

Impact of Capital Structure on Profitability of Non-Financial Institutions Listed on Nepal Stock Exchange: Revisiting from the Theoretical Lens

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ABSTRACT

This study aims to examine the interplay between capital structure and profitability across the non-financial institutions listed in Nepal Stock Exchange, NEPSE. The applicability of Modigliani-Miller (MM), Trade-Off theory, and Net Income theories was tested in an emerging market context of Nepal. Cross-sectional panel design was employed in this study. Descriptive as well as causal-explanatory technique assessed the capital structure-profitability relationship and test the validity of the theories. Using sample of firms selected through convenience cum purpose sampling technique, the study analyze leverage ratios (long-term debt, and debt-to-equity) and profitability metrics (ROA, ROE and NPM) via correlation and regression. Sample comprised of 17 firms with total of 121 observations, prioritizing firms with ≥ 3 years of continuous data. Major findings unveil: (1) a positive impact of long-term debt on NPM but negative impact on ROA and ROE, but positive impact on NPM, aligning with Trade-Off theory that suggests to maintain a balance between the cost and benefit arising from the use of debt capital. Same notion is sustained in the case of debt-to-equity ratio as it has positive impact on ROE but negatively impact NPM, keeping the effect on ROA insignificant (2) liquidity (current ratio) enhances profitability viz., ROA and ROE, leaving NPM insignificant, underpinning the liquidity-profitability trade-off; and (3) growth escalates ROA and ROE but not NPM (insignificant), which is once again in line with trade-off theory (4) size enhances NPM but adversely effect ROE, keeping ROA insignificant, which supports trade-off theory that optimum level of size increases profitability but beyond that optimal level, leads to decrement in the profitability. Empirical insights suggest firms should optimize debt capital, liquidity and size of the institutions. Among the theories undertaken in the study, Trade-Off is best suited in the imperfect emerging markets like Nepal. Policymakers and managers must

Online Access

Website:

<https://nepjol.info/index.php/njbms>

DOI: 10.3126/njbms.v4i1.96907

E-ISSN: 2961-1660

P-ISSN: 2961-1652

Article History

Received: 9 April 2025

Revised: 28 June 2025

Accepted: 16 July 2025

Vol. 4, No. 1, Page: 57-77

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realize the practical relevance of the trade-off theory while making decisions on capital structure and profitability. Future research should employ non-linear models and cross-country comparisons to generalize and further validate the findings.

Keywords: Capital structure, emerging markets, NEPSE-listed non-financial institution, profitability, trade-off theory

JEL Classification: G31, G32, L25

Introduction

Capital structure is a component of financial structure which considers long term sources of the funds. Capital structure refers to the aggregation of long-term financing provisioned by common stock equity, debt, and preferred stock (Van Horne & Wachowicz, 2009). While equity financing is obtained from the sales of common stock, debt source collects funds from bank and financial institutions. Major feature of the debt is that a fixed rate of interest has to be paid at a specified rate to shareholders. There are several sources of debt like bank loans and personal loans, which has to be repaid along with the specified interest rate regardless of its source. Similarly, preferred stock, also known as hybrid capital, is issued by a firm to generate the funds. Individual and institutional investors invest in the preferred stock who prefer to expect more stable income pattern and have preference in receiving dividend and asset distribution over the common shareholders that makes it relatively a low-risk investment with secured dividends. Capital structure is the method in which a company finances their operation either through the use of equity or debt or combination of these two (Brigham & Gapenski, 2004). Capital structure refers to the mix of debt and equity capital which requires a manager to take a crucial financial decision. A proper structure which includes reasonable amount of debt and equity can provide a company with optimum

capital structure which eventually helps in increasing the value and profitability of the company ultimately maximizing the shareholders equity (Wipperfurth, 1996).

There is inconsistency in the findings of the prior studies and results are often found to be contradictory and mixed. Pratheepkanth (2011) conducted a study in business companies from Colombo Stock Exchange, Sri Lanka also found the impact of capital structure on profitability (ROA, ROE and ROCE) was negative. Another study done by Dave et al. (2019) examined the relationship between capital structure and profitability in Indian steel industry and the result also showed that capital structure negatively impact the profitability. Bhattarai (2016) analyzed the effect of capital structure on firm's performance and these firms where the manufacturing firm listed in NEPSE and concluded that capital structure negatively affects the firm performance.

Ebaid (2009) carried a study in Egyptian capital market and found the impact of capital structure on profitability (ROA, ROE and GPM) was either weak or none. Another study done by Bhatt and Jain (2020) in Nepalese commercial banks, revealed the relationship between capital structure and profitability and envisaged that capital structure (Long term debt to total assets and short term debt to total assets) insignificantly impact the profitability, measured by return on equity.

Ahmed and Bhuyan (2020) empirically examined the interplay between capital structure/debt financing (measured by debt ratio and long term debt to total assets ratio) and firm performance/profitability (measured by ROA, ROE, ROCE. And OM, Operating margin) of service sector companies listed in the Australian Stock Exchange. Along with the other findings, the result revealed that capital structure measured by long-term debt to total asset has positive impact on the profitability measured by ROA, ROE and ROCE). Abor (2005) examined the relationship between capital structure and profitability of listed firms in the Ghana Stock Exchange (GSE). The regression analysis produced the result showing significant positive impact of capital structure, measured by short term debt to total assets and total debt ratio, on profitability, measured by return on equity. Jaishi and Poudel (2021) investigated firm specific factors composition and its effect on financial performance of life and non-life insurance companies in Nepalese context. The study employed panel data set of 14 insurance companies listed in Nepal Stock Exchange. Along with the other results, findings envisage that capital structure, measured by debt ratio, positively effect the profitability, measured by return on assets.

