DETERMINANT OF CAPITAL STRUCTURE OF NEPALESE HYDROPOWER COMPANIES

A Dissertation submitted to the Office of the Dean, Faculty of Management in partial fulfillment of requirement for the Master's Degree

By

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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled "**Determinant of Capital Structure of Nepalese Hydropower Companies".** The work of this dissertation has not been submitted previously for the purpose conferral of any degrees nor it has been proposed and presented as part of requirements for any other academic purposes.

The assistance and cooperation that I have received during this research work has been acknowledged. In addition, I declare that all information sources and literature used are cited in reference section of the dissertation.

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Birendra Bohara

August, 2024

REPORT OF RESEARCH COMMITTEE

Mr**.** Birendra Bohara has defended research proposal entitled **"Determinant of Capital Structure of Nepalese Hydropower Companies"** successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestion and guidelines of supervisor Arun Neupane and submit the thesis for evaluation and viva-voce examination.

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APPROVAL SHEET

We, the undersigned, have examined the thesis entitled **“Determinant of Capital Structure of Nepalese Hydropower Companies"** Presented by Birendra Bohara a candidate for the degree of Master of Business Studies (MBS Semester) and conducted the Viva voce examination of the candidate. We hereby certify that the thesis is worthy of acceptance.

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Birendra Bohara

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

ANOVA:	Analysis of Variance
BPC:	Butwal Power Company
BPCL:	Butwal Power Company Limited
CHCL:	Chilime Jalavidyut Company Limited
CR:	Current Ratio
D/E ratio:	Debt-Equity Ratio
DOED:	Department of Electricity Development
ESG:	Environmental, Social, and Governance
FA:	Fixed Assets
Fintech:	Financial Technology
GDP:	Gross Domestic Product
IDX:	Indonesia Stock Exchange
KW:	Kilowatt
MW:	Megawatt
NEA:	Nepal Electricity Authority
NEPSE:	Nepal Stock Exchange
NHCL:	National Hydropower Company Ltd.
NI:	Net Income
NOI:	Net Operating Income
ROA:	Return on Assets
ROE:	Return on Equity
SG:	Sales Growth
SHPC:	Sanima Mai Hydropower Limited

SPSS:	Statistical Package for the Social Sciences
TDA:	Total debt assets
TDE:	Total debt equity
UPPER:	Upper Tamakoshi Hydropower Ltd
WACC:	Weighted Average Cost of Capital

ABSTRACT

This study investigates the determinants of capital structure in five major Nepalese hydropower companies over a ten-year period (2070/71 to 2079/80). The research employs descriptive and causal comparative designs, analyzing secondary data from annual reports and other financial documents. Key variables examined include Return on Assets (ROA), Bank Size, Assets Growth Rate, and Return on Equity (ROE), with Total Debt to Assets (TDA) and Total Debt to Equity (TDE) as the dependent variables. The findings reveal that Bank Size is a significant determinant of capital structure, with larger companies exhibiting higher debt ratios. Profitability measures, conversely, show an inverse relationship with leverage, indicating that more profitable companies tend to rely less on debt.

The analysis of individual companies highlights diverse financial strategies and performance profiles within the sector. While some companies, like Butwal Power Company Limited (BPCL) and Sanima Mai Hydropower Limited (SHPC), demonstrated a trend toward reducing debt, others, such as Upper Tamakoshi Hydropower Ltd (UPPER), faced profitability challenges despite substantial asset growth. Regression models underscore the significance of Bank Size, ROE, and ROA in determining capital structure, with Bank Size emerging as the most influential factor.

The study's findings have important implications for financial management, regulatory policies, and investor decisions in the Nepalese hydropower sector. Financial managers are advised to monitor debt levels carefully, particularly in larger firms, and focus on profitability to reduce reliance on debt financing. Regulatory bodies may need to consider sector-specific guidelines to encourage balanced capital structures. Overall, this research contributes valuable insights into the financial strategies and risks associated with capital structure decisions in Nepal's hydropower industry, providing a foundation for future research and development.

Key Words: *Capital Structure, Nepalese Hydropower Companies, Bank Size, ROA, ROE, TDA, TDE, Financial Performance, Leverage, Profitability*

CHAPTER I

INTRODUCTION

1.1 Background of the study

Capital structure is the composition of debt and equity of a company used to finance its assets. Both debt and equity are used in most of the companies. Having determined its capital structure policy, a company should plan the sources of finance and their mix. Companies which do not formally plan their capitals structures are likely to have uneconomical and imbalanced capital structures and could face difficulties in raising capital on favorable terms in the long-run (Wippern, 1966). Also, inappropriate mix of sources of finance can render the operations of companies inflexible.

Capital structure has been one of the most broadly argued subjects in corporate finance. The term capital structure refers to the mix of different types of securities (long-term debt, common stock, preferred stock) issued by a company to finance its assets. A firm may invite general public and institutions to invest in its assets by purchasing its shares which is called equity. On the other hand, a firm may issue bonds or ask banks for debt to meet its financial requirements which is called leverage (Tariq, 2015). The success or failure of any firm depends upon the managerial and financial decisions made by the management. The financial decisions include the raising of funds from different sources. Any decision to increase or reduce leverage depends on market conditions and investors' acceptance of debt. It is a very important decision for every organization. This decision revolves around a question "How to make an optimal capital structure for the firm?" and what are the factors that influence the decision? Because the capital structure decision ultimately affects the management, investors and lenders (Panda et al, 2012). This implies effective planning and financial management through combination of an optimum capital structure by managers so as to maximize the shareholders' wealth. A firm can finance investment decision by debt, equity or both. Capital structure decision is one of the most crucial decisions made by financial managers and borders on the mix of debt and equity used by firms in financing their assets (Chandrasekharan, 2012).

Capital is the major part of all kinds of business activities, which are decided by the size, and nature of the business concern. Capital may be raised with the help of various sources. If the company maintains proper and adequate level of capital, it will earn high profit and they can provide more dividends to its shareholders. Capital structure refers to the kinds of securities and the proportionate amounts that makeup capitalization. It is the mix of different sources of long-term sources such as equity shares, preference shares, debentures, long-term loans and retained earnings. The term capital structure refers to the relationship between the various long-term sources financing such as equity capital, preference share capital and debt capital. Deciding the suitable capital structure is the important decision of the financial management because it is closely related to the value of the firm. (Ibrahim, 2015).

The choice of debt-equity still remains an unresolved issue. A pioneer work of MM (1958) and other many studies have been conducted to find a logical explanation in which capital structure matters. MM argued that the value of the firm is independent of its capital structure (Modigliani & Miller, 1958). Several studies have been conducted in developed countries in capital structure and equity timing; however, limited studies have been carried out in the context of Nepal. Raising cash in capital markets is accomplished usually at discrete intervals, thus at some point in time the firm will evaluate the state of these markets and consider the possible effects of a current decision on future financing flexibility (Horne, 1974). Graham and Harvey (2001) argued that firms which require new finance tend to issue equity if they are above their target debt level and issue debt if they are below.

Financial experts and authorities differ as to the composition of funds in capital structure. While some believe that the capital structures and the financial structures are the same, and, hence, the capital structure represents both long-term and short-term sources of finance. The capital structure used to mean the financial plan according to which all assets of a corporation are furnished. Titman and Wessels (1988) this capital is supplied by the long and short-term borrowings, the sale of preferred and common stock and the reinvestment of earnings. In analyzing the capital structure of a bank, short-term debt is often excluded from consideration. Many others include only long-term sources of

finance under the capital structure. Capital structure covers the total combined investment of the bondholders, including any long-term debts, such as mortgages and long-term loans as well as total stockholders' investment including retained earnings as well as original investment (Mazhar & Nasr, 2010). In board sense, the capital structure comprises owned funds and borrowed funds. The owned funds include the share capital and free reserves and the surplus and the borrowed funds represent debentures, long-term and medium-term loans provided by various financial institutions.

Capital structure refers to a company's outstanding debt and equity. It allows a firm to understand what kind of funding the company uses to finance its overall activities and growth. In other words, it shows the proportions of senior debt, subordinated debt and equity (common or preferred) in the funding. The capital structure is the particular combination of debt and equity used by a company to finance its overall operations and growth. Debt comes in the form of bond issues or loans, while equity may come in the form of common stock, preferred stock, or retained earnings. Short-term debt such as working capital requirements is also considered to be part of the capital structure (Tuovila, 2019).

The composition of capital structure is governed by a number of factors and no uniform standard can be prescribed for all the banks. For instance, a public utility concern can absorb a greater proportion of borrowed funds than a bank in a more competitive sector of bank due to more stability in earnings in the case of former than latter Titman and Wessels (1988). Within these broad parameters, each bank will have to plan its own capital structure keeping in view both its short-term requirements and long-term expansion program.

An optimal or sound capital structure can properly be defined as that combination of debt and equity which achieves the goal of maximizing the company's market value (Mazhar & Nasr, 2010). The optimal capital structure is also defined as that combination of debt and equity which minimizes the company's cost of capital. Hence, the optimal capital structure is concerned with two important factors at one time the maximization of shareholder's wealth as well as minimization of cost of capital.

The capital structure of a company is a particular combination of debt, equity and other sources of finance that it uses to fund its long-term asset. The key division in capital structure is between debt and equity. The proportion of debt funding is measured by gearing or leverages. There are different factors that affect a firm's capital structure, and a firm should attempt to determine what its optimal, or best, mix of financing (Hutchinson & Michaelas, 2004). But determining the exact optimal capital structure is not a science, so after analyzing a number of factors, a firm establishes a target capital structure which it believes is optimal. Capital structure policy also involves a trade-off between risk and return. Using more debt raises the risks in the firm's earnings stream, but a higher proportion of debt generally leads to a higher expected rate of return and the higher risk associated with greater debt tends to lower the stock's price. At the same time, however, the higher expected rate of return makes the stock more attractive to investors, which, in turn, ultimately increases the stock's price. Therefore, the optimal capital structure is the one that strikes a balance between risk and return to achieve our ultimate goal of maximizing the stock prices. Capital structure is basically permanent long-term financing of a firm including long term, common stock and preferred stocks and retain earning (Mayers, 1984). Although there has been plenty of research focusing on the primary determinants of capital structure, there is still disagreement regarding which factors significantly affect a firm's capital structure.

The capital structure decision is crucial for any business organization. The decision is important because of the need to maximize returns to various organizational constituencies, and also because of the impact such a decision has on a firm’s ability to deal with its competitive environment (Mayers, 1984). The capital structure of a firm is actually a mix of different securities. In general, a firm can choose among many alternative capital structures. It can issue a large amount of debt or very little debt. It can arrange lease financing, use warrants, issue convertible bonds, sign forward contracts or trade bond swaps. It can issue dozens of distinct securities in countless combinations; however, it attempts to find the particular combination that maximizes its overall market value.

Adhikari (2022) examines the relationship between capital structure and firm performance in the context of companies listed on the Nepal Stock Exchange (NEPSE). The study analyzes how the mix of debt and equity impacts key financial metrics, such as return on assets (ROA) and return on equity (ROE), in the Nepalese market. Adhikari's findings contribute to understanding the optimal capital structure for maximizing firm performance in Nepal's emerging economy.

Sharma and Dahal (2021) investigate the determinants of capital structure in Nepalese firms, focusing on the factors that influence the choice between debt and equity financing. Their empirical analysis considers variables such as firm size, profitability, asset tangibility, and growth opportunities to determine how these factors shape the capital structure decisions in the unique economic and regulatory environment of Nepal. The study provides insights into the capital structure strategies employed by Nepalese companies and their implications for financial management practices.

A number of theories have been advanced in explaining the capital structure of firms. Despite the theoretical appeal of capital structure, researchers in financial management have not found the optimal capital structure. The best that academics and practitioners have been able to achieve are prescriptions that satisfy short-term goals. For example, the lack of a consensus about what would qualify as optimal capital structure has necessitated the need for this research. A better understanding of the issues at hand requires a look at the concept of capital structure and its effect on firm profitability.

1.2 Problem statement

In Nepalese context there are highly levered, however the long-term debt ratio is significantly low. Asset structure and size are observed positively related to leverage whereas liquidity, risk, grown, non-debt tax shield is negative related to leverage (Harris & Raviv, 1990). The problems related with dynamics involved in the determination of capital structure of banks in Nepal have been always a subject of study and the same is expected to persist in the coming days as well.

The study by Dahal and Nyaupane (2021) investigated the determinants of capital structure in Nepalese commercial banks, providing valuable insights into financial decision-making within Nepal's banking sector. Using statistical analysis of financial data

from multiple banks, the research likely examined factors such as bank size, profitability, asset tangibility, growth opportunities, and risk to determine their impact on capital structure decisions. While focused on commercial banks rather than hydropower companies, this study offers a crucial benchmark for understanding capital structure determinants in the Nepalese financial landscape. Its findings can serve as a comparative reference point for research on hydropower companies, potentially highlighting sector-specific differences or similarities in capital structure approaches within the broader Nepalese economic context.

