Original Article

Capital structure and bank performance of the commercial bank in Nepal

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Abstract - *This study has been conducted to examine the determinants of the capital structure of Nepalese commercial banks. Eleven commercial banks have been selected for the study based on the availability of data. This study has been conducted with the secondary data obtained from the financial statements, annual publications of NRB, and even from the official website of respective banks for the period 2008-2015. Four independent variables, total debt to equity ratio, long-term debt to assets, short-term debt to assets, and total debt to assets, have been included. Profitability is the dependent variable and is measured by the return on assets (ROA) and return on equity (ROE). To determine the variables, previous studies, particularly of* Zafar, Zeeshan, & Ahmed (2016) *and* Ghosh(2007), *have been consulted. A descriptive research design has been adopted for the study. Different descriptive statistical measures such as minimum, maximum, percentage, average, standard deviation, and coefficient of variation have been used to analyze. A multiple regression model has been applied for analyzing the data. The study reveals that long-term debt to asset, total debt to asset, and total debt to total equity are statistically significant to ROE and ROA.*

Keywords - *Capital structure, commercial banks, secondary data, profitability, descriptive and inferential analysis.*

I. INTRODUCTION

Capital structure is simply defined as the combination of debt and equity that achieves the stated managerial goal of maximizing the value or wealth of shareholders. The wealth of shareholders' in turn, is measured by the current price of the firm's shares. In order to achieve this objective, a firm's management should take rational financing decisions regarding optimal capital structure, which in turn would minimize its cost of capital (Goyal, 2013).

Capital structure studies have been inspired by the pioneering work by Modigliani and Miller (1958). The authors at the time argued that a firm's choice of capital structure does not have any positive effect on firm value. This argument was made on the assumption that there are no taxes, no transaction costs; there is symmetric access to the credit market, etc. Since then, three different theoretical explanations on the subject have been developed: The Static Trade-off, the Pecking Order, and the Agency Cost theories (Buferna et al., 2005).

The aim of the present article is to determine the impact of the capital structure and bank performance on the profitability indicators of the Nepalese commercial banks in the period of 2005 to 2015. For this purpose, analysis of the present capital structure of commercial banks in Nepal has been done with reference to Nepal Bank Limited, Nabil Bank Ltd, and Standard Chartered Bank Nepal, Nepal State Bank of India, Nepal Investment Bank Ltd, Rashtriya Banijya Bank, Himalayan Bank Ltd, and Agricultural Development Bank.

II. LITERATURE REVIEW

According to Holz(2002), there are different ways to measure financial performance, such as ROA, return on equity (ROE) and return on invested capital (ROIC). ROA is an indicator of how profitable a company is relative to its total assets. It gives us an idea as to how efficient management is in using its assets to generate earnings, whereas ROE measures a company's profitability which reveals how much profit a company generates with the money shareholders have invested. ROIC is a measure used to assess a company's efficiency in allocating the capital under its control in profitable investments. This measure gives a sense of how well a company is in using its money to generate returns.

Wippern (1966) investigated the relationship between financial leverage and firm value in some industries, which marked on a high degree in different characteristics from where growth cost and demand. The study used the debt to equity ratio as financial leverage indicator and earnings to the market value of the common stock as a performance indicator. Results revealed that leverage effect positively on firm value, and this traditional evidence said that shareholders' wealth could enhance by using outside financing.

Ningsih & Djuaeriah (2013) examined the correlation of firms' capital structure towards their financial leverage, and he focused on the static tradeoff framework and pecking order framework. He used secondary data of the publicly listed cement industry in an eleven-year period (2003-2012). There are three ratios being used in this, which are ROA, ROE, and EPS, and he used MS. Excel and E-

Views 6. Descriptive statistics, linear regression tests using pooled least square analysis, and hypothesis testing using F-test and T-test are the method being used in data analysis. The result shows that capital structure indicators correlated significantly on financial leverage simultaneously. Meanwhile, the T-test result shows that only ROA and ROE correlated significantly with financial leverage.

