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Does Capital Structure Affect Banks' Profitability? Evidence from Nordic Commercial Banks

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ABSTRACT: This study uses panel data analysis with profitability variables measured by return on assets, return on equity and net interest margin to examine the relationship between capital structure and profitability in 19 Nordic commercial banks from the year 2015 to 2024. This study concludes that the leverage or the ratio of liabilities to total assets is found to have a significant and inverse relationship with bank profitability through random effect regression model. Whereas higher equity values tends to improve performance on asset returns and interest margins, higher leverage results in lower profitability. Bank size promotes profitability through economies of scale whereas inflation has a positive effect on banks capacity to negotiate higher pricing. GDP growth shows no relevant influence on bank performance. These findings are in favor of the tradeoff theory of capital structure and indicate that maintaining an optimal debt and equity balance is vital for profitability and financial stability throughout the Nordic bank scenario, providing invaluable lessons for bank managers, regulators, and investors in the developed market setting.

KEYWORDS: (Capital Structure, Profitability, Return on Assets, Return on Equity and Net interest Margin).

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Abbreviations

NORDEA BANK ABP	**NORDEA**
DANSKE BANK A/S	**DANSKE**
DNB BANK ASA	**DNB**
SKANDINAVISKA ENSKILDA BANKEN AB	**SEB**
SWEDBANK AB	**SWEDBANK**
SVENSKA HANDELSBANKEN AB	**HANDELSBANKEN** or **SHB**
OP FINANCIAL GROUP	**OP**
JYSKE BANK A/S	**JYSKE**
NYKREDIT BANK A/S	**NYKREDIT**
SYDBANK A/S	**SYDBANK**
SPAREBANK 1 SMN	**SPAREBANK1**
SPAREBANKEN VEST	**VEST**
RINGKJOBING LANDBOBANK. AKTIESELSKAB	**RLB** (Ringkjøbing Landbobank)
LANSFORSAKRINGAR BANK AB (PUBL)	**LF BANK**
SPANKKI OY	**SPANKKI**
AKTIA BANK PLC	**AKTIA**
POP PANKKI	**POP**
ALANDSBANKEN ABP	**ALANDS**
SPAREBANKEN MORE	**MORE**
Return on assets	**ROA**
Return on equity	**ROE**
Net interest margin	**NIM**

Equity to total asset	**ETA**
Liabilities to total asset	**LTA**
Inflation	**INF**
Gross domestic product growth	**GDP**

1 Introduction

1.1 Background of Study

The banking industry offers a way to transfer the funds in surplus to deficit sector in a given economy. The banking industry is a crucial means of funding economic operations in any given economy. To this effect, banks can be described as a financial institution that funds the funds of its customers and stockholders and acts as a financial intermediary between the parties having an excess of money (depositors) and the parties who borrow the money to finance their investment requirements (borrowers).

Capital structure illustrates the debt equity combination (Pandey, 2005). The balanced structure of debt and equity for a firm is the one that optimizes the value of the firm and mitigates the overall cost of capital. The Modigliani and Miller (1958) argue that in the perfectly competitive market, value of a firm does not rely on the capital structure of the firm. Nonetheless, leverage is a strategic decision that should be taken into consideration by a bank due to the presence of taxes, agency costs, and regulation (Myers, 2001). Nevertheless, given risks and costs of increased debt the theory of the trade business holds that firms can compute a good capital structure by evaluating costs and returns of an extra dollar debt. The advantages of debt are that interest expense is deductible as tax and free cash problem is reduced. The potential costs of bankruptcy and conflict of agency between the shareholders and the debt holders are costs of debt (Fama and French, 2002). One of the most disputed aspects of corporate finance is capital structure and it has been the focus of recent attention due to the structure of the debt-to-equity ratios of various industries (Chakraborty, 2010). Instead, the pecking order theory argues that in case of the lack of funds internally, firm will borrow, instead of issuing equity to fund the capital expenditure program. According to the free cash flow theory, the debt levels may lead to enhancement in the value of the firm even though it may face financial distress in situations where the operating cash flow of a firm is far much more than its lucrative investment opportunities (Jensen, 1986). To conclude, the various conditional theories of capital structure explain varying levels of debt as each theory is premised on various assumptions. Capital structure includes a total sum of investments made by the bondholders in total that include all long term debts like mortgages and long term loans and the total investment made by the stock holders including retained earnings and the original investment.

The banking sector has been contributing largely to the economy of the developing nation and the entire world. There is increased attention on the regulation and supervision of the banks. Banks are the mediators between the investors and the borrowers and they also play some other significant roles in financial markets. The banks have one of the roles of supplying the contracts and distributing the risks (Elomaa, Puttonen & Siikala 1996). An increase in the profitability of the bank is a highly significant indicator to every bank. When one of the banks fails, others more likely will also fail and the entire economy is likely to be affected by the ills in the banking industry. Increased bank profitability aids the bank in its better performance and an increased growth rate among the competitors. Bank capitalization, high lending activities, and low credit risk as well as good cost management are linked with bank profitability. The banks are assessed on the basis of the profitability which is determined by a number of factors including internal and external. It is also subject to the economic or industrial condition. As an illustration, the determinants of the profit of domestic commercial banks are the management efficiency, the quality of assets, the interest income, the capital adequacy and the inflation. The ability to control the capital structure banks can attempt to avoid the risk of credit risks, and reduce the risk of insolvencies of the banks.

Berger and Bouwman (2013) indicate that there exist both positive and negative effects with respect to performance variable, however the DemirgucKunt and Huizinga (2000) study indicates no impact. Variables have different effects. This study aims at discovering the answer to the question of whether capital structure of Nordic banks can influence the profitability or performance of Nordic banks or not.

According to Khodamoradi, Najafi, and Gheisari (2017), there is a significant positive relationship between capital structure and return on assets among companies listed on the Tehran Stock Exchange. Using support vector regression and the colonial competitive algorithm, they found that higher financial leverage leads to greater profitability, with the highest ROA achieved at higher debt levels. Over the last few decades, capital structure has attracted discussion and academic attention on the topic of corporate finance. It still has been gaining interest from researchers. In simple words, the main point of discussion among scholars and experts has been about how companies build their capital and how they use their debt and equity. Salawu (2009) examined the relationship between profitability and total leverage ratio (TLR), long-term debt and short term debt. The study covered Nigerian companies from 1990 to 2004. According to the study, companies can enhance their performance by managing efficiently their capital structure. Additionally, Gill et al. (2011) examined the relationship between return on equity and short-term debt, long-term debt and total debt in a study of U.S. enterprises conducted between 2005 to 2007. The study found that capital structure positively affects profitability, and recommended that firms increase the use of debt to improve their profitability.

Nordic banks historically operated in a stable macroeconomic backdrop with high financial inclusion, good corporate governance, and a tradition of conservative risk management. After 2008-09 global crises, the regulatory framework was tightened: Basel III introduced higher Tier 1 capital ratios, leverage limits, and liquidity buffers forcing equity raising and cutting down on short-term wholesale funding by the Nordic banks (European Banking Authority, 2014).

In other jurisdictions, evidence points to non-linearities in the leverage profitability relationship: at moderate leverage levels, profitability increases due to the interest rate differential, whereas excessive leverage reduces returns because of heightened default and funding risks (Berger & Bouwman, 2009). Given that regulatory capital requirements levels, lowinterest rate points, and longdated mortgage portfolios are prevalent in the Nordic lands, a different scenario is created wherein the socalled optimal capital value could be completely divergent from that found in the US or emerging markets.

In addition, the latest research emphasizes “capital structure as a strategic tool” (Bolivar, Duran, & LozanoVivas, 2024) for banks to cope with changing market conditions and credit risk while conforming to stakeholder expectations. Yet, specialized studies that isolate the effect of capital structure on profitability for Nordic commercial banks with a control of macro financial variables like policy rates, yield curve dynamics, and cycles in the regional economy are few and far between. Filling this lacuna will thus catapult academic knowledge and policy guidance on leverage decisions on banks in a region noted for its banking stability and ever-changing regulatory landscape.

1.2 Problem Statement

The banking industry is highly risky and, therefore, is regulated vastly by the government and central banks in most countries. As a result, regulatory agencies play a significant role in helping to maintain control over banks because their performance is vital for economic functions. The past studies about the relationship between capital structure and profitability of the firm has concluded that there is a positive relationship between capital structure and firm performance (e.g: San and Heng (2011)), while some of the studies concluded that there is no significant relationship between capital structure and firm performance (e.g: Ebaid (2009)). And some of the studies concluded that there is negative relationship between capital structure and firm performance (e.g: Khan (2012)). That is, there is no consistent conclusion but different conclusions from different studies.

Capital structure of a firm is explained to be the manner of how a firm acquires capital required to establish up and grow its business operations. One of the most significant decisions taken by the financial managers in this contemporary age is the capital structure decision. Many other decisions in corporate finance revolve around the capital structure decision. Amongst the numerous goals of a corporate financial manager is to make sure that the cost of capital is low thereby maximizing shareholder wealth. It is said that optimal capital structure can minimize the total risk of company by balancing out the various sources of capital according to the company objectives (Ferati and Ejupi, 2009). Therefore, capital structure is part of the effective management tool that can be used to control the cost of capital.

Those issues have been discussed in a number of theoretical studies and numerous empirical ones, yet there is yet no fully supported and widely agreed theory; and the arguments about the role of determinants factors are still to be played out. Additionally, despite the immense contribution made by previous research to the capital structure theory, they were restricted to the advanced financial system, as well as being restricted to nonbanks. Less developed nations such as Ethiopia were not given much consideration in the literature. It is reported that very limited studies have investigated the capital structure of financial firms especially banks and their decisionmaking processes are partially informed by various local and international regulatory frameworks (Khan, Bashir, Attuwaijri, and Khalid, 2023).

Constrained firms tend to use internal funding and put more effort into obtaining credit from banks, anticipating restricted access to credit in the future (Campello et al., 2010). According to Booth, Aivazian, DemirgüçKunt, and Maksimovic (2001), across developing countries, firms with more tangible assets tend to borrow more and face lower borrowing costs, confirming that the collateral value of fixed assets is crucial in debt financing. Myers and Majluf (1984) found that profitable companies tend to finance investments from internal sources and therefore such companies tend to be associated with lower levels of leverage. Using G7 countries, Rajan & Zingales (1995) focused on four determinants of capital structure such as tangible assets, market to book ratio, size, and profitability. The study showed that in most countries, size and tangible assets are positively correlated to the level of debt, providing support for the tradeoff theory of capital structure. The pecking order theory is proven by the study's findings that profitability and the market to book ratio are in reverse connected with debt levels.

In the study conducted by Chechet and Olayiwola (2014), who examined the companies in Nigeria between 2000 to 2009 found that the debt ratio (DR) had a negative relationship with profitability, whereas the equity ratio had a positive relationship with profitability. In order to explain these study’s findings, the authors suggested the idea of agency cost, which states that while dependence on equity improves companies performance, larger debt will increase agency conflicts and thus lowers profitability. A research conducted by Abor (2025) looked into the impact of capital structure on the profitability of companies in Ghana. He analyzed the connection between the company performance and short-term debt, long-term debt and overall debt ratios among other debt components, using a panel regression model. The study results showed that the short-term debt ratio significantly improved profitability, indicating that businesses who depended more on short term funding were able to increase their profits. Moghadas et al. (2013) examined Iranian businesses from the year 2006 to 2010, market value measures were used to investigate the determinants of profitability. The variables that are included in this study were debt ratio (DR), revenue growth (RG), firm size, and asset growth. Their findings showed that both debt ratio and revenue growth had a significant positive effect on profitability, suggesting that higher leverage and stronger sales growth enhance firm performance in the Iranian context. On the same note, Ayalew (2021) found that the capital structure variables and certain aspects of bank specifics explain a significant portion of the differences in bank profitability. An increase in measures of profitability of ROA and net interest margin is likely to be related with a relatively high total and short-term debt ratios, the loan to deposit ratios, and credit risks. Endri et al. (2021) discovered that the debt to equity ratio does not correlate with the return on assets and earning per share, whereas debt to assets ratio significantly impacts negatively on the return on assets and earnings per share. Besides, long-term debt to total equity is positively significantly related to the return on equity. There is a negative significant relationship between long-term debt to total capital and return on asset and no relationship between long-term debt and total capital and return on equity and earnings per share. Musah (2018) studied the effect of the capital structure on the profitability of commercial banks in Ghana. The outcome of the regression indicated that the total debt ratio had a positive relationship with profitability of Banks in Ghana. The findings demonstrated that the dependence of commercial banks in Ghana on short-term financing (deposits) decreases the profitability of banks. The findings indicated that the optimal combination of both the short-term and the long-term debts will be the most profitable to the banks.

Although there are aforementioned empirical research in the scenario of other countries and Nordics. This study, therefore, deals with the issues outlined below in the situation of banks operating in Nordic countries.

i. What is the structure and pattern of equity to total assets, total liabilities to total assets, return on assets, net interest margin, return on equity, bank size, inflation and GDP growth of selected Nordic commercial banks?

ii. Is there any relationship between equity to total assets, total liabilities to total assets, bank size, inflation and GDP growth with return on assets, return on equity and net interest margin?

iii. What is the impact of bank capital structure (total liabilities to total assets, equity to total assets) on profitability in Nordic commercial banks?

1.3 Research Objectives

The main purpose of the study is to evaluate the effect of capital structure over profitability of selected Nordic banks. However, the other detailed objectives are given below:

i. To calculate the formation and dynamics of capital structure and bank performance of Nordic banks.

ii. To explore the correlation between capital structure and performance in Nordic banks.

iii. To analyze the effect of capital structure on bank performance in Nordic banks.

1.4 Hypotheses

Based on different studies, this study has developed the following hypotheses:

Hypothesis 1(H1): Liabilities to total asset have significant relationship with bank profitability.

Hypothesis 2(H2): Equity to total assets have significant relationship with bank profitability.

Hypothesis 3(H3): GDP growth has a positive effect on bank profitability.

Hypothesis 4(H4): Inflation has a significant effect on bank profitability.

Hypothesis 5(H5): Bank size has a positive effect on bank profitability.

1.5 Rationale of the study

The study focuses on analyzing the capital structure and profitability in Nordic commercial banks. It focuses on studying the relationship between different dependent variables and independent variables. Managers and potential investors are always concerned about the capital structure and profitability ratios of an organization. First, even though research studies related to the area of capital structure decisions are plentiful, those that are concerned in the financial system of developing countries are few. This study, therefore, attempts its best to contribute to the literature by assessing the capital structure decision determining firm specific factors of commercial banks in the developing countries. Second, the study will have great importance to external investors and shareholders, bank managers, lenders and policy makers in making knowledgeable decisions and regulations considering the financing patterns of the banking sector in Nordic countries. Finally, the study notably contributes to other studies made in different economic sectors by providing a picture of the firm level factors determining capital structure decisions of Nordic commercial banks by serving as a reference point.

