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The Impact of Capital Adequacy and Cost-Income Ratio on Performance of Nepalese Commercial Banks

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Abstract -

This paper examines the impact of capital adequacy and cost-income ratio on the performance of Nepalese commercial banks. The descriptive research designs have been adopted for the study. The study is conducted using panel data of 10 commercial banks operating in the Nepali economy with 100 observations for the period 2007/8 to 2016/17. The dependent variables return on an asset which measures bank performance while the independent variables are bank size, Debt-equity ratio, cost-income ratio, Equity ratio, Total capital adequacy. For the purpose of this study, secondary data have been used. Fixed Effect Model (FEM) of panel data analysis is used as a major tool of analysis the regression results revealed that the Cost-income ratio has a negative significant impact on banks performance and total capital adequacy has a negative insignificant impact on the bank performance(ROA) whereas debt-equity ratio and bank size has a positive insignificant impact with bank performance and equity ratio has positive significant impact on bank performance which indicates that higher equity ratio the higher would be bank performance. This study concludes that there is a negative impact of cost income and capital adequacy on bank performance.

Keywords - *Capital adequacy, Commercial banks, Cost-income ratio, Return on assets (ROA)*

I. INTRODUCTION

The banking sector is an important sector for the stabilization of financial systems. It plays a critical role in the economy of our country. Commercial banks help in the economic development and growth of the country as money saved in the banks is used to invest in enterprises or other active industries. Without commercial banks, it is impossible to implement various economic activities of the govt. It plays a crucial role in employment, human resource transfer, and capital mobilization.

In recent years, the banking sector has undergone significant transformation and continues to develop new regulations and guidelines with the aim of maintaining stability. The existence, growth, and survival of a business organization mostly depend upon the profit which an organization is able to earn. A commercial bank by definition is a profit-hunting institution. The bank has to earn profit to earn income to pay salaries to the staff, interest to the depositors, dividends to the shareholders and to meet the day-to-day expenditure. It is true that when Profitability increases the value of shareholders may increase to a considerable extent.

The financial performance involves measuring the firm's effectiveness and efficiency use of resources in its operation to generate revenue. Bank performance may be defined as the reflection of the way in which the resources of a bank are used in a form, which enables it to achieve its objectives. Some of the reasons why we evaluate the performance of banks are to determine their operational results and the overall financial condition of bank services. (Kamandea, 2016).

Banks capital plays a very important role in maintaining the safety and solidarity of banks and the security of banking systems in general as it represents the buffer gate that prevents any unexpected loss that banks might face, which might reach depositors funds, given that banks operate in a highly uncertain environment that might lead to their exposure to various risks, and losses, that might result from risks facing banks. Operational efficiency is narrowly defined as the ability to deliver products and services cost-effectively without sacrificing quality. It can also be defined as what occurs when the right combination of people, processes, and technology come together to enhance the productivity and value of any business operation while driving down the cost of routine operations to the desired level(Shawk, 2008).

The ratio, which measures operating expense as a percentage of operating income, is used to gauge efficiency and productivity for banks. Lower ratios generally indicate higher efficiency and higher ratios indicate lower efficiency of the bank. Finally, the study of bank performance becomes even more important; also in view of the ongoing financial and economic crises, which will have a fundamental impact on the banking industry in many countries around the global (Poudel, 2016).

The main purpose of this study is to analyze the impact of capital adequacy and cost-Income ratio on

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the financial performance of Nepalese commercial banks.