The study of Ameen & Shahzadi(2017) stated their study that the effect of capital structure on the financial performance of cement companies and this study has been undertaken for the period of four years from 2008 to 2011 on 28 Iran cement companies and the researcher used return on equity (ROE) and return on asset (ROA) as a proxy of financial performance, while used the short term debt to equity ratio (STD/E) and long term debt to equity ratio (LTD/E) as a proxy of capital structure The results suggested that there was a significant and negative relationship between capital structure and financial performance.

Another study by Jhon(2013) using three manufacturing companies selected randomly from the food and beverage categories and a period of five years (2007-2011) using the static trade-off and the pecking order theory point of view. He adopted the use of correlation analysis method and revealed that each of debt to capital, debt to common equity, short term debt to total debt, and the age of the firms' is significantly and positively related to return on asset and return on equity, but long term debt to capital is significantly and relatively related to return on asset and return on return on equity. His hypothesis also tested that there is a significant relationship between capital structure and financial performance using both returns on assets and return on equity.

Ndirangu(2010) studied the relationship between capital structure and financial performance of insurance companies in Kenya. This study covered four years, from 2006 to 2009. The study found out that there is a weak relationship between financial performance and capital structure. This implies that the debt to equity ratio accounted for only a small percentage of financial performance among the companies studied.

III. THEORETICAL MODEL

This study follows the theoretical model of Zafar, Zeeshan, & Ahmed (2016), which has considered a certain factor in analyzing the relation between capital structure and profitability. Incorporating these factors, the theoretical framework for conducting the study is as follows:
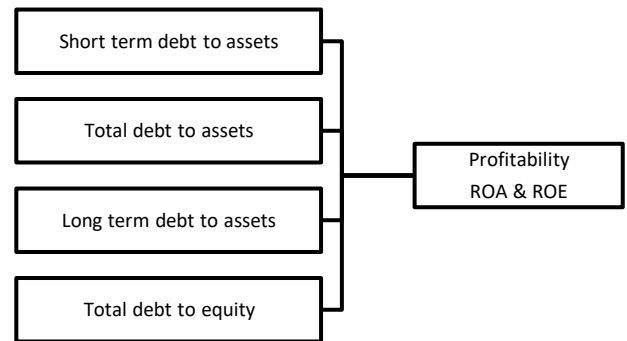

Fig. 1 Theoretical Framework

A. Variable

Dependent variable: Profitability is the dependent variable and is measured by the return on assets (ROA) and return on equity (ROE). The reason for choosing the return on asset (ROA) variable as a proxy of financial performance measurement is that it shows the percentage of profit that a company earns in relation to its overall resource (total asset) (Ghosh, 2007).

$$ROA = \text{Net income / Total Assets}$$

The other reason for choosing return on equity (ROE) as a proxy of financial performance is that it measures the rate of return for ownership interest (shareholder equity) of common stock owners, and it also measures the efficiency of a firm at generating profits from each unit of shareholder equity (Abor, 2005)

$$ROE = \text{Net income / Total Equity}$$

Independent variable: Capital structure is the independent variable of this research and is measured by total debt to equity ratio, long-term debt to assets, short-term debt to assets, and total debt to assets.

IV. METHODOLOGY

A. Research design

The study adopts the descriptive approach of research design in line with previous studies and the objectives of the study.

B. Sources of information

This study is based on secondary data. Data are collected from the annual report and website of selected banks for the period 2008-2015.

C. Population and sample

For the purpose of study, the population has been defined in the term of a number of commercial banks in Nepal. Depending on the availability of information, out of 28 commercial banks, 11 banks have been selected as samples. Nepal Bank Limited, Nabil Bank Ltd, Standard Chartered Bank Nepal, Nepal State Bank of India, Nepal Investment Bank Ltd, Rashtriya Banijya Bank, Himalayan Bank Ltd,

and Agricultural Development Bank have been selected as sample banks.