Concerning the research gap, literature has revealed few studies examining capital structure-profitability interplay in emerging markets like Nepal, despite extensive research using varied leverage and profitability metrics. Results from the prior studies are often context-dependent and Nepalese economy holds peculiar features constrained by an underdeveloped capital market and poor long-term financing capacity which pose significant

challenged for investment and development (Asian Development Bank, n.d.). These differentiates from the developed economies, underpinning the necessary of investigating the study. Testing the relationship between capital structure and profitability with several metrics from the theoretical lens is yet to be explored, providing insights on how global finance theories prevail amid the country's unique context. Hence, this study aim to assess the impact of capital structure on the profitability of non-financial institutions through the theoretical lens. Specific objectives of this study are:

- To analyze the metrics of capital structure (leverage ratio) and profitability (ROA, ROE, NPM) among NEPSE-listed non-financial firms.
- To empirically examine the relationship between capital structure (long-term debt to assets, debt to equity) and profitability of non-financial institutions listed in Nepal stock exchange.
- To evaluate the applicability of Modigliani-Miller (MM), Net Income Approach, and Trade-off theories in explaining capital structure-profitability relationships among NEPSE-listed non-financial institutions, given Nepal's imperfect market conditions (high borrowing costs and liquidity constraints).

The remainder of the study consists of literature review, methods, results and discussion, and conclusion.

Literature Review

The study is based on major theories of capital structure viz., Modigliani-Miller (MM) theory, Net Income Approach, and Trade-off theory. Modigliani and Miller

(1958) theory argue that capital structure is irrelevant in perfect markets with no taxes, bankruptcy, or agency costs. Firm's value is dependent merely on cash flows instead of debt-equity mix.

Likewise, Durand (1952) proposed Net Income Approach (NI) emphasizing on more debt reduces WACC, because of the cheap debt and constant cost of equity, which increases net income. This theory suggest that a change in leverage ratio leads to change in cost of the capital and eventually the value of company. The Net Income Approach argue that with the increase in leverage (proportion of debt), the weighted average cost of capital decreases and the firm's value increases. On the contrary, if there is decrement in the leverage, the weighted cost of capital will increases, hence decreasing the firm's value.

Kraus and Litzenberger (1973) founded the trade-off theory of capital structure which states that appropriate balance of tax shields and bankruptcy risk must be balanced. They emphasize on using optimum level debt that reduces risk and not using excessive debt as the interest costs outweigh the benefit

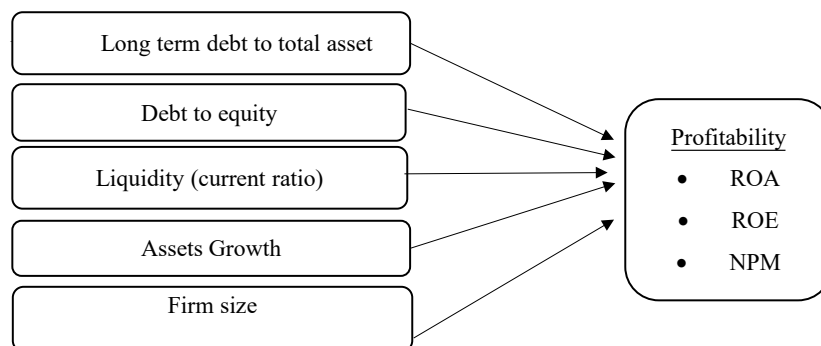
realized from the use of debt. The theory extended MM theory by incorporating real-world frictions.

The market in Nepal exhibits various imperfections including elevated borrowing costs and restricted access to capital (Nepal Rastra Bank, 2022; World Bank, 2021). These issues are especially pertinent for non-financial institutions listed on the Nepal Stock Exchange (NEPSE), which frequently encounter difficulties in optimizing their capital structure and attaining profitability within a financially underdeveloped context.

Research framework

A research framework has been presented to portray the study of relationships between the variables considered in the study. Profitability (measured as return on asset, return on equity and net profit margin) is an outcome variable and capital structure (long term debt to total asset and debt to equity), liquidity ratio (measured as current ratio), firm size and assets growth are the predictor variables of the study demonstrated in Figure 1.

Figure 1



Source: Shubita & Alawalthah (2012), Vuong et al. (2017), Bhatta (2018), Miko & para (2019), Rahman et al. (2019), Ahmed & Bhuyan (2020)

Long term debt to total asset

Long term debt is the debt which doesn't mature before 12 months. It is termed as non-current liability in the [balance sheet of the company](#). It can include [bonds](#), mortgages, bank loans, [debentures](#), etc. The long-term debt to total-asset ratio is percentage measure of firm's assets financed using long term sources which have maturity more than a year ([Kenton, 2020](#)). [Vatavu \(2015\)](#), [Yazdanfar and Öhman \(2015\)](#), [Vuong, Mitra and Vu \(2017\)](#) had recognized long term debt to total asset as independent variable in their study and was measured as long term debt to total assets. The study uses the definition as portion of long term debt on total asset. Value of long term debt and total asset are found in the balance sheet of the company.