The study by Adhikari (2023) expanded the investigation of capital structure determinants to encompass Nepalese non-financial firms, including potentially hydropower companies. Utilizing a sample of various industries and likely employing panel data analysis, the research explores both traditional determinants (such as firm size, profitability, growth opportunities, and asset tangibility) and Nepal-specific factors (like economic policies, market conditions, and regulatory environment). This recent study is particularly relevant for research on hydropower companies, as it offers insights into capital structure decisions across non-financial firms in Nepal. It provides a valuable opportunity to compare and contrast the determinants of capital structure in hydropower companies with those of other non-financial sectors, potentially revealing both common trends and industry-specific factors influencing financing decisions in the Nepalese context.

A great deal of controversy has been developed over whether the capital structure of the firm, as determined by its financing decision, affects its overall value. Traditionalist argues that the firm can lower its cost of capital and increase market value per share by the judicious use of leverage. Modigliani and Miller (1958) argued that in the absent of taxes and other market imperfection the total value of the firm and its cost of capital are independent of capital structure.

The crucial problem facing companies while raising funds is whether to raise debt or equity. Though there is continuing theoretical debate on this issue, relatively little empirical evidence exists on how companies actually select between financing instruments. Decisions on capital structure or the plan of long-term financing are not

always based on a consideration of objective factors. Management differs in their general attitude towards risk- taking, in their evaluation of the same risks, and in their willingness to assume debt. The age, experience and personal ambitions of the management and its confidence in the information on which financial decisions are made, will influence its decision towards or away from a conservative capital structure (Rajan & Zingales, 1998). In spite of the fact that management makes its own decision on its capital structure, there are certain general factors which seem to influence the capital structure of a bank. Capital structure is the composition of long-term sources of funds used by the company. These long-term funds are represented by debt and equity capital. Further debt includes debentures, long-term and medium-term borrowings from banks, financial institutions and other sources, while the equity includes the equity capital, preference capital, and reserves and surplus. The management of capital structure is of paramount significance because it affects the prices of shares in the stock market and return to the shareholder. Therefore, the financial manager is confronted with the task for determining the judicious mix of debt and equity order to maximize the wealth of shareholders. This can be done only when all those factors which are relevant to the company's capital structure decision are properly analyzed and balanced.

The study, therefore, aims to analyze and evaluate selected Nepalese hydropower companies and its determinants of capital structure, based on above problems; this study will answer the following research questions:

i. What are the main factors that determine the capital structure in Nepalese hydropower companies?
ii. What is the relationship between capital structure and size, profitability and asset's structure?
iii. Whether the capital structure is affected by size, profitability and asset's structure?

1.3 Objectives of the study

In light of the above background, the aim of the study is to determinants of capital structure of hydropower companies of Nepal. Some of the specific objectives of this paper are:

i. To analyze the major determinants of capital structure in Nepalese hydropower companies.
ii. To investigate the relationship of capital structure on size, profitability and asset's structure.
iii. To assess the impact of capital structure on size, profitability and asset's structure.

1.4 Rationale of the study

The study of the determinants of capital structure of Nepalese hydropower companies is motivated by the sector's pivotal role in Nepal's economic development and energy sustainability. Understanding how these companies structure their financing—balancing debt and equity—provides insights into their financial stability, performance, and ability to contribute to national development goals. This research also addresses investor concerns, as capital structure influences investment decisions by shaping risk-return profiles. Furthermore, by identifying the factors shaping capital structure decisions, policymakers can design regulations to foster sustainable growth and investment in the hydropower sector. Analyzing these determinants within the unique context of Nepal's hydropower industry contributes both to academic knowledge in corporate finance and to practical understanding of industry-specific challenges and opportunities in emerging markets.

By examining the determinants of capital structure in Nepalese hydropower companies, this research aims to provide a comprehensive understanding of how financing decisions are made within this critical sector. This analysis not only informs strategic decision-making within hydropower companies but also enriches academic literature on corporate finance by offering insights into financing practices in emerging markets with specific industry characteristics. Ultimately, the findings of this research have implications for policymakers, investors, and industry stakeholders, aiding in the formulation of effective policies, better investment decisions, and enhanced understanding of financial management strategies within the Nepalese hydropower sector.

1.5 Limitations of the study

While this study aims to provide a comprehensive analysis of the determinants of capital structure in Nepalese hydropower companies, several limitations should be acknowledged:

i. Data Availability and Quality: The reliability and completeness of data on Nepalese hydropower companies might be a constraint. Limited availability of financial records and inconsistencies in reporting standards can affect the accuracy of the analysis.

ii. Sector-Specific Focus: This study focuses exclusively on hydropower companies in Nepal, which may limit the generalizability of the findings to other sectors or regions. The unique characteristics of the hydropower sector, such as regulatory frameworks and specific financial challenges, might not be applicable to other industries.

iii. External Factors: Macroeconomic factors, such as political instability, economic policies, and global financial conditions, can significantly influence capital structure decisions. This study may not fully capture the impact of these external factors due to its limited scope.

iv. Time Constraints: The study covers a specific period, which may not account for long-term trends and cyclical variations in the capital structure decisions of hydropower companies. Changes in economic conditions or regulatory environments over time might influence the results.

v. Subjectivity in Decision-Making: The capital structure decisions of companies are influenced by managerial preferences, risk tolerance, and strategic goals, which can introduce a level of subjectivity. These qualitative factors may not be fully quantifiable or included in the analysis.

vi. Methodological Constraints: The study employs certain statistical and analytical methods to evaluate the determinants of capital structure. The choice of methodology and potential limitations in the analytical tools can impact the robustness of the findings.

vii. Comparative Analysis: Limited comparative analysis with international benchmarks or similar studies in other emerging markets might restrict the

contextual understanding of the determinants of capital structure in Nepalese hydropower companies.

viii. Regulatory and Policy Changes: The dynamic nature of regulatory and policy changes in Nepal's energy sector can affect the capital structure decisions of hydropower companies. The study may not fully anticipate or account for future regulatory shifts.

Despite these limitations, the study aims to provide valuable insights into the capital structure decisions of Nepalese hydropower companies and contribute to the broader understanding of corporate finance practices in emerging markets.

CHAPTER II

LITERATURE REVIEW

A literature review critically examines and synthesizes existing research related to a specific topic. It involves identifying, analyzing, and integrating relevant studies, theories, and concepts to gain a comprehensive understanding of the research area. An effective literature review helps researchers identify gaps in existing knowledge, justify the significance of their research, and develop a theoretical framework. Additionally, it situates the research within the broader academic discourse and informs the selection of appropriate methodologies and data analysis techniques (Booth, Sutton, & Papaioannou, 2016).

2.1 Theoretical review

There are number of capital structure theories proposed by different individuals which also create some controversy due to different concepts of capital structure theory hold by different personalities. This is the area in which several theoretical and empirical works have been done by different personalities. Capital structure theories developed so far revolve around the question of existence of the optimal capital structure. Most of the theoretical and empirical debuts so far are revolved around the maximization of the value of firms through the judicious composition of its debt and equity fund. Net income (NI) approach and Traditional theory of capital structure claims that there is the existence of the optimal capital structure. They contend that proper mix of debt and equity can maximize the value of the firms. Whereas, net operating income (NOI) approach and M-M hypothesis contend that capital structure is irrelevant to the value and cost of capital of the firm. According to the NOI approach, cost of equity increases linearly as debt increases in the capital structure. The use of debt does not affect the value of the firm as the benefit of debt capital is just offset by the increase in the cost of equity. (Solomon, 1969) Likewise, M-M hypothesis states that there is no level optimal capital structure. They support the NOI approach by providing logically consistent behavioral 27 justifications in its favor. Between the two extreme views, we have the middle position of intermediate version advocated by the traditional writers.

Hydropower companies in Nepal

Nepal is endowed with abundant water resources, making it one of the countries with the highest hydropower potential in the world. The estimated potential for hydropower generation in Nepal is around 83,000 MW, out of which approximately 42,000 MW is technically and economically feasible. Despite this vast potential, the actual installed capacity is significantly lower, with only a fraction of the potential being harnessed.

The history of hydropower in Nepal dates back to the early 20th century. The first hydropower plant, the Pharping Hydropower Station, was commissioned in 1911 with a capacity of 500 KW. This marked the beginning of hydropower development in Nepal. Subsequently, several small and medium-sized projects were developed, particularly during the 1960s and 1970s, supported by various international aid agencies.

The development of hydropower in Nepal involves a mix of government, private sector, and international investments. The Nepal Electricity Authority (NEA), a state-owned entity, has traditionally played a central role in the development and management of hydropower projects. However, in recent years, there has been a significant increase in private sector participation. Key private players include Butwal Power Company (BPC), Sanima Hydropower, and Chilime Hydropower Company, among others.

Some notable hydropower projects in Nepal include:

i. Kali Gandaki A Hydroelectric Plant: With an installed capacity of 144 MW, this is one of the largest hydropower projects in Nepal, commissioned in 2002.
ii. Upper Tamakoshi Hydroelectric Plant: Expected to generate 456 MW, it is the largest hydropower project in Nepal and is nearing completion.
iii. Middle Marsyangdi Hydroelectric Plant: With an installed capacity of 70 MW, this project was completed in 2008.

Policy and Regulatory Environment

The Government of Nepal has introduced various policies and reforms to attract investment in the hydropower sector. The Hydropower Development Policy, 2001, and the Electricity Act, 1992, have provided a framework for private sector participation and

foreign investment. Additionally, the establishment of the Department of Electricity Development (DOED) aims to facilitate the development of hydropower projects.

Despite the favorable conditions, the hydropower sector in Nepal faces several challenges:

Financing and Investment: Securing adequate funding for large-scale projects remains a significant hurdle. Political instability and regulatory uncertainties often deter investors. Technical and Infrastructural Issues: The rugged terrain and remote locations of many potential hydropower sites pose significant technical challenges. Additionally, the lack of adequate transmission infrastructure hampers efficient distribution of generated power. Environmental and Social Concerns: Hydropower projects can have significant environmental impacts, including disruption of ecosystems and displacement of local communities. Addressing these concerns is crucial for sustainable development.

On the other hand, the sector offers numerous opportunities:

i. Regional Electricity Trade: Nepal has the potential to become a significant exporter of electricity to neighboring countries like India and China, contributing to regional energy security.
ii. Renewable Energy Integration: Hydropower can play a key role in Nepal's transition to a more sustainable and renewable energy-based economy.

In conclusion, while Nepal's hydropower sector has made considerable progress, realizing its full potential requires addressing the existing challenges through enhanced investment, robust policy implementation, and sustainable practices. The strategic development of hydropower can significantly contribute to Nepal's economic growth and energy security.

Capital Structure

Capital structure refers to the mix of different forms of financing used by a company to fund its operations and growth, typically a combination of debt and equity. The capital structure decision is crucial for financial managers as it affects the overall value and financial stability of the firm. It involves determining the proportion of debt (such as bonds, loans) and equity (such as common stock, preferred stock, retained earnings) that constitutes the company's total capital.

i. Debt Financing: Debt involves borrowing funds that must be repaid over time with interest. It can take the form of long-term bonds, short-term loans, or other financial instruments. Debt financing has the advantage of being tax-deductible, as interest payments reduce taxable income. However, excessive reliance on debt increases financial risk, as the firm must meet its debt obligations regardless of its financial performance.

ii. Equity Financing: Equity involves raising capital by selling shares of the company. This does not require repayment and provides funds that can be used for long-term investments. However, issuing new equity dilutes existing ownership and may require sharing profits with a larger group of shareholders.

Modigliani and Miller's (MM) proposition assert that, in a perfect market (without taxes, bankruptcy costs, or asymmetric information), the value of a firm is unaffected by its capital structure. According to MM, the firm’s value is determined by its earning power and the risk of its underlying assets, rather than by the way it finances these assets. This theory suggests that in an ideal world, the mix of debt and equity does not impact the firm's overall value (Modigliani & Miller, 1958).

The trade-off theory posits that companies balance the tax advantages of debt financing against the potential costs of financial distress. According to this theory, there is an optimal capital structure where the benefits of debt (tax shields) are maximized while minimizing the costs associated with financial distress and bankruptcy. Firms aim to reach this optimal balance to enhance their value (Myers, 1984).

Determinants of capital structure

The capital structure of a company is shaped by various internal and external factors. Internally, a key determinant is profitability; firms with higher profits often rely on internal funds like retained earnings, minimizing the need for external debt or equity and avoiding associated costs such as interest payments and ownership dilution. The asset structure also influences capital structure, as firms with more tangible assets are more likely to use debt financing due to their ability to provide collateral, which lowers lending risks. Additionally, larger firms typically exhibit higher leverage owing to their

predictable cash flows and better access to capital markets. Conversely, firms with high growth opportunities tend to favor equity financing over debt to maintain flexibility for future investments. Higher liquidity ratios also lead firms to use less debt, as they have sufficient current assets to cover short-term obligations. Firms with volatile earnings are less inclined to use debt due to the increased risk of financial distress and challenges in meeting fixed interest payments.