IV. Data type

The nature of data used in this study enables the researcher to use a panel data model. Panel data is the combinations of cross-sectional and times series data.

V. Data Analysis Methods

The researcher has used analytical and descriptive study methods with the help of appropriate statistical or financial tools. The important financial and statistical tools and methods used for the analysis are ratio analysis, descriptive statistics, and multiple regression analysis. Secondary data was also collected and analyzed using MS-Excel and E-VIEWS 8. Multiple regression has been used to test the theoretical relation between capital structure and financial performance of commercial banks.

V. DATA ANALYSIS AND INTERPRETATION

Various measures such as ratio analysis, arithmetic mean, standard deviation, coefficient of correlation, testing of hypothesis, regression analysis, etc., have been employed to analyze the impact of the capital structure on the profitability of eleven sample commercial banks of Nepal.

Descriptive

Table 1. Descriptive Statistics

	ROA	ROE	SHORT_TERM_DEBT_TO_ASSET	LONG_TERM_DEBT_TO_ASSETS	DEBT_TO_EQUITY	DEBT_ASSETS_RATIO
Mean	2.256426	17.822265	23.31703	2.698191	6.764831	86.53323
Median	2.370844	15.554387	23.40193	3.238557	5.997802	85.70904
Maximum	2.969387	35.780300	26.14866	4.210161	11.044973	91.70106
Minimum	1.392842	10.61317	20.69326	0.432687	5.114394	83.64515
Std. Dev.	0.424821	7.2034212	1.891132	1.461571	1.862678	2.524264
Observations	88	88	88	88	88	88

As it is presented in table 1, During the period 2008-2015, the mean value of financial performance measured by return on assets (ROA) and return on equity (ROE) are 2.256% and 17.82%, respectively. It indicates that commercial banks under this study generate 2.256% revenues from their invested total asset and 17.82% revenue from total equity. The standard deviation of return on asset (ROA) and return on equity (ROE), 0.424 and 7.203 respectively, this statistical measurement implies that the volatility of return on asset (ROA) and return on equity (ROE) from the mean value is 0.424 and 7.203 respectively. Furthermore, in the period 2008- 2015, the minimum and the maximum return on asset (ROA) are 1.392 and 2.969, and the minimum and the maximum return on equity (ROE) are 10.61 and 35.78, respectively. The mean value of debt to asset ratio is 86.53%, which means that commercial banks under the study finance their project by debt, i.e., 86.53% of their long-term investment finance comes from debt. Similarly, the mean value of short-term debt, long-term debt, and debt to equity ratio is 23.317%, 2.689%, and 6.78%, respectively.

A. Hypothesis testing

($H01_a$): There is no significant relationship between ROA and short-term debt to assets ratio sample banks.
($H02_a$): There is no significant relationship between ROA and long-term debt to asset ratio of sample banks.
($H03_a$): There is no significant relationship between ROA and total debt to asset ratio of sample banks.
($H04_a$): There is no significant relationship between ROA and debt to equity ratio of sample banks.
($H01_b$): There is no significant relationship between ROE and short-term debt to assets ratio sample banks.
($H02_b$): There is no significant relationship between ROE and long-term debt to asset ratio of sample banks.
($H03_b$): There is no significant relationship between ROE and total debt to asset ratio of sample banks.
($H04_b$): There is no significant relationship between ROE and debt to equity ratio of sample banks.

B. Specification of the Model

The following multiple regression model has been used to test the theoretical relation between the financial performance and capital structure of commercial banks.