II. LITERATURE OF REVIEW

Capital adequacy is the amount of capital a bank or another financial institution has to hold as required by its financial regulator. Capital Adequacy is a measure of a bank's capital to cushion against or absorb a reasonable amount of losses before they become insolvent and consequently lose depositors' funds. It ensures the efficiency and stability of a financial system by lowering the risk of banks becoming insolvent. 'Capital Adequacy' is therefore the statutory minimum capital reserve that a financial institution or investment firm must have available and regulatory capital adequacy provisions thus require relevant firms to maintain these minimum levels of capital, calculated as a percentage of its risk-weighted assets. Capital adequacy ratios are a measure of the amount of a bank's capital expressed as a percentage of its risk-weighted credit exposures. An international standard that recommends minimum capital adequacy ratios has been developed to ensure banks can absorb a reasonable level of losses before becoming insolvent. Applying minimum capital adequacy ratios serves to protect depositors and promote the stability and efficiency of the financial system.

There are multiple indicators of the profitability of the banking sector, including Return on asset (ROA), Return on equity (ROE), etc. However, the most commonly used measure is ROA, because it is the main ratio for the evaluation of the profitability of banks (Golin, 2001).

The capital adequacy ratio, also known as the capital to risk-weighted assets ratio, measures a bank's financial strength by using its capital and assets. It is used to protect depositors and promote the stability and efficiency of financial systems around the world. Generally, a bank with a high capital adequacy ratio is considered safe and likely to meet its financial obligations (Beer, 2018).

Musyoka(2017) studied the effect of capital adequacy on the financial performance of the commercial bank in Kenya and concluded that capital adequacy has an inverse and significant relationship with commercial banks in Kenya's Financial performance.

Nzioki (2011) studied the impact of capital adequacy on the financial performance of commercial banks quoted at the Nairobi stock exchange and the main finding in the study is that capital adequacy contributes positively to the profitability of commercial banks and therefore it is paramount for banks to have a sound capital base in order to remain competitive and maintain the confidence of its customers.

Odunga, Nyangweso, & Nkobe (2013)examined the effect of liquidity and capital adequacy on the operating efficiency of commercial banks in Kenya. The results show that the previous year's operational efficiency, liquidity, and capital adequacy combined explain about 41% of the bank's operating efficiency. Further, the total capital ratio and a liquid asset to deposits ratio positively affect the operating efficiency of the banks.

Jackson (2011) studied the impact of credit risk management on the financial performance of commercial banks in Kenya and concluded that credit risk management has a positive relationship with banks' profitability. Kolapoc (2012) concluded that credit risk management has a significant impact on the profitability of Nigerian banks.

Sedhain (2012) concluded that capital adequacy has helped in developing suitable prudential norms to save the banks and financial institutions from financial crisis and signals of failure. The dissertation further concluded that the operating environment of the bank has changed radically, and its risk management system has also improved.

Onaolapo and Olufemi (2012) examined the effects of capital adequacy conditionality on the performance of selected banks within the Nigerian banking sector. The study hypothesized no significance between Capital Adequacy Ratio (CAR) (Statutorily mandated) and five bank performance variables. Data employed were mainly secondary and were obtained from the publications of regulatory agencies like the Central Bank of Nigeria in a ten-year period 1999-2008. Ordinary Least Square (OLS) estimation was adapted to analyze the relationship between the variables. Findings indicate that all the performance indicators tested such as Returns on Assets (ROA), Returns on Capital Employed (ROCE), and Efficiency Ratios (ER) among others do not reflect much on the Capital Adequacy Ratio (CAR) of the Nigerian banking sector. The non-significance relationship between reflective adjustment in banks' capital base, profitability, and performance informed by the paper recommendations for pragmatic changes in bank regulatory focus, improved corporate governance, personnel training, and stable polity as antidotes for ensuring sound financial health for the Nigerian banking sector.

This study aims at examining the effect of capital adequacy and cost-income ratio on the performance of commercial banks of Nepal.

Following are the research hypothesis in this study

H1: There is a positive and significant relationship between the Cost-Income ratio and Bank performance.

H2: There is a positive and significant relationship between the Debt-Equity ratio and Bank performance.

H3: There is a positive and significant relationship between the Equity ratio and Bank performance.

H4: There is a positive and significant relationship between Bank size and Bank performance.

