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COMPARATIVE FINANCIAL STATEMENT ANALYSIS OF MAJOR ESTONIAN BANKS IN THE YEARS 2018–2021

Master's thesis
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I hereby declare that I have compiled the thesis independently
and all works, important standpoints and data by other authors
have been properly referenced and the same thesis
has not been previously presented for grading.

The document length is 14,746 words from the introduction to the end of the conclusion.

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ABSTRACT

The aim of the thesis is to identify differences and similarities in the structure of the main financial statements, financial performance, and efficiency between major Estonian banks in the years 2018–2021 using data from annual reports. Swedbank, SEB, Luminor, and LHV banks were chosen for the analysis as they constitute nearly 90% of the Estonian banking sector. The author applied horizontal and vertical analysis of the primary financial statements, as well as compilation of overall efficiency matrix, growth and benchmark indices, and decomposition analysis approach.

The financial statements' structures were largely similar among banks, yet a few noteworthy differences were present. LHV stood out from its peers by holding a considerably larger liquidity buffer due to the rapid expansion of its deposit portfolio. Swedbank had the most diverse income structure due to its highly developed insurance business and income from IT services provided to parent group companies. Luminor had much larger operating expenses due to its transition from former parents' systems.

All banks apart from Luminor grew in size. The bank had major problems on the customer side that considerably reduced its client base. LHV demonstrated an impressive growth by quadrupling in size due to the consistent improvement of its mobile app and the implementation of new products and solutions. SEB and Swedbank both demonstrated organic growth. The COVID-19 pandemic in 2020 affected both banks but had a more adverse effect on Luminor. LHV's growth remained immune to external shocks.

The ranking of the banks based on the benchmark index was correlated with size growth. Individual efficiencies showed mixed results. Only SEB efficiency showed a modest growth of 1% annually during the period. LHV efficiency remained at the same level. Swedbank and Luminor annually decreased their efficiency levels on average by 4% and 6%, respectively.

Keywords: financial statement analysis, comparative analysis, commercial banks, overall efficiency, efficiency matrix.

INTRODUCTION

The banking sector is critical to every country's economic prosperity. A robust banking industry enables the efficient administration of funds and financial investments, enhancing a country's financial and economic system (Claessens & Laeven, 2005; Ayadi et al., 2015). Furthermore, volatility in the banking sector has a detrimental impact on economic growth (Creel et al., 2015). Because of the introduction of new technologies, banks are becoming increasingly competitive, making significant efforts to enhance their performance and efficiency (Menor & Roth, 2008; Wonglimpiyarat, 2014). Although the relative performance of the banking sector has long been a major issue, it is still critical for both scholars and policymakers.

Banks constitute most of the Estonian financial industry. In recent years, a lot has happened in the Estonian banking industry. Banks merged, owners changed, new banks created with local capital joined the market, and some banks changed their names. The financial supervision and crisis resolution authority revoked one bank's operating license and prohibited another's Estonian branch from functioning. Despite changes in the market players, the number of credit institutions has only decreased by a little. By the end of 2022, Estonia had 13 banks, four of which were branches of foreign credit institutions. All this local turmoil got limited scholarly attention. Considering the importance of banking sector in the stability of a country’s whole financial system, individual banks’ performance and efficiency are crucial factors to study.

The aim of the thesis is to identify differences and similarities in the structure of the main financial statements, financial performance, and overall efficiency between major Estonian banks in the years 2018–2021 using data from annual reports.

The period of 2018–2021 was chosen for two reasons. Firstly, 2018 is the first full financial year of a newly established bank Luminor. This allows for a more accurate comparison of the financial data. Secondly, 2021 is the latest available financial data at the time of writing the thesis.

In order to achieve the aim of the thesis, the author conducts a comparative analysis of financial results. The approaches include vertical, horizontal, trend, and matrix analysis. A special emphasis is put on the overall efficiency matrix introduced by Siimann (2018). The author uses an industry-specific efficiency matrix by applying a different set of quantitative indicators compared to the commonly used efficiency matrix format. The author will test the applicability of this method to the major Estonian banks and discuss the results.

The following research questions are defined to achieve the aim of the thesis:

1. What are the main differences in the structures of the financial statements of the banks? What could be the reasons behind the differences, if any?
2. What are the main differences in the dynamics of the financial statements of the banks? What could be the reasons behind the differences, if any?
3. How do banks differ from an overall efficiency perspective? What could be the reasons behind differences? What could be the reasons behind the differences, if any?
4. How do they rank compared to each other based on the overall efficiency, and what are the reasons behind the differences, if any?

The following research tasks require completion to find answers to aforementioned research questions:

1. Investigation of financial analysis methods commonly employed.
2. Application of financial analysis methods to address research questions 1 through 4.
3. Investigation of efficiency matrix concept.
4. Adoption of overall efficiency matrix concept to the selected banks to address research question 3 and 4.

The thesis is composed of three chapters. The first chapter contains introduction and provides background information on Estonian banking sector, the banks selected for study, and a summary of previous research as well as theoretical frameworks used in the thesis. The second chapter focuses on a comparative analysis of the financial statements of the banks in the years 2018–2021. Finally, the third chapter is dedicated to compilation of industry specific overall efficiency matrix on the example of the selected banks, identifying the reasons behind the differences as well as defining banks' strong and weak areas.

The author believes the thesis to be useful for those in management positions within the banking industry, potential investors and general public who are interested in this field.

The author would like to express his gratitude to his supervisor, Paavo Siimann, for guidance, professional advice, feedback, and patience.

1. OVERVIEW OF THE BANKING INDUSTRY AND BANKS BACKGROUND

1.1. Industry overview

The Estonian financial sector is relatively small compared to other European markets. The ratio of assets of the Estonian banking sector to GDP was 128% in 2020, which is considerably lower than EU average of 292% (Eurostat, 2022). This can be attributed to several factors, such as the young age of the financial sector that supports the market economy, lower levels of income and savings among Estonian citizens, and smaller debt loads of private and public entities compared to other states. Additionally, the size and ownership structure of Estonian companies have also contributed to the relatively small size and structure of the country's banking industry. Particularly for small companies, accessing financial markets to raise cash is more expensive than doing so through banks. It is worth noting that a significant portion of companies in Estonia are foreign-owned – in 2022, out of 8,190 active enterprise groups 2,318 were foreign-controlled (Estonian Statistics, 2023). This allows them to obtain funding from their parent companies. Furthermore, the limited size of the domestic market has led many larger companies to seek borrowing opportunities abroad and issue bonds in foreign markets.

The Estonian financial sector is centred around banks. In addition to the Estonian financial sector being bank-centred, the banking sector itself is one of the most concentrated in the European Union. The assets of the three largest banks constitute more than 75% of the total banking sector’s assets (Finantsinspektsioon Statistics, 2022). The largest Estonian banks in terms of assets are Swedbank AS (31%), Luminor Bank AS (30%), AS SEB Pank (16%), AS LHV Group (12.5%). The share of the remaining ten banks in the total banking sector’s assets is around 10% (Figure 1).

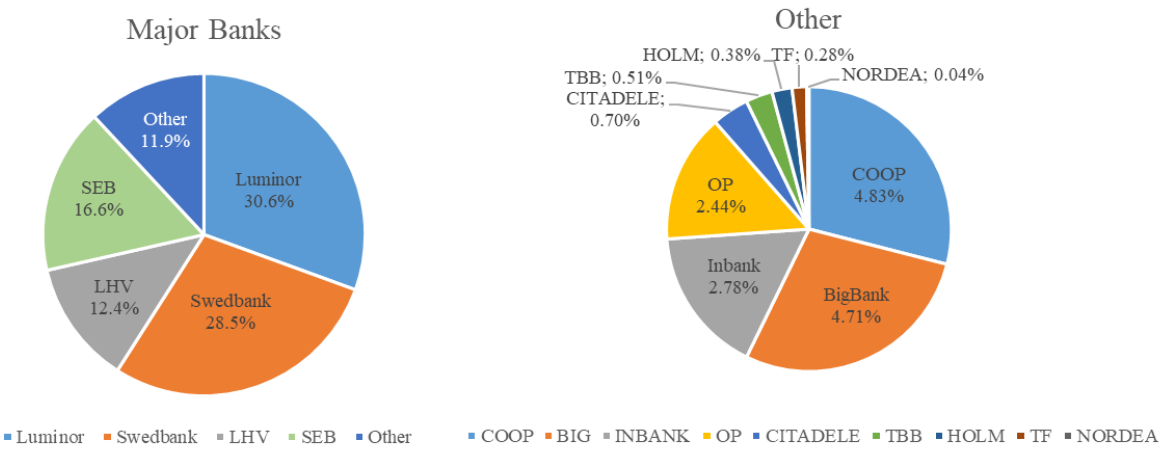

Figure 1. Market share of banks in Estonia as end of 2022 by total assets.

Source: Compiled by author on the basis of data provided by Finantsinspektsioon Statistics website (Balance sheet statement of credit institutions 31.12.2022).

The financial industry in Estonia is dominated by financial conglomerates from the Nordic region that control credit institutions, insurance firms, and fund managers. As a result, the ownership structure of the Estonian financial sector is closely linked to that of the Nordic countries. These financial conglomerates own the largest banks, insurance providers, asset managers, and leasing businesses in Estonia. Conversely, Estonian citizens own a relatively small share of this sector. However, their share has been increasing in the past years.

Despite the relatively small size, there were no shortage of the events in the Estonian banking industry in recent years. One of the biggest changes of recent times in the banking sector was the creation of Luminor. On October 2017, Nordea, the largest financial services group in northern Europe, and DNB, Norway's largest financial services group, completed the combination of their banking, leasing and pensions businesses in Estonia, Latvia, and Lithuania. Then, at the start of 2019, the Luminor head office was founded in Estonia, and assets and liabilities of the Latvian and Lithuanian branches of Luminor were consolidated in Estonia. The consequence of this was that the Estonian banking sector became much larger. In 2018, the financial supervision and crisis resolution authority revoked Versobank AS operating license for a serious and long-lasting breaches of legal requirements, particularly concerning the prevention of money laundering. In 2019, after the case of suspicious transactions in Estonia in the period from 2007 to 2015, the Estonian Financial Supervision Authority (FSA) has ordered Danske Bank to discontinue its banking operations in Estonia. Despite changes in the market players, the number of credit

institutions has only decreased by a little. At the end of 2022, Estonia had 13 banks, four of which were branches of foreign credit institutions (Finantsinspektsioon, 2021).

The structure of assets and liabilities in the Estonian banking industry is impacted by both the considerable presence of foreign capital and the undeveloped local capital market. The parent institutions of the foreign-owned banks are largely in charge of managing their liquidity. As a result, the proportion of cash and claims on the central bank is different compared to the European Union banking sector, as they average 16% compared to the 7% in EU. This indicates that the level of risk of the Estonian banking sector's assets is lower than that of banks in the EU (Eesti Pank, 2021).

There is a major difference in the composition of loan portfolios between EU and Estonian banks. Approximately 45% of the loan portfolio of Estonian banks is made up of loans to households, slightly exceeding the EU average. At the same time, household loans amount on average to 29% of the total assets of Estonian banks. Compared to the EU average of 15% this is one of the most substantial shares in the EU. This can be explained by Estonian residents' preference for owning a property rather than renting. Loans to companies account for 41% of the portfolio as companies mainly finance themselves through banks. As it was mentioned before, leasing companies in Estonia are mainly owned by banks. This affects the volume of intra-group transactions with leasing companies. As a result, the share of loans to financial institutions is 11%, which is above average in the EU. The remaining 3% of the loans to the government are smaller than the EU average, which mirrors the relatively small size of the state debt in Estonia (Eesti Pank, 2023a). Figure 2 demonstrates the comparison of loan portfolio structure between Estonian and euro area banks.

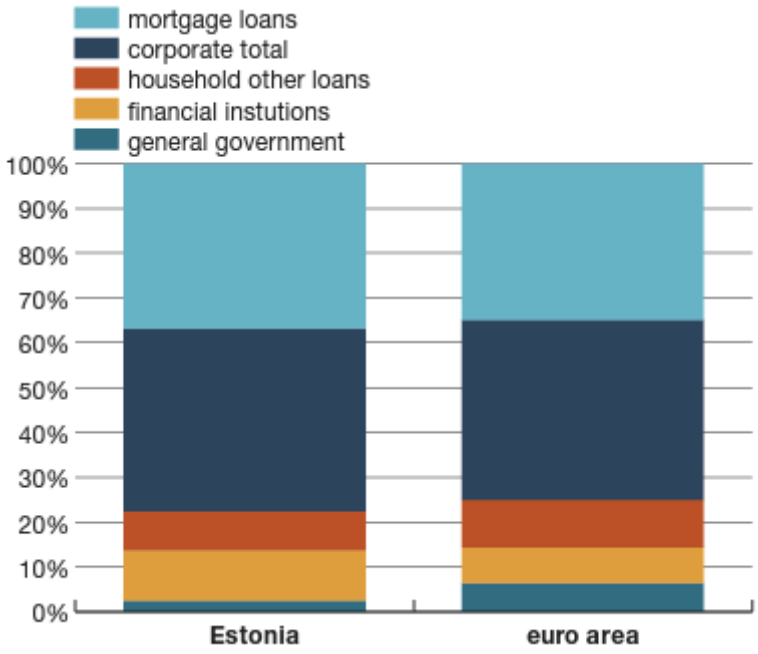

Figure 2. Structure of the total lending portfolio of banks in Estonia and the euro area as end of Q3 2020.
Source: (Eesti Pank, 2021).

Tradable assets and derivatives are important parts of EU banks' assets, totalling 18% compared to only 0.4% of Estonian banks. This implies that Estonian banks on average take more credit risk, while EU banks are taking more financial market risk. Lastly, the local money market is negligible, amounting to around 0.1% of total assets.

The liabilities of Estonian banks are primarily composed of client deposits, which accounted for a substantial 82% of all liabilities as of the end of 2020 (Eesti pank, 2021). Demand deposits made up the majority of them, since unfavourable interest rates on term deposits prevented depositors from placing their money in them. The proportion of corporate deposits in Estonia is notably higher compared to the EU average. This is due to the peculiarity of the Estonian corporate income tax system. This system encourages companies to keep their available resources as deposits within the company, resulting in a larger proportion of corporate deposits and a smaller proportion of household deposits in Estonian banks.

The loan-to-deposit ratio in Estonia at the end of 2022 was 87%, showing that the country's banking sector could finance its entire loan portfolio with customer deposits. Deposits remain the cheapest source of funds for both small and large banks, with the latter also utilizing financing

from their parent banks. However, in recent years, there has been a slight increase in the funding by bonds, totalling 7% of the liabilities (Eesti Pank, 2023b).

Another difference that stands out between the Estonian and EU banking sectors is the share of equity on the balance sheet. As of the end of 2020, undistributed profit made up most of the Estonian banking industry's equity, or 13% (Finantsinspektsioon, 2021). This can be traced to the previous income tax system, which required banks to pay income tax once they distributed profits, similar to other companies, rather than when they generated profits. However, this system was altered in April 2018, and banks are now required to pay income tax on profits every quarter. The effects of the prior system are strong, as the capitalization of Estonian banks remains higher than the average in the EU.

Conclusively, banking sector in Estonia is highly concentrated and strongly dominated by foreign investors. The participants of Estonian banking can be described as traditional ones. The key source of funding for banks are customer deposits. The main income source is interest income which is primarily generated from loans to households and non-financial corporations.

1.2. Introduction of the selected banks

The author selected the four largest banks for the analysis: Swedbank AS, AS SEB Pank, Luminor Bank AS and AS LHV Group. As can be seen from figure 1 in previous subchapter, these banks constitute nearly 90% of the Estonian banking sector. The author believes the analysis of these banks will provide sufficient information about the dynamics, trends, and overall picture of the Estonian banking sector. Below is the brief introduction to each of the four major Estonian banks with a summary provided in table 1.

Swedbank is one of the oldest banks in Estonia. Its beginning dates back to 1991, when it was named Hansabank. In 2008, it became part of the Nordic-based Swedbank group. Its principal activities include retail banking, corporate banking, and wealth management. Swedbank Estonia offers a wide range of financial products and services to individuals, small and medium-sized enterprises, and corporate clients. These include, but are not limited to, current and savings accounts, personal loans, mortgages, credit cards, factoring, insurance, and IT services. The bank

also provides services such as online and mobile banking, as well as various investment and pension options.

As of the end of 2021, Swedbank Estonia had total assets of approximately 16.5 billion euros, with a loan portfolio of around 9.2 billion euros and customer deposits of around 12.1 billion euros (Swedbank AS, 2021). The bank has a network of 20 offices and more than 400 ATMs across Estonia.

In addition to having the largest market share among banks in Estonia, Swedbank became the most valuable enterprise in 2022 (Nasdaq Baltic, 2022). The bank is aware of its impact on the country's economic and social aspects, often appearing among the best employers in Estonia. However, Swedbank's reputation has been damaged after a money-laundering scandal. The scandal first came to light in 2018, when the Estonian FSA began investigating money laundering suspicions at Danske Bank's Estonian branch. In 2019, the FSA imposed a fine on Swedbank Estonia of 1.5 million euros for failing to prevent money laundering. Later that year, Swedish Financial Supervisory Authority after conducting its own investigation issued a fine of SEK 4 billion on the parent company. The scandal has led to the resignation of several top executives, including the CEO.

SEB Pank is another large bank in Estonia with Swedish shareholders. The bank was originally founded in 1992 through a merger of 10 smaller banks under the name Eesti Ühispank. In 2005, after its purchase by Swedish financial services group SEB, it changed its name to SEB Eesti Ühispank, and in 2008, the bank changed its name to SEB Pank. The main activity of SEB is banking services, but it also provides leasing, asset management, and data communication services. The bank offers a wide variety of services similar to those of Swedbank. Unlike Swedbank, SEB has not had any major money-laundering scandals. In 2020, however, the FSA issued a fine of 1 million euros to the bank for breaches of anti-money laundering and terrorist financing rules.

As of the end of 2021, SEB Pank Estonia had total assets of 7.9 billion euros, of which 6.2 billion euros were loans, and 5.8 billion euros in customer deposits (SEB Pank AS, 2021). The bank's customer base includes both private individuals and corporate customers, with a focus on small and medium-sized enterprises (SMEs).

Luminor Bank was founded in August 2017 after the merger of the Baltic operations of Nordea and DNB. The bank became the third-largest bank in the Baltics. In early 2019, Luminor completed the cross-border merger of the banks, setting up the head office in Estonia and establishing Latvian and Lithuanian branches. Later, in September 2019, Blackstone Group, the largest private equity firm in the world, bought 60% of Luminor's shares. The deal was valued at 1 billion euros, making it one of the largest M&A transactions in Baltic history. Over the years 2021–2022 Blackstone Group has acquired Nordea share increasing its stake to 80%. The remaining 20% is still owned by DNB.

The impressive M&A is not the only success story for the bank. In 2020, following its course to replace funding from previous parent banks, Luminor was the first to issue covered bonds in the amount of 500 million euros. This practice was later adopted by other banks in Estonia.

The daily activities of Luminor were negatively impacted by such rapid transformations. Clients complained about internet banking, managers could not align their vision with the new owner, and key personnel left, including the CEO and CFO (Salu, 2021). Moreover, the bank had an ongoing investigation related to the money-laundering of its previous parent banks, Nordea and DNB (Kauranen & Ahlander, 2019). As a result, many customers left the bank, and Luminor no longer holds the top position in terms of asset size.

The bank's total assets at the end of 2021 were 14.9 billion euros. Loans constituted 9.4 billion euros, and customer deposits accounted for 11.8 billion (Luminor Bank AS, 2021). The bank plans to enhance its e-commerce payments with an acquisition of Maksekeskus, which is the leading service provider in the Baltic region.

LHV Bank was founded in 1999. It was initially established as an investment bank focused on brokerage and portfolio management services. Over time, it expanded its operations to offer a wide range of banking services, including current accounts, payment services, and financing. Until 2015, the bank was fully cashless, dealing only with card payments and electronic transfers. In 2016, the bank began offering its shares on the Nasdaq Tallinn Stock Exchange. Since then, the stock price has increased by more than 400% (Nasdaq Baltic, 2023).

The increase in share price is justified as the bank became one of the favourites among Estonian citizens. In 2022, the UK financial magazine The Banker named LHV Bank the best bank of the

year in Estonia for the fourth consecutive year. The magazine praised the bank's financial performance and rapid growth, as well as innovative banking products and services such as crypto investing and virtual cards. A year before, survey company Dive had assigned LHV the best customer service in Estonia for the sixth time. The bank also consistently appears on the list of top employers, topping the list in 2022 (CV Keskus, 2022).

At the end of 2021, the group's total assets were 6.8 billion euros. The loan portfolio amounted to 2.7 billion euros, and deposits totalled 5.8 billion (LHV Pank AS, 2021). In late 2022, the bank has registered its UK branch in FCA register and started issuing loans for SME clients.

Table 1. Overview of major Estonian banks

Bank Name	Swedbank	SEB	Luminor	LHV
Foundation year	1991	1992	2017	1999
Countries of operation	Estonia	Estonia	Estonia, Latvia, Lithuania	Estonia, U.K.
Total Assets, million EUR, end of 2021	16,517	7,940	13,317	6,845
Loan/deposit ratio, % (2021)	75%	104%	97%	46%

Source: compiled by the author based on the data provided in banks' annual reports and official websites

As shown, the main participants in Estonian banking can be considered traditional ones. Their key source of funding is customer deposits, which are utilized primarily for retail and corporate loans. The homogeneity of the selected banks in terms of services allows for the employment of the methodologies discussed in Chapter 1.4.

1.3. Overview of previous research and theoretical background

The measuring of the relative efficiency of banks has drawn a lot of attention in the literature. Research focus on bank performance has shifted to assessing efficiency through frontier methodologies rather than the more traditional approach of analysing financial ratios. A few studies have used changes in earnings-based financial ratios, such as return on assets (ROA), return on equity (ROE), income to cost ratio, and others, to gauge the performance of banks (Rhoades,

1993). The financial ratios approach is frequently criticised for accounting data ignoring the bank's current market value and failing to reflect behaviour that maximises economic value (Kohers et al., 2000). These financial ratios are also failing to take input price and output mix into account (Berger and Humphrey, 1992). Additionally, financial ratios are single-factor measurements of performance, and they may be misleading indicators of efficiency because they do not account for product mix or input prices.

These issues have led Berger and Humphrey (1997) to conclude that efficient frontier approaches appear to be superior to conventional financial ratios analysis for measuring performance. In their analysis of the efficiency of financial institutions, they discovered that the data envelopment analysis (DEA), stochastic frontier analysis (SFA), thick frontier approach (TFA), and distribution free approach (DFA) are the most frequently utilized metrics. The first one is non-parametric, while the others are parametric techniques. There has been no consensus on the best estimating approach among academics. According to Berger and Humphrey (1997), almost half of the data from depository institutions is studied using parametric methods, and the other half use non-parametric methods.

Although the body of literature on bank efficiency is substantial, unlike the case in many other regions, the examination of efficiency in the banking industry in the Baltic countries has received limited attention. Most of the studies include the region when measuring banking efficiency on pan-European level, while some studies include it research on Central and Eastern Europe (CEE), and only a few focus on single countries.

Kraft and Tirtiroglu (1998), using SFA to analyse scale efficiency of banks in Croatia for the years 1994–1995, found that while newly created banks are less efficient than older privatized banks and than state-run ones, they are more profitable. Hasan and Marton's (2003) analysis of the banking industry in Hungary during the transition period showed that efficiency levels increased during the period of 1993–1998 and that foreign banks were more efficient than local ones. Jemric and Vujcic (2002) used data on Croatian banks from 1995 to 2000 and demonstrated that foreign and recently founded banks are more efficient. Grigorian and Manole (2002) analysed the banking industry in 17 countries from central and eastern Europe between 1995 and 1998. They showed that banking sectors with fewer but better capitalized banks are more efficient, and the growth in efficiency is not always correlated with the privatization of banks. Weill (2003) examined how the efficiency of 47 in the Czech Republic and Poland was impacted by the ownership form. The study was done

at the level of the year 1997 and revealed that foreign banks are more efficient than local banks. Matousek and Taci (2004) studied the efficiency of the Czech banking system in the 1990s and showed an improvement in efficiency during the research period, with foreign banks being more efficient. Drakos (2002) examined the impact of structural reforms on the efficiency of banks in six states of the CEE in the years 1993–1999.

Fries and Taci (2005) analysed the banking systems of 15 states in Eastern Europe and found that privatised banks with local investors are the most efficient. They also showed that banking systems where foreign banks have a larger share of overall assets demonstrate lower cost inefficiency. Bonin, Hasan, and Wachtel (2005) examined the impact of ownership form by analysing the data from 225 banks in 11 countries that were in transition between 1996 and 2000; the study showed that neither bank privatization nor state capitalization significantly reduced the efficiency of banks. Rossi et al. (2005) studied the performance of management at the bank level in nine countries in Central and Eastern Europe from 1995 to 2002. The analysis revealed that there are substantial variations between countries and that the banks in these countries are not very efficient.

