simple meaningful information of the study. It also helps in graphical analysis of the quantitative data.

3.3.2. Correlation Analysis

It is the statistical evaluation tool which measures the relationship between two variables. It measures the degree to what extent two variables are inter-related to each other. It usually studies to what extent one variable is affected when nature of another variable is changed. The range of correlation lies between -1 to +1.

Positive Correlation:

Positive correlation in research indicates that, if change in one variable leads to change in another variable in the same direction and vice versa then there is a positive correlation between variables.

Negative Correlation:

While negative correlation in research indicates that, if Increase in one variable leads to decrease in another variable and vice-versa then there is a negative correlation between variables.

No Correlation:

Whereas, correlation with zero value in research indicates that there is no relationship between the variables.

3.3.3. Regression analysis

It is one of the frequently used tools in the research. It simply expresses the degree of relationship between independent and dependent variables. Regression analysis can help to predict the changes in dependent variables through the changes observed in independent variables. In this study, Return on Assets (ROA), which is a dependent variable, is put under investigation to find the extent of relationship with independent variables- Non-Performing Loan Ratio (NPLR), Total Operating Expenses to Total Assets Ratio (TOTA), Capital Adequacy Ratio (CAR), and Cash Reserve Ratio (CRR).

4. Analysis and Interpretation

4.1. Table 1: Descriptive Statistics

Table 1

	Capital Adequacy Ratio (CAR)	Cash Reserve Ratio (CRR)	Non-Performing Loan Ratio (NPLR)	Return on Assets (ROA)	Total Operating Expenses to Total Assets Ratio (TOTA)
Mean	17.56437	4.983750	1.492917	1.759583	4.269167
Median	15.63500	5.315000	0.945000	1.715000	2.905000
Maximum	66.82000	13.93000	8.330000	3.600000	9.220000
Minimum	11.42000	0.290000	0.000000	-0.930000	0.090000
Std. Dev.	8.307056	2.622187	1.912154	0.992472	2.798591
Skewness	4.564020	0.441294	1.959029	-0.503995	0.244995
Kurtosis	27.10266	5.095049	6.861763	2.950307	1.367503
Jarque-Bera	1328.518	10.33638	60.52878	2.037029	5.810272
Probability	0.000000	0.005695	0.000000	0.361131	0.054741
Sum	843.0900	239.2200	71.66000	84.46000	204.9200
Sum Sq. Dev.	3243.337	323.1655	171.8476	46.29499	368.1092
Observations	48	48	48	48	48

The descriptive statistics for all five variables are shown in Table 1. A distribution is considered normal if the kurtosis and skewness are 3 and 0 respectively. From the above table, it can be seen that the value of skewness in Cash Reserve Ratio (CRR) and Total Operating Expenses to Total Assets Ratio (TOTA) are close to 0 which represent the normal distribution. The

probability value of Capital Adequacy Ratio (CAR), Cash Reserve Ratio (CRR) and Non-Performing Loan Ratio (NPLR) is less than 0.05 so we reject null hypothesis i.e. distribution is not normal. The value of Total Operating Expenses to Total Assets Ratio (TOTA) is greater than 0.05, we accept the null hypothesis.

4.2 Table 2: Correlation Analysis

Table 2

	Capital Adequacy Ratio (CAR)	Cash Reserve Ratio (CRR)	Non-Performing Loan Ratio (NPLR)	Return on Assets (ROA)	Total Operating Expenses to Total Assets Ratio (TOTA)
Capital Adequacy Ratio (CAR)	1.000000	-0.014104	-0.183159	-0.290329	0.123039
Cash Reserve Ratio (CRR)	-0.014104	1.000000	0.403882	-0.340656	0.096038
Non-Performing Loan Ratio (NPLR)	-0.183159	0.403882	1.000000	0.106550	-0.069775
Return on Assets (ROA)	-0.290329	-0.340656	0.106550	1.000000	0.005039
Total Operating Expenses to Total Assets Ratio (TOTA)	0.123039	0.096038	-0.069775	0.005039	1.000000

From the above table, it can be observed that there is negative correlation between Capital Adequacy Ratio (CAR) and Return on Assets (ROA). Similarly, there is a negative correlation between Cash Reserve Ratio (CRR) and Return on Assets (ROA). On the other hand, there is a positive correlation between Non-Performing Loan Ratio (NPLR) and Return on Assets (ROA) and also between Total Operating Expenses to Total Assets Ratio

(TOTA) and Return on Assets (ROA). When the value of Cash Reserve Ratio (CRR) and Capital Adequacy Ratio (CAR) increases, Return on Assets (ROA) decreases. When the value of Non-Performing Loan Ratio (NPLR) and Total Operating Expenses to Total Assets Ratio (TOTA) increased, the value of Return on Assets (ROA) also increased.