1.6 Limitations of the study

Capital structure and profitability in Nordic commercial banks is one of the most controversial issues to research on which this study attempts to test in the context of Nordic countries. Although attempts are incessantly undertaken to reach significant conclusions of the study, there are few limitations of any study because of multiple elements of entities, academic timing, quality of data statistics, instruments, methods and distribution. The limitations of this study are the major ones and are as follows:

i. Only 19 Nordic commercial banks are considered for the study purpose over a relatively short time period, limiting crosssectional and timeseries variation.

ii. Iceland was not included in sampling because its banking was significantly more unstable compared to the other four Nordic countries, due to overleverage, rapid international expansion, and lack of capacity to support such a large banking sector relative to its economy.

iii. Only leverage and size are included as firmlevel variables, and other factors influencing profitability, such as ROI, EPS, capital adequacy, liquidity, or cost-to-income ratios, are not considered.

iv. The variation in macroeconomic variables, such as inflation and GDP growth, across the four Nordic countries and observed years is relatively low, limiting their explanatory power.

v. No efforts are made to study the dependability of the available secondary data since they are formally issued by the respective banks and central banks of the Nordic countries. Hence, the reliability of results and decisions are reliant upon the secondary information and evidence.

vi. Only limited statistical and financial tools have been used in the study.

2 Literature Review

2.1 Introduction

This section aims to provide literature review on the relationship between capital structure and profitability and present conceptual framework of the study. A literature review is a summary, classification and comparison of previous research article, literature review and theoretical studies that examine a portion of the published body of knowledge. Literature review has three sections. The theoretical framework in the first section which provides a thorough overview of relevant research in the context of the global banking sector including both developed and developing nations. The literature that has been done on variables and how they relate to one another is presented in the second section. Lastly, a brief overview of empirical works is also covered.

2.1.1 Theoretical review

According to a classic capital structure theory, the value of the firm reaches a particular level of debt capital, and then the value is more likely to be at that point and only start to decline in case of excessive borrowing. This fall in value beyond the debt tipping point occurs due to over leveraging. Conversely, zero leverage will imply that the WACC of a company will be identical to its cost of equity financing and it can lower the WACC by taking debt to the level at which the marginal cost of debt is the same as the marginal cost of equity financing. Simply put, a trade-off the firm has to make is between the value of more leverage and the rising cost of debt as the cost of borrowing finance is rising to compensate the rising value. Any further debt will result in the market value downward and an augmentation in the cost of capital beyond this point. A combination of both the equity and debt financing may result to optimal capital structure of a firm.The traditional theory can be contrasted with the Modigliani and Miller (MM) theory, which argues that if financial markets are efficient, then debt and equity finance will be essentially interchangeable and that other forces will indicate the optimal capital structure of a firm, such as corporate tax rates and tax deductibility of interest payments.

The Net Income approach is offered by Durand David in 1959 (Pandey, 2005). This theory explains that value of a firm's shares price relies on its profit or income that is accessible after the settlement of interest on loans. Hence, the firm's income that is available after the settlement of capital cost excluding cost of interest is explained as net operating income (NOI), whereas, the income that is present for stockholders after adjustment of total costs together with cost of interest is named as firm's Net Income. Particularly, this theory is known as a net income approach (NI) because it emphasizes on the idea that a firm's market value and price of its equity share depend on its total income that is available for its shareholders. Likewise, the value of a firm is explained by observing the value of its debt to the value of its shares. Thus, this suggests that the use of debt in a company's capital structure has an impact on its net income and capital costs. In a similar way, the use of debt has an impact on the firm's equity share market value in addition to its net income and capial cost. To sum up, this theory suggests that any changes to a company's capital structure also affects its total cost of capital and value.

A company's capital structure has been thoroughly examined from a number of theoretical angles, each of which provides unique insights into the connection between debt, equity and firm performance. Companies are usually financed partially with debt and partially with equity. According to the trade-off theory, it suggests that businesses determine the best balance between debt and equity by weighing the costs and benefits of debt financing wheares debt has tax benefits, it also carries the risk of financial distress, which includes both bankruptcy and non-bankruptcy expenses. The information disparity between investors and company insiders, however is stated by peking order theory. It means that the market may have undervalued stock, which could decrease the value of existing owners and lead to low investment. In order to avoid this, companies should establish a system of preference for financing and prioritizing the internal funds first, then safe debt then convertibels or risky debt and finally common stock. These firms do this without a clear target debt-to-equity ratio, which makes capital structure pathdependent. Although more factors have been added over time to assess the relevance of capital structure, the Miller and Modigliani theory also know as the ”Theory of Irrelevance,” contends that no specific capital structure mix is intrinsically better in frictionless capital markets because the increased expected return from debt financing is precisely offset by the associated risk in realworld settings. At last, Agency Theory which was developed by Berle and Means in the year 1932 states how ownership and control are differ in large firms where manager may value their own interests over those of shareholders. Though, shareholders have an incentive to keep upated about managerial behavior, variations in ownership shareholdings and autonomous behavior can make this monitoring less efffective which can hamper the financing structure of the company. Jointly, these theories provide a comprehensive framework for understanding the determinants of capital structure and its implications for financial performance, building the basis for empirical studies that examines how different financing choices affect firm profitability and risk.

2.1.2 Empirical Review

A literature review is a scholarly article, which encompasses the existing information such as substantive results, theoretical and methodological contributions to a given topic. There are numerous studies conducted on the relationship of capital structure and profitability. This chapter is a compilation of past research and research findings regarding the independent variables used in this study as regards their association with the dependent one to gauge the performance of the bank.

Alkhazali, Helmi, Mirzaei, and Saad (2024), found that banks with stronger capital positions before the COVID19 pandemic performed better during the crisis. Using data from 819 banks across 26 emerging economies between 2019 and 2020, the study shows that highquality capital indicators such as Tier 1 capital and total regulatory capital ratios positively affected profitability, whereas the standard leverage ratio was less influential. The findings further reveal that the positive capital profitability relationship was more pronounced for larger banks and for those with stronger liquidity and lower credit risk exposure prior to the crisis. In summary, these findings highlights the importance of capital quality over quantity in mitigating the adverse effects of external events on bank performance.

Berger and Bonaccorsi di Patti (2006) investigate capital structure related agency costs in the banking sector and suggests an alternative simultaneous equations model for managing the external relationship between leverage and performance. By improving discipline, the debt decreases agency disputes between managers and shareholders. Leverage is strongly connected with firms performance, supporting agency theory. The study is mainly based on U.S. commercial banks and considers for important factors like capital structure relationship and performance. By comparing that market based agency concerns keep affecting banks capital structure inspite of regulations, this strengthens to the body of current knowledge. When analyzing the dualistic nature of capital as a governance tool and regulatory need in banking industry, the ideas and techniques presented in this study are really helpful.

According to the capital structure theories on business entities, Gropp and Heider (2010) focused on the capital structure of banks. Their major samples were European and American Banks. They examined the trade-off and pecking order theories of leverage. Since banks, mainly well capitalized ones, have a tendency to act like non-financial companies, the research demonstrates that banks are in fact capital structure algorithms. The corporate finance expectation of leverage or the raio of debt to equity has historicaly been satisfied by important variables like profitability, asset risk and bank size. The random capital adjustments made by a bank still are impacted by some regulatory restrictions such as the minimum capital requirements. This study is among the first attempt to combine corporate finance frameworks with banking scholarship, especially to conduct research on the capital structure phenomena in regulated industries.

Yogen et al. (2014) had carried out an empirical investigation that examined the connection between companies profitability and capital structure. This research was conducted in Kenya’s banking industry. Over a nine year period, beginning from 2004, the researchers used a panel data methodology to collect the financial data from annual reports of banks registered on the Nairobi stock exchange. Knowing how several capital components mostly debt affect these institutions financial performance was the main motive of their study. By analyzing the interaction between short-term and long-term debt levels and profitability metrics, researcher sought to determine which elements of a bank's capital structure could enhance or hinder financial performance. The outcome of the study findings showed a significant positive relationship between short-term debt and profitability, suggesting that banks that depends more on short-term debt were able to provide good returns. This might be further explained by the ease of usage and lower costs of short-term debts, which enable the banks to finance businesses and investment opportunities more effectively without depending on long-term liabilities and increased risks of long-term debt. The study had provided a significant impact for managers and policy makers, describing how decisions regarding capital structures will have impact on bank performance and supporting the idea that a better balance of sources of funding can increase profitability in banking industry of Kenya.

Addae et al. (2013) examined the relationship between capital structure and profitability taking commercial banks of Ghana as a sample for over the period of five years from 2005 to 2009. Researcher had used panel regression model in his study. Thus the study mainly aims to find out how capital structure decisions made by the companies of Ghana have either increased or decreased shareholder value in relation with profitability. In total of 34 commercial banks were taken for the study. Regression 1 findings which had investigated a relationship between short-term debt and profitability, suggested a significant positive correlation for the banking industry.

Berger and Bouwman (2013) analyze how investment in capital can help banks to operate better operationally, mainly during financial crisis. The researcher had used data from U.S. banks from both crisis and non-crisis periods. The study findings shows that strong capital reserves greatly increases banks position in the market, profitability and survivability in times of crisis. The positive effects of capital are significantly less apparent at regular time interval. The researcher differentiate betweeen small and large banks and discover that while capital is vital for both size groups during times of crisis, it is more important for small banks success during regular times. Thus, these results supports the current capital regulation arguement by providing evidence in favor of the hypothesis that capital increases improves the financial stability and enhances competitiveness during recessions. The research article can be used as a source for thesis ideas that analyze how capital structure affects the performance of a company in various economic environments.

According to the study of DeAngelo and Stulz (2015), banks should technically take as much debt as they can. Bank are very important factor to maintain the financial stability since they have been established to issue safe debt. Banks focuse on generating liquidity which is largly dependent upon effective risk management that helps to make their debt seem secure. In order to prevent any losses, banks and companies undertake hedging. They study however assume perfect scenarios, such as the absence of moral hazard, agency conflicts and taxation. Theoretically banks should aim for the maximum amount of leverage but the researchers claims that such a high leverage model is unfeasible in practice.

Faulkender and Petersen (2006) analyze whether a company's capital structure is determine by the source of money. According to their study findings, companies that have access to securities markets generally takes more debt than those companies that do not have the access. In other words, a company's capital strucutre is heavliy affected by the sources of debt and its ability to access securities markets because their financial data are more assessible and transparent. Companies which are authorized to offer bonds publicly are more likely to comply with regulatory requirements. However, these companies depends their opinions on issuing bonds on the state of the capital markets.

Harding, Lian, and Ross (2012) examined the optimal capital structure for banks. Their study discovered that banks who fance severe restrictions frequently decide to maintain more capital than as required by law. According to their study analysis, a particular minimum capital ratio has been considered to be appropriate for the banks.

Logavathani and Kengatharan (2018) state that the study used actual data from annual reports to find out the relationship between capital structure and financial performance of commercial banks operating in Sri Lanka between 2007 to 2016. Profitability was measured by return on assets (ROA) and return on equity (ROE) wheares capital structure was measured using the variable total debt to total assets, long-term debt to total assets and short-term debt to total assets. The study findings showed that although increase in bank deposits had a strong relationship with return on assets, the ratio of total debt to total assets was significantly negatively correlated with return on assets. Moreover, return on equity was found to be strongly positively correlated with both bank size and short-term debt to total assets ratio but not with the long-term debt to total assets ratio. The findings indicate that since improving capital structure can improve bank profitability but financial managers should offer internal funding source priority over a significant reliance on debt. Thus, for investors and decision makers who want to maximize returns on their investments, this study offers insightful information (Logavathani & Kengatharan, 2018).

Ramadan and Ramadan (2015) analyzed the link between capital composition and business performance of financial firms operating in Jordan focusing on how decisions regarding financing affects a company's profitability. The study concluded that capital structure had a negative relationship with return on assets, stating that higher leverage led to lower profitability in the companies they examined. These study findings however differs with those of AlTaani, whose study provides different concluson regarding how capital structure affects firms performance, showing a gap in the body of knowledge about the relationship between leverage and financial outcomes in the Jordanian setting.

Siddik et al. (2017) performed an empirical study to investigate the relationship between debt-equity structure and firm performance of banks operating in Bangladesh. A comprehensive overview of the banking industry was given by this study in which data was collected from 22 chosen banks during a ten year period starting from 2005. The researcher used three primary measures to evaluate the financial performance: earning per share (EPS), return on equity (ROE) and return on assets (ROA). According to their study analysis, capital structure normally has a negative and inverse effect on banks performance stating that higher dependence on debt financing will reduce the banking industry's level of efficiency and profitability in Bangladesh. This study findings both supports and contradicts multiple aspects of earlier research, adding to the current discussion and stressing that the correlation between capital structure and financial performance differs based on the situation. The researcher findings support the belief that financing decisions effects on performance are frequently challenging and can change based on market situations, industry attributes, and institutional settings. This allows them to explain why previous research finding has consistently produced inconsistent and sometimes contradict the results.

Salim and Yadav (2012) conducted a study in Malaysia using data from 1995 to 2011. They looked at how different measures of profitability specifically Return on Assets (ROA), Return on Equity (ROE), and Earnings Per Share (EPS) are influenced by various types of debt, including shortterm debt (STD), longterm debt (LTD), and total debt (TD). Their findings showed a significant positive relationship between profitability and both shortterm and longterm debt. However, total debt had a negative effect on profitability. Overall, the study concluded that capital structure can have a positive impact on a firm's profitability when managed properly.

Shubita and Alsawalhah (2012) conducted a study between 2004 to 2009 in Jordan. They mainly considered the effects of short-term debt, long-term debt and total debt with a focus on return on equity (ROE) as the main indicator of profitability. Their study findings showed a negative relationship between profitability and all types of debt. The researcher suggests that companies should finance their projects more with the equity that relying with debt considering these findings.

Sorsa (2016) conducted research taking 27 banks from Sweden, Finland, Denmark and Norway between 2006 to 2014 to determine how capital structure affects bank performance in the Nordic countries. The study considered return on asset and return on equity as performance indicator and the study highlights Tier 1 capital and the equity to assets ratio as capital structure measures. The thesis finds a positive correlation between capital structure and banks performance by using panel data regression model with fixed and random effect factors, stating that banks with more capital perform better. The equity to assets ratio and return on equity shows the strongest results. According to researcher, a robust capital structure improves performance and verifies earlier empirical research. The study contributes to existing findings on the Nordic banking sector by emphasizing the role that the capital plays in these banks stability and profitability.