Yildirim and Philippatos (2007) analysed the efficiency of the banking industries in 12 countries in Central and Eastern Europe during their transition period between 1993 and 2000. The authors confirmed that the efficiency level of banks correlated with asset size and profitability rate. They also found foreign banks to be more cost efficient but less profit-efficient relative to local banks and noted that a third of the banks are inefficient. Havrylchyk (2006) after investigating the efficiency of the Polish banking sector between 1997 and 2001, found that the level of efficiency had not increased during the studied period and that newly established foreign banks were more efficient than domestic banks or foreign banks that acquired local ones. Koutsomanoli-Filippaki et al. (2009), by analysing efficiency in Central and Eastern Europe from 1998 to 2003, showed that foreign banks perform better than local private banks and state banks and that bank efficiency is influenced by the level of concentration and competition in the national banking system.

Kosak et al. (2009) researched the efficiency of banks in Central and Eastern Europe between 1996 and 2006. The author showed that the level of competition in the banking industry has a greater effect on cost efficiency improvements than the ownership structure itself. Gallizo et al. (2015) examined the development of banking efficiency in the new European member states before and after they joined the EU. The authors used data from 29 European states between 2000 and 2013. The results showed a positive impact of European integration on cost efficiency. The authors also

indicated that advanced economies were more severely affected by the financial crisis because of their greater exposure to toxic assets.

Few studies have focused on the Baltic States. Popovici (2014) showed the evolution of banking efficiency in the Baltic countries over the period 2007–2011. The results showed a slight improvement in banking efficiency in the post-crisis period. Titko & Jureviciene (2014) estimated the relative efficiency of Latvian and Lithuanian banks by employing the non-parametric frontier technique. The authors found no statistically significant correlation between efficiency scores and performance ratios such as ROE and ROA and indicated that larger banks were more efficient within the sample. Using the same approach separately for Latvia, Titko et al. (2014) assigned efficiency scores to 15 commercial banks in Latvia. Novickyte & Drozdz (2018) examined the efficiency of the banks in Lithuania from 2012 to 2016 using the DEA method. The authors concluded that the larger Lithuanian banks, most of which are Nordic subsidiaries, applied a more appropriate business model than the smaller banks, which are mostly local.

There are few studies on the efficiency of banks in Estonia in the literature. As the Estonian banking industry was beginning to form, several research papers attempted to evaluate its operating performance. Vensel (2001) created an efficiency matrix to analyse commercial bank performance. Vensel compiled the annual consolidated balance sheets and income statements of Estonian commercial banks for the period 1994–1999 in order to build up the efficiency matrix. The base year was 1994, and the analysed years were 1997 and 1999. Later, Vensel et al. (2004) extended the study period to 1994-2002 and provided empirical results using both the DuPont financial ratio analysis and the matrix model. They concluded that the respective model contains all relevant information for carrying out different versions and modifications of the traditional financial ratio analysis as well as a more profound bank performance analysis. Sõrg & Tuusis (2008) cite European Central Bank research that found several performance measures—net cost to income, return on assets, and net interest margin—for the Estonian banks are as good as or better compared to euro area banks. Kirikal et al. (2004) used the Malmquist productivity index and a modified version of DuPont analysis to estimate productivity change in Estonian banking from 1999 to 2002. The author did not find any papers that would use a non-parametric or parametric approach solely for banks operating in Estonia.

As shown from the literature overview (Appendix 1), most studies on bank efficiency are focused on the period from 1990 to early 2000s (Doan et al., 2018). These studies are based on the years

prior to the global financial crisis and just a few around it, not surpassing 2012 in most cases. There are strong calls in favour of continuing the research further (Sousa de Abreu et al., 2019). The author believes there is still a lack of research on the recent period following the latest global financial crisis and the implementation of Basel III. Therefore, as another contribution to the existing literature, the author seeks to utilize the overall efficiency matrix to explore the efficiency of major Estonian banks in the recent period and provide an in-depth comparative analysis.

1.4. Overview of analytical methods

The author of the thesis is aiming to identify strong and weak areas of the banks from the financial results as well as overall efficiency perspective. Ravinder (2013) identifies two main types of analysis undertaken for the interpretation of a company's financial position: vertical and horizontal analysis of primary financial statements.

Vertical analysis is used to understand the specifics of categories on the company's financial statements. The method lists each line item on a financial statement as a percentage of a base item within the statement for the same accounting period.

Horizontal analysis is used to analyse the dynamics of changes in specific financial statement items across time. The technique involves the examination of recurring changes in various elements presented on financial statements for two or more accounting periods. This analysis is also referred to as trend analysis.

Financial ratio analysis is a form of ratio analysis that involves comparing one or more elements of a financial statement to one or more items within the same or different types of financial statements. This analysis allows for evaluating the different contexts of a company's activities over time. Most notably, this type of analysis allows for comparisons between the financial ratio values of one company to another or the industry as a whole (Sherman, 2015; Barnes, 1987).

Concerning efficiency measurement, many studies have concentrated mostly on cost efficiency techniques largely due to the difficulty in determining the output prices (Fries & Taci, 2005; Kosak et al., 2009). Nevertheless, some empirical data suggests that profit efficiency may be more significant quantitatively than cost efficiency, highlighting that the primary inefficiency may lie

on the revenue side. This might be the result of establishing a bad pricing policy or selecting a manufacturing composition that is not ideal considering the prices of services (Kasman & Yildirim, 2006). Furthermore, the most cost-efficient banks may not always be the most profit efficient, and vice versa (Berger & Mester, 1997). For all these reasons, this paper uses an overall efficiency matrix to achieve a more complete vision of this topic.

The efficiency matrix is a methodology developed by Mereste in the late 1970s at the Tallinn Polytechnical Institute with the ultimate goal of analysing the level of efficiency of a company's primary business activities. This method has a number of advantages over previously discussed conventional methods. The most notable are its presentation form's compactness, which increases the clarity of financial information; the aggregation of financial ratios with clear expression of the relationships between ratios; the utilization of various methods and approaches used in financial analysis; and being comprehensive enough for non-business professionals. Moreover, a matrix-based approach to firm efficiency research overcomes the limitations of traditional ratio-based analysis, where a ratio expressed as a single indicator over the other does not allow for a thorough study of the aspects that affect a company's efficiency (Siimann, 2018).

Siimann (2018) argues that a single ratio indicator is not sufficient to measure efficiency, and therefore, a combination of various input and output indicators must be chosen to obtain a more comprehensive measure of company efficiency. Additionally, it is critical to organise the quantitative indicators by their level of finality, which is based on their relevance to the company's business activities.

While prior studies have primarily focused on analysing efficiency in conventional companies, this does not preclude the potential adaptation of the efficiency matrix for entities with different types of business activities. By adhering to the principle of intensity development and selecting indicators that are specific to the field of interest, it is possible to modify the overall efficiency matrix to suit other types of economic entities. Gasimov (2021) analysed the structure of the overall efficiency matrix and its applicability to the banking industry. He presented six quantitative indicators in the following order of finality:

- average equity (C),
- average assets (A),
- operating expenses (O),

– net interest income (I),
– total income (R),
– profit before tax (P).

Based on the indicators above, Gasimov (2021) introduced 11 submatrices (Figure 3). In order to enhance comparability between banks and account for the unique nature of their activities, the cash indicators are excluded from the overall efficiency matrix for banks. The author believes that the resource and income groups are critical components of overall bank performance and thus selects two indicators from each group. By implementing these changes, the overall efficiency matrix provides a more accurate representation of bank efficiency.

Indicators	Profit before tax (P)	Total Income (R)	Net interest income (I)	Operating expenses (O)	Average Assets (A)	Average Equity (C)
Profit before tax (P)	11 1	12	13	14	15	16
Total Income (R)	21 $\frac{P}{R}$ IPM	22 1	23	24	25	26
Net interest income (I)	31 $\frac{P}{I}$ IPM	32 $\frac{R}{I}$ IM	33 1	34	35	36
Operating expense (O)	41 $\frac{P}{O}$ EPM	42 $\frac{R}{O}$ EIM	43 $\frac{I}{O}$ EIM	44 1	45	46
Average Assets (A)	51 $\frac{P}{A}$ RPM	52 $\frac{R}{A}$ RIM	53 $\frac{I}{A}$ RIM	54 $\frac{O}{A}$ REM	55 1	56
Average Equity (C)	61 $\frac{P}{C}$ KPM	62 $\frac{R}{C}$ KIM	63 $\frac{I}{C}$ KIM	64 $\frac{O}{C}$ KEM	65 $\frac{A}{C}$ KRM	66 1

Figure 3. The bank's overall efficiency matrix.
Source: (Gasimov, 2021)

It should be noted that the overall efficiency matrix utilizes the notion of efficiency as a link between input and output (Figure 4). Thus, selecting the qualitative indicators is crucial for the matrix analysis. The author is aware of the deposit dilemma, which is the problem of defining the role of deposits when measuring efficiency. According to Holod and Lewis (2011), the researchers treat deposits as either an input or an output based on whether they use production approach or

intermediation approach (table 2). Gasimov has used a modified profitability approach, which does not imply the use of deposits.

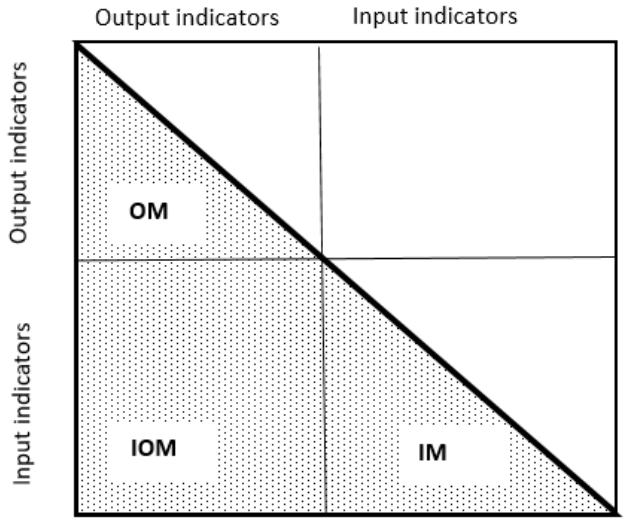

Figure 4. Division of efficiency field into three submatrices.
Source: Jlyyp, 1982

Table 2. Usage of inputs and outputs under different approaches

	Intermediation approach	**Production approach**	**Profitability approach**
Input	Number of employees	Number of employees	Total assets
Input	Total of deposits	Operational expenditures	Operational expenditures
Input	Expenditures with interest rates	Fixed assets	Net assets
Output	Credit operations	Total of deposits	Net profit
Output	Financial intermediation revenues	Revenues not related to interest	ROA
Output	Investments	–	ROE

Source: Macoris et al., 2015

Although the matrix format provides a clear representation of a company's efficiency, the overall efficiency matrix does not offer a singular measure of efficiency. This presents a challenge, particularly in situations where ranking or benchmarking is required. The matrices used to evaluate one company may highlight strengths in certain areas, while another company m ay perform better in different areas. To accurately create ranking lists, it is necessary to consider an overall measure

that incorporates all relevant matrices and is presented as a single number. This measure should address both static ranking problems and dynamic ranking problems.

The static ranking problem is a challenge that arises when conducting a complex comparative analysis of an economic entity's efficiency. This problem can be addressed by computing the Benchmark Index of Company's Overall Efficiency (BICOE). Siimann (2018) proposes two methods for determining BICOE, one of which is based on the growth indices of each element in an efficiency field. Solving the static ranking problem this way requires the following steps (Siimann, 2018):

1) Develop overall efficiency matrices for all analysed companies for the same period.
2) Divide the efficiency field elements of all companies by corresponding field elements of the company adopted as a benchmark (i.e., market leader or a competitor), resulting in a comparative matrix.
3) Calculate BICOE using the following formula:

$$BICOE = \sqrt[\frac{n^2-n}{2}]{\prod c_{ij}^{A/0}},$$

where $c_{ij}^{A/0}$ – all efficiency field elements of comparative matrix,

n – number of quantitative indicators in the model.

To address the dynamic ranking problem, one must explain the changes and how they occurred in relation to the reference period. This problem can be solved by calculating the Growth Index of Company's Overall Efficiency (GICOE). The calculation of GICOE is similar to BICOE, as it is also based on the growth indices of each element on an efficiency field. The solution involves several steps (Siimann, 2018):

1) Develop overall efficiency matrix based for all analysed companies for both the analysed and the base period.
2) Divide all the efficiency field elements of all companies in the analysed period by the efficiency field elements of the base period.
3) Calculating the GICOE using the following formula:

$$GICOE = \sqrt[\frac{n^2-n}{2}]{\prod i_{ij}^{t_k/t_0}},$$

where $i_{ij}^{t_k/t_0}$ – all index efficiency field elements,

n – number of quantitative indicators in the model.

After the initial data organization in the matrix architecture, the calculation of BICOE and GICOE indices enables both benchmark analysis and efficiency growth analysis of the banks.

The author aims to analyse the financial performance of banks and any changes over time with methods such as vertical and horizontal analysis, financial ratio analysis, and component analysis. However, these techniques do not provide clear estimate of bank's efficiency thus, in order to analyse overall efficiency levels with changes, the overall efficiency matrix methodology is applied.

2. COMPARATIVE ANALYSIS OF THE FINANCIAL STATEMENTS

The following thesis sections are dedicated to analysing the structure and the dynamics of primary financial statements during the period of 2018–2021. The structure of financial statements is analysed using vertical analysis and the dynamics using horizontal analysis.

2.1. Banks' accounting principles comparison

All four banks are incorporated in Estonia and prepare financial statements in accordance with the International Financial Reporting Standards (IFRS), as adopted by the EU. Some of the main principles listed in the financial statements of the analysed banks:

1. Classification and measurement of financial assets and liabilities.

A financial asset is measured initially at fair value. Transaction costs are included in the fair value on initial recognition except for financial assets at fair value through profit or loss. The fair value of a financial instrument at initial recognition is generally its transaction price. The subsequent measurement of financial assets depends on the classification determined by a bank at initial recognition. Financial assets can be divided into one of the following categories:

- Amortised cost,
- Fair value through profit or loss (FVTPL),
- Fair value through other comprehensive income (FVOCI).

Only Luminor has items classified as FVOCI. However, the amount is negligible of less than 0.1% of bank's total assets.

All four banks classify financial liabilities as measured at amortised cost or at FVTPL and financial guarantee contracts or loan commitments.

Financial instruments are further divided into three levels based on the degree of observability in the valuation:

- Level 1 includes assets and liabilities that are measured using quoted prices in active markets for identical instruments that the entity can access at the measurement date.

- Level 2 includes assets and liabilities that are measured using inputs other than quoted prices in active markets included in Level 1, but which are observable either directly or indirectly.
- Level 3 includes assets and liabilities that are measured using unobservable inputs and are therefore subject to greater management judgment and estimation uncertainty.

All four banks use the same approach at dividing financial assets and liabilities measured at FVTPL, but not for those measured at amortised cost. Swedbank measures both financial assets (i.e., cash and balances with central banks, and loan portfolio), and financial liabilities (i.e., deposits and borrowings) at level 2, while SEB measures everything at level 3. Luminor and LHV measure financial assets at level 2, except for the loan portfolio, and most of the financial liabilities at level 2, except for the small portion of deposits.

2. Income and expense recognition.

The banks use the effective interest method to recognise interest income and interest expenses in profit or loss for financial assets and financial liabilities measured at amortised cost or at fair value through other comprehensive income. The method determines the gross carrying amount of a financial asset or the amortised cost of a financial liability and allocates interest income and interest expenses. It involves discounting estimated future cash payments or receipts through the expected life of the financial instrument to the net carrying amount of the financial instrument, using the effective interest rate. All payments included in the terms and conditions of the contract, including advance payments, are taken into consideration when calculating future payments. Fees that are integral to the effective interest rate are included in the calculation of the effective interest rate, but expected credit losses are not. If a financial asset becomes credit-impaired, the interest income is recognised by applying the effective interest rate to the amortised cost, which is the gross carrying amount adjusted for the loss allowance. In the case where a financial asset is credit-impaired at initial recognition, the expected credit losses are included in the estimated cash flows to calculate a credit-adjusted effective interest rate, which is then applied to recognise interest income.

3. Credit impairment.

According to IFRS9, the following financial instruments are subject to credit impairment requirements: financial assets at amortised cost and FVOCI, and loan commitments and financial guarantee contracts. For those instruments a forward-looking expected credit loss (ECL) approach is applied. The ECL model has a three-stage approach based on changes in the credit risk. A 12-

month ECL (Stage 1) applies to all items, unless there is a significant increase in credit risk since initial recognition. For items where there is a significant increase in credit risk (Stage 2) or in default (Stage 3), lifetime ECL applies. This approach is used by every bank that is preparing its financial statements according to the IFRS.

4. Fee and commission income and expense.

The recognition of revenue from contracts with customers is reported as fee and commission income, except for revenue from leasing contracts or financial instruments within the scope of IFRS 9 Financial Instruments. Revenue is recognized when control of the services is transferred to the customer, and the total consideration received is allocated to each performance obligation depending on whether they are satisfied over time or at a point in time. Commission income for asset management and custody services is generally recognized over time, while payment commissions and card fees are recognized at a point in time. Lending fees that are not an integral part of the effective interest rate are recognized as commission income, and lending and deposit fees are recognized over time or at a point in time depending on when the performance obligation is satisfied. Fee and commission expense is recognized based on the accrual basis and when the liability has been incurred.

The banks differ in their data representation on the main financial statements. Some banks selectively disclose certain categories with varying levels of detail. Nevertheless, the main categories are the same for all banks. This similarity is expected, as banks are highly regulated institutions and are subject to rigorous regulatory oversight.

The author concludes that, in general, the accounting methods of all four major banks in Estonia do not have strong distinctions, making banks' financial statements usable for comparative analysis.

2.2. Comparative analysis of structures of financial statements

2.2.1. Structure analysis of balance sheet

A vertical analysis of the banks' balance sheets shows that the asset structures of Swedbank, SEB, and Luminor are generally comparable, while the structure of LHV is more different. As expected

for retail banks, the largest part of the asset structure for all banks, with the exception of LHV in 2021, is loans to customers. The second-largest part are balances held at the central bank.

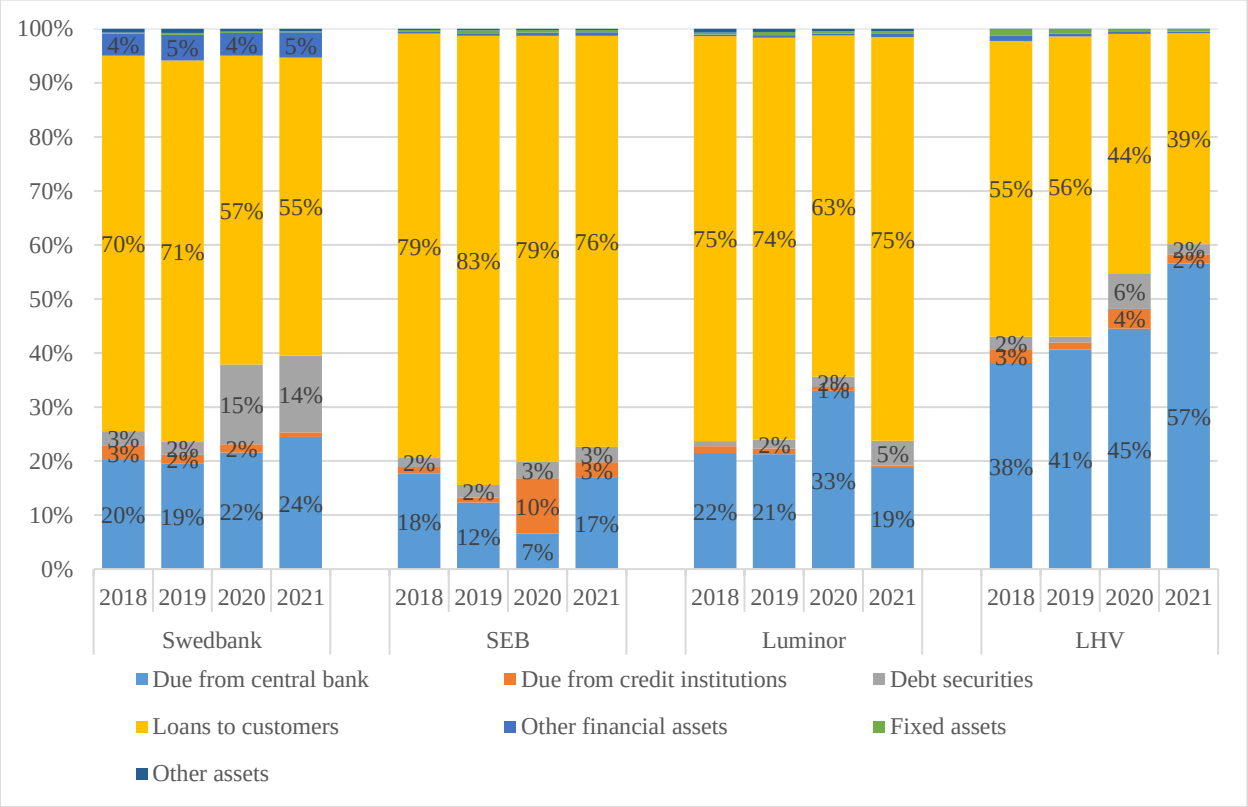

Figure 5. Swedbank, SEB, Luminor and LHV asset structure 2018–2021, end of year data
Source: Compiled by author based on data in appendix 2

Swedbank has seen a significant decrease in the proportion of loans to customers from 70% to 55% during 2018–2021 (Figure 5). While the size of the loan portfolio has expanded, the reduced share in total assets is attributed to the significant rise in bonds and other interest-bearing securities. In 2020, Swedbank participated in the European Central Bank's (ECB) targeted longer-term refinancing operations (TLTRO), borrowing 1,645 million euros for the three-year term. The bank acquired a bond from Swedbank Group worth 1,868 million euros as of the end of 2020 that was used as collateral for the TLTRO loan (Swedbank, 2020). This partly explains the slight increase in the share of cash and balances held at the central bank. Compared to the other banks, Swedbank has a noticeable share of other financial assets of 4–5%. These are financial assets pledged for investment contracts—assets (mostly investment fund units) that are covering liabilities from unit-linked contracts in Swedbank Life Insurance SE.

SEB has the largest proportion of retail and corporate loans compared to the other banks, ranging from 76% to 83% (Figure 5). The bank's structure remained relatively stable, apart from 2020.

Loans due from credit institutions saw a significant increase to 10% from 1% a year earlier. This relates to SEB funding one of its parent group companies (SEB, 2020). At the same time, cash and balances at the central bank have decreased from 12% to 7%, indicating where the funding came from.

Luminor's asset structure remained the same during the investigated period, with the only exception of 2020. The bank built up its balances with central banks from 21% to 33%, or by 2 billion euros (Appendix 2). The author believes this was done to increase the bank's liquidity position during the COVID-19 uncertainty period. In the following year, Luminor nearly halved the balance, returning to the pre-pandemic asset structure. Another noticeable change in 2021 is the increase in the share of debt securities to 5% (Figure 5). Luminor has made investments in the amount of 325 million euros in high-quality governmental covered bonds that could be pledged with the ECB in case of necessity (Luminor, 2021).

LHV differs the most in terms of asset structure compared to other banks. LHV has the lowest loan-to-deposit ratio among the analysed banks. This means that LHV must extend its liquidity buffer mainly in terms of cash in order to comply with the EU Liquidity Coverage Ratio (LCR) regulations. In 2018, the bank retained a substantial portion of 38% in cash and balances in central banks, which notably increased to an impressive 57% by 2021 (Figure 5). Loans to customers accounted for only 39% of the balance sheet in the same year.

The structure of liabilities and equity for the four banks is largely similar. Deposits from customers dominate the liability structure for all banks. The noticeable difference pertains to the proportion of deposits from central banks and credit institutions, which varies annually.

Swedbank's share of deposits from customers contracted from 77% to 73% during the research period (Figure 6). The reason behind this was the increase in deposits from central banks and credit institutions. This happened due to the bank's aforementioned TLTRO borrowing of 1,645 million euros. Mirroring the asset structure, Swedbank has a considerable portion of other financial liabilities compared to the other banks. Like on the asset side, this category relates to the bank's insurance operations and is comprised of liabilities, which are investment risks borne by policyholders. Swedbank's equity, while remaining constant in nominal amount, gradually lost its share from 16% to 11% due to increases in its liabilities.