Model 1

ROA = A + C(1)*LONG_TERM_DEBT_TO_ASSETS + C(2)*DEBT_TO_EQUITY + C(3)*DEBT_ASSETS_RATIO + C(4)*SHORT_TERM_DEBT_TO_ASSET + e

Model 2

$ROE = A +$
$C(1)*LONG\_TERM\_DEBT\_TO\_ASSETS +$
$C(2)*DEBT\_TO\_EQUITY +$
$C(3)*DEBT\_ASSETS\_RATIO+C(4)*SHORT\_TERM\_DEBT\_TO\_ASSET + e$
Where,
A= constant
C1, C2, C3 and C4 are beta coefficient
e is error term

C. Hausman test

There are broadly two classes of panel estimator approaches that can be employed in financial research: fixed-effects models and the random-effects model. The question is which model is more appropriate fixed effect model or the random effect model in this research model. In order to isolate which model is appropriate, the researcher used the Hausman test. The Hausman test examines whether the unobservable heterogeneity term is correlated with explanatory variables while continuing to assume that regressors are uncorrelated with the disturbance term in each period. The null hypothesis for this test is that the unobservable heterogeneity term is not correlated or random-effect model is appropriate with the independent variables. If the null hypothesis is rejected, then we employ the Fixed Effects method(Brooks, 2008).

The Hausman test hypothesis is
H_0= Random effect model is appropriate
H_1= Fixed effect model is appropriate

Table 2. Hausmen tests for ROA

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.0000004		1.0000

Source: E-views 8

According to the above table 2 shows Hausmanthe specification test, the P-value of model 1 is 1which is more than 5% level of the significant level. This implies that for this research model random effect model is more appropriate than the fixed-effect model.

Table 3. Hausman tests for ROE

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	0.0000004		1.0000

According to the above table 3 shows the Hausman specification test, the P-value of model 2 is 1, which is more than 5% level of the significant level. This implies that for this research model random effect model is more appropriate than the fixed-effect model.

D. Regression analysis

Table 4. Regression output for ROA

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 01/10/19 Time: 18:07
Sample: 2008 2015
Periods included: 8
Cross-sections included: 11
Total panel (balanced) observations: 88
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LONG_TERM_DEBT_TO_ASSETS	0.070966	0.032780	2.164956	0.0333 *
DEBT_TO_EQUITY	0.910975	0.120648	7.550685	0.0000 *
DEBT_ASSETS_RATIO	-0.591419	0.092502	-6.393609	0.0000 *
SHORT_TERM_DEBT_TO_ASSET	0.009001	0.024932	0.361009	0.7190
C	46.86984	7.696547	6.089723	0.0000

	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.264692	1.0000

Weighted Statistics			
R-squared	0.674258	Mean dependent var	2.256426
Adjusted R-squared	0.658560	S.D. dependent var	0.424821
S.E. of regression	0.248235	Sum squared resid	5.114523
F-statistic	42.95076	Durbin-Watson stat	3.077796
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.67425	Mean	2.2564

	8	dependent var	26	
Sum squared resid	5.11452 3	Durbin-Watson stat	3.0777 96	

*correlation coefficient significant at 5%

Table 4 shows that the Adjusted R-squared is 0.6742; this means 67.42% variation of return on asset explained by independent variables of the model. The above table shows that the P-value of the F-statistic is 0.0000, which implies all the independent variables in the above model can jointly influence the dependent variable. The panel random effect estimation regression result in the above table shows coefficient intercept (α) is 48.68. This means, when all explanatory variables took a value of zero, the average value of ROA would take 48.68 units and be statistically significant at 5% of the significance level.

