

Impact of Financial Leverage on the Performance of Nepalese Commercial Banks¹

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Abstract

The objective of this study is to investigate the impact of bank leverage on performance (profitability) of Nepalese commercial banks. Banks are highly leveraged institutions; so, it is an important task to measure the relation between banks' degree of financial leverage and performance. The sample size of this quantitative research guided by positivist research philosophy was twenty commercial banks of Nepal. The study has sought to explore the relationship between independent variable (debt ratio, DR & debt equity ratio, DER) and the dependent variables (net interest margin, NIM, return on assets, ROA, & return on equity, ROE). Bank performance was measured by ROA, NIM and ROE. These variables are the indicators of bank profitability and DR and DER are the indicators of leverage. The econometric method was applied in the study to investigate the relationship of financial leverage with performance of commercial banks. The study period covered ten years from 2012/13 to 2020/21. The data were analysed using descriptive statistics, correlation, simple regression, and multiple regression. Financial leverage was proxied by debt ratio and debt to equity ratio. The bank performance was measured by net interest margin, return on assets and return on equity. The results showed nonlinear relation between bank leverage and performance. It indicates that the bank management should pay attention while employing the borrowed funds to expand their business and operations.

Keywords: bank, leverage, nonlinear relation, performance

Introduction

Financial leverage represents a firm's financial framework which consists of the debt and equity used to finance the firm. A firm's ability to carry out its stakeholders' requirements is closely related to capital structure. Therefore, this foundation is an imperative piece of information that should not be disregarded. Financial leverage, in

financial terms, means the way firms finance their assets through the mixture of a company's debt (long-term and short-term), common equity, and preferred equity (Akintoye, 2008). The foremost contemporary theory of capital structure started with the article of Modigliani and Miller (1958). Since then, various studies have been carried out to investigate the

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optimal capital structure in the absence of Modigliani Miller's assumption

The bank and financial institutions are crucial components of the healthy and wealthy financial system of the country. They receive money from those who want to save in the form of deposits and lends money to those who need it. Thus, it is said that the banking sector mirrors the larger economy (Singh & Dutta, 2013). Financial leverage has always been one of the main topics among the studies of finance. Its importance derives from the fact that capital structure is tightly related to the ability of firms to fulfil the needs of various stakeholders. The last century has witnessed the continuous development of new theories on the optimal debt to equity ratio. The first milestone on the issue was set by Modigliani and Miller (1958) whose model argued on their relevance of the capital structure in determining a firm's value and performance.

Financial leverage allows a greater potential return to the investors than otherwise would have been available, but the potential loss is also greater, if the investment becomes worthless, the loan principal and all accrued interest on the loan still need to be repaid. The optimal financial leverage structure implies that with the smallest amount of weighted average cost of capital there is the maximization of the worth of the organization. Although optimal financial leverage is a concept that has been researched severally, yet one cannot find any formula or theory that, with certainty, provides optimal financial leverage for an organization (Tian & Zeitun, 2007).

Leverage comes under financial strategy planning which helps to increase the rate of return by generating a greater return on borrowed money than the cost of using that money. If a firm's return on asset is greater than the before-tax interest rate paid on debt, then we can say that leverage is positive. If the return on asset of the firm is less than before-tax interest rate, then we can say that leverage is negative (Larry & Stulz, 1995). Mandelker and Rhee (1984) showed that the most profitable firm in many industries often have the lowest leverage ratio. They found that large positive abnormal returns for a firm's stockholders are associated with leverage increasing events such as a stock repurchase or debt for equity exchange instead of leverage decreasing events such as issuing stocks.

Mangalam and Govindasamy (2010) analysed and understood the impact of leverage on the performance of the firm by investigating the relationship between the leverage and the earning per share. This study analysed leverage in three ways: financial leverage, operating leverage, and combine leverage. The basic responsibility of corporate financial managers is to boost up the property of participators, raise of investment, and reduction in the capital cost. Thus, the study reaches this conclusion from the theory of capital structure that the cost of outside equity reduces through high leverage. Managers of firms do right-way jobs in favour of the interest of shareholders (Berger & Patti, 2006). Baker (1973) analysed the effect of financial leverage or relatively greater use of debt capital, on industry performance.