Externally, market conditions, including prevailing interest rates and economic climates, significantly impact capital structure decisions, with favorable conditions making debt financing more attractive. Tax policies, particularly the tax deductibility of interest payments, incentivize debt usage by reducing the overall tax burden. Industry characteristics further influence these decisions; stable industries with low business risks tend to use more debt, while volatile industries rely more on equity. Regulatory environments also play a role, as stringent regulations can limit debt capacity, while supportive legal frameworks ease access to capital. Access to capital markets is another crucial factor; firms with better market access can choose between debt and equity more flexibly. Established firms with good credit ratings can secure lower-cost debt, whereas smaller or riskier firms might opt for equity financing. Understanding these diverse factors helps financial managers optimize capital structure, balancing risk and return to maximize firm value.

The tradeoff theory & financial distress costs

The trade-off theory, based on research on taxes (Modigliani & Miller, 1963) and bankruptcy and financial distress costs (Warner, 1977) and the insights from the agency literature (Jensen & Meckling, 1976), suggests that firms have a unique optimal capital structure that balances between the tax advantage of debt financing (i.e. debt tax shields), the costs of financial distress and the agency benefits and costs of debt. Then the trade-off theory predicts optimal capital structure.

Optimal capital structure is a combination of funding sources which consist of debt and stock that will yield the highest value of the firm. One indication of the high value of the company is the high stock prices. Thus, the optimal capital structure is a capital structure that generates the highest stock price. Another indication of an optimal capital structure is

lowest cost of capital weighted (Weighted Average Cost of Capital - WACC). WACC is the combination cost of debt and capital stock that calculated by weighted average. According to Myers (1984), a firm that follows the tradeoff theory sets a target debt-to value ratio and then gradually moves towards the target. The target is determined by balancing debt tax shields against costs of bankruptcy.

Trade of theory of capital structure compares benefits and costs of issuing debt as an attempt to reach to the optimal point of financial debt ratio that maximizes firm's value (Myers, 2001). The theory considers three main factors: taxes, costs of financial distress or bankruptcy costs and agency conflicts (Modigliani & Miller, 1963). Trade of theory aims to maintain a balance between these three factors to achieve capital optimal structure. According to this theory, taxes play significant role in determining the firm's level of leverage by lowering tax liability and increasing after-tax cash flows. However, when a firm raises excessive debt to finance its operations, it may default on this debt and be subject to bankruptcy. Accordingly, trade of theory claims there is a positive relationship between the value of the firm and a realistic level of tax (Warner, 1977). Trade of theory explains the organization’s optimal capital structure as the mix of financing that links the marginal costs and benefits of debt financing. It is fair to state that Trade of theory can be hold if there is a positive relationship between profitability from one side and financial leverage in the other side.

Pecking order theory

Pecking order theory (Myers & Majluf 1984) and Myers (1984)) and the extension of this theory (Lucas & McDonald, 1990) studied based on the asymmetric information between managers and investors. Managers have more information about the true value of the enterprise and enterprise risk compared to outside investors. According to Myers (1984), firms finance their activities with retained earning when feasible. If the return earning is inadequate, then debt is used. Only in extreme cases will firms use new equity finance. Thus, the order of financial sources used was the source of internal funds from profits, short-term securities, debt, preferred stock and common stock last. Pecking order theory predicts that the issuance of equity (common stock) is the last alternative sources of funding.

As described by Myers (1984), the pecking order theory suggests that firms first prefer internal sources of finance, and they adjust their target dividend payout ratio to their investment opportunities. If the firms seek external finance, due to generous dividend policies, unpredictable fluctuations in profitability or investment opportunities, firms will choose debt (as the safest instrument), and then hybrid securities such as convertible bonds, and then equity as a last resort. The pecking order theory generally explains why firms might rationally let cash flows determine leverage. This suggests that firms turn to debt funds under pressure of an internal fund's shortage.

2.2 Empirical review

Hassan and Ali (2023) conducted this study aimed to examine capital structure determinants of the private Iraqi banks listed on the Iraq "Stock Exchange" for the period 2014-2018. This study reviewed various models of capital structure in order to form proposals regarding the capital structure determinants of the Iraqi private commercial bank. This study used the combined ordinary least squares and econometric techniques; random effects and fixed effects so as to explore the important aspects affecting the selection of the bank's capital structure. The results of the study indicated that size, profitability, and investment opportunities available to the bank are positively related to the debt ratio (financial leverage). Conversely, liquidity proportion is negatively associated to the debt ratio. The study revealed that assets tangibility and assets growth did not show any relationship with the bank debt ratios. This study laid a basic foundation of exploring the determinants of the capital structure of private Iraqi banks on which a more detailed evaluation can be based. Moreover, the empirical results of the current study will help the bodies responsible for managing banks take optimal capital structure decisions.

Hawariyuni and Suprayitno (2023) explained the effect of Profitability, Liquidity, Asset Growth, Bank Size, and Asset Structure on the Capital Structure of Islamic banks in Indonesia, Malaysia, and Brunei Darussalam. The type of research used was descriptive quantitative, which was a descriptive approach with a quantitative approach. The analysis technique used was panel data regression with fixed effect model was the selected model. The population used in this study is Islamic banks in Indonesia, Malaysia, and Brunei

Darussalam. The data was collected from Asian Banker website for 27 banks. The sample selected using purposive sampling method was 22 Islamic banks in Indonesia, Malaysia and Brunei Darussalam which consistently published annual reports during 2015-2021 period. Data collection was carried out using secondary data in the form of annual reports of 22 banks during the 2015-2021 period. The results showed that the Profitability and Asset Growth variables had a positive and insignificant effect on Capital Structure, Liquidity had a negative and significant effect on Capital Structure, and Bank Size and Asset Structure had a significant positive effect on Capital Structure.

Damayanti and Jayanti (2023) conducted this study and aimed to prove the impact of the independent variable's profitability, liquidity, asset structure and sales growth on the dependent variable capital structure. Based on the outcomes of study conducted on mining companies listed on the Indonesia Stock Exchange from 2017 to 2021, it can be concluded as follows the variable profitability (i.e. ROE) had an insignificant negative impact on the capital structure of mining companies listed on the Indonesia Stock Exchange, the variable liquidity (i.e. CR) had a significant negative impact on the capital structure of mining companies listed on the Indonesia Stock Exchange, the variable asset structure (FA) had an insignificant positive impact on the capital structure of mining companies listed on the Indonesia Stock Exchange and the sales growth variable (SG) had an insignificant positive impact on mining companies listed on the Indonesia Stock Exchange.

Bae et al. (2022) explored the impact of environmental, social, and governance (ESG) factors on capital structure decisions. The study found that firms with better ESG performance tended to have lower leverage ratios, indicating a preference for equity over debt. This reflects a growing trend where sustainable practices influence capital structure choices. Chen et al. (2022) examined the role of financial technology (fintech) on capital structure decisions in the banking sector. Their research highlighted that bank integrating advanced fintech solutions showed a lower reliance on traditional debt financing. This suggests that technological advancements can influence capital structure by providing alternative financing options.

Kumar and Sharma (2021) investigated the effect of corporate governance on the capital structure of Indian banks. They used regression analysis and found that banks with stronger governance mechanisms, including more independent directors and better board practices, tended to have lower leverage ratios. This supports the idea that effective governance reduces agency costs related to debt. Nicolau and Andrade (2021) conducted a study on the determinants of capital structure in Latin American firms. They identified that firm size and profitability were positively related to leverage, while liquidity had a negative effect. Their findings indicated that firms with larger sizes and higher profitability are more likely to use debt financing.

Sánchez et al. (2020) explored the influence of macroeconomic factors on capital structure decisions in emerging markets. Their study highlighted that economic stability and interest rates significantly impact capital structure. High economic stability encouraged higher leverage, while rising interest rates prompted firms to reduce debt levels. Gómez-García et al. (2019) investigated the impact of corporate governance on capital structure in Spanish firms. They used a panel data approach and found that better corporate governance, characterized by larger boards and more independent directors, was associated with lower leverage ratios. This suggests that firms with strong governance structures prefer less debt to mitigate agency costs.

Matemilola et al. (2018) found a negative relationship between Return on Equity (ROE) and leverage in South African firms. Mekonnen (2016) further explored this in the banking sector, noting that banks with higher ROE tend to have lower leverage, indicating a preference for financing growth through retained earnings. Ghosh and Sahu (2017) investigated the capital structure of Indian firms using a panel data approach. They found that firm size, profitability, and asset structure significantly impacted leverage. Larger firms with higher profitability and substantial tangible assets were more likely to use debt financing, whereas firms with higher liquidity preferred equity.

Graham and Leary (2016) conducted a comprehensive review of capital structure theories and empirical evidence. They highlighted that while traditional theories such as the Trade-off Theory and Pecking Order Theory continue to influence capital structure decisions, newer perspectives focusing on market timing and agency costs have gained

prominence. Their review emphasized the complexity and evolving nature of capital structure determinants.

Alipour et al. (2015) found a negative relationship between ROA and leverage in Iranian companies. This supports the pecking order theory, suggesting that firms with higher profitability prefer internal financing over debt. In the banking sector, Gropp and Heider (2010) observed that more profitable banks tend to have lower leverage ratios. Jucá et al. (2012) confirmed a positive relationship between firm size and leverage in Brazilian companies. For banks specifically, Teixeira et al. (2014) found that larger banks tend to have higher leverage ratios, possibly due to better access to debt markets and perceived lower risk.

Frank and Goyal (2009) identified asset growth as a reliable factor in determining capital structure. They found a positive relationship between growth and leverage. However, in the banking sector, Awunyo-Vitor and Badu (2012) found a negative relationship between growth opportunities and leverage in Ghanaian banks. Matemilola et al. (2018) found a negative relationship between ROE and leverage in South African firms. In the banking context, Mekonnen (2016) observed that banks with higher ROE tend to have lower leverage, preferring to finance growth through retained earnings.

Rajan and Zingales (1995) identified the ratio of total debt to total assets as a key measure of leverage across G-7 countries. In the banking sector, Berger et al. (2008) found that banks with higher debt-to-assets ratios tend to have lower capital ratios, indicating a trade-off between leverage and capital adequacy. Ahmad and Abbas (2011) used the debt-to-equity ratio as a primary measure of capital structure in Pakistani firms. They found that firms with higher growth opportunities tend to have higher debt-to-equity ratios. In the banking sector, Okuyan (2013) found that Turkish banks with higher debt-to-equity ratios tend to have lower profitability.

Öztekin (2015) conducted a meta-analysis of capital structure determinants and found that industry characteristics significantly influence leverage decisions. For banks, Schaeck and Cihák (2012) noted that capital structure decisions are heavily influenced by regulatory requirements and risk management considerations. Kunt and Maksimovic (1999) found that macroeconomic factors, such as inflation and GDP growth,

significantly impact firms' capital structure decisions. In the banking sector, Brei and Schclarek (2013) observed that banks tend to decrease leverage during economic downturns.

Brewer et al. (2008) highlighted the importance of regulatory capital requirements in shaping bank capital structure. They found that banks often maintain capital levels above the regulatory minimum to provide a buffer against potential losses. Baker and Wurgler (2002) proposed the market timing theory of capital structure, suggesting that firms time their equity issuances when market valuations are high. In the banking context, Belkhir et al. (2016) found evidence of market timing behavior in MENA region banks' capital structure decisions.

Table 1:

Summary of Literature Review Table

S.N.	Author(s)	Variables	Methodology	Major findings
1	Hassan and Ali (2023)	Size, profitability, investment opportunities, liquidity proportion, assets tangibility, assets growth Debt ratio (financial leverage)	The research employed a combination of ordinary least squares (OLS) and econometric techniques, including random effects and fixed effects models, to analyze the data. The study focused on private Iraqi banks listed on the Iraq Stock Exchange over the period from 2014 to 2018.	The study identified that the liquidity proportion had a negative relationship with the debt ratio. This implies that banks with higher liquidity levels prefer to use less debt, likely due to their ability to meet financial obligations without needing external financing. Interestingly, the study found that assets tangibility and assets growth did not have any significant relationship with the debt ratios of the banks.
2	Hawariyuni and	Profitability, Liquidity, Asset	Conducted a descriptive	The study showed that bank size and asset structure had

	Suprayitno (2023)	Growth, Bank Size, Asset Structure, Capital Structure	quantitative study to examine the effects of various factors on the capital structure of Islamic banks in Indonesia, Malaysia, and Brunei Darussalam.	a significant positive effect on capital structure. This implies that larger banks and those with a higher proportion of tangible assets are more likely to use debt financing.
3	Damayanti and Jayanti (2023)	Profitability (measured by Return on Equity, ROE), Liquidity (measured by Current Ratio, CR), Asset Structure (measured by Fixed Assets, FA), Sales Growth (SG), Capital Structure.	Conducted a study to investigate the impact of various independent variables on the capital structure of mining companies listed on the Indonesia Stock Exchange (IDX). The study covered the period from 2017 to 2021.	The study yielded several important findings regarding the determinants of capital structure in mining companies listed on the IDX. The results indicated that profitability, as measured by ROE, had an insignificant negative impact on the capital structure
4	Bae et al. (2022)	ESG Factors, Leverage Ratios	Empirical Analysis	Firms with better ESG performance tend to have lower leverage ratios, reflecting a preference for equity.
5	Chen et al. (2022)	Financial Technology (Fintech), Leverage	Empirical Analysis	Banks integrating fintech solutions show lower reliance on traditional debt financing.
6	Kumar & Sharma (2021)	Corporate Governance, Leverage Ratios	Regression Analysis	Stronger governance mechanisms are associated with lower leverage ratios in Indian banks.