As can be presented in the above table random effect regression output, the coefficient of total debt to assets ratio is -0.5914, and its P-value is 0.0. This implies that, holding other variables constant at their average value, when debt to asset ratio increased by 1 unit, ROA of sampled banks would be decreased by -0.5914 units and statistically significant at 5% of

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LONG_TERM_DEBT_TO_ASSETS	0.514181	0.250171	2.055315	0.0430 *
DEBT_TO_EQUITY	10.490677	0.920774	11.39332	0.0000 *
DEBT_ASSETS_RATIO	-5.139610	0.705963	-7.280284	0.0000 *
SHORT_TERM_DEBT_TO_ASSET	0.208569	0.190281	1.096108	0.2762
C	385.3516	58.73932	6.560368	0.0000

Effects Specification		S.D.	Rho
Cross-section random		0.000000	0.0000
Idiosyncratic random		2.020106	1.0000

Weighted Statistics			
R-squared	0.934010	Mean dependent var	17.82265
Adjusted R-squared	0.930830	S.D. dependent var	7.203412
S.E. of regression	1.894508	Sum squared resid	297.9004
F-statistic	293.69	Durbin-Watson	2.9928

significant level. In other words, there is a significant negative relationship between debt to assets ratio and ROA.

As can be seen in the above table 4, the coefficient of long-term debt to asset and debt to equity ratio are 0.070966 and 0.910975 with P-value 0.033 and 0.0, respectively. It implies that there is a significant positive relationship between debt to equity and long-term debt to the asset with return on asset. The other variable in this model is a short-term debt ratio, and its P-value is0.7190, which indicates there exists no significant relationship between return on assets and short-term debt ratio.

Table 5. Regression output for ROA

Dependent Variable: ROE__Y2_
Method: Panel EGLS (Cross-section random effects)
Date: 01/10/19   Time: 18:20
Sample: 2008 2015
Periods included: 8
Cross-sections included: 11
Total panel (balanced) observations: 88
Swamy and Arora estimator of component variances

	35	Watson stat	49
Prob(F-statistic)	0.0000 00		

Unweighted Statistics			
R-squared	0.934010	Mean dependent var	17.82265
Sum squared resid	297.9004	Durbin-Watson stat	2.9928 49

*correlation coefficient significant at 5%

Table 5 shows that the Adjusted R-squared is 0.934010; this means 93.41% variation of return on equity explained by independent variables of the model. The above table shows that the P-value of the F-statistic is 0.0000, which implies all the independent variables in the above model can jointly influence the dependent variable. The panel random effect estimation regression result in the above table shows coefficient intercept (α) is 385.3516. This means, when all explanatory variables took a value of zero, the average value of ROE would take 385.3516 units and be statistically significant at 5% of the significance level.

As can be presented in the above table random effect regression output, the coefficient of total debt to assets ratio is -5.139610, and its P-value is 0.0. This implies that, holding other variables constant at their average value, when debt to asset ratio increased by 1 unit, ROE of sampled banks would be decreased by -5.139610 units and statistically significant at 5% of significant level. In other words, there is a significant

negative relationship between debt to assets ratio and ROE.

As can be seen in the above table 5, the coefficient of long-term debt to asset and debt to equity ratio are 0.514181 and 10.49067 with P-value 0.043 and 0.0, respectively. It implies that there is a significant positive relationship between debt to equity and long-term debt to the asset with return on equity. The other variable in this model is a short-term debt ratio, and its P-value is 0.276, which indicates there exists no significant relationship between return on equity and short-term debt ratio.

VI. SUMMARY AND CONCLUSION

The study reveals that long-term debt to asset, total debt to asset, and total debt to total equity are statistically significant to ROE and ROA matches with findings of Ameen & Shahzadi(2017), Zafar, Zeeshan, & Ahmed(2016), and Holz(2002). The results show a significant negative relationship between profitability and long-term debt, consistent with the findings of Abor(2005). Margaritis & Psillaki(2010) also found a positive impact and proved that debt ratio positively affects the performance of a firm.

This study was conducted in the commercial banking sector to evaluate the impact of capital structure on banks' profitability in the Nepalese banking sector. The study has contributed something new to the existing studies done in the banking sector. The study is not free from limitations, as the study covers only the financial aspects. It is conducted solely on the basis of secondary data of the past 8 years. However, the outcome of this comparative study is expected to help the other researchers or students who are interested in understanding the capital structure management of the Nepalese commercial management practices of the bank.

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