$$\text{Long term debt to total asset} = \frac{\text{Long term debt}}{\text{Total asset}}$$

Debt to equity

The debt to equity is the measure which helps in evaluating company's financial leverage which is measured by dividing total liabilities by shareholders equity. It reflects the ability of shareholder equity to cover all outstanding debts ([Miko and Para \(2019\)](#), [Akeem, et al., \(2014\)](#) and [Rahman et al., \(2019\)](#) had recognized total debt to total equity as independent variable in their study. The study uses debt to equity tells the use of total debt in capital structure in terms of the shareholder's equity. Information regarding total liabilities and total shareholders' equity are found on the balance sheet of the company.

$$\text{Debt to equity} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Current ratio

Liquidity ratio is a financial measure which is used in determining the debtor's ability in paying off the current liability obligations without the external sources of capital. The current ratio measures firm's capacity to pay its short term obligation with current assets ([Investopedia, n.d.](#)). To be specific, it the ration or current assets (assets which can be converted into cash within a year) and current liabilities (liabilities to be paid within a year). Higher current ratio states better capacity of the firm to meet its short term obligations.

$$\text{Current ratio} = \frac{\text{Current Asset}}{\text{Current liabilities}}$$

Firm size

Firm's size can be determined in several ways. Some consider the amount of sales as the firms size, other consider value added as the size. This means scholars use various methods to determine the firm size. According to [Hitt et al., \(1997\)](#) firm size can be calculated by taking natural log of total asset. The study use total asset to calculate the firm size.

$$\text{Firm size} = \ln(\text{book value of total assets}).$$

Asset growth

Growth means the increment, calculated at the certain time interval. Asset growth means how much is the growth realized in the assets of a particular firm. s refer to the percentage change of a specific variable within a specific time period. Growth rates may be negative or positive depending on whether variable is increasing or decreasing over time. In this study, asset growth is

taken as one of the independent variables. Asset growth is calculated as year-over-year change in total assets (Cooper et al., 2008). Asset growth can be calculated by using the formulae;

$$\text{Asset Growth}_t = \frac{\text{Total Asset}_t - \text{Total Asset}_{t-1}}{\text{Total Asset}_{t-1}} \times 100$$

Return on asset

The term return on assets refers to financial ratio which indicates profitability position with comparison to total asset. It measure how efficiently a company uses the assets owned to generate profits. A higher return on asset means the company is operating efficiently increasing productivity and managing to generate more profit. Ebaid (2009), Dalci (2018), Ahmed and Bhuyan (2020), Gill, Biger and Mathur (2011) had recognized return on asset as dependent variable in their study and was calculated as net income divided by total asset. The study uses the definition of return on asset as the profitability ratio that provides how much profit a company can generate from its assets. The return of asset is measured by dividing net profit by total asset. Value of net profit is taken from income statement and value of total asset is taken from balance sheet of the company's financial report.

$$\text{ROA} = \frac{\text{Net profit after tax}}{\text{Total asset}} \times 100$$

Return on equity

Return on equity is the measure of financial profitability obtained by dividing net profit by shareholders equity (Dalci, 2018). Return of equity can simply be defines as the return from the employed equity by

the investor. It is also considered as the return on net asset as it is shareholders equity minus debt. Ebaid (2009), Shubita and Alsawalhah (2012), Salim and Yadav (2012), Akeem et al., (2014), Rahman et al., (2019) acknowledged return on equity as dependent variable and is calculated by dividing net profit by average shareholder's equity. The study uses the definition of return on equity as the measure of financial profitability. The value of income can be found in income statement and shareholders' equity in balance sheet of the company.

$$\text{ROE} = \frac{\text{Net profit after tax}}{\text{Total Equity}} \times 100$$

Net profit margin

It is also called return on sales. It helps to analyze how much net profit a company makes in the overall sales of the company. Levine (1997) applied net profit margin to measure the profitability in the banking context and found that NPM is connected with improved financial stability and lending capacity in developing economies. It is the measure which provides with the information of how much margin of profit a company makes from the unit sales of the product or service. It is measured by dividing net profit by sales of the company.

$$\text{NPM} = \frac{\text{Net profit after tax}}{\text{Total Sales}} \times 100$$

Methods

The research is based on quantitative research design where various financial tools and statistical tools are used to analyse data. Research design of this study can be classified as cross-sectional panel design. To be specific, unbalanced panel data set has been used in the study that comprise of

17 NEPSE-listed non-financial firms with varying time spans (3 to 11) years, totaling 121 firm-year observations. The approach integrates descriptive-comparative method (summary statistics, correlation) analysis of capital structure with causal-explanatory techniques (regression) to examine the capital structure-profitability relationship and test the validity of MM, Trade-Off, and Net income theories.

The population of the study are all listed non-financial institutions (manufacturing, trading, hotels, and hydropower) which are listed on Nepal stock exchange. The population of the study consists of 19 manufacturing, 6 hotel, 48 hydropower,

and 2 trading companies while the samples for the same are 6, 3, 7, and 1 respectively. Sample firms are shown in the Table 1. Primarily, convenience sampling technique is adopted based upon the regular trading of the selected firms due to ease in data accessibility. In addition, purposive sampling technique also applies in the same study for two reasons. First, firms with at least three years of data (ending 2079 or 2021/22) were included with is a purpose of gaining analytical consistency. Second, sample across the multiple sectors (manufacturing, hydropower, hotels and trading) were intentionally selected to represent all the the non-financial sectors listed in the NEPSE.