Ezeoha (2008) showed the significance of the firm size as a determinant of corporate financial leverage from an undeveloped market perspective. The key variables used in the study were firm size, financial leverage ratios, profitability, firm age, and assets tangibility as control variables. Financial leverage served as a dependent variable, while the other used as the independent variable. The study used financial leverage in three forms: short term financial leverage measured as short-term debt to total assets ratio, long term financial leverage measured as long-term debt to total assets ratio, and total financial leverage measure as total debt to assets ratio.

In the Nepalese context, banks are the major institutions of financial system which accounted for more than 70% of the total assets of all the financial institutions (Poudel, 2005). The performance of banks with lower leverage and higher capital adequacy ratio is found to be more efficient and bank loans seem to be more highly valued than alternative bank outputs (Neupane, 2013). Joshi (2013) found that liquidity and bank size are positively related to a bank's performance.

The objective of the study was to assess the impact of financial leverage on bank's performance in Nepalese commercial banks. More specifically, it examined the impact of debt to total assets and debt to equity ratio on performance of Nepalese commercial banks measured by net interest margin, return on assets, and return on equity. The remainder of this paper is organized as follows: Section two describes the sample, data, and methodology. Section three presents the

empirical results and the final section draws conclusions and discusses the implications of the study findings, return on assets (ROA), return on equity (ROE) and net interest margin (NIM) of Nepalese commercial banks.

Review of Literature

Salim and Yadav (2012) found that return on assets, return on equity, and earnings per share had a negative relationship with short-long-term debt, and total debt. The study showed that Tobin's Q had a significant positive relationship with the performance of firms. The study found that the relationship between financial leverage and firm performance measures was negative. A negative relationship between financial leverage and firm performance for other one-country samples was observed for Nigeria (Onaolapo & Kajola, 2010) and India (Majumdar & Chhibber, 1999) with profitability used as a performance measure. In the case of 10 developing countries (India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan, and South Korea), the negative relationship between the financial leverage and firm performance measures was also found (Booth et al., 2001).

Iqbal and Usman (2018) argued that there was the large impact of financial leverage on performance of financial institutions of Pakistan during 2011 to 2015. Financial leverage was proxied by debt-to-equity ratio, solvency ratio (debt ratio), and equity ratio. Return on assets (ROA) and return on equity (ROE) were used as the performance indicators. Descriptive statistics, correlation and multiple regression were employed to

analyse the data. The result showed negative or insignificant impact of financial leverage on ROE, but positive or significant impact on ROA. The theme of review was the impact of leverage in performance was positive when debt was less than the equity in total financing.

A study found that profitability was negatively associated with leverage (Poyry & Maury, 2009). In the study the relationship between ownership structures and capital structures was explored. Joshua (2005) investigated the relationship between leverage and performance of listed companies on the Ghana stock exchange during 5 years period. The study showed that there was a positive relationship between the ratios of short-term debt to total asset and ROE, and a negative relationship between the ratios of long-term debt to total assets and ROE. The research further found a positive association between the ratio of total debt to total assets and return on equity. This study was consistent with the findings of Joshau (2007) which found that the effect of debt policy on the performance of the small and medium-sized enterprise in Ghana and South Africa suggested that capital structure especially long-term and total debt ratio negatively affect the performance of SMEs.

Kyereboah-Coleman (2007) investigated the impact of leverage on the performance of microfinance institutions in sub-Saharan Africa. Most of the microfinance institutes financed their operation with long-term debt as compared to short-term debt and they usually employed high leverage. The study found that high leverage firms performed better to deal with risk and they enjoyed

economies of scale. Ebai (2009) examined the impact of leverage on firm performance in Egypt which was considered as an emerging or transitional economy of the period 1997-2005. The research showed that capital leverage had weak to no impact on a firm's performance. Richard (2004) found that the amount of debt is positively related to the percentage of firms' leverage.

Graham (2000) found that all highly profitable firms showed their debt level low as it had a negative relationship between debt ratio and performance of the firm. Ferati (2012) took short term debts and long-term debts as independent variables and firm's performance as the dependent variable; and found a negative correlation of long-term debts with financial performance and positive correlation between short term debts with the financial performance of the company. Abbas (2012) displayed negative and inconsistent relationship between debts and financial performance. Khan (2012) found a negative and inconsistent relationship between two leverage and performance. Mesquita (2003) showed that the rate of return with short-term held an inverse relationship with long-term debt and equity. Ceasar (2003) and Hall (2004) examined a negative connection among profitability of firms with an elongated term of debts and short-term debts. Amsaven (2009) found that there is a negative relation between leverage and a firm's performance.