Ahmad, Naveed, Ahmad, and Butt (2019) conducted an in-depth research on the effectiveness, profitability and performance of the banking industry. Using a citation based methodology, researcher summarizes major findings and trends in academic literature form more than two decades. The key recapitalization themes are described in the assessment, along with macroeconomic factors that affect capital, ownership governance and bank profitability. The researcher underline capital structure as a performance indicator and explain why different research often display different regional, methodological or historical differences. The review brings attention to the research gap in emerging economies regarding the capital to performance ratio in relation to certain bank regulations and regulated economies. The study demonstrates the great significance of systematic reviews of literature by helping to clarify one's own scholarly work within the changing academic situation.

Rumler and Waschiczek (2016) found in their study that the financial structure of the Austrian banking industry changed over a 15 year period due to disintermediation, globalization and privatization. All of these changes had different effects on the profitability of the banks. Researcher had used dynamic panel regression techniques with macroeconomic factors and microlevel balance sheet data which determined that (described as a smaller proportion of loans to total assets) and increased market concentration had an encouraging effect on bank profitability. Nevertheless, there was no obivious or substantial impact on bank performance from the changes in ownership structure such as privatization and a rise in foreign ownership or lending more abroad by Austrian banks.

Taani (2013) investigated the correlation between capital structure and bank performance in Jordan using the data from the year 2007 to 2011. In this study, profitability was measured using return on invested capital (ROIC), net profit, return on equity (ROE) and net interest margin (NIM). In the same way, capital structure was measured using the ratios of total debt to equity (TDTE) and total debt to total funds (TDTF). Thus, the researcher finds that bank performance in Jordan has little to no significant impact on the profitability of banks operating in Jordan.

According to the study of Schepens (2016), banks that have less tax discrimination between debt and equity financing are better capitalized because equal treatment of debt and equity promotes higher capital ratio by increasing common equity. The study further indicates that such policy changes discourge risk taking behaior particulary among banks that were initially undercapitalized, using the implementation of a tax shield for equity as an external factor. These results indicate that tax shields could be a creative and useful regulatory instrument for improving banks resilience and enhancing financial stability.

Xu (2012) found in his study that firms facing greater import competition tend to reduce their leverage ratio by issuing equity and liquidating assets to re pay debt. The researcher has used import tariffs and foreign exchange rates as instrumental variables that confimrs this outcome is not simply due to endogenous relationships between competition and leverage. The study findings are consistent with traditional tradeoff theory which suggests a positive relationship between book leverage and expected future profitability. Moreover, the evidence suggests that import penetration influences capiatl structure decisions by changing the tradeoff between the tax advantages of debt financing and the potential costs of financial distress.

According to Arifin (2017), inconsistent treatment of two factors in earlier research has left the research has left the relationship between capital structure and profitability in Indonesian enterprises unclear. This study used Granger causality analysis to find out the direction of this link using data from all non-financial companies listed on the Indonesia stock exchange (IDX). The study finding showed a unidirectional relationship between capital structure influencing profitability rather than the other way around. The effect was visible at a two period lag level and it was determined that profitability was the external variable that was influencing capital structure which functioned as the endogenous variable. Further insights into the dynamics of corporate financial decision making are provided by this suggestion that businesses modify their financial structures in accordance with previous levels of profitability.

Doku, Kpekpena, and Boateng (2019) had used a sample of 21 banks from the year 2000 to 2014 to investigate how capital structure affected the profitability. This study was conducted in Ghana and commercial banks of Ghana were taken into consideration. The study findings showed that return on assets (ROA) and net interest margin (NIM) which are the profitability variables in this study are strongly and favorably influenced by capital structure variable as determine by the capital to asset ratio. Additionally, this study discovered that banks profitability is significantly impacted by customer demand deposits. These results confirm the bank of Ghana’s capitalization strategy and the growing focus on short-term deposit mobilization by commercial banks to improve their performance.

Enow (2025) examines the connection between firms’ profitability and capital structure. The researcher concludes that capital structure (the proportion of debt and equity financing) does not take into consideration for differences in profitability indicating that capital structure has no influence on profitability. The result raise doubt on the idea that a firm’s performance can always be increased by an ideal capital structure pointing to the necessity for additional study to identify the scope and direction of the influence of independent variables.

Wieczorek, Kosmala, et al. (2021) analyzed the relationship between capital structure and performance by studying the companies of Czech Republic between 2015 to 2019. The study was conducted to ascertain the extent to which the amount of debt in a companys capital structure in particular has an impact on its financial performance. In this study, capital structure was evaluated using indicators like debt to assets, long term debt and short term debt. In the same way, profitability is measured using return on equity and return on assets. The study looked into the relationship between these variables using statistical and econometric analysis. The study findings shows a negative relationship between capital structure and profitability i.e. if debt levels is higher then profitability indicators than either equity or assets will be lower. The researchers further suggested that companies adopt the pecking order theory of financing which gives internal funding priority over debt and equity as a last option. This strategy helps companies to lower their cost of capital and avoiding the adverse effects that excessive leverage can affect the profitability. In summary, this study analysis supports the theoretical framework suggesting a cautious approach to external financing and offers empirical evidence that to preserve company profitability careful control of debt levels is essential.

According to Nadeem and Muhammad (2016), the study analyzes the key factors impacting the capital structure decisions made by Pakistani conventional and Islamic banks. To evaluate both bank specific and macroeconomic factors the researcher used the pooled regression methods and used the data from the annual reports of banks listed on Karachi stock exchange between 2004 to 2014. The study findings shows that conventional banks are typically more indebted than Islamic banks. Capital structure is significantly shaped by bank specific factors including profitability, size and tangibility. But macroeconomic factors also have a big impact. Furthermore, because of shariah constraints, Islamic banks are less dependent on debt financing rather than regular banks. The study highlights that banks financing practices are highly influenced by both internal and external economic forces. These study results offer regulators and bank management useful information for creating capital structure strategies and financial regulations that work for traditional and Islamic financial systems for Pakistan.

Pham, Hoang, and Hoang (2022) analyzed into how capital structure has affect the profitability of commercial banks of Vietnam. The study reveals that customer deposits have a negative impact on profitability whereas non-deposit liabilities have a positive impact on profitability. The study uses an unbalanced panel dataset of 30 banks from 2012 to 2018. In addition to more comprehensive studies of long term loans and investment projects, the findings recommend that banks implement more equitable and complete evaluations prior to the lending. This study further adds to the body of literature by putting light on the unexplored relationship between capital structure and bank profitability in Vietnam.

Alshafi and Ben Salem (2025) found that capital structure significantly affects banking profitability based on the researcher examination of six Islamic banks in the United Arab Emirates from the year 2019 to 2024. The researcher discoverd that the two profitability indicator i.e. return on equity and return on total assets and the two capital structure variables total liabilities to total assets and total liabilities to equity had an inverse relationship with each other. Particularly, total liabilities to total assets directly impact profitability but total liabilities to equity have the oppositve relationship. Thus, these findings shed light on the relationship between capital strucutre and bank performance in United Arab Emirates Islamic banking sector.

According to Ho, Doan, Hoang, and Doan (2025), the study on joint stock commercial banks that were quoted on the share market of Vietnam from 2014 to 2024 and state that both structural and financial considerations have a major impact on the capital structure. The total liabilities to asset ratio (TLEV) is negatively and perfectly significant impacted by liquidity and profitability. This study is based on regression analysis of data from 15 top banks of Vietnam. This study suggests that banks with higher profitability and liquidity have a lower impact on debt financing. On the other hand, banks with larger percentage of fixed assets are higher in size and typically uses more financial leverage. These study findings illustrates that banks repeatedly favor internal funding since it is less expensive and carries a smaller risk of ownership dilution.

According to Tomak (2025), capital structure of Turkish private deposit banks has a significant influence on their performance from the year 2012 to 2023. The study findings concludes that return on assets (ROA) is negatively impacted by the debt ratio and the debt to equity ratio. Similarly, non-performing loans, credit risk and cost managment also have a negative impact on return on assets. On the other hand, return on assets is positively impacted by inflation, GDP growth and bank size. Debt to equity ratio, non-performing loans, credit risk and cost management have negative impact on return on requity (ROE). However, debt to equity ratio, bank size and GDP growth have positive benefits. Overall, the findings showed that Turkish banks financial performance is significantly influenced by capital structure proxies.

According to Tran, Tran, and Huong (2025), Vietnamese commercial banks have an ideal capital structure that significantly affects their profitability. This study uses data from 24 listed banks between 2011 and 2021 and a Bayesian regression model was used. The study illustrates the significance of bank size in improving performance and supports the existence of an ideal capital structure. Furthermore, the study results indicate that bank profitability is positively impacted by inflation. An analysis of Asia commercial Bank (ACB) and Vietnam joint stock commercial bank for industry and trade (CTG) shows that while their non-deposit to total assets ratios are still low, indicating potential for an increase to maximize financial results. The ratio of deposits to total assets at both banks are higher than they should be and need to be lowered.

The findings showed that bank performance had a positive relationship with all capital structure measures except for ROE. In other words, as banks increased their use of debt (up to a certain point), performance improved, particularly in terms of ROIC, NP, and NIM. The study suggests that banks can enhance their overall performance by focusing on improving these key indicators.

2.2 Research gap

Based on the literature above, it is possible to make a conclusion that there are no uniform findings of the studies. An overview of the literature on capital structure developed so far shows that time series or cross section data has been used as the basis of most studies. These researches have tried to examine the effects of capital structure in profitability of banks operating in Nordic region using panel data. Nonetheless, these research have used the traditional regression method and evaluate if the data is fit on the fixed or random effect model. Different research report have been reviewed in this study. The inverse and direct relationship existing between outcome variable and predictor variable are demonstrated in those literatures. This emerging trend of globalization has rendered the aspect of financial structure and profitability more relevant to both the financial and non financial institutions. Banks largely rely on competition marketing strategy that defines their success and growth. An abundance of research on the effect of capital structure on profitability in various countries was conducted. Although, factors of profitability and capital structure remain controversial among various researchers that may be because of circumstantial reasons such as country level factors, bank level factors and state of country legal and regulatory framework. These debates can therefore just be remembered by conducting quantitative analysis on the effects of capital structure on profits. In addition, majority of the related literatures reviewed present varied studies that have been conducted in the banking industries of both developing and developed countries.

Although there are rather large volumes of studies that have explored the determinants of debt to equity and debt to asset, the majority of the studies have been conducted in the developed countries with only a few studies having been conducted in the developing countries. Therefore, in line of the knowledge, number of literatures in the Nordic banking industry is still limited. Moreover, the vast majority of the previous researches have not been based on the capital structure in the same model. The different studies have also failed to use the same literature to cover the debt level and determinants of financial structure. This research hence, attempts to experience the gap in defining the association between the dependent variable (return on equity, return on assets and net interest margin) and the independent variables (Total liabilities to total assets and equity to total assets) of commercial banks in Nordic countries using the available recent data and analysis. Therefore, this research project will give broad coverage of information to dedicate the subsequent study.

3 Research Methodology

3.1 Introduction

Research methodology is a logical approach to the problem solution that defines the plan associated with study. It is a science of research methodology. In simple terms, the steps that researchers follow when conducting their work of explaining, clarifying and predicting the phenomena are referred to as research methodology. Research methodology refers to a complex way of arriving at a problem. It is a scientific examination of the research methodology. Research strategy, research method, research approach, data collection methods, selection of sample, research process, data presentation and type of data analysis, software used in the analysis, ethical considerations, and limitations of project are some of the things which may be included in methodology. In essence, research methodology is a process through which researchers take their way in explaining, clarifying and predicting phenomena. Study methodology must come first before the presentation of the data and its analysis and interpretation of data. Without methodology, one can probably lose the meaning of the conclusions made.

3.2 Study Design

The research study design which will be applied in the study will include descriptive, correlational and causal research design to address the effect of capital structure and profitability of Nordic commercial banks. The descriptive research design is used to find facts and collect sufficient information on the underlying problems accompanying the relationship between capital structure and profitability of the chosen Nordic commercial banks. Correlational and causal research design will also be used in the study as an effort to determine the impact of capital structure on profitability. To be more precise, the paper examines the correlations between liabilities and total assets, equity and total assets, bank size, nonperforming loans, GDP growth rate and inflation to the profitability in the framework of Nordic commercial banks between FY2015 and FY2024.

3.3 Population and Selected Sample

In order to explore the interdependency between the capital structure and profitability of the chosen Nordic commercial banks, 19 commercial banks in Finland, Sweden, Norway, and Denmark are involved in the study with their corresponding data taken between the years of FY2015 and FY2024. The banks that will be included in this study are selected by purposive sampling.

Table 3.1 *Listed are the Nordic banks selected for the study with their study period*

S.No.	Bank Name	Study Period	Study intervals	Country
1	Nordea Bank Abp	FY2015FY2024	10	Finland
2	Swedbank AB	FY2015FY2024	10	Sweden
3	Skandinaviska Enskilda Banken AB (SEB)	FY2015FY2024	10	Sweden
4	Svenska Handelsbanken AB	FY2015FY2024	10	Sweden
5	Länsförsäkringar Bank AB	FY2015FY2024	10	Sweden
6	OP Financial Group	FY2015FY2024	10	Finland
7	Aktia Bank Plc	FY2015FY2024	10	Finland
8	SBank Ltd	FY2015FY2024	10	Finland
9	Ålandsbanken Abp (Bank of Åland)	FY2015FY2024	10	Finland
10	POP Bank Group	FY2015FY2024	10	Finland
11	DNB Bank ASA	FY2015FY2024	10	Norway
12	SpareBank 1 SMN	FY2015FY2024	10	Norway
13	Sparebanken Vest	FY2015FY2024	10	Norway
14	Sparebanken Møre	FY2015FY2024	10	Norway
15	Danske Bank A/S	FY2015FY2024	10	Denmark
16	Jyske Bank A/S	FY2015FY2024	10	Denmark
17	Sydbank A/S	FY2015FY2024	10	Denmark
18	Nykredit Bank A/S	FY2015FY2024	10	Denmark
19	Ringkjøbing Landbobank A/S	FY2015FY2024	10	Denmark
	Total Number of Observations		**190**	

3.4 Data collection and sources

The research is grounded on the secondary information that is collected based on the sample of 19 commercial banks of Nordic countries over the duration of 10 years (2015-2024). Secondary data and information is going to be gathered by Orbis Bank Focus, Bloomberg, or Refinitiv, and yearly reports of the chosen banks. The measurements employed in the research are return on assets, return on equity, net interest margin, liabilities to total assets and total liabilities to total assets. The information about the outcome variable and predictor variables of the chosen banks are gathered and identified with a distinct ID to each selected bank in order to be easily identified and evaluated. In general, the time frame of study with reference to bank specific variables will be between the fiscal year 2015 and 2024.

3.5 Data Handling and Analytical Methods

The primary objective of data analysis in the research is to discuss the correlation between the capital structure and profitability of the selected Nordic commercial banks. Hence, this section concerns the statistical models that can be utilized in the aim of the secondary data analysis. The study uses descriptive, correlation and regression techniques of analysis.