Table 1

List of sample firms

Name of the company	Type of institution	Observations
Himalayan Distillery Company (2069 BS to 2079 BS or 2011/12 to 2021/22)	Manufacturing	11
Unilever Nepal ltd	Manufacturing	7
Nepal lube oil	Manufacturing	7
Bottler's Nepal Terai limited	Manufacturing	8
Bottler's Nepal limited	Manufacturing	8
Shivam cement	Manufacturing	4
Oriental Hotel limited	Hotel	4
Soaltee Hotel limited	Hotel	10
Taragaon Regency Hotel limited	Hotel	10
Upper Tamakoshi Hydropower	Hydropower	8
Chilime Hydropower company limited	Hydropower	7
Butwal power company limited	Hydropower	10
National Hydropower company limited	Hydropower	8
Arun Valley Hydropower	Hydropower	4
Sanima Mai Hydropower limited	Hydropower	7
Ridi Power company limited	Hydropower	5
Salt Trading corporation	Trading	3
Total		121

Statistical package for social science (SPSS) is used to calculate related information from the collected data. Descriptive statistics is used to calculate mean, standard deviation, minimum and maximum. And for correlation analysis, Pearson's correlation method is used and multiple regression is used for further analysis of data.

Secondary data are used relying on the financial annual reports of the sampled institutions and are sourced from websites of the sample institution and website of Nepal stock exchange. Data relating to sales and profit are taken from income statement and other data relating to long term debt, total debt, total equity and total asset are taken from balance sheet of the sampled institutions. MS Excel and SPSS software are used for further coding, data processing and analysis. The study employ mixed statistical tools of descriptive as well as inferential statistics to analyze the collected data.

Statistical and descriptive analysis is based on mean, maximum, minimum and standard deviation are calculated under descriptive statistics. For correlation analysis, Pearson's correlation is implied to find the relationship between variables, independent and dependent variables. Pearson's 'r' is calculated to find the significance of the relation between capital structure and profitability of the firm. Multiple regression is applied to examine the degree of impact of independent variable (capital structure) on the dependent variable (profitability). Multiple regression is the extension of ordinary least square regression and calculated to measure impact of predictor variable on the outcome variable.

Coefficient of multiple regression is calculated to identify the variation in dependent variable because of independent variable. The model for the study is summarized from various empirical study of [Abor \(2005\)](#), [Ebaid \(2009\)](#), [Vatavu \(2015\)](#) and [Bhatta \(2018\)](#). Regression model used in the study are:

$$\text{Model 1: ROA} = b_0 + b_1 (\text{LDA}) + b_2 (\text{DE}) + b_3 (\text{CR}) + b_4 (\text{SZ}) + b_5 (\text{GR}) + e$$

$$\text{Model 2: ROE} = b_0 + b_1 (\text{LDA}) + b_2 (\text{DE}) + b_3 (\text{CR}) + b_4 (\text{SZ}) + b_5 (\text{GR}) + e$$

$$\text{Model 3: NPM} = b_0 + b_1 (\text{LDA}) + b_2 (\text{DE}) + b_3 (\text{CR}) + b_4 (\text{SZ}) + b_5 (\text{GR}) + e$$

(Where, ROA = Return on asset, ROE = Return on equity, NPM= Net profit margin, LDA = Long term debt to total asset, DE = Debt to equity, SZ = firm size, CR = current ratio, GR = growth and e = error)

Results and Discussion

Descriptive and inferential analysis have been carried out in the study. Descriptive analysis is done on the basis of the presented table. Table 2 presents the descriptive statistics for the selected variables across 121 non-financial institutions, including the number of observations (N), minimum, maximum, mean, and standard deviation (SD) for each variable.

Table 2*Descriptive statistics of the selected non-financial institutions*

Variables	N	Minimum	Maximum	Mean	SD
ROA	121	-0.10	0.43	0.09	0.10
ROE	121	-0.31	0.55	0.15	0.15
NPM	121	-0.49	0.81	0.20	0.27
LDA	121	0.02	0.82	0.19	0.21
DE	121	0.08	4.33	1.27	1.25
CR	121	0.11	6.63	1.64	1.53
GR	121	-0.17	1.77	0.14	0.27
SZ (million)	121	19.57	25.22	22.10	1.13

Major findings are presented in the table that demonstrate the summarized statistics regarding the measures of profitability, liquidity and capital structure. Concerning the measures of profitability, it shows mean return on assets (ROA) of 9% (SD = 0.10) which ranges from -0.10 to 0.43, signifying the prevalence of variation in profitability across the selected institution. Likewise, another measure of profitability, return on equity (ROE) has a mean value of 15% (SD = 0.15) and the value ranges from -0.31 to 0.55 which resembles wide variation in the equity return. Similarly, another measure of profitability, net profit margin (NPM) demonstrates a mean score of 20% (SD = 0.27) and the NPM ranges from -0.49 to 0.81. The variation reveals that the variation is highest in NPM followed by ROE and ROA.