Sudan (2021) revealed that debt to assets ratio, long term debt ratio, debt to equity ratio, interest coverage ratio, and liquidity ratio had a positive relationship with return on assets, net profit margin,

and earning per share. But the board size and Tobin's q had a negative relationship with return on assets during 2011 -2017.

Destar (2020) showed that Debt Ratio (DR) had a negative and so insignificant effect on banks' performance measured by Return on Assets (ROA) and Return on Equity (ROE); while Debt Equity Ratio (DER) and Interest Coverage Ratio (ICR) had significant positive effect on banks' performance measured by Return on Assets (ROA) and Return on Equity (ROE) during 2008-2017.

Many studies in Nepal and other countries have been conducted to measure the relationship between bank leverage and performance (profitability). But most of them had measured linear relationship. In Nepal, all the studies have been conducted to investigate the linear relationship. Very few studies have investigated nonlinear relation. Thus, this study attempts to investigate linear and nonlinear relation between bank's leverage and performance in Nepalese context.

Method

Research Design

This study was purely quantitative; so, it was guided by positivist research philosophy. Because of the purely quantitative nature of the study, it applied descriptive, correlational, and causal-comparative research designs to deal with the issues associated with relationship between bank size and performance. The descriptive research design was used to summarize the study variables. It was useful to know the status of variables and explain the variables that are present at a given situation. The fundamental premise

behind this approach was that the variables and problems had already been identified by the investigation.

The link or relationship between two variables was examined using a correlational study design. To determine the direction, amount, and kind of link, the study first determined if the variables were associated or not. According to Kothari (2004), variables may be related in the same direction, in the opposite direction, or not at all. Investigating potential cause and effect relationships between the variables is the goal of causal-comparative study design. It assesses the current effects of one or more variables on another variable. The "ex-post facto research design" was also used. It is the kind of design where the independent variable(s) have already happened and where the investigation begins with the observation of a dependent variable before observing the independent variable(s) or variables in retrospect for their potential relationship (Kerlinger, 1983). This methodology has also been used in this work to quantify the potential causal connections between several dependent and independent variables. More specifically, the study looks at the connections of debt ratio, debt to equity ratio, and with net interest margin, return on assets and return on equity (measures of bank performance) respectively.

Population, Sample, Nature, and Source of Data

The population of this study was twenty-one commercial banks running currently in Nepal and the sample size was twenty commercial banks excluding Rastriya Banijya Bank since it is not listed in stock exchange. The data were

secondary, quantitative and hand collected from the annual reports of the banks and the data covered ten years' period from 2012/13 to 2020/21 leading to 200 observations.

Variables Selection

The study has sought to explore the relationship between independent variable (debt ratio, DR & debt equity ratio, DER) and the dependent variables (net interest margin, NIM, return on assets, ROA, & return on equity, ROE). Bank performance was measured by ROA, NIM and ROE. These variables are the indicators of bank profitability and DR and DER are the indicators of leverage. Many studies had used these indicators as the proxies of firm performance and leverage (Shehzad, De Haan & Scholtens, 2013; Neves, Proença, & Dias, 2020; Islam & Nishiyama, 2016).

Methods of the Data Analysis

This research has used quantitative design due to quantitative nature of the data. Twenty-one commercial banks were the population and twenty commercial banks were taken as sample based on the availability of secondary data. The data were secondary and quantitative, and they were hand collected from annual reports of the respective banks. Descriptive statistics, correlation analysis, simple and multiple linear regression analysis were applied to analyze the data.