7	Nicolau & Andrade (2021)	Firm Size, Profitability, Liquidity	Empirical Analysis	Larger and more profitable firms are more likely to use debt financing, while liquidity has a negative effect.
8	Sánchez et al. (2020)	Macroeconomic Factors, Leverage	Panel Data Analysis	Economic stability encourages higher leverage; rising interest rates lead firms to reduce debt levels.
9	Gómez-García et al. (2019)	Corporate Governance, Leverage Ratios	Panel Data Approach	Better corporate governance (larger boards, more independent directors) is associated with lower leverage.
10	Matemilola et al. (2018)	Return on Equity (ROE), Leverage (capital structure).	This research focused on South African firms and investigated the relationship between ROE and leverage. The study used quantitative analysis of financial data to identify how profitability affects leverage.	The research observed a negative relationship between ROE and leverage in South African firms. This indicates that firms with higher profitability tend to use less debt.
11	Ghosh & Sahu (2017)	Firm Size, Profitability, Asset Structure	Panel Data Approach	Firm size, profitability, and asset structure significantly impact leverage; larger, more profitable firms use more debt.
12	Graham & Leary (2016)	Capital Structure Theories, Empirical	Literature Review	Traditional theories (Trade-off, Pecking Order) remain influential; new

		Evidence		perspectives on market timing and agency costs are gaining prominence.
13	Mekonnen (2016)	Return on Equity (ROE), Leverage	Empirical Analysis	Banks with higher ROE tend to have lower leverage, preferring retained earnings for growth.
14	Belkhir et al. (2016)	Market timing behavior, Capital structure	This study examined market timing behavior in the capital structure decisions of banks in the MENA (Middle East and North Africa) region. The researchers used an empirical approach, analyzing financial data from MENA region banks to investigate whether these banks time their capital structure decisions based on market conditions.	The study provided evidence of market timing behavior in the capital structure decisions of banks in the MENA region. It found that these banks adjust their capital structures based on market conditions, supporting the idea that banks in this region engage in market timing to optimize their capital structure decisions.
15	Mekonnen (2016)	Return on Equity (ROE), Leverage (capital structure).	The study analyzed the banking sector, examining how banks with higher ROE manage their capital structure. The research employed empirical methods	The study found that banks with higher ROE tend to have lower leverage, preferring to finance growth through retained earnings. This highlights a preference for internal financing in more profitable

			using financial data from banks to explore the relationship between ROE and leverage.	banks.
16	Öztekin (2015)	Profitability (measured by Return on Assets, ROA), Leverage (capital structure)	A meta-analysis was conducted to investigate the determinants of capital structure across different industries. The study synthesized data from multiple empirical studies to identify common patterns and industry-specific influences on leverage decisions.	The meta-analysis revealed that industry characteristics significantly influence leverage decisions. The study highlighted that capital structure determinants vary across industries, emphasizing the importance of considering industry-specific factors when analyzing leverage.
17	Alipour et al. (2015)	Profitability (measured by Return on Assets, ROA), Leverage (capital structure)	This study used quantitative analysis to examine the relationship between profitability and leverage in Iranian companies. The data was collected from financial statements of Iranian companies, and the analysis involved statistical techniques to explore the correlation between ROA and	The study found a negative relationship between ROA and leverage in Iranian companies, indicating that firms with higher profitability prefer internal financing over debt. This finding supports the pecking order theory, which suggests that more profitable firms are less likely to rely on external debt.

			leverage.	
18	Teixeira et al. (2014)	Bank size, Leverage (capital structure)	The research employed empirical methods using financial data from banks to assess how size influences leverage.	The study found that larger banks tend to have higher leverage ratios. This may be due to their better access to debt markets and the perception of lower risk associated with larger banks.
19	Schaeck and Cihák (2012)	Firm size, Leverage (capital structure)	This study focused on the banking sector, analyzing how regulatory requirements and risk management considerations impact capital structure decisions.	This study focused on the banking sector, analyzing how regulatory requirements and risk management considerations impact capital structure decisions. The methodology included a review of regulatory frameworks and empirical analysis of bank data to understand the effects on leverage.
20	Jucá et al. (2012)	Firm size, Leverage (capital structure)	This research focused on Brazilian companies and used quantitative methods to explore the relationship between firm size and leverage. The study analyzed financial data from Brazilian firms to identify patterns and	The research confirmed a positive relationship between firm size and leverage in Brazilian companies, indicating that larger firms tend to have higher leverage ratios.

			correlations.	
21	Awunyo-Vitor and Badu (2012)	Growth opportunities, Capital Structure	The study examined the banking sector in Ghana, focusing on the relationship between growth opportunities and leverage. The research used empirical methods to analyze financial data from Ghanaian banks.	The study found a negative relationship between growth opportunities and leverage in Ghanaian banks. This suggests that banks with higher growth opportunities prefer to use internal financing rather than increasing debt.
22	Gropp and Heider (2010)	Profitability, Capital structure	This research involved an empirical analysis of banks, examining how profitability impacts leverage ratios. The study utilized financial data from banks and employed statistical methods to analyze the relationship between profitability and leverage.	In the banking sector, the study observed that more profitable banks tend to have lower leverage ratios. This aligns with the idea that profitable banks have more internal funds available and thus rely less on debt financing.
23	Frank and Goyal (2009)	Asset growth, Capital structure	This study identified determinants of capital structure by analyzing the relationship between asset growth and leverage. The	The research identified asset growth as a reliable determinant of capital structure, finding a positive relationship between growth and leverage. This implies that firms

			research used quantitative methods to analyze financial data and determine the impact of growth on leverage.	experiencing growth are more likely to increase their leverage.
24	Brewer et al. (2008)	Regulatory capital requirements, Capital structure	This study focused on the impact of regulatory capital requirements on banks' capital structures. It involved an empirical analysis of banks, examining how regulatory requirements influence capital levels	The study highlighted the significance of regulatory capital requirements in shaping bank capital structures. It found that banks often maintain capital levels above the regulatory minimum to create a buffer against potential losses, ensuring financial stability and compliance with regulatory standards.
25	Baker and Wurgler (2002)	Market valuations, Capital structure	The researches proposed the market timing theory of capital structure, suggesting that firms time their equity issuances based on market conditions. The study used quantitative methods to analyze the timing of equity issuances relative to market valuations, utilizing financial data from	The research supported the market timing theory of capital structure, indicating that firms tend to issue equity when market valuations are high. This suggests that firms strategically time their equity issuances to take advantage of favorable market conditions, thereby optimizing their capital structure.

various firms.

2.3 Research gap

Despite extensive research on capital structure in various sectors, the specific determinants within the hydropower sector in Nepal remain underexplored. Previous studies, such as those by Brewer et al. (2008) and Belkhir et al. (2016), have primarily focused on banks and other financial institutions, leaving a gap in understanding how capital structure decisions are made in the hydropower industry. Given the unique financial and operational challenges faced by hydropower companies, including long project durations, substantial initial capital investments, and regulatory uncertainties, a detailed investigation into the factors influencing their capital structure is crucial. This study aims to fill this gap by focusing on the hydropower sector in Nepal, providing insights that can guide both academic research and practical financial management within this industry.

Additionally, much of the existing literature on capital structure has been centered on developed markets with well-established financial systems and regulatory environments. The specific context of Nepal, an emerging market with a distinct economic and regulatory landscape, has not been sufficiently addressed. For instance, the role of regulatory frameworks, government policies, and local financial market conditions in shaping capital structure decisions in Nepalese hydropower companies is not well-documented. By concentrating on this unique context, the study seeks to uncover how these local factors interact with traditional determinants of capital structure, such as profitability, asset structure, and company size, thereby contributing to a more nuanced understanding of capital structure dynamics in emerging markets.

Moreover, there is a scarcity of empirical research that combines quantitative analysis with sector-specific insights in the context of Nepalese hydropower companies. While theoretical frameworks like the pecking order theory and trade-off theory provide general guidelines on capital structure decisions, their applicability and relevance to the hydropower sector in Nepal have not been rigorously tested. This study addresses this research gap by employing robust quantitative methods to analyze financial data from

Nepalese hydropower companies, coupled with qualitative insights to interpret the findings within the specific industry context. This comprehensive approach aims to bridge the gap between theory and practice, offering actionable insights for financial managers, policymakers, and investors in the hydropower sector.

CHAPTER III

RESEARCH METHODOLOGY

This chapter is a critical component of a research paper that outlines the systematic approach used to conduct the study. This chapter typically describes the research design, data collection methods, sampling techniques, and data analysis procedures employed in the study. It explains how the research objectives will be addressed and justifies the chosen methodological approach.

3.1 Research design

This study utilizes descriptive and causal comparative research designs to address fundamental issues related to the determinants of capital structure of hydropower sector of Nepal. The descriptive research design is employed for fact-finding and obtaining sufficient information about the determinants of capital structure of hydropower companies. The primary objective of incorporating the causal comparative research design is to investigate whether predicting size, asset's structure and profitability impact on the determinants of capital structure of hydropower. Further methodological considerations are thoroughly addressed in the relevant sections of this study.

3.2 Population, sample and design

In the study, the targeted population consists of hydropower listed in the NEPSE. Among all the 91 hydro power which are listed in NEPSE, only some of the hydropower companies was taken for the sample of the study. Although the sample size was small, the information obtained was very rich. Out of the 91 hydropower companies, only 5 were selected for the study. The study period covered ten years, from the fiscal year 2070/71 to 2079/80.

The listed 5 hydro powers are:

i. Butwal Power Company Limited (BPCL)
ii. Chilime Jalavidyut Company Limited (CHCL)
iii. Sanima Mai Hydropower Limited (SHPC)
iv. Upper Tamakoshi Hydropower Ltd (UPPER)
v. National Hydropower Company Ltd. (NHCL)

3.3 Nature and sources of data collection

The required information for the study is of a secondary nature. The data is sourced from annual reports of the selected hydropower companies, serving as the primary reservoir of secondary data. Information has been extracted from the annual reports obtained directly from the respective hydropower companies and downloaded from their official websites. Supplementary data and information have been gathered from diverse sources, including newspapers, magazines, brochures, booklets, periodicals, bulletins, and relevant documents and journals available in the library of Tribhuvan University, as well as other organizations like Nepal Rastra Bank and NEPSE.

3.4 Methods of analysis

The data analyses in this study were conducted using the Statistical Package for the Social Sciences (SPSS) program. The analytical procedures encompassed descriptive statistics, incorporating frequencies, mean, and standard deviation.

Multiple regression analysis

This is defined as a statistical device which is used to predict the most probable value of a dependent variable on the basis of the known value of two or more independent variables so, this is a logical extension of the simple regression analysis. In this study, the following multiple regression equation is analyzed.

TDA =a+b1 ROA+b2 SIZE+ b3 GROWTH+b4 ROE…… (i)

TDE =a+b1 ROA +b2 SIZE +b3 GROWTH+b4 ROE……... (ii)

Statistical Analysis for Model

For data analysis, the Statistical Package for the Social Sciences program (SPSS) was employed. The analysis comprised both descriptive and inferential statistics. Descriptive statistics, including means, standard deviations, and the maximum and minimum values of commercial banks, were utilized to examine the data. Inferential statistics were employed to analyze the relationships between variables, differences in variables among various banks, and how multiple independent variables could account for the variance in

a dependent variable. Inferential statistical techniques such as the Correlation Coefficient, Multiple Regression Analysis, and Analysis of Variance (ANOVA) were applied.

3.5 Research framework and definition of variables

The study consists of following set of five variables to explore the determinants of the capital structure. The study consists of capital structure as dependent variables which are followed from the dependent variables of an existing literature, while the three independent variables are followed from the independent variables of existing literatures:

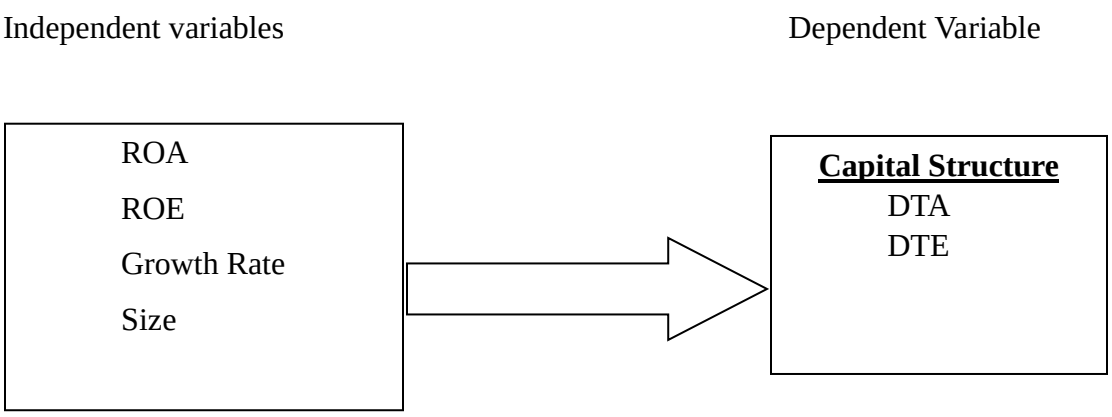

***Figure 1**: Conceptual Framework*

Source: Timilsina (2020)

Independent variables

Return on assets: Return on assets is defined as net income divided by total assets. The return on assets which is often called the firm's return on total assets, measure the overall effectiveness of management in generating profit with its available assets. Return on assets measures the profit earned per dollar of assets and reflect how well bank management uses the bank's real investments resources to generate profits (Naceur, 2003).

