

**FINANCIAL RATIOS AS EMPIRICAL PREDICTORS OF RISK
AND DISTRESS**

**A Dissertation Submitted to the office of the Dean, Faculty of Management in
Partial Fulfillment of the 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 “**Financial Ratios as Empirical Predictors of Risk and Distress**” the work of this dissertation has not been submitted previously for the purpose of 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 the reference section of this dissertation.

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ABBREVIATIONS

CAR	Capital Adequacy Ratio
CCD	Core Capital plus Credit to Deposit
CDR	Credit to Deposit Ratio
CDR	Credit to Deposit Ratio
CR	Current Ratio
CRR	Cash Reserve Ratio
CV	Coefficient of Variations
EBIT	Earning Before Interest & Tax
FD	Financial Distress
FY	Fiscal Year
GDP	Gross Domestic Product
HBL	Himalayan Bank Limited
MDA	Multiple Discriminant Analysis
NABIL	Nabil Bank Limited
NBL	Nepal Bank Limited
NPA	Non-Performing Assets
NPL	Non-performing Loan
NRB	Nepal Rastra Bank
OD	Over Draft
RBB	Rashtriya Banijya Bank
ROA	Return on Assets
SCBNL	Standard Chartered Bank Nepal Ltd.
SD	Standard Deviation
SPSS	Statistical Package for the Social Science
USA	United State of America

ABSTRACT

Financial Distress Risk denotes the possibility of a company going bankrupt, which is contingent upon its access to credit and the extent of its liquid assets. It characterizes a scenario in which a firm encounters challenges in its operational, managerial, and financial aspects. This paper aims to examine the effects of financial ratios on financial distress risk in Nepalese commercial banks using modified Altman Z-score as measure of financial distress risk, the study employed secondary data for three banks listed in Nepal Stock Exchange for the study period from 2012/13 to 2021/22. The result shows that liquidity have significant positive effect on Z-score indicating lower financial distress risk of firms. Profitability have insignificant negative effect on Z-score. Similarly, leverage and efficiency have insignificant negative and positive impact on Z-score. This study offers valuable insights into the regulatory framework and supervisory authority overseeing banks. It emphasizes the importance for managers to actively manage the bank's liquidity position and develop effective strategies to maximize profitability, thereby mitigating the risk of financial distress.

KEY WORD: Financial Distress Risk, Z-score, Financial Ratios.

CHAPTER-I

INTRODUCTION

1.1 Background of the Study

Banks act as agents in the economy by taking deposits from individuals, corporations, financial institutions, and sovereigns with excess savings. These deposits are then distributed in the form of credit loans to individuals, business entities, financial institutions, investors, and governments that require the capital for various kinds of investment and spending purposes. Banks' investment activities aren't without issues and risks, as they seek to achieve the greatest expected profits on their investments, which demands making the best possible use of the resources at their available. Banks act as a financial mediator between depositors and borrowers; the banking sector is crucial for a nation's economic growth. The central bank, commercial bank, and other financial institution comprise the three main components of the developed global financial system. They go by the name of financial intermediaries as well (Sayer, 1976). Banking and financial institutions are a unique set of business firms whose assets and liabilities, regulatory restrictions, economic functions and operating make them an important subject of research, particularly in the conditions of the emerging financial sectors. Banks' performance monitoring, analysis and control needs special analysis in respect to their operation and performance results from the viewpoint of different audiences, like investors/owners, regulators, customers/clients, and management themselves (Pandey, 2010). A bank as a financial institution who lends, accepts and deposits money, operates financial transaction between the lenders and the borrowers. Banks are not only dealing with money but are also producers of money from investment, capital generation and exchange of money. Banks are required to compete to maintain the viability of the company. It aims to gain profits and avoid the existing risks. Banking sector plays a vital role for the country's economic development. Banks are so highly important to growth economic world. It plays vital role in trade and industry as operates different kinds of jobs like agencies. They are analyzing their financial performance through measuring and evaluating day by day for ensuring certain return of investment of shareholder's (Vetrova, 2017).

Financial risk is one major factor that threatens the survival of many firms all over the world due to its adverse effect on the operations of the firms. Risk threatens the financial viability and firms' long term survival in effect the financial distress levels of firms (Muriithi & Waweru, 2017). Financial risk is a considerable example of factors affecting the financial distress levels a firm is exposed to and its management is of great consequence to the economic activity levels of a firm and economy at large (Madhushani & Kawshala, 2018). Financial distress in corporate finance refers to a scenario where a company is unable to fulfill its debt obligations to creditors. Many business failures are associated with this condition. Essentially, financial distress signifies a state of significant financial trouble that could potentially result in bankruptcy (Isayas, 2021).

Financial distress occurs when an organization struggles to fulfill its financial commitments or cannot paid their financial obligations during regular business activities. It is important to note that financial trouble does not necessarily mean the end of the company. It signifies the state between financial stability (healthy) and bankruptcy (danger). Enhancing the corporate governance practice of the firm can help resolve financial distress, whereas bankruptcy (failure) cannot be resolved (Abdu, 2022).

To gain insight into financial distress in the banking sector, it's helpful to start with the fundamentals of banks. Banks operate by borrowing money for short periods and lending it out for longer periods. This plays a crucial role in supporting the overall economy, as it enables credit creation and facilitates economic growth. However, this service is built upon the fragile nature of the banking system. If depositors lose confidence and decide to withdraw their funds simultaneously, banks may struggle to meet these demands due to the illiquidity of their assets (Grauwe, 2008). Distress is commonly understood as the state of being in danger or having difficulty and seeking help (Donl, 2004). However, financial distress does not mean corporate death. It simply signifies a state between financial stability (healthy) and bankruptcy (danger). While financial distress can be solve by improving corporate governance practices, bankruptcy is an irreversible situation. A financially distressed bank may face various costs, including increased efforts to attract deposits, a higher likelihood of loan defaults, opportunity costs of operations, damage to reputation, loss of experienced

staff, and even a bank run in the worst-case scenario. The cost of collecting additional deposits generally rises, leading to an increase in interest charges on credit. Consequently, management may have to sacrifice long-term profitable credits in order to meet short-term obligations. In the case of distress in public companies, the "Too big to fail" concept may come into play, where higher taxes could be imposed on the public to save large institutions from failure. However, this approach also places a burden on the country's economy (Tibebu, 2018). For example, a financial distress in Nigeria in 2004 resulted in the liquidation of 36 banks; the restructuring and acquisition of 7 banks by new investors; the regulatory authorities taking control of 24 bank management; an allocation of 2.3 billion Nigerian dollars in facilitations for 10 banks. Since October 1, 2009, 563 banks have failed in the USA. Kenya's economy suffered in the 2000s due to the financial distresses of 39 commercial banks (Donl, 2004; Taliani, 2010). Various factors such as changes in market policy, fraudulent activities, economic conditions, lack of lending autonomy, political influence, and poor corporate governance can contribute to financial distress. The worst-case scenario for financial difficulty is business failure. It's crucial to remember that bank financial difficulty can have a significant impact on the nation's economy in addition to being harmful to a single company. The examples of banks like Lehman Brothers in the USA during 2007/08 and in Asia during 2011/12 serve as clear evidence that bank financial distress affects more than just individual companies. Traditionally, financial managers and advisors have used univariate analysis to evaluate the financial distress condition of companies by examining each individual financial index. However, this approach can be challenging when indicators provide conflicting information, making it difficult to draw conclusions. For example, a bank's liquidity ratio may indicate a deteriorating position while its profitability is actually improving due to a liquidity profitability trade-off. To address this limitation of ratio analysis, the literature has predominantly focused on multivariate financial distress analysis models. Among these models, Altman's Z-score has been widely recognized as a reliable tool globally (Mohammed, 2017).

The identification of a company's financial distress condition is crucial for both the company itself and its stakeholders. It enables them to make proactive and preventive decisions, thereby avoiding potential losses. This serves as an early warning signal that empowers management to take pre-emptive actions against any impending

financial difficulties. In consequence, a dozen of research has been conducted on the financial distress condition of companies across various countries. Notably, the financial distress condition of banks has garnered significant attention from scholars due to their economic significance. For example, Agarwal (2018) examined Indian public sector banks. (Ephrem and Nidu 2015; Robel 2021) focused on Ethiopian Private commercial banks. Parvin et al. (2016) conducted research on Bangladesh commercial banks. Cipollini and Fiordelisi (2009) studied European commercial banks. (Sah and Pradhan 2022; Shahu 2019) are investigated among Nepalese commercial banks of their financial condition by using Altman's Z-score model. Nevertheless, previous research has excluded developing nations from financial distress analysis for their own reasons. Thus, Altman's Z-score model was used in this study to evaluate the financial distress situation of commercial banks.

Financial statements reflect the company's financial ratios as a crucial indicator of financial distress. Studies on bankruptcy, insolvency, and financial distress typically rely on financial performance metrics to forecast future company outcomes. The financial ratios in the company's financial statement disclosures, such as balance sheet, profit and loss account, and cash flow statements, are used to calculate these metrics.

Ratio analysis is a valuable method for examining financial statements. It involves comparing quantitative data from the balance sheet and profit and loss to gain insights into a company's financial performance. By using ratios, we can compare different companies, track efficiency and profitability, and identify trends in areas such as profitability, efficiency, gearing, liquidity, and return on investment. Ultimately, financial ratios help assess a company's past, present, and future financial performance. Various ratio variables, such as liquidity ratios, profitability ratios, efficiency ratios, and leverage ratios, can designate financial distress in a company. The liquidity ratios, for example, demonstrate a company's ability to meet short-term obligations. The liquidity of the company as a predictor of financial distress, as determined by (Kasmir, 2012). The ability of the business to generate a profit is demonstrated by the profitability ratio (Bhandari, 2020). The company's profitability as a financial distress predictor is measured by (Kasmir, 2012). The leverage ratio is the ratio that illustrates the extent of company activity financed by receivables

(Niroula, 2021). Efficiency is a ratio that illustrates a bank's overall ability to meet its depositors' financial obligations (Sah & Pradhan, 2022). Bessis (2011) classified a number of primary risks that banks encounter as credit risk, interest rate risk, liquidity risk, market liquidity risk, market risk, mismatch risk, and foreign exchange risk.

Walela, Omagwa, and Muathe (2022) evaluated a number of risks that banks face and identified credit risk as having significant effects on their financial performance. This is because a significant portion of a bank's revenue is produced by interest income on loans provided to its customers. Sah and Pradhan (2022) maintain an appropriate degree of exposure while managing risk to optimize the bank's return after analyzing financial statements for the risk. Senior management is responsible for the supervision of developing policies and procedures for loan administration, obtaining board approval before carrying them out.

In general, investment means to pay out money to get more. It is the sacrifice of current rupees for future rupees. It is geared by two factors; time and risk. The sacrifice takes place in the present, is certain while the reward comes later, and is generally uncertain. Investment policy ensures efficient allocation of funds to achieve the overall objectives. Investment policy provides banks with several inputs through which they can handle their investment operations efficiency assuring maximum return with minimum exposure to risks.

Financial distress factors are costs that impact the operational efficiency of a company, ultimately influencing its investment choices (Tshitangano, 2010). Additionally, research conducted by John (2014) revealed that the financial sector encounters numerous obstacles when experiencing financial distress. It is evident that the identification of such circumstances is crucial for the sustained viability of companies in the long run. Financial distress remains a major concern for numerous firms worldwide, irrespective of their size and nature.

Various tools and techniques are utilized in financial analysis to assess the financial performance and strengths and weaknesses of a firm. One important tool is ratio analysis, which serves as a benchmark for evaluating a company's financial condition and performance. Ratio analysis is widely employed as a powerful tool in financial analysis. It aids in identifying the strengths and weaknesses in a firm's performance.

According to Webster's New Collegiate dictionary, a ratio is defined as the indicative quotient of two statistical evaluations and as the relationship between two or more variables (Pandey, 2010). In essence, financial analysis involves the selection, correlation, and evaluation of financial statements. Businesses' investment value, operational efficiency, and credit ratings can be determined, tested, and assessed using these analysis tools. Therefore, financial analysis supports to shed light on the truths and relationships pertaining to managerial performance, financial strength and weaknesses, corporate efficiency, and the creditworthiness of the firm (Pradhan, 2000).

Supriyanto and Darmawan (2019) found that capital adequacy plays a crucial role in establishing appropriate prudential standards to protect banks and financial institutions from financial trouble and indications of collapse. Meanwhile, Kariani and Budiasih (2017) discovered that the liquidity of commercial banks in Nepal is significantly influenced by factors such as non-performing loans, credit to deposit ratio, total deposits to total assets ratio, bank size, and capital adequacy ratio.

Evaluating the financial performance involves assessing the firm's financial strengths and weaknesses through establishing the correlation between balance sheet items and profit and loss account. This analysis aids in forecasting both short-term and long-term growth. 'Analysis' refers to sorting out or breaking down a thing into its fundamental parts to understand their relationship to the whole and to each other. In financial performance analysis, we scrutinize financial statements such as the balance sheet, income statement, and cash flow of the firm.

In the Nepalese context, commercial bank plays vital role in the financial sector as well as economic development. There are 20 commercial banks in operating in Nepal till Ashadh end, 2080. The commercial banks have been facing various problems in time to time. In spite of these, Nepalese banking sector making good impact in economic stability and growth. Nepal Rastra Bank (NRB) is regulatory body of commercial bank in Nepal. It gives permission to open new financial institutions and monitors their operation and growth.

1.2 Problem statement

Banking institutions are inevitable for resource mobilization and economic development of country. It boosts economic trust across different sectors and provides loans to individuals. In Nepal, profit margins, operational costs, shareholder dividend payout rate, and other factors have been shown to be irregular. The studies have been conducted from the development of statistical models of financial ratios that are useful in prediction of financial distress.

Commercial banks in Nepal are confronting a range of obstacles and issues. These problems are caused by a variety of circumstances, including the country's economic situation, puzzling government policies, and borrower defaults. The main factors have been identified as lax credit criteria and weak portfolio risk management. A considerable number of commercial banks in Nepal have sanctioned loans without undertaking rigorous evaluations, resulting in an increase in loan defaults and non-performing loans (Bhandari, 2020).

Sah and Pradhan (2022) discovered that the Z-score was negatively impacted by the loan loss provision. It follows that the Z-score significantly reduces as the loan loss provision increases. Increasing risks were concerning since they could lead to a financial collapse. Shahu (2019) observed that decisions regarding loan portfolio of management should have significant impacted on bank performance. The banks can achieve financial stability by reducing the provisioning of loan loss, increasing net interest income, and effectively managing solvency risk. This, in turn, contributes to their overall financial sustainability. The financial sustainability of banks remains unaffected by systematic risks that arise from macroeconomic factors (Meher & Getaneh, 2019).