Model Specification

The econometric method was applied in the study to investigate the relationship of financial leverage with performance of commercial banks. The performance of commercial banks was measured by net interest margin, return on assets and return on equity. The econometric model was:

$$\text{Performance} = f(\text{leverage})$$

The specific models were:

- $$\text{NIM}_{it} = a + b_1\text{DR}_{it} + b_2\text{DR}_{it}^2 + b_3\text{DR}_{it}^3 + e_{it} \dots \dots \dots i$$
- $$\text{NIM}_{it} = a + b_1\text{DER}_{it} + b_2\text{DER}_{it}^2 + b_3\text{DER}_{it}^3 + e_{it} \dots \dots \dots i$$
- $$\text{ROA}_{it} = a + b_1\text{DR}_{it} + b_2\text{DR}_{it}^2 + b_3\text{DR}_{it}^3 + e_{it} \dots \dots \dots i$$
- $$\text{ROA}_{it} = a + b_1\text{DER}_{it} + b_2\text{DER}_{it}^2 + b_3\text{DER}_{it}^3 + e_{it} \dots \dots \dots i$$
- $$\text{ROE}_{it} = a + b_1\text{DR}_{it} + b_2\text{DR}_{it}^2 + b_3\text{DR}_{it}^3 + e_{it} \dots \dots \dots i$$
- $$\text{ROE}_{it} = a + b_1\text{DER}_{it} + b_2\text{DER}_{it}^2 + b_3\text{DER}_{it}^3 + e_{it} \dots \dots \dots i$$

Where:

ROE_{it} = return on equity, measured as net profit after taxes divided by yearend total equity of bank_i in year_t.

NIM_{it} = net interest margin, measured as net interest income divided by yearend total assets of bank_i in year_t.

ROA_{it} = return on assets, measured as net profit after taxes divided by yearend total assets of bank_i in year_t.

DR_{it} = debt ratio, measured as total debt divided by yearend total assets of bank_i in year_t.

DER_{it} = debt equity ratio, measured as total debt divided by yearend total equity of bank_i in year_t.

e_i = Error term of the Model.

Results and Discussion

Descriptive Statistics

The descriptive statistics applied in this study included the number of observations, minimum values, maximum values, mean values, and standard deviations of the variables under

investigation. Descriptive statistics provide information in summarised and meaningful form, which is usually easier for interpretation and understand. Table 1 shows the descriptive statistics of dependent and independent variables during the study period.

Table 1

Summary Statistics of Study Variables

Variables	N	Minimum	Maximum	Mean	Std. Dev
DR	200	0.00	99.35	88.2314	8.74678
DER	200	0.00	15355.37	948.2445	1062.73508
ROA	198	0.09	10.33	1.5869	0.83919
ROE	198	0.89	74.62	14.8549	7.01457
NIM	200	0.28	34.65	3.2972	2.34826

Table 1 shows that the average net interest margin was 3.2972 and standard deviation 2.34826 with minimum 0.28 to maximum 34.65. The average return on assets was 1.5466 percent and 0.83919 percent standard deviation with the minimum ROA 0.09 percent to maximum ROA 10.33 percent. The mean of debt ratio is 88.3214 percent and standard deviation 8.74678 percent with minimum value of 0

percent and maximum value of 99.35 percent. Debt to equity ratio ranges 0.00 percent to 15355.37 percent with average 948.2445 percent and standard deviation 1062.73508. The return on equity has maximum value of 74.62 percent and minimum value of 0.89 percent with the average value of 14.8549 percent and standard deviation 7.01457 percent during the study period.

Table 2
Correlation Between Study Variables

Variables	DR	DER	ROA	ROE	NIM
DR	1.000				
DER	1.000**	1.000			
ROA	-.323**	-.323**	1.000		
ROE	.456**	.456**	.611**	1.000	
NIM	-.208**	-.208**	.630**	.357**	1.000

Note. ** indicates correlation is significant at 0.01 level and * indicates correlation is significant at 0.05 level.

In this correlation table, net interest margin, return on assets and return on equity are the dependent variables and debt ratio and debt to equity ratio are independent variables. It showed that the

net interest margin and return on assets had negative relation with debt ratio and debt to equity ratio and positive relation with the rest dependent variables.

Table 3
Regression of Net Interest Margin on Debt Ratio

Model	Constant	DR	DR ²	DR ³	F-Value	AdjR ²	SEE
Linear	24.5	-0.24 (0.000)	-	-	125	38.40	1.84
Quadratic	35.4	-0.58 (0.000)	0.002 (0.0000)		68	40.10	1.82

Table 3 shows the relationship between debt ratio and net interest margin. The coefficients of linear and quadratic models were significant. The value of adjusted R-square of quadratic model was higher than the linear model; so, it is concluded that the relationship between net

interest margin and debt ratio was nonlinear. It indicated that there is threshold value of debt ratio in Nepalese commercial banking that maximizes the net interest margin. Our finding supports prior study of Poyry and Maury (2009).