H5: There is a positive and significant relationship between Capital adequacy ratio and Bank performance.

III. METHODOLOGY

Research design

The research design adopted in this study is descriptive type as it deals with the impact of capital adequacy and cost-income ratio on the financial performance of Nepalese commercial banks.

Sample selection

All the commercial banks operating in the Nepali economy were considered as the total population. As per the latest data from Nepal Rastra Bank (Baisakh, 2076), at present, there are a total of 28 commercial banks in Nepal. Out of them, 10 commercial banks have been selected as samples. Nabil Bank Ltd, Standard Chartered Bank Nepal, Nepal State Bank of India, Nepal Investment Bank Ltd, Himalayan Bank Ltd, Agricultural Development Bank, Everest Bank Ltd, Laxmi Bank Limited, Sunrise Bank Ltd prime Commercial Bank Limited has been selected as sample bank. This study examines the effect of capital adequacy and cost-income ratio on the performance of commercial banks in Nepal over the period of 10 years.

Sources of information

This study is based on secondary sources of data from the 10 commercial banks of Nepal with the period of 2007/8 to 2016/17, leading to a total of 100 observations. The secondary data are obtained from the annual reports of respective sample banks, Banking and Financial Statistics of Nepal Rastra bank through the website.

Mode of Data Analysis:

The study follows a panel data approach where it runs initially descriptive statistics. Then, the study selects Fixed Effect Regression Model by performing the Hausman test. Here, Statistical software Evievs-8 is used to perform all tests.

Estimation Equation:

In order to explain effect of capital adequacy and cost-income on the performance of Nepalese commercial banks, the regression model has been specified as under:

ROA = C(1) + C(2)*CIR + C(3)*DER + C(4)*EQR + C(5)*BS + C(6)*TCR + et

Where,

ROA = Return on assets (ratio of earnings after taxes to total assets)

CIR =Cost-income ratio

DER =Debt-Equity ratio

EQR = Equity ratio

BS = Bank size (natural logarithm of total assets)

TCR = Total capital adequacy ratio

et = Error term

C(1)= The intercept (constant)

C(2), C(3), C(4), C(5), C(6)= The slope which represents the degree with which bank performance changes as the independent variable changes by one unit variable.

Variables Specification

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(ROA).

Cost-income ratio(CIR)

The cost-to-income ratio is a key financial measure, particularly important in valuing banks. It shows a company's costs in relation to its income. To get the ratio, divide the operating costs (administrative and fixed costs, such as salaries and property expenses, but not bad debts that have been written off) by operating income.

Equity ratio (EQR)

The equity ratio 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.

Bank size (BS)

Bank size as measured by total assets is one of the control variables used in analyzing the performance of the bank system (Smirlock, 1985) Bank size is generally used to capture potential economies or diseconomies of scale in the banking sector. This variable controls for cost differences in product and risk diversification according to the size of the financial institution.

Debt/Equity ratio(DER)

The debt/Equity Ratio is a debt ratio used to measure a company's financial leverage, calculated by dividing a company's total liabilities by its stockholders' equity. The D/E ratio indicates how much debt a company is using to finance its assets relative to the amount of value represented in shareholders' equity. It also shows the extent to which the shareholder's equity can fulfill a company's obligations to creditors in the event of liquidation. The debt to equity ratio measures the riskiness of the firm's capital structure in terms of the relationship between the funds supplied by creditors and investors (Frase and Ormiston, 2004). Shah and Khan (2007) analyzed that profitability is negatively correlated to debt to equity ratio (Pradhan & Shrestha, 2016).

Total capital adequacy (TCR)

Capital adequacy ratios measure the amount of a bank's capital in relation to the amount of its risk-weighted credit exposures. It is also known as the capital risk-weighted assets ratio and is used to protect depositors and promote the stability and efficiency of financial systems.