Sah and Pradhan (2022) found that capital adequacy ratio influence on Z-score. It implies that the Z-score increases with the capital adequacy ratio. Similarly, the credit to deposit ratio influence on Z-score. It denotes that the larger the credit to deposit ratio, the higher the Z-score. The advancement of relevant prudential standards to protect banks and other financial institutions from financial crises and failure signals has been assisted by capital adequacy. For commercial banks, non-performing assets

have grown to be a big problem. Commercial banks are required by NRB regulations to keep aside a specific percentage of their profits as provisions for non-performing assets and bad loans. Banks seem unable to make large profits because of the nation's economic environment and high provision. Borrowing in the productive and industrial sectors is a very unsafe venture. For safety purposes, banks are investing in home loans, hire purchase loans, and education loans. Banks are experiencing difficulties with excess liquidity due to a lack of satisfactory lending opportunities. The financial performance of government banks is visibly low. Government banks have deal with various social obligations and gave to provide different subsidies. At the same time, Joint venture banks can merely operates for profit making. The concentration of CBs in urban areas like Kathmandu, Biratnagar, and Pokhara has sparked some concerns. This situation does not indicate well for the socio-economic development of the country, especially when over 80% of the population lives in rural areas and 81% depends on agriculture. These CBs show reluctance in expanding their operations to rural areas. Despite the NRB's directive for a 10% compulsory investment in the agriculture sector, these banks prefer to pay fines rather than invest in less profitable sectors. This issue must be addressed so that even small investors in rural areas can access the services provided by these banks. Additionally, the existing branches of commercial banks in rural areas seem to struggle in effectively mobilizing local resources. In the changed scenario, these banks need to explore their strengths and weaknesses, and improve their performance because their success depends upon their ability to boost their productivity and financial performance.

The bank's main tasks are amount collection and their investment. They collect adequate amount from the mass, however they could not find or locate new investment sectors required to mobilize their funds on the changing context of Nepal. Some banks having clients or proper deposits, but they are unable to figure out profitable sectors or chances to invest the deposit collections. They've always faced a high level of risk and uncertainty. They are in hydropower, consumer lending, tourism, garments, private institutions, land, houses, autos, share collateral, real estate, OD, professional and trading sectors, etc.; these are the major sectors. In the current circumstances of the country, every individuals lack the authority to determine their preferred sector for entry. The pivotal element influencing the prosperity of any

establishment is the security environment. Only after the security situation normalizes, will commercial banks contemplate thoughtfully on where to allocate their investments and expand. Hence, the security challenge remains a pressing issue for every commercial bank when it comes to allocating their resources. A significant number of Nepalese commercial banks have not developed a systematic investment policy, with the majority relying on the guidance and regulations of the Nepal Rastra Bank. Then proper unorganized behavior/culture of banks will be faced many problems, obstacles and bad situations like bankruptcy, business failure etc.

Bank failure is a prevalent issue worldwide, with limited evidence available despite numerous banks facing financial challenges caused by liquidity shortages. Researchers have predominantly examined the effects of both internal and external factors on bank profitability on a global scale, with minimal attention given to financial stability and sustainability. This current study delves into the specific factors within firms that contribute to financial distress and how they impact the financial sustainability of banks in Nepal. Hence, the study seeks to analyze and assess the influence of firm-specific indicators of financial distress on Nepalese banks. The study is obtained for factors that affect financial risk and distress and the degree to which they affect the financial distress of Nepalese commercial banks. The study also measured financial distress risk using Altman's Z-score model and evaluated how effective it is. There is still a gap in the corpus of knowledge that has to be filled by this study.

The purpose of this research is to discover several indicators of financial distress and analyze their association with Nepalese commercial banks' financial ratios. The present study seeks to respond to the following research questions:

- i.) Do the sampled banks have to manage their liquidity, efficiency, leverage, and profitability positions?
- ii.) What is the relationship between financial ratios and financial distress risk of commercial banks?
- iii.) Does the bank's financial ratio impact on financial distress risk?

1.3 Objectives of the Study

The main objective of this dissertation is to determine the financial ratios as empirical predictors on risk and distress. To be more specific, this study keeps the following objectives;

- i.) To determine the liquidity, efficiency, leverage and profitability position of commercial banks.
- ii.) To examine the relationship between financial ratios and financial distress risk of commercial banks.
- iii.) To evaluate the effects of financial ratio on financial distress risk of commercial banks.

1.4 Rationale of the Study

Banking business is growing rapidly with increasing competition and risk. The government banks are facing threats from individuals who are creating problems. Many investors are putting their money and assets at risk without proper knowledge. Financial ratios play a crucial role in financial analysis. This study is important in Nepal. It has academic, theoretical, and practical significance. The findings and conclusions will be valuable for banks, financial analysts, and others making financial decisions. This study will also benefit individuals, researchers, scholars, and interest groups who want to understand ratios and their predictive power, as well as the most powerful ratio and different prediction models in various environments. This study will be summarizing, sensible and precious to the people having interest in the Financial Ratios as Empirical Predictors of Risk and Distress of Commercial Banks, represented by these three banks, NBL, HBL and NABIL. The significance of the study might be pointed out by the following points;

1. The study informs shareholders about the financial performance of their particular banks. It permits them to compare whether their funds were better utilized or not. Similarly, the derived financial ratios assist in predicting risk and distress when competing in a competitive market.
2. The study encourages bank management to self-assess their past practices and enhance future strategies and procedures.

3. The performance of banks is of interest not only to financial agencies, stock exchanges, and stock traders, but also to customers, depositors, and debtors. These stakeholders seek to objectively identify the most profitable, safe, and liquid banks to engage with.
4. Macro-level policymakers, such as the government and NRB, will benefit from the emergence of economic development strategies through banks.

Aside from this study, there will be interest from academicians, students, and teachers in the fields of trade and finance.

1.5 Limitations of the Study

The limitations of the study are outlined below:

1. The study just includes appropriate data information for the ten years from 2012/13 to 2021/22.
2. The analysis and interpretation heavily rely on the secondary data and information that is accessible. Therefore, the reliability of secondary data and information is absolutely necessary for the consistency of the findings and conclusions.
3. This report cannot be without defects. The best effort has been made to ensure that this report contains as few errors as possible. Because it is nearly impossible to avoid errors, the presence of unrecognized errors is an important limitation of the study.
4. The research is focused on Nepal Bank Limited as a public government bank, a senior first bank in Nepal; Nabil Bank Ltd. as a Nepalese and foreign-owned first private sector bank of Nepal; and Himalayan Bank Limited as a joint venture bank, which is also one of the oldest banks of Nepal. All banks existed before the Financial Sector Reform Program of 2001. So these sample banks may not explore the whole scenario of the banking industry.

CHAPTER-II

REVIEW OF LITERATURE

The study adopted liquidity, profitability, efficiency and leverage as the independent variable because it is believed that robustness of such a system could be altered or changes under different financial institutions. Financial distress risk is adopted as the dependent variable which is basically the key factor that the research seeks to interrogate its changes of the distress risk management systems. It's means reviewing research studies or other relevant proposition in the related area of the study so that all the past studies, their conclusion and deficiencies may be known and future research can be conducted. The main reason for the full review of research in the past is to know the outcomes of those investigations in areas where similar concept and methodologies had been used successfully, and to avoid investigating problems that have been definitely answered.

2.1 Theoretical Review

This subdivision offers an analysis of various theories related to financial distress, including those focused on predicting financial distress, explaining its effects, and outlining strategies to mitigate and distribute the costs associated with financial distress to lessen its consequences. The study goes through distress determinant theories, the Wreckers theory of financial distress, and the theory of bankruptcy as discussed in this segment.

Predictive Models

Determinant hypotheses give a collection of experimentally evolved trouble prescient models through matching accounting ratios and distress firms. Multiple discriminant analysis (MDA), logit, probit, recursive partitioning, hazard models, and neural networks have all been utilized in the academic literature to create a variety of models. Despite the numerous models available, the business community and researchers frequently rely on the models developed by (Altman, 1968; Ohlson, 1980; Wang & Campbell, 2010). Further models were created by Altman in 1968 and Ohlson in 1980 (Altman, 1968; Ohlson, 1980). Altman broadened Beaver's model by

fostering a discriminant capability which consolidates proportions in a multivariate examination. Altman discovered that Beaver's cash flow to total debt ratio performed worse than his five ratios. The Altman model joins seven accounting terms (current assets, current liabilities, noncurrent assets, retained earnings, profit before interest and taxes, long-term liabilities, book value of equity, and net earnings) to deliver a solitary Z score that gathering broke down firms into distressed, grey and safe zones. As per Altman (2000), the model's exactness in predicting bankruptcy one year in the wake of announcing is 80% - 90% earlier. Ohlson's 1980 investigation brought up issues about the MDA model, especially in regard to the prohibitive factual necessities forced by the model (Wang and Campbell, 2010). In order to get around the limitations, Ohlson used logistic regression to forecast business failure. He utilized the logit model and US firms to foster a gauge of the probability of failure for each firm. He claimed that this approach addresses some of the drawbacks of MDA, including its arbitrary nature in finding matching businesses that do not fail and its reliance on the assumption of a normal distribution of predictors. Ohlson offered no theoretical explanation for his choice of nine independent factors, which he believed would be useful in predicting bankruptcy. The following variables were employed: cash flow from operations, net income for the two financial periods preceding to study, total assets, gross national product, total liabilities, current liabilities, and current assets (Wang & Campbell, 2010).

Wrecker's theory of financial distress

Campbell, Hilscher, and Szilagi (2005) introduced a reduced form default risk indicator and put forth a hypothesis that stocks of distressed firms perform significantly worse compared to financially healthy firms. The aim of the wreckers' theory of financial distress is to describe the potential benefits that stakeholders could perceive. It is not required to blame inefficient or irrational markets for the negative excess returns of financially troubled companies. These negative excess returns can be seen as the natural outcome in an efficient market where certain participants can benefit from distressed companies. For firms on the brink of bankruptcy, non-cash returns to ownership may be the primary form of payout. If markets are efficient, these returns should be reflected in stock valuation. This concept is known as the 'wreckers theory' of financial distress, which effectively explains the overall pattern of

results. The authors then proceed to demonstrate how to directly test this hypothesis against the alternative of inefficient markets using the theory of convenience yields. It is difficult to believe that the collective financial market participants can be so irrational or inefficient. Thus, Campbell, Hilscher, and Szilagi (2005) take a step back and present a different perspective on "profiting from a ship wreckage." They create an illusion of a firm being struck by a series of negative shocks, incurring losses, and approaching a state of financial distress. With higher leverage, the volatility of share prices increases due to private information, and the ultimate fate of the firm depends on unknown factors to the general public.

Due to the increasing significance of information asymmetry, uninformed investors such as widows and orphans will likely withdraw from the market, perceiving it as a risky investment. Consequently, equity ownership will predominantly shift to insiders who possess a distinct advantage in accessing and understanding company-related information. Two potential groups that come to mind are the managers themselves and competing firms. Another possibility could be private equity or funds engaged in restructuring efforts (Campbel, Hilscher, & Szilagy, 2005).

The group of knowledgeable insiders can benefit from their investments in ways other than receiving cash dividends. For managers, it is well-known that preventing them from exploiting the company is challenging, as evidenced by extensive research on corporate governance. In the case of a financially troubled company, it would be unwise for managers to tap into hidden reserves and generate cash flow, as this money would likely be allocated to creditors (Campbel, Hilscher, & Szilagy, 2005). The managers who aim to maximize utility will attempt to utilize the resources of the company in a more straightforward manner. On the other hand, competitors are market participants who have access to the same resources as the company, including specialized labor, market information, technical and engineering knowledge, and product expertise. These resources can be transferred by anyone with executive power. Additionally, controlling the market behavior of a competing company can directly benefit the competitor's profits without depleting their own resources (Campbel, Hilscher, & Szilagy, 2005). Equity is not just about receiving dividends, it also grants control rights. These control rights have their own economic value because they allow owners to benefit from them. If control rights had no value, nobody would

be interested in having them. The value of control rights makes equity similar to a commodity. A commodity's return includes both the capital gain and the convenience yield, which refers to the services received by the owner of a physical inventory but not by the owner of a contract for future delivery (Brennan, 1991). Corporate control convenience yield includes all non-monetary benefits of ownership, which are not necessarily illegal. Even though it is not reflected in financial records, the convenience yield of corporate control is economically similar to a dividend. This value is acknowledged not only by the owner, but also by other market participants who aim to make rational price predictions. Distressed company shares do yield returns in line with their risk category, but only a portion of investors can capitalize on these returns (Brennan, 1991).

Early Bankruptcy theory

The concept of formal bankruptcy theory originated from the need to address collective action issues among creditors of a bankrupt company. Insolvency can stem from economic or financial distress, or a combination of both. Economic distress arises when a company cannot generate enough revenue to cover its expenses, excluding financing costs. In contrast, financial distress occurs when a company would be profitable if it didn't have to repay its debts. The presence of debt becomes irrelevant once insolvency sets in. The optimal scenario for social welfare involves liquidating economically distressed companies while allowing financially distressed ones to continue. Creditors are primarily concerned with asset availability to settle their claims rather than saving the company. In cases of financial distress, creditors benefit more from the company's continuation. However, saving a financially distressed company requires coordination among creditors, which can be costly. Without regulation, both financially and economically distressed companies are typically liquidated piecemeal. A bankruptcy system can prevent this by pausing creditor actions, allowing a state official to determine if the company is salvageable (Alder, 2002).

In the early modern era, there was a preference for allowing the market to determine whether a business should be liquidated or continued. To be more specific, a government representative would oversee auctions for insolvent companies, free off

current claims and distributing the resulting funds to creditors. If it was deemed more profitable to sell off the assets piece by piece, the highest bids would be for individual items. On the other hand, if keeping the company intact would generate greater economic value, then the highest bids would be for the entire firm (Longhover, 2004). Early scholars held the belief that a bankruptcy system should strictly adhere to the absolute priority rule. According to this rule, creditors must be paid in the precise order specified by the firm's contracts. As a result, equity-holders, who are the owners, would receive nothing since their claim on an insolvent firm holds no value. The only reason to deviate from the absolute priority rule would be to pursue distributional goals. However, utilizing a bankruptcy system to achieve such goals raises two concerns. Firstly, implementing these goals becomes challenging as parties can find ways to bypass the distributional rules through pricing or other contractual terms. For instance, if the bankruptcy system is modified to prioritize junior creditors over senior creditors, senior creditors can respond by demanding higher interest rates or imposing stricter lending conditions. Consequently, in the long run, bankruptcy systems fail to accomplish distributional objectives. These objectives are sometimes framed in social terms, such as preserving jobs. Nevertheless, early scholars believed that a bankruptcy system was an ineffective tool for attaining social goals (Douglas, 2002).