3.6 Data Processing Methods and techniques

Quantitative data is presented in a manageable form with the aid of descriptive statistics. It assists us in simplifying big data in a justifiable manner (such as mean, standard deviations, minimum and maximum levels of variables that have been utilized to characterize the features of sample firms) between the years 2015 and 2024. The method of investigating the intensity of that connection utilizing accessible data statistics and is applied in the determination of direction and intensity amid two groups of variables is termed the correlation analysis. As a result, method is a quantitative procedure of calculating the correlation between variables and is applied to determine the effects of the independent variable on the dependent variable in isolation and in concurrence with other variables. It describes the various significance tests of verification of models such as t-test, F-test, finding and regression analysis. Since multicollinearity can distort regression estimates, this assumption was tested before running the models. The correlation matrix was employed as an initial diagnostic, and the results revealed a perfect negative correlation between LTA and ETA. To address this issue, only one of these variables was included at a time in the regression analysis. This ensured that the estimated coefficents remained reliable and were not biased by redundant information. Due to data availability, the study includes only two firmspecific variables and two macroeconomic controls, which may limit the model's complexity. Because the dataset is relatively small and the countrylevel variables show little variation across countries and over time, both fixed and random effects models were estimated. However, given these data characteristics, the random effects model is considered more appropriate for this study. The Hausman test was used to verify this model choice, and results are interpreted with caution due to the dataset's limitations.

Model specification

Model I

In this model, the dependent variable is return of assets of the commercial banks. Total liabilities to total assets, equity to total assets, bank size, GDP growth rate and inflation are explanatory variables which are assessed on performance of banks. The structur is presented as:

$$\mathbf{ROA_{it} = \beta_0 + \beta_1\, LTA_{it} + \beta_2\, ETA_{it} + \beta_3\, BS_{it} + \beta_4\, INF_{it} + \beta_5\, GDP_{it} + e}$$

Model II

In this model, the dependent variable is return on equity of banks. Total liabilities to total assets, equity to total assets, bank size, GDP growth rate and inflation are independent variables which are tested on performance of banks. The model is presented as follows:

$$\mathbf{ROE_{t} = \beta_0 + \beta_1\, LTA_{it} + \beta_2\, ETA_{it} + \beta_3\, BS_{it} + \beta_4\, INF_{it} + \beta_5\, GDP_{it} + e}$$

Model III

In this model, the dependent variable is net interest margin of banks. Total liabilities to total assets, equity to total assets, bank size, GDP growth rate and inflation are independent variables which are tested on performance of banks. The model is presented as follows:

$$\mathbf{NIM_{it} = \beta_0 + \beta_1\, LTA_{it} + \beta_2\, ETA_{it} + \beta_3\, BS_{it} + \beta_4\, INF_{it} + \beta_5\, GDP_{it} + e}$$

Where,

ROE=Return on equity

NIM = Net interest margin

ROA = Return on assets

LTA= Liabilities to total assets.

ETA= Equity to total assets.

BS = Bank size

GDP = GDP growth rate

INF = Inflation

β_0= Constant term

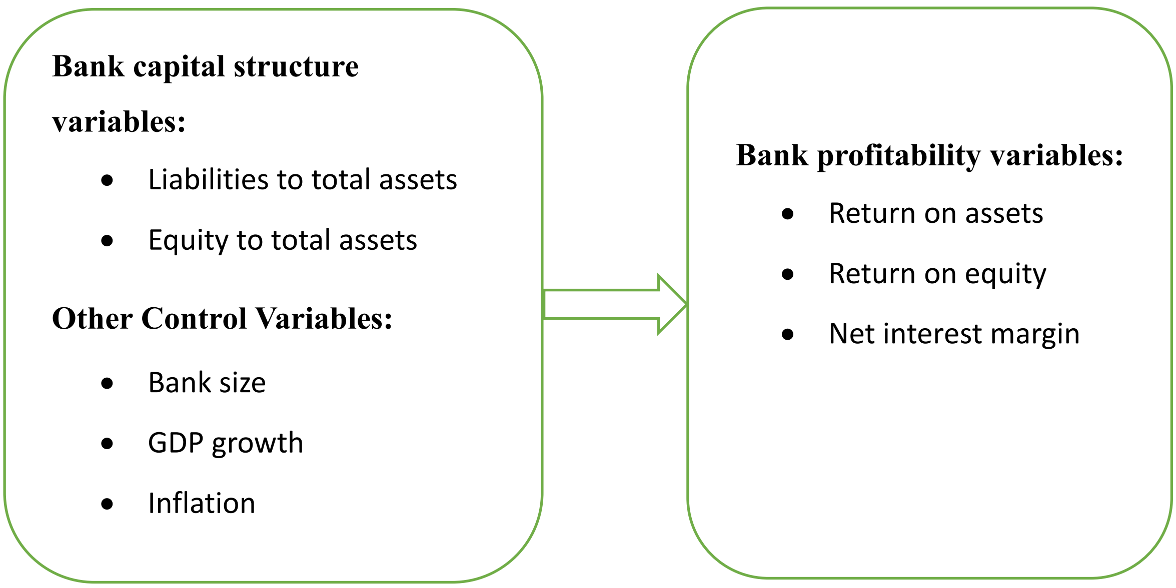
$\beta_1 - \beta_2$= Coefficients

e= Error term

3.7 Analytical Frameworks

Analytical framework refers to a framework that the researcher assume that can best explain the natural flow of the phenomenon he or she is studying. Theory of concept connected to the concepts, empirical studies and significant theories that are applied in the marketing and organizing the knowledge that is spread by the researcher. It would describe the way in which the research problem would be researched. The conceptual framework gives a comprehensive manner of how to examine and analyze a problem being studied. The conceptual framework in a statistical perspective explains the correlation between the key concepts of a study. It is handled in logical format to facilitate provide a picture or graphical outlook of how concepts in a study connect to each other. In addition, it demonstrates the sequence of activities to be undertaken in a research study by the researcher. Conceptual framework facilitates the researcher to identify and delineate the concepts of the problem of the study. Conceptual frameworks are a graphical or narrative representation of the major variables to be analyzed and the assumptions of how they relate. A analytical framework refers to an analytical instrument that has a number of alteration and situations. Analytical framework of the study explains the way in which there is a systematic description of the relationship between the dependent and the independent variables with the aim of elucidating relationship between capital structure and profitability of Nordic banks. It is a theoretical organization of suppositions, values, scheme and regulations that are applied in formulating conceptual differentiation and systematization of thought and concepts. In this research, the dependent variables will be return on assets, net interest margin, and return on equity as well as the liabilities as dependent variables and the independent variables will be all liabilities to total assets and equity to total assets. Figure 3.1 shows the conceptual framework of the relationship between capital structure and bank profitability.

Figure 3.1 *Conceptual framework*



4 Result and Discussion

The chapter provides the systematized and organized findings of the research in the presentation form, interpretations and analyses of the secondary data on different issues related to the bond between capital structure and profitability of chosen Nordics commercial banks.

4.1 Results

This part contains the concise description of the various types of information and ratios of the chosen Nineteen banks that have been gathered and organized to serve the purpose for the research. Then, they are calculated, analysed and justified and measured against across the banks under study. The section presents methodical and organized and orderly outputs of the study in form of presentation, interpretations and analysis of the secondary data with numerous issues surrounding the effect of capital structure on the profitability of selected commercial banks in the period of 2015 to 2024.

4.1.1 Framework (structure) and distribution (pattern) of study variables

Structure and pattern of return on assets (ROA)

The ratio of the net income to the total assets is the return on assets. The improvement of the ratio is a measure of effectiveness of profitability of any company.

Table 4.1 *Distribution/pattern of ROA (in percentage) for the period of 2015 to 2024*

Bank	NORDEA	DANSKE	DNB	SEB	SWED BANK	SHB	OP	JYSKE	NYKREDIT	SYD BANK	SPARE BANK1	VEST	RLB	LF BANK	S-PANKKI	AKTIA	POP	ALANDS	MORE	Mean	SD
2024	0.84	0.63	1.30	0.97	1.19	0.78	1.24	0.69	1.43	1.46	1.91	1.44	3.02	0.37	1.13	0.63	1.18	1.02	1.09	1.18	0.58
2023	0.84	0.57	1.18	1.07	1.20	0.83	0.98	0.77	1.42	1.83	1.62	1.24	3.02	0.37	1.24	0.67	1.97	0.87	1.13	1.20	0.60
2022	0.62	-0.12	1.09	0.79	0.76	0.63	0.52	0.54	1.21	1.09	1.32	1.13	2.31	0.37	0.41	0.82	0.38	0.59	0.90	0.81	0.51
2021	0.68	0.32	0.87	0.80	0.78	0.60	0.54	0.48	1.36	0.84	1.50	1.10	2.13	0.43	0.24	0.61	0.71	0.63	0.79	0.81	0.45
2020	0.41	0.12	0.74	0.53	0.52	0.50	0.42	0.24	0.77	0.51	1.12	0.97	1.71	0.36	0.22	0.42	0.23	0.54	0.73	0.58	0.37
2019	0.28	0.41	0.95	0.74	0.85	0.56	0.47	0.39	0.62	0.59	1.57	1.07	1.91	0.39	0.37	0.65	0.48	0.47	0.97	0.72	0.42
2018	0.54	0.41	0.95	0.90	0.95	0.60	0.54	0.42	0.92	0.83	1.33	0.91	1.76	0.36	0.11	0.60	0.21	0.42	0.88	0.72	0.40
2017	0.52	0.60	0.84	0.63	0.89	0.60	0.60	0.53	1.70	1.07	1.25	0.84	2.35	0.42	0.23	0.41	0.37	0.39	0.87	0.80	0.52
2016	0.61	0.59	0.77	0.42	0.91	0.63	0.71	0.55	0.34	1.02	1.22	0.94	2.32	0.43	0.35	0.51	0.25	0.40	0.95	0.73	0.47
2015	0.57	0.39	0.99	0.65	0.74	0.61	0.72	0.46	0.76	0.78	1.09	0.68	2.11	0.38	0.26	0.50	0.21	0.55	0.96	0.71	0.41
Mean	0.59	0.39	0.97	0.75	0.88	0.63	0.67	0.51	1.05	1.00	1.39	1.03	2.26	0.39	0.46	0.58	0.60	0.59	0.93		
SD	0.17	0.23	0.17	0.19	0.19	0.09	0.24	0.14	0.41	0.38	0.24	0.20	0.44	0.03	0.37	0.12	0.54	0.20	0.12		

Source: Annual Reports of Banks

Table 4.1 presents the ROA for various Nordic and European banks over the period 2015 to 2024 and gives clues about the prevailing banking profits and asset utilization efficiency trends. Most banks included showed their lowest ROA around 2019 or 2020, pointing towards the economic uncertainties and the high-interest rate environment from when the industry mean fell to around 0.39 and 0.41 percent. However, it would seem there had been a recovery from that, especially in 2023, when the mean ROA stood at 0.60%. SPARE BANK shines through, with the highest mean ROA of 1.39%, followed by NYKREDIT (1.05%) and SYD BANK (1.00%), indicating these institutions have better asset utilization strategies. While NORDEA seemed to have faced extreme challenges with negative ROA of 0.12% in 2022 and DANSKE showed volatility with a poor performance of 0.57% in 2023. The standard deviations also shows that banks such as SPARE BANK which had better ROA tended to be more volatile and riskier in their operational approach. Overall, the table illustrates the fluctuating nature of banking profitability with a recent resurgence suggesting rebounded operating situations in Nordic banking sector, although banks may vary substantially in their efficiency in converting asset holdings into income. Figure 4.1 shows the pattern of average return on assets of commercial banks of Nepal.

Figure 4.1 *Pattern of average return on assets (in percentage) of Banks operating in Nordics region from 2015 to 2024*

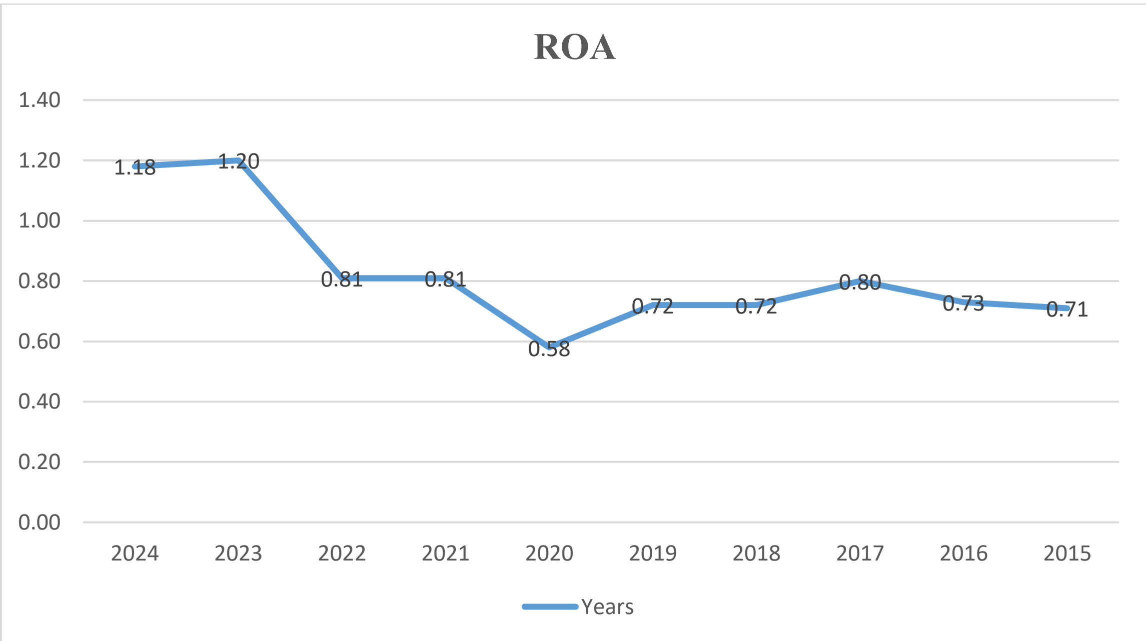


Figure 4.1 has drawn up the Nordic banking sector's consolidated ROA trend between 2015 and 2024, followed by the decadetone cyclical nature of banking profitability. Starting from a moderate level of 0.71% in 2015, a gradual improvement was observed in ROA, with the latter peaking at 1.20% in 2023, thus indicating the highest point of profitability during the analysis period. However, the path was anything but linear, marked by periods of volatility. After the initial observation of 0.71% in 2015, ROA dropped marginally to 0.73% in 2016; then, it recovered to 0.80% between 2017 to 20 18, before coming down again to 0.58% in 2020its lowest level, presumably reflecting the economic shock brought about by the COVID19 pandemic and the long low interest rate scenario. A recovery appears to have picked up again in 2019, with gradual improvement seen to 0.72% through 2018 and then steadily growing from 0.81% in 2021 to 0.81% in 2022 and reaching an extraordinary peak in 2023. A slight decline in recognition to 1.18% in 2024 appears to be in line with the normalization from the exceptional 2023 performance. This pattern reflects the banking sector's resilience and ability to adapt to changing economic conditions, regulatory environments, and monetary policy shifts, with the recent strong performance indicating improved operational efficiency and favorable market conditions in the Nordic banking landscape.