Regarding the capital structure, loan to deposit ratio (LDA) has a mean score of 0.19 (SD = 0.21) and ranges from 0.02 to 0.82 which reflects the presence of variation in the lending practices. Likewise, debt to equity (DE) show mean value of 1.27 times

(SD = 1.25), ranging from 0.08 to 4.33 times, unveiling the diverse range of capital structure. Variation in the ranges of these measures of capital structure, LDA and DE, unmasked the prevalence of differences across the non-financial institutions listed in NEPSE.

In the case of liquidity, mean value of current ratio (CR) is 1.64 times (SD = 1.53) and the value ranges from 0.11 to 6.63 times. This reveals the differences in the liquidity positions managed across the selected institutions. In the same way, Growth (GR) and size (SZ) has mean value of 0.14 (SD = 0.27) and 22.10 million (SD = 1.13) with ranges of -0.17 to 1.77 and 19.57M to 25.22M respectively. This reveals the variability in growth and the scale of operations as well.

Correlation analysis

Table 3 mentions the results of Pearson's correlation reflecting the relationship between capital structure variables and profitability measures.

Return on assets (ROA)

ROA has a moderate negative correlation with long-term debt to total assets (LDA) (-0.370, $p = 0.001$) which informs that higher leverage reduces the profitability, measured by ROA. Further, ROA shows moderate negative correlation with debt-to-equity (DE) (-0.344, $p = 0.001$). Again, it suggests that higher leverage results into decreased profitability. This suggests that, higher leverage must be avoided to increase the profitability. Similarly, ROA is positively and moderately correlated with the current ratio (CR) (0.422, $p = 0.001$), signifying that higher liquidity enhances profitability. ROA has a weak and negative correlation with firm size (SZ) (-0.230, $p = 0.001$) which suggests that increase in the firm's size will slightly lead to decrease in the profitability, measured by ROA. This may be due to firm's experiencing inefficiencies at scale. ROA's relationship with growth (GR) is weak and insignificant (0.131, $p = 0.153$), implying that growth is not significant enough to impact profitability, measured by ROA. Thus, the profitability, measured by ROA, is negatively influenced by higher leverage (LDA and DE) and firm size (SZ) and is positively associated to liquidity (CR).

Return on equity (ROE)

ROE has a moderate negative correlation with long-term debt to total assets (LDA) (-0.420, $p = 0.001$) which informs that higher long-term debt lowers the profitability, measured by ROE. Likewise, ROA shows moderate negative correlation with size (SZ) (-0.326, $p = 0.001$) which also signify that higher use of long-term debt results into decreased equity returns. Similarly, ROE is

weakly and negatively correlated with debt-to-equity (DE) (-0.234, $p = 0.010$), indicating that higher debt slightly reduce profitability, ROE. Similarly, ROE has a weak positive correlation with liquidity, measured by current ratio (CR) (0.227, $p = 0.012$), which suggests that better liquidity slightly increases return on equity. The correlation between ROE and growth rate (GR) is weak and insignificant (0.119, $p = 0.193$), implying that growth does not significantly influence ROE. All these analysis suggest that similar to ROA, profitability (measured by ROE) is negatively influenced by higher leverage (LDA and DE) and firm size (SZ) and positively related to liquidity (CR).

Net Profit Margin (NPM)

NPM reveals weak and insignificant correlations with long term debt to assets (LDA) (-0.128, $p = 0.162$) and weak negative correlation with DE (-0.278, $p = 0.002$), implying that debt reduces net profit margin. Likewise, NPM is weak and insignificantly correlated with liquidity, measured by current ratio (CR), (0.097, $p = 0.290$), size (0.081, $p = 0.376$), and GR (0.103, $p = 0.261$). This findings is contrary to the findings with ROA and ROE as it suggests insignificant influence of the variables like LDA, CR, SZ and GR. The only significant relation is with debt-to-equity (DE) lower sensitivity to capital structure and firm size exhibiting a weak and negative influence.

Magnitude of Correlations

Moderate correlations were observed between ROA and ROE with LDA, DE, and CR, while weak correlations were found between ROA, ROE, and GR. Similarly,

NPM exhibited weak correlations with all independent variables except DE, which showed a significant relationship. Insignificant relationships ($p > 0.05$) of GR were identified with ROA, ROE, and NPM, as well as between NPM and LDA, CR, SZ, and GR. According to [Cohen \(1988\)](#) and

[Hair et al. \(2019\)](#), correlation strengths are categorized as follows: 0 to 0.3 indicates weak correlation, 0.3 to 0.5 indicates moderate correlation, 0.5 to 0.7 indicates strong correlation, and 0.7 to 1 indicates very strong correlation.”

Table 3

Correlation analysis

Variables	ROA	ROE	NPM	LDA	DE	CR	SZ	GR
ROA	1.000							
ROE	0.908** (0.001)	1.000						
NPM	0.221* (0.015)	0.173 (0.058)	1.000					
LDA	-0.370** (0.001)	-0.420** (0.001)	-0.128 (0.162)	1.000				
DE	-0.344** (0.001)	-0.234** (0.010)	-0.278** (0.002)	0.618** (0.001)	1.000			
CR	0.422** (0.001)	0.227* (0.012)	0.097 (0.290)	-0.135 (0.141)	-0.399** (0.001)	1.000		
SZ	-0.230* (0.011)	-0.326** (0.001)	0.081 (0.376)	0.468** (0.001)	0.488** (0.001)	-0.093 (0.312)	1.000	
GR	0.131 (0.153)	0.119 (0.193)	0.103 (0.261)	0.148 (0.106)	0.096 (0.296)	0.005 (0.952)	0.042 (0.650)	1.000