Table 1: Variables definition and measurement

No	Abbreviation variables	Description	Measurement
1	ROA	Return on Assets	Net profit or profit after tax/ Total assets
2	CIR	Cost-income ratio	Operating expenses/Operating income
3	EQR	Equity ratio	Total equity/Total assets
4	BS	Business size	Natural logarithm of Total assets
5	DER	Debt to Equity Ratio	Total Debt/Total Equity
6	TCR	Total capital adequacy	Tier1 Capital +Tier 2 Capital)/risk weighted assets

Source:(Bhattarai, 2016)

IV. DATA ANALYSIS AND INTERPRETATION

This section deals with the various issues and analyzed the impact of capital adequacy and cost-income ratio on the performance of Nepalese commercial banks. It includes descriptive statistics of variables, correlation results for dependent and explanatory variables, diagnosis tests for the regression models, regression analysis, and discussion of results. 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 10 sample commercial banks for the study period of 2007/2008 to 2017/18 that makes a total of 100 observations. In this table, ROA is the dependent variable, and CIR, EQR, LOG BS, DER, and TCR are independent variables.

Table 2. Descriptive Statistics

	ROA (%)	CIR (%)	EQR (%)	ln(BS)	TCR (%)	DER (ratio)
Mean	1.7945	36.28547	9.894176	24.6083	12.7304	9.967083
Median	1.76	33.86	9.2048	24.7094	11.92	9.817017
Maximum	3.99	79.06	22.26397	25.7529	21.08	27.05323
Minimum	0.00	20.34	3.564652	22.57776	10.38	3.491562
Std. Dev.	0.705021	12.61325	3.257077	0.628652	2.246442	3.241196
Observations	100	100	100	100	100	100

Source: Annual report of sample banks and results are drawn from E-views 8

The result shows that the average performance of bank(ROA) with 10 samples of commercial banks is 1.7945% with an average period of 2007/8-2017/18, where the minimum value is 0.00 and the maximum value is 3.99%with volatility ratio of 0.705021 %.The cost-income ratio(CIR) ranges from 20.34% to 79.06% with average 36.28547%.Likewise, The equity ratio ranges from 3.564652% to22.26397% with an equity ratio average of 9.894176%, and bank size with an average of 24.6083 ranges from 22.57776 to 25.7529. Similarly, capital adequacy range from 10.38 % to 21.08 % with an average of 12.7304%, and the average debt-equity ratio is 9.967083 ranges from 3.491562 to 27.05323.

Hausman test

This is used as a test to determine the right model between the fixed and random-effects models. A fixed group effect model examines individual differences in intercepts, assuming the same slopes and constant variance across individuals (group and entity). A random-effects model assumes that individual effect (heterogeneity) is not correlated with any regressor and then estimates error variance specific to groups (or times) (Ahmed, 2017) The Hausman test hypothesis is

Null hypothesis (H0): Random effect model is appropriate.

Alternative hypothesis (H1): Fixed effects model is appropriate.

Table 3. Hausman tests

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	19.354164	5	0.0017

Source: Annual report of sample banks and results are drawn from E-views 8

Table 3 shows that p-values of cross-section random for the model are less than 0.05, hence the null hypothesis that is random-effects model is rejected, implying that fixed-effects model was preferred then random effects model (REM). Therefore, it is found that the fixed effect model is the appropriate model after the Hausman test.

Regression analysis

. The regression results for ROA have been reported in Table 4.

Table 4. Regression output

Dependent Variable: ROA

Method: Panel Least Squares

Date: 07/13/19 Time: 17:33

Sample: 2008 2017

Periods included: 10

Cross-sections included: 10

Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.006768	2.510294	0.401056	0.6894
CIR	-0.025835	0.007135	-3.620896	0.0005*
DER	0.055438	0.028633	1.936119	0.0562
EQR	0.138941	0.048955	2.838149	0.0057*
BS	0.015637	0.099053	0.157867	0.8749
TCR	-0.046103	0.040497	-1.138438	0.2581