Structure and pattern of the return on equity

Return on equity is the ratio of net income divided by total equity. ROE is considered a gauge of a corporation's profitability and how efficient it is in generating profits. The higher the ROE, the more efficient a company's management is at generating income and growth from its equity financing.

Table 4.2 *Structure of return on equity (in percentage) for the period of 2015 to 2024.*

Bank	NORDEA	DANSKE	DNB	SEB	SWED BANK	SHB	OP	JYSKE	NYKREDIT	SYD BANK	SPARE BANK1	VEST	RLB	LF BANK	S-PANKKI	AKTIA	POP	ALANDS	MORE	Mean	SD
2024	15.89	13.45	16.58	15.84	16.69	13.23	11.56	11.01	8.97	17.52	15.53	18.73	21.42	7.26	16.24	10.49	10.03	15.57	12.27	14.12	3.634
2023	15.90	12.66	15.21	17.88	18.21	14.52	10.62	13.65	9.58	22.48	13.76	15.65	21.83	7.42	20.11	12.10	18.71	14.94	12.57	15.15	4.024
2022	11.15	-2.72	13.54	13.57	12.65	11.37	6.29	9.51	8.53	13.98	11.54	13.51	16.59	7.50	6.93	14.27	3.79	11.35	9.92	10.17	4.479
2021	11.39	7.48	10.30	13.92	13.17	11.07	6.62	8.48	9.85	10.97	13.03	13.14	14.57	8.90	3.92	9.59	6.94	12.77	8.69	10.25	2.843
2020	6.94	2.71	8.30	9.61	8.80	9.41	4.99	4.45	6.45	6.58	9.48	11.50	11.67	7.51	3.26	6.68	2.16	11.43	8.00	7.37	2.898
2019	4.79	9.03	10.42	13.25	14.27	11.21	5.51	6.97	5.66	7.28	13.11	12.69	13.22	8.33	5.33	10.30	4.31	10.51	10.64	9.31	3.25
2018	9.31	8.86	10.74	15.81	15.62	12.23	6.55	7.25	8.10	9.79	11.55	11.18	12.05	7.76	1.61	9.43	1.84	9.63	9.70	9.42	3.651
2017	9.15	12.48	10.06	11.40	14.71	11.58	7.66	9.37	17.11	12.93	11.14	10.44	15.97	8.99	3.06	6.50	3.32	9.09	9.67	10.24	3.663
2016	11.62	12.13	9.86	7.48	15.45	12.28	9.36	9.96	3.82	12.70	11.28	12.48	15.75	9.01	4.36	8.03	2.33	9.06	10.92	9.89	3.591
2015	11.8	8.38	14.76	11.96	13.08	12.81	10.32	8.60	10.75	10.10	10.64	10.26	14.35	8.42	3.21	7.90	1.99	11.89	12.03	10.17	3.301
Mean	10.79	8.45	11.98	13.07	14.27	11.97	7.95	8.92	8.88	12.43	12.11	12.96	15.74	8.11	6.80	9.53	5.54	11.62	10.44		
SD	3.50	5.07	2.79	3.10	2.58	1.39	2.33	2.48	3.58	4.77	1.75	2.58	3.49	0.70	6.23	2.42	5.30	2.27	1.53		

Source: Annual Report of Banks

Table 4.2 gives an account of ROE, a measure that indicates how well banks are able to profit from equity investments on shareholders, of Nordic and European banks for the period from 2015 to 2024. As can be observed from the data, the banking sector underwent a drastic change in profitability during this decade, first being put under huge challenges and then making a huge recovery. Industry average ROE shrank austere from 10.17% in 2015 to a crisis level of 7.37% in 2020 amidst economic uncertainties and regulatory pressures as well as a low interest rate scenario compressing on banking margins. 2021 witnessed the turnaround of fortunes with the ROE soaring to 10.25%, thereafter the sector experienced superior performance from 2022 to 2024, rising even higher to 15.15% in 2023 and 14.12% in 2024, which are the peak levels in the period under review. Individual bank performance varies quite dramatically. SPARE BANK1 steered clear of the negative and earned high marks the longest as the best performer with the highest average of 12.11% ROE and managed returns on equity capital efficiently over the assessment window. Danske had its struggles with negative ROE of -2.72% in 2022 only to recover after Nordea managed to hold on to its stock till the returns got frosty in 2022 with major drawdowns of -13.45% before 2024. A recent high of 3.63% ROE in 2024 shows that the range of RoE among Nordic banks is “weak” as high dispersion is observed. The pandemic economic crisis and the central banks’ policies with respect to interest rates and the international banks’ policies regarding operatinal efficiency certainly improved the economic environment for the banks to perform efficiently relative to the pandemic years. The wide dispersion in the returns of equity among the banks is indicative of their relative management efficiency in the post equity crisis environment.

Figure 4.2 *Framework and Distribution of average return on equity (in percentage) of Banks operating in Nordics region from 2015 to 2024*

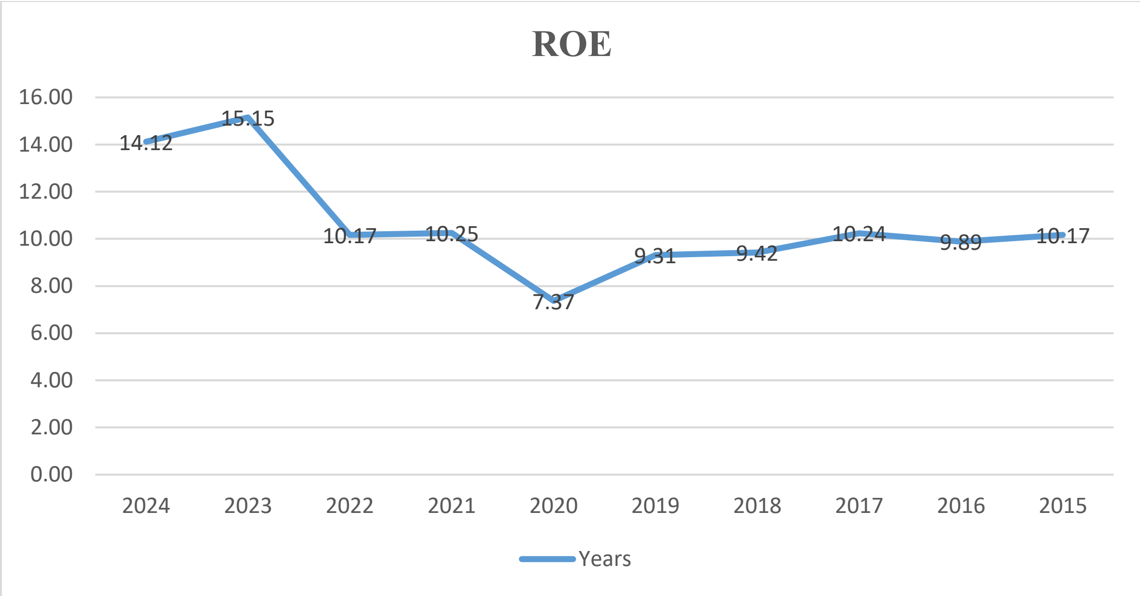


Figure 4.2 represents the aggregate return on equity trends for the Nordic banking cluster from 2015 to 2024, presenting a highly pronounced Ushaped recovery pattern accentuating the resilience and subsequent adaptive response of the sector during changes in economic conditions. From the chart, it can be observed that the ROE started at a stable 10.17% in 2015 and remained almost unchanged during 2016 to 2017 (9.89 to 10.24 percent) before entering the phase of an extended slide until it hit the bottom at 7.37 percent in 2020 what seemed to be perhaps the most difficult time for banking profitability, the environmental cues probably being due to the socio-economic constraints from the pandemic, regulatory pressures, and an extended lowinterest environment hurting the net interest margins. Apart from a gradual start to the recovery in 2019 with ROE at 9.31%, the period saw sustained improvements in 2018 at 9.42% and 2021 at 10.25%, before rebounding to exceptional ranges at 10.17% in 2022 and hitting an escarpment of 15.15% in 2023, a highwater mark for the entire decade. The slight moderation to 14.12% in 2024 points to some normalization from the extraordinary 2023 performance, yet it still constitutes the secondhighest level of ROE for the examined period. The trajectory exhibits the sector's ability to handle economic turmoil and make the most of better market conditions, higher interest rates, and

improved operational efficiency to give equity holders higher returns, an amplification of management's capability to convert profit from shareholder investments through the recovery phase.

Structure and pattern of the net interest margin

Net interest margin is the ratio of net interest income divided by total assets. The NIM is a profitability indicator that approximates the likelihood of a bank or investment firm thriving over the long haul. This metric helps prospective investors determine whether or not to invest in a given financial services firm by providing visibility into the profitability of their interest income versus their interest expenses. Table number 4.3 shows the structure of net interest margin for the period of 2015 to 2024.

Table 4.3 *Structure of net interest margin (in percentage) for the period of 2015 to 2024*

Bank	NORDEA	DANSKE	DNB	SEB	SWED BANK	SHB	OP	JYSKE	NYKREDIT	SYD BANK	SPARE BANK1	VEST	RLB	LF BANK	S-PANKKI	AKTIA	POP	ALANDS	MORE	Mean	SD
2024	1.41	1.07	1.98	1.39	1.89	1.64	2.02	1.35	2.12	2.55	2.28	1.93	3.90	1.39	3.43	1.31	3.41	2.25	2.10	2.08	0.78
2023	1.44	1.01	2.08	1.55	2.03	1.70	1.94	1.40	2.24	2.87	2.08	1.85	3.92	1.54	3.62	1.20	3.33	1.95	2.06	2.10	0.80
2022	1.11	0.71	1.78	1.15	1.38	1.39	1.18	0.91	1.11	1.75	1.62	1.62	2.85	1.25	1.65	0.88	1.84	1.24	1.78	1.43	0.48
2021	0.98	0.73	1.50	0.97	1.14	1.15	1.03	0.81	0.83	1.31	1.49	1.46	2.59	1.13	1.29	0.93	1.62	1.15	1.58	1.25	0.42
2020	0.92	0.76	1.64	0.94	1.21	1.18	0.96	0.81	0.84	1.14	1.60	1.50	2.57	1.25	1.41	0.84	1.66	1.15	1.62	1.26	0.44
2019	0.89	0.79	1.87	0.93	1.23	1.22	0.97	0.88	0.84	1.29	1.68	1.63	2.52	1.29	1.46	0.86	1.62	1.09	1.83	1.31	0.46
2018	0.89	0.85	1.73	0.95	1.26	1.24	0.97	0.99	0.98	1.46	1.58	1.50	2.69	1.36	1.34	0.96	1.56	1.13	1.74	1.33	0.44
2017	0.95	0.88	1.69	0.89	1.24	1.23	0.96	1.11	0.95	1.49	1.58	1.53	2.76	1.36	1.44	0.99	1.53	1.21	1.74	1.34	0.44
2016	0.75	0.98	1.59	0.81	1.21	1.21	0.95	1.20	0.88	1.72	1.44	1.49	3.10	1.32	1.46	1.04	1.58	1.24	1.81	1.36	0.52
2015	0.79	1.02	1.56	0.80	1.18	1.22	0.95	1.47	1.00	1.74	1.53	1.55	3.05	1.25	1.61	0.99	1.60	1.28	2.16	1.41	0.53
Mean	1.01	0.88	1.74	1.04	1.38	1.32	1.19	1.09	1.18	1.73	1.69	1.61	3.00	1.31	1.87	1.00	1.98	1.37	1.84		
SD	0.24	0.13	0.19	0.25	0.32	0.20	0.42	0.25	0.54	0.56	0.27	0.16	0.52	0.11	0.88	0.15	0.74	0.40	0.20		

Source: Annual Report of Banks

Table 4.3 presents the Net Interest Margin (NIM) of Nordic Commercial Banks from the year 2015 to 2024. The table shows how well the banks cover the interest they pay on deposits and other liabilities with the interest they earn on loans and other assets. The sector experienced its lowest average NIM of 1.25% in 2020, probably a reflection of ultralow interest rates and monetary policy accommodation during the pandemic period, before recovering to around the level of 2.062.10% in 2023 to 2024 with improved interest rate environments and better margin management. Although there are differences in the individual bank performances, RLB tends to have the highest NIM, averaging about 3.00% throughout the years, showing a better ability to charge interest against assets, whereas banks such as NORDEA, with an average NIM of merely 1.01%, and DANSKE, whose average NIM stands at 0.88%, experience relatively thinner margins but perhaps on account of their differing business models, asset compositions, or competitive positioning. SPARE BANK1 and SYD BANK also maintain good NIM levels, with means of 1.69% and 1.73%, respectively. This would suggest that such banks are managing their interest rate risks well and have profitable lending strategies. It is noted that low standard deviation values across most banks tend to confirm that NIM is a somewhat more stable profitability measure in comparison with others, like ROA or ROE, as interest margin is the core banking function. The recent improvements in Nordic banks' industrywide NIM levels during 2023 to 2024 indicate that they have effectively adapted to rising interest rate environments, with many institutions profiting from the fast repricing of assets against liabilities, which in turn enhances their longterm sustainability and attractiveness to investors looking for safe stable interest income generation.