Bank size: One common measure of a bank's size is its total assets. Total assets represent the value of all the financial resources controlled by the bank. Larger banks typically have higher total assets. Pervan and Visic (2012) showed that the firm size has a significant (but weak) positive influence on firm leverage. Similarly, the study of Dogan (2013) indicated a positive relation between size indicators and capital structure of firms.

Assets growth rate: Assets growth is defined as the Percentage of assets of current year minus assets of previous year divided by assets of current year. Assets are the economic resources of a company expected to benefit the firm's future operations. Mutai (2014) indicated a positive but insignificant relationship between financial leverage and asset growth of firm

Return on equity: Return on Equity (ROE) is a financial ratio that measures the profitability of a company in relation to its shareholders' equity. It is a key indicator of a company's financial performance and is often used by investors to assess the efficiency of a company in generating profits from its equity. ROE is expressed as a percentage, and a higher ROE is generally considered favorable as it indicates that the company is effectively using shareholder funds to generate profits. However, it's essential to consider industry standards and compare ROE with other companies in the same sector for a more meaningful analysis.

Dependent variables

Capital structure: Capital structure refers to the mix of long-term sources of funds, such as debentures, long term debt, preference share capital and equity share capital including reserves and surplus.

Total debt assets: The debt to assets is a measure of the financial leverage of the company. It tells you what percentage of the firm's assets is financed by debt and is a measure of the level of the company's leverage. It is calculated as debt divided by total assets. The total debt of the firm comprises long term debt plus current liabilities while total assets consist of permanent capital plus current liabilities. Assets may be described as valuable resources owned by a business which have been acquired at a measurable money cost. Assets as an economic resource satisfy three requirements. They are firstly, the resources must be valuable or it may provide future benefits to the operations of the firms; secondly, the resources must be owned, and thirdly the resources must be acquired at a measurable money cost. When intangible assets are the significant, they are frequently deducted from net worth to obtain the tangible net worth of the firm.

Total debt equity: Total debt equity measures the contribution of financing by owners compared with financial provided by the outsiders. They also provide some measure of

the debt financing by the calculation of the coverage of fixed charge. It is one of the most popular tools of the long-term financial solvency of the firm. It can be calculated by the long-term debt divided by shareholders' equity. In the calculation, shareholders' equity preference shares capital accumulated losses, discount on issue of share etc., so the shareholders' equity is defined as net worth and D/E ratio also called debt to net worth ratio related with the total debt.

CHAPTER IV

RESULT AND DISCUSSION

This chapter focuses on the analysis and interpretation of the collected data, aiming to present the findings in alignment with the research objectives. The presentation and analysis of data are critical steps in any research project. The data is systematically organized and structured into tables for clarity. The analysis is intended to highlight financial data using tables and/or graphs to support recommendations for corrective actions. To achieve the study's objectives, various statistical and financial methods are employed. The chapter then discusses the results and findings derived from both descriptive and inferential analyses. This chapter is organized into three sections to analyze and present the data obtained primarily from secondary sources. The methods of analysis employed are as follows:

i. Financial analysis
ii. Statistical analysis
iii. Discussion

4.1 Financial analysis

Financial performance analysis focuses on assessing a company’s financial results to evaluate its overall performance and stability. This analysis involves examining financial statements—including the income statement, balance sheet, and cash flow statement—to measure key indicators such as profitability, efficiency, liquidity, and solvency. By analyzing financial ratios like Return on Assets (ROA), Return on Equity (ROE), and various debt ratios, analysts can determine how well the company generates profits, controls expenses, and manages debt. This process provides valuable insights for stakeholders—such as investors, management, and analysts—helping them make informed decisions and develop strategies. In this study, financial measures such as ROA, which assesses asset efficiency in generating profits, and ROE, which evaluates how well shareholders' equity is used to produce earnings, are key metrics. The Growth Rate reflects the pace at which the company’s financial metrics, such as revenue or profits, are changing. Bank Size indicates the scale of operations, while Total Debt to Assets shows

the proportion of assets funded by debt, and Total Debt to Equity reveals the reliance on debt versus equity for financing. Collectively, these metrics offer a detailed view of the company's profitability, efficiency, growth, and financial risk.

Table 2:

Financial Performance Metrics of Butwal Power Company Limited (BPCL)

Year	ROA	ROE	Growth Rate	Bank Size	TDA	TDE
2071	0.0599	0.1741	11.37	4,859,043,000	0.2812	0.8167
2072	0.0984	0.1342	5.58	5,146,217,642	0.2666	0.3636
2073	0.1205	0.1580	1.31	5,214,756,351	0.2372	0.3109
2074	0.1278	0.1562	2.88	5,369,332,948	0.1819	0.2224
2075	0.0914	0.1079	30.14	7,685,591,570	0.1529	0.1805
2076	0.0956	0.1102	3.32	7,949,269,832	0.1318	0.1519
2077	0.0930	0.1040	(1.05)	7,866,285,330	0.1064	0.1191
2078	0.0653	0.0716	(2.33)	7,687,408,027	0.0882	0.0967
2079	0.0167	0.0303	43.95	13,715,477,061	0.0521	0.0945
2080	(0.0030)	(0.0058)	(0.62)	13,630,383,026	0.0445	0.0855

Source: Annual Report of BPCL

The Table 2, provides a comprehensive overview of Butwal Power Company Limited's (BPCL) financial performance over a 10-year period from 2071 to 2080. The data highlights several key aspects of the company's financial health and performance.

Firstly, the company's assets, denoted as Bank Size, experienced substantial growth, rising from approximately 4.86 billion in 2071 to 13.63 billion in 2080. This significant increase in total assets reflects BPCL's expansion and growth in its operations over the decade. However, despite this growth, the company's profitability indicators, such as Return on Assets (ROA) and Return on Equity (ROE), exhibited a declining trend after peaking in 2074. In 2074, ROA was at its highest at 12.78%, and ROE was 15.62%, indicating strong performance. However, these metrics decreased in subsequent years,

culminating in negative values by 2080, suggesting that the company faced challenges in maintaining profitability as it grew.

The Growth Rate data shows substantial variability. The company achieved an impressive growth rate of 43.95% in 2079, reflecting a robust expansion phase. Yet, this was followed by a decline, with negative growth reported in 2080. This fluctuation indicates that while BPCL experienced periods of significant growth, it also faced downturns, impacting its overall performance.

Regarding financial leverage, the company has demonstrated a positive trend towards reducing its debt over time. The Total Debt to Assets (TDA) and Total Debt to Equity (TDE) ratios have decreased, signaling a reduction in the company’s reliance on debt financing. This decrease suggests improved financial stability and a more conservative approach to debt management.

Overall, the data presents a mixed picture of BPCL's financial performance. The company's asset base grew significantly, but profitability declined towards the end of the period. The fluctuation in growth rates and the decrease in debt ratios reflect the dynamic nature of BPCL's financial strategy and operational challenges.

Table 3:

Financial Performance Metrics of Chilime Jalavidyut Company Limited (CHCL)

Year	ROA	ROE	Growth Rate	Bank Size	TDA	TDE
2071	0.1372	0.1395	11.25	6,848,333,719	0.3633	0.3694
2072	0.1159	0.1164	7.00	7,363,996,834	0.2541	0.2551
2073	0.0718	0.1219	43.91	13,128,769,727	0.2370	0.4025
2074	0.0545	0.1112	22.97	17,044,513,664	0.3670	0.7492
2075	0.0387	0.1012	25.24	22,800,410,107	0.4041	1.0566
2076	0.0281	0.0858	18.63	28,022,349,305	0.3914	1.1931
2077	0.0172	0.0606	18.67	34,454,499,616	0.4917	1.7276
2078	0.0149	0.0593	12.51	39,378,905,130	0.5550	2.2152
2079	0.0138	0.0626	14.15	45,870,205,308	0.5823	2.6444
2080	0.0102	0.0548	14.67	53,757,011,477	0.6231	3.3327

Source: Annual Report of CHCL

The Table 3, outlines the financial performance of Chilime Jalavidyut Company Limited (CHCL) from 2071 to 2080, revealing several key insights into the company's financial trajectory.

Firstly, the company has demonstrated remarkable growth in its total assets, or Bank Size, which surged from approximately 6.8 billion in 2071 to 53.8 billion in 2080. This substantial increase signifies a major expansion of the company's operations and asset base over the decade. However, despite this growth, the Return on Assets (ROA) and Return on Equity (ROE) have shown a downward trend. ROA, which measures how efficiently assets are used to generate profits, and ROE, which evaluates the effectiveness in using shareholders' equity for profit generation, both decreased over time. This decline may indicate that while the company has grown, its profitability and operational efficiency have diminished.

The Growth Rate of CHCL has been highly variable, with fluctuations between 7% and nearly 44% year-over-year. This volatility reflects periods of both rapid expansion and

slower growth. The company saw particularly high growth rates in certain years, followed by lower or even negative growth in others, highlighting the challenges of maintaining consistent growth amidst changing market conditions.

Additionally, the company's reliance on debt has increased significantly, as shown by the rising Total Debt to Assets (TDA) and Total Debt to Equity (TDE) ratios. These ratios have grown over the years, indicating a higher proportion of debt financing compared to equity. The latest year, 2080, reveals the highest TDA and TDE ratios alongside the lowest ROA and ROE, suggesting that the increase in debt may be impacting profitability, despite the growth in assets.

Overall, while CHCL has expanded its asset base and demonstrated significant growth, the data indicates a trend of decreasing profitability and increasing financial leverage. The company's performance suggests a need for careful management of debt and a focus on improving profitability to ensure sustainable growth.

Table 4:

Financial Performance Metrics of Sanima Mai Hydropower Limited (SHPC)

Year	**ROA**	**ROE**	**Growth Rate**	**Bank Size**	**TDA**	**TDE**
2072	0.0148	0.0524	100.00	3,870,008,231	0.8235	2.9140
2073	(0.0068)	(0.0278)	10.83	4,339,872,889	0.8113	3.3091
2074	0.0573	0.1693	10.91	4,871,246,552	0.6616	1.9548
2075	0.0503	0.1016	11.63	5,512,129,075	0.5047	1.0189
2076	0.0430	0.0811	(2.53)	5,375,906,768	0.4691	0.8835
2077	0.0669	0.1143	2.03	5,487,404,815	0.4151	0.7098
2078	0.0745	0.1174	0.15	5,495,827,656	0.3655	0.5760
2079	0.0951	0.1358	4.26	5,740,545,061	0.2996	0.4278
2080	0.0553	0.0736	12.41	6,554,137,662	0.3763	0.5012

Source: Annual Report of SHPC

The Table 4, provides an overview of key financial metrics for SHPC over a nine-year period from 2072 to 2080. Return on Assets (ROA) began at 1.48% in 2072 but

experienced a significant downturn to -0.68% in 2073, reflecting a loss during that year. However, ROA improved notably thereafter, reaching a peak of 9.51% in 2079 before ending at 5.53% in 2080. This trajectory indicates a strong recovery in profitability and efficient asset utilization in the later years.

Return on Equity (ROE) also began at 5.24% in 2072 but fell to -2.78% in 2073, mirroring the decline seen in ROA. It showed substantial improvement in 2074, achieving 16.93%, and continued to fluctuate in the following years, ending at 7.36% in 2080. This volatility in ROE suggests varied profitability performance but a general trend towards recovery over time.

The Growth Rate was highly volatile, ranging from -2.53% in 2076 to a high of 12.41% in 2080. The exceptionally high growth rate of 100% in 2072 might signify the start of operations or a major expansion phase. This volatility reflects fluctuations in the company's year-over-year performance and expansion activities.

Bank Size, measured by total assets, grew steadily from 3.87 billion in 2072 to 6.55 billion in 2080, with a slight dip in 2076. This consistent growth indicates an expansion of the company’s asset base over time.

Total Debt to Assets (TDA) started at a high 82.35% in 2072 but showed a general downward trend, falling to 29.96% in 2079 before a slight increase to 37.63% in 2080. This decline suggests a reduction in debt relative to assets, indicating improved financial stability.

Total Debt to Equity (TDE) was very high at 2.914 in 2072, peaked at 3.3091 in 2073, and then decreased consistently, ending at 0.5012 in 2080. The reduction in TDE reflects a substantial decrease in leverage, highlighting a shift towards a more balanced financial structure with reduced reliance on debt.