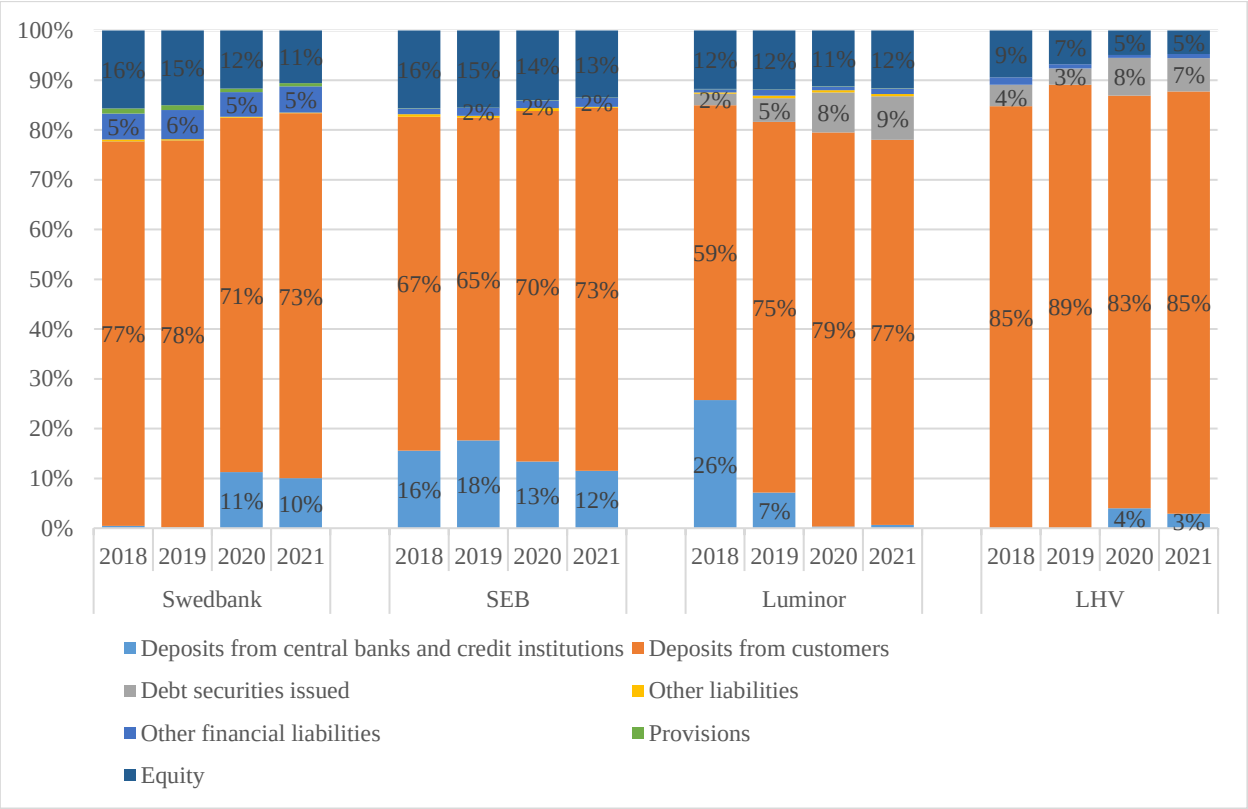

Figure 6. Swedbank, SEB, Luminor and LHV liabilities' structure 2018–2021, end of year data
Source: Compiled by Author based on data in appendix 2

SEB's liabilities and equity structure remained relatively stable. Deposits fluctuated from 65% to 73% during the period (Figure 6). Deposits from credit institutions, consisting mainly of parent loans, remained between 12 and 18 percent throughout the period. Equity was at the same level, both nominally and in terms of the proportion of total assets, accounting for 13–16%.

Luminor has the most noticeable change in its liability structure among other banks. After the merger, the bank reduced its financing from parent companies from 26% to less than 1% (Figure 6). At the same time, the bank started replacing the financing by issuing first fix-rate bonds in 2019 and then first covered bonds in 2020 (Luminor, 2020), increasing the proportion of issued debt securities to 9% in 2021. The change in financing structure resulted in an increased share of customer deposits from 59% to 77% during the period. The equity, though decreasing nominally, remained at a constant rate of 12%.

LHV has the largest proportion of customer deposits at 83–85% (Figure 6). The bank's participation in the TLTRO program in 2020 increased its share of the central bank's deposits to 4% (LHV, 2020). Following Luminor's steps, the bank issued its first covered bonds in 2020,

raising the share of issued debt to 8%. Equity has increased at a slower pace than liabilities, therefore contracting from 9% to 5% of total assets.

Conclusively, the author would claim that banks' balance sheets are similar in the structure of liabilities and equity, with customer deposits being the largest part for all banks. The asset structures are similar for Swedbank, SEB, and Luminor, with loans to customers accounting for the largest share. LHV stands out from the other banks, holding a considerably larger proportion of cash at central banks, which surpassed loan portfolio share by 18% in 2021. This surge can be explained by the necessity for compliance with the EU LCR regulations since LHV's deposit portfolio grew much faster than the loan portfolio during 2018–2021 (Appendix 4).

2.2.2. Structure analysis of income statement

A vertical analysis of banks' income statements shows that net interest income (NII) constitutes a major part of revenues. The second largest part is net commission income. The remaining parts are similar between SEB and Luminor but different for Swedbank and nearly absent for LHV.

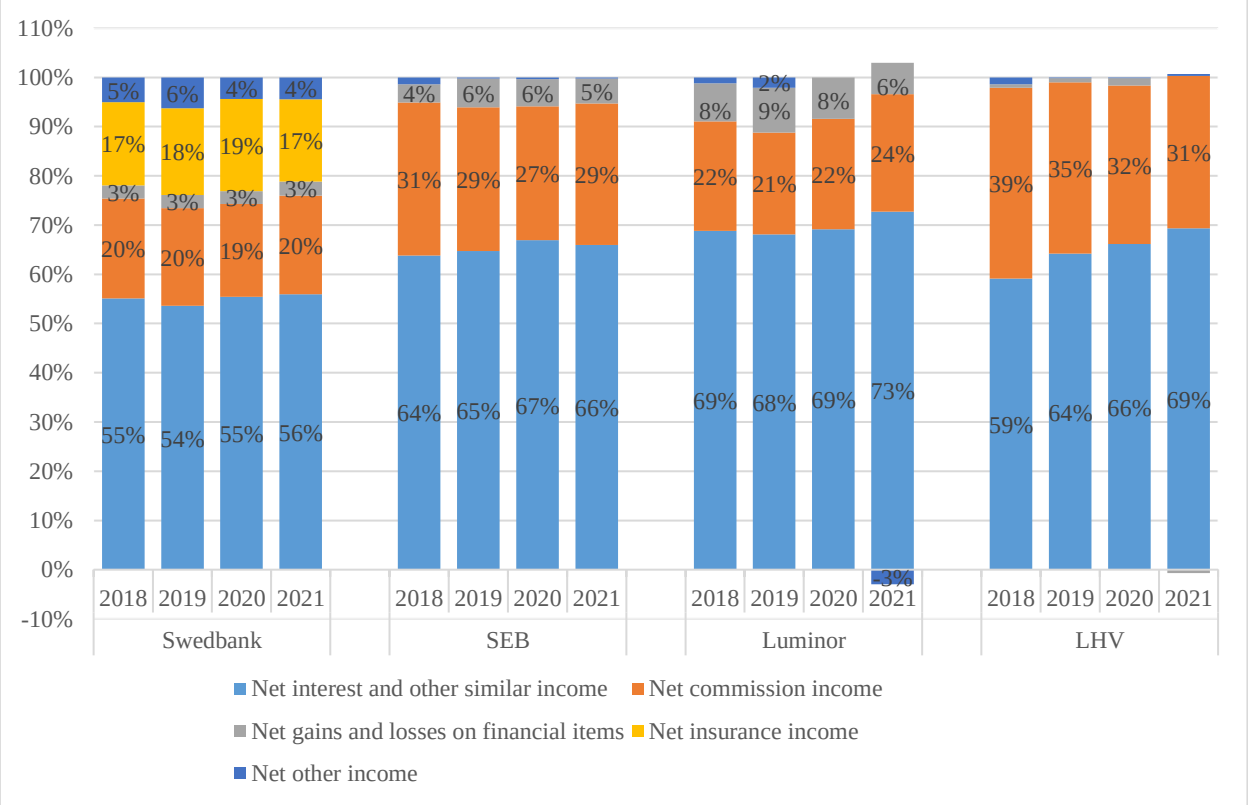

Figure 7. Swedbank, SEB, Luminor and LHV total income structure 2018–2021
Source: Compiled by author based on data in appendix 3

The share of net interest income remained relatively stable for Swedbank and SEB, constituting 55–56% of total revenue for the former and 64–67% for the latter. Luminor has seen an increase in the share of NII from 69% to 73% during 2018–2021. LHV had a noticeable surge from 59% to 69% for the same period, due to the growing loan portfolio. The net commission income part has stayed relatively constant during the research period, constituting around 20% for Swedbank, 29% for SEB, and 22% for Luminor. LHV has seen a contraction of its net commission income share from 39% to 31% (Figure 7).

In terms of other parts of the income statement, Swedbank has the most diverse structure, with net insurance income at around 17–18%, which is almost the size of its net commission income. This considerable share is due to the highly developed and competitive insurance business of its subsidiary, Swedbank P&C Insurance AS. Other banks do not have any net insurance income. Another part that is almost absent in other banks but is present in Swedbank's revenue structure is net other income. This income includes income from IT services and other services provided to parent group companies, constituting a comparatively noticeable share of 4–6% (Figure 7). The remaining part of its revenue structure is net gains and losses on financial items, which stood constant at 3% throughout the period.

The third largest share of SEB's revenue is net gains and losses on financial items, at around 4–6%. Luminor has the same case, with the share being slightly larger at around 6–8%. In 2021, Luminor had a significant increase in contributions to resolution funds and deposit guarantee schemes (Luminor, 2021). That resulted in negative net other income with a share of –3%. Other parts of the revenue structure of LHV stand at around 2% or less altogether at any time during 2018–2021.

Besides revenues, it is worth noting the different levels of banks' overall expenses. Figure 8 summarizes the researched banks' total operating expenses before impairments and tax expenses as a share of total income during 2018–2021. These expenses mostly consist of personnel expenses and other administrative expenses. The graph shows a relatively similar and stable share of total expenses for Swedbank of around 36–42% and SEB of 36%. LHV's share of total expenses is larger compared to previous banks, fluctuating from 42% to 53%. Luminor has seen a significant increase from an already high share of 63% in 2018 to a solid 80% in 2021. The bank has significantly higher administrative expenses compared to the other banks. After the merger,

Luminor had to quickly align the systems of two banks, thus incurring considerable IT costs. The share of personnel expenses is also the largest at Luminor compared to other banks.

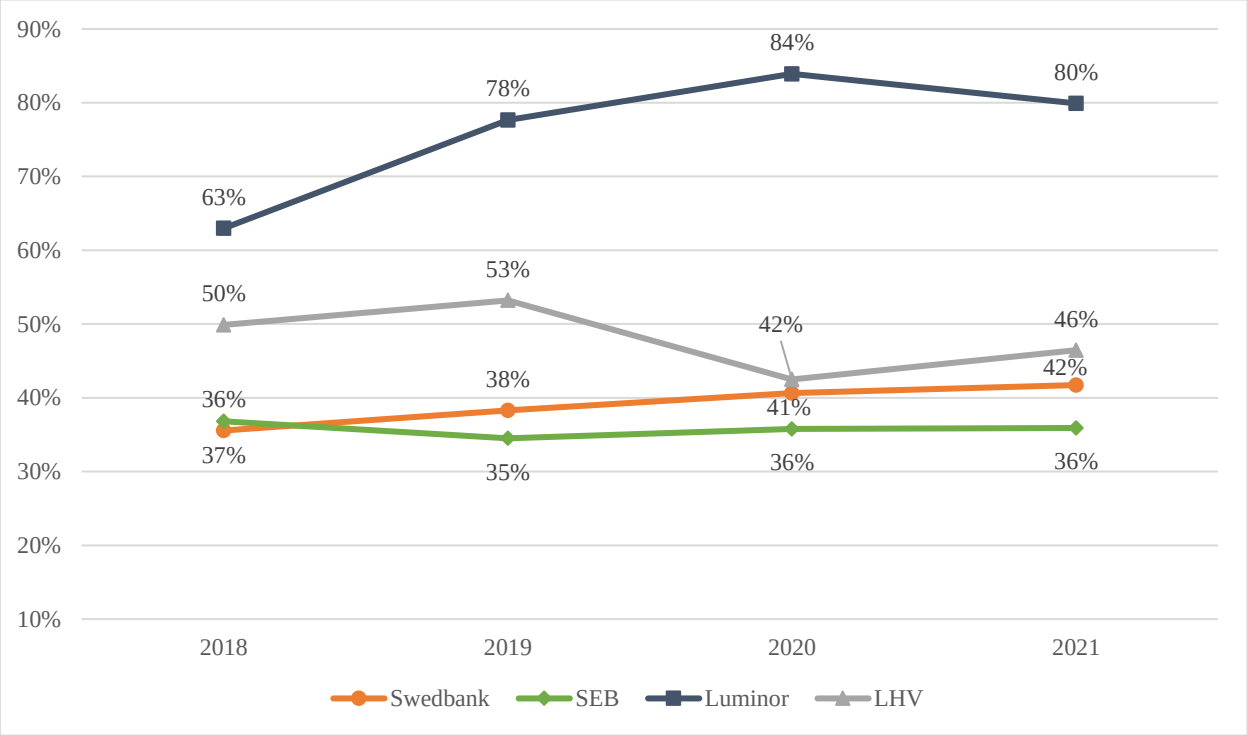

Figure 8. Total operating expenses to total income 2018–2021
Source: Compiled by author based on data in appendix 5

Conclusively, one can state that SEB, Luminor and LHV income statement structures are quite alike. Swedbank has a more diversified structure due to its insurance subsidiary and service provision to parent group companies. The ratio of total operating expenses to total income is comparable for Swedbank and SEB, slightly higher for LHV, and significantly higher for Luminor due to IT expenses related to the merger.

2.2.3. Structure analysis of cash flow statement

Cash flow statement depicts bank's ability to generate cash from various activities such as operating, investing, and financing. The statement shows inflows and outflows of cash and cash equivalents during the year and the ending position for a specific period, usually a fiscal year. Figure 8 shows cash flow statements per activity for each bank during 2018–2021.

Net cash flow from operating activities (CFO) includes interest, fees and commissions received and paid, other operating income and expenses, as well as adjustment changes to operating assets

and liabilities. CFO is typically the main part of a retail bank's overall cash flow statement. LHV's rapid expansion of its deposit portfolio has resulted in a significant positive CFO of more than one billion euros in 2020–2021 (Figure 9). Swedbank's CFO has been fluctuating during the period. In 2020, the outflow was around half a billion, due to the acquisition of the bond used as TLTRO collateral. The following year, CFO reached nearly a billion euros due to a continuing increase in demand deposits (Appendix 4). SEB has seen similar fluctuations to CFO, but on a smaller scale. In 2019, due to an increased loan portfolio, the CFO went into the negative zone, which improved to around half a billion euros in the next two years (Figure 9). Luminor has the most dramatic fluctuation in CFO among the group. In 2020, the CFO saw a 1.4-billion-euro inflow, compared to an outflow of around half a billion euros a year earlier. The next year, Luminor had an outflow of a staggering 2.2 billion euros (Appendix 6). The outflow in 2019 was due to the bank's renunciation of former parents' funding. Next year, a surge in customer deposits coupled with an increased loan portfolio boosted cash flow. In 2021, the situation reversed, which led to the largest outflow among the group.

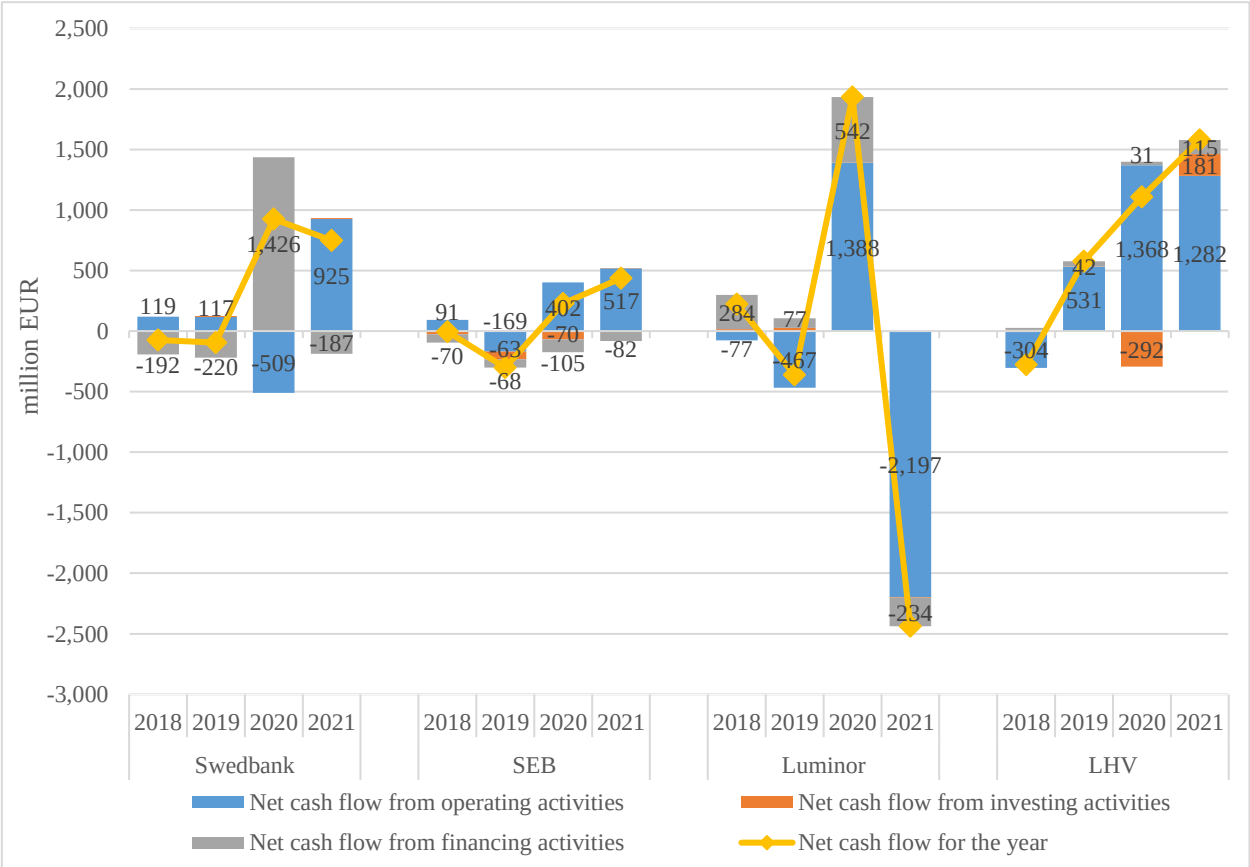

Figure 9. Swedbank, SEB, Luminor and LHV cash flow statement structure 2018–2021
Source: Compiled by Author based on data in appendix 6

Net cash flow from investing activities (CFI) indicates how much money has been spent on investments, which, in the case of the selected banks, are mostly related to operations with fixed assets, received dividends, and proceeds and outflows from financial instruments. This part is insignificant compared to the other two for all banks. Only LHV has noticeable amounts in years 2020–2021. The bank reports net changes in investment securities at FVTPL under CFI. It is the only bank that reports this item this way; other banks place it under CFO.

Net cash flow from financing activities (CFF) means raising capital through issuing bonds and taking loans from central banks. This part of the cash flow statement also includes repayment of bonds at maturity, buybacks, lease payments, and dividend payments. Swedbank had the most profound CFF inflow among peers in 2021, due to receiving funds via the TLTRO program. Luminor also had a remarkable spike in 2020 because of a 500-million-euro issue of covered bonds. Other banks do not have such noticeable changes. All banks consistently pay dividends annually, except for Luminor, which does it biannually (Appendix 6).

Net cash flow is the sum of all parts of the cash flow statement. It shows a cash surplus or deficit during the reporting year. The analysis shows that the net amount tends to be correlated with the CFO. LHV has had a steady upward trend during the research period. Swedbank and SEB experience similar patterns. Luminor has the most significant year-to-year fluctuations of all banks (Figure 9).

Overall, major Estonian banks are somewhat similar in terms of cash flow structure, with the CFO as the main part. However, banks exhibit significant differences in terms of yearly fluctuations, with LHV seeing consistent net cashflow growth and Luminor having the most notable ups and downs.

2.3. Growth analysis

The growth analysis has been done using horizontal and trend analysis. The analysis focused on the main categories of financial statements identified during the structural analysis of financial statements.

2.3.1. Growth analysis of balance sheet

Swedbank's balance has been most affected by its participation in the TLTRO program. The bank's balances at the central bank increased from 2,259 million euros in 2018 to 4,093 million euros in 2019 (table 3). The increase is related to the funds received via loan from the central bank in 2020 and an inflow of cash from deposits in 2021. SEB and Luminor have both had fluctuating amounts over the years. SEB saw a plunge in 2020, when it provided liquidity for one of the parent companies, but in the next year, the balance returned to the 2018 level. Luminor, on the other hand, has seen a spike in 2020. This cash came from the issue of covered bonds and an increase in the deposit portfolio. LHV had a relatively modest amount in 2018, but experienced substantial growth of more than 75% each year, reaching 3,874 million euros in 2021.

Table 3. Growth of balances at central banks and loans to customers, year-end data (items in EUR million)

Item	Bank	2018	2019	2020	2021
Due from central bank	Swedbank	2,259	2,284	3,209	4,043
	Growth rate	–	*1%*	*40%*	*26%*
	SEB	1,157	844	493	1,339
	Growth rate	–	*–27%*	*–42%*	*171%*
	Luminor	3,293	2,924	4,927	2,494
	Growth rate	–	*–11%*	*68%*	*–49%*
	LHV	640	1,233	2,213	3,874
	Growth rate	–	*93%*	*80%*	*75%*
Loans to customers	Swedbank	7,785	8,278	8,520	9,117
	Growth rate	–	*6%*	*3%*	*7%*
	SEB	5,153	5,707	5,908	6,040
	Growth rate	–	*11%*	*4%*	*2%*
	Luminor	11,472	10,223	9,431	9,947
	Growth rate	–	*–11%*	*–8%*	*5%*
	LHV	919	1,687	2,209	2,677
	Growth rate	–	*84%*	*31%*	*21%*

Source: compiled by author based on the appendices 2 and 4

All banks have increased their loan to customer amounts except Luminor, which saw a consistent decrease with a slight rise in 2021. In 2019, the bank focused on more appropriate risk-adjusted pricing of old and new portfolios and an improvement in its funding position, resulting in a 11% decrease. Next year, the loan portfolio contracted by another 8% due to COVID-19 and customer migration of legacy Nordea customers in Latvia and Lithuania. In 2021, mortgage demand

recovered, and the bank doubled the volume of new sales, which resulted in a moderate increase of 5%. Nevertheless, Luminor's portfolio amount remained the highest throughout the years compared to other banks. Swedbank and SEB have seen steady growth during 2018–2021. COVID-19 had no negative effect on these banks. Swedbank utilised funds from TLTRO to support its mortgage, corporate lending, and leasing portfolio, while SEB had stable group funding. LHV's customer loan amount, although the smallest, expanded quite rapidly, nearly tripling to 2,677 million euros (table 3). The organic growth came mostly from corporate loans. On top of that, the bank has purchased Danske Bank's Estonian branch retail portfolio in amount of 393 million euros in 2019 and 254 million euros in 2020 (LHV, 2019; LHV, 2020).

Table 4. Growth of deposit balances, year-end data (items in EUR million)

Item	**Bank**	**2018**	**2019**	**2020**	**2021**
Deposits from central banks and credit institutions	Swedbank	50	20	1,679	1,655
	Growth rate	–	*–60%*	*8295%*	*–1%*
	SEB	1,022	1,212	1,003	914
	Growth rate	–	*19%*	*–17%*	*–9%*
	Luminor	3,939	981	47	84
	Growth rate	–	*–75%*	*–95%*	*77%*
	LHV	0	0	200	197
	Growth rate	–	–	–	*–1%*
Deposits from customers	Swedbank	8,650	9,113	10,604	12,111
	Growth rate	–	*5%*	*16%*	*14%*
	SEB	4,400	4,446	5,274	5,791
	Growth rate	–	*1%*	*19%*	*10%*
	Luminor	9,070	10,235	11,822	10,305
	Growth rate	–	*13%*	*15%*	*–13%*
	LHV	1,422	2,701	4,120	5,808
	Growth rate	–	*90%*	*53%*	*41%*

Source: compiled by author based on the appendices 2 and 4

The deposits from central banks and credit institutions show a mixed trend for all banks. Swedbank has increased its balance from 2020 due to the loan from the central bank in the amount of 1,645 million euros. The same happened for LHV; the bank took a loan of 200 million euros from the central bank in 2020 (LHV, 2020). SEB amount, which consists mainly of deposits from the parent company, remained stable at around one billion euros, with only a 20% increase in 2019. Luminor's amount decreased rapidly from 3,939 to 84 million euros during the period (table 4).

After the merger, the bank has moved away from financing from former parent banks and replaced it with other sources, e.g., debt issuance.

All four banks have shown a steady increase in customer deposits over the years. LHV had a remarkable growth, quadrupling its amount to 5,808 million euros during the period and surpassing the amount of SEB. LHV was consistently implementing modern solutions such as electronic identification during account opening, introduction of virtual card, as well as constantly improving its mobile app. LHV was the first to offer the opportunity of a pension investment account (PIA) after the announcement of pension reform. At the end of 2021, the bank was also the first to offer trading in crypto assets. Swedbank and SEB steadily grew customer deposits, although at a slower pace (table 4). In 2020, deposits were growing due to the cautiousness among businesses and households. 2021 saw a recovery in credit demand; at the same time, the year was influenced by the pension reform. People withdrew their Pillar II funds, some of which were transferred to deposit or pension investment accounts. Luminor had a growth during 2019–2020, then the amount dropped by 13%, which was the only decrease among the group. The main reason could be Luminor's brand-new internet bank and digital channels that the bank has introduced at the end of 2020. This novelty was poorly received, with clients identifying a multitude of problems. By the end of 2021, some of the basic functions present in other banks, like SEPA payments or digitally signed extracts of account data, were still absent (Salu, 2021).