Figure 4.3 *Pattern of average net interest margin (in percentage) of Banks operating in Nordic regions from 2015 to 2024.*

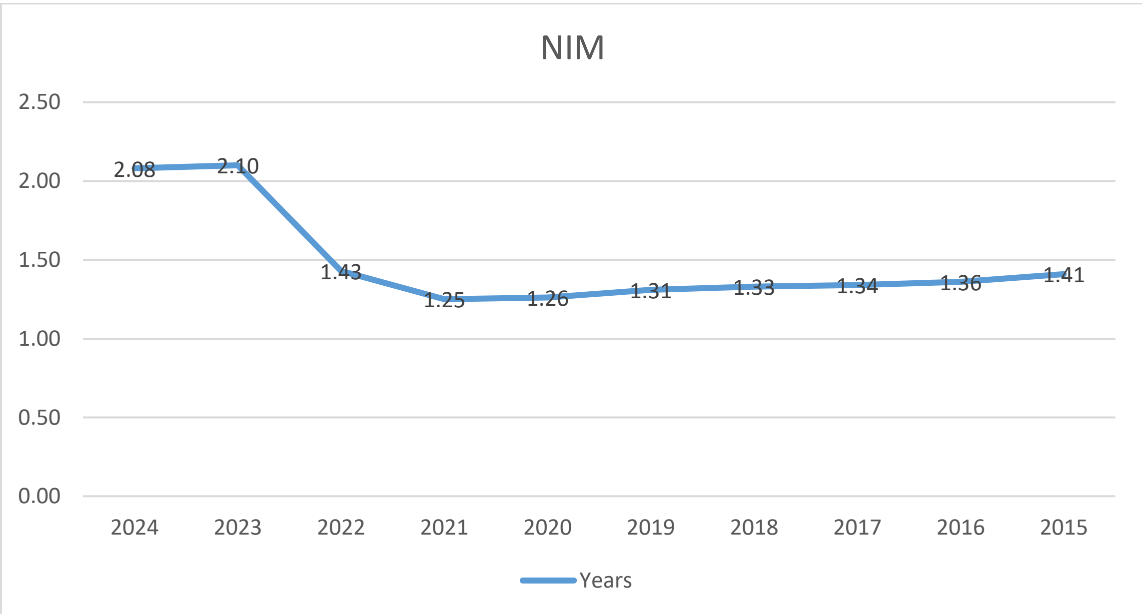


Figure 4.3 provides an overview of Nordic banking sector NIMs throughout the years of 2015 to 2024. This shows the characteristic trend in response to changing interest rate environments and monetary policy cycles. The chart indicates that the margin had a

moderate figure of 1.41% in 2015 and remained relatively stable during 2016 and 2017 (between 1.36% and 1.34%). Subsequently, the margin experiences a slow decline, reaching its deeprooted low of 1.25 in 2021, representing its most compressed period, likely a result of long periods of low and negative interest rate policies implemented by central banks during and after the financial crisis and pandemic response. However, the prettiest part of this graph must be the extraordinary recovery that began in 2020, with the NIM climbing slowly to a high of 2.10 in 2023 from 1.26 in 2019, 1.31 in 2018, 1.33 in 2022, and 2.06 in 2024 making these levels the highest of the entire analyzed period. In the recent past, we have seen remarkable improvements reflecting many aspects of the Nordic banking sector, which has historically been able to make money out of rising interest rate environments, wherein banks can move quickly to reprice their lending portfolios relative to their deposit costs, increasing the spread between interest earned and interest paid. This sharply upward movement, starting with the time frame of 2022 onward, depending upon one's perspective, paints a picture of how fast bank earning power recovers when monetary policy shifts from accommodative to restrictive, with such working against the sensitivity of this sector to an interest rate cycle and the most basic angle of its intermediation being that it earns from the positive yield curves and from having a higher absolute level of interest rates.

Structure and pattern of the equity to total asset ratio

The equity to total assets ratio, also known as the equity ratio, is a financial ratio that measures the percentage of a company's assets that are financed by equity. It is calculated by dividing the company's total equity by its total assets. A high equity to total assets ratio indicates that a company is financially strong, as it has a large amount of equity to support its assets.

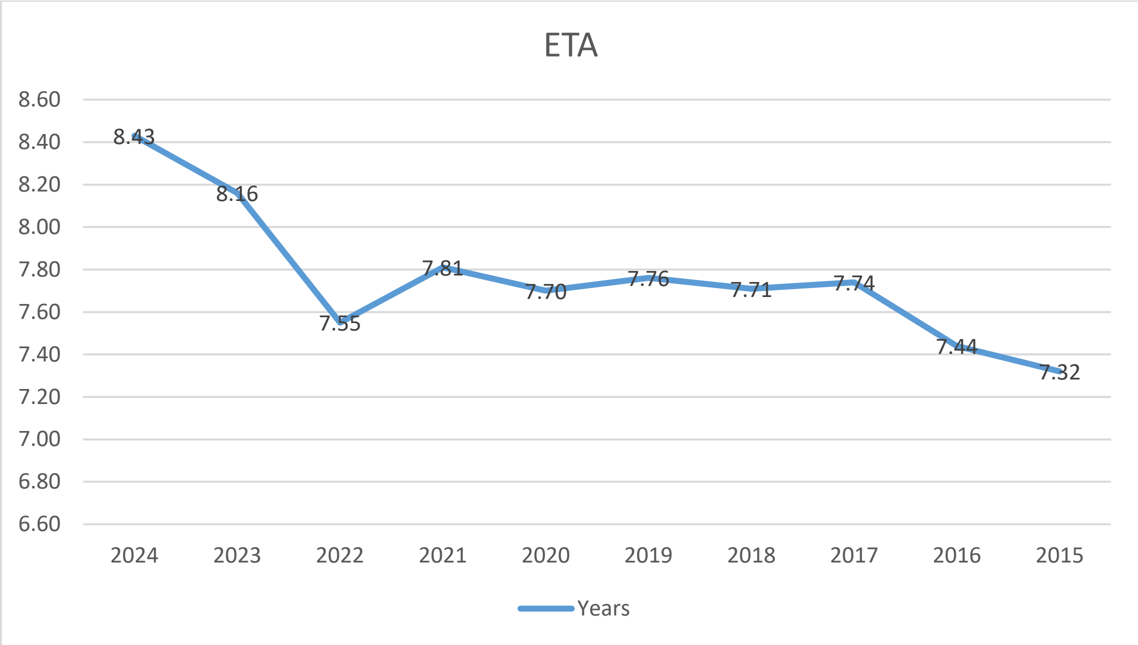
Table 4.4 *Structure of equity to total assets ratio (in percentage) for the period of 2015 to 2024.*

Bank	NORDEA	DANSKE	DNB	SEB	SWED BANK	SHB	OP	JYSKE	NYKREDIT	SYD BANK	SPARE BANK1	VEST	RLB	LF BANK	S-PANKKI	AKTIA	POP	ALANDS	MORE	Mean	SD
2024	5.20	4.73	7.84	6.15	7.27	5.93	11.24	6.74	16.36	8.15	12.32	7.77	14.03	5.03	7.38	6.23	12.14	6.82	8.82	8.43	3.26
2023	5.34	4.71	7.83	6.15	6.96	5.80	10.16	5.89	15.56	8.51	12.29	7.64	14.22	5.05	6.45	5.86	11.33	6.28	8.97	8.16	3.17
2022	5.19	4.23	7.73	5.79	6.17	5.68	8.35	5.42	14.13	7.80	11.20	8.30	13.47	4.94	5.86	5.16	9.70	5.37	9.05	7.55	2.89
2021	5.87	4.49	8.36	5.85	5.88	5.43	8.15	5.91	14.33	7.86	11.69	8.44	14.45	4.82	5.99	6.34	10.32	5.00	9.14	7.81	3.02
2020	6.11	4.10	8.51	5.66	5.98	5.47	8.18	5.45	13.16	7.54	11.34	8.33	14.85	4.84	6.41	6.31	10.15	4.84	9.07	7.70	2.94
2019	5.68	4.53	9.29	5.45	5.76	5.21	8.55	5.50	10.79	7.96	12.25	8.57	14.37	4.85	7.16	6.29	11.21	4.61	9.31	7.76	2.86
2018	5.97	4.56	9.01	5.80	6.13	4.78	8.37	5.72	11.27	8.31	11.63	8.26	14.48	4.60	6.86	6.37	10.97	4.36	9.00	7.71	2.83
2017	5.73	4.75	8.63	5.62	6.04	5.12	8.08	5.79	11.45	8.61	11.43	8.02	14.80	4.54	7.30	6.26	11.36	4.36	9.14	7.74	2.88
2016	5.26	4.78	8.09	5.38	6.02	5.19	7.65	5.54	8.59	8.02	11.08	8.03	14.65	4.78	7.71	6.46	10.95	4.32	8.83	7.44	2.65
2015	4.80	4.88	7.49	5.72	5.74	5.09	7.45	5.53	9.24	8.01	10.54	7.00	14.77	4.80	8.19	6.23	10.41	4.63	8.50	7.32	2.61
Mean	5.52	4.58	8.28	5.76	6.19	5.37	8.62	5.75	12.49	8.08	11.58	8.04	14.41	4.83	6.93	6.15	10.85	5.06	8.98		
SD	0.42	0.25	0.59	0.25	0.51	0.36	1.17	0.39	2.63	0.33	0.58	0.47	0.42	0.16	0.76	0.38	0.71	0.86	0.22		

Source: Annual Report of Banks

Table 4.4 depicts this ratio for the Nordic and European banks in years 2015 to 2024. The data shows that expectation of capital has been rising consistently of late across the banking sector, with the industry average increasing successively from 7.32% in 2015 to 8.43% in 2024, building higher capital buffers in line with various regulatory directives like Basel III on liquidity requirements and depending on the learnings from prior financial crises. The slow and steady augmentation of equity ratios shows a willingness across the entire industry to support strong capital positions that are able to absorb losses and continue engaging in lending during periods of economic stress. Across the spectrum, the performance levels of different banks are quite far apart, where RLB stands out as the strongest at 14.41% vesting of equity averages, followed by SPARE BANK1 (11.58%) and VEST (8.04%). This indicates these banks are running with equity cushions, and thus financially resilient and flexible. In contrast, the larger systemic banks, DANSKE (4.58%) and NORDEA (5.82%), have lower but acceptable levels of equity and are still able to sustain their business models which rely on deposit funding and the wholesale markets. The lower standard deviation relative to the equity capital suggests that while strategies are different, the trend within the sector for equity capital is clearly higher. The positive trend among equity capital levels permits banks within the Nordics to bolster and reinforce their financial positions, thus softening the negative impacts of changes in the economy and of the regulatory environment. This change augurs well for retaining the trust of their investors, and for strong capital levels that the banks are able to provide strong, growth-promoting loans to the economy.

Figure 4.4 *Framework and Distribution of average equity to total asset ratio (in times) for the period of 2015 to 2024*



The figure 4.4 illustrates the Nordic banking sector's average ETA ratio from the period 2015 to 2024. It shows 10 years strong capital composition of Nordic banking sector along with fluctuations because of regulatory changes and market responses. As shown in the graph, there was 7.32% of ETA on 2015 which raised to 8.43% on 2024 which is little over than 100 basis points. This indicates that there is an improvement in capital adequacy of the banking sector.

However, this movement was not consistently linear, as there was a steep decline of ETA to 7.55% in 2022, and again rose with 8.16% in 2023 and recorded the highest of 8.43% in 2024. ETA ratios remained stable from 2016 to 2021 showing volatility between 7.44% and 7.81%. This indicates a period where banks maintained stable capital levels while accomodating postfinancial crisis regulatory requirements, such as the implementation of Basel III. The decline in 2022 might have been from the results of economic uncertainty, asset pricing and strategic balance sheet adjustments while sharp recovery in 2023 and 2024 indicates banking sector's strong resilience and also commitment to standing strong capital buffers.

This trend of past years shows how Nordic banks have proritized in building strong equity bases enabling all the banking institutions to bear losses, meet regulatory capital requirements and maintain financial stability even when there is an economic uncertainty to become well-capitalized institutions which can sustain economic growth alongside offering assurance to depositors, investors, and regulators about their long-term viability and risk management competence.

Structure and pattern of the liabilities to total asset

The liabilities to total assets ratio, also known as the debt to asset ratio, is a financial ratio that measures the percentage of a company's assets that are financed by debt. It is calculated by dividing the company's total liabilities by its total assets. A high liability to total assets ratio indicates that a company is highly leveraged, meaning that it relies heavily on debt to finance its operations.

Table 4.5 *Structure of liabilities to total assets ratio (in percentage) for the period of 2015 to 2024.*

Bank	NORDEA	DANSKE	DNB	SEB	SWED BANK	SHB	OP	JYSKE	NYKREDIT	SYD BANK	SPARE BANK1	VEST	RLB	LF BANK	S-PANKKI	AKTIA	POP	ALANDS	MORE	Mean	SD
2024	94.80	95.27	92.16	93.85	92.73	94.07	88.76	93.26	83.64	91.85	87.68	92.23	85.97	94.97	92.62	93.77	87.86	93.18	91.18	91.57	3.26
2023	94.66	95.29	92.17	93.85	93.04	94.20	89.84	94.11	84.44	91.49	87.71	92.36	85.78	94.95	93.55	94.14	88.67	93.72	91.03	91.84	3.17
2022	94.81	95.77	92.27	94.21	93.83	94.32	91.65	94.58	85.87	92.20	88.80	91.70	86.53	95.06	94.14	94.84	90.30	94.63	90.95	92.45	2.89
2021	94.13	95.51	91.64	94.15	94.12	94.57	91.85	94.09	85.67	92.14	88.31	91.56	85.55	95.18	94.01	93.66	89.68	95.00	90.86	92.19	3.02
2020	93.89	95.90	91.49	94.34	94.02	94.53	91.82	94.55	86.84	92.46	88.66	91.67	85.15	95.16	93.59	93.69	89.85	95.16	90.93	92.30	2.94
2019	94.32	95.47	90.71	94.55	94.24	94.79	91.45	94.50	89.21	92.04	87.75	91.43	85.63	95.15	92.84	93.71	88.79	95.39	90.69	92.24	2.86
2018	94.03	95.44	90.99	94.20	93.87	95.22	91.63	94.28	88.73	91.69	88.37	91.74	85.52	95.40	93.14	93.63	89.03	95.64	91.00	92.29	2.83
2017	94.27	95.25	91.37	94.38	93.96	94.88	91.92	94.21	88.55	91.39	88.57	91.98	85.20	95.46	92.70	93.74	88.64	95.64	90.86	92.26	2.88
2016	94.74	95.22	91.91	94.62	93.98	94.81	92.35	94.46	91.41	91.98	88.92	91.97	85.35	95.22	92.29	93.54	89.05	95.68	91.17	92.56	2.65
2015	95.20	95.12	92.51	94.28	94.26	94.91	92.55	94.47	90.76	91.99	89.46	93.00	85.23	95.20	91.81	93.77	89.59	95.37	91.50	92.68	2.61
Mean	94.48	95.42	91.72	94.24	93.81	94.63	91.38	94.25	87.51	91.92	88.42	91.96	85.59	95.17	93.07	93.85	89.15	94.94	91.02		
SD	0.42	0.25	0.59	0.25	0.51	0.36	1.17	0.39	2.63	0.33	0.58	0.47	0.42	0.16	0.76	0.38	0.71	0.86	0.22		

Source: Annual Report of Banks

Table 4.5 shows liabilities to total assets ratio for Nordic and European banks. It measures what proportion of bank assets is financed by way of debt and deposits as opposed to equity capital, which is a complementary indicator to share capital ratio, and shows the leverage and funding structure of a banking sector. The trend shows a progressive decline in leverage in the sector, with the industry average falling steadily from 92.68%

in 2015 to 91.57% in 2024. Banks have continued to reduce their dependence on debt financing created capital structures to withstand economic shocks minimal capital during risk management practices. The third phase of deleveraging shows that the banking sector is now developing resilient capital structures that can adapt to economic uncertainty and regulatory shocks. Although, each individual bank's leverage strategy is different. For instance, RLB has the lowest average liability ratio of 85.59%, followed by SPAREBANK1 (88.42%) and VEST (91.96%). It indicates that these banks have adopted conservative funding profiles and maintain substantial equity protection. While large systemic banks like DANSKE (95.42%) and NORDEA (94.48%) maintain higher leverage ratios and operate their lending operations by relying more on their customer deposits and wholesale funding. Relatively low standard deviation values for most banks indicate that while there may be some degree of individuality in strategies, the overall massive decline in leverage has been the accepted trend throughout the sector. The steady improvement from 92.30% in 2020 to 91.57% in 2024 mainly highlights a postpandemic focus by the sector toward balance sheet strengthening, and therefore, this deleveraging has reflected an increase in capital adequacy positioning the Nordic banks as adequately capitalized, allowing them to stand on a much firmer footing toward maintaining stability while supporting economic growth through sustained lending capacity, and hence, depositing considerably more confidence in their longterm financial resilience as perceived by depositors, regulators, and investors.