Overall, SHPC experienced significant financial changes during this period. After a challenging year in 2073, the company improved its profitability and reduced its dependence on debt. The consistent growth in total assets and the decreasing debt ratios suggest a stronger and more stable financial position over time.

Table 5:

Financial Performance Metrics of Upper Tamakoshi Hydropower Ltd (UPPER)

Year	ROA	ROE	Growth Rate	Bank Size	TDA	TDE
2072	(0.0098)	(0.0476)	100.00	30,545,359,636	0.7951	3.8813
2073	(0.0035)	(0.0206)	16.08	36,398,176,641	0.8316	4.9366
2074	(0.0006)	(0.0036)	23.16	47,366,562,002	0.8416	5.3122
2075	(0.0018)	(0.0139)	17.39	57,338,087,422	0.8712	6.7611
2076	(0.0008)	(0.0053)	17.45	69,461,454,794	0.8567	5.9800
2077	(0.0020)	(0.0157)	11.29	78,299,534,447	0.8748	6.9902
2078	(0.0006)	(0.0055)	11.00	87,975,586,602	0.8892	8.0269
2079	(0.0258)	(0.3115)	2.07	89,833,106,584	0.9173	11.0891
2080	(0.0160)	(0.1059)	(3.03)	87,191,522,253	0.8463	5.6163

Source: Annual Report of UPPER

As per Table 5, the data for UPPER over this period reveals a challenging financial situation marked by consistent unprofitability. The Return on Assets (ROA) remained negative throughout, ranging from -0.0006 in 2074 and 2078 to -0.0258 in 2079. This indicates that the company has struggled to generate profits from its assets, reflecting a lack of efficiency in utilizing its resources to achieve financial returns.

Similarly, the Return on Equity (ROE) was consistently negative, with the worst performance recorded in 2079 at -31.15%. This severe negative return suggests that shareholders have experienced significant losses, highlighting ongoing issues with profitability and shareholder value.

The Growth Rate started at a high 100% in 2072, which might signify the initiation of operations or a major expansion. It remained positive for several years, ranging between 2.07% and 23.16%, but turned negative in 2080 with a -3.03% growth rate. This volatility in growth reflects fluctuations in the company's expansion and performance over the years.

Despite these financial difficulties, the company's Bank Size, or total assets, showed substantial growth from approximately 30.5 billion in 2072 to 89.8 billion in 2079, although there was a slight decrease to 87.2 billion in 2080. This indicates significant asset accumulation, albeit with diminishing returns.

The company's reliance on debt financing was notably high, as evidenced by the Total Debt to Assets (TDA) ratio, which remained consistently high between 0.7951 and 0.9173. This suggests that UPPER has heavily relied on debt to finance its growth. Similarly, the Total Debt to Equity (TDE) ratio was extremely high, peaking at 11.0891 in 2079, indicating a high level of leverage and significant financial risk.

Overall, the data paints a picture of a company undergoing rapid asset expansion largely financed by debt, yet facing persistent profitability issues. The negative returns and high leverage ratios underscore the financial challenges faced by Upper Tamakoshi Hydropower Ltd, with a particularly difficult year in 2079 and only a slight improvement in debt ratios by 2080.

Table 6:

Financial Performance Metrics of National Hydropower Company Ltd. (NHCL)

Year	**ROA**	**ROE**	**Growth Rate**	**Bank Size**	**TDA**	**TDE**
2072	0.0590	0.0604	100.00	1,191,984,724	0.0235	0.0241
2073	(0.0637)	(0.0650)	(3.81)	1,148,195,080	0.0193	0.0197
2074	0.8580	0.8921	0.37	1,152,429,408	0.0534	0.0555
2075	0.0117	0.0120	(3.25)	1,116,194,523	0.0468	0.0483
2076	0.0411	0.0416	(1.27)	1,102,200,143	0.0801	0.0811
2077	0.0455	0.0470	4.28	1,151,531,547	0.0973	0.1006
2078	0.4635	0.3582	14.64	1,349,065,186	0.3732	0.2884
2079	0.0100	0.0081	7.65	1,460,861,400	0.4735	0.3820
2080	0.0034	0.0023	(19.36)	1,223,860,847	1.1809	0.8048

Source: Annual Report of NHCL

The data from Table 6, for NHCL reveals a period of extreme financial volatility marked by significant fluctuations in profitability and debt levels. The Return on Assets (ROA) was highly variable, with notable peaks in 2074 at 85.80% and 2078 at 46.35%. These spikes indicate periods of exceptional asset utilization efficiency. However, the ROA was negative in 2073 at -6.37%, and generally low in other years, ending at 0.34% in 2080. This pattern underscores a period of unstable performance and inconsistent asset profitability.

Similarly, the Return on Equity (ROE) mirrored the volatility observed in ROA. The highest ROE was recorded in 2074 at 89.21%, reflecting a peak in shareholder returns. However, like ROA, the ROE was negative in 2073 at -6.50% and declined to 0.23% by 2080. This trend highlights significant variability in shareholder profitability over the period.

The Growth Rate exhibited considerable variability, ranging from a negative -19.36% in 2080 to a positive 14.64% in 2078. The frequent negative growth rates suggest challenges in sustaining consistent growth, indicating periods of contraction or slower expansion compared to more positive years.

The Bank Size, or total assets, started at approximately 1.19 billion in 2072 and saw fluctuations throughout the years. It peaked at 1.46 billion in 2079 before declining to 1.22 billion in 2080. This pattern indicates a period of stable asset base with a significant growth phase followed by a decline.

The Total Debt to Assets (TDA) ratio started very low at 0.0235 in 2072 but increased significantly over time, with a dramatic rise to 0.4735 in 2079 and an even higher level of 1.1809 in 2080. This increase suggests a shift towards higher debt financing, culminating in a situation where total debt exceeded total assets by 2080. Similarly, the Total Debt to Equity (TDE) ratio followed this upward trend, increasing from 0.0241 in 2072 to 0.8048 in 2080, indicating a substantial rise in leverage.

Overall, NHCL experienced substantial changes in its financial structure, transitioning from a low-debt and moderate-growth model to a high-debt structure with significant performance volatility. The exceptional ROA and ROE in 2074 and 2078 may reflect

extraordinary events or adjustments that had a notable impact on the financial results for those years.

4.2 Statistical analysis

Statistical analysis is a method used to collect, review, analyze, and draw conclusions from data. It involves applying statistical techniques to summarize and interpret data, helping to identify patterns, trends, and relationships. The main goals of statistical analysis are to understand data distributions, make predictions, and inform decision-making.

i. Descriptive analysis (Means, Standard Deviation)
ii. Inferential analysis (Correlation analysis, Regression analysis)

4.2.1 Descriptive analysis

Table 7:

Descriptive Analysis of Data

		ROA	ROE	Growth Rate	Bank Size	TDA	TDE
BPCL							
	Mean	0.0765	0.1041	9.4547	7912376478.7	0.1543	0.2441
	S. D	0.0424	0.0579	15.4001	3286264474.2	0.0857	0.2222
CHCL							
	Mean	0.0502	0.0913	18.90	26866899488.7	0.4269	1.3945
	S. D	0.04503	0.0307	10.3484	16270350593.46	0.1327	1.0545
SHPC							
	Mean	0.0500	0.0908	18.85	5249675412.1	0.5252	1.3661
	S. D	0.0306	0.0565	30.93	792064376.64	0.1948	1.0929
UPPER							
	Mean	-0.0068	-0.0588	21.71	64934376709	0.8582	6.5104
	S. D	0.0088	0.1001	30.46	22936317931.17	0.0353	2.1054
NHCL							
	Mean	0.1587	0.1507	11.03	1210702539.78	0.2609	0.2005
	S. D	0.3033	0.3024	34.64	119245470.05	0.3820	0.2593

Source: Researcher's Survey 2024

The descriptive statistics for the financial metrics of five companies—BPCL, CHCL, SHPC, UPPER, and NHCL—reveal interesting insights into their financial performance

and stability. These metrics include Return on Assets (ROA), Return on Equity (ROE), Growth Rate, Bank Size, Total Debt to Assets (TDA), and Total Debt to Equity (TDE).

NHCL stands out with the highest mean ROA of 0.1587 and ROE of 0.1507, indicating that it is the most efficient in generating profits from its assets and equity among the five companies. In contrast, UPPER has the lowest mean ROA at -0.0068 and ROE at -0.0588, suggesting that it is struggling to generate positive returns, possibly due to inefficiencies or higher operating costs.

The growth rate, likely indicative of revenue or profit growth, is the highest for UPPER at 21.71%, while BPCL has the lowest at 9.4547%. This suggests that UPPER is expanding rapidly despite its negative returns, which could be a result of aggressive growth strategies that may not yet be yielding profits. In terms of size, UPPER is the largest with a mean size of 64,934,376,709 (units not specified), significantly outpacing the others, which points to its substantial market presence or asset base.

However, UPPER's financial structure appears heavily leveraged, with the highest mean TDA at 0.8582 and TDE at 6.5104, indicating that a significant portion of its assets is financed through debt, which could be a double-edged sword—potentially magnifying returns during good times but also increasing financial risk during downturns. On the other hand, BPCL, with the lowest TDA of 0.1543 and relatively low TDE, seems to adopt a more conservative approach to financing, relying less on debt.

NHCL, despite being the smallest company in terms of bank size, shows superior profitability metrics with the highest ROA and ROE, coupled with a low TDE of 0.2005, suggesting a balanced approach to leverage that supports its profitability without excessive risk.

Lastly, the varying standard deviations across these metrics and companies highlight different levels of volatility or consistency in their financial performance. This variability indicates that while some companies may exhibit stable financial indicators, others might experience significant fluctuations, impacting their risk profiles and investment attractiveness.

4.2.2 Inferential analysis

4.2.2.1 Correlation analysis

Correlation analysis was a statistical technique used to determine the strength and direction of the relationship between two variables. In the context of this analysis of hydropower companies, it examined how independent variables like Return on Assets (ROA), Return on Equity (ROE), Bank Size, and Growth Rate were related to dependent variables such as the Total Debts to Assets Ratio (TDA) and Total Debts to Equity Ratio (TDE).

Table 8:

Correlation Analysis of Variables

		ROA	ROE	Growth Rate	Bank Size	TDA	TDE
ROA	Pearson Correlation	1	0.924**	-0.107	-0.309*	-0.330*	-0.311*
	Sig. (2-tailed)		<0.001	0.475	0.035	0.024	0.033
ROE	Pearson Correlation		1	-0.079	-0.455**	-0.412**	-0.498**
	Sig. (2-tailed)			0.596	0.001	0.004	<0.001
Growth Rate	Pearson Correlation			1	-0.005	0.081	0.076
	Sig. (2-tailed)				0.975	0.591	0.614
Bank Size	Pearson Correlation				1	0.643**	0.903**
	Sig. (2-tailed)					<0.001	<0.001
TDA	Pearson Correlation					1	0.782**
	Sig. (2-tailed)						<0.001
TDE	Pearson Correlation						1
	Sig. (2-tailed)						

Source: Researcher's Survey 2024

The analysis of Total Debt to Assets (TDA) and Total Debt to Equity (TDE) as dependent variables reveals significant insights into their relationships with various financial indicators. Both TDA and TDE are negatively correlated with profitability measures, specifically Return on Assets (ROA) and Return on Equity (ROE). For TDA, the correlation with ROA is -0.330, which is statistically significant ($p = 0.024$), while its correlation with ROE is -0.412, highly significant ($p = 0.004$). Similarly, TDE shows a negative correlation with ROA (-0.311, $p = 0.033$) and a stronger negative correlation with ROE (-0.498, $p < 0.001$). These findings suggest that higher debt levels are associated with lower profitability, indicating that as a bank's debt increases, its profitability tends to decrease.

In contrast, the Growth Rate exhibits very weak and statistically insignificant correlations with both TDA and TDE. Specifically, TDA has a correlation of 0.081 ($p = 0.591$) and TDE has a correlation of 0.076 ($p = 0.614$) with the Growth Rate. These results imply that there is no clear or meaningful relationship between a bank’s growth rate and its debt levels within the context of this dataset.

Bank Size, however, demonstrates strong positive correlations with both TDA and TDE, highlighting the influence of a bank's size on its debt levels. The correlation between Bank Size and TDA is 0.643, which is highly significant ($p < 0.001$), and the correlation with TDE is even stronger at 0.903 ($p < 0.001$). This suggests that larger banks tend to have higher debt levels relative to both their assets and equity, reflecting perhaps their greater capacity or propensity to leverage.

Overall, the analysis indicates that Bank Size is the strongest predictor of debt levels among the independent variables, while profitability measures (ROA and ROE) have a moderate negative relationship with debt levels. Growth Rate, on the other hand, does not appear to significantly impact debt levels. Additionally, the correlations are generally stronger for TDE compared to TDA, particularly in relation to ROE and Bank Size, underscoring the more pronounced impact of equity-based debt measures in the financial structure of banks. The statistically significant correlations, denoted by asterisks, reinforce the reliability of these findings, indicating that these relationships are unlikely to have occurred by chance.