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Regression analysis

This section of the study reveals the result and major findings based upon the regression analysis. Table 4 depicts the model summary, the adjusted value 0.282 of R^2 indicates that 28.2% of the variation in return on asset (ROA) can be explained by the independent variables (long-term debt to total assets [LDA], debt to equity ratio [DE], current ratio [CR], size [SZ], and growth [GR]) as included in the Model 1. Similarly, the adjusted R-squared values

for Model 2 and Model 3 are 0.250 and 0.223 respectively. This means that 25% of the variation in return on equity (ROE) and 22.3% of the variation in net profit margin (NPM) can be explained by the independent variables (LDA, DE, CR, SZ and GR) for the non-financial institutions.

statistics of 10.426 (for ROA), 9.987 (for ROE) 4.337 (for NPM) suggest that each of these models is statistically significant in establishing the relationship between

independent variables (long term debt to total asset, debt to equity, current ratio, size, and growth) and the dependent variables (ROA, ROE and NPM respectively). The p -value of F-statistics clearly indicates that the regression model was a good fit. The variance inflation factor (VIF) of the independent variables, less than 2.5 (Heidel, 2024) indicates that there is absence of multi-collinearity issue.

Table no. 4 concerning the model 1 reveals that the long term debt to total assets, negatively impacts the return on assets. To be specific, every unit increase in long term debt to assets ratio, return on assets decline by 0.161 unit ($\beta = -0.161$, $t = -3.245$, $p < 0.01$). Similarly, the current ratio positively impact the profitability, as measured by return on assets. For every unit increase in the current ratio, return on assets will increase by 0.023 unit ($\beta = 0.023$, $t = 4.436$, $p < 0.01$). Growth in the assets lead to the increase in return on assets. One percentage increase in the growth will decrease the return on assets by 0.070 ($\beta = 0.070$, $t = 2.273$, $p < 0.01$). Debt to equity ratio ($\beta = 0.002$, $t = 0.233$, $p > 0.05$) has positive impact and size ($\beta = -0.005$, $t = -0.636$, $p > 0.05$) has negative impact on the return on assets however, their impact is statistically insignificant.

The same table pertaining to model 2 unveil that long term debt to total asset negatively impacts the profitability as measured by return on equity. Further, it states that for each unit increase in long term debt to assets ratio, return on equity will decline by 0.353 unit ($\beta = -0.353$, $t = -4.339$, $p < 0.01$). Similarly, the debt to equity ratio positively impact the return on equity. The

value signify that one unit increase in debt to equity ratio will lead to increase the return on equity by 0.028 unit ($\beta = -0.028$, $t = 1.986$, $p < 0.015$). Liquidity is found to impact the profitability positively. One unit of increase in current ratio increase the return on equity by 0.023 unit ($\beta = 0.023$, $t = 2.703$, $p < 0.01$). However the size of the institution negatively impacts the profitability as it suggests that one unit increase in total assets size decreases the profitability, measured by return on equity by 0.028 unit ($\beta = -0.028$, $t = -2.235$, $p < 0.05$). Growth has negative impact on the profitability. One unit increase in growth of total assets increases net profit margin by 0.108 unit ($\beta = 0.108$, $t = 2.149$, $p < 0.05$).

Table no. 4, regarding the model 3, shows the result for regression coefficient of net profit margin and its affecting factors. It demonstrates that debt to equity and size of total assets have significant impact on the profitability, measured by net profit margin. Debt to equity has negative impact on the net profit margin. One unit increase in debt to equity leads to decline net profit margin by 0.025 unit ($\beta = 0.025$, $t = -3.600$, $p < 0.01$). Regarding the assets size, it positively impacts the net profit margin. One unit increase in assets size increases the net profit margin by 0.071 ($\beta = 0.071$, $t = 2.934$, $p < 0.01$). Results on the table show that long term debt to total assets ($\beta = -0.025$, $t = -0.155$, $p > 0.877$) and current ratio ($\beta = -0.010$, $t = -0.610$, $p > 0.05$) have negative impact on net profit margin but the impact is insignificant. Finally, assets growth ($\beta = 0.155$, $t = 1.578$, $p > 0.05$) has positive impact on net profit margin and the impact is statistically insignificant.

Table 4

Results of multiple regression analysis for return on assets, return of equity, and net profit margin on all predictor variables

Variable	Coefficient for return on assets (Model 1)	Coefficient for return on equity (Model 2)	Coefficient for net profit margin (Model 3)	VIF
Intercept	0.166	0.729	-1.262	
LDA	-0.161***	-0.353***	0.025***	1.771
DE	0.002	0.2028**	-0.098***	2.130
CR	0.023***	0.023***	-0.010	1.232
SZ	-0.005	-0.028**	0.071***	1.025
GR	0.070**	0.108**	0.155	1.410
R ²	0.312	0.281	0.160	
Adjusted R ²	0.282	0.250	0.123	
F-statistics	10.426***	8.987***	4.377***	
P value (F-statistics)	0.001	0.001	0.001	

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level

This section presents and interprets empirical findings on the relationship between capital structure and profitability among NEPSE-listed non-financial institutions. Findings are discussed based on how key predictors (leverage, liquidity, size, and growth) impact the profitability metrics (ROA, ROE, and NPM), contextualizing from the theoretical framework and prior literature.