Table 4

Regression on Net Interest Margin on Debt-to-equity Ratio.

Model	Constant	DER	DER ²	F-Value	AdjR ²	SEE
Linear	3.5	0.0 (0.16)	-	1.93 (0.17)	0.5	2.34
Quadratic	5.54	-0.003 (0.000)	1.635E-7 (0.000)	8.68 (0.000)	7.2	2.26

Table 4 shows the relationship between debt-to-equity ratio and net interest margin. The coefficient of linear model was not significant; but the coefficient of quadratic model was significant. So, the relationship between net interest margin and debt to equity ratio

was nonlinear. It indicated that there is lower limit value of debt-to-equity ratio in Nepalese commercial bank that maximizes the net interest margin. Our finding supports prior study of Poyry and Maury (2009).

Table 5

Regression of Return on Assets on Debt Ratio

Model	Constant	DR	DR ²	F-Value	AdjR ²	SEE
Linear	9.76	-0.093 (0.000)	-	111.77 (0.000)	36.6	0.74
Quadratic	8.59	-0.56 (0.314)	0.000 (0.500)	58	36.4	0.74

Table 5 shows the relationship between debt ratio and return on assets. The coefficient of linear model was significant but the coefficient of quadratic model was not significant. The relationship between debt ratio and return on assets was

linear. It showed the inverse relation between debt ratio and return on assets. This finding was consistent with the findings of Amsaven (2009) and Khan (2012).

Table 6

Regression of Return on Assets on Debt-to-equity Ratio

Model	Constant	DER	DER ²	F-Value	AdjR ²	SEE
Linear	1.73	0.00 (0.008)	-	7.13 (0.000)	3	0.83
Quadratic	2.68	-0.001 (0.000)	7.756E-8 (0.000)	18.41	15	0.77

Table 6 shows the relationship between return on assets on debt-to-equity ratio. The coefficient of each model was significant. The value of adjusted R-square of quadratic model was higher than the

linear model. So, the relation between return on assets and debt to equity ratio was nonlinear. This finding was not consistent with Salim and Yadav (2012).

Table 7

Regression of Return on Equity on Debt-to-equity Ratio

Model	Constant	DER	DER ²	F-Value	AdjR ²	SEE
Linear	10.64	0.004 (0.000)	-	168.88 (0.000)	46	5.15
Quadratic	6.32	0.01 (0.000)	- 3.495E7 (0.000)	97.03 (0.000)	49.4	4.99

The regression results showed the relation between return on equity and debt to equity ratio. The coefficient of each model was significant. The value of adjusted R-square of quadratic model was higher than that of linear model. So, the

relation between return on equity and debt to equity ratio was non-linear. This showed a positive relationship between return on equity and debt to equity ratio. This finding was consistent with Desta (2020).

Table 8*Regression of Return on Equity on Debt Ratio*

Model	Constant	DR	DR ²	F-Value	AdjR ²	SEE
Linear	-4.78	0.22 (0.000)	-	16.47 (0.000)	7.3	6.75
Quadratic	12.28	-70 (0.000)	0.008 (0.000)	19.02 (0.000)	15.5	6.45

Table 8 shows the relationship between return on equity and debt ratio. It had the negative and significant effect on banks performance measure by return on equity. Our findings match with the study of Graham (2000).

Conclusion

In this study, we empirically examined the impact of financial leverage on performance of Nepalese commercial banks. We applied the recently published data of twenty commercial banks of Nepal. The results show nonlinear relation between NIM and DR. It indicates that there is an optimal level of DR that maximizes NIM of the bank. The

relationship between NIM and DER is also found nonlinear. The relation between DR and ROA is negative and linear which indicates inverse relation between ROA and DR. The relation of ROE with DER and DR are also found nonlinear. The above results indicate that the impact of bank leverage on NIM, ROA and ROE are nonlinear. Therefore, the bank should pay attention while choosing the level of leverage. This study was conducted using only bank's data and data were analysed using ordinary least square estimate regression model. The inclusion of other nonbank firms and data analysis using other models of estimation may produce more reliable and valid results.

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