Figure 10 gives a perspective on the total asset and liability growth of all banks during 2018–2021, taking 2018 as a base value. Swedbank and SEB demonstrated good growth of 56% and 24%, respectively, during the period. LHV expanded in size by four times over the same period. Luminor showed poor performance, decreasing by 13% during the research period. It can be noted that Swedbank and Luminor are quite similar in size. SEB is larger than LHV by one billion euros in terms of total assets, whereas SEB's loan portfolio is more than twice as large.

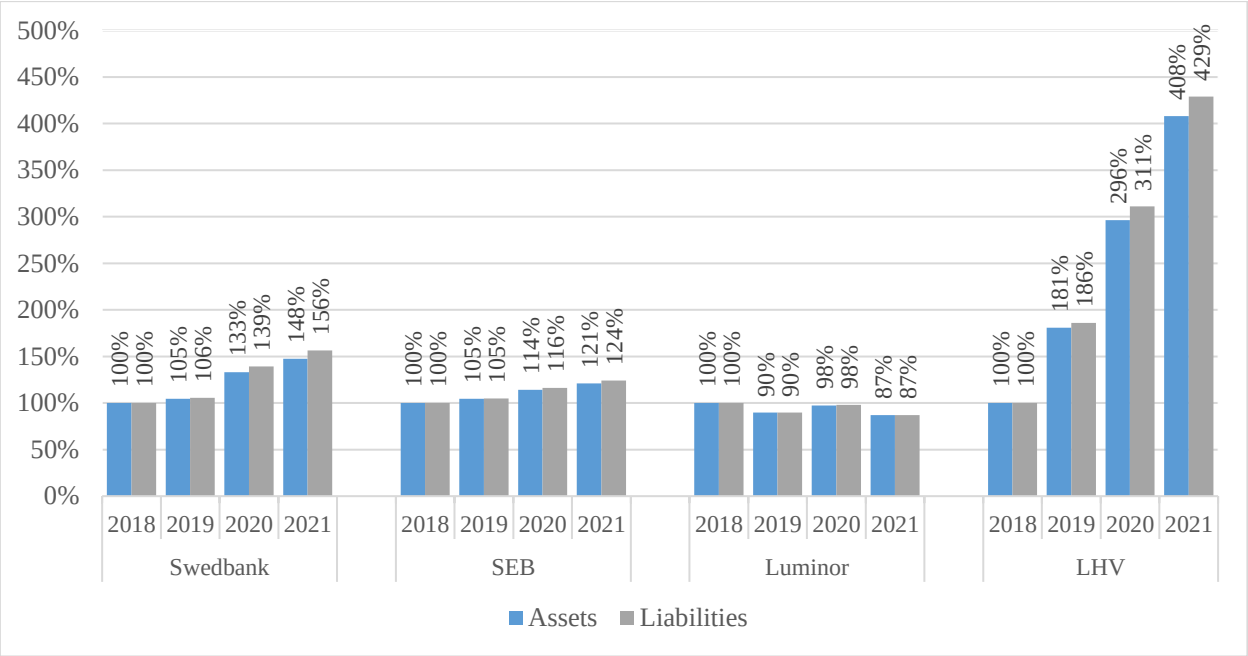

Figure 10. Banks' assets and liabilities trend analysis during 2018–2021
Source: Compiled by author based on data in appendices 2 and 4

To conclude, all banks showed different trends during the research period. Swedbank's loan from the central bank had a major effect on its balance sheet. Luminor was the only bank whose asset amount contracted, mainly due to the drop in customer loans. Swedbank and SEB showed steady growth throughout the period, and LHV demonstrated impressive expansion, mainly due to the inflow of deposits from customers. During the period, customer deposits grew at a higher rate than customer loans in all banks.

2.3.2. Growth analysis of income statement

As seen from the income statement structure analysis in Chapter 2.2.2, the main sources of income for all banks are net interest income and net commission income. Both categories varied on a yearly basis for each bank.

From 2018 to 2021, Swedbank's NII saw a modest growth of 5%, with a slight dip of 1% in 2020 (table 5). SEB showed a more substantial increase of 15% over the same period, though it also saw a decrease of 1% in 2021. Considering that customer loan portfolios of both banks have grown by the same percentage (17%), the difference in NII is unexpected. The author sees the reason in interest expense. Swedbank receives most of its funding from customer deposits. At the same time, bank was holding an increasing amount in cash at the central bank, which is quite costly due to the

negative interest rates. Comparatively, SEB relies more on parent funding, and its cash amounts at central banks constitute a smaller portion of total assets (Figure 5). Luminor, on the other hand, experienced a decline in NII from 2018 to 2020 but demonstrated an increase of 5% in 2021. Luminor was hit the hardest by the 2020 pandemic, showing a noticeable drop of 11% in 2020. This can be related to the decrease in amount of corporate loans (Luminor, 2020). Additionally, in 2020, the bank achieved a fully independent funding structure, replacing cheap parent funding with relatively more expensive bond issues. In terms of Luminor geography, the decrease in interest income showed banks in all three countries. Finally, LHV had the largest growth in net interest income, with a 155% increase from 2018 to 2021, driven largely by 45% and 42% growth in 2020 and 2021, respectively. This growth is in line with the bank's expanding loan portfolio; the main source of interest income has come from retail and corporate loans.

Net commission income had a similar trend to NII. It remained largely flat from 2018–2021 for Swedbank and SEB and slightly decreased for Luminor. LHV, again, saw a significant increase of 74% during the period (table 5), with most income coming from financial intermediaries. It can be noted that both net interest and commission income are proportional to the size of banks.

Table 5. Growth of net interest and net commission income, year-end data (items in EUR million)

Item	**Bank**	**2018**	**2019**	**2020**	**2021**
Net interest and other similar income	Swedbank	211	218	216	221
	Growth rate	–	*3%*	*–1%*	*2%*
	SEB	100	112	117	115
	Growth rate	–	*13%*	*4%*	*–1%*
	Luminor	259	254	227	239
	Growth rate	–	*–2%*	*–11%*	*5%*
	LHV	38	47	68	97
	Growth rate	–	*24%*	*45%*	*42%*
Net commission income	Swedbank	78	81	74	79
	Growth rate	–	*4%*	*–9%*	*7%*
	SEB	49	51	48	50
	Growth rate	–	*5%*	*–6%*	*6%*
	Luminor	84	77	74	79
	Growth rate	–	*–8%*	*–5%*	*7%*
	LHV	25	26	33	43
	Growth rate	–	*3%*	*30%*	*30%*

Source: compiled by author based on the appendices 3 and 5

Figure 11 shows the amounts of total income and profit before tax (PBT), which implies that the difference between the two is total expenses before tax. The directions of NII can be applied to banks' total income, which followed the same growth trend. Swedbank has a noticeable amount of net insurance and other income; however, both remained flat during the period, thus having no effect on the total income fluctuation. Profit before tax demonstrated a mixed trend and varied from total income. Swedbank's PBT saw a decline of 16% from 2018 to 2020 and stayed at the same level in 2021. The drop in 2020 was due to a combination of increases in staff expenses and credit loss allowances. SEB's total income and profit before tax moved in tandem except for 2020, when PBT dipped by 17 million euros mainly due to the increase in credit loss allowances. Luminor's PBT dropped sharply in 2018–2020 due to the surge in credit loss allowances in 2019, followed by a drop in total income in 2020. In 2021, despite the same level of total income, the bank increased its PBT by 50 million euros, mainly due to the change in credit loss recoveries of 30 million euros and the contracting of other administrative expenses by 13 million euros. LHV showed a high correlation between total income and PBT, which experienced steady growth over the period.

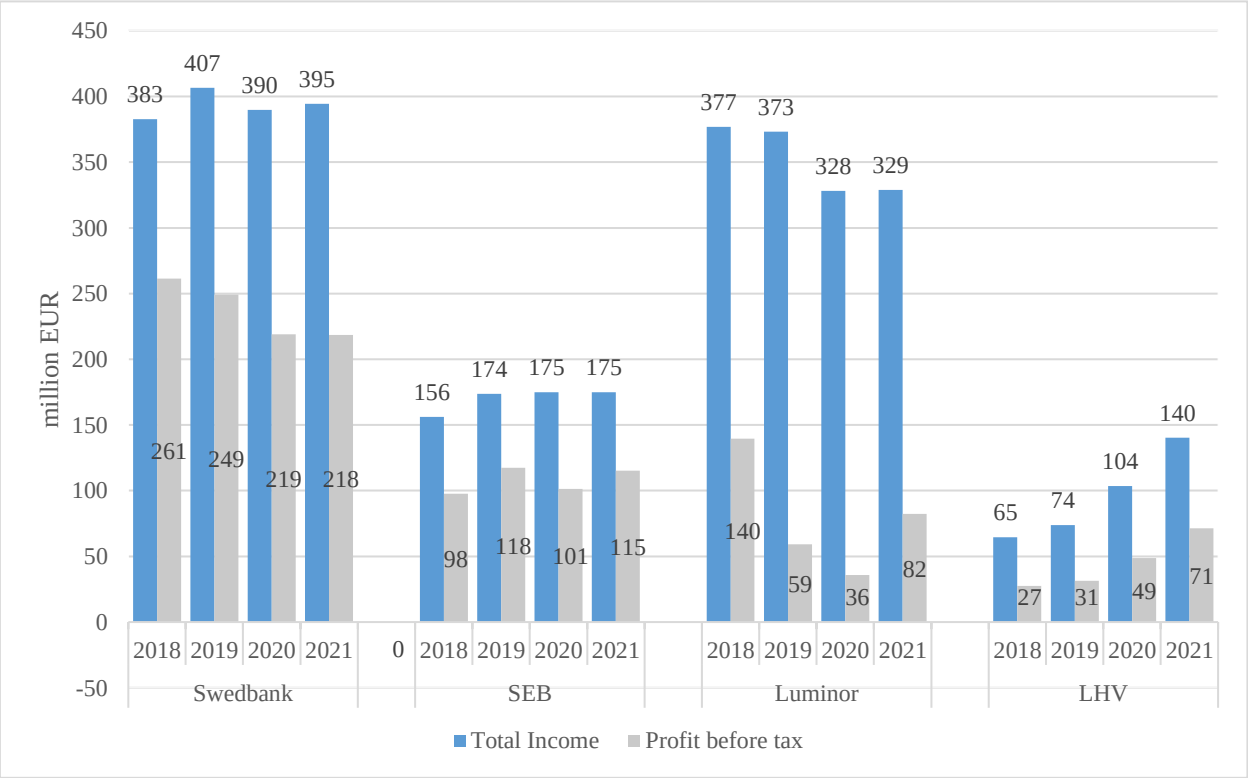

Figure 11. Total income and profit before tax during 2018–2021
Source: Compiled by author based on data in appendix 3

Overall, total income was driven by net interest and commission income. Both categories varied on a yearly basis for each bank. LHV has seen the largest growth due to the rapid expansion of its loan portfolio. Swedbank and SEB remained relatively flat, while Luminor has seen the largest drop, mainly because of the contraction of its corporate loan portfolio in 2020. Profit before tax did not show a strong correlation to total income, except for LHV. The difference was mainly due to the changes in credit recoveries and loss allowances.

3. EFFICIENCY ANALYSIS AND RANKING

In this chapter, the author applies the efficiency matrix methodology to compile growth and benchmark indices of banks' overall efficiency. The author also ranks four major Estonian banks based on a synthetic overall efficiency index.

3.1. Overall efficiency matrix analysis

The author combined the overall efficiency matrix structure depicted in Figure 3 with the banks' initial data presented in Appendix 7. The author started with a brief analysis of the banks' efficiency level in terms of submatrices for efficiency. Next, the author calculated benchmark and growth indices of banks' overall efficiency (BICOE and GICOE).

Table 6 shows banks' overall efficiency growth during the research period. The base value of index is 100%, meaning the difference between the index and the base value is the change in bank's overall efficiency level for a given year.

Table 6. Growth indices of banks' overall efficiency

GICOE	Swedbank	SEB	Luminor	LHV
2021/2020	97%	103%	135%	103%
2020/2019	92%	94%	83%	105%
2019/2018	97%	108%	75%	93%
CAGR (2021/2018)	96%	101%	94%	100%

Source: compiled by author based on the appendix 8

Swedbank's efficiency has been declining during 2018–2021 by 4% on average, with 2020 seeing the largest drop of 8%. The value of 11 out of 15 elements has decreased (CAGR less than 0). The remaining four fields are related to equity staying relatively stable throughout the period (Appendix 8). The bank's operating expenses were one of the major contributors to its overall decreased efficiency. The bank had an increased staff cost in 2020 and a surge in intra-group service expenses in 2021 (Swedbank 2020; Swedbank 2021). Balances with central banks as well

as loan portfolio grew at a faster pace than profit and income, which also made a significant contribution. The year 2020 was the worst in terms of efficiency level, with 12 out of 15 fields in decline. The demand for credit nearly froze due to the pandemic. This caused a remarkable increase in credit loss allowances, which led to a decrease in indicators related to profit. The bank entered the TLTRO program in June 2020 to support bank lending. Still, a significant portion of funds were held at central banks, which, due to negative interest rates, increased bank's interest expense. Thus, the share of NII in the profitability of operating and financial activities decreased over the years. Return on equity (ROE), which is in case of overall efficiency matrix defined as Profit before tax to Average equity, decreased from 15% in 2018 to 13% in 2021 (Appendix 8).

SEB's overall efficiency has been increasing by 1% on average during the period. The bank has experienced growth in 2019 and 2021 of 8% and 3%, respectively (table 6). As for Swedbank, 2020 was the worst year for SEB. The bank also joined the EBA moratorium period, granting grace periods to private clients. The bank had a decrease in efficiency of 6%, with 10 out of 15 indicators decreasing during the year. The largest contribution came from an increase in credit impairments that significantly decreased profit before tax compared to the previous year. A year prior, the situation was vice versa, with 13 out of 15 elements showing growth (Appendix 8). SEB has strongly increased its large corporate customers portfolio by 16% (SEB, 2019). Moreover, clients started more actively using bank's digital market services, which helped to mitigate the drop the following year. The main contribution was again from the increase in profit before tax, which itself grew due to an increase in net interest and net commission income. Thus, income ratios were also important contributors to the 2019 efficiency level. The intensity of asset usage (Operating expense to Average assets) is the only indicator that has been consistently decreasing over the period. During the period, the Average assets increased more than income indicators and profit before tax, decreasing overall efficiency in 2018–2021.

Mirroring the dramatic year-on-year changes in financial statements, Luminor has experienced the most significant fluctuations on a yearly basis, ranging from a decline of 25% in 2019 to an increase of 35% in 2021 (table 6). The overall efficiency dropped on average by 6% during the period. During the period, 10 out of 15 elements were declining, with 3 out of the remaining five being stable (Appendix 8). Unlike at Swedbank and SEB, 2020 was not the worst year for Luminor in terms of efficiency drop, even though 14 out of 15 elements experienced a decline during that year. In 2019, two major reasons led to a 25% fall in efficiency. Firstly, an impressive increase in operating expenses by 53 million euros due to the continuous transformation process (the bank

treats it as exceptional costs). Secondly, an increase in expected credit losses as a result of a review of several large exposures in legacy portfolio (Luminor, 2019). In 2020, while operating expenses dropped by 15 million euros, the related elements were still declining due to the fall in NII and Total income. In 2021, the situation significantly improved, with 12 out of 15 fields showing growth during the year. Profit before tax contributed the most to the rising efficiency level, owing to credit recoveries that came as a rebound from a pandemic year before, and a continuous decrease in operating expenses. The latter was significantly reduced, as the exceptional costs, which relate to Luminor's digital transformation, fell by 25% (Luminor 2021).

LHV showed a surprising result: despite the bank's significant growth in size, the overall efficiency level stayed at the same level during 2018–2021 (table 6). During the period, 10 out of 15 elements grew (Appendix 8). The main indicator that contributed to decreasing the efficiency level was Average assets. This indicator rose much faster than the income and profit ones. LHV was not utilising its assets fully, as half of them were balances in central banks that were not generating income (except 2.3 million euros in 2021). These cash balances were also growing at a much faster pace; during 2018–2021, the amount of cash balances increased by five times while the loan portfolio increased by three. At the same time, NII and total income were growing even slower, by 1.6 and 1.2 times, respectively. Although every indicator was increasing during the period, the bank saw a drop in efficiency of 7% in 2019. Only two out of the 15 elements increased; one remained stable, and all the other fields fell. Besides the increase of cash balances by two times compared to 2018, another contribution was a significant increase in Average equity mainly due to a 50% increase in share premium (Appendix 4). The decrease in other fields relates to the faster pace of operating expenses growth compared to Total income. NII was also a contributor, having an increasing share in Total income and profit. The share of NII in Total income was increasing during the whole period, reducing the ratio from 1.69 to 1.44. Return on equity (Profit before tax to Average equity) increased from 19% to 25% (Appendix 8). It is worth noting that, compared to other banks, 2020 was a good year for LHV in terms of efficiency, which grew by 5%.

Overall, it can be concluded that none of the banks showed significant efficiency improvements during 2018–2021. SEB showed an overall efficiency improvement of 1% per year, LHV remained the same, and Swedbank and Luminor experienced decreases of 4% and 6%, respectively. The yearly efficiency fluctuations varied by bank, with Luminor having the most noticeable swings. Surprisingly, despite the noticeable growth in size, LHV did not show a significant increase in efficiency. The author concluded that this is due to the bank's inefficient asset usage, mainly due

to holding a significant amount of cash on hand. 2020 was the worst year in terms of efficiency growth for Swedbank and SEB, and the best for LHV. Luminor has also seen a drop in efficiency that year, but the worst fall was in 2019, the same as for LHV.

3.2. Efficiency ranking

The banks' individual efficiency levels move in different directions. Therefore, the author compiled benchmark matrices in order to compare banks' performance in terms of overall efficiency with one another. The compiled matrices with elements expressing the relation of SEB, Luminor, and LHV matrix elements over the respective benchmark element Swedbank can be found in Appendix 9.

Table 7 provides benchmark indices of the overall efficiency of SEB, Luminor, and LHV, with Swedbank serving as a benchmark. The author of the thesis used Swedbank as a benchmark due to its size and history. Although Luminor has a similar size and an even larger loan portfolio, it also incorporates Latvian and Lithuanian branches, while Swedbank shows operations only in Estonia.

Table 7. Benchmark indices of banks' overall efficiency over Swedbank

BICOE	SEB	Luminor	LHV
2021	95%	71%	125%
2020	90%	51%	118%
2019	89%	57%	103%
2018	80%	74%	108%

Source: compiled by author based on the appendix 9

Based on the benchmark indices, it can be said that the overall efficiency level in Swedbank was higher than in SEB and Luminor. SEB's efficiency level was 20% lower than the benchmark in 2018. Swedbank was off to a good start due to considerable credit recoveries. The efficiency gap between two banks has been decreasing over the years, reaching nearly par level in 2021. The main contributors to the increase in SEB and Swedbank BICOE were SEB's relatively low operating expenses and total income (Appendix 9). Swedbank experienced a steady increase in administrative and staff expenses, which hurt its dominant position in efficiency. Swedbank also

had a relatively higher income thanks to the net insurance income. This allowed Swedbank to consistently outperform SEB in profit and income to assets and equity ratios.

Luminor showed the reverse direction compared to SEB. The bank was already 26% less efficient than the benchmark in 2018, reaching its lowest point in 2020. During that year, Swedbank was twice as efficient as Luminor. The efficiency gap is quite impressive, considering that these banks are nearly the same size. Even though Swedbank's operating expenses were increasing, Luminor's operating expenses were increasing even more on average. As mentioned previously, the pandemic hit Luminor the hardest. Luminor's NII had a significant drop in 2020 due to the fall in loan portfolio amount, which greatly impacted the bank's inefficiency compared to the benchmark. In 2021, the bank managed to reduce the efficiency level gap by ramping up the BICOE index to 71%. This level is still, however, the lowest among the other two banks.

LHV is the only bank that has shown a higher efficiency level than the benchmark. The bank has been consistently more efficient than Swedbank, reaching its highest point in 2021, when it was 25% more efficient. The increase mostly comes from equity related fields. LHV's equity level, despite doubling over the years, remained relatively much lower than Swedbank's. On the other hand, to mitigate the risk, the bank was holding a significant amount of liquidity buffer, reducing the comparative efficiency level in other fields. Holding such an amount of cash at central banks additionally hurt net interest income due to the negative interest rates. Nevertheless, the banks focus on corporate loans and rapid expansion outweighed these effects and contributed to comparatively higher efficiency levels throughout the period.

In conclusion, based on the benchmark index of overall efficiency, LHV ranks first, demonstrating significantly higher efficiency levels than the benchmark. SEB and Luminor demonstrated lower levels of efficiency, ranking third and fourth, respectively. SEB was catching up to the benchmark, reaching nearly par level in 2021. Luminor exhibited significant underperformance throughout the research period. Swedbank, as a benchmark, ranks second.

3.3. Decomposition analysis of return

The decomposition analysis of return on equity is present in Appendix 8. The matrix in figure 3 provides 5 components that characterise the formation of ROE (table 8).

Table 8. The greatest impact on ROE by other components

P/C =	(A/C) ×	(O/A) ×	(I/O) ×	(R/I) ×	(P/R) ×
Profit before tax/Equity (ROE)	Average Assets/ Average Equity	Operating expenses/ Average Assets	NII/ Operating expenses	Total Income/NII	Profit before tax/Total Income

Source: compiled by author based on the appendix 10

Table 9 summarises the analysis and indicates which component had a greatest impact on the ROE. P/R had the greatest impact on Luminor's and SEB's ROE throughout the period. A/C had the greatest impact on Swedbank in 2020–2021 and on LHV in 2021. LHV's ROE in 2019–2020 was mainly affected by O/A.

Table 9. The greatest impact on P/C by other components

Bank	2019/2018	2020/2019	2021/2020
Swedbank	182% – I/O & P/R	–144% – A/C	14499% – A/C
SEB	47% – P/R	97% – P/R	104% – P/R
Luminor	103% – P/R	77% – P/R	98% – P/R
LHV	109% – O/A	–185% – O/A	106% – A/C

Source: compiled by author based on the appendix 10

It can be concluded that Luminor's ROE, as previously mentioned, was mainly affected by an increased operating expense due to transition in 2019, increased credit loss allowances and decreased income during the 2020 pandemic, and the reversal of credit loss allowances the next year. SEB's decrease in ROE in 2020 and subsequent increase in 2021 were mainly caused by credit loss allowances. The bank had a significant increase in expected credit losses of nearly 15 million euros in 2020 due to the pandemic and 14 million euros in recoveries in 2021 as credit demand started to improve. In 2019, the main driver of ROE was an increase in interest income. The bank took advantage of the consolidating banking landscape in Estonia and increased its large corporate customers portfolio by 16% (SEB, 2019). The bank also had a reversal of 4.7 million euros in credit recoveries from 2018.

In 2019, Swedbank's ROE decreased almost by 1%. The bank had a good year in terms of interest, commission, and insurance income, amounting to a total income increase of 24 million euros. However, its increase in operating expenses overshadowed this amount. The bank has increased

its staff, marketing, regulatory, and intra-group expenses by 20 million euros. Additionally, the bank had credit impairments of 1.9 million euros in 2019 compared to credit recoveries of 14.8 million in 2018. This decreased profit before tax by another 16.7 million euros. In 2020, the bank's ROE decreased by another 1.6%. A/C had the biggest impact and was the only component that contributed to an increase in ROE. This happened due to inflows of cash from TLTRO and growing deposits. However, all other components outweighed the positive effect, as the bank could not fully utilize these funds for loans and subsequent income. This happened because of the decreased credit demand because of the pandemic and the moratoria on loan payments. In 2021, the bank's ROE stayed at the same level, indicating that improvements in income compared to the previous year were cancelled out by increased expenses.

LHV's decrease in ROE in 2019 can be attributed to the growing equity base, caused by its stock price increase. O/A was the biggest contributor to the ROE decrease. This is counterintuitive, as the decrease in ratio actually means the bank has become more efficient by spending comparatively fewer resources managing a comparatively larger asset base. The same applies to 2020, when the same component had the biggest negative contribution despite the ROE increasing by 5%. All other components outweighed the negative effect of O/A due to the continued rapid expansion of the bank's loan and deposit portfolios. In 2021, this was evident via the biggest contributor, A/C.

Overall, it can be concluded that changes in ROE were caused mostly by the same factors as in matrix analysis, except for LHV in 2019–2020.

CONCLUSION

The aim of the thesis is to identify differences and similarities in the structure of the main financial statements, financial performance, and overall efficiency between major Estonian banks in the years 2018–2021 using data from annual reports.

To achieve the aim of the thesis, the author stated the four research questions that have been addressed by completing four research tasks defined in the introduction. After applying structural, trend, and efficiency matrix analysis, the author can provide the following answers to the research questions:

1. What are the main differences in the structures of the financial statements of the banks? What could be the reasons behind the differences, if any?