Figure 4.5 *Framework and Distribution of average liabilities to total assets ratio (in times) of Banks operating in Nordic regions from 2015 to 2024.*

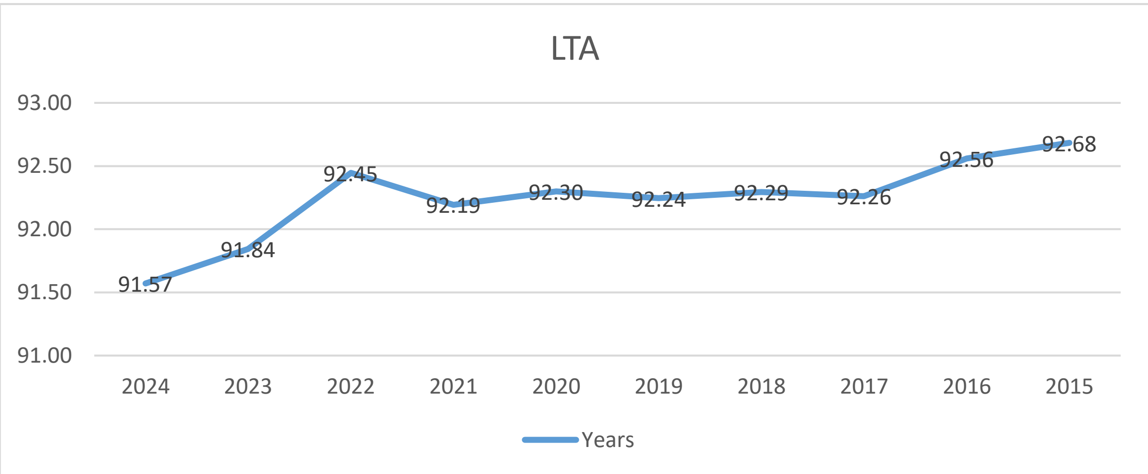


Figure 4.5 illustrates the pattern of the ratio of aggregate liabilities to total banking assets in the Nordic banking sector shown in Appendix 4.5 confirms the strategy of the sector since 2015 with the shift towards building stronger capital and reducing the dependency on debtfinanced funds. As shown in the ratio of aggregate liabilities to total assets to started the decade in 2015 with the LTA Ratio of 92.68%, a peak of 92.68%, which in a significant sink by 91.84 in 2023. This ratio value is slightly above 91.57 in 2024 which amounts to 111 Fisse in the decade. Collapse of LTA in 2024 was the outcome of the efforts on reduction in tier 1 debt to asset which was 92.19% in 2021 and subsequently declined to 91.57 in 2024. The shift in ratio in this case was the response to the regulatory tier 1 capital requirements as well as the risk management priorities. Between 2017 and 2020, the period shows relative stability between 92.2492.30%, revealing a consolidation phase where banks maintained steady leverage levels while adjusting to postcrisis regulatory frameworks. The drastic decline since 2022 shows the sector's commitment to building more resilient capital structures as this deleveraging pattern is the reflex i.e. inverse relationship of equity to total assets ratio, confirming that the Nordic banks see less reliance on debt financing from their end even as they increase the equity cushion for their stronger financial stability and regulatory compliance.

4.1.2 Descriptive Statistics

Descriptive statistics is a fundamental analytical framework that is used to summarize, interpret and explain the central features of financial data. It provides important information about timely distribution of critical applications and trends. During the analysis period of Nordic banking sector between 2015 to 2024, descriptive statistics played an important role in showing sector level performance and individualised institutional characteristics.

In descriptive statistics, measures of central tendency are given with high level of importance. For example, the mean explains an average performance level of all banks during the study period which shows bank’s performance providing an essential baseline. Standard deviation is another important variability measure that helps banks to identify the level of dispersion between means and volatility in their performance patterns.

Range analysis shows difference between minimum and maximum values on performance levels among the banks during the study period.
Descriptive statistics provides interesting information about the banking financial ratios such as ROA, ROE, NIM, ETA, and LTA. Time series analysis of mean values shows the sector-wide trends like post recovery of 2020 economic downturn, improvements in capitalization ratios due to regulatory compliance. Cross-sectional analysis shows outliers or strong performed banks through sector performance averages like SPARE BANK1 which always have a better ROE performance, and RLB, which enjoys the highest net interest margins.

Variability measures indicate risk profiles and operational stability where a low standard deviation shows presumed patterns of bank performance that interests picky conservative investors. Likewise, high standard deviation shows the probability of higher level of profitability and higher operational risk. Coefficient of variation which is calculate and the ratio of standard deviation to the mean helps to evaluate risk-adjusted performance across different institutions.

Skewness and kurtosis of data distribution also impact on strategic regulation and investment decisions When extreme values show tendency towards positive and negative results, it can give important indication on strategic regulations, investment decisions and investment allocation decisions.

This kind of statistical analysis builds foundation, offers means to implement complex analytical techniques for institutional heterogeneity, timely development and formulating strategic regulation of Nordic banking sector.

Table 4.6 *Descriptive Statistics*

Date: 10/04/25 Time: 15:59
Sample: 2015 2024

	ROA	ROE	NIM	ETA	LTA	LOGSIZE	GDPGROW
Mean	0.825223	10.60876	1.485727	7.760268	92.23972	3.788065	1.802632
Median	0.716962	10.62888	1.371331	7.078329	92.92167	3.331934	2.000000
Maximum	3.024890	22.48310	3.924017	16.35569	95.89512	6.472142	6.800000
Minimum	-0.118555	-2.718246	0.710483	4.104880	83.64431	1.099059	-2.400000
Std. Dev.	0.505341	4.110373	0.616878	2.864434	2.864430	1.656961	1.943744
Skewness	1.625941	-0.017580	1.664166	1.023756	-1.023755	0.155806	-0.118568
Kurtosis	6.612711	3.484112	6.218106	3.280600	3.280612	1.538134	3.747549
Jarque-Bera	187.0425	1.865173	169.6858	33.81244	33.81239	17.68706	4.869247
Probability	0.000000	0.393534	0.000000	0.000000	0.000000	0.000144	0.087631
Sum	156.7924	2015.664	282.2881	1474.451	17525.55	719.7323	342.5000
Sum Sq. Dev.	48.26489	3193.186	71.92182	1550.742	1550.737	518.9035	714.0687
Observations	190	190	190	190	190	190	190

The descriptive statistics table shows Nordic banking sector's statistical summary of ROA, ROE, NIM, ETA, LTA, Bank size, GDP growth and inflation from the period 2015 to 2024. It gives detail insights on performance characteristics and also the data distribution of a sector. On an average, the sample banks were profitable during the study period with a mean ROA of 0.82% and ROE of 10.6%. Even though the averages are all positive, the values are widely different as few banks had negative returns while others scored a very high level of profit. The average Net interest margin (NIM) was around 1.5% which was also widely different among the selected banks. In terms of capital structure, Banks were highly leveraged where liabilities were more than 92% of total assets while average equity was made only just about 7.8%. Bank size, which was converted into a logarithmic form (LOGSIZE) for consistency and better distributional properties, also differed substantially within the sample, ranging from very small to very large institutions. At the macroeconomic level, GDP growth averaged close to 1.8 percent during the period, covers a generally favorable macroeconomic envirionment with periods of expansion. Overall, the descriptive results suggest a stable and profitable banking sector with healthy variation across banks, which provides a strong foundation for futher empirical analysis.

4.1.3 Correlation analysis

After calculating the descriptive statistics, next correlation coefficients of Pearson is derived and the results shown in Table 4.7. To be more exact, it demonstrates the relationship between both of dependent and independent variables of Banks in Nordic regions. This part is thus dedicated to the description of direction and magnitude relationship between various pairs of these specific variables. Correlation is used to measure the strength of the linear relationship between dependent and independent variables and the direction of the relationship. The paper has employed the correlation analysis to demonstrate the correlation between the dependent variables which are the return on assets (ROA), return on equity (ROE) and net interest margin (NIM), and the independent variables are the liabilities to total asset (LTA), and equity to total assets (ETA).

Table 4.7 *Correlation coefficient matrix*

Variable	ROE	ROA	NIM	LTA	LOG SIZE	INF	ETA	GDP
ROE	1							
ROA	0.738***	1						
NIM	0.507***	0.765***	1					
LTA	0.121	0.712***	0.600***	1				
LOG SIZE	0.115	0.234**	0.434***	0.467***	1			
INF	0.283***	0.183**	0.202**	0.00013	0.08	1		
ETA	0.121	0.712***	0.600***	1.000***	0.467***	0.00013	1	
GDP	0.140*	0.131	0.052	0.032	0.056	0.041	0.032	1

** denotes 10% significance level, ** denotes 5% significance level, *** denotes 1% significance level*

The correlation analysis shows strong positive relationships among the profitability measures, with return on assets (ROA) highly correlated with both return on equity (ROE) and net interest margin (NIM). This indicates that banks with efficient use of assets and strong interest margins tend to achieve higher overall profitability. ROE and NIM are also positively related, reinforcing the link between interest income and shareholder returns.

Focusing on capital structure, LTA is negatively correlated with ROA and NIM, meaning higher access to the capital markets is correlated with a decline in profitability. On the other hand, the ETA ratio is positively correlated with ROA and NIM. This means higher LTA ratio translated to a decline in profitability, but higher ETA ratio means improved solvency translated to an improvement in ROA and NIM. To a greater extent LTA and ETA being negatively correlated in a “perfect” meaning they answer a “yes” and “no” to the same question slopes reflects the same balance sheet information: the two ratios correlate and balance the sheet positively and negatively, granting decline in solvency and LTA in higher debt.

With the other control variables, especially LOGSIZE. To balance the sheet size, LOGSIZE was adjusted in a logarithmic format. The allocated size with debt and profitability ratios, ROA and NIM, as well as LTA ratios shows a decline in profitability and disengagement was observable. Larger banks tend to complicate the process of maintaining higher profitability. Moving the inflation rates higher, the profitability ratios move in alignment with the profitability and NIM ratios suggesting inflation is overall creating beneficial outcomes for banks who can reprice liabilities and assets quickly. On the same note, higher inflation positively correlated with the profitability variables suggesting overall beneficial outcomes profitability wise for banks that can reprice liabilities and assets quickly.

Overall, the correlation analysis illustrates how closely connected the different dimensions of profitability are and discusses the impact of the capital structure, size of the bank, and macroeconomic elements, while limiting the warning regarding regression analysis and the multicollinearity of LTA and ETA.

4.1.4 Regression Analysis

Regression analysis focuses on the relationships between dependent and independent variables. It aims to extract an equation that defines the relation between dependent and independent variables. In Table 4.8, the output of regression analysis presents the dependent variable, ROA, and the independent variable, LTA. Data interpretation employed the random effects model. This approach was driven by the small sample size and few banks, as well as the relatively stable inflation and GDP growth cross-country variables in the Nordic countries. Given these conditions, random effects were preferable as they accommodate firm-specific and time-invariant country-level variables together with efficient estimation. As a result, the random effects model will be the basis of all regression analysis in the subsequent chapters of this study.

Table 4.8 *Regression Results*

Variables	ROA		ROE		NIM	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	10.5364***	4.98	32.9076	1.19	15.6589***	5.26
LTA	0.1371***	(5.82)	0.3989	(1.57)	0.1559***	(5.82)
LOGSIZE	0.0734***	6.28	0.7511***	3.42	0.0199***	4.51
INFLATION	0.0321**	2.25	0.3961**	2.25	0.0505***	2.31
GDPGROWTH	0.0151	1.74	0.171	1.5	0.0246	(1.65)
R-squared	0.808		0.501		0.745	
Adjusted R-squared	0.782		0.435		0.711	
F-statistic	31.86***		7.62***		22.13***	
Observations (N)	190		190		190	
Hausman χ^2 (p-value)	18.29 (0.0011)		12.17 (0.0161)		25.38 (0.0000)	

Table 4.8 shows the effect of capital structure on profitability of Nordic commercial banks as a result of random effect regression. The main profitability metrics are Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM). The main independent variable, Liabilities to Total Assets (LTA) is statistically significant and negative with all profitability metrics. It suggests that highly leveraged Nordic banks achieve less profit when relied more on debt and can reduce the returns as well.

Bank size (LOGSIZE), ROA, ROE and NIM shows positive and highly significant relationship which means larger banks are more profitable due to economies of scale and better diversification of operations. Among macroeconomic control variables, inflation shows positive and highly important relationship with all three-profitability metrics. That means during high inflation, banks might be able to adjust their interest margins. On the other hand, GDP growth is statistically insignificant although it is positive which shows that short-term GDP growth fluctuations do not effect on the profitability of Nordic commercial banks.

Overall, R-squared values indicate that the models explain a big part of profitability variation with 80.8% ROA, 50.1% ROE, and 74.5% NIM. The F-statistics are significant in all regressions, confirming that the models are statistically valid. The Hausman test results show that while fixed effects could also be appropriate, the random effects model was retained due to the small dataset and limited variation in country level variables. This approach provides more efficient estimates and better captures the effects of both firm specific and macroeconomic factors on bank profitability.

4.1.5 Robustness check

To ensure the robustness of the findings, the regression models were re-estimated using equity to total assets (ETA). Since LTA and ETA are perfectly negatively correlated, separate regressions were run with ROA, NIM and ROE as dependent variables. Output was generated using EViews.

To test the reliability of the main findings, the study conducted a robustness check by replacing the leverage measure (liabilities to total assets) with equity to total assets (ETA) as an alternative indicator of capital structure. The results of random effects of regression presented in Table 4.9 show the relationships consistent with original analysis. The coefficient of ETA shows positive and statistically significant with ROA and NIM, which indicates that banks with higher equity ratios tend to be more profitable. It means strong equity base improves constant returns especially through interest margins and asset utilization. But even though ETA has positive effect on ROE, it is statistically insignificant that it might reflect trade-off between achieving higher returns for shareholders and maintaining higher level of equities.