Normative theory of Bankruptcy

Normative theory, also known as the modern theory of bankruptcy, connects the outcomes of a bankruptcy process to the previous phases in the existence of the borrowing company. A bankruptcy system that is ex post efficient would aim to maximize the returns that creditors get from insolvent companies. For instance, a system that only saves financially troubled companies would result in greater returns for creditors compared to a system that tries to save economically troubled companies too. During the borrowing stage, a competitive credit market has the effect of reducing the repayment amounts that lenders demand from financially stable companies when the lenders anticipate potential insolvency. According to this theory, as the efficiency of the bankruptcy system improves (meaning higher payoffs for creditors), the interest rates or cost of debt decrease. In order to maximize social welfare, a society would prefer that companies pursue any project for which they can

secure credit. However, debt-financed companies tend to pursue fewer projects than what society would prefer because they have to give up returns in bad states to creditors, while sharing returns in good states with them. Therefore, it is in society's best interest to have an efficient bankruptcy system, as lower interest rates allow firms to retain a larger portion of the returns in good states. This helps bridge the gap between the socially efficient project set and the project set that debt-financed firms actually pursue. Additionally, an efficient bankruptcy system also enhances the borrower's investment incentives, as firms invest in projects to maximize their net expected profits, which increase as the interest rate decreases (Alder, 2002).

Moreover, an efficient bankruptcy system that lowers the expense of debt capital will ultimately lower the overall cost of capital. Shareholders essentially hold a call option on a leveraged company since they have the ability to purchase the company by paying off the debt. The strike price for exercising this call option is influenced by the firm's cost of credit. By decreasing this cost, which in turn reduces the strike price, the shares of a leveraged company become more attractive to investors. Consequently, it becomes simpler for companies to secure equity capital as the efficiency of their country's bankruptcy system improves (Douglas, 2002).

In the United States, the economic findings of normative theory have practical policy implications, four of which are briefly discussed. To begin, the US Bankruptcy Code grants trustees or debtors in possession "avoiding powers." These abilities allow the insolvent party or its representative to recover for the bankrupt estate's pre-bankruptcy payments to creditors and to challenge liens that may not have been obtained in complete conformity with state law. The avoidance powers have been a major part of bankruptcy law for a century, but their presence necessitates a more solid theoretical foundation. Except for the conventional prohibition on fraudulent conveyances, these rights often reduce rather than boost the value of the bankrupt corporation (Douglas, 2002). Secondly, it is crucial to allow parties the freedom to draft contracts that enable customers and suppliers to discontinue their association with an insolvent company. By granting solvent parties the option to exit, debtors can focus on pursuing profitable ventures while facing challenges in maintaining unproductive projects. As a result, the ability to freely negotiate exit terms will lead to a decrease in interest rates, surpassing the limitations imposed by the existing bankruptcy system (Alder, 2002). Thirdly, the

debtor-in-possession must determine which creditor expenses are to be reimbursed. Currently, bankruptcy courts are allowed by the Code to reimburse junior creditor expenses that enhance the amount available for distribution to the juniors, while senior creditor spending is rarely reimbursed. This system of compensation can lead to juniors engaging in rent-seeking behavior, as they may choose to litigate in order to bypass absolute priority instead of focusing on increasing the value of the insolvent firm. A more effective approach would be to entrust the decision of reimbursement to the debtor-in-possession. The debtor lacks the motivation to support rent-seeking activities and may even involve the seniors in efforts to maximize the firm's value (Alder, 2002). Fourthly, it is crucial for the law to allow parties to include provisions in the lending agreement that can impact the bankrupt company's decision on which bankruptcy procedure to follow. These contracts play a significant role in preventing the firm from unnecessarily prolonging its entry into the bankruptcy system and selecting a procedure that solely benefits the company, rather than ensuring fair distribution of funds to creditors (Longhover, 2004).

This overview demonstrates that, while attributing the aim of capital cost reduction to a bankruptcy system is unlikely to be contentious, genuine pursuit of the goal would have significant consequences. A bankruptcy legislation with no avoidance powers, in which suppliers and customers could contract out, that reverses the method for compensating creditor expenses, and that is just a default procedure from which parties can depart would be vastly different from current law (Longhover, 2004).

Altman Z score model

Altman (1968) conducted a research study to evaluate the effectiveness of ratio analysis as an analytical tool. Scholars and Bum (2003) argue that traditional ratio analysis is no longer considered a significant analytical technique in academia due to its simplistic presentation. The study focused on predicting corporate bankruptcy as a case study. It involved examining a series of financial and economic ratios within the context of bankruptcy prediction using a multiple discriminant statistical methodology. The study specifically analyzed data from manufacturing companies. By combining a set of financial ratios in a discriminant analysis, the study aimed to rigorously assess their predictive potential for corporate bankruptcy. The underlying

theory is that ratios, when analyzed in a multivariate framework, will demonstrate greater statistical significance compared to the conventional method of sequential ratio comparisons (Altman, 1968).

The discriminant-ratio model demonstrated high accuracy in forecasting bankruptcy, correctly predicting bankruptcy in 94% of the initial sample, with 95% of firms in both bankrupt and non-bankrupt groups correctly classified. Additionally, the discriminant function showed accuracy in various secondary samples used to assess the model's reliability. Analysis of individual ratio movements before bankruptcy supported the model's conclusion that bankruptcy can be predicted with accuracy up to two years before actual failure, with accuracy decreasing significantly after the second year. One limitation of the study was that it focused solely on publicly traded manufacturing companies, which provided comprehensive financial data, including market price quotations. The study suggested future research should explore smaller asset-sized firms and unincorporated entities, where the risk of business failure is higher compared to larger corporations (Altman, 1968).

2.2 Empirical Review

Empirical review refers to the review of previously conducted research and article of scholars related to study. The empirical review of various research studies are as:

Molla (2022) conducted a research on Assessment of Financial Distress Condition of Commercial Bank in Ethiopia. The primary aims of the research were to evaluate the financial distress status of CBE by employing Altman's Z-score model. The research adopted a descriptive research design utilizing a quantitative model-based approach. The research utilized quantitative secondary data obtained from the audited financial statements of the highest 6 profitable private limited banks in 2020/21. The primary reason for financial distress was identified as the liquidity position. Furthermore, it was discovered that commercial banks exhibit relatively similar financial distress statuses in the current financial environment. As a result, it is suggested that senior managers, along with the board of directors, should improve the bank's dividend policy and practices.

Walela, Omagwa and Muathe (2022) conducted a study on Financial Risk and Distress: What We Learn from Firms in Kenya, listed at the Nairobi Securities

Exchange. The main objectives of the study were to explore the impact of financial risk on the financial distress experienced by listed firms in the Nairobi Stock Exchange during the period from 2009 to 2018. The research methodology employed a positivist research philosophy, along with explanatory, non-experimental, and descriptive research designs. The analysis of time series cross-sectional panel secondary data involved conducting various diagnostic tests, such as multicollinearity, heteroscedasticity, linearity, outliers, autocorrelation, goodness of fit, stationary, and model specification. Data analysis was carried out using both descriptive statistics and inferential statistics, specifically utilizing a Binary Logistics regression model. The study's results revealed that credit risk was not statistically significant, while currency risk, interest rate risk, and liquidity risk were statistically significant at the 5% level of significance.

Sah and Pradhan (2022) had examined the effect of the financial distress on performance of Nepalese commercial banks by choosing the liquidity ratio, spread rate, capital adequacy ratio, credit risk, credit to deposit ratio, and loan loss provision as independent variables and the Z-score and return on assets as dependent variables. The study is based on secondary data collected from 27 commercial banks during the years of 2012/13 and 2019/20, comprising 216 observations. The data was acquired from the Banking and Financial Statistics of Nepal Rastra Bank, publications and websites of the Ministry of Finance (MoF), and annual financial statement reports of selected commercial banks. To examine the significance and relevance of financial stress on the performance of Nepalese commercial banks, correlation coefficients and regression models were estimated. The findings indicate that an increase in the spread rate has a positive impact on both the return on assets and the Z-score. In other words, as the spread rate increases, so does the return on assets and the Z-score. Conversely, the study reveals that loan loss provision has a negative effect on the return on assets and the Z-score. This implies that a larger loan loss provision results in a lower return on assets and Z-score. Additionally, credit risk is found to have a negative influence on the return on assets and the Z-score. This suggests that a higher credit risk leads to a decrease in the return on assets and the Z-score. Ultimately, the study concludes that the leverage ratio has a detrimental effect on the return on assets and the Z-score, indicating that as the leverage ratio increases, the return on assets and the Z-score

worsen. The liquidity ratio also affects the Z-score and return on assets. It means that a higher liquidity ratio is associated with improved return on assets and Z-score. Similar to how capital sufficiency affects return on assets, it also affects Z-score. It means that the rise in capital adequacy ratio is positively associated with the increase in both return on assets and Z-score. The credit to deposit ratio also affects Z score and return on assets. It means that the credit to deposit ratio, the higher the Z score and return on assets. Similarly, negative effects are seen by the leverage ratio on the Z-score and return on assets.

Dajcman, Kavkler, Merzlyakov, Pekarski and Romih (2022) researched International Transmission of Conventional and Unconventional Monetary Policy and Financial Stress Shocks from the Euro Area to Russia. It is used the impact of euro area conventional and unconventional monetary policy and financial stress on the Russian Economy is assessed by fitting a two-country VAR model and computing impulse response. The results show that financial stress in the euro area damages Russian economic activity and stock prices, but not its trade balance. The contractionary euro area monetary policy shock decreases Russian GDP, leads to real appreciation of the euro against the Russian ruble, damages Russian stock prices, but does not significantly affect the trade balance between countries. We also found that the Central Bank of the Russian Federation adjusts to monetary policy shocks in the euro area.

Bhandari (2020) conducted a research on Impacts of Financial Distress on Profitability of Nepalese Commercial Banks. The study used the ratios like; return on assets and earnings per share are as dependent variables and leverage ratio, non-performing loan, liquidity ratio, credit to cash plus deposit (CCD), and capital adequacy ratio are as independent variables and collected the data from secondary sources of among 20 selected commercial banks for the period from 2013/14 to 2017/18. The study also tests by using regression models. The study found that leverage, liquidity & CCD ratios are positively correlated to ROA, there is negative relationship between EPS and non-performing loan, and there are positive relationships between leverage ratio, CCD ratio with EPS. In the study the beta coefficients for non-performing loans were found to be negative in the regression

analysis with respect to EPS and leverage, liquidity, CCD ratios are positive with ROA & EPS respectively.

Shahu (2019) examined that distress risk can affected probable ratios which were defined by modified Altman Z-score for measuring financial distress risk. The study engaged secondary data of 18 commercial banks which were listed in Nepal Stock Exchange Limited during time period from 2008-2014. The results demonstrate that liquidity ratio, profitability ratio and bank size have the significant positive effect with Z-score which means banks have lower distress risk. These results proved that too big size by capital is not affect to any reason like “too big to fail” doctrine and encouraged to increment of capital to 8 Arab ruled by NRB. The study sheds light on banks' regulatory bodies and relevant authorities. To prevent being financially distressed, managers should work to maintain the bank's liquidity position and develop effective strategies to increase profitability.

Gandhy and Fardinal (2019) conducted a research on Analysis of Financial Ratio to Predict Financial Distress. This study examines financial measures to determine whether they might indicate whether manufacturing businesses listed on the Stock Exchange between 2014 and 2017 are in financial distress. Liquidity ratios, profitability ratios, and solvency ratios are used to calculate financial ratios. While Altman Z-Score assesses financial strain. The financial statements of manufacturing firms in the basic and chemical industry sub-sector from 2014 to 2017 make up the study's population. Purposive sampling is the sampling method. Secondary data is the type of information used. Additionally, the corporation provided 26 data. According to the test results, there is a very high negative correlation between financial distress and the liquidity ratio and solvency ratio. Although there is a very significant positive correlation between the profitability ratio and financial difficulty.

Uprety (2019) conducted a study on effectiveness of investment policy and profitability position of public sector commercial banks (With special reference to Nepal Bank Limited and Rastriya Banijya Bank Limited). The study was conducted on the basis of primary and secondary data. The study used questionnaire method to know the view of management and bankers regarding effectiveness of investment policy. The study used both financial and statistical tools like trend analysis and ratio

analysis. The study found that the share of RBB and NBL in the assets and liabilities of the banking sector was around 50% before implementation of sound investment policy. After international financial experts have been managing these banks, the performance especially for reducing NPA was satisfactory. The management teams were supposed to bring NPA level to 5% level. The NPA to total credit ratios of RBB decreased from 60.15% in FY 2009/10 to 20.17% in FY 2014/15. Investment policy of both the management teams are unsatisfactory; they have improved in other areas. Credit related financial indicators in NBL and RBB seem relevant in comparison with the specified standard of NRB.

Meher and Getaneh (2019) had studied to find out how financial hardship variables affect the financial viability of commercial banks in Ethiopia. For the study, balanced panel data from 12 Ethiopian commercial banks was gathered between 2011 and 2017. The research makes use of an OLS (Ordinary Least Square) Regression Model. Internal bank data and macroeconomic variables are good indicators of financial hardship. The Financial Stability Index, Return on Equity, Return on Assets, and Bank Soundness serve as indicators for financial sustainability. Findings indicate that Absolute Liquidity Risk and Net Income Growth exhibit significant and positive relationships, while Solvency Risk shows a notable negative correlation with Return on Assets. When compared to the Financial Stability Index, Net Income Risk and Asset Quality both demonstrate considerable and positive associations, while Solvency Risk remains significant but negative. Absolute liquidity risk and liquidity risk are considerable and positive, whereas credit risk is significant and negative in relation to bank soundness. Enhancing Return on Assets and bank soundness requires free cash flow and net income growth. Managing equity within prudential guidelines might result in the short-term financial sustainability of commercial banks. Reduced provisioning for loan losses, growth in net interest income, and risk management of solvency might provide the banks with the financial stability they need to become financially sustainable. According to the report, banks' financial stability is protected from exposure to systematic risks resulting from macroeconomic causes.