4.3. Table 3: Regression Analysis

Table 3

Dependent Variable: Return on Assets (ROA)					
Method: Least Squares					
Date: 06/04/20 Time: 02:36					
Sample: 1 48					
Included observations: 48					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	2.827295	0.425705	6.641435	0.0000	
Capital Adequacy Ratio (CAR)	-0.031457	0.016086	-1.955576	0.0570	
Cash Reserve Ratio (CRR)	-0.171928	0.054928	-3.130088	0.0031	
Non-Performing Loan Ratio (NPLR)	0.129059	0.076329	1.690830	0.0981	
Total Operating Expenses to Total Assets Ratio (TOTA)	0.034899	0.047392	0.736399	0.4655	
R-squared	0.258176	Mean dependent var	1.759583		

Adjusted R-squared	0.189169	S.D. dependent var	0.992472
S.E. of regression	0.893683	Akaike info criterion	2.711400
Sum squared resid	34.34275	Schwarz criterion	2.906317
Log likelihood	-60.07361	Hannan-Quinn criter.	2.785060
F-statistic	3.741303	Durbin-Watson stat	1.260820
Prob(F-statistic)	0.010660		

The above table shows that the probability of Capital Adequacy Ratio (CAR), N\PLR and Total Operating Expenses to Total Assets Ratio (TOTA) is greater than 5 percent level of significance, so we accept the null hypothesis which means these three variables are insignificant variables. The probability of Cash Reserve Ratio (CRR) is less than 5% so we reject the null hypothesis which means these variables have significant impact on Return on Assets (ROA). In the case of R-square, and adjusted R-square, 25.82% of dependent variable is explained by independent variable and the remaining percentage is explained by other factors.

5. Conclusion

This paper examines the effect of credit risk on the performance of Nepalese Development Banks. From the research, it can be concluded that Non-Performing Loan Ratio (NPLR) and Total Operating Expenses to Total Assets Ratio (TOTA) are insignificant variable. Furthermore, the Capital Adequacy Ratio (CAR) and Cash Reserve Ratio (CRR) was found to be significant with the Return on Assets (ROA). This study helps to understand the credit risk on Bank's performance so that it helps in regulating the system of credit risk management. In the past research, it was found that Capital Adequacy Ratio (CAR), Non-Performing Loan Ratio (NPLR) and Cash Reserve Ratio (CRR) have significant influence on Return on Assets (ROA). However, the findings from the sample taken in this empirical study point out that Non-Performing Loan Ratio (NPLR) has weak positive studies with Return on Assets in the case of Development Banks in Nepal. Additionally, Cash Reserve Ratio (CRR) and Capital Adequacy Ratio (CAR) have negative correlation with Return on Assets (ROA). From both the analysis (correlation and regression), it can be summarized that the Nepalese Development Banks have weak mechanism and poor risk management of credit.

6. References

1. Ali L, Dhiman S. The Impact of Credit Risk Management on Profitability of Public Sector Commercial Banks in India. *Journal of Commerce and Accounting Research*. 2019; 8(2):86-92.
2. BASEL Committee on Banking Supervision. *Basel III: A global Regulatory framework for More Resilient Banks and Banking Systems*. Bank for International Settlements, 2010a.
3. Brigham EF, Ehrhardt MC. *Financial Management: Theory and Practices* (14 ed.). Mason: South Western Cengage Learning, 2013.
4. Buchory AH. Banking Profitability: How the Credit Risk and Operational Efficiency Effect? *Journal of Business and Management Science*. 2015; 3(4):118-123.
5. Isanzu Stanley J. The Impact of Credit Risk on Financial Performance of Chinese Banks. *Journal of International Business Research and Marketing*. 2017; 2(3):14-17.
6. Islam KZ, Alam MB, Hoshain MM. Impact of Credit Risk Management on Bank Performance: Empirical Evidence from Bangladesh. *South Asian Journal of Management*. 2019; 26(2):32-64.
7. Liu B, Tripe D. New Zealand Bank Mergers and Efficiency Gains. *Journal of Asia-Pacific Business*. 2003; 4(10):61-81.
8. Lodhi S. Impact of Change in Reserve Requirement on Bank's Profitability: A Case of Commercial Banks in Pakistan. *Impact Factor 3.582 Case Studies Journal ISSN (2005-59X)*, 2015, 4(11).
9. Nepal Rastra Bank. *Unified Directives 2070*. Retrieved 06, 15, 2020, from Nepal Rastra Bank, 2013. https://www.nrb.org.np/contents/uploads/2019/12/Directive_sUnified_Directives_2070.pdf