Control variables also show consistent behavior with the main results. Bank size (LOGSIZE) remains positive and an important relationship with all profitability measures, showing larger banks benefit from diversified operations and economies of scale. Nordic banks might adjust their pricing and interest margins during high inflation period shown by positive and significant relationship of inflation with profitability measures. Short-term macroeconomic variations do not have an impact on profitability which is shown by statistically insignificant GDP growth with all models. All the results confirm that the conclusions of study are robust and not in the choice of capital structure variables strengthening the validity of empirical findings.

Table 4.9 *Regression outcomes*

Variables	ROA		ROE		NIM	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	2.1299***	(4.64)	13.2454**	(2.20)	2.7111***	(4.20)
ETA	0.1267***	5.64	0.4615	1.57	0.1837***	5.82
LOGSIZE	0.5012***	4.39	5.1091***	3.42	0.7244***	4.51
INFLATION	0.0186**	2.23	0.2468**	2.25	0.0271**	2.31
GDPGROWTH	0.0159	1.74	0.18	1.5	0.0212	(1.65)
R-squared	0.808		0.501		0.745	
Adjusted R-squared	0.782		0.435		0.711	
F-statistic	31.86***		7.62***		22.13***	
Observations (N)	190		190		190	
Hausman χ^2 (p-value)	18.29 (0.0011)		12.17 (0.0161)		25.38 (0.0000)	

4.2 Discussion

The statistical analysis indicates that the capital structure of Nordics banks profits is in the positive and growing order. Furthermore, the significant and negative association of all the profitability measures (ROA, ROE, and NIM) with liabilities to total assets (LTA) indicates that the rise of leverage results in the decline of profitability, which might be to the rise in the financial costs and exposure to risk. This matches with almost all the previous works such as Abor (2005), Gill et al. (2011), Taani (2013), Booth et al. (2001), and Sorsa (2016) which concluded that the increase in debt is associated with the lower profitability of firms and banks. Other scholars, such as Shubita and Alsawalhah (2012), and Endri et al. (2021) seem to be on the contrary side as they reported positive association of leverage with profitability arguing that the linkage could be attributed to differences in regional and financial systems.

Due to price shifting benefits under inflation, larger banks also acquire greater operational efficiency, and economies of scale, which translates to even more inflated profits. This correlates with Musah (2017), and Rumler and Waschiczek (2016) findings, where bank size and inflation were similarly established as positive influencers. Given the limited sample size and country level variable exposure across the Nordic countries, the data were likely better fit with the Random Effects model to perform estimations. The lack of significance of GDP growth in all models implies that the banks’ performance is largely unaffected by the short-term fluctuations of the economy, which is also in accordance with the results of Pham, Hoang, and Nhung (2022). The use of equity to total assets (ETA) in place of leverage in the robustness check further confirms the findings. This, in addition to the findings, provides evidence that Nordic banks’ profitability and financial stability rely on the optimal balance maintained between equity and debt.

5 Summary, Conclusion and Limitations

5.1 Summary

This research was analyzed to understand the interaction between the Nordic commercial banks' profitability with respect to their capital structure from the period 2015 to 2024. Among the 19 commercial banks located in Finland, Sweden, Norway, and Denmark included in the study, the impact of capital structure measures such as liabilities to total assets, and equity to total assets ratios on profitability indicators like return on assets, return on equity, and net interest margin was assessed.

Descriptive analysis identified and encompassed a variety of important banking profitability patterns. Particularly from 2020 the banking sector experienced a reduction in profitability, which was primarily cyclical, and was probably attributable to the uncertainties surrounding the pandemic. The years 2021 to 2024 are indicative of a turnaround, with growing profitability measures as ROA attained 1.20% in 2023, ROE at 15.15% and net interest margin at 2.10% during the same year. Improved operational efficiency of banks in the Nordic region was the result of increased interest rates during these years.

An analysis of the decade long trends in capital structure illustrates how the trend is leve depresiong and improving the organizations capital structure. Equity as a proportion of total assets moved up from 7.32% in 2015 to 8.43% in 2024 and average total liabilities as a proportion of total assets decreased from 92.68% to 91.57% over the same period. This illustrates how the firms in the banking sector are responding to the challenges posed to the sector as a consequence of the Basel 2 and Basel 3 banking regulations and the capital structural global challenges posed in the counter cyclical capital regulation crisis of global banking during the late 2000’s.

The analyses of correlation revealed predictable results within the profitability metrics as well as within the bank for assigns the profitability as assets, profitability as interest margins profitability as total and operating profit which can be used as a strong predictor for overall profitability performance. Concerning capital structure, correlation is expected where total liabilities as a proportion of assets is expected to correlate negatively with profitability and assets as equity to positively. The strong negative correlation between these profitability metrics is why the models needed to treat them separately in the estimates to counter multicollinearity.

Using the relevant random effects models, the regression analysis presented strong results concerning the capital structure influence on the profitability of banks. The analysis consistently demonstrated that all three measures of profitability are negatively and significantly affected by higher levels of leverage (LTA), whereas higher equity ratios (ETA) positively influence ROA and NIM. The size of the banks consistently being a positive factor suggests that larger institutions gain more from economies of scale. The positive influence of inflation on all the measures of profitability suggests that banks can pass on the inflation costs to their customers. The moderation of inflation makes it easy for banks to price their interest and fees profitably. The statistically insignificant effects of GDP growth suggest that macroeconomic fluctuations at least in the shortrun do very little in influencing the performance of Nordic banks.

Using alternative specifications to perform the robustness checks on the study confirmed the relationship stability and strengthened the conclusions made on the capital structure and profitability relationship in Nordic banking.

5.2 Conclusion

The study enables an improved understanding of the interrelation of capital structure and profitability within the advanced and highly regulated banking systems of the Nordic countries, considering their stable economies. It adds to the theoretical and practical understanding regarding the financing alternatives that influence the performance of banks in developed economies.

The main conclusion indicates that Nordic commercial banks negatively affect profitability to a considerable extent as they increase the amounts of debt in their capital structure. Data shows that banks with a higher proportion of debt relative to total assets incur lower returns on assets, lower returns on equity, and lower net interest margins. Excessive debt financing does increase the risk of financial distress, and thus, exposure to unprofitable high debt financing expenses outweighs the profitability that stems from tax shield and lower agency costs of debt. This evidence also reinforces the theories that underline the costs of financial distress and the requirements regarding capital adequacy of banks.

On the other hand, banks that have stronger equity positions capture more profitability, especially in terms of the profitability of assets and in the interest margins. The ability of banks to capture equity profitability provides evidence that well capitalized banks operate more efficiently and incur less bankruptcy risk, coupled with greater risk to return opportunities. This observation deserves attention, especially considering the regulatory focus on capital adequacy in the years following the financial crisis. It seems, therefore, that requirements on banks to increase their capital ratios will not hinder performance and may enhance it.

This study also demonstrates that size profitability with respect to the neutralization of large resources still underplays strategically large positions for dispersion and possibly dominant market power. This result complements the consolidation trends in the banking industry and highlights the importance of scale, even with the technological changes and the shifting of business models.

Higher inflation thereby enhances bank profitability; it means that Nordic banks have been able to effectively manage their asset liability structure in such a way as to benefit from the rising price levels, probably with loans being repriced at a faster rate than deposits. This capacity becomes especially relevant in the current economic environment where many developed economies are having high inflation after such an extended period of price stability.

Theoretically, such results reinforce the tradeoff theory of capital structure that is about weighing the benefits and the costs of debt financing. Although banks would face different regulatory constraints than nonfinancial firms, the basic principle that the optimal capital structure involves taking into consideration the costs of financial leverage should apply. Results do not fully support the pecking order theory, which would have predicted that more profitable banks increased leverage along two dimensions, a situation not observed in the study.

Several important implications arise from the research for practitioners. Bank managers should recognize that the optimal debt equity mix holds much more importance compared to any other factor behind a bank's profitability. While leverage can provide some benefits, too much reliance on borrowing to finance activity may be counterproductive to bank performance. This study finds that the Nordic banks raising capital levels have done well on profitability, thus backing strategic decisions for reinforcing equity bases farther than the minimum prescribed under regulation.

Regulators should be encouraged by the fact that strong capital requirements do not appear to restrict bank profitability. Better capitalized banks perform better, and to that extent, a regulatory framework that promotes banks to maintain higher capital positions shall enhance financial stability alongside commercial viability. The regulatory objective, therefore, is aligned with the outcome regarding the bank's performance and consequently gives support for continued existence and refinement of the capital adequacy framework.

Investors and stakeholders may use this information to more accurately appraise banks' performance and risk profiles. The positive association between equity ratios and profitability means that banks that maintain conservative capital structures could provide more sustainable returns, while banks with higher leverage could bear greater performance volatility and risk.

Maintaining profitability in the post COVID world, the Nordic banking space has in the past shown resilience in face of economic challenges and has further evolved through changing market conditions. This industry is thus well positioned to build upon a foundation provided by the strength of capital positions, coupled with efficient operations and deep risk management practices. Yet, banks will need to maintain a keen eye on capital management issues such as regulation, macroeconomic conditions, and the competitive environment evolve.

Based on the literature published recently, most, if not all, prior studies focused on the developing world or mentioned studying the previous decades. This study thus suggests the relationship between the capital structure profitability functions in a regulated banking sector during economically significant periods, especially during and after the COVID-19 era.

To conclude, this study confirms that in the Nordic region, the capital structure fundamentally affects the profitability of banks. This suggests that Nordic countries may sensibly balance their capital structures with equity buffers and thus improve the financial and economic stability of their banking systems and overall countries. In the context of the economic and regulatory changes that banks around the world are undergoing, the Nordic region may testify safely to the economic benefits of a conservative and strong capital position and the economic stability of the region to reassure the banking sector of the world that strong capital positions do not adversely affect economic performance.

5.3 Limitations

While the study offers insight into capital structure and profitability linkages in Nordic commercial banks, certain other limitations, apart from those discussed in Chapter 1, should be considered. A perfect negative correlation existed between liabilities to total assets and equity to total assets ratios, which made severe multicollinearity a big problem; hence, they had to be used alone in the regression models. While this approach is methodologically sound and widely accepted, this also means that the effects of these two capital structure variables cannot be investigated jointly in the models. Alternatively, one could test if structural equation modeling or principal components analysis might eliminate some of these barriers in future research. Secondly, this study relies solely on secondary data from credible sources, including annual reports, Orbis Bank Focus, Bloomberg, and Refinitiv. However, the accuracy of this data has never been independently verified; if the original data the sources of which were unwilling or unable to properly verify arrived at any inconsistency or errors, the consequences would have been parroted by the end results of the analysis. In addition, accounting standards, reporting practices, or disclosure requirements may vary across countries and time periods, thus introducing measurement errors that are difficult to detect or correct.

The panel regression method with random effects was applied based on the findings of the Hausman test and the peculiarities of the dataset. However, other methods such as dynamic panel models using GMM estimators could, in theory, provide different insights, along with fixed effects models or other more advanced techniques that take into consideration the potential endogeneity that lies between capital structure and profitability. Every model specification implicitly trades off a set of assumptions with respect to estimation properties. Estimation techniques, because they are based on regression analyses, indicate associations between capital structure and performance; however, the precise causal mechanisms are yet to be determined. While one can never completely dismiss the possibility of reverse causation, whereby profitability dictates the actual capital structure decisions rather than the other way around, it remains somewhat of a legitimate possibility: Hence, profitable banks might opt for different capital structures, or an unobserved factor might influence both capital structure and profitability simultaneously as well. Future research implementing instrumental variables, natural experiments, or other advanced causal identification tools should put this limitation firmly to rest.

The results pertain to Nordic commercial banks operating in highly developed and well-regulated financial markets with well sophisticated institutional frameworks. The nature of such a very well-developed economy might curb the generalizability of the findings to banking sectors in developing economies, different geographies, or other types of financial institutions such as investment banks, cooperative banks, or credit unions. The exceptional features of Nordic bank’s system such as thorough regulatory oversight, high level of financial development as well as cultural and institutional configuration indicate that the relationships shown here can be taken to different levels on other sectors. In addition, during this study conventional statistical methods such as descriptive statistics, correlation analysis and panel regression methods are used, and these methods fit the respective research questions, but it does not mean that they are free from all the limitations. The estimation carried on here assumes linear relationships between variables, which may very well be unrepresentative of the more complex, nonlinear interactions. In addition, the present study mostly focuses little or no attention whatsoever to any threshold effects, structural breaks, or regime shifts that might be at play in the relationship between capital structure and profitability.

Although this model contains several controls, a variable omitted bias might still arise. Management quality, corporate governance structures, technological capabilities, competitive positioning, specific changes in regulation, customer base characteristics, or other bank specific or market specific attributes potentially affecting profitability are not explicitly considered in the model. Such omitted factors potentially confound the capital structure to profitability relationships observed in this study. On the other hand, the banking sector witnessed transformations with the onset of and in the years following this study, with technological disruptions, regulatory reforms, and changes in business models such as digital banking and fintech competition. The trends that began during the study period can potentially affect the relationship determined in this research. Future research must continuously reexamine whether the relationship between capital structure and profitability determined in the past can still hold or should be reinterpreted in the context of the ongoing transformation of the industry. But nevertheless, this study gives an impression regarding the capital structure and profitability relations in Nordic commercial banks, so that there is a foundation upon which future research can be built.

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Appendices

Appendix 1. Description of Variables and Data Sources

Variable	Description	Measurement / Formula	Source
ROA	Return on Assets	Net Income / Total Assets	Annual Reports
ROE	Return on Equity	Net Income / Total Equity	Annual Reports
NIM	Net Interest Margin	Net Interest Income / Total Assets	Annual Reports
LTA	Leverage Ratio	Total Liabilities / Total Assets	Annual Reports
ETA	Equity Strength	Total Equity / Total Assets	Annual Reports
LOGSIZE	Bank Size	Natural Log of Total Assets	Annual Reports
INFLATION	Inflation Rate	Annual % Change in Consumer Prices	World Bank
GDPGROWTH	GDP Growth Rate	Annual % Change in Real GDP	World Bank

Appendix 2. Data Processing and Transformation

Bank Size (LOGSIZE)	It was derived as the natural logarithm of total assets.
Profitability Ratios	(ROA, ROE, and NIM) were calculated from audited annual financial statements obtained from Annual Reports.
Capital Structure Ratios	(LTA and ETA) were computed using balance sheet data.
Macroeconomic Variables	(Inflation and GDP Growth) were collected from the World Bank's World Development Indicators.
Data processed	All variables were crosschecked for consistency before conducting panel regression analysis in EViews 12.