Maaji, Abdullah and Khaw (2019) conducted a research on the early warning signals of financial distress among small and medium-sized enterprises (SMEs) in Malaysia. SMEs are crucial for the economic progress of a nation. In order to ensure the survival

of SMEs, it is imperative to develop a failure prediction model that can act as an effective early warning system. Through the utilization of multiple discriminant analysis (MDA) and logistic regression model on data from 176 manufacturing companies spanning from 2000 to 2012, it was determined that controlling shareholders, number of directors, gender of managing director, earnings before interest and tax, size, and age of the company are significant factors in predicting financial distress among SMEs in Malaysia. The findings revealed that model 3, which encompasses all variables, yielded a higher accuracy rate for both MDA and logistic regression. This suggests that an effective prediction model should not solely focus on financial, non-financial, or corporate governance variables. Additionally, the accuracy rate of the logit model was found to be superior to that of MDA across all models.

Darmawan and Supriyanto (2019) researched The Effect of Financial Ratio on Financial Distress in Predicting Bankruptcy. This study was conducted to investigate Financial Distress in mining companies listed on the Indonesian Stock Exchange (BEI). IBM SPSS 22 and for analytical technique in Dependent Variable as Altman Z-Score consisting with four ratios; Net Working to Total Assets (H1), Retained Earning to Total Assets (H2), Earning Before Interest and Tax to Total Asset (H3), and Market Value of Equity to Book Value of Debt (H4). By using SPSS 22 to test the hypothesis, the result are all those four Independent variables H1, H2, H3 & H4 had positive effect on Financial Distress

Devkota (2018) conducted study on Comparative analysis of profitability position of Nepalese commercial banks (Standard Chartered Bank Nepal Ltd., Nabil Bank Limited and Himalayan Bank Ltd.). The study used both financial and statistical tools like trend analysis and ratio analysis. The study found that the profitability position of SCBNL & NABIL is better than that of HBL in terms of return on total assets and total deposits. During the study period, HBL was found to be the highest deposit holding bank. In other words, Total deposits of HBL exceeded the other two banks under study. The total deposits trend of NABIL explained that its deposit is declining by NRs. 389.22 million each year. Other financial indicators like Earning per share (EPS), Dividend per share (DPS) and Book Value per share of SCBNL was found in the better position as compared to that of NABIL & HBL. The SCBNL has dominated

in this regard during almost the whole period of study except for one or two cases where NABIL took off. The loan loss provision of SCBNL had been least during the whole period under analysis among the three selected commercial banks signifying that it had fewer amounts of bad loans, which is obviously good for any bank.

Yirgu (2016) conducted a research on determinants of Financial Distress: Empirical Evidence from Banks in Ethiopia. This study aims to gauge the degree of financial hardship experienced by commercial banks in Ethiopia and to pinpoint its causes. To accomplish these goals, secondary data for eight banks were gathered for the sample period, which ran from 2006 to 2015, and were examined using fixed effect (FE) regression modeling and descriptive statistics. The analysis comes to the conclusion that the sampled banks were in distress based on the descriptive data. The FE regression model identified asset quality and liquidity as having a positive effect, but liquidity was the only factor that was significant. The model also identified capital adequacy, the macroeconomic factors, economic growth and saving interest rate have significantly negative and positive effect on banking financial distress respectively; whereas inflation was not significant. In general, the research concludes that both bank specific and macroeconomic factors determine the level of financial distress of Ethiopian commercial banks.

Alshubiri (2015) conducted a research on The Impacts of Financial Positions on Risk and Ratios is based on four groups of risk asset ratios as capital adequacy are based on three variables in the banking sector listed in Muscat Security Market (MSM) of Oman of six banks during periods from 2009 to 2013, are used multiple regression results indicate there is an impact of asset quality and total regulatory capital ratio and between asset quality, profitably and tier-1 capital ratio and finally, debt, liquidity ratios and risk of default ratio. The result shows there is a relationship between asset quality, profitability, debt and liquidity in different variables and asset risk which recommended for financial growth must have searched alternative plans rather than specific sector lending.

Subedi (2010) conducted a research on topic a study on predictive power of financial ratios was carried out on a sample of 20 companies, consisting of 10 sick companies and 10 non-sick companies, over the period of 2004-2008. In this study had used the

various ratio analysis; liquidity, leverage, activity and profitability ratios. It also used arithmetic mean and univariate model. In the study found that 1. In liquidity ratio; the current ratio is more reliable in predicting future outcomes compared to the quick ratio and net working capital ratio, 2. In leverage ratio; interest coverage ratio has the best predictive power among all others, while predicting future, debt to equity ratio and debt to total assets ratio have moderate predictive power, and fixed assets to current ratio has less predictive power among all others.

Pesola (2005) conducted research with the focus was on examining the relationship between macroeconomic determinants and banking fragility and distress. The research specifically analyzed the banking sector distresses in the Nordic countries, Germany, Spain, Greece, Belgium, and the UK. To achieve this, an econometric model was utilized, which was estimated on panel data spanning from the early 1980s to 2002. The dependent variable in this study was the ratio of banks' loan losses to lending. In addition to the lagged dependent variable, the explanatory variables included a surprise change in incomes and real interest rates. These variables were also considered separate cross-product terms with lagged aggregate indebtedness. The main argument put forth in this paper is that loan losses are primarily generated by strong adverse aggregate shocks, particularly when banks are highly exposed to such shocks. The underlying macroeconomic account suggests that these shocks have a significant impact on the banking sector's stability and distress. As per the findings, the banking industry's hardship was caused by excessive client debt levels paired with unfavorable macroeconomic surprise shocks to income and real interest rates. Loan losses also exhibit high autoregressive behavior, which in severe recessions may point to a feedback effect from loan losses to macroeconomic level. The banking sector's macro stress test may be performed using the findings.

Niroula (2021) researched the paper topic of Determinants of Financial Distress of Nepalese Commercial Banks has been chosen fifteen (15) commercial banks during the study period from 2011-2019. The data have collected through secondary sources and conducted by using Altman Z-score model to measure financial distress condition or in strength condition actually. The paper found that on average z-score was greater than safe position $Z > 2.99$ which was indicates safe zone. The study conducted five

ratios which are liquidity ratio, reserve ratio, return ratio, solvency ratio, and capital adequacy ratio. Among them liquidity ratio has found positive but not significant. Others ratios are return ratio, solvency ratio, reserve ratio, and capital adequacy ratio have occurred positive and significant with Z-score. However, leverage ratio has negative but not significant impact on Z-score. Likewise, the study also tested multicollinearity test which shows there is no multicollinearity problem in individual independent variables.

Internal articles so far reviewed and presented in the Meta table

Table 1

Review Table

S. N	Author(s)	Methodology	Findings
1	Sah & Pradhan (2022)	-Correlation coefficients and regression models are estimated. -Z score model	The loan loss provision had an adverse impact on both the return on assets and the Z-score. Consequently, as the loan loss provision increases, the return on assets and Z-score decrease. Conversely, credit risk also negatively affects the return on assets and Z-score. This indicates that the bigger the credit risk, the lower the return on assets and Z-score. The leverage ratio has a negative influence on the return on assets and the Z-score. It follows that the larger the leverage ratio, the worse the return on assets and Z-score. Furthermore, the liquidity ratio influences the return on assets and the Z-score. It denotes that the higher the liquidity ratio, the better the return on assets and Z-score.
2	Molla (2022)	-Descriptive research design with a quantitative model based approach. -Altman's Z-score model.	The primary reason for financial difficulties was the lack of liquidity. Furthermore, it has been observed that commercial banks are facing similar financial challenges in the current financial condition.
	Walela, Omagwa and Muathe	Positivism is a research philosophy that is often paired with explanatory non-experimental and descriptive research designs.	The findings indicated that: credit risk was not statistically significant while currency risk, interest rate risk and liquidity risk were statistically

3	(2022)	<p>Before conducting data analysis, several diagnostic tests were performed on the time series cross-sectional panel secondary data. These tests included assessing multicollinearity, outliers, heteroscedasticity, autocorrelation, linearity, goodness of fit, stationary, and model specification.</p> <p>The analysis of data was conducted through the use of descriptive statistics and inferential statistics using Binary Logistics regression model.</p>	significant at 5% significance levels.
4	<p>Dajcman, Kavkler, Merzlyakov, Pekarski & Romih (2022)</p>	<p>-The impact of euro area conventional and unconventional monetary policy and financial stress on the Russian Economy is assessed by fitting a two-country VAR model and computing impulse response.</p>	<p>The results show that financial stress in the euro area damages Russian economic activity and stock prices, but not its trade balance. The contractionary euro area monetary policy shock decreases Russian GDP, leads to real appreciation of the euro against the Russian rouble, damages Russian stock prices, but does not significantly affect the trade balance between countries. Also found that the Central Bank of the Russian Federation adjusts to monetary policy shocks in the euro area.</p>
5	<p>Supra Dwitami, Suryanto, Noviarita, Anggraeni (2021)</p>	<p>-Quantitative method of Sukuk Rating, the dependent variable in the Sukuk ranking study with an ordinal scale. The financial ratios are used in this study. At the same time, corporate governance is calculated using the calculation of effectiveness, and competence of the board of commissioners using several indicators, namely activity, size, independence, and competence of the board of commissioners.</p>	<p>The research results prove that only the profitability ratio variable influence the Sukuk rating.</p>
6	<p>Imdadul Haque, Tausif, & Ali (2020)</p>	<p>The process of measuring bank performance is divided into two categories, namely Traditional Approach for used financial analysis like Return on Assets (ROA), Return of Equity (ROE) and Frontier Approach like Data Envelopment Analysis (DEA).</p>	<p>The result shows, in terms of ROA, the performance of conventional banks is better than that of Islamic banks, but in terms of ROE, vice versa. DEA results show that conventional banks are more efficient than Islamic Banks. The study also finds no correlation between the ratio and efficiency scores.</p>
7	<p>Nahar, Faza & Azizurrohman (2020)</p>	<p>The methodology used is panel data with various independent variables such as Non-Performing Finance (NPF), Capital Adequacy Ratio (CAR), Financing to Deposit Ratio (FDR), Operational Efficiency Ratio (OER),</p>	<p>The results of this study explain that Non-Performing Finance (NPF), Capital Adequacy Ratio (CAR), Financing to Deposit Ratio (FDR), Operational Efficiency Ratio (OER) have a significant influence on Sharia Bank Asset Returns (ROA) in Indonesia. The opposite occurs in</p>

		Inflation, Domestic Product Growth (GDP), and Exchange Rates.	macroeconomic indicators, Domestic Product Growth (GDP) and Exchange Rate do not seem to have a significant effect on the Return on Assets (ROA) of Sharia Commercial Banks in Indonesia.
8	Shahu (2019)	The objective of descriptive and casual comparative research is to address fundamental issues. Financial distress risk is measured by using Altman Z-score model with Book to market Ratio, Size, Liquidity, Profitability, and Leverage as independent variables.	The results by using Descriptive statistics, Correlation matrix, Portfolio analysis, Regression results & Test of Multicollinearity have found positive effect. The study demonstrated that liquidity ratio, profitability ratio and bank size have measured positive relation and significant effect with Z-score model. Likewise, book values to market value ratio and leverage ratio have found insignificant effect with distress risk.
9	Meher & Getaneh (2019)	Quantitative and inferential approach. The analysis conducted in this study utilized the Ordinary Least Square (OLS) regression model, which included both pooled regression and fixed effect regression analysis. The analysis was performed using R Studio.	Financial sustainability proxies, such as Return on Equity and Financial Stability Index, indicate that maintaining a low provision for loan losses leads to improved Asset Quality in commercial banks over the long term. Additionally, while a low Capital Adequacy Ratio may increase Solvency Risk, it encourages investment of equity capital in the business, resulting in higher ROA and overall sustainability of banks in the future. The combination of Net Interest Income and Asset Quality plays a crucial role in ensuring borrowers make timely interest payments, thereby enhancing the Financial Stability Index.
10	Ma'aji, Hiau, Abdullah & Khaw (2019)	Multiple discriminant analysis (MDA) and logistic regression for 176 manufacturing companies.	The results show that model 3 which includes all variables provides a higher accuracy rate for both models. It is also found that the accuracy rate of the log it model is higher than the MDA for all models.
11	Darmawan & Supriyanto (2019)	IBM SPSS 22 and for analytical technique in Dependent Variable as the Altman Z-Score comprises four ratios: New Working to Total Assets (H1), Retained Earnings to Total Assets (H2), Earnings Before Interest and Tax to Total Assets (H3), and Market Value of Equity to Book Value of Debt (H4).	By using SPSS 22 to test the hypothesis, the result are all those four Independent variables H1, H2, H3 & H4 had positive effect on Financial Distress.
12	Gandhy Fardinal (2019)	Logistic regression analysis is the statistical technique employed to examine the hypothesis in this research. Liquidity ratios, profitability	According to the findings from the analysis of data and the subsequent discussion on financial ratios, it was observed that the liquidity ratio and solvability ratios exhibited a significant negative correlation

		ratios, and solvency ratios are the determinants utilized to assess financial ratios. Altman Z-Score, on the other hand, is the measure employed to evaluate financial distress.	with financial distress. On the other hand, the profitability ratio displayed a substantial positive correlation with financial distress.
13	Moch, Prihatni & Buchdadi (2015)	Statistical methods utilized for hypothesis testing consist of the Likelihood Statistic Test (simultaneous) and the z statistical test (partial) derived from multiple logistic regression analysis with Financial distress (Y) as the dependent variable. The research utilizes Altman discriminant analysis with four variables to ascertain the Z-Score value for predicting the classification of companies into financially distressed, vulnerable, or healthy categories.	The research findings revealed that CR liquidity was partially demonstrated, while WCTA had a notable adverse impact on financial distress. Additionally, ROA profitability was observed, and ROE had a significant negative influence. Moreover, DAR solvency and DER had a significant positive effect on financial distress. On the other hand, TIE ratio did not exhibit any significant impact on financial distress.

2.3 Research Gap

The literature examined in this study leads to the conclusion that there are no consistent findings among the various studies conducted. The majority of these studies have utilized either time series or cross-sectional data to examine the impact of financial ratios on the financial distress risk of commercial banks in Nepal, employing panel data. However, these studies have primarily utilized conventional regression analysis to assess whether the data conforms to a fixed effect or random effect model. The analysis of multiple sources of literature during this study has revealed both negative and positive relationships between the dependent and independent variables.

Adeyemi (2012) posited that financial distress denotes a condition in which an institution faces difficulties in its operational, managerial, and financial aspects. Conversely, financial distress factors are expenses that exert an influence on an organization's performance, thereby prompting alterations in its investment decisions (Tshitangano, 2010).