A vertical analysis of the banks' balance sheets revealed that the structures of their liabilities and equity are largely similar. Customers' deposits make up most of the liabilities in each bank. The noticeable differences are in the proportion of deposits from central banks and credit institutions, which varies annually. SEB relied on parent funding, holding a share of 12–18% during the period. Luminor has replaced its parent funding with bond issue, decreasing the share from 26% to virtually zero in 2020. Swedbank's participation in the TLTRO program increased the share of deposits from credit institutions from zero to 10%. The asset structures of Swedbank, SEB, and Luminor are generally comparable, while the structure of LHV is more dissimilar. As anticipated for retail banks, loans to customers constitute the largest share of the asset structure for all banks, except for LHV in 2021. The second-largest component is balances held at the central bank. LHV stands out with a significantly higher proportion of cash held at central banks, surpassing its loan portfolio share by 18% in 2021. This anomaly can be attributed to compliance with the EU LCR regulations, as LHV's deposit portfolio experienced faster growth compared to its loan portfolio during the period of 2018–2021.

Net interest income, as revealed by a vertical analysis of banks' income statements, makes up a significant share of total income. Net commission income is second. The remaining components

are similar for SEB and Luminor, different for Swedbank, and almost non-existent for LHV. Swedbank has a more diversified income structure due to its insurance subsidiary and its service provision to parent group companies. The ratio of total operating expenses to total income is comparable for Swedbank and SEB, slightly higher for LHV, and significantly higher for Luminor due to IT expenses related to the merger.

All banks are also similar in terms of cash flow structure, with net cash flow from operating activities being the main part. However, banks exhibit significant differences in terms of yearly fluctuations, with LHV seeing consistent net cash flow growth and Luminor having the most notable ups and downs.

2. What are the main differences in the dynamics of the financial statements of the banks? What could be the reasons the behind differences, if any?

Throughout the research period, the four banks displayed different trends. LHV demonstrated an impressive expansion, quadrupling in size over the research period. The bank attracted customers by offering new products, a convenient mobile app, and innovative banking solutions. The bank was additionally growing its loan portfolio via purchases of Danske Bank's retail loans. On the contrary, Luminor was the only bank that contracted in size over the years. The bank had a very dynamic period, going through two mergers and carving out the technology of former parent banks. This came with a cost, both in terms of operating expenses and customer numbers. Luminor had a few success stories related to raising capital via bond issue, thus replacing parent funding. On the customer side, however, the bank had little success. The troublesome new internet bank and lack of basic functions such as SEPA payments and digitally signed extracts that were long present in other banks, have reduced Luminor's client base. Swedbank and SEB both displayed consistent organic growth over the research period. Compared to SEB, Swedbank has increased its size more due to its participation in the TLTRO program in 2020.

Each bank demonstrated different annual variations. Apart from LHV, COVID-19 has negatively affected banks' income mainly due to the freezing demand for credit and an increase in credit loss allowances. The rebound of the next year has improved the situation of banks, but on a different scale. Luminor's total income remained the same, mainly because of the significant increase in contributions to resolution funds and deposit guarantee schemes. At the same, profit before tax increased because of the credit recoveries. SEB had a similar pattern. Swedbank had an increase in total income, but profit before tax stayed at the same level. The bank, unlike others, has not had

significant credit recoveries in 2021. LHV's total income and profit remained unaffected by outside shocks and showed consistent growth.

3. How do banks differ from an overall efficiency perspective? What could be the reasons the behind differences, if any?

The overall matrix efficiency analysis revealed that none of the banks significantly improved their efficiency during 2018–2021. Swedbank's efficiency has been decreasing each year by 4% on average. The continuous increase in operating expenses, such as staff, marketing, regulatory and intra-group expenses, was one of the main contributors. During the pandemic, efficiency dropped the most, by 8%. The bank has acquired funds from TLTRO to mitigate the effect but could not fully utilise in its loan portfolio. Like other banks, Swedbank increased its expected credit losses in 2020 but did not have major recoveries the following year. Luminor also saw a decrease in efficiency level by 6% annually. Following the substantial year-on-year changes in financial statements, the bank saw major swings in efficiency levels, falling by 25% and 17% in 2019 and 2020, respectively, due to the same problems identified in the previous research question. Nevertheless, in 2021, the bank experienced a 35% surge in efficiency level. The increase was not because of the improved income, however. The main causes were post-pandemic credit reversals and a decrease in operating expenses related to digital transformation. Surprisingly, despite the apparent increase in size, LHV efficiency level remained at the same level during the period. The bank had an efficiency drop of 7% in 2019, followed by a modest increase of 5% and 3% in the next two years. LHV was constantly holding over 40% of its total assets in cash at central banks. This suggests that the bank was not utilising its assets efficiently, as nearly half of the assets were losing money due to the negative interest rates. As a result, income and profit rose less quickly than balance sheet, which stalled bank's efficiency levels. Finally, SEB was the only bank that showed an overall efficiency improvement, although of only 1% per year. 2020 was the worst year in terms of efficiency. The bank saw a drop of 6% and a rebound of 3% next year. In 2019, the bank saw an improvement of 8%. The bank strongly increased its large corporate customers portfolio that year, which led to an increase in both interest income and profit. The bank also relied on cheap parent funding. This allowed SEB to minimise its interest expenses, thus improving overall efficiency.

Decomposition analysis of return showed that changes were caused mostly by the same factors as in matrix analysis. Returns of Swedbank, SEB, and Luminor were more driven by fluctuations in expenses rather than in total income. Increase in credit loss allowances during pandemic, and

subsequent recoveries next year had a significant impact on these banks. Large operating expenses also had considerate contribution on Swedbank and Luminor. LHV's return was mainly affected by the bank's swift growth, which outweighed all other negative effects.

4. How do they rank compared to each other based on the overall efficiency, and what are the reasons behind the differences, if any?

The author made a ranking of the banks based on benchmark indices of overall efficiency. The author of the thesis used Swedbank as a benchmark due to its size and operations' geography. Based on these indices, LHV ranks first. The bank demonstrated considerably higher efficiency levels than the benchmark throughout the period, reaching its highest point in 2021, when LHV was 25% more efficient. The bank's rapid expansion contributed the most. SEB and Luminor demonstrated lower levels of efficiency and rank third and fourth, respectively. SEB was underperforming the benchmark during the research period, although the gap significantly decreased. The bank's control over its operating expenses compared to Swedbank's increasing staff and administrative expenses allowed SEB to reach nearly the same level of efficiency in 2021. As expected, Luminor became the least efficient bank among the three. The magnitude of underperformance compared to the benchmark ranged from 26% to 49% during 2018–2021. Luminor was more affected by the pandemic compared to other banks. The bank had significantly larger operating expenses compared to Swedbank. The shrinking size due to the second research question also contributed to the profound efficiency gap. Swedbank, as the benchmark, ranked second.

The thesis could be developed further by adjusting efficiency matrix with inputs and outputs from other banking efficiency approaches such as intermediation or production approach. In addition, the dataset could be expanded to include other banks, and the results could be compared to more widespread efficiency metrics such as DEA or SFA.

KOKKUVÕTE

Magistritöö eesmärk oli välja selgitada põhiaruannete struktuuride, finantstulemuste ja üldse efektiivsuste erinevused ja sarnasused Eesti suuremate pankade vahel aastatel 2018–2021, kasutades majandusaasta aruannete andmeid.

Magistritöö eesmärgi saavutamiseks tõi autor välja neli uurimisküsimust, mida on käsitletud sissejuhatuses määratletud nelja uurimisülesande täitmisega. Pärast struktuuri- trendi- ja efektiivsusmaatriksi analüüsi rakendamist saab autor anda uurimisküsimustele järgmised vastused.

1. Kuidas erinesid suuremate pankade põhiaruannete struktuurid? Mis olid erinevuste tekkimise põhjused, kui üldse?

Pankade bilansside vertikaalanalüüs näitas, et nelja panga kohustiste ja omakapitali struktuurid on suures osas sarnased. Igas pangas moodustavad kliendi hoiused suurema osa kohustistest. Võlgnevused krediidiasutustele märgatavalt varieerusid aastati. SEB-l oli suhteliselt rohkem rahastamist emaettevõtetest perioodi jooksul, osatähtsusega 12-18%. Luminor asendas emaettevõtete rahastamist võlakirjaemissiooniga, vähendades osatähtsust aastatel 2018–2020 26% -lt peaaegu nullini. Swedbanki osalemine Euroopa Keskpanga sihtotstarbeliste pikemaajaliste refinantseerimisoperatsioonide (TLTRO) programmis suurendas võlgnevused krediidiasutustele nullist 10% -ni. Swedbanki, SEB ja Luminori varade struktuurid on üldiselt võrreldavad, samal ajal kui LHV struktuur erineb rohkem. Ootuspäraselt, moodustavad klientidele antud laenud kõigi pankade varastruktuurist suurima osa, välja arvatud LHV puhul 2021. aastal. Teiseks suurimaks komponendiks on raha ja nõuded keskpankadele. LHV eristub märkimisväärselt suurema osakaaluga rahast, mida hoitakse keskpankades, mis ületab tema laenuportfelli osakaalu 2021. aastal 18% võrra. Selle anomaalia põhjuseks võib pidada vastavust EL-i likviidsuskattekordaja regulatsioonidele, kuna LHV hoiuseportfell kasvas perioodil 2018–021 laenuportfelliga võrreldes kiiremini.

Puhasintressitulu, nagu selgub pankade kasumiaruannete vertikaalanalüüsist, moodustab olulise osa kogutulust. Puhasteenustasutulu on teisel kohal. Ülejäänud tululiigid on SEB-l ja Luminoril

jaoks sarnased, Swedbankil jaoks erinevad ning LHV-l peaaegu olematud. Swedbanki tulude struktuur on mitmekesisem tänu kindlustusega tegelevale tütarettevõttele ja teenuste osutamisele kontserni emaettevõtetele. Tegevuskulude suhe kogutuludesse on võrreldav Swedbanki ja SEB puhul, veidi kõrgem LHV puhul ja oluliselt kõrgem Luminori puhul ühinemisega seotud IT-kulude tõttu.

Kõik pangad on sarnased ka rahakäibe struktuuri poolest, mille peamine osa on äritegevuse puhasrahakäibe. Samas on pankadel märkimisväärseid erinevusi aastaste kõikumiste osas: LHV netorahavoo kasv on järjepidev ning kõige märkimisväärsemad kõikumised on Luminoril.

2. Kuidas erines analüüsitavate pankade arengukiirus? Mis olid erinevuste tekkimise põhjused, kui üldse?

Kogu uurimisperioodi jooksul ilmnesid nelja panga erinevad suundumused. LHV näitas muljetavaldavat kasvu; pank suurendas oma varad neljakordselt uurimisperioodi jooksul. Pank meelitas kliente, pakkudes uusi tooteid, mugavat mobiilirakendust ja uuenduslikke pangalahendusi. Lisaks kasvatas pank oma laenuportfelli Danske Banki jaelaenude ostude tõttu. Vastupidiselt sellele, oli Luminor ainus pank, mille suurus aastate jooksul kahanes. Pangal oli väga dünaamiline periood, mis hõlmas kaks ühinemist ja endiste emapankade tehnoloogia ümbertegemist. Sellega kaasnesid kulud nii tegevuskulude kui ka klientide arvu osas. Luminoril oli paar edulugu, mis olid seotud kapitali kaasamisega võlakirjaemissiooni kaudu, asendades seega emaettevõtte rahastamist. Klientide poolel oli pangal aga vähe edu. Tülikas uus internetipank ning põhifunktsioonide, nagu SEPA maksed ja digitaalselt allkirjastatud väljavõtted, puudumine, mis olid teistes pankades pikka aega olemas, vähendanud Luminori kliendibaasi. Nii Swedbank kui ka SEB näitasid uuringuperioodil järjepidevat orgaanilist kasvu. Võrreldes SEB-ga on Swedbank oma suurust suurendanud rohkem tänu TLTRO-programmis osalemisele 2020. aastal.

Iga pank näitas erinevaid aastaseid kõikumisi. Välja arvatud LHV, on COVID-19 negatiivselt mõjutanud pankade tulusid peamiselt krediidinõudluse külmutamise ja krediidikahjude reservide suurenemise tõttu. Järgmise aasta taastumine on parandanud pankade olukorda, kuid erineva ulatusega. Luminori kogutulu jäi samaks, peamiselt tänu olulisele suurenemisele panustes lahendusfondidesse ja hoiuste tagamise skeemidesse. Samal ajal suurenes kasum enne tulumaksu tänu laenukasuile. SEB-l oli sarnane muster. Swedbanki kogutulu suurenes, kuid kasum enne tulumaksu jäi samal tasemel. Erinevalt teistest pankadest ei olnud tal märkimisväärseid

krediidikasumid 2021. aastal. LHV kogutulu ja puhaskasum ei mõjutanud välised šokid ning näitasid järjepidevat kasvu.

3. Kuidas erinesid võrreldavad pangad üldise efektiivsuse poolest? Mis olid erinevuste tekkimise põhjused, kui üldse?

Üldise efektiivsusmaatriksi analüüs näitas, et ükski pank ei parandanud aastatel 2018–2021 märkimisväärselt oma üldist efektiivsust. Swedbanki efektiivsus on aastate lõikes keskmiselt 4% võrra vähenenud. Pidevalt suurenevad tegevuskulud nagu personalikulud, IT-kulud, ja kontsernisisesed teenused oli üks peamisi tegureid. Pandeemia ajal langes efektiivsus kõige rohkem 8% võrra. Selle mõju leevendamiseks sai Pank vahendeid TLTRO-st, kuid ei suutnud neid täielikult kasutada laenuportfelli jaoks. Sarnaselt teistele pankadele on suurendas ka Swedbank 2020. aastal krediidikahjude eraldist, kuid järgmisel aastal suuri krediidikasumeid nagu teistel pankadel ei olnud. Luminori üldise efektiivsuse tase langes samuti 6% aastas. Finantsaruannetes toimunud märkimisväärsed aastate vaheliste muudatuste järel oli pangal olulised kõikumised efektiivsuse tasemetes, langedes vastavalt 25% ja 17% 2019. ja 2020. aastal, tingituna samadest probleemidest, mida on esitatud varasemas uurimisküsimuses. Siiski, 2021. aastal oli pangal efektiivsuse taseme tõusu 35%. Kasv ei tulnud tulude suurenemisest. Peamised põhjused olid pandeemiajärgsed laenukasumid ja digipöördega seotud tegevuskulude vähenemine. Üllatavalt jäi LHV efektiivsuse tase, vaatamata ilmsele suuruse suurenemisele, samale tasemele kogu perioodi vältel. Pangal oli 2019. aastal efektiivsuse langus 7%, mida järgnesid tagasihoidlikud tõusud 5% ja 3% järgnevatel aastatel. LHV hoidis pidevalt üle 40% koguvaradest rahana keskpankades. See viitab sellele, et pank ei kasutanud oma varasid efektiivselt, kuna peaaegu pool varadest kaotas tulu negatiivsete intressimäärade tõttu. Selle tulemusena kasvasid tulud ja kasum mitte nii kiiresti kui bilansimaht, mistõttu panga üldine efektiivsus jäi samaks. SEB ainus pank, mis näitas üldist efektiivsuse paranemist, ehkki ainult 1% aastas. 2020. aasta oli efektiivsuse poolest halvim aasta. Panga langus oli 6% võrra ja taastumine järgmisel aastal 3%. 2019. aastal paranes pank 8% võrra. Sellel aastal suurendas pank oluliselt oma suurte ettevõtete klientide portfelli, mis tõi kaasa nii intressitulude kui ka kasumi suurenemise. Pank tugines ka odavale emaettevõtte rahastamisele. See võimaldas SEB-l minimeerida intressikulusid ning parandada seeläbi üldist efektiivsust.

Tegurianalüüs näitas, et muutused omakapitali tasuvuses tulenesid peamiselt samadest teguritest nagu tuvastati maatriksianalüüsisi käigus. Swedbanki, SEBi ja Luminori omakapitali tasuvused sõltusid rohkem kulude kõikumistest kui kogutuludest. Pandeemia ajal suurenenud krediidikahjumite eraldised ning nendele järgnenud taastumised järgmisel aastal avaldasid nendele

pankadele olulist mõju. Suured tegevuskulud mõjutasid oluliselt ka Swedbanki ja Luminori. LHV tagasimakseid mõjutas peamiselt panga kiire kasv, mis kaalus üles kõik teised negatiivsed mõjud.

4. Kuidas järjestuvad pangad suhtelise efektiivsuse alusel?

Autor tegi pankade järjestuse üldise efektiivsuse võrdlusindeksite põhjal. Magistritöö autor kasutas võrdlusena Swedbanki selle suuruse ja tegevuspiirkonna tõttu. Võrdlusindeksite alusel paigutub esimeseks LHV. Pank näitas kogu perioodi vältel oluliselt kõrgemat efektiivsuse taset võrreldes võrdlusnäitajaga. Kõrgeim tase oli 2021. aastal, kui LHV oli 25% efektiivsem. Enim panustas panga kiire laienemine. SEB ja Luminor näitasid madalamat efektiivsustaset ning paigutuvad vastavalt kolmandale ja neljandale kohale. SEB-l oli uurimisperioodil võrdlusnäitajaga võrreldes nõrgem efektiivsus, kuigi vahe vähenes oluliselt. Panga kontroll tegevuskulude üle võrreldes Swedbanki kasvava tööjõu- ja halduskuludega võimaldas SEB-l jõuda peaaegu samale efektiivsuse tasemele 2021. aastal. Ootuspäraselt oli Luminori üldine efektiivsus kõige madalam analüüsitud pankade seas. Võrdlusnäitajaga võrreldes oli efektiivsuse negatiivne erinevus vahemikus 26% kuni 49% aastatel 2018–2021. Luminor oli pandeemiast teiste pankadega võrreldes rohkem mõjutatud. Panga tegevuskulud olid märkimisväärselt suuremad kui Swedbankil. Eelpoolmainitud probleemidest tingitud suuruse vähenemine andis ka olulise panuse sügavasse efektiivsuse lõhesse. Swedbank, võrdlusnäitajana, paigutus teisele kohale.

Magistritööd on võimalik edasi arendada, kaastes efektiivsusmaatriksisse sisend- ja väljundnäitajaid teistest panganduse efektiivsuse lähenemistest, nagu vahendus- või tootmise lähenemisest. Lisaks võiks andmekogumit suurendada, et see hõlmaks ka teisi panku, ning tulemusi võiks võrrelda laialdasemate efektiivsuse meetoditega, nagu suhtelise efektiivsuse andmeraja analüüsiga (DEA) või stohhastilise piiranalüüsiga (SFA).

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APPENDICES

Appendix 1. Summary of methods used in previous researches

Author and year	Research period	Region or country	Method			
			DEA	SFA	DFA	Other
Kraft, Tirtiroglu (1998)	1994–1995	Croatia		x		
Drakos (2002)	1993–1997	Central and Eastern Europe				x
Grigorian, Manole (2002)	1995–1998	Central and Eastern Europe	x			
Jemric, Vujcic (2002)	1995–2000	Croatia	x			
Hasan, Marton's (2003)	1993–1998	Hungary		x		
Weill (2003)	1997	Czech Republic and Poland		x		
Matousek, Taci (2004)	1993–1998	Czech Republic			x	
Bonin *et al* (2005)	1996–2000	Central and Eastern Europe		x		
Fries and Taci (2005)	1994–2001	Eastern Europe		x		
Rossi *et al* (2005)	1995–2002	Central and Eastern Europe		x		
Havrylchyk (2006)	1997–2001	Poland	x			
Yildirim, Philippatos (2007)	1993–2000	Central and Eastern Europe		x	x	
Kosak *et al* (2009)	1996–2006	Central and Eastern Europe		x		
Koutsomanoli-Filippaki *et al* (2009)	1998–2003	Central and Eastern Europe		x		
Popovici (2014)	2007–2011	Baltic countries	x			

Titko, Jureviciene (2014)	2006, 2009, 2012	Latvia, Lithuania	x			
Titko *et al* (2014)	2012	Latvia	x			
Gallizo *et al* (2015)	2000–2013	European Union		x		
Novickyte, Drozdz (2018)	2012–2016	Lithuania	x			

Source: Compiled by author.

Appendix 2. Balance Sheets

Swedbank AS balance sheet 2018–2021, in million EUR, end of year data

Balance Sheet Item	**2018**	**2019**	**2020**	**2021**
Cash and balances with central banks	2,259.0	2,284.0	3,209.0	4,043.0
Treasury bills and other bills eligible for refinancing with central banks, etc.	165.0	154.0	186.0	389.0
Loans to credit institutions	293.0	195.0	231.0	135.0
Loans to the public	7,785.0	8,278.0	8,520.0	9,117.0
Value change of interest hedged items	1.0	1.0	1.0	0.0
Bonds and other interest-bearing securities	139.0	125.0	2,011.0	1,961.0
Financial assets for which the customers bear the investment risk	428.0	534.0	603.0	738.0
Shares and participating interests	12.0	14.0	11.0	14.0
Derivatives	18.0	9.0	12.0	15.0
Intangible fixed assets	1.0	1.0	1.0	1.0
Tangible assets	19.0	36.0	34.0	28.0
Deferred tax assets	2.0	2.0	2.0	3.0
Other assets	67.0	80.0	64.0	65.0
Prepaid expenses and accrued income	7.0	8.0	8.0	8.0
Total assets	**11,196.0**	**11,721.0**	**14,893.0**	**16,517.0**
Amounts owed to credit institutions	50.0	20.0	1,679.0	1,655.0
Deposits and borrowings from the public	8,650.0	9,113.0	10,604.0	12,111.0
Debt securities in issue	1.0	1.0	0.0	0.0
Financial liabilities in insurance operations	458.0	566.0	630.0	764.0
Derivatives	19.0	12.0	12.0	15.0
Current tax liabilities	8.0	6.0	6.0	5.0
Deferred tax liabilities	25.0	12.0	12.0	11.0
Other liabilities	107.0	108.0	92.0	85.0
Accrued expenses and prepaid income	10.0	11.0	11.0	12.0
Provisions	115.0	115.0	113.0	116.0
Total liabilities	**9,443.0**	**9,964.0**	**13,159.0**	**14,774.0**
Equity attributable to parent shareholders	1,753.0	1,757.0	1,734.0	1,743.0
Share capital	85.0	85.0	85.0	85.0
Share premium	31.0	31.0	31.0	31.0
Other equity	42.0	42.0	42.0	42.0
Retained earnings	1,380.0	1,393.0	1,389.0	1,396.0
Profit for the year	215.0	206.0	187.0	189.0
Total equity	**1,753.0**	**1,757.0**	**1,734.0**	**1,743.0**
Total liabilities and equity	**11,196.0**	**11,721.0**	**14,893.0**	**16,517.0**

Source: Swedbank annual reports 2018–2021

Appendix 2 continued

SEB Pank AS balance sheet 2018–2021, in million EUR, end of year data

Balance Sheet Item	**2018**	**2019**	**2020**	**2021**
Cash and balances with central bank	1,156.9	844.1	493.2	1,339.0
Loans to credit institutions	80.4	66.0	765.7	231.2
Loans to the public	5,153.3	5,706.9	5,908.0	6,040.4
Debt securities	109.7	159.2	227.1	227.1
Derivatives	6.6	6.1	6.6	6.1
Equity instruments	9.9	13.4	9.6	4.7
Investments in associates	1.2	1.2	1.4	1.7
Intangible assets	4.9	5.1	5.0	4.7
Property, plant and equipment	9.8	10.6	10.6	9.9
Right of use assets	0.0	20.4	18.0	16.6
Investment property	0.0	0.0	0.0	2.4
Other assets	12.3	11.1	28.2	40.1
Prepaid expenses and accrued income	13.0	19.4	16.5	16.0
Total assets	**6,558.0**	**6,863.5**	**7,489.9**	**7,939.9**
Deposits from central banks and credit institutions	1,022.0	1,212.3	1,002.7	914.0
Deposits and borrowings from the public	4,399.9	4,446.1	5,273.8	5,790.7
Derivatives	6.2	7.8	7.9	5.0
Current income tax liabilities	10.5	6.9	9.0	5.0
Deferred income tax liabilities	10.0	9.7	5.3	2.1
Provisions	5.8	3.3	4.5	6.2
Other liabilities	66.0	104.1	108.8	136.1
Accrued expenses and prepaid income	14.2	13.6	30.2	10.0
Total liabilities	**5,534.6**	**5,803.8**	**6,442.2**	**6,869.1**
Share capital	42.5	42.5	42.5	42.5
Share premium	86.3	86.3	86.3	86.3
Other reserves	19.4	19.4	19.4	19.4
Retained earnings	875.2	911.5	899.5	922.6
Total equity	**1,023.4**	**1,059.7**	**1,047.7**	**1,070.8**
Total liabilities and equity	**6,558.0**	**6,863.5**	**7,489.9**	**7,939.9**