4.2.2.2 Multiple regression analysis

In this study, regression analysis was conducted using SPSS version 29 to assess the impact of ROA, ROE, Growth Rate and Bank Size on dependent variables, measured by TDA and TDE.

Model 1

It has been employed to examine the relationship between the independent variables and TDA.

TDA =a+b1 ROA+b2 SIZE+ b3 GROWTH+b4 ROE…… (i)

Table 9:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.661[a]	0.437	0.384	0.2442

a. Predictors: (Constant), Bank Size, Growth Rate, ROA, ROE

Source: Researcher's Survey 2024

The model summary provides insight into the relationship between the independent variables and Total Debt to Assets (TDA). With an R value of 0.661, there is a moderate positive correlation between the predictors and TDA. The R Square value of 0.437 indicates that the model explains 43.7% of the variance in TDA, which represents a moderate level of explanatory power. The adjusted R Square value of 0.384, slightly lower than the R Square, offers a more conservative estimate by accounting for the number of predictors in the model. The Standard Error of the Estimate is 0.2442, reflecting the average distance between the observed and predicted values of TDA.

Table 10:

ANOVA[a]

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	1.946	4	0.487	8.157	<0.001[b]
	Residual	2.505	42	0.060		
	Total	4.451	46			

a. Dependent Variable: Total Debt Assets
b. Predictors: (Constant), Bank Size, Growth Rate, ROA, ROE

Source: Researcher's Survey 2024

The ANOVA results further validate the model's significance. The F-statistic of 8.157, with a significance level of less than 0.001, demonstrates that the model as a whole is statistically significant. This means that the independent variables collectively have a meaningful impact on TDA, indicating that the model is reliable for explaining the variation in TDA.

Table 11:

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	0.299	0.064		4.682	<0.001
	ROA	-0.202	0.711	-0.091	-0.284	0.778
	ROE	-0.106	0.688	-0.053	-0.154	0.878
	Growth Rate	0.001	0.001	0.069	0.595	0.555
	Bank Size	6.983E-12	0.000	0.591	4.293	<0.001

a. Dependent Variable: Total Debt Assets

Source: Researcher's Survey 2024

Examining the coefficients, the only variable that shows a statistically significant relationship with TDA is Bank Size, with a coefficient of 6.983E-12 and a p-value of less than 0.001. This suggests that as Bank Size increases, TDA also tends to increase, making Bank Size a key predictor in the model. Conversely, the other variables—ROA, ROE, and Growth Rate—do not exhibit statistically significant relationships with TDA, as indicated by their high p-values (0.778, 0.878, and 0.555, respectively). This implies that these variables do not have a significant individual effect on TDA in this model. The constant term, with a coefficient of 0.299 and a p-value of less than 0.001, is also significant. This indicates that there is a baseline level of TDA present even when all other variables are zero.

In summary, this regression analysis suggests that among the variables considered, Bank Size is the most critical predictor of Total Debt to Assets. Although the overall model is significant, ROA, ROE, and Growth Rate do not independently show significant effects on TDA. This finding implies that Bank Size is the primary driver behind the model's explanatory power, while the other variables contribute less to the variation in TDA. One reason for the insignificance of ROA, ROE, and Growth Rate in predicting TDA, that these variables do not have a direct or strong relationship with a firm's capital structure. TDA is more influenced by factors like Bank Size, which reflects the institution's capacity to manage and leverage debt. In contrast, profitability measures like ROA and ROE, as well as Growth Rate, may have a more indirect impact on TDA, influencing other aspects of the business rather than directly affecting the proportion of debt to assets. Therefore, in this model, these variables do not emerge as significant predictors of TDA.

Model 2

It has been employed to examine the relationship between the independent variables and TDE.

TDE =a+b1 ROA+b2 SIZE+ b3 GROWTH+b4 ROE…… (ii)

Table 12:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.924[a]	0.853	0.839	1.03377

a. Predictors: (Constant), Bank Size, Growth Rate, ROA, ROE

Source: Researcher's Survey 2024

The model summary for Total Debt to Equity (TDE) indicates a very strong relationship between the independent variables and TDE, with an R value of 0.924. This strong positive correlation suggests that the predictors collectively explain a significant portion of the variation in TDE. The R Square value of 0.853 reveals that 85.3% of the variance in TDE is explained by the model, demonstrating a very high level of explanatory power. The adjusted R Square value, slightly lower at 0.839, provides a more conservative estimate, accounting for the number of variables included in the model. The Standard Error of the Estimate, at 1.03377, indicates the average deviation of the observed TDE values from the predicted values.

Table 13:

ANOVA[a]

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	260.958	4	65.240	61.046	<0.001[b]
	Residual	44.885	42	1.069		
	Total	305.843	46			

a. Dependent Variable: Total Debt Equity
b. Predictors: (Constant), Bank Size, Growth Rate, ROA, ROE

Source: Researcher's Survey 2024

The ANOVA results further support the strength of the model, with an F-statistic of 61.046 and a significance level of less than 0.001. This shows that the model as a whole is highly statistically significant, meaning that the independent variables collectively have a significant impact on TDE.

Table 14:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	0.272	0.271		1.004	0.321
	ROA	7.878	3.008	0.430	2.619	0.012
	ROE	-8.750	2.912	-0.525	-3.005	0.004
	Growth Rate	0.009	0.006	0.083	1.400	0.169
	Bank Size	7.802E-11	0.000	0.797	11.332	<0.001

a. Dependent Variable: Total Debt Equity

Source: Researcher's Survey 2024

In terms of individual coefficients, three of the four independent variables show statistically significant relationships with TDE. Bank Size has a highly significant positive relationship with TDE, with a p-value of less than 0.001, indicating that as bank size increases, TDE also increases significantly. ROE has a highly significant negative relationship with TDE ($p = 0.004$), suggesting that higher return on equity is associated with lower total debt to equity. ROA shows a significant positive relationship with TDE, with a p-value of 0.012, indicating that higher return on assets is associated with higher total debt to equity.

Growth Rate, however, does not exhibit a statistically significant relationship with TDE in this model, as indicated by its p-value of 0.169. This suggests that Growth Rate does not have a meaningful impact on TDE within the context of this analysis. Additionally, the constant term is not significant ($p = 0.321$), implying that the baseline TDE is not significantly different from zero when all other variables are set to zero. Among the variables, Bank Size stands out with the largest standardized coefficient (Beta = 0.797), indicating that it has the strongest influence on TDE. This reinforces the importance of Bank Size as a key predictor of Total Debt to Equity.

In summary, this model for TDE demonstrates much stronger explanatory power compared to the earlier model for TDA. It identifies Bank Size, ROE, and ROA as significant predictors of TDE, with Bank Size having the most substantial positive effect, ROE having a strong negative effect, and ROA having a moderate positive effect. Growth Rate, however, does not appear to significantly impact TDE in this model. The reason for the insignificance is that the impact of ROA, ROE, and Growth Rate on TDA have nonlinear or context-dependent, meaning their effects vary under different conditions. If the model assumes a linear relationship but the true relationship is more complex, this could lead to the variables appearing insignificant. Consequently, their influence on TDA do not be fully captured in the regression analysis.

4.3 Discussion

The financial performance analysis of Butwal Power Company Limited (BPCL), Chilime Jalavidyut Company Limited (CHCL), Sanima Mai Hydropower Company Limited (SHPC), Upper Tamakoshi Hydropower Ltd (UPPER), and National Hydropower Company Limited (NHCL) from 2071 to 2080 reveals notable trends and implications for financial management in the hydropower sector.

Butwal Power Company Limited (BPCL) showed substantial growth in total assets over the period. However, its profitability indicators, such as Return on Assets (ROA) and Return on Equity (ROE), declined significantly after 2074, ending with negative values by 2080. This decline suggests that while BPCL expanded its asset base, it struggled to maintain profitability, a trend often observed when asset growth outpaces profit generation. The company's reduction in debt ratios indicates a shift towards improved financial stability, consistent with the idea that lower leverage can reduce financial risk and enhance stability (Modigliani & Miller, 1958).

Chilime Jalavidyut Company Limited (CHCL) experienced substantial growth in assets but faced declining profitability and increased debt financing. This scenario highlights the challenges of managing rapid expansion, where asset growth can sometimes lead to financial instability if not matched by proportional improvements in profitability. The rising debt ratios reflect complexities in balancing growth with financial health, as

companies in rapid expansion phases often struggle with managing increasing debt (Myers, 1984).

Sanima Mai Hydropower Company Limited (SHPC) exhibited considerable financial volatility, with profitability improving after a downturn in 2073. The reduction in debt levels over time suggests a strategic move towards more sustainable financial practices, supporting the notion that reducing leverage can enhance financial stability. SHPC's steady asset growth alongside decreasing debt aligns with strategies aimed at improving financial resilience and managing risks more effectively (Graham & Harvey, 2001).

Upper Tamakoshi Hydropower Ltd (UPPER) faced ongoing profitability challenges despite substantial asset growth. The persistent negative ROA and ROE, coupled with high leverage ratios, indicate significant financial risk. The company's struggle reflects the difficulties of managing high leverage and sustaining profitability amidst rapid asset expansion, illustrating the complexities of effective debt management (Jensen & Meckling, 1976).

National Hydropower Company Limited (NHCL) demonstrated extreme financial volatility, with notable peaks in profitability and high leverage towards the end of the period. The high mean ROA and ROE during peak years highlight periods of effective asset utilization, but the increased debt ratios signify higher financial risk. NHCL's transition from low to high-debt financing underscores the impact of financial structure on performance stability, revealing the challenges of maintaining performance amidst shifting debt levels (Fama & French, 1992).

NHCL exhibits the highest profitability metrics, with mean Return on Assets (ROA) of 0.1587 and Return on Equity (ROE) of 0.1507. This strong performance suggests effective asset and equity utilization, possibly due to efficient management practices or favorable market conditions (Fama & French, 1992). Conversely, UPPER's significantly lower ROA (-0.0068) and ROE (-0.0588) reflect ongoing profitability challenges, potentially stemming from high operational costs or inefficient asset management (Jensen & Meckling, 1976). Despite UPPER's negative returns, its high growth rate of 21.71% suggests an aggressive expansion strategy. This indicates that rapid asset growth may not

necessarily translate into immediate profitability, a phenomenon observed in companies undergoing significant expansion phases (Myers, 1984).

UPPER's substantial size, with a mean of 64,934,376,709, and high Total Debt to Assets (TDA) of 0.8582 and Total Debt to Equity (TDE) of 6.5104, highlights a heavily leveraged financial structure. This high leverage can amplify both returns and risks, reflecting the dual nature of debt financing in magnifying financial outcomes during favorable conditions while increasing risk during downturns (Modigliani & Miller, 1958). In contrast, BPCL's conservative approach, with a lower TDA of 0.1543 and TDE, indicates a more cautious use of debt, potentially leading to lower financial risk but also potentially limiting growth opportunities.

The negative correlations between Total Debt to Assets (TDA) and Total Debt to Equity (TDE) with profitability metrics (ROA and ROE) underscore the detrimental effect of high debt levels on profitability. The significant negative correlations suggest that higher debt levels are associated with lower profitability, aligning with findings that increased leverage can erode profit margins and financial stability (DeAngelo & Roll, 2015). The strong positive correlations between Bank Size and both TDA and TDE reveal that larger banks tend to have higher debt levels, reflecting their greater capacity to leverage but also indicating higher financial risk (Fama & French, 1992). The weak correlations of Growth Rate with debt levels suggest that growth rates do not significantly impact a bank's debt structure, implying that growth and leverage may not be directly related in this dataset.

The regression analysis for Total Debt to Assets (TDA) identifies Bank Size as the most significant predictor, with a strong correlation indicating that larger banks tend to have higher TDA. This finding aligns with the notion that larger institutions often engage in more extensive debt financing due to their greater asset bases and market presence (Harris & Raviv, 1991). The lack of significant relationships between TDA and profitability measures (ROA and ROE) in this model suggests that other factors, such as operational efficiency and market conditions, might play a more critical role in determining TDA than profitability alone.

For Total Debt to Equity (TDE), the model demonstrates a strong explanatory power, with Bank Size, ROE, and ROA emerging as significant predictors. The highly significant

positive relationship between Bank Size and TDE indicates that larger banks have a greater propensity for high equity-based debt financing, while the negative relationship with ROE suggests that higher returns on equity are associated with lower debt levels. ROA's positive correlation with TDE implies that banks with higher asset returns also tend to have higher equity-based debt, reflecting a potential strategy of leveraging profitable assets (Graham & Harvey, 2001). The non-significant impact of Growth Rate on TDE suggests that growth alone does not substantially influence the debt structure, reinforcing the importance of bank size and profitability in determining financial leverage.

In conclusion, the analysis underscores the critical role of Bank Size in influencing both Total Debt to Assets and Total Debt to Equity, with significant implications for financial management and risk assessment in the hydropower sector. The findings suggest that while profitability measures and growth rates provide insights into financial performance, Bank Size emerges as a dominant factor affecting debt levels and financial structure.

CHAPTER V
SUMMARY AND CONCLUSION

5.1 Summary

The study focuses on determining the capital structure of Nepalese hydropower companies. It employs descriptive and causal comparative research designs, analyzing data from five listed hydropower companies over a ten-year period from 2070/71 to 2079/80. The research uses secondary data sourced primarily from annual reports and other financial documents.