Several national and international studies have been conducted to examine the impact of financial ratios on the risk of financial distress. These studies have aimed to determine the relationship between financial distress variables and financial ratios variables. However, the findings from these studies have been

inconsistent; indicating that the results obtained in other countries cannot be applied universally to Nepal. In Nepalese context, only a few studies have been conducted to investigate the issues related to financial distress variables. This particular study is designed to address the gaps in existing research conducted in Nepal. It distinguishes itself from previous studies by considering factors such as sample size, the nature of the sample firms, and the research methodology employed. The study focuses on three banks and analyzes ten years of data. Therefore, it is believed that this study differs significantly from earlier studies conducted in Nepal. While empirical evidence exists for other countries, there is a lack of such evidence in the context of Nepal. Hence, this study aims to analyze the relationship between financial distress and financial ratios variables in commercial banks, specifically focusing on liquidity ratio, leverage ratio, efficiency ratio, and profitability ratio on the financial distress variables of commercial banks of Nepal during the period of 2012/13 to 2021/22. The significance of this study lies in its ability to connect past research with the most recent data from commercial bank annual reports. The findings of this study can also enhance the current literature.

In Nepal, there have been very few or almost no studies conducted on the financial distress factors of commercial banks. Pradhan et al. (2002) discovered that financial distress negatively affects productivity, profitability, and liquidity. Neupane (2013) found that banks with higher capital adequacy ratios and lower leverage are more efficient and that bank loans are valued more highly than other bank outputs such as investments and securities. Subedi (2010) showed that the current ratio is more reliable in predicting future outcomes compared to the quick ratio and net working capital ratio. Additionally, interest coverage ratio has best predictive power among all others while predicting future, and debt to equity ratio and debt to total assets have moderate predictive power, and fixed assets to current ratio has less predictive power among all others. Shahu (2019) results demonstrate that liquidity ratio, profitability ratio and bank size have the significant positive effect with Z-score which means banks have lower distress risk. These results proved that too big size by capital is not affect to any reason like too big to fail doctrine and encouraged to increment of capital to 8 Arab ruled by NRB. Bhandari (2020) found that leverage, liquidity & CCD

ratios are positively correlated to ROA, there is negative relationship between EPS and Non-performing loan, and there are positive relationships between leverage ratio, CCD ratio with EPS. In the study regression results revealed that non-performing loans have negative beta coefficients with respect to EPS and leverage, liquidity, CCD ratios are positive with ROA & EPS respectively. Niroula (2021) revealed that mean value Z-score through descriptive statistics is 5.76 which is higher than the modified Z-score standard point $Z' > 2.99$ which indicates Nepalese commercial banks are in safe zone or are not in financially distress condition. In the study four major financial ratios are selected for measurement of Z-score as suggested by (Altman, 1968) and additional two other ratios are chosen as independent variables. The result shows that liquidity ratio is positive and insignificant with Z-score. The study demonstrates reserve ratio, return ratio, solvency ratio and capital adequacy ratio have positive and significant relationship with Z-score indicating same or direct impact with financial distress. However, with leverage there is negative relationship and but not significant with Z-score. Also, the study tested multicollinearity test where stated that values of all independent variables are smaller, values < 10 , happening there is no multicollinearity problem with independent variables individually. Sah and Pradhan (2022) discovered that the Z-score and return on assets were negatively impacted by the loan loss provision as well as by the credit risk also. Liquidity ratio also affects the Z-score and return on assets. The credit to deposit ratio also affects Z score and return on assets. Similarly, the leverage ratio negatively affects the Z-score as well as the return on assets.

While several studies have been conducted in different developing countries and developed countries, the results of these studies are not applicable to Nepalese context. This study intended to determine the variables that affect how financial ratios affect Nepalese commercial banks' financial distress risk.

CHAPTER -III

RESEARCH METHODOLOGY

This chapter presents research design, population, sample and sampling design, nature and sources of data, data collection method and method of analysis in a systematic way to solve the research problem.

3.1 Research Design

Descriptive and causal research design has been used for the study. The descriptive research design explains the characteristics, fact and data. It focus on describe the nature of data what is seen there. However, the causal research design shows relationship and effects between the dependent and independent variables.

3.2 Population, Sample and Sampling Design

Nepal Bank Limited, Himalayan Bank Limited and Nabil Bank Limited has been selected as sample for the present study among the 20 commercial banks (till the end of Ashadh, 2080). In selecting the most reliable and representative samples, purposive sampling technique has been used, which selects samples based on oldest banks before the implementation of Financial Sector Reform Program, 2001. All the commercial banks in Nepal are the population of the study. This study covers the data from 2012/13 to 2021/22 of selected commercial banks.

3.3 Nature and Source of Data

Every study needs satisfactory data and information from various sources. Therefore, the primary responsibility of the researcher is to gather data and information from various sources. There are two main types of data collection: primary data collection and secondary data collection. Primary data are data that are freshly collected and are unique in nature. Similarly, secondary data are those that have previously been gathered and subjected to the statistical process by another party. The data used in this study have been sourced from Nepal stock exchange limited's website, related bank's published annual reports like Balance Sheet, Profit and loss accounts, schedules as per necessities and the annual report of Ministry of Finance, NRB's report.

3.4 Data Collection Method

The data collection method was non-probability purposive techniques due to already published secondary data used to complete study. Annual report of bank and published data report by NRB used.

3.5 Methods of Analysis

Financial & statistical tools and approaches are utilized to assess the predictive capacity of financial measures. For this purpose, a wide range of statistical and financial methods and tools are available. It's possible that no financial or statistical tool or strategy will ever be able to fully address the problem. Therefore, it is the duty of the researcher to choose the suitable financial ratio, which may be assessed using arithmetic mean, ratio analysis, and the Altman Z score model. A detailed explanation of each of these is provided below.

3.5.1 Financial Tools

Financial ratio analysis is used as techniques to quantify the relationship between two or more sets of financial data taken from income statement, balance sheet and schedules of financial reports. It provides the information about strengths and weakness of a financial data in relationship to other. There are various types of financial ratios to make a comparative analysis of financial statement. The study required financial ratio are:

A. Liquidity Ratio

Liquidity Ratios show the relationship of firm's cash and other current assets to its current liabilities. Liquid Assets trade in active markets which are easily converted to cash within one year; it helps to pay short term debts.

i.) Current Ratio

The current ratio indicates banks liquidity and short-term debt paying ability. It shows the relationship between current assets and current liabilities. In current assets includes cash, marketable securities, account receivables, and inventories and in

current liabilities includes account payables, accrued wages and taxes, short term securities (debts) etc. It is calculated dividing the current assets by current liabilities.

Thus,

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

ii) Cash and Bank Balance to Total Deposit Ratio

The amount of money a bank should have minimum available as a percentage (we called not to cross more than CRR (Cash Reserve Ratio) standard given by NRB) of the total deposit amount of customers have paid into the bank is cash and bank balance to Total deposit ratio. This ratio can be calculated using the following formula.

$$\text{Cash and Bank Balance to Total Deposit Ratio} = \frac{\text{Cash and Bank Balance}}{\text{Total Deposits}}$$

iii) Cash and Bank Balance to Current Assets Ratio

This ratio is computed to disclose the soundness of the company to pay total calls made of current assets. It can be expressed as:

$$\text{Cash and Bank Balance to Current Assets Ratio} = \frac{\text{Cash and Bank Balance}}{\text{Current Assets}}$$

B. Activity/Efficiency Ratio

Activity or efficiency ratio measure the performance of a company's short-term or current performance. It is determine the efficiency of the firm in utilizing its assets for generating cash and revenue and used to analyze the level of investment made on an asset and the revenue that it is generating.

i) Loan and Advances to Total Deposits Ratio

The percentage of bank's loan it lending with its deposits. It is also called loan to deposit. It represents a bank's capacity to pay for customer withdrawals and loan losses. The ratio can be calculated by using following formula:

$$\text{Credits and Advances to Total Deposits Ratio} = \frac{\text{Loan and advances}}{\text{Total deposits}} \times 100$$

ii) Loan and Advances to Total Working Fund Ratio

This ratio is computed by dividing loan and advance by total working fund.

$$\text{Loan and Advances to Total working fund ratio} = \frac{\text{Loan and Advances}}{\text{Total Working Fund}} \times 100$$

iii) Total Investment to Total Deposits Ratio

This ratio is calculated to see how efficiently the banks have mobilized the deposits on total investment for short term and long term period. This ratio is calculated by using the following formula:

$$\text{Total Investments to Total Deposits ratio} = \frac{\text{Total Investments}}{\text{Total Deposits}} \times 100$$

C. Leverage Ratio

The ratios which are measure how effectively a firm manages its debt. It also called debt management or capital structure ratio which measures the financial leverage-the level of debt financing and the firm's ability to pay interest and other fixed charges.

i) Total Debt to Equity Ratio

Total debt to equity ratio is the relationship between borrowed funds and owners capital which ratio measures for long term solvency of a firm. The dept capital and equity capital reflects of their claim on the firm. The formula used to determine the ratio is:

$$\text{Total Debt to Equity Ratio} = \frac{\text{Total Debt}}{\text{Equity}} \times 100$$

ii) Net Worth to Total Assets Ratio

Net worth is calculated by subtracting all liabilities from assets. This ratio is derived by dividing shareholders fund by total assets. This can be stated as,

$$\text{Net Worth to Total Assets ratio} = \frac{\text{Net Worth}}{\text{Total Assets}} \times 100$$

iii) Total Debt to Total Assets Ratio

It is also called debt ratio. The debt borrowed for support of the assets of the firm. In total debt includes all current liabilities and long-term debt. It is computed as:

$$\text{Total Debt to Total Assets Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}} \times 100$$

D. Profitability Ratio

A group of ratios that show the combined effects of liquidity, asset management, and debt on operating income by sales. The operating efficiency of a firm and its ability to ensure adequate return to its shareholders depends ultimately on the profits earned by it. It measures the earnings of the company for a certain period.

i. Net Profit to Total Assets

Net profit divided by total assets gives us the return on total assets (ROA). This ratio is computed by:

$$\text{Net Profit to Asset Ratio} = \frac{\text{Net Profit}}{\text{Total Asset}} \times 100$$

ii. Return on Net Worth Ratio

It is calculated the actual return from without using any external lending or debt. The actual return by shareholders equity is measuring to ensure if bad situation is coming.

It is calculated by the following formula:

$$\text{Return on Net Worth ratio} = \frac{\text{Net Profit}}{\text{Net Worth}} \times 100$$

iii. Earnings Per Share (EPS)

It is the amount a firm can distributed per share amount for its equity holders. The main focus is here by both investors and management for earning point of view. It is calculated by the following formula:

$$\text{Earnings per Share} = \frac{\text{Net Profit After Tax}}{\text{No. of Common Shares}}$$

3.5.2 Statistical Analysis

Mean

The sum of all observation of data the quantity obtained by dividing the number of observations is called the arithmetic means of data. The arithmetic means is often abbreviated as arithmetic means and it is denoted by \bar{X} .

$$\bar{X} = \frac{\Sigma X}{n}$$

Standard Deviation

The square of the arithmetic mean of the squares of the deviation of the items of a data set is called the standard deviation or root means square deviation. It is generally denoted by the letter σ .

$$\sigma = \frac{\sqrt{\Sigma D}}{N} \quad \text{or} \quad \sigma = \sqrt{\frac{\Sigma d^2}{N} - \left(\frac{\Sigma d}{N}\right)^2}$$

Correlation coefficient

Correlation is a statistical tool which is used to assess the degree of relationship between two or more variables. Correlation coefficient calculation is defined as the measurement of the linear relationship between those variables. The correlation coefficient's value is consistently between $-1 \leq r \leq +1$. Correlation can always be expressed mathematically as:

$$\text{Coefficient (r)} = \frac{n\Sigma xy - \Sigma x \Sigma y}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2]} \sqrt{[n\Sigma y^2 - (\Sigma y)^2]}}$$

Regression Analysis

Basnet (2014) a statistical measurement of the average relationship between two or more variables expressed in terms of the original data unit is called regression analysis. Regression can therefore be defined as the estimation or prediction of the value of one variable based on the value of another variable. This statistical tool is used to predict unknown variable values based on the available variable values. The average relationship only between two variables is defined by the simple regression analysis. It measures the change per unit, while multiple regression describes the two or more independent variables that are used to estimate the unknown value of a dependent variable. Regression can be expressed mathematically as:

Model:

$$D/risk = \alpha + b_1lev_{it} + b_2Liq_{it} + b_3Effi_{it} + b_4Prof_{it} + u_t$$

Altman Z-score Model

According to Willy (2017), a design a multiple regression analysis model called the Altman Z-score has a reliable and valid degree of accuracy and precision when predicting a company's bankruptcy. Using data from a year just before to the bankruptcy, this model has a 95% accuracy rate. Using the four main variable ratios, this model applies discriminant analysis to predict the company's level of bankruptcy and its financial performance: Book Value of Equity to Total Assets, Earnings before Interest and Tax to Total Assets, Net Working Capital to Total Assets, and Retained Earnings to Total Assets.

A model that has been modified to function properly including all kinds of businesses has been created by Altman (1968) to assess the Altman model formulation with the following modifications:

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Information:

$$X_1 = (\text{Current Assets} - \text{Current Liabilities}) / \text{TotalAssets}$$

$$X_2 = \text{Retained Earnings} / \text{TotalAssets}$$

$$X3 = \text{EBIT} / \text{TotalAssets}$$

$$X4 = \text{Book Value of Equity} / \text{Total Liabilities}$$

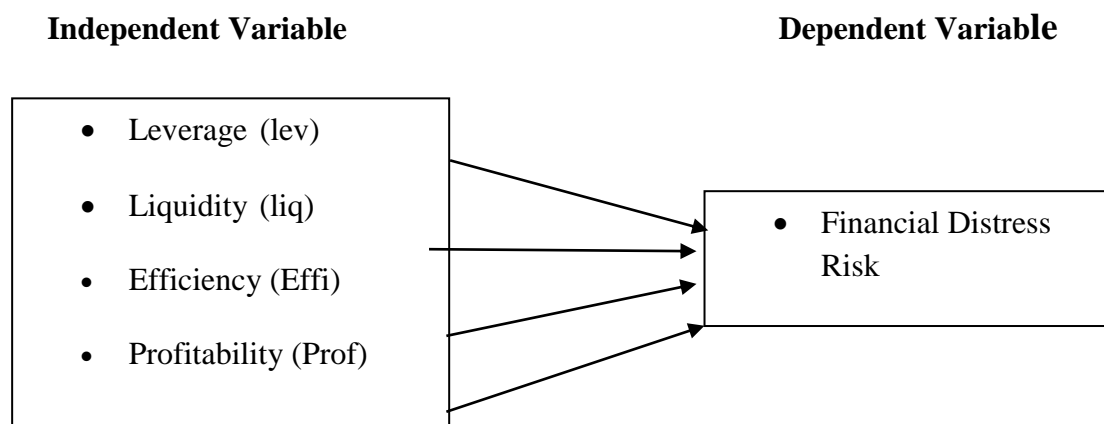
In this modification Altman model has a score value to determine the condition of the company into three zones. Score 2.6 and larger show that companies in the safe zone, and below 1.1 indicates in the danger zone. Value 1.1 - 2.6 represents a gray zone where there is no clear prediction. Financial distress risk is measured by using Altman Z-score following (Dichev, 1998; Griffin & Lemmon, 2002; Ferguson & Shockley, 2003).