Source: SEB annual reports 2018–2021

Appendix 2 continued

Luminor Bank AS balance sheet 2018–2021, in million EUR, end of year data

Balance Sheet Item	**2018**	**2019**	**2020**	**2021**
Cash and balances with central banks	3,293.1	2,924.0	4,926.5	2,494.2
Due from other credit institutions	185.3	141.6	103.6	64.4
Debt securities	152.6	228.0	284.3	608.2
Loans to customers	11,472.1	10,222.5	9,430.8	9,946.7
Derivative financial instruments	44.4	59.2	43.4	75.5
Equity instruments	1.0	3.0	2.8	3.2
Investments in associates	6.3	5.6	5.3	6.4
Intangible assets	7.4	8.2	6.7	10.0
Property, plant and equipment	16.4	67.5	56.6	47.0
Investment properties	24.0	2.4	0.6	0.1
Current tax assets	0.9	0.0	0.5	2.6
Deferred tax assets	0.9	3.0	9.4	8.7
Other assets	101.5	73.4	53.6	49.8
Total assets	**15,305.9**	**13,738.7**	**14,924.1**	**13,316.8**
Loans and deposits from credit institutions	3,939.4	980.7	47.3	83.8
Deposits from customers	9,069.9	10,235.4	11,821.7	10,305.4
Debt securities issued	351.2	651.7	1,201.2	1,163.6
Derivative financial instruments	41.3	58.3	50.6	70.3
Tax liabilities	8.9	3.8	0.2	0.5
Lease liabilities	0.0	57.1	49.7	43.4
Other liabilities	27.9	69.8	64.2	62.9
Other financial liabilities	64.3	45.3	14.7	29.0
Provisions	5.9	4.2	9.3	9.1
Total liabilities	**13,508.8**	**12,106.4**	**13,258.9**	**11,768.0**
Issued capital	34.9	34.9	34.9	34.9
Share premium	1,628.3	1,412.2	1,412.2	1,412.2
Retained earnings	129.5	183.9	215.1	97.9
Other reserves	4.5	1.2	3.0	3.8
Total equity	**1,797.1**	**1,632.3**	**1,665.3**	**1,548.9**
Total liabilities and shareholder's equity	**15,305.9**	**13,738.7**	**14,924.2**	**13,316.9**

Source: Luminor annual reports 2018–2021

Appendix 2 continued

LHV Group AS balance sheet 2018–2021, in million EUR, end of year data

Balance Sheet Item	**2018**	**2019**	**2020**	**2021**
Due from central bank	639.9	1,232.7	2,213.2	3,874.3
Due from credit institutions	25.8	32.9	170.3	106.8
Due from investment companies	17.0	5.5	10.0	6.2
Debt securities	38.7	32.3	322.7	127.5
Shares and fund units	8.5	8.6	7.4	8.4
Loans and advances to customers	918.8	1,687.0	2,208.8	2,677.2
Receivables from customers	3.7	3.6	9.4	9.8
Other financial assets	2.9	2.2	2.1	2.2
Other assets	1.7	2.0	2.2	3.5
Strategical financial investments	1.1	0.0	0.0	5.2
Tangible assets	0.0	1.9	2.8	4.5
Right-of-use assets	0.0	4.8	3.8	4.0
Intangible assets	15.5	14.7	15.1	11.8
Goodwill	3.6	3.6	3.6	3.6
Total assets	**1,677.1**	**3,031.9**	**4,971.4**	**6,844.9**
Amounts owed to central banks (TLTRO)	0.0	0.0	200.0	197.5
Deposits from customers	1,422.3	2,700.9	4,119.8	5,807.6
Loans received and debt securities in issue	21.5	25.6	268.6	349.1
Financial liabilities at fair value through profit or loss	0.0	0.0	0.2	0.2
Accounts payable and other liabilities	24.6	24.3	27.0	55.4
Subordinated debt	50.9	75.0	110.6	110.4
Total liabilities	**1,519.3**	**2,825.9**	**4,726.1**	**6,520.1**
Share capital	26.0	28.5	28.8	29.9
Share premium	46.7	70.1	71.5	97.4
Statutory legal reserve	3.5	4.7	4.7	4.7
Other reserves	2.1	3.3	3.4	4.7
Retained earnings	75.4	94.2	128.4	179.7
Total equity attributable to owners of the parent	**153.6**	**200.8**	**236.8**	**316.4**
Non-controlling interest	4.1	5.2	8.5	8.4
Total equity	**157.8**	**206.0**	**245.3**	**324.8**
Total liabilities and equity	**1,677.1**	**3,031.9**	**4,971.4**	**6,844.9**

Source: LHV annual reports 2018–2021

Appendix 3. Income Statements

Swedbank AS income statement 2018–2021, in million EUR, end of year data

Income Statement Item	**2018**	**2019**	**2020**	**2021**
Interest income at EIR	218.9	207.9	210.1	222.1
Other similar income	13.5	31.4	31.5	31.9
Interest and other similar income	**232.4**	**239.3**	**241.6**	**254.0**
Interest expense	–21.6	–21.3	–25.7	–33.4
Net interest and other similar income	**210.8**	**218.0**	**215.9**	**220.6**
Commission income	110.5	113.7	104.4	110.5
Commission expense	–32.9	–32.9	–30.7	–31.4
Net commission income	**77.6**	**80.8**	**73.7**	**79.1**
Net gains and losses on financial items	**10.4**	**10.7**	**9.9**	**11.4**
Insurance premium revenues	150.3	165.3	165.6	161.9
Insurance premium ceded to reinsurers	–16.2	–18.1	–16.3	–14.0
Insurance claims	–83.2	–90.8	–89.9	–95.9
Insurance claims recovered from reinsurers	13.8	15.4	13.6	13.9
Net insurance income	**64.7**	**71.8**	**73.0**	**65.9**
Other income	19.2	25.4	17.2	17.5
Total income	**382.7**	**406.7**	**389.7**	**394.5**
Staff costs	–83.3	–93.2	–99.1	–91.7
Other general administrative expenses	–47.8	–52.3	–48.0	–62.9
Depreciation/amortisation of tangible and intangible fixed assets	–5.0	–10.2	–11.2	–10.0
Total expenses before impairments and tax	**–136.1**	**–155.7**	**–158.3**	**–164.6**
Credit recoveries/credit loss allowances	14.8	–1.9	–12.4	–11.5
Profit before tax	**261.4**	**249.1**	**219.0**	**218.4**
Tax expense	–46.5	–43.2	–31.9	–29.8
Profit for the year	**214.9**	**205.9**	**187.1**	**188.6**
Total comprehensive income	**214.9**	**205.9**	**187.1**	**188.6**

Source: Swedbank annual reports 2018–2021

Appendix 3 continued

SEB Pank AS income statement 2018–2021, in million EUR, end of year data

Income Statement Item	**2018**	**2019**	**2020**	**2021**
Interest income calculated using the effective interest rate method	90.6	101.5	107.2	108.6
Other interest and similar income	18.2	20.3	20.0	18.8
Interest expenses	–9.1	–9.4	–10.2	–12.1
Net interest income	**99.7**	**112.4**	**117.0**	**115.3**
Fee and commission income	67.6	69.9	65.3	67.0
Fee and commission expenses	–19.1	–19.2	–17.8	–16.7
Net fee and commission income	**48.5**	**50.7**	**47.5**	**50.3**
Net financial income	**5.8**	**10.1**	**9.7**	**8.8**
Dividends	1.2	0.0	0.1	0.0
Profit and loss from investments in associates	0.3	0.0	0.2	0.4
Other operating income	0.7	0.4	0.3	0.0
Net other income	**2.2**	**0.4**	**0.6**	**0.4**
Total operating income	**156.2**	**173.6**	**174.8**	**174.8**
Personnel expenses	–39.7	–42.0	–43.6	–45.3
Depreciation, amortization and impairment of tangible and intangible, etc.	–3.5	–7.4	–7.8	–7.7
Other expenses	–14.3	–10.5	–11.1	–9.8
Total operating expenses	**–57.5**	**–59.9**	**–62.5**	**–62.8**
Profit before credit losses	**98.7**	**113.7**	**112.3**	**112.0**
Net expected credit losses	–0.9	3.8	–11.0	3.2
Profit before income tax	**97.8**	**117.5**	**101.3**	**115.2**
Income tax expense	–34.1	–16.8	–13.9	–15.8
Net profit for the year	**63.7**	**100.7**	**87.4**	**99.4**
Total comprehensive income for the year	**63.7**	**100.7**	**87.4**	**99.4**

Source: SEB annual reports 2018–2021

Appendix 3 continued

Luminor Bank AS income statement 2018–2021, in million EUR, end of year data

Income Statement Item	**2018**	**2019**	**2020**	**2021**
Interest income calculated using the effective interest method	236.2	244.8	226.6	223.5
Other similar income	62.0	56.9	47.1	42.9
Interest and similar expense	–38.8	–47.5	–46.8	–27.2
Net interest and similar income	**259.4**	**254.2**	**226.9**	**239.2**
Fee and commission income	109.6	105.8	95.8	102.1
Fee and commission expense	–25.8	–28.4	–22.2	–23.6
Net fee and commission income	**83.8**	**77.4**	**73.6**	**78.5**
Net gain (–loss) from derivatives	10.4	10.7	–9.6	23.4
Net gain (–loss) from foreign currency operations	14.2	11.3	24.1	–7.9
Net other financial income	4.4	11.9	13.2	5.4
Other operating income	4.6	17.8	6.4	1.6
Other operating expenses	0.0	–10.0	–6.4	–11.3
Net other operating income	**33.7**	**41.8**	**27.7**	**11.2**
Total operating income	**376.8**	**373.3**	**328.2**	**328.9**
Salaries and other personnel expenses	–111.3	–111.3	–100.2	–101.0
Other administrative expenses	–117.2	–165.3	–163.1	–149.7
Depreciation and amortization	–8.8	–13.2	–12.1	–12.1
Total operating expenses	**–237.3**	**–289.8**	**–275.4**	**–262.8**
Share of profit from associates	0.9	1.1	1.0	1.8
Credit loss allowance, excluding off-balance sheet commitments	6.3	–24.0	–14.5	13.1
Credit loss allowance on off-balance sheet commitments	0.0	1.0	–3.1	1.7
Other non-operating expenses	–7.1	–2.3	–0.4	–0.3
Profit before tax	**139.6**	**59.3**	**35.8**	**82.4**
Tax expense	–16.1	–5.3	–2.7	–7.7
Profit for the period	**123.4**	**54.0**	**33.1**	**74.7**
Other comprehensive income for the year	**1.6**	**–0.1**	**0.0**	**0.0**
Total comprehensive income	**125.0**	**53.9**	**33.1**	**74.7**

Source: Luminor annual reports 2018–2021

Appendix 3 continued

LHV Group AS income statement 2018–2021, in million EUR, end of year data

Income Statement Item	**2018**	**2019**	**2020**	**2021**
Interest income	45.6	61.4	88.4	124.6
incl interest income based on EIR	43.0	57.8	84.5	119.0
Interest expense	–7.5	–14.0	–19.9	–27.3
Net interest income	**38.2**	**47.4**	**68.5**	**97.3**
Fee and commission income	32.8	37.0	46.1	60.8
Fee and commission expense	–7.8	–11.3	–12.8	–17.3
Net fee and commission income	**25.0**	**25.7**	**33.3**	**43.5**
Net gains from financial assets measured at fair value	0.4	0.6	1.5	–0.9
Foreign exchange rate gains/losses	0.1	0.1	0.0	0.0
Net gains from financial assets	**0.4**	**0.7**	**1.6**	**–0.9**
Other income	0.9	0.1	0.1	0.5
Total Income	**64.5**	**73.8**	**103.6**	**140.4**
Staff costs	–15.8	–19.3	–23.9	–31.3
Administrative and other operating expenses	–16.4	–20.0	–20.1	–33.9
Profit before credit losses	**32.4**	**34.6**	**59.6**	**75.2**
Impairment losses on loans and advances	–4.9	–3.2	–10.9	–3.9
Profit before income tax	**27.5**	**31.3**	**48.7**	**71.2**
Income tax expense	–3.6	–4.2	–8.8	–11.0
Profit from continuing operations	**23.9**	**27.1**	**39.8**	**60.3**
Profit from discontinued operations	3.3	0.0	0.0	0.0
Profit for the year	**27.2**	**27.1**	**39.8**	**60.3**
Other comprehensive income for the year	**0.0**	**0.1**	**0.0**	**0.0**
Total comprehensive income for the year	**27.2**	**27.2**	**39.8**	**60.3**

Source: LHV annual reports 2018–2021

Appendix 4. Balance Sheet Vertical and Horizontal Analysis 2018–2021

Swedbank AS balance sheet vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Balance Sheet Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Cash and balances with central banks	20.2%	19.5%	21.5%	24.5%	1.1%	25.0	40.5%	925.0	26.0%	834.0
Treasury bills and other bills eligible for refinancing with central banks, etc.	1.5%	1.3%	1.2%	2.4%	–6.7%	–11.0	20.8%	32.0	109.1%	203.0
Loans to credit institutions	2.6%	1.7%	1.6%	0.8%	–33.4%	–98.0	18.5%	36.0	–41.6%	–96.0
Loans to the public	69.5%	70.6%	57.2%	55.2%	6.3%	493.0	2.9%	242.0	7.0%	597.0
Value change of interest hedged items	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0%	0.0	–100.0%	–1.0
Bonds and other interest–bearing securities	1.2%	1.1%	13.5%	11.9%	–10.1%	–14.0	1508.8%	1,886.0	–2.5%	–50.0
Financial assets for which the customers bear the investment risk	3.8%	4.6%	4.0%	4.5%	24.8%	106.0	12.9%	69.0	22.4%	135.0
Shares and participating interests	0.1%	0.1%	0.1%	0.1%	16.7%	2.0	–21.4%	–3.0	27.3%	3.0
Derivatives	0.2%	0.1%	0.1%	0.1%	–50.0%	–9.0	33.3%	3.0	25.0%	3.0
Intangible fixed assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Tangible assets	0.2%	0.3%	0.2%	0.2%	89.5%	17.0	–5.6%	–2.0	–17.6%	–6.0
Deferred tax assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0%	0.0	50.0%	1.0
Other assets	0.6%	0.7%	0.4%	0.4%	19.4%	13.0	–20.0%	–16.0	1.6%	1.0
Prepaid expenses and accrued income	0.1%	0.1%	0.1%	0.0%	14.3%	1.0	0.0%	0.0	0.0%	0.0
Total assets	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**4.7%**	**525.0**	**27.1%**	**3,172.0**	**10.9%**	**1,624.0**
Amounts owed to credit institutions	0.4%	0.2%	11.3%	10.0%	–60.0%	–30.0	8295.0%	1,659.0	–1.4%	–24.0
Deposits and borrowings from the public	77.3%	77.7%	71.2%	73.3%	5.4%	463.0	16.4%	1,491.0	14.2%	1,507.0
Debt securities in issue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	–100.0%	–1.0	0.0%	0.0

Financial liabilities in insurance operations	4.1%	4.8%	4.2%	4.6%	23.6%	108.0	11.3%	64.0	21.3%	134.0
Derivatives	0.2%	0.1%	0.1%	0.1%	–36.8%	–7.0	0.0%	0.0	25.0%	3.0
Current tax liabilities	0.1%	0.1%	0.0%	0.0%	–25.0%	–2.0	0.0%	0.0	–16.7%	–1.0
Deferred tax liabilities	0.2%	0.1%	0.1%	0.1%	–52.0%	–13.0	0.0%	0.0	–8.3%	–1.0
Other liabilities	1.0%	0.9%	0.6%	0.5%	0.9%	1.0	–14.8%	–16.0	–7.6%	–7.0
Accrued expenses and prepaid income	0.1%	0.1%	0.1%	0.1%	10.0%	1.0	0.0%	0.0	9.1%	1.0
Provisions	1.0%	1.0%	0.8%	0.7%	0.0%	0.0	–1.7%	–2.0	2.7%	3.0
Total liabilities	**84.3%**	**85.0%**	**88.4%**	**89.4%**	**5.5%**	**521.0**	**32.1%**	**3,195.0**	**12.3%**	**1,615.0**
Equity attributable to parent shareholders	15.7%	15.0%	11.6%	10.6%	0.2%	4.0	–1.3%	–23.0	0.5%	9.0
Share capital	0.8%	0.7%	0.6%	0.5%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Share premium	0.3%	0.3%	0.2%	0.2%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Other equity	0.4%	0.4%	0.3%	0.3%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Retained earnings	12.3%	11.9%	9.3%	8.5%	0.9%	13.0	–0.3%	–4.0	0.5%	7.0
Profit for the year	1.9%	1.8%	1.3%	1.1%	–4.2%	–9.0	–9.2%	–19.0	1.1%	2.0
Total equity	**15.7%**	**15.0%**	**11.6%**	**10.6%**	**0.2%**	**4.0**	**–1.3%**	**–23.0**	**0.5%**	**9.0**
Total liabilities and equity	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**4.7%**	**525.0**	**27.1%**	**3,172.0**	**10.9%**	**1,624.0**

Source: compiled by author based on appendix 2

Appendix 4 continued

SEB Pank AS balance sheet vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Balance Sheet Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Cash and balances with central bank	17.6%	12.3%	6.6%	16.9%	–27.0%	–312.8	–41.6%	–350.9	171.5%	845.8
Loans to credit institutions	1.2%	1.0%	10.2%	2.9%	–17.9%	–14.4	1060.2%	699.7	–69.8%	–534.5
Loans to the public	78.6%	83.1%	78.9%	76.1%	10.7%	553.6	3.5%	201.1	2.2%	132.4
Debt securities	1.7%	2.3%	3.0%	2.9%	45.1%	49.5	42.7%	67.9	0.0%	0.0
Derivatives	0.1%	0.1%	0.1%	0.1%	–7.6%	–0.5	8.2%	0.5	–7.6%	–0.5
Equity instruments	0.2%	0.2%	0.1%	0.1%	35.4%	3.5	–28.4%	–3.8	–51.0%	–4.9
Investments in associates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	16.7%	0.2	21.4%	0.3
Intangible assets	0.1%	0.1%	0.1%	0.1%	4.1%	0.2	–2.0%	–0.1	–6.0%	–0.3
Property, plant and equipment	0.1%	0.2%	0.1%	0.1%	8.2%	0.8	0.0%	0.0	–6.6%	–0.7
Right of use assets	0.0%	0.3%	0.2%	0.2%	–	20.4	–11.8%	–2.4	–7.8%	–1.4
Investment property	0.0%	0.0%	0.0%	0.0%	–	0.0	–	0.0	–	2.4
Other assets	0.2%	0.2%	0.4%	0.5%	–9.8%	–1.2	154.1%	17.1	42.2%	11.9
Prepaid expenses and accrued income	0.2%	0.3%	0.2%	0.2%	49.2%	6.4	–14.9%	–2.9	–3.0%	–0.5
Total assets	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**4.7%**	**305.5**	**9.1%**	**626.4**	**6.0%**	**450.0**
Deposits from central banks and credit institutions	15.6%	17.7%	13.4%	11.5%	18.6%	190.3	–17.3%	–209.6	–8.8%	–88.7
Deposits and borrowings from the public	67.1%	64.8%	70.4%	72.9%	1.1%	46.2	18.6%	827.7	9.8%	516.9
Derivatives	0.1%	0.1%	0.1%	0.1%	25.8%	1.6	1.3%	0.1	–36.7%	–2.9
Current income tax liabilities	0.2%	0.1%	0.1%	0.1%	–34.3%	–3.6	30.4%	2.1	–44.4%	–4.0
Deferred income tax liabilities	0.2%	0.1%	0.1%	0.0%	–3.0%	–0.3	–45.4%	–4.4	–60.4%	–3.2

Provisions	0.1%	0.0%	0.1%	0.1%	–43.1%	–2.5	36.4%	1.2	37.8%	1.7
Other liabilities	1.0%	1.5%	1.5%	1.7%	57.7%	38.1	4.5%	4.7	25.1%	27.3
Accrued expenses and prepaid income	0.2%	0.2%	0.4%	0.1%	–4.2%	–0.6	122.1%	16.6	–66.9%	–20.2
Total liabilities	**84.4%**	**84.6%**	**86.0%**	**86.5%**	**4.9%**	**269.2**	**11.0%**	**638.4**	**6.6%**	**426.9**
Share capital	0.6%	0.6%	0.6%	0.5%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Share premium	1.3%	1.3%	1.2%	1.1%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Other reserves	0.3%	0.3%	0.3%	0.2%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Retained earnings	13.3%	13.3%	12.0%	11.6%	4.1%	36.3	–1.3%	–12.0	2.6%	23.1
Total equity	**15.6%**	**15.4%**	**14.0%**	**13.5%**	**3.5%**	**36.3**	**–1.1%**	**–12.0**	**2.2%**	**23.1**
Total liabilities and equity	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**4.7%**	**305.5**	**9.1%**	**626.4**	**6.0%**	**450.0**

Source: compiled by author based on appendix 2

Appendix 4 continued

Luminor Bank AS balance sheet vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Balance Sheet Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Cash and balances with central banks	21.5%	21.3%	33.0%	18.7%	–11.2%	–369.1	68.5%	2,002.5	–49.4%	–2,432.3
Due from other credit institutions	1.2%	1.0%	0.7%	0.5%	–23.6%	–43.7	–26.9%	–38.0	–37.8%	–39.2
Debt securities	1.0%	1.7%	1.9%	4.6%	49.4%	75.4	24.7%	56.3	113.9%	323.9
Loans to customers	75.0%	74.4%	63.2%	74.7%	–10.9%	–1,249.6	–7.7%	–791.7	5.5%	515.9
Derivative financial instruments	0.3%	0.4%	0.3%	0.6%	33.5%	14.9	–26.7%	–15.8	74.0%	32.1
Equity instruments	0.0%	0.0%	0.0%	0.0%	200.3%	2.0	–7.3%	–0.2	14.3%	0.4
Investments in associates	0.0%	0.0%	0.0%	0.0%	–9.9%	–0.6	–6.0%	–0.3	20.8%	1.1
Intangible assets	0.0%	0.1%	0.0%	0.1%	10.6%	0.8	–18.3%	–1.5	49.3%	3.3
Property, plant and equipment	0.1%	0.5%	0.4%	0.4%	311.8%	51.1	–16.1%	–10.9	–17.0%	–9.6
Investment properties	0.2%	0.0%	0.0%	0.0%	–89.9%	–21.5	–75.3%	–1.8	–83.3%	–0.5
Current tax assets	0.0%	0.0%	0.0%	0.0%	–100.0%	–0.9	–	0.5	420.0%	2.1
Deferred tax assets	0.0%	0.0%	0.1%	0.1%	233.8%	2.1	210.1%	6.4	–7.4%	–0.7
Other assets	0.7%	0.5%	0.4%	0.4%	–27.7%	–28.1	–27.0%	–19.8	–7.1%	–3.8
Total assets	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**–10.2%**	**–1,567.2**	**8.6%**	**1,185.4**	**–10.8%**	**–1,607.3**
Loans and deposits from credit institutions	25.7%	7.1%	0.3%	0.6%	–75.1%	–2,958.7	–95.2%	–933.4	77.2%	36.5
Deposits from customers	59.3%	74.5%	79.2%	77.4%	12.9%	1,165.6	15.5%	1,586.3	–12.8%	–1,516.3
Debt securities issued	2.3%	4.7%	8.0%	8.7%	85.5%	300.5	84.3%	549.5	–3.1%	–37.6
Derivative financial instruments	0.3%	0.4%	0.3%	0.5%	41.3%	17.0	–13.2%	–7.7	38.9%	19.7
Tax liabilities	0.1%	0.0%	0.0%	0.0%	–56.6%	–5.0	–94.8%	–3.6	150.0%	0.3

Lease liabilities	0.0%	0.4%	0.3%	0.3%	–	57.1	–12.9%	–7.4	–12.7%	–6.3
Other liabilities	0.2%	0.5%	0.4%	0.5%	150.0%	41.9	–8.0%	–5.6	–2.0%	–1.3
Other financial liabilities	0.4%	0.3%	0.1%	0.2%	–29.6%	–19.0	–67.6%	–30.6	97.3%	14.3
Provisions	0.0%	0.0%	0.1%	0.1%	–28.2%	–1.7	118.9%	5.1	–2.2%	–0.2
Total liabilities	**88.3%**	**88.1%**	**88.8%**	**88.4%**	**–10.4%**	**–1,402.4**	**9.5%**	**1,152.5**	**–11.2%**	**–1,490.9**
Issued capital	0.2%	0.3%	0.2%	0.3%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Share premium	10.6%	10.3%	9.5%	10.6%	–13.3%	–216.0	0.0%	0.0	0.0%	0.0
Retained earnings	0.8%	1.3%	1.4%	0.7%	42.1%	54.5	17.0%	31.2	–54.5%	–117.2
Other reserves	0.0%	0.0%	0.0%	0.0%	–73.1%	–3.3	150.4%	1.8	26.7%	0.8
Total equity	**11.7%**	**11.9%**	**11.2%**	**11.6%**	**–9.2%**	**–164.8**	**2.0%**	**33.0**	**–7.0%**	**–116.4**
Total liabilities and shareholder's equity	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**–10.2%**	**–1,567.2**	**8.6%**	**1,185.5**	**–10.8%**	**–1,607.3**