Long-term debt to total assets and profitability

Long-term debt to total assets and profitability measures, especially ROA and ROE, are found to be negatively and significantly correlated in the study. The impact of the long-term debt to total assets is negative and substantial on the profitability. This is in line to the findings of [Abor \(2005\)](#), [Aziz and Abbas \(2019\)](#), [Lidovolo, P. M.,](#)

and Atieno, M. (2023). This finding is more directly connected to the trade-off theory as it argue that excessive debt is prone to bankruptcy risk incur financial distress cost which hampers the profitability of the firm. To be specific, this imply that costs of debt is more than the tax benefit from the use of it. The finding contradicts to the Modigliani-Miller theory with taxes (that argue the use of debt increase profitability because of the tax shields) and Net Income approach (that argue higher level of debt lowers the cost of capital and increase the profitability).

Debt-to-equity ratio and profitability

The findings of debt-to equity (DER) ratio have a mixed relationship with profitability. While debt-to equity is negatively correlated with ROA, ROE, and NPM, the regression results show insignificant positive impact on ROA, significant positive impact on ROE, and significant negative impact on NPM. While the DER has no significant impact on ROA (Damayanti & Chaerudin, 2021), it positively affects ROE (Nurhikmawaty & Widiyanti, 2020) and negatively affect the NPM (Suryana & Syarif, 2022). These mixed findings of DER suggests that optimal level of debt increases ROE via leverage, but beyond the optimal level, interests expenses outweigh the margin (NPM negative) and total assets weaken the effects (ROA insignificant) which is consistent with the trade-off theory.

Capital structure and profitability

The study analyzed how capital structure affects profitability of non-financial institution listed in Nepal stock exchange. Basically, the capital structure used two metrics; long-term debt to total

assets and debt-to-equity ratio whereas, the profitability used three measures; return on assets (ROA), return on equity (ROE), and net profit margin (NPM). Findings from these metrics envisage that long-term debt (ROA and ROE negative, but NPM positive) and debt-to-equity (ROE positive, NPM negative, ROA insignificant), both have mixed effect on the profitability (Hajisaaid, 2020; Addae et al., 2013; San & Heng, 2011) of non-financial institutions, signifying that if debt is used at moderate level, profitability gets increased, but, the extravagant use of debt jeopardise the profitability. It means if we use more and more debts, profitability jeopardize. This suggest to use the leverage optimally, maintaining a trade-off between the cost (interest to be paid for debt) and benefit (tax shield) from its use. This findings is in line to the Trade-off theory.

Liquidity and profitability

The findings unveil that liquidity when measured by current ratio considerably relate and impact the profitability, specially when measured by return on assets and return on equity. It implies that better liquidity increase the profitability of non-financial institutions listed in Nepal Stock Exchange. This argue that ensuring current assets to meet short-term obligations reduce financial distress, and support earnings from profitable opportunities, which is in line to the findings mentioned by Ahmed and Bhuyan (2020) that firm's profitability (including ROA and ROE) enhances with the greater liquidity ratio (current ratio). This finding is connected to trade-off theory which suggests that higher liquidity (current ratio) decreases bankruptcy risks

thereby improving short-term solvency and lowering the financial distress costs. This allows firm to use the debt capital optimally boosting the profitability, ROA and ROE.

Size and profitability

Relationship between size with profitability is found to be complex. While the result of correlation suggests that size is significant and negatively correlated with ROA and ROE (leaving the NPM positive but insignificant), the regression result suggest that it is negatively related to ROE and positively related to NPM, leaving the ROA negative but insignificant.

The results show that the size negatively but insignificantly impact ROA. This suggests that larger sized institution face marginally lower asset return due to higher operational costs or potential inefficiencies. But since the impact is statistically insignificant, it's not strong enough to conclude the impact on ROA. Considering the impact of size on ROE, it negatively impacts the ROE and the impact is statistically significant. *The negative impact of size on ROE aligns with findings by Goyal (2013) and Yazdanfar and Öhman (2015) but contradicts results from Salim and Yadav (2012) and Abor (2005).* This signify that larger size reduces return to equity holders, possibly due to higher debt level diluting their return. Interestingly, size positively impact the net profit margin at a significant level. This is because larger size benefits from economies of scale in converting sales into profits. This mixed result envisage that although bigger institutions benefit from operational efficiency (NPM), their overall profitability (ROE) is constrained, possibly, due to

ineffective use of their equity base and administrative complexities.

Trade-off theory best explains the findings as it posits that larger firms can access cheaper debt for tax benefits (positive NPM), but more debt requires more interest expenses which reduce net income available to shareholders (Negative ROE) and large size demands managerial efficiency which either minimizes profit or keeps stagnant (negative and insignificant ROA). MM theory is irrelevant as the findings show that size impacts profitability (positively on NPM, negatively on ROE) that unveil real-world frictions which the theory ignores. Likewise, Net income approach assume that more debts amplify profitability but the findings reveal higher size (total assets, including more debt) reduces profitability (negative ROE) which contradicts with the argument of Net income approach argument.