Table 2

Description of variables

Variables	Measure
<u>Dependent variable</u>	
Financial Distress risk (FD/risk)	Altman's Z score
<u>Independent variables</u>	
Leverage (lev)	Debt / total assets
Liquidity (liq)	Current ratio
Efficiency (Effi)	Loan and advances / total deposits
Profitability (Prof)	ROA

3.6 Research Framework and Definition of Variable



Source: Adopted from (Shahu, 2019).

Figure 1: Conceptual Framework of study

Liquidity: Liquidity ratio is a ratio that illustrates the ability of companies to meet short-term obligations. Company's liquidity as a financial distress predictor measured by (Kasmir, 2012).

- Current ratio, It is a ratio to measure a company's ability to pay short-term liabilities or debt that are due immediately when billed.

Profitability: Namely the ratio to measure the company's ability to generate profits (Bhandari, 2020). The company's profitability as a financial distress predictor is measured by (Kasmir, 2012).

- Return on assets, it is a ratio to show the results (return) on the amount of assets used in the company.

Leverage: Namely the ratio used to measure the extent of company's activity financed by receivables (Niroula, 2021).

- Debt to Total Asset Ratio (DAR): Namely the debt ratio used to measure the ratio between total debts to total assets.

Efficiency: Namely the ratio used to measure overall liquidity of a bank to fulfill the financial obligation of the depositors (Sah & Pradhan, 2022).

- Loan and advances to total deposit (CDR): Namely the ratio used to measure by the quantum of total cash and bank balance divided by the total deposits by the customers.

Table 3

Variable Operations

No	Variable	Concept	Indicator	Scale
1	Liquidity Ratio	The ratio used to describe the ability of the company to meet short-term obligations (Bhandari, 2020)	Current ratio (current ratio), with the formula: current assets / current liabilities (Sah & Pradhan, 2022).	Ratio
2	Profitability Ratio	Ratios that can be used to measure a company's ability to earn profit (Kasmir, 2014).	ROE formula: EAIT / Equity (Shahu, 2019)	Ratio
3	Leverage Ratio	This ratio measures the ability of companies to pay debts when a company is liquidated (Niroula, 2021)	DAR formula: Debt / Asset (Shahu, 2019)	Ratio
4	Efficiency Ratio	This ratio measures the ability of a bank to fulfill the financial obligation of the depositors (Sah & Pradhan, 2022).	CDR formula: loan and advances to total deposit (Sah & Pradhan, 2022).	Ratio
5	Financial Distress	Financial distress is the stage of a decline in the company's financial condition that occurred before the bankruptcy or liquidation of the company (Bhandari, 2020)	Altman Z-Score $Z = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4$ Zones of discriminations: $Z > 2.6$ - "Safe" Zone $1.1 < Z < 2.6$ - "Gray" Zone $Z < 1.1$ - "Distress" Zone. (Sah & Pradhan, 2022).	Ratio

CHAPTER IV

RESULT AND DISCUSSION

This chapter's purpose is to analyze and evaluate data the acquired for the study. For this, a series of statistical and financial tools covered in chapter three have been employed. This chapter is classified into four sections. The first section addresses descriptive statistics, second section deals with correlation analysis, third chapter deals with regression analysis and this section wraps up this chapter with concluding remarks about the results derived from the secondary data.

4.1 Results

The chapter four deals with the finding and result of data analysis collected from the secondary source. The descriptive statistical tools are used for analyzing and explaining the result of data. The SPSS software is used for the data analysis.

4.1.1 Descriptive Statistics of Liquidity Position of Commercial Banks

Table 4

Descriptive Statistics of Current Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	1.22	1.18	1.40	1.27	0.12	0.10
2013/14	1.18	1.16	1.23	1.19	0.04	0.03
2014/15	1.19	1.28	1.14	1.20	0.07	0.06
2015/16	1.18	1.22	1.21	1.20	0.02	0.02
2016/17	1.25	1.20	1.64	1.36	0.24	0.18
2017/18	1.28	1.53	1.75	1.52	0.24	0.16
2018/19	1.30	1.70	1.94	1.65	0.33	0.20
2019/20	1.47	1.67	2.06	1.73	0.30	0.17
2020/21	1.50	1.88	1.95	1.78	0.24	0.13
2021/22	1.78	2.39	2.68	2.28	0.46	0.20
Mean	1.34	1.52	1.70			
S.D.	0.19	0.40	0.48			
C.V.	0.1455	0.2644	0.282			

Source: SPSS Output, Appendix I

The Table 4 shows the current ratio of sample commercial bank. The current ratio of HBL has been fluctuating which is more than one between around three. The mean

current ratio of NBL has remained at 1.34:1. In fact the ratio of all the banks seems to be appropriate. HBL has high current ratio of 1.70:1 which is the sign that the HBL is sufficiently liquid and can easily pay off its current liabilities using its current assets. The Coefficient of Variation of HBL is 28.20 percent that is followed by NABIL and NBL. Higher the C.V. of Current Ratio of HBL shows that there is less consistency than that of NABIL and NBL.

Table 5

Descriptive Statistics of Cash and Bank Balance to Total Deposits Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	0.25	0.12	0.11	0.16	0.08	0.49
2013/14	0.10	0.14	0.09	0.11	0.03	0.27
2014/15	0.12	0.16	0.13	0.13	0.02	0.15
2015/16	0.23	0.10	0.11	0.15	0.07	0.50
2016/17	0.06	0.06	0.05	0.06	0.01	0.09
2017/18	0.06	0.06	0.05	0.05	0.01	0.11
2018/19	0.09	0.08	0.04	0.07	0.02	0.35
2019/20	0.04	0.03	0.06	0.04	0.02	0.42
2020/21	0.04	0.03	0.06	0.05	0.02	0.35
2021/22	0.03	0.03	0.07	0.04	0.02	0.44
Mean	0.1005	0.0807	0.0762			
S.D.	0.08	0.05	0.03			
C.V.	0.7765	0.5827	0.3905			

Source: SPSS Output, Appendix I

The Table 5 shows the mean, standard deviation and coefficient of variation of cash and bank balance to total deposits ratio of sample commercial bank. The CRR of banks are quite fluctuating. Although NBL's mean CRR is quite high i.e. 10.05 percent is followed by NABIL and HBL. All banks have more CRR ratios than regulatory requirement. It indicates that banks have low lending capacity in terms of fund. The Coefficient of Variation of HBL, NABIL and NBL are 39.05 percent, 58.27 percent and 77.65 percent respectively. From this, we can conclude that HBL has better maintain its liquidity followed by NABIL and NBL.

Table 6

Descriptive Statistics of Cash and Bank Balance to Current Assets Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	0.22	0.12	0.10	0.15	0.06	0.43
2013/14	0.09	0.14	0.09	0.11	0.03	0.29
2014/15	0.11	0.14	0.13	0.13	0.02	0.14
2015/16	0.20	0.09	0.11	0.13	0.06	0.47
2016/17	0.05	0.06	0.05	0.06	0.01	0.10
2017/18	0.05	0.06	0.05	0.05	0.01	0.10
2018/19	0.08	0.07	0.04	0.06	0.02	0.33
2019/20	0.03	0.02	0.05	0.03	0.01	0.36
2020/21	0.03	0.03	0.05	0.04	0.01	0.35
2021/22	0.03	0.03	0.06	0.04	0.02	0.45
Mean	0.0889	0.0758	0.0719			
S.D.	0.07	0.04	0.03			
C.V.	0.7774	0.5929	0.4318			

Source: SPSS Output, Appendix I

The Table 6 shows the mean, standard deviation and coefficient of variation of cash and bank balance to current assets ratio of sample commercial bank. NBL has higher mean cash and bank balance to current assets ratio i.e. 8.89 percent which is followed by NABIL and HBL. It indicates that NBL's current asset is liquid asset which is the sign of efficiency. HBL's low mean ratio i.e. 7.19 percent implies that the bank has a small amount of liquid assets and might depend on other current assets to pay off its debts. The Coefficient of Variation of NBL is 77.74 percent that is followed by NABIL and HBL. Higher the C.V. of cash and bank to current assets ratio of NBL shows the capacity to manage the deposit withdrawal from the customers.

4.1.2 Descriptive Statistics of Activity/Efficiency/Assets Management Position of Commercial Banks

Table 7

Descriptive Statistics of Loan and Advances to Total Deposits Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	60.10	72.90	74.85	69.28	8.01	0.12
2013/14	59.45	72.55	70.07	67.36	6.96	0.10
2014/15	65.35	62.84	72.72	66.97	5.14	0.08
2015/16	68.50	69.02	77.57	71.70	5.09	0.07
2016/17	78.10	78.74	84.26	80.37	3.38	0.04
2017/18	78.66	84.28	87.04	83.33	4.27	0.05
2018/19	81.68	81.96	89.11	84.25	4.21	0.05
2019/20	75.48	80.65	85.28	80.47	4.90	0.06
2020/21	87.19	92.46	93.73	91.13	3.47	0.04
2021/22	90.60	95.20	92.08	92.63	2.35	0.03
Mean	74.51	79.06	82.67			
S.D.	10.83	10.13	8.34			
C.V.	0.15	0.13	0.10			

Source: SPSS Output, Appendix I

The Table 7 shows the mean, standard deviation and coefficient of variation of loans and advances to total deposits ratio of sample commercial bank. The mean CD ratio of HBL, NABIL and NBL are 82.67 percent, 79.06 percent and 74.51 percent respectively. It indicates that HBL has strong position regarding the mobilization of total deposit on loan and advances and acquiring high profit of comparison. But only higher ratio is not better form the view point of liquidity as the loan and advances are not as liquid as cash and bank balance. The coefficient of variation of HBL is less than NABIL followed by NBL i.e. 10 percent < 13 percent < 15 percent, which indicates that loan and advances is stable and consistent than that of NABIL and NBL.

Table 8

Descriptive Statistics of Loan and Advances to Total Working Fund Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	51.31	63.31	64.96	59.86	7.45	0.12
2013/14	51.26	62.67	61.58	58.50	6.29	0.11
2014/15	57.78	56.47	64.58	59.61	4.35	0.07
2015/16	59.19	59.78	67.84	62.27	4.83	0.08
2016/17	56.20	64.21	71.99	64.13	7.90	0.12
2017/18	58.66	70.58	73.98	67.74	8.04	0.12
2018/19	55.81	66.40	73.20	65.14	8.76	0.13
2019/20	55.88	64.75	68.53	63.05	6.49	0.10
2020/21	63.76	70.99	74.05	69.60	5.28	0.08
2021/22	68.30	73.98	71.70	71.33	2.86	0.04
Mean	57.82	65.31	69.24			
S.D.	5.20	5.35	4.42			
C.V.	0.09	0.08	0.06			

Source: SPSS Output, Appendix I

The Table 8 shows the mean, standard deviation and coefficient of variation of loans and advances to total working fund ratio of sample commercial bank. The mean ratios of HBL, NABIL and NBL are 69.24 percent, 65.31 percent and 57.82 percent respectively. It indicates that HBL has strong position regarding the mobilization of fund as loan and advances for the purpose of profit generation. The coefficient of variation of HBL is less than NABIL followed by NBL i.e. 6 percent < 8 percent < 9 percent, which indicates that HBL has higher consistency followed by NABIL and NBL.

Table 9

Descriptive Statistics of Total Investments to Total Deposits Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	17.43	25.68	24.48	22.53	4.46	0.20
2013/14	32.69	24.24	30.68	29.20	4.41	0.15
2014/15	21.67	29.71	23.27	24.88	4.26	0.17
2015/16	14.36	33.13	22.11	23.20	9.43	0.41
2016/17	17.33	13.14	10.91	13.80	3.26	0.24
2017/18	16.41	13.73	11.97	14.04	2.23	0.16
2018/19	14.11	15.61	15.51	15.08	0.84	0.06
2019/20	23.10	17.71	15.18	18.67	4.05	0.22
2020/21	18.50	17.92	15.03	17.15	1.86	0.11
2021/22	21.88	19.67	19.32	20.29	1.39	0.07
Mean	19.75	21.05	18.85			
S.D.	5.49	6.84	6.25			
C.V.	0.28	0.32	0.33			

Source: SPSS Output, Appendix I

The Table 9 shows the mean, standard deviation and coefficient of variation of total investment to total deposit ratios of sample commercial bank. The mean total investment to total deposit ratio of sample commercial bank. The mean total investment to total deposit ratio of NABIL had the highest value during the review period, at 21.05. During the same time period, NBL's average ratio remained 19.75, while HBL's average ratio was 18.85. Similarly, the S.D. values of NABIL, HBL & NBL are 6.84, 6.25 and 5.49 respectively. This data suggests that NABIL bank's ratio exhibits a higher degree of fluctuation and dispersion from its mean ratio. Furthermore, the C.V. for NBL, NABIL & HBL are 0.28, 0.32 and 0.33 respectively. HBL bank's per unit ratio appears to be more risky. This implies that, apart from HBL, the other two banks heavily rely on investments to mobilize their surplus deposits volume.

4.1.3 Descriptive Statistics of Leverage Position of Commercial Banks

Table 10

Descriptive Statistics of Total Debt to Equity Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	-377.61	9.63	10.46	-119.18	223.82	-1.88
2013/14	20.72	9.93	10.63	13.76	6.03	0.44
2014/15	20.38	11.05	10.58	14.00	5.53	0.39
2015/16	13.32	9.72	9.90	10.98	2.03	0.18
2016/17	4.07	7.34	7.59	6.33	1.97	0.31
2017/18	4.35	6.64	7.11	6.04	1.48	0.24
2018/19	4.07	7.12	7.15	6.12	1.77	0.29
2019/20	4.80	7.59	7.67	6.69	1.64	0.25
2020/21	5.21	7.02	7.71	6.65	1.29	0.19
2021/22	6.03	6.66	8.59	7.09	1.33	0.19
Mean	-29.47	8.27	8.74			
S.D.	122.51	1.63	1.49			
C.V.	-4.16	0.20	0.17			

Source: SPSS Output, Appendix I

Table 10 shows the mean, standard deviation and coefficient of variation of cash and bank balance to current assets ratio of sample commercial bank. The mean debt to equity ratio of NBL, HBL and NABIL are -29.47 times, 8.74 times and 8.27 times accordingly. It appears that HBL has kept higher debt to equity ratio followed by NABIL and NBL. In the context, shareholders find investing in HBL shares more satisfactory compared to NABIL and NBL, as the utilization of lower-cost external funds to acquire assets leads to higher returns. Consequently, a lower debt-to-equity ratio is perceived favorably from the perspective of creditors and depositors. In terms of maintaining consistency in this ratio, HBL exhibits greater consistency compared to NABIL. This is evident from the coefficient of variation (CV) of HBL, which stands at 0.17, whereas the CV of NABIL is higher at 0.20.