The study examines several independent variables including Return on Assets (ROA), Bank Size (total assets), Assets Growth Rate, and Return on Equity (ROE). The dependent variables are Total Debt to Assets (TDA) and Total Debt to Equity (TDE), which represent the capital structure. The analysis was conducted using SPSS, employing descriptive statistics, correlation analysis, and multiple regression analysis.

The study also focuses on determining the capital structure of Nepalese hydropower companies, analyzing data from five listed companies over a ten-year period from 2070/71 to 2079/80. The companies examined are Butwal Power Company Limited (BPCL), Chilime Jalavidyut Company Limited (CHCL), Sanima Mai Hydropower Limited (SHPC), Upper Tamakoshi Hydropower Ltd (UPPER), and National Hydropower Company Ltd. (NHCL).

BPCL experienced substantial growth in its asset base, with total assets rising from 4.86 billion to 13.63 billion over the decade. However, its profitability indicators (ROA and ROE) showed a declining trend after peaking in 2074. The company's growth rate was volatile, with an impressive 43.95% in 2079 followed by negative growth in 2080. BPCL demonstrated a positive trend in reducing its debt over time, suggesting improved financial stability.

CHCL showed remarkable growth in total assets, increasing from 6.8 billion to 53.8 billion. Despite this growth, the company's ROA and ROE declined over time, indicating diminishing profitability and operational efficiency. CHCL's growth rate was highly variable, and its reliance on debt increased significantly over the years.

SHPC experienced significant financial changes, with ROA and ROE showing volatility but generally improving over time. The company's growth rate was highly variable, while its total assets grew steadily. SHPC notably reduced its debt ratios over the period, suggesting a shift towards a more balanced financial structure.

UPPER faced persistent profitability challenges, with consistently negative ROA and ROE. Despite these difficulties, the company's total assets grew substantially, from 30.5 billion to 87.2 billion. UPPER heavily relied on debt financing, as evidenced by high TDA and TDE ratios, indicating significant financial risk.

NHCL demonstrated extreme financial volatility, with ROA and ROE fluctuating dramatically over the years. The company's growth rate was highly variable, and its asset base showed fluctuations. NHCL transitioned from a low-debt model to a high-debt structure, with TDA and TDE ratios increasing significantly by the end of the period.

The descriptive analysis revealed significant variations among the five companies. NHCL showed the highest mean ROA and ROE, indicating efficient profit generation, while UPPER had the lowest, suggesting profitability challenges. UPPER, despite negative returns, showed the highest growth rate and was the largest in terms of assets. It also had the highest debt ratios, indicating a heavily leveraged financial structure.

Correlation analysis showed that both TDA and TDE were negatively correlated with profitability measures (ROA and ROE), suggesting that higher debt levels are associated with lower profitability. Growth Rate had weak, insignificant correlations with debt levels. However, Bank Size demonstrated strong positive correlations with both TDA and TDE, indicating that larger banks tend to have higher debt levels.

The regression analysis for TDA revealed that the model explained 43.7% of the variance, with Bank Size being the only statistically significant predictor. For TDE, the model was much stronger, explaining 85.3% of the variance. Bank Size, ROE, and ROA were all significant predictors of TDE, with Bank Size having the strongest positive effect, ROE a strong negative effect, and ROA a moderate positive effect.

Overall, the study highlights the complexity of capital structure determinants in Nepalese hydropower companies, with Bank Size emerging as a crucial factor influencing debt

levels. The findings suggest that larger companies tend to have higher debt ratios, while profitability measures generally have an inverse relationship with leverage. These insights provide valuable information for understanding financial strategies and risks in the Nepalese hydropower sector.

5.2 Conclusion

The study of five major Nepalese hydropower companies over a ten-year period reveals significant insights into the determinants of capital structure in the sector. Bank Size has emerged as the most crucial factor influencing capital structure. Larger companies consistently demonstrated higher debt ratios, both in terms of Total Debt to Assets (TDA) and Total Debt to Equity (TDE). This trend suggests that as hydropower companies expand, they tend to increase their leverage, possibly due to enhanced access to debt financing or the need for substantial capital to support their growth and operational needs.

In contrast, profitability measures such as Return on Assets (ROA) and Return on Equity (ROE) generally exhibited an inverse relationship with leverage. This negative correlation indicates that more profitable companies tend to rely less on debt financing, favoring the use of retained earnings for their growth and operational activities.

Growth rates, on the other hand, showed weak and inconsistent correlations with debt levels, suggesting that a company's growth trajectory may not be a reliable predictor of its capital structure decisions within the Nepalese hydropower sector.

The companies demonstrated diverse financial strategies and performance profiles. For instance, while National Hydropower Company Ltd (NHCL) displayed high profitability with increasing leverage, Upper Tamakoshi Hydropower Ltd (UPPER) struggled with profitability despite significant asset growth. This variability underscores the complex interplay of factors affecting financial performance and capital structure decisions in the sector.

Regression models, particularly those analyzing Total Debt to Equity (TDE), exhibited strong explanatory power, indicating that the selected variables, especially Bank Size, ROE, and ROA, are significant determinants of capital structure in this context.

Notably, a trend towards reducing debt ratios was observed in some companies, such as Butwal Power Company Limited (BPCL) and Sanima Mai Hydropower Limited (SHPC). This shift towards more conservative financial management could be in response to sector-specific risks or broader economic factors.

In conclusion, the capital structure decisions of Nepalese hydropower companies are predominantly influenced by company size, with profitability playing a secondary but significant role. The sector shows a tendency towards increased leverage with growth, yet also exhibits signs of evolving towards more balanced financial structures in certain cases. These findings have important implications for financial management strategies, investor decisions, and regulatory policies within the Nepalese hydropower sector. Future research could delve into additional factors such as the regulatory environment, market conditions, and company-specific operational characteristics to further enhance the understanding of capital structure determinants in this critical sector.

5.3 Implications

Based on the study of capital structure determinants in Nepalese hydropower companies, several important implications can be drawn for various stakeholders in the sector.

For financial managers in hydropower companies, the findings underscore the need for careful debt management, particularly as companies grow larger. The strong correlation between company size and leverage suggests that larger firms should be especially vigilant in monitoring and controlling their debt levels. Managers should focus on improving profitability as a means to reduce reliance on debt financing, given the inverse relationship observed between profitability measures and leverage. This implies developing balanced growth strategies that don't overly depend on debt, as rapid asset expansion without corresponding profitability improvements can lead to financial instability.

The high volatility in financial performance across companies highlights the critical need for robust risk management practices in the sector. Companies with high debt ratios, particularly larger ones, should implement stringent risk assessment and mitigation strategies to manage their increased financial risk. This implication extends to investors, who should pay close attention to a company's size and debt ratios when evaluating

investment opportunities in the Nepalese hydropower sector. The inconsistent relationship between growth rates and debt levels suggests that investors should not rely solely on growth projections when assessing a company's financial health or future leverage.

For regulatory bodies, the findings imply a need for policies that encourage more balanced capital structures, particularly for larger companies that tend to have higher leverage. There might be a need for sector-specific guidelines on debt management and financial stability, given the unique characteristics and challenges of the hydropower industry. The trend towards reducing debt ratios in some companies indicates a maturing sector, which could lead to more stable and sustainable growth in the long term. However, the diverse financial strategies observed suggest that a one-size-fits-all approach to capital structure regulation may not be appropriate for the sector.

The study's implications extend to broader economic considerations. The financial health of hydropower companies has significant implications for Nepal's energy sector and overall economy. Ensuring sustainable capital structures is crucial for the sector's long-term viability and its contribution to national development. This underscores the importance of regular monitoring of key financial indicators like ROA and ROE, as these profitability measures have significant implications for a company's capital structure and overall financial health.

Finally, the findings point to several areas for future research and development in the sector. There's a need for further investigation into other potential determinants of capital structure, such as regulatory environment, market conditions, and operational characteristics specific to hydropower companies. The study also highlights the importance of strong corporate governance in managing capital structure decisions, particularly in larger companies where the stakes are higher. As the sector continues to evolve, developing more sophisticated debt management strategies and financial performance monitoring systems will be crucial for balancing the benefits of leverage with the associated risks.

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APPENDIX

Year	Name	ROA	ROE	Growth Rate	Bank Size	TDA	TDE
2071	BPCL	0.0599	0.1741	11.37	4,859,043,000	0.2812	0.8167
2072	BPCL	0.0984	0.1342	5.58	5,146,217,642	0.2666	0.3636
2073	BPCL	0.1205	0.1580	1.31	5,214,756,351	0.2372	0.3109
2074	BPCL	0.1278	0.1562	2.88	5,369,332,948	0.1819	0.2224
2075	BPCL	0.0914	0.1079	30.14	7,685,591,570	0.1529	0.1805
2076	BPCL	0.0956	0.1102	3.32	7,949,269,832	0.1318	0.1519
2077	BPCL	0.0930	0.1040	(1.05)	7,866,285,330	0.1064	0.1191
2078	BPCL	0.0653	0.0716	(2.33)	7,687,408,027	0.0882	0.0967
2079	BPCL	0.0167	0.0303	43.95	13,715,477,061	0.0521	0.0945
2080	BPCL	(0.0030)	(0.0058)	(0.62)	13,630,383,026	0.0445	0.0855
2071	CHCL	0.1372	0.1395	11.25	6,848,333,719	0.3633	0.3694
2072	CHCL	0.1159	0.1164	7.00	7,363,996,834	0.2541	0.2551
2073	CHCL	0.0718	0.1219	43.91	13,128,769,727	0.2370	0.4025
2074	CHCL	0.0545	0.1112	22.97	17,044,513,664	0.3670	0.7492
2075	CHCL	0.0387	0.1012	25.24	22,800,410,107	0.4041	1.0566
2076	CHCL	0.0281	0.0858	18.63	28,022,349,305	0.3914	1.1931
2077	CHCL	0.0172	0.0606	18.67	34,454,499,616	0.4917	1.7276
2078	CHCL	0.0149	0.0593	12.51	39,378,905,130	0.5550	2.2152
2079	CHCL	0.0138	0.0626	14.15	45,870,205,308	0.5823	2.6444
2080	CHCL	0.0102	0.0548	14.67	53,757,011,477	0.6231	3.3327
2072	SHPC	0.0148	0.0524	100.00	3,870,008,231	0.8235	2.9140
2073	SHPC	(0.0068)	(0.0278)	10.83	4,339,872,889	0.8113	3.3091
2074	SHPC	0.0573	0.1693	10.91	4,871,246,552	0.6616	1.9548
2075	SHPC	0.0503	0.1016		5,512,129,075	0.5047	

				11.63			1.0189
2076	SHPC	0.0430	0.0811	(2.53)	5,375,906,768	0.4691	0.8835
2077	SHPC	0.0669	0.1143	2.03	5,487,404,815	0.4151	0.7098
2078	SHPC	0.0745	0.1174	0.15	5,495,827,656	0.3655	0.5760
2079	SHPC	0.0951	0.1358	4.26	5,740,545,061	0.2996	0.4278
2080	SHPC	0.0553	0.0736	12.41	6,554,137,662	0.3763	0.5012
2072	UPPER	(0.0098)	(0.0476)	100.00	30,545,359,636	0.7951	3.8813
2073	UPPER	(0.0035)	(0.0206)	16.08	36,398,176,641	0.8316	4.9366
2074	UPPER	(0.0006)	(0.0036)	23.16	47,366,562,002	0.8416	5.3122
2075	UPPER	(0.0018)	(0.0139)	17.39	57,338,087,422	0.8712	6.7611
2076	UPPER	(0.0008)	(0.0053)	17.45	69,461,454,794	0.8567	5.9800
2077	UPPER	(0.0020)	(0.0157)	11.29	78,299,534,447	0.8748	6.9902
2078	UPPER	(0.0006)	(0.0055)	11.00	87,975,586,602	0.8892	8.0269
2079	UPPER	(0.0258)	(0.3115)	2.07	89,833,106,584	0.9173	11.0891
2080	UPPER	(0.0160)	(0.1059)	(3.03)	87,191,522,253	0.8463	5.6163
2072	NHCL	0.0590	0.0604	100.00	1,191,984,724	0.0235	0.0241
2073	NHCL	(0.0637)	(0.0650)	(3.81)	1,148,195,080	0.0193	0.0197
2074	NHCL	0.8580	0.8921	0.37	1,152,429,408	0.0534	0.0555
2075	NHCL	0.0117	0.0120	(3.25)	1,116,194,523	0.0468	0.0483
2076	NHCL	0.0411	0.0416	(1.27)	1,102,200,143	0.0801	0.0811
2077	NHCL	0.0455	0.0470	4.28	1,151,531,547	0.0973	0.1006
2078	NHCL	0.4635	0.3582	14.64	1,349,065,186	0.3732	0.2884
2079	NHCL	0.0100	0.0081	7.65	1,460,861,400	0.4735	0.3820
2080	NHCL	0.0034	0.0023	(19.36)	1,223,860,847	1.1809	0.8048

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