Source: compiled by author based on appendix 2

Appendix 4 continued

LHV Group AS balance sheet vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Balance Sheet Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Due from central bank	38.2%	40.7%	44.5%	56.6%	92.7%	592.9	79.5%	980.5	75.1%	1,661.1
Due from credit institutions	1.5%	1.1%	3.4%	1.6%	27.7%	7.2	417.0%	137.4	–37.3%	–63.5
Due from investment companies	1.0%	0.2%	0.2%	0.1%	–67.8%	–11.5	82.4%	4.5	–38.0%	–3.8
Debt securities	2.3%	1.1%	6.5%	1.9%	–16.5%	–6.4	898.1%	290.4	–60.5%	–195.2
Shares and fund units	0.5%	0.3%	0.1%	0.1%	2.1%	0.2	–14.8%	–1.3	13.5%	1.0
Loans and advances to customers	54.8%	55.6%	44.4%	39.1%	83.6%	768.3	30.9%	521.8	21.2%	468.3
Receivables from customers	0.2%	0.1%	0.2%	0.1%	–4.6%	–0.2	164.5%	5.8	3.8%	0.4
Other financial assets	0.2%	0.1%	0.0%	0.0%	–23.5%	–0.7	–7.7%	–0.2	7.9%	0.2
Other assets	0.1%	0.1%	0.0%	0.1%	18.8%	0.3	11.3%	0.2	59.1%	1.3
Strategical financial investments	0.1%	0.0%	0.0%	0.1%	–100.0%	–1.1	–	0.0	–	5.2
Tangible assets	0.0%	0.1%	0.1%	0.1%	–	1.9	45.6%	0.9	62.5%	1.7
Right–of–use assets	0.0%	0.2%	0.1%	0.1%	–	4.8	–20.3%	–1.0	4.0%	0.2
Intangible assets	0.9%	0.5%	0.3%	0.2%	–4.9%	–0.8	3.0%	0.4	–21.9%	–3.3
Goodwill	0.2%	0.1%	0.1%	0.1%	0.0%	0.0	0.0%	0.0	0.0%	0.0
Total assets	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**80.8%**	**1,354.8**	**64.0%**	**1,939.5**	**37.7%**	**1,873.5**
Amounts owed to central banks (TLTRO)	0.0%	0.0%	4.0%	2.9%	–	0.0	–	200.0	–1.3%	–2.5
Deposits from customers	84.8%	89.1%	82.9%	84.8%	89.9%	1,278.7	52.5%	1,418.9	41.0%	1,687.8

Loans received and debt securities in issue	1.3%	0.8%	5.4%	5.1%	19.1%	4.1	947.4%	242.9	30.0%	80.6
Financial liabilities at fair value through profit or loss	0.0%	0.0%	0.0%	0.0%	–27.3%	0.0	2662.5%	0.2	–29.0%	–0.1
Accounts payable and other liabilities	1.5%	0.8%	0.5%	0.8%	–1.3%	–0.3	10.8%	2.6	105.5%	28.4
Subordinated debt	3.0%	2.5%	2.2%	1.6%	47.3%	24.1	47.5%	35.6	–0.2%	–0.2
Total liabilities	**90.6%**	**93.2%**	**95.1%**	**95.3%**	**86.0%**	**1,306.5**	**67.2%**	**1,900.2**	**38.0%**	**1,794.0**
Share capital	1.6%	0.9%	0.6%	0.4%	9.4%	2.4	1.3%	0.4	3.6%	1.0
Share premium	2.8%	2.3%	1.4%	1.4%	50.3%	23.5	1.9%	1.3	36.2%	25.9
Statutory legal reserve	0.2%	0.2%	0.1%	0.1%	36.6%	1.3	0.0%	0.0	0.0%	0.0
Other reserves	0.1%	0.1%	0.1%	0.1%	56.9%	1.2	3.9%	0.1	38.8%	1.3
Retained earnings	4.5%	3.1%	2.6%	2.6%	24.9%	18.8	36.2%	34.2	40.0%	51.4
Total equity attributable to owners of the parent	**9.2%**	**6.6%**	**4.8%**	**4.6%**	**30.7%**	**47.2**	**17.9%**	**36.0**	**33.6%**	**79.6**
Non–controlling interest	0.2%	0.2%	0.2%	0.1%	26.5%	1.1	62.6%	3.3	–1.2%	–0.1
Total equity	**9.4%**	**6.8%**	**4.9%**	**4.7%**	**30.6%**	**48.3**	**19.0%**	**39.2**	**32.4%**	**79.5**
Total liabilities and equity	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**80.8%**	**1,354.8**	**64.0%**	**1,939.5**	**37.7%**	**1,873.5**

Source: compiled by author based on appendix 2

Appendix 5. Income Statement Vertical and Horizontal Analysis 2018–2021

Swedbank AS income statement vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Income Statement Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Interest income at EIR	57.2%	51.1%	53.9%	56.3%	–5.0%	–11.0	1.1%	2.2	5.7%	12.0
Other similar income	3.5%	7.7%	8.1%	8.1%	132.6%	17.9	0.3%	0.1	1.3%	0.4
Interest and other similar income	**60.7%**	**58.8%**	**62.0%**	**64.4%**	**3.0%**	**6.9**	**1.0%**	**2.3**	**5.1%**	**12.4**
Interest expense	–5.6%	–5.2%	–6.6%	–8.5%	–1.4%	0.3	20.7%	–4.4	30.0%	–7.7
Net interest and other similar income	**55.1%**	**53.6%**	**55.4%**	**55.9%**	**3.4%**	**7.2**	**–1.0%**	**–2.1**	**2.2%**	**4.7**
Commission income	28.9%	28.0%	26.8%	28.0%	2.9%	3.2	–8.2%	–9.3	5.8%	6.1
Commission expense	–8.6%	–8.1%	–7.9%	–8.0%	0.0%	0.0	–6.7%	2.2	2.3%	–0.7
Net commission income	**20.3%**	**19.9%**	**18.9%**	**20.1%**	**4.1%**	**3.2**	**–8.8%**	**–7.1**	**7.3%**	**5.4**
Net gains and losses on financial items	**2.7%**	**2.6%**	**2.5%**	**2.9%**	**2.9%**	**0.3**	**–7.5%**	**–0.8**	**15.2%**	**1.5**
Insurance premium revenues	39.3%	40.6%	42.5%	41.0%	10.0%	15.0	0.2%	0.3	–2.2%	–3.7
Insurance premium ceded to reinsurers	–4.2%	–4.5%	–4.2%	–3.5%	11.7%	–1.9	–9.9%	1.8	–14.1%	2.3
Insurance claims	–21.7%	–22.3%	–23.1%	–24.3%	9.1%	–7.6	–1.0%	0.9	6.7%	–6.0
Insurance claims recovered from reinsurers	3.6%	3.8%	3.5%	3.5%	11.6%	1.6	–11.7%	–1.8	2.2%	0.3
Net insurance income	**16.9%**	**17.7%**	**18.7%**	**16.7%**	**11.0%**	**7.1**	**1.7%**	**1.2**	**–9.7%**	**–7.1**
Other income	5.0%	6.2%	4.4%	4.4%	32.3%	6.2	–32.3%	–8.2	1.7%	0.3
Total income	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**6.3%**	**24.0**	**–4.2%**	**–17.0**	**1.2%**	**4.8**
Staff costs	–21.8%	–22.9%	–25.4%	–23.2%	11.9%	–9.9	6.3%	–5.9	–7.5%	7.4
Other general administrative expenses	–12.5%	–12.9%	–12.3%	–15.9%	9.4%	–4.5	–8.2%	4.3	31.0%	–14.9
Depreciation/amortisation of tangible and intangible fixed assets	–1.3%	–2.5%	–2.9%	–2.5%	104.0%	–5.2	9.8%	–1.0	–10.7%	1.2

Total expenses before impairments and tax	**–35.6%**	**–38.3%**	**–40.6%**	**–41.7%**	**14.4%**	**–19.6**	**1.7%**	**–2.6**	**4.0%**	**–6.3**
Credit recoveries/credit loss allowances	3.9%	–0.5%	–3.2%	–2.9%	–112.8%	–16.7	552.6%	–10.5	–7.3%	0.9
Profit before tax	**68.3%**	**61.2%**	**56.2%**	**55.4%**	**–4.7%**	**–12.3**	**–12.1%**	**–30.1**	**–0.3%**	**–0.6**
Tax expense	–12.2%	–10.6%	–8.2%	–7.6%	–7.1%	3.3	–26.2%	11.3	–6.6%	2.1
Profit for the year	**56.2%**	**50.6%**	**48.0%**	**47.8%**	**–4.2%**	**–9.0**	**–9.1%**	**–18.8**	**0.8%**	**1.5**
Total comprehensive income	**56.2%**	**50.6%**	**48.0%**	**47.8%**	**–4.2%**	**–9.0**	**–9.1%**	**–18.8**	**0.8%**	**1.5**

Source: compiled by author based on appendix 3

Appendix 5 continued

SEB Pank AS income statement vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Income Statement Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Interest income calculated using the effective interest rate method	58.0%	58.5%	61.3%	62.1%	12.0%	10.9	5.6%	5.7	1.3%	1.4
Other interest and similar income	11.7%	11.7%	11.4%	10.8%	11.5%	2.1	–1.5%	–0.3	–6.0%	–1.2
Interest expenses	–5.8%	–5.4%	–5.8%	–6.9%	3.3%	–0.3	8.5%	–0.8	18.6%	–1.9
Net interest income	**63.8%**	**64.7%**	**66.9%**	**66.0%**	**12.7%**	**12.7**	**4.1%**	**4.6**	**–1.5%**	**–1.7**
Fee and commission income	43.3%	40.3%	37.4%	38.3%	3.4%	2.3	–6.6%	–4.6	2.6%	1.7
Fee and commission expenses	–12.2%	–11.1%	–10.2%	–9.6%	0.5%	–0.1	–7.3%	1.4	–6.2%	1.1
Net fee and commission income	**31.0%**	**29.2%**	**27.2%**	**28.8%**	**4.5%**	**2.2**	**–6.3%**	**–3.2**	**5.9%**	**2.8**
Net financial income	**3.7%**	**5.8%**	**5.5%**	**5.0%**	**74.1%**	**4.3**	**–4.0%**	**–0.4**	**–9.3%**	**–0.9**
Dividends	0.8%	0.0%	0.1%	0.0%	–100.0%	–1.2	–	0.1	–100.0%	–0.1
Profit and loss from investments in associates	0.2%	0.0%	0.1%	0.2%	–100.0%	–0.3	–	0.2	100.0%	0.2
Other operating income	0.4%	0.2%	0.2%	0.0%	–42.9%	–0.3	–25.0%	–0.1	–100.0%	–0.3
Net other income	**1.4%**	**0.2%**	**0.3%**	**0.2%**	**–81.8%**	**–1.8**	**50.0%**	**0.2**	**–33.3%**	**–0.2**
Total operating income	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**11.1%**	**17.4**	**0.7%**	**1.2**	**0.0%**	**0.0**
Personnel expenses	–25.4%	–24.2%	–24.9%	–25.9%	5.8%	–2.3	3.8%	–1.6	3.9%	–1.7

Depreciation, amortization and impairment of tangible and intangible, etc.	–2.2%	–4.3%	–4.5%	–4.4%	111.4%	–3.9	5.4%	–0.4	–1.3%	0.1
Other expenses	–9.2%	–6.0%	–6.4%	–5.6%	–26.6%	3.8	5.7%	–0.6	–11.7%	1.3
Total operating expenses	**–36.8%**	**–34.5%**	**–35.8%**	**–35.9%**	**4.2%**	**–2.4**	**4.3%**	**–2.6**	**0.5%**	**–0.3**
Profit before credit losses	**63.2%**	**65.5%**	**64.2%**	**64.1%**	**15.2%**	**15.0**	**–1.2%**	**–1.4**	**–0.3%**	**–0.3**
Net expected credit losses	–0.6%	2.2%	–6.3%	1.8%	–522.2%	4.7	–389.5%	–14.8	–129.1%	14.2
Profit before income tax	**62.6%**	**67.7%**	**58.0%**	**65.9%**	**20.1%**	**19.7**	**–13.8%**	**–16.2**	**13.7%**	**13.9**
Income tax expense	–21.8%	–9.7%	–8.0%	–9.0%	–50.7%	17.3	–17.3%	2.9	13.7%	–1.9
Net profit for the year	**40.8%**	**58.0%**	**50.0%**	**56.9%**	**58.1%**	**37.0**	**–13.2%**	**–13.3**	**13.7%**	**12.0**
Total comprehensive income for the year	**40.8%**	**58.0%**	**50.0%**	**56.9%**	**58.1%**	**37.0**	**–13.2%**	**–13.3**	**13.7%**	**12.0**

Source: compiled by author based on appendix 3

Appendix 5 continued

Luminor Bank AS income statement vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Income Statement Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Interest income calculated using the effective interest method	62.7%	65.6%	69.0%	68.0%	3.6%	8.6	–7.4%	–18.2	–1.4%	–3.1
Other similar income	16.5%	15.2%	14.4%	13.0%	–8.3%	–5.1	–17.2%	–9.8	–8.9%	–4.2
Interest and similar expense	–10.3%	–12.7%	–14.3%	–8.3%	22.5%	–8.7	–1.5%	0.7	–41.9%	19.6
Net interest and similar income	**68.8%**	**68.1%**	**69.1%**	**72.7%**	**–2.0%**	**–5.3**	**–10.7%**	**–27.3**	**5.4%**	**12.3**
Fee and commission income	29.1%	28.3%	29.2%	31.0%	–3.4%	–3.8	–9.5%	–10.0	6.6%	6.3
Fee and commission expense	–6.9%	–7.6%	–6.8%	–7.2%	10.2%	–2.6	–21.9%	6.2	6.3%	–1.4
Net fee and commission income	**22.2%**	**20.7%**	**22.4%**	**23.9%**	**–7.6%**	**–6.4**	**–4.9%**	**–3.8**	**6.7%**	**4.9**
Net gain (–loss) from derivatives	2.8%	2.9%	–2.9%	7.1%	3.2%	0.3	–189.4%	–20.3	–343.8%	33.0
Net gain (–loss) from foreign currency operations	3.8%	3.0%	7.3%	–2.4%	–20.3%	–2.9	112.4%	12.8	–132.8%	–32.0
Net other financial income	1.2%	3.2%	4.0%	1.6%	170.0%	7.5	11.4%	1.4	–59.1%	–7.8
Other operating income	1.2%	4.8%	2.0%	0.5%	286.1%	13.2	–64.1%	–11.4	–75.0%	–4.8
Other operating expenses	0.0%	–2.7%	–2.0%	–3.4%	–	–10.0	–35.9%	3.6	76.6%	–4.9
Net other operating income	**8.9%**	**11.2%**	**8.4%**	**3.4%**	**24.2%**	**8.1**	**–33.7%**	**–14.1**	**–59.6%**	**–16.5**
Total operating income	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**–0.9%**	**–3.5**	**–12.1%**	**–45.1**	**0.2%**	**0.7**

Salaries and other personnel expenses	–29.5%	–29.8%	–30.5%	–30.7%	0.0%	0.0	–10.0%	11.1	0.8%	–0.8
Other administrative expenses	–31.1%	–44.3%	–49.7%	–45.5%	41.1%	–48.1	–1.4%	2.2	–8.2%	13.4
Depreciation and amortization	–2.3%	–3.5%	–3.7%	–3.7%	50.4%	–4.4	–8.2%	1.1	0.0%	0.0
Total operating expenses	**–63.0%**	**–77.6%**	**–83.9%**	**–79.9%**	**22.1%**	**–52.6**	**–5.0%**	**14.4**	**–4.6%**	**12.6**
Share of profit from associates	0.2%	0.3%	0.3%	0.5%	24.0%	0.2	–6.2%	–0.1	80.0%	0.8
Credit loss allowance, excluding off–balance sheet commitments	1.7%	–6.4%	–4.4%	4.0%	–480.4%	–30.3	–39.6%	9.5	–190.3%	27.6
Credit loss allowance on off-balance sheet commitments	0.0%	0.3%	–0.9%	0.5%	–	1.0	–398.7%	–4.1	–154.8%	4.8
Other non–operating expenses	–1.9%	–0.6%	–0.1%	–0.1%	–67.4%	4.8	–82.8%	1.9	–25.0%	0.1
Profit before tax	**37.0%**	**15.9%**	**10.9%**	**25.1%**	**–57.5%**	**–80.3**	**–39.6%**	**–23.5**	**130.2%**	**46.6**
Tax expense	–4.3%	–1.4%	–0.8%	–2.3%	–67.4%	10.9	–48.7%	2.6	185.2%	–5.0
Profit for the period	**32.8%**	**14.5%**	**10.1%**	**22.7%**	**–56.3%**	**–69.5**	**–38.7%**	**–20.9**	**125.7%**	**41.6**
Other comprehensive income for the year	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**–103.4%**	**–1.7**	**–100.0%**	**0.1**	**–**	**0.0**
Total comprehensive income	**33.2%**	**14.4%**	**10.1%**	**22.7%**	**–56.9%**	**–71.1**	**–38.6%**	**–20.8**	**125.7%**	**41.6**

Source: compiled by author based on appendix 3

Appendix 5 continued

LHV Group AS income statement vertical and horizonal analysis 2018–2021, in million EUR, end of year data

	Vertical Analysis				Horizontal Analysis					
					%	Δ	%	Δ	%	Δ
Income Statement Item	**2018**	**2019**	**2020**	**2021**	**2019/2018**		**2020/2019**		**2021/2020**	
Interest income	70.7%	83.2%	85.3%	88.8%	34.6%	15.8	43.9%	27.0	41.0%	36.3
incl interest income based on EIR	66.7%	78.3%	81.6%	84.8%	34.3%	14.8	46.1%	26.7	40.9%	34.5
Interest expense	–11.6%	–19.0%	–19.2%	–19.5%	87.7%	–6.6	41.7%	–5.9	37.4%	–7.4
Net interest income	**59.1%**	**64.2%**	**66.1%**	**69.3%**	**24.2%**	**9.2**	**44.5%**	**21.1**	**42.1%**	**28.8**
Fee and commission income	50.9%	50.2%	44.5%	43.3%	12.7%	4.2	24.6%	9.1	31.9%	14.7
Fee and commission expense	–12.1%	–15.4%	–12.3%	–12.4%	45.5%	–3.6	12.5%	–1.4	35.8%	–4.6
Net fee and commission income	**38.8%**	**34.8%**	**32.2%**	**31.0%**	**2.5%**	**0.6**	**29.9%**	**7.7**	**30.4%**	**10.1**
Net gains from financial assets measured at fair value	0.6%	0.8%	1.5%	–0.7%	55.9%	0.2	160.7%	1.0	–160.0%	–2.5
Foreign exchange rate gains/losses	0.1%	0.1%	0.0%	0.0%	23.4%	0.0	–45.6%	0.0	–151.2%	–0.1
Net gains from financial assets	**0.7%**	**0.9%**	**1.5%**	**–0.7%**	**51.2%**	**0.2**	**136.4%**	**0.9**	**–159.7%**	**–2.5**
Other income	1.4%	0.1%	0.1%	0.4%	–89.7%	–0.8	57.0%	0.1	265.8%	0.4
Total Income	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**14.4%**	**9.3**	**40.3%**	**29.7**	**35.5%**	**36.8**
Staff costs	–24.5%	–26.1%	–23.1%	–22.3%	22.0%	–3.5	24.2%	–4.7	30.9%	–7.4
Administrative and other operating expenses	–25.4%	–27.1%	–19.4%	–24.1%	22.1%	–3.6	0.3%	–0.1	68.8%	–13.8
Profit before credit losses	**50.1%**	**46.8%**	**57.5%**	**53.6%**	**6.8%**	**2.2**	**72.4%**	**25.0**	**26.2%**	**15.6**
Impairment losses on loans and advances	–7.6%	–4.3%	–10.5%	–2.8%	–34.2%	1.7	239.5%	–7.7	–63.8%	7.0

Profit before income tax	**42.6%**	**42.5%**	**47.0%**	**50.8%**	**14.1%**	**3.9**	**55.3%**	**17.3**	**46.4%**	**22.6**
Income tax expense	–5.6%	–5.8%	–8.5%	–7.8%	17.6%	–0.6	107.7%	–4.6	24.5%	–2.2
Profit from continuing operations	**37.0%**	**36.7%**	**38.5%**	**42.9%**	**13.5%**	**3.2**	**47.1%**	**12.8**	**51.2%**	**20.4**
Profit from discontinued operations	5.1%	0.0%	0.0%	0.0%	–100.0%	–3.3	–	0.0	–	0.0
Profit for the year	**42.1%**	**36.7%**	**38.5%**	**42.9%**	**–0.4%**	**–0.1**	**47.1%**	**12.8**	**51.2%**	**20.4**
Other comprehensive income for the year	**0.1%**	**0.2%**	**0.0%**	**0.0%**	**219.0%**	**0.1**	**–100.0%**	**–0.1**	**–**	**0.0**
Total comprehensive income for the year	**42.2%**	**36.9%**	**38.5%**	**43.0%**	**0.0%**	**0.0**	**46.4%**	**12.6**	**51.4%**	**20.5**

Source: compiled by author based on appendix 3

Appendix 6. Statement of Cash Flows 2018–2021

Swedbank AS statement of cash flows 2018–2021, in million EUR, end of year data

Cash flow statement item	**2018**	**2019**	**2020**	**2021**
Profit before tax	**261.0**	**249.0**	**219.0**	**218.0**
Credit impairments	–27.0	2.0	10.0	11.0
Interest income	–232.0	–239.0	–242.0	–254.0
Interest expense	22.0	21.0	26.0	33.0
Depreciation, amortisation and impairment	5.0	10.0	11.0	10.0
Total adjustments to operating activities	**–232.0**	**–206.0**	**–195.0**	**–200.0**
Changes in operating assets and liabilities				
Net change in prepayments	2.0	–2.0	0.0	–1.0
Net change in deposits placed with other banks	–21.0	–19.0	–25.0	29.0
Net change in securities FVPL	–159.0	–84.0	–1,999.0	–305.0
Net change in compulsory reserve in CB	–4.0	–5.0	–11.0	–20.0
Net change in loans	–476.0	–494.0	–251.0	–606.0
Net change in other assets	–14.0	–13.0	16.0	–2.0
Net change in short-term liabilities due to other banks	–132.0	–27.0	21.0	–1.0
Net change in demand deposits	723.0	579.0	1,567.0	1,616.0
Net change in time deposits	19.0	–116.0	–75.0	–109.0
Net change in other liabilities	–9.0	94.0	44.0	137.0
Total adjustments to operating assets and liabilities	**–71.0**	**–87.0**	**–713.0**	**738.0**
Interest received	240.0	239.0	238.0	233.0
Interest paid	–22.0	–21.0	–26.0	–33.0
Income tax paid	–57.0	–57.0	–32.0	–31.0
Cash flow from operating activities	**119.0**	**117.0**	**–509.0**	**925.0**
Investing activities				
Proceeds from redemption of debt securities carried at amortised cost	3.0	10.0	13.0	14.0
Acquisition of tangible assets	–4.0	–3.0	–3.0	–4.0
Acquisition of intangible assets	–1.0	0.0	–1.0	–1.0
Cash flow from investing activities	**–2.0**	**7.0**	**9.0**	**9.0**
Financing activities				
Credit lines of Central Bank and government received	0.0	0.0	1,645.0	0.0
Long-term loans paid back to other banks	–3.0	–3.0	–3.0	–2.0
Payments of leases	0.0	–5.0	–6.0	–5.0
Dividends paid	–188.0	–212.0	–210.0	–177.0
Share based payments	–1.0	0.0	0.0	–3.0

Cash flow from financing activities	**–192.0**	**–220.0**	**1,426.0**	**–187.0**
Cash flow for the year	**–75.0**	**–96.0**	**926.0**	**747.0**
Net increase/decrease in cash and cash equivalents	**–75.0**	**–96.0**	**926.0**	**747.0**
Cash and cash equivalents at the beginning of the year	2,452.0	2,377.0	2,281.0	3,207.0
Cash flow for the year	–75.0	–96.0	926.0	747.0
Cash and cash equivalents at the end of the year	2,377.0	2,281.0	3,207.0	3,954.0

Source: Swedbank annual reports 2018–2021

Appendix 6 continued

SEB Pank AS statement of cash flows 2018–2019, in million EUR, end of year data

Cash flow statement item	**2018**	**2019**
Operating activities		
Interest received	108.1	121.8
Interest paid	–7.8	–9.0
Fee and commission received	67.6	69.9
Fee and commission paid	–19.1	–19.2
Net trading income and other operating income	6.2	5.8
Personnel expenses	–53.2	–51.8
Income tax paid	–34.1	–17.1
Net cash from (+) / used in (–) operating activities before change in operating assets and liabilities	**67.7**	**100.4**
Changes in operating assets:		
Increase (–) /decrease (+) in mandatory reserve in central bank and loans to credit institutions	–13.7	38.7
Increase(–) / decrease (+) in loans to public	–423	–560.7
Increase(–) / decrease (+) in other financial and non–financial assets	18.7	–26.3
Changes of operating liabilities:		
Increase (+) / decrease (–) in deposits from central bank and credit institutions	–205.1	228.1
Increase (+) / decrease (–) in deposits and borrowings from the public	652.1	46.0
Increase (+) / decrease (–) in other liabilities	–5.4	–0.1
Net cash flows from (+) / used in (–) operating activities	**91.3**	**–173.9**
Investing activities		
Net proceeds from debt securities	–20.5	–49.4
Net proceeds from investment portfolio securities	–1.2	1.0
Purchase of property, plant and equipment and intangible assets	–4.6	–10.5
Dividends received	0	0.1
Net cash flows from (+) / used in (–) investing activities	**–26.3**	**–58.8**
Financing activities		
Dividends paid	–70	–63.0
Lease payments	–	–4.9