The debt equity ratio of NBL is -29.47 times which indicates that the bank is in financial distress.

Table 11

Descriptive Statistics of Net Worth to Total Assets Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	-0.23	9.13	8.67	5.86	5.28	0.90
2013/14	4.16	8.76	8.27	7.06	2.52	0.36
2014/15	4.34	8.18	8.40	6.98	2.28	0.33
2015/16	6.49	9.11	8.84	8.14	1.44	0.18
2016/17	17.72	11.60	11.41	13.57	3.59	0.26
2017/18	17.21	12.79	12.14	14.05	2.76	0.20
2018/19	17.07	11.53	12.01	13.54	3.07	0.23
2019/20	15.71	10.88	11.25	12.61	2.69	0.21
2020/21	14.92	11.63	11.28	12.61	2.01	0.16
2021/22	13.64	12.62	10.18	12.14	1.78	0.15
Mean	11.10	10.62	10.24			
S.D.	6.69	1.68	1.56			
C.V.	0.60	0.16	0.15			

Source: SPSS Output, Appendix I

The Table 11 shows the mean, standard deviation and coefficient of variation of Net Worth to Total Assets Ratio of sample commercial bank. The mean net worth to total assets ratio of NBL, NABIL and HBL is 11.10 per cent, 10.62 per cent and 10.24 per cent respectively. It seems that NBL has maintained higher net worth to total assets ratio followed by NABIL and HBL. It indicates that HBL is more leveraged or utilized more debts followed by NABIL and NBL. It may be observed that HBL maintains consistency better than NABIL in this particular ratio followed by NBL i.e. $0.15 < 0.16 < 0.60$.

Table 12

Descriptive Statistics of Total Debt to Total Assets Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	88.54	87.98	90.62	89.05	1.39	0.02
2013/14	86.24	86.97	87.89	87.03	0.83	0.01
2014/15	88.51	90.34	88.91	89.25	0.96	0.01
2015/16	86.44	88.58	87.49	87.50	1.07	0.01
2016/17	72.07	85.11	86.64	81.27	8.01	0.10
2017/18	74.92	84.97	86.30	82.06	6.22	0.08
2018/19	69.55	82.08	85.92	79.18	8.56	0.11
2019/20	75.35	82.61	86.36	81.44	5.60	0.07
2020/21	77.79	81.62	86.96	82.12	4.61	0.06
2021/22	82.23	84.10	87.39	84.57	2.61	0.03
Mean	80.16	85.44	87.45			
S.D.	7.11	2.96	1.42			
C.V.	0.09	0.03	0.02			

Source: SPSS Output, Appendix I

Table 12 shows the mean, standard deviation and coefficient of variation of Total Debt to Total Assets Ratio of sample commercial bank. The average total debt to total assets ratios of NBL, NABIL and HBL are 80.16 per cent, 85.44 per cent and 87.45 per cent separately. Each of the banks possesses a particularly high debt ratio. This implies the banks' entire asset financing was mostly dependent on debt. HBL has a slightly higher debt ratio than NABIL, with NBL following in next. It may be observed that HBL maintains consistency better than NABIL in this particular ratio followed by NBL in term of CV i.e. 0.02, 0.03 and 0.09 separately.

4.1.4 Descriptive Statistics of Profitability Position of Commercial Banks

Table 13

Descriptive Statistics of Net Profit to Total Assets Ratio (ROA) of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	1.07	3.25	1.30	1.87	1.20	0.64
2013/14	0.92	2.65	1.34	1.64	0.90	0.55
2014/15	0.55	2.06	1.94	1.52	0.84	0.55
2015/16	2.79	2.32	2.03	2.38	0.38	0.16
2016/17	2.77	2.70	2.19	2.55	0.32	0.12
2017/18	2.41	2.61	1.67	2.23	0.50	0.22
2018/19	1.51	2.11	2.21	1.94	0.38	0.19
2019/20	1.22	1.58	1.79	1.53	0.29	0.19
2020/21	1.33	1.71	1.63	1.56	0.20	0.13
2021/22	1.12	1.20	1.09	1.14	0.06	0.05
Mean	1.57	2.22	1.72			
S.D.	0.80	0.61	0.39			
C.V.	0.51	0.28	0.22			

Source: SPSS Output, Appendix I

Table 13 shows that the mean, standard deviation and coefficient of variation of Net Profit to Total Assets Ratio or ROA of sample commercial bank. The average ROA ratio of NABIL is 2.22 followed by HBL i.e. 1.72 and NBL i.e. 1.57. It highlights that NABIL performs better HBL as well as NBL in terms of rate of return on total assets. According to coefficient of variation of HBL has 0.22 likewise, NABIL has 0.28 followed by NBL has 0.51. This demonstrates that HBL is more uniform or steady since the CV of HBL which is lower than both of NABIL and NBL. Comparatively, there is very less rate of return than investment in total assets.

Table 14

Descriptive Statistics of Net Profit to Total Equity Ratio (ROE) of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	-4.58	32.78	17.81	15.34	18.80	1.23
2013/14	21.42	29.71	17.06	22.73	6.43	0.28
2014/15	12.63	22.73	24.53	19.96	6.41	0.32
2015/16	42.94	25.61	21.22	29.92	11.48	0.38
2016/17	7.57	25.61	21.58	18.25	9.47	0.52
2017/18	14.03	20.94	14.17	16.38	3.95	0.24
2018/19	8.87	17.76	18.34	14.99	5.31	0.35
2019/20	7.77	13.61	15.40	12.26	3.99	0.33
2020/21	8.92	15.19	14.89	13.00	3.54	0.27
2021/22	8.24	9.78	10.76	9.59	1.27	0.13
Mean	12.78	21.37	17.58			
S.D.	12.43	7.33	4.06			
C.V.	0.97	0.34	0.23			

Source: SPSS Output, Appendix I

Table 14 shows that the mean, standard deviation and coefficient of variation of the return on shareholder's equity (ROE) of sample commercial bank. The average percentage or mean return on equity of NBL, NABIL and HBL is 12.78, 21.37 and 17.58 per cents separately. This indicates NABIL has greater ROE than followed by HBL and NBL. From the shareholder's point of view NABIL is better to invest or purchase their equity to get reliable return. But, from the view point of coefficient of variation, HBL has lower 0.23 than NABIL i.e. 0.34 followed by NBL i.e. 0.97. It indicates that HBL is more consistent than that of NABIL followed by NBL. HBL is more reliable to invest for long term prospective and can aspects same rate of returns through investment in every year.

Table 15

Descriptive Statistics of Earnings per Share (EPS) of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL	Mean	S.D.	C.V.
2012/13	198.53	91.05	34.19	107.92	83.46	0.77
2013/14	18.08	76.12	33.10	42.43	30.12	0.71
2014/15	7.48	57.24	33.37	32.70	24.89	0.76
2015/16	44.59	59.32	43.03	48.98	8.99	0.18
2016/17	38.77	58.41	33.55	43.58	13.11	0.30
2017/18	39.98	51.84	23.11	38.31	14.44	0.38
2018/19	26.99	50.57	32.44	36.67	12.35	0.34
2019/20	20.68	36.16	27.60	28.15	7.75	0.28
2020/21	23.43	33.57	28.07	28.36	5.08	0.18
2021/22	20.29	18.64	18.26	19.06	1.08	0.06
Mean	43.88	53.29	30.67			
S.D.	55.53	20.86	6.81			
C.V.	1.27	0.39	0.22			

Source: SPSS Output, Appendix I

Table 15 shows that the mean, standard deviation and coefficient of variation of earnings per share (EPS) of sample commercial bank. The average EPS of HBL, NBL and NABIL are 30.67, 43.88 and 53.29 respectively. NABIL has a higher EPS than NBL, with HBL topping the list. From the investor point of view, this recommends that NABIL is a more efficient means of generating earnings. HBL has a CV of 0.22, which is lower than NABIL's CV of 0.39 and NBL's CV of 1.27. This implies that due to its low CV, HBL is more reliable or consistent.

4.1.5 Descriptive Statistics of Dependent and Independent Variables

The descriptive statistics used in this study consists of mean, standard deviation, maximum and minimum values associated with variable under consideration. Table 16 summaries the descriptive statistics of dependent and independent variables used in this study during the period from 2012/13 to 2021/22 of three commercial banks of Nepal.

Table 16

Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Leverage	10	79.18	89.25	84.3470	3.62328
Efficiency	10	66.97	92.63	78.7490	9.49042
Profitability	10	1.14	2.55	1.8360	.44290
Liquidity	10	1.19	2.28	1.5180	.35087
Financial Risk	Distress 10	1.21	3.64	2.0910	0.75933

Source: SPSS Output, Appendix I

Table 16 shows the descriptive statistics of the variables are utilized in the study. The value of Distress Risk from used of modified Altman Z-Score is 2.0910 with standard deviation of 0.75933. The value of Z-Score indicates that Nepalese commercial bank are not in bankruptcy situation during ten years period. They are at grey zone stage. On the other hand, a minimal Z-Score of 1.21 indicates that there is no immediate financial crisis. Additionally demonstrates that more are struggling to reach the safety zone. Similarly, Leverage, Efficiency and Profitability are 84.35 per cent, 78.75 per cent and 1.84 per cent respectively. The Liquidity of Commercial Bank is 1.52 times. The first three variables: Leverage, Efficiency and Profitability are measured in percentage, the Liquidity is measured in times, and Distress Risk is assessed by employing a modified Altman Z-Score. Leverage is the ratio of total debt to total assets. Efficiency is the ratio of loan and advances to total deposits. Profitability is the ratio of net income to total assets. Liquidity is the ratio of current assets to current liabilities.

4.1.6 Correlation Analysis

Correlation serves as a statistical tool to assess the degree to which two or more variables change in relation to each other. By examining the directional connection between variables through the use of descriptive statistics, Pearson Correlation Coefficients are calculated and displayed in Table 17. This analysis provides insight into the Correlation Coefficient between dependent and independent variables.

Table 17

Correlation Matrix

	FDRISK	LEV	LIQ	EFFI	PROF
FDRISK	1				
LEV	-.604*	1			
LIQ	.983**	-.510	1		
EFFI	.945**	-.738*	.892**	1	
PROF	-.458	-.172	-.559	-.219	1

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

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

Source: SPSS Output, Appendix I

Table 17 shows the correlation coefficients involving the variables are examined in the study. The table indicates that over the study period, there has been a significant negative correlation between leverage and the Z-Score, indicating a higher chance of financial trouble. Likewise, liquidity and efficiency both have significant positive relationship with Z-score, which indicates that higher the liquidity and efficiency, lower would be the financial distress risk. Profitability has an insignificant negative relationship with Z-score.

Table 18

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.995 ^a	.990	.982	.10322	2.400

a Predictors: (Constant), PROF, LEV, EFFI, LIQ

b Dependent Variable: FDRISK

Source: SPSS Output, Appendix I

Table 18 shows the R Square is 0.990 which is often referred as the coefficient of determination of the variables. The R Square which is also a measure of the overall fitness of the model indicates that the model is capable of explaining about 99.0 percent of the variability in financial distress risk of banks. This means that the model explains about 99.0 percent of the systematic variation in the dependent variable. This is, about 1.0 percent of variations in financial distress risk are accounted for by other factor not captured by the model. This result is complemented by the adjusted R Square of about 98.2 percent which in essence is the proportion of total variance that is explained by the model.

Table 19

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5.136	4	1.284	120.521	.000 ^b
Residual	.053	5	.011		
Total	5.189	9			

a Dependent Variable: FDRISK

b Predictors: (Constant), PROF, LEV, EFFI, LIQ

Source: SPSS Output, Appendix I

Table 19 shows the regression line liquidity, leverage, efficiency and profitability on financial distress risk is significant. Since, the p value of 0.000 is less than the level of significance at 0.05. It indicates the independent variables have significant impact on dependent variable financial distress risk.

Table 20

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-1.652	1.932		-.855	.432
1 LEV	-.005	.016	-.025	-.319	.763
LIQ	1.496	.389	.691	3.840	.012
EFFI	.025	.014	.308	1.778	.136
PROF	-.014	.145	-.008	-.097	.927

a. Dependent Variable: FDRISK

Source: SPSS Output, Appendix I

Table 20 demonstrates the selected commercial banks' regression result, which focuses on financial distress risk, is presented in this study. The findings indicate that both liquidity and efficiency have positive beta coefficients. Liquidity ratio has positive effects on Z-score suggesting a significant positive relationship with financial distress risk because a higher Z-score signifies a lower level of financial distress risk. The sign of positive indicates same or direct relationship on Z-score and financial distress risk. It can say that larger the value of liquidity, then the possibility to financial distress is lower. Similarly, efficiency ratio has insignificant positive effect on financial distress risk. Likewise, leverage and profitability ratio have negative insignificant relationship on Z-score. This indicates, the relationship is not statistically significant with Z-score.

The result reveals that a beta coefficient for leverage and profitability are negative. Leverage ratio has negative effects on Z-Score. Leverage and profitability ratio have positive impact on financial distress risk because lower Z-score signifies a higher level of financial distress risk. However, the outcome indicates negative but not significant relationship on Z-score.

4.2 Discussion

Financial distress refers to the state of an institution experiencing various issues related to its finances, management, and operations. This term is commonly used to describe situations where financial institutions are confronted with unethical business practices, a lack of sufficient capital, and an unstable deposit base. Consequently, a low level of financial distress indicates that banks are performing well financially. The manifestation of financial distress is evident through a decline in a bank's financial performance, leading to an inability to fulfill payment obligations to creditors and depositors, ultimately resulting in bankruptcy (Tan, 2012). According to Khalid (2017) there are two categories of financial distress variables of firm one is specific and another is external factors of country.

The basis of the research is secondary data from three commercial banks in Nepal for the fiscal year 2012/2013 to 2021/22. The data has been taken from commercial banks' annual reports and the bank's supervision report by NRB. Descriptive and causal comparative research designs have been employed during this study. Multiple regression analysis and single step analysis are used to examine the relationship between the independent and dependent variables. Liquidity, efficiency, profitability and leverage are the independent variable, whereas financial distress risk is dependent variable.