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.715860	Mean dependent var	1.794500
Adjusted R-squared	0.669060	S.D. dependent var	0.705021
S.E. of regression	0.405580	Akaike info criterion	1.170486
Sum squared resid	13.98211	Schwarz criterion	1.561261
Log-likelihood	-43.52428	Hannan-Quinn criter.	1.328639
F-statistic	15.29629	Durbin-Watson stat	1.632883
Prob(F-statistic)	0.000000		

**Correlation coefficient significant at 5%*

Source: Annual report of sample banks and results are drawn from E-views 8

In this Section, the regression model is applied to explain the relationship between bank performance (ROA) and explanatory variables (CIR, EQR, LOG BS, DER, TCR). The regression results are obtained based on a Fixed effect model using panel data of sample with the help of E-views software version 8. This table shows regression results based on the panel data of 10 commercial banks with 100 observations for the period of 2007/2008 to 2016/17. This presents regression results that show the predicting power of explanatory variables in determining the performance of Nepalese commercial banks. The model is ROA = C(1) + C(2)*CIR + C (3)*DER + C(4)*EQR + C(5)*BS + C(6)*TCR + et Where ROA is dependent variables which are only taken for determining the financial performance of commercial banks in this study and cost-income ratio, equity ratio, bank size, total capital adequacy, and the debt-equity ratio is independent variables. The above table shows that the adjusted R Square value (0.669060) suggests that the model serves its purpose in determining the impact of the specific variable on bank performance. In other words, 66.9% variability of the bank performance (ROA) can be explained by the CIR, DER, EQR, BS, TCR. 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(1) is 1.006768. It means an average value of return on assets is 1.006768 if there is no effect of independent variables.

From table 4, fixed effect estimation, the beta coefficient for equity ratio (EQR) are positive and significant at 5percent. The significant positive coefficients confirmed that the equity ratio has a significant positive impact on the profitability of the commercial banks in Nepal. This indicates that the higher the equity ratio, the higher would be the return on equity. The probability of cost-income ratio is 0.0005 which is less than a 5 % level of significance and the coefficient is negative. Therefore, the relationship between the cost-income ratio and bank performance is negatively significant. This is an indication that there is an inverse and significant relationship between bank performance (ROA) and the cost-income ratio.

On the other hand, the coefficients of debt to equity ratio and bank size are statistically insignificant and positive. The insignificant positive coefficients confirmed that the debt to equity ratio and bank size

has an insignificant positive impact on the profitability of the commercial banks in Nepal. There is a negative and insignificant relationship between capital adequacy and bank performance (ROA). The coefficient of capital adequacy ratio is insignificant meaning that it cannot explain the variation of the dependent variable (ROA).

V. SUMMARY AND CONCLUSION

This study is conducted especially with the aim of investigating the impact of capital adequacy and cost-income ratio on the financial performance of Nepalese commercial banks. The study is conducted using the sample of 10 commercial banks operating in the Nepali economy with 100 observations for the period 2007/8 to 2016/17. Fixed Effect Model (FEM) of panel data analysis is used as a major tool of analysis.

The study revealed that the average return on assets is 1.7945percent while the average of capital adequacy is 12.7304percent and the average ratio of cost income is observed to be 36.28547percent. Hausman's test reveals that the fixed effects model is the most appropriate model.

The result shows that the bank equity ratio has a positive significant impact on bank performance which indicates that the higher the equity ratio the higher would be bank performance. Similarly, debt to equity ratio, bank size has a positively insignificant relationship with bank performance and total capital adequacy ratio are negatively related to return on assets which indicates that the higher the total capital adequacy ratio the lower would be bank performance. This is inconsistent with previous findings (Pradhan & Parajuli, 2017)and the Cost-income ratio is negatively significant with bank performance which means a higher cost-income ratio lower would be bank performance. Poor expenses management is the main contributor to poor profitability (Sufian, 2008) Same results have been found by (Almazari, 2013).

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