Growth and profitability

The result from the data analysis suggests that growth is positively correlated with ROA, ROE and NPM however, they all are found to be insignificant. Interestingly, the regression result imply that growth significantly and positively impact profitability, particularly ROA and ROE. *This finding aligns with studies by Coad (2007), Serrasqueiro (2009), and Vijayakumar and Devi (2011).* Growth is positively related to NPM as well, however the relationship remained insignificant. This findings can be connected to trade-off theory as the growth in assets enables to use more collateral which lowers bankruptcy risk and permits to use optimal debt for

tax shields which indirectly supports the profitability of the selected institutions.

Conclusion

This study examines the intricate effect of capital structure, liquidity, size, and growth on profitability metrics like ROA, ROE, and NPM across non-financial institutions listed on the Nepal Stock Exchange, revealing several key insights. Long-term debt decreases ROA and ROE but increases NPM suggesting that debt capital must be used optimally, not excessively which supports the trade-off theory. Similarly, Debt-to-equity ratio positively impact ROE but negatively impact NPM, keeping ROA insignificant, which again is in line with the trade-off theory, not to use excessive leverage. In the capital structure. The debt-to-equity ratio amplifies ROE through leverage effects while reducing NPM due to higher debt service. Greater liquidity (CR) enhance profitability measures (ROA and ROE) by maintaining short term obligation, regular operation and lowering the risk. Firm size enhances NPM due to benefits arised from tax shields and economies of scale but hampers ROE from equity dilution and keeps ROA stagnant because of management engagement in larger transactions. Growth powerfully improves ROA and ROE through better asset utilization and profit re-investment opportunities, although NPM demonstrates minimal gain due to upfront costs. Regarding the theories, MM theory fails to prevail here as our findings reveal that size and debt directly affect profitability metrics like ROA and ROE, which is contrary to

the MM's claim that financing structure remains irrelevant in the perfect markets. Net Income Approach doesn't sustain in our context because higher debt (via size) leads to reduced profitability (negative ROE and lower NPM), contrary to the theories argument.

Implications of the study

In Nepal, factors like bankruptcy risk and borrowing limits minimize the effective tax shield. Findings from the relationship between capital structure and profitability study exhibit that optimal level of leverage enhances profitability, however, if it goes beyond the optimal level it minimizes the profitability, which supports the trade-off theory. An appropriate balance must be maintained between the cost of serving the debt and benefit of tax shield, arising from the use of the debt capital. Likewise, Size shows mixed effects which enhances NPM through tax shields due to higher debt in larger total assets but adversely effect the ROE leaving the negative impact on ROA insignificant. This highlights that total assets must be used cautiously such that the benefits realized and the costs associated to maintain/manage the size maintain a proper trade-off. All these findings, best support trade-off theory over other theories of capital structure like MM theory, and Net Income approach in non-financial institutions listed in Nepal Stock Exchange.

Financial managers can consider the findings of the study while making their financial decision, specially the relationship between capital structure and profitability. Although the tax benefits persists, over-

leveraging must be avoided. Balanced debt-equity mix can maximize the profitability, supporting the Trade-off theory. Managers must maintain adequate short-term funds to avoid costly external financing and exploit growth opportunities. Firms must regard the growth strategy not only to enhance the return on assets and return on equity but also to increase the operational efficiency.

Investors can examine firms with high long-term debt ratios, as they may face lower profitability and higher financial risk. Investors should consider the role played by liquidity position, size and growth of the institution. Investors should select the institutions with moderate debt and strong liquidity position. Larger company can realize scale advantage (NPM) but can lower the profitability (ROE) due to inefficiencies.

Policymakers and regulators should encourage prudent borrowing limits and promote alternative financing (eg. equity market) to minimize over-reliance on costly debts. Regulators might consider guidelines on minimum liquidity buffers for non-financial institution of Nepal. These measures are vital regarding Nepal's post-pandemic economic resilience.

Finally, considering the theoretical contribution, findings challenge the tax-shield benefit of Net Income Approach. Likewise, the perfect-market assumption of MM theory is also questioned. This underpins trade-off theory's practical relevance in imperfect markets like Nepal.

Limitations and directions for future research

The study offers valuable insights, however, certain limitations are acknowledged. First, the analysis is concentrated on non-financial institutions listed in Nepal Stock Exchange which can limit the generalizability of the findings. Second, few measures are used in the study which may not address the industry-specific nuances that affect financial results and the relationship between capital structure and profitability. Third, mixed convenience-purposive sampling approach followed in the study may contain selection bias which limits the effective representation of the non-financial institution. Fourth, the study disregards major economic shocks like COVID-19, interest rate increment and policy changes like tax reforms, which neglect non-linear effect, and oversimplify the capital structure and profitability dynamics.

Future research could address the aforementioned limitations by: (1) adopting a rigorous methodology like stratified random sampling which eliminates the selection bias leading to better generalizability of the findings (2) including market-based performance measures like Tobin's Q (3) incorporating longitudinal data that envisages how capital structure interact with market changes of crises (4) adding macroeconomic factors like inflation and GDP growth to examine how (if any) these factors moderate the relationship. In addition, the relationship between capital structure and profitability can be examined through non-linear models to get deeper insights about the relationship. This attempt provides a comprehensive understanding of

capital structure in emerging markets like Nepal. Likewise, comparative study on the relationship between capital structure and profitability with similar markets like BSE India, COLSE Sri Lanka, DSE Bangladesh could be done to assess whether the findings are context-specific or generalizable across the economies. This test whether the trade-off theory, best suited in Nepal is context-specific or universal.

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