Various prior researches have presented diverse findings regarding the relationship between financial distress prediction and the ratios of financial liquidity, profitability, efficiency, and leverage. Studies related to liquidity ratios by (Widhiari and Merkusiwati 2015; Antikasari and Djuminah 2017) have demonstrated that liquidity ratios, specifically the current ratio, play a significant role in influencing financial distress risk. These studies suggest that companies with higher liquidity are better equipped to avoid financial distress. A study made by Andre (2013) documented the evidence that there is no significant impact of the liquidity ratio represented by current ratio on financial distress (Sopian & Rahayu, 2017; Kariani & Budiasih, 2017; Dewi & Dana, 2017; Murni, 2018).

Rohmadini, Saifi, and Darmawan (2018) concluded that there is no significant relationship between profitability ratio and financial distress. But different results in a

study conducted by Maulida et al. (2018) stated that the profitability ratio (ROA) has a significant negative impact on financial distress. Additionally, Pranowo et al. (2010) also reported that profitability ratio does not have a significant effect on corporate financial distress.

Simanjuntak et al. (2017) demonstrated that leverage, as measured by DAR, significantly influences a company's financial distress. This finding aligns with the study conducted by Muhtar and Aswan (2017) which indicated that DAR has a significant impact on financial distress. In contrast, Banjarnahor (2018) found that DAR does not affect financial distress.

The correlation coefficient of the variable reveals that in indicating a higher risk of financial distress, leverage has a significant negative relationship with the Z-Score. Likewise, liquidity and efficiency both have significant positive relationship with Z-score, which indicates that higher the liquidity and efficiency, lower would be the financial distress risk. Profitability has an insignificant negative relationship with Z-score. The correlation coefficient of financial distress risk with profitability is very low degree that means financial distress risk depends on capital adequacy ratio at very low level and with leverage is at moderate level. Liquidity and efficiency has highest degree of relationship with financial distress risk.

From the regression model, the results of leverage, efficiency and profitability have no significant relationship with financial distress risk. Only liquidity has positive significant relationship with financial distress risk of selected commercial banks.

The results concerning the leverage ratio (total debt to total assets) do not indicate a significant impact on the level of financial distress risk is consistent with (Banjarnahor, 2018; Shahu, 2019).

The results of profitability ratio (ROA) have no significant negative relationship with financial distress risk is consistent with (Maulida et al., 2018; Shahu, 2019).

The results of liquidity ratio (CR) having significant positive relationship with financial distress risk is consistent with the findings of (Khalid, Altarturi, Thaker, Harun & Nahar, 2014; Rohmadini, Saifi, & Darmawan, 2018).

The results of efficiency ratio (CDR) having positive relationship with financial distress risk is consistent with the findings of (Sah & Pradhan, 2022).

CHAPTER -V

SUMMARY AND CONCLUSION

This chapter provides the brief summary of the entire study i.e. effects of financial ratio on financial distress risk of sampled commercial banks and highlights the major findings of the study.

5.1 Summary

The study examined the determinants of financial ratio on financial distress risk in Nepalese commercial bank. Accordingly, financial ratios that determine financial distress risk were carefully analyzed using different technique. In this study financial distress risk is dependent variables where liquidity, efficiency, leverage and profitability are independent variables. The study is based on the secondary source of data. Secondary data has been employed in order to analyze the forms of relationship, cause and effect between dependent and independent variables. And the data have been collected from the annual report of respective banks and NRB's website. This study is primarily based on the secondary data for the time period 2012/13 to 2021/22 of three commercial banks. The research aims to investigate the influence of Financial Ratio on the risk of Financial Distress in commercial banks in Nepal.

First chapter carried out the introduction of financial ratios, financial distress and risk, problem statement, objectives, rational and limitations of the overall study.

Second chapter brought brief study of existing theoretical research and prior empirical research related of the study and under the studies and articles helps to know the previous research in Nepal and in foreign country. The study attempts to explore impact of financial ratio on financial distress risk.

Third chapter the methodology of the study provides a brief description of the ratios, model, estimation technique, data source, and definition of the variables of the model with the prior expectations, and the method and process used in the study help to address systematic issues. Research Methodology is employed to collect information and data, and establish an overall plan.

Fourth chapter is dedicated to analyzing and interpreting the data gathered in the study. Different statistical and financial tools are utilized for this purpose. Altman Z-

score model, Descriptive statistics, correlation, regression are used to analysis the data. Descriptive analysis, correlation matrix have been ascertained to derive the facts regarding the dependent and independent variables. The correlation analysis has been executed to investigate the degree of correlation of financial distress risk and its determinants liquidity, efficiency, leverage and profitability of commercial banks. Similarly, in order to test statistical significance of the result, multiple regression models have been used.

Furthermore, the main conclusions are addressed in a separate section of this chapter, along with some implications and recommendations on the use of financial ratios as empirical predictors of financial distress risk in Nepalese commercial banks. To conclude, the chapter looks ahead to potential future research in the field.

5.2 Conclusion

As per the objectives and analysis of the study, the following conclusions have been draw: Regarding the first objective, the liquidity position of sampled commercial banks in the study time periods. All the banks are able to maintain their liquidity ratios according to regulatory requirements. As per the results drawn, this study concludes that HBL has better maintained its liquidity, followed by NABIL and NBL. Generally, a bank with an optimal liquidity position is considered safe and likely to meet its financial obligations.

The efficiency position of sampled commercial banks, loans and advances to total deposits ratio of HBL is highest, followed by NABIL and NBL. It indicates that HBL has a strong position regarding the mobilization of total deposit on loan and advances and acquiring high profit of comparison. The loans and advances to total working fund ratio of HBL is highest, followed by NABIL and NBL. It indicates that HBL has a strong position regarding the mobilization of funds as loans and advances for the purpose of profit generation. During the review period, NABIL had the highest investment to total deposit ratio, followed by NBL and HBL. This indicates that, except for HBL, the other two banks heavily depend on investments to make use of their surplus deposits.

The leverage position of sampled commercial banks, a study can conclude that HBL has maintained higher debt equity ratio, followed by NABIL and NBL. Hence, from

the perspective of shareholders, investing in HBL shares feels more gratifying than in NABIL and NBL due to the economical cost of utilizing outside funds to buy assets in order to make greater returns. A study concludes that NBL has maintained higher net worth to total assets ratio followed by NABIL and HBL. It indicates that HBL is more leveraged or utilized more debts followed by NABIL and NBL. HBL has a slightly higher debt ratio than NABIL, followed by NBL. The debt ratio of all sample banks is quite high. This shows that banks depended substantially on debt to fund their entire assets.

The profitability position of sampled commercial banks, the ROA and ROE ratio of NABIL, is highest, followed by HBL and NBL. The data reveals that NABIL achieves a greater rate of return on its assets and equity compared to HBL and NBL. Additionally, NABIL has a higher earnings per share compared to NBL and HBL. This indicates that NABIL is more efficient in earning income from the perspective of its owners.

Regarding the second objective, the leverage ratio has a significant negative relationship with Z-score. Likewise, liquidity and efficiency are significant and positive relationship with Z-score. Similarly, profitability has occurred insignificant relation.

Regarding the third objective, by observing the impact of the liquidity ratio on the Z-Score, it becomes evident that there is a positive and significant relationship with financial distress risk. A higher Z-Score is indicative of a reduced risk of financial distress. Similarly, efficiency ratio has insignificant positive effect on financial distress risk. Likewise, the leverage ratio demonstrates a negative impact on the Z-Score, suggesting a positive but insignificant correlation with financial distress risk. This is because a lower Z-Score is associated with a higher risk of financial distress. Similarly, profitability ratio has insignificant negative effect on financial distress risk as lower Z-Scores are indicative of increased financial distress risk.

5.3 Implications

The financial distress risk of Nepalese commercial banks has been thoroughly investigated in this study by analyzing the influence of financial ratios. However, there is still ample room for future research to explore additional aspects such as data

collection, modeling techniques, and methodological approaches. Consequently, this study serves as a foundation for further investigations, which are outlined below:

- i. The study primarily focuses on data obtained from commercial banks in Nepal. Future research endeavors could encompass a broader range of financial institutions, including development banks, finance companies, and microfinance institutions, and others such as insurance company, non-manufacturing organizations.
- ii. Additionally, additional research can be conducted utilizing more sophisticated statistical methodologies. For instance, upcoming studies may employ non-linear statistical techniques and investigate causality.
- iii. The present study solely relies on secondary data, indicating that a more extensive investigation can be conducted by incorporating primary sources like questionnaires, surveys, and special group discussions. By considering qualitative phenomena, future research endeavors can explore new possible lines of inquiry.
- iv. There exist numerous additional factors that determine the extent of financial distress within the banking industry. Future research projects may therefore include more variables that depend on other variables and also more independent variables.
- v. The study contributes to improving financial soundness on the basis of the analyzed data.
- vi. The study is useful for long-term financial planning, strategy, and the selection of financial tools to ensure the sound performance of banking institutions.
- vii. The study is useful for comparative analysis among competitive firms and the whole industry and for making future business strategies, policies, and plans.

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Appendix I

Current Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	0.25	0.12	0.11
2013/14	0.10	0.14	0.09
2014/15	0.12	0.16	0.13
2015/16	0.23	0.10	0.11
2016/17	0.06	0.06	0.05
2017/18	0.06	0.06	0.05
2018/19	0.09	0.08	0.04
2019/20	0.04	0.03	0.06
2020/21	0.04	0.03	0.06
2021/22	0.03	0.03	0.07

Cash and Bank Balance to Total Deposits Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	0.25	0.12	0.11
2013/14	0.10	0.14	0.09
2014/15	0.12	0.16	0.13
2015/16	0.23	0.10	0.11
2016/17	0.06	0.06	0.05
2017/18	0.06	0.06	0.05
2018/19	0.09	0.08	0.04
2019/20	0.04	0.03	0.06
2020/21	0.04	0.03	0.06
2021/22	0.03	0.03	0.07

Cash and Bank Balance to Current Assets Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	0.22	0.12	0.10
2013/14	0.09	0.14	0.09
2014/15	0.11	0.14	0.13
2015/16	0.20	0.09	0.11
2016/17	0.05	0.06	0.05
2017/18	0.05	0.06	0.05
2018/19	0.08	0.07	0.04
2019/20	0.03	0.02	0.05
2020/21	0.03	0.03	0.05
2021/22	0.03	0.03	0.06

Loan and Advances to Total Deposits Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	60.10	72.90	74.85
2013/14	59.45	72.55	70.07
2014/15	65.35	62.84	72.72
2015/16	68.50	69.02	77.57
2016/17	78.10	78.74	84.26
2017/18	78.66	84.28	87.04
2018/19	81.68	81.96	89.11
2019/20	75.48	80.65	85.28
2020/21	87.19	92.46	93.73
2021/22	90.60	95.20	92.08

Loan and Advances to Total Working Fund Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	51.31	63.31	64.96
2013/14	51.26	62.67	61.58
2014/15	57.78	56.47	64.58
2015/16	59.19	59.78	67.84
2016/17	56.20	64.21	71.99
2017/18	58.66	70.58	73.98
2018/19	55.81	66.40	73.20
2019/20	55.88	64.75	68.53
2020/21	63.76	70.99	74.05
2021/22	68.30	73.98	71.70

Total Investments to Total Deposits Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	17.43	25.68	24.48
2013/14	32.69	24.24	30.68
2014/15	21.67	29.71	23.27
2015/16	14.36	33.13	22.11
2016/17	17.33	13.14	10.91
2017/18	16.41	13.73	11.97
2018/19	14.11	15.61	15.51
2019/20	23.10	17.71	15.18
2020/21	18.50	17.92	15.03
2021/22	21.88	19.67	19.32

Total Debt to Equity Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	-377.61	9.63	10.46
2013/14	20.72	9.93	10.63
2014/15	20.38	11.05	10.58
2015/16	13.32	9.72	9.90
2016/17	4.07	7.34	7.59
2017/18	4.35	6.64	7.11
2018/19	4.07	7.12	7.15
2019/20	4.80	7.59	7.67
2020/21	5.21	7.02	7.71
2021/22	6.03	6.66	8.59

Net Worth to Total Assets Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	-0.23	9.13	8.67
2013/14	4.16	8.76	8.27
2014/15	4.34	8.18	8.40
2015/16	6.49	9.11	8.84
2016/17	17.72	11.60	11.41
2017/18	17.21	12.79	12.14
2018/19	17.07	11.53	12.01
2019/20	15.71	10.88	11.25
2020/21	14.92	11.63	11.28
2021/22	13.64	12.62	10.18

Total Debt to Total Assets Ratio of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	88.54	87.98	90.62
2013/14	86.24	86.97	87.89
2014/15	88.51	90.34	88.91
2015/16	86.44	88.58	87.49
2016/17	72.07	85.11	86.64
2017/18	74.92	84.97	86.30
2018/19	69.55	82.08	85.92
2019/20	75.35	82.61	86.36
2020/21	77.79	81.62	86.96
2021/22	82.23	84.10	87.39

**Net Profit to Total Assets Ratio (ROA) of NBL,
NABIL and HBL**

Fiscal Year	NBL	NABIL	HBL
2012/13	1.07	3.25	1.30
2013/14	0.92	2.65	1.34
2014/15	0.55	2.06	1.94
2015/16	2.79	2.32	2.03
2016/17	2.77	2.70	2.19
2017/18	2.41	2.61	1.67
2018/19	1.51	2.11	2.21
2019/20	1.22	1.58	1.79
2020/21	1.33	1.71	1.63
2021/22	1.12	1.20	1.09

Net Profit to Total Equity Ratio (ROE) of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	-4.58	32.78	17.81
2013/14	21.42	29.71	17.06
2014/15	12.63	22.73	24.53
2015/16	42.94	25.61	21.22
2016/17	7.57	25.61	21.58
2017/18	14.03	20.94	14.17
2018/19	8.87	17.76	18.34
2019/20	7.77	13.61	15.40
2020/21	8.92	15.19	14.89
2021/22	8.24	9.78	10.76

Earnings per Share (EPS) of NBL, NABIL and HBL

Fiscal Year	NBL	NABIL	HBL
2012/13	198.53	91.05	34.19
2013/14	18.08	76.12	33.10
2014/15	7.48	57.24	33.37
2015/16	44.59	59.32	43.03
2016/17	38.77	58.41	33.55
2017/18	39.98	51.84	23.11
2018/19	26.99	50.57	32.44
2019/20	20.68	36.16	27.60
2020/21	23.43	33.57	28.07
2021/22	20.29	18.64	18.26