Net cash flows from (+) / used in (–) financing activities	**–70.0**	**–67.9**
Net increase (+) / decrease (–) in cash and cash equivalents	**–5.0**	**–300.6**
Cash and cash equivalents at 1 January	**1,155.6**	**1,150.6**
Changes on cash and cash equivalents	–5	–300.6
Cash and cash equivalents at 31 December	**1,150.6**	**850.0**
Cash and cash equivalents include:		
Cash on hand	35.9	37.8
Balances with the central bank without mandatory reserve	1076.8	753.2
Demand deposits with credit institutions	37.9	59
Total	**1,150.6**	**850.0**

Source: SEB annual reports 2018–2019

Appendix 6 continued

SEB Pank AS statement of cash flows 2020–2021, in million EUR, end of year data

Cash flow statement item	**2020**	**2021**
Profit before income tax	**101.3**	**115.2**
Adjustments for:		
Depreciation, amortization and impairment of tangible and intangible asset, etc.	7.8	7.7
Increase (+) / decrease (–) in ECL allowances	11.0	–3.2
Increase (+) / decrease (–) in provisions	–0.1	1.9
Interest income	–127.2	–127.4
Interest expense	10.2	12.1
Gain (–) / loss (+) from exchange differences	–4.5	6.9
Loss on disposal of property, plant and equipment, intangible assets or investment property	1.5	0.3
Increase in share-based compensations	0.6	0.7
Share of profit of an associate	–0.2	–0.3
Change in operating assets and liabilities		
Increase (–) / decrease (+) in loans to credit institutions and mandatory reserve in central bank	–116.8	117.8
Increase in loans and advances to customers	–210.3	–129.7
Net change in derivative financial instruments	–0.4	–2.4
Increase in equity instruments	0.0	–1.4
Increase in other assets, prepaid expenses and accrued income	–14.2	–11.4
Decrease in deposits from central banks and credit institutions	–209.7	–88.7
Increase in deposits and borrowings from the public	827.9	517
Increase in other liabilities, accrued expenses and prepaid income	26.8	9.6
Interest received	126.7	127.7
Interest paid	–10.1	–12
Income tax paid	–18.3	–23
Net cash flows from operating activities	**402**	**517.4**
Investing activities		
Purchase of property, plant and equipment, investment property and intangible assets	–5.7	–6
Proceeds on sale of property, plant and equipment and investment property	0	0
Net cash outflow from debt securities	–67.9	0
Proceeds from equity instruments	3.7	6.3

Dividends received	0.1	0
Net cash flows used in investing activities	**–69.8**	**0.3**
Financing activities		
Dividends paid	–100	–77
Lease payments	–4.7	–4.7
Net cash flows from used in financing activities	**–104.7**	**–81.7**
Net increase in cash and cash equivalents	**227.5**	**436**
Cash and cash equivalents at 1 January	**850.0**	**1,082.0**
Net foreign exchange difference	4.5	–6.9
Changes on cash and cash equivalents	227.5	436
Cash and cash equivalents at 31 December	**1,082.00**	**1,511.10**
Cash and cash equivalents include:		
Cash on hand	38.4	41
Balances with the central bank without mandatory reserve	404.7	1,242.50
Demand deposits with credit institutions	638.9	227.6

Source: SEB annual reports 2020–2021

Appendix 6 continued

Luminor Bank AS statement of cash flows 2018–2021, in million EUR, end of year data

Cash flow statement item	**2018**	**2019**	**2020**	**2021**
Profit before tax	139.6	59.3	35.8	82.4
Adjustment for non-cash Items: Credit loss allowance				
Credit loss allowance	–6.3	23.0	17.6	–14.8
Depreciation and amortisation	8.8	13.2	12.1	12.1
Other non-cash items	10.1	–8.0	–3.1	–1.5
Interest and similar income	–298.2	–301.7	–273.7	–266.4
Interest and similar expense	38.8	47.5	46.8	27.2
Change In operating assets/liabilities:				
Increase (–) / decrease (+) of lending to customers	158.1	1,260.0	763.8	–509.1
Increase (–) / decrease (+) of other assets	215.7	–61.7	–50.3	–318.5
Increase (+) / decrease (–) of client deposits	–610.3	–1,796.3	658.2	–1,478.5
Increase (+) / decrease (–) of other liabilities	10.3	47.3	–35.8	31.2
Interest received	306.5	314.0	285.0	276.5
Interest paid	–36.1	–51.8	–54.8	–27.8
Income tax paid	–14.2	–11.5	–13.1	–8.8
Dividend income	–0.1	–0.1	–0.1	–0.7
Cash flow from operating activities	**–77.3**	**–466.7**	**1,388.4**	**–2,196.7**
Acquisition of property, equipment and intangible assets	–9.1	–9.4	–3.0	–8.0
Proceeds from disposal of property. equipment and intangible assets	1.4	5.2	3.5	0.3
Proceeds from disposal of investment property	23.1	30.1	1.5	0.5
Dividend received	0.1	1.8	0.8	0.7
Cash flows from Investing activities	**15.4**	**27.7**	**2.8**	**–6.5**
Debt securities issued	284.3	298.8	802.8	299.3
Debt securities bought back	0.0	0.0	–254.9	–235.5
Debt securities repayment on maturity	0.0	0.0	0.0	–100.8
Payments of principal on leases	0.0	–6.0	–6.2	–6.3
Dividends paid	0.0	–216.0	0.0	–191.0
Cash flows from financing activities	**284.3**	**76.8**	**541.7**	**–234.3**
Net Increase or decrease in cash and cash equivalents	**222.5**	**–362.3**	**1,932.9**	**–2,437.5**
Cash and cash equivalents at the beginning of the period	3,088.3	3,310.5	2,948.7	4,884.7
Effects of currency translation on cash and cash equivalents	–0.2	0.4	3.1	0.0

Net increase or decrease in cash and cash equivalents	222.5	–362.3	1,932.9	–2,437.5
Cash and cash equivalents at the end of the period	**3,310.5**	**2,948.7**	**4,884.7**	**2,447.2**
Cash and cash equivalents comprise:				
Cash on hand	178.4	140.5	123.8	136.1
No-restricted current account with central banks	2,986.6	2,670.7	4,690.3	2,249.3
Due from other credit institutions within three months	145.5	137.5	70.6	61.8
Total	**3,310.5**	**2,948.7**	**4,884.7**	**2,447.2**

Source: Luminor annual reports 2018–2021

Appendix 6 continued

LHV Group AS statement of cash flows 2018–2021, in million EUR, end of year data

Cash flow statement item	2018	2019	2020	2021
Cash flows from operating activities				
Interest received	45.0	59.8	87.1	124.7
Interest paid	–6.8	–11.0	–21.3	–29.9
Fees and commissions received	32.8	37.0	46.1	59.9
Fees and commissions paid	–7.8	–11.3	–12.8	–17.3
Other income received	0.9	0.1	–0.1	–0.8
Staff costs paid	–14.6	–17.9	–21.6	–27.1
Administrative and other operating expenses paid	–13.4	–13.9	–14.4	–23.8
Income tax paid	–3.1	–4.2	–5.0	–10.8
Cash flows from operating activities before change in operating assets and liabilities	**33.0**	**38.6**	**58.1**	**74.8**
Net increase/(decrease) in operating assets:				
Net increase/(decrease) in financial assets at fair value through profit or loss	–0.1	0.0	–0.1	–0.1
Loans and advances to customers	–199.3	–770.4	–531.9	–475.1
Mandatory reserve at central bank	1.1	–12.1	–14.8	–16.0
Security deposits	–0.6	0.7	0.2	–0.2
Other assets	–0.6	0.0	–5.5	1.4
Net increase/(decrease) in operating liabilities:				
Demand deposits of customers	–105.6	885.4	1,445.7	2,014.4
Term deposits of customers	–9.3	390.8	–25.2	–324.0
Loans received	16.3	10.0	448.7	0.0
Repayments of loans received	–0.7	–5.9	–5.9	–21.8
Financial liabilities held for trading at fair value through profit or loss	0.0	0.0	0.2	–0.1
Other liabilities	–38.5	–6.3	–1.1	28.2
Net cash from/ (used in) operating activities	**–304.4**	**530.7**	**1,368.3**	**1,281.6**
Cash flows from investing activities				
Purchase of tangible and intangible assets	–3.5	–3.8	–4.7	–6.7
Acquisition of strategical financial investment	0.0	0.0	0.0	–5.2
Disposal of subsidiaries, net of cash disposed	5.0	0.0	0.0	0.0
Proceeds from disposal and redemption of investment securities at fair value through other comprehensive income	0.5	0.0	0.4	0.0
Net changes of investment securities at fair value through profit or loss	9.5	6.9	–287.9	193.4
Net cash from/ (used in) investing activities	**11.6**	**3.1**	**–292.2**	**181.5**

Cash flows from financing activities				
Paid in share capital (incl. share premium)	0.6	26.0	1.7	26.9
Acquisition of non–controlling interest in subsidiaries	0.0	0.0	2.8	0.0
Paid dividends	–5.3	–6.7	–6.8	–10.5
Subordinated loans received	20.0	40.0	50.0	139.4
Subordinated loans redeemed	0.0	–15.9	–15.0	–40.0
Repayment of principal of lease liabilities	0.0	–1.0	–1.3	–1.3
Net cash from (used in) financing activities	**15.3**	**42.4**	**31.4**	**114.6**
Effect of exchange rate changes on cash and cash equivalents	0.1	0.1	0.0	0.1
Net increase/(decrease) in cash and cash equivalents	**–277.5**	**576.3**	**1,107.6**	**1,577.7**
Cash and cash equivalents at the beginning of the year	**945.8**	**668.4**	**1,244.7**	**2,352.3**
Cash and cash equivalents at the end of the year	**668.4**	**1,244.7**	**2,352.3**	**3,930.0**

Source: LHV annual reports 2018–2021

Appendix 7. Initial data for efficiency matrices

Swedbank data for efficiency matrices

In million EUR	**Profit before tax (P)**	**Total income (R)**	**Net interest income (I)**	**Operating expenses (O)**	**Average assets (A)**	**Average Equity (C)**
2021	218	395	221	165	15,705	1,739
2020	219	390	216	158	13,307	1,746
2019	249	407	218	156	11,459	1,755
2018	261	383	211	136	10,882	1,732
2021/2020	1.00	1.01	1.02	1.04	1.18	1.00
2020/2019	0.88	0.96	0.99	1.02	1.16	0.99
2019/2018	0.95	1.06	1.03	1.14	1.05	1.01
CAGR (2021/2018)	0.94	1.01	1.02	1.07	1.13	1.00

Source: compiled by author based on appendices 2 and 3

SEB data for efficiency matrices

In million EUR	**P**	**R**	**I**	**O**	**A**	**C**
2021	115	175	115	63	7,715	1,059
2020	101	175	117	63	7,177	1,054
2019	118	174	112	60	6,711	1,042
2018	98	156	100	58	6,341	1,033
2021/2020	1.14	1.00	0.99	1.00	1.07	1.01
2020/2019	0.86	1.01	1.04	1.04	1.07	1.01
2019/2018	1.20	1.11	1.13	1.04	1.06	1.01
CAGR (2021/2018)	1.06	1.04	1.05	1.03	1.07	1.01

Source: compiled by author based on appendices 2 and 3

Luminor data for efficiency matrices

In million EUR	**P**	**R**	**I**	**O**	**A**	**C**
2021	82	329	239	263	14,120	1,607
2020	36	328	227	275	14,331	1,649
2019	59	373	254	290	14,522	1,715
2018	140	377	259	237	15,200	1,756
2021/2020	2.30	1.00	1.05	0.95	0.99	0.97
2020/2019	0.60	0.88	0.89	0.95	0.99	0.96
2019/2018	0.42	0.99	0.98	1.22	0.96	0.98
CAGR (2021/2018)	0.84	0.96	0.97	1.03	0.98	0.97

Source: compiled by author based on appendices 2 and 3

Appendix 7 continued

LHV data for efficiency matrices

In million EUR	**P**	**R**	**I**	**O**	**A**	**C**
2021	71	140	97	65	5,908	285
2020	49	104	68	44	4,002	226
2019	31	74	47	39	2,355	182
2018	27	65	38	32	1,725	143
2021/2020	1.46	1.36	1.42	1.48	1.48	1.26
2020/2019	1.55	1.40	1.45	1.12	1.70	1.24
2019/2018	1.14	1.14	1.24	1.22	1.36	1.27
CAGR (2021/2018)	1.37	1.30	1.37	1.27	1.51	1.26

Source: compiled by author based on appendices 2 and 3

Appendix 8. Individual overall efficiency matrices

Swedbank overall efficiency matrix 2018–2021

Year/QI (in million EUR)		P	R	I	O	A
R	2021	0.55	1			
	2020	0.56				
	2019	0.61				
	2018	0.68				
	2021/2020	**0.99**				
	2020/2019	**0.92**				
	2019/2018	**0.90**				
	CAGR (2021/2018)	**0.93**				
I	2021	0.99	1.79	1		
	2020	1.01	1.81			
	2019	1.14	1.87			
	2018	1.24	1.82			
	2021/2020	**0.98**	**0.99**			
	2020/2019	**0.89**	**0.97**			
	2019/2018	**0.92**	1.03			
	CAGR (2021/2018)	**0.93**	**0.99**			
O	2021	1.33	2.40	1.34	1	
	2020	1.38	2.46	1.36		
	2019	1.60	2.61	1.40		
	2018	1.92	2.81	1.55		
	2021/2020	**0.96**	**0.97**	**0.98**		
	2020/2019	**0.86**	**0.94**	**0.97**		
	2019/2018	**0.83**	**0.93**	**0.90**		
	CAGR (2021/2018)	**0.88**	**0.95**	**0.95**		
A	2021	0.01	0.03	0.01	0.01	1
	2020	0.02	0.03	0.02	0.01	
	2019	0.02	0.04	0.02	0.01	
	2018	0.02	0.04	0.02	0.01	
	2021/2020	**0.84**	**0.86**	**0.87**	**0.88**	
	2020/2019	**0.76**	**0.83**	**0.85**	**0.88**	
	2019/2018	**0.91**	1.01	**0.98**	1.09	
	CAGR (2021/2018)	**0.83**	**0.89**	**0.90**	**0.94**	
C	2021	0.13	0.23	0.13	0.09	9.03
	2020	0.13	0.22	0.12	0.09	7.62
	2019	0.14	0.23	0.12	0.09	6.53
	2018	0.15	0.22	0.12	0.08	6.28
	2021/2020	1.00	1.02	1.03	1.04	1.18
	2020/2019	**0.88**	**0.96**	**1.00**	1.02	1.17
	2019/2018	**0.94**	1.05	1.02	1.13	1.04
	CAGR (2021/2018)	**0.94**	1.01	1.01	1.06	1.13

Source: compiled by author based on appendix 7

Appendix 8 continued

SEB overall efficiency matrix 2018–2021

Year/QI (in million EUR)		P	R	I	O	A
R	2021	0.66	1			
	2020	0.58				
	2019	0.68				
	2018	0.63				
	2021/2020	1.14				
	2020/2019	**0.86**				
	2019/2018	1.08				
	CAGR (2021/2018)	1.02				
I	2021	1.00	1.52	1		
	2020	0.87	1.49			
	2019	1.05	1.54			
	2018	0.98	1.57			
	2021/2020	1.15	1.01			
	2020/2019	**0.83**	**0.97**			
	2019/2018	1.07	**0.99**			
	CAGR (2021/2018)	1.01	**0.99**			
O	2021	1.83	2.78	1.84	1	
	2020	1.62	2.80	1.87		
	2019	1.96	2.90	1.88		
	2018	1.70	2.72	1.73		
	2021/2020	1.13	1.00	**0.98**		
	2020/2019	**0.83**	**0.97**	1.00		
	2019/2018	1.15	1.07	1.08		
	CAGR (2021/2018)	1.03	1.01	1.02		
A	2021	0.01	0.02	0.01	0.01	1
	2020	0.01	0.02	0.02	0.01	
	2019	0.02	0.03	0.02	0.01	
	2018	0.02	0.02	0.02	0.01	
	2021/2020	1.06	**0.93**	**0.92**	**0.93**	
	2020/2019	**0.81**	**0.94**	**0.97**	**0.98**	
	2019/2018	1.14	1.05	1.07	**0.98**	
	CAGR (2021/2018)	**0.99**	**0.97**	**0.98**	**0.96**	
C	2021	0.11	0.17	0.11	0.06	7.28
	2020	0.10	0.17	0.11	0.06	6.81
	2019	0.11	0.17	0.11	0.06	6.44
	2018	0.09	0.15	0.10	0.06	6.14
	2021/2020	1.13	**0.99**	**0.98**	1.00	1.07
	2020/2019	**0.85**	1.00	1.03	1.03	1.06
	2019/2018	1.19	1.10	1.12	1.03	1.05
	CAGR (2021/2018)	1.05	1.03	1.04	1.02	1.06

Source: compiled by author based on appendix 7

Appendix 8 continued

Luminor overall efficiency matrix 2018–2021

Year/QI (in million EUR)		P	R	I	O	A
R	2021	0.25	1			
	2020	0.11				
	2019	0.16				
	2018	0.37				
	2021/2020	2.30				
	2020/2019	**0.69**				
	2019/2018	**0.43**				
	CAGR (2021/2018)	**0.88**				
I	2021	0.34	1.38	1		
	2020	0.16	1.45			
	2019	0.23	1.47			
	2018	0.54	1.45			
	2021/2020	2.18	**0.95**			
	2020/2019	**0.68**	**0.98**			
	2019/2018	**0.43**	1.01			
	CAGR (2021/2018)	**0.86**	**0.98**			
O	2021	0.31	1.25	0.91	1	
	2020	0.13	1.19	0.82		
	2019	0.20	1.29	0.88		
	2018	0.59	1.59	1.09		
	2021/2020	2.41	1.05	1.10		
	2020/2019	**0.64**	**0.93**	**0.94**		
	2019/2018	**0.35**	**0.81**	**0.80**		
	CAGR (2021/2018)	**0.81**	**0.92**	**0.94**		
A	2021	0.01	0.02	0.02	0.02	1
	2020	0.00	0.02	0.02	0.02	
	2019	0.00	0.03	0.02	0.02	
	2018	0.01	0.02	0.02	0.02	
	2021/2020	2.34	1.02	1.07	**0.97**	
	2020/2019	**0.61**	**0.89**	**0.90**	**0.96**	
	2019/2018	**0.44**	1.04	1.03	1.28	
	CAGR (2021/2018)	**0.86**	**0.98**	**1.00**	1.06	
C	2021	0.05	0.20	0.15	0.16	8.79
	2020	0.02	0.20	0.14	0.17	8.69
	2019	0.03	0.22	0.15	0.17	8.47
	2018	0.08	0.21	0.15	0.14	8.66
	2021/2020	2.36	1.03	1.08	**0.98**	1.01
	2020/2019	**0.63**	**0.91**	**0.93**	**0.99**	1.03
	2019/2018	**0.43**	1.01	**1.00**	1.25	**0.98**
	CAGR (2021/2018)	**0.86**	**0.98**	**1.00**	1.07	**1.00**

Source: compiled by author based on appendix 7

Appendix 8 continued

LHV overall efficiency matrix 2018–2021

Year/QI (in million EUR)		P	R	I	O	A
R	2021	0.51	1			
	2020	0.47				
	2019	0.42				
	2018	0.43				
	2021/2020	1.08				
	2020/2019	1.11				
	2019/2018	1.00				
	CAGR (2021/2018)	1.06				
I	2021	0.73	1.44	1		
	2020	0.71	1.51			
	2019	0.66	1.56			
	2018	0.72	1.69			
	2021/2020	1.03	**0.95**			
	2020/2019	1.07	**0.97**			
	2019/2018	**0.92**	**0.92**			
	CAGR (2021/2018)	1.01	**0.95**			
O	2021	1.09	2.15	1.49	1	
	2020	1.11	2.35	1.56		
	2019	0.80	1.88	1.21		
	2018	0.85	2.01	1.19		
	2021/2020	**0.99**	**0.91**	**0.96**		
	2020/2019	1.39	1.25	1.29		
	2019/2018	**0.93**	**0.94**	1.02		
	CAGR (2021/2018)	1.09	1.02	1.08		
A	2021	0.01	0.02	0.02	0.01	1
	2020	0.01	0.03	0.02	0.01	
	2019	0.01	0.03	0.02	0.02	
	2018	0.02	0.04	0.02	0.02	
	2021/2020	**0.99**	**0.92**	**0.96**	1.00	
	2020/2019	**0.91**	**0.83**	**0.85**	**0.66**	
	2019/2018	**0.84**	**0.84**	**0.91**	**0.89**	
	CAGR (2021/2018)	**0.91**	**0.86**	**0.91**	**0.84**	
C	2021	0.25	0.49	0.34	0.23	20.73
	2020	0.22	0.46	0.30	0.19	17.73
	2019	0.17	0.41	0.26	0.22	12.94
	2018	0.19	0.45	0.27	0.23	12.07
	2021/2020	1.16	1.07	1.12	1.17	1.17
	2020/2019	1.25	1.13	1.17	**0.90**	1.37
	2019/2018	**0.90**	**0.90**	**0.98**	**0.96**	1.07
	CAGR (2021/2018)	1.09	1.03	1.09	1.01	1.20

Source: compiled by author based on appendix 7

Appendix 9. Comparison matrices

SEB / Swedbank efficiency matrix 2018–2021

Year/QI (in million EUR)		P	R	I	O	A
R	2021	1.19	1			
	2020	1.03				
	2019	1.11				
	2018	**0.92**				
	2021/2020	1.15				
	2020/2019	0.93				
	2019/2018	1.21				
	CAGR (2021/2018)	1.09				
I	2021	1.01	**0.85**	1		
	2020	**0.85**	**0.83**			
	2019	**0.91**	**0.83**			
	2018	**0.79**	**0.86**			
	2021/2020	1.18	1.02			
	2020/2019	0.93	1.00			
	2019/2018	1.16	0.96			
	CAGR (2021/2018)	1.08	0.99			
O	2021	1.38	1.16	1.37	1	
	2020	1.17	1.14	1.37		
	2019	1.23	1.11	1.34		
	2018	**0.89**	**0.97**	1.12		
	2021/2020	1.18	1.02	1.00		
	2020/2019	0.96	1.02	1.02		
	2019/2018	1.38	1.15	1.20		
	CAGR (2021/2018)	1.16	1.06	1.07		
A	2021	1.07	**0.90**	1.06	**0.78**	1
	2020	**0.86**	**0.83**	1.00	**0.73**	
	2019	**0.81**	**0.73**	**0.88**	**0.66**	
	2018	**0.64**	**0.70**	**0.81**	**0.73**	
	2021/2020	1.25	1.08	1.06	1.06	
	2020/2019	1.06	1.14	1.14	1.11	
	2019/2018	1.25	1.04	1.08	0.91	
	CAGR (2021/2018)	1.19	1.09	1.09	1.02	
C	2021	**0.87**	**0.73**	**0.86**	**0.63**	**0.81**
	2020	**0.77**	**0.74**	**0.90**	**0.65**	**0.89**
	2019	**0.79**	**0.72**	**0.87**	**0.65**	**0.99**
	2018	**0.63**	**0.68**	**0.79**	**0.71**	**0.98**
	2021/2020	1.13	0.98	0.96	0.96	0.90
	2020/2019	0.96	1.03	1.03	1.01	0.91
	2019/2018	1.27	1.05	1.10	0.92	1.01
	CAGR (2021/2018)	1.11	1.02	1.03	0.96	0.94

Source: compiled by author based on appendix 8

Appendix 9 continued

Luminor / Swedbank efficiency matrix 2018–2021

Year/QI (in million EUR)		P	R	I	O	A
R	2021	**0.45**	1			
	2020	**0.19**				
	2019	**0.26**				
	2018	**0.54**				
	2021/2020	2.33				
	2020/2019	0.75				
	2019/2018	0.48				
	CAGR (2021/2018)	0.94				
I	2021	**0.35**	**0.77**	1		
	2020	**0.16**	**0.80**			
	2019	**0.20**	**0.79**			
	2018	**0.43**	**0.80**			
	2021/2020	2.24	0.96			
	2020/2019	0.76	1.02			
	2019/2018	0.47	0.98			
	CAGR (2021/2018)	0.93	0.99			
O	2021	**0.24**	**0.52**	**0.68**	1	
	2020	**0.09**	**0.48**	**0.60**		
	2019	**0.13**	**0.49**	**0.63**		
	2018	**0.31**	**0.56**	**0.71**		
	2021/2020	2.51	1.08	1.12		
	2020/2019	0.74	0.98	0.96		
	2019/2018	0.42	0.87	0.89		
	CAGR (2021/2018)	0.92	0.97	0.99		
A	2021	**0.42**	**0.93**	1.21	1.78	1
	2020	**0.15**	**0.78**	**0.98**	1.62	
	2019	**0.19**	**0.72**	**0.92**	1.47	
	2018	**0.38**	**0.70**	**0.88**	1.25	
	2021/2020	2.76	1.19	1.24	1.10	
	2020/2019	0.81	1.08	1.06	1.10	
	2019/2018	0.49	1.03	1.04	1.18	
	CAGR (2021/2018)	1.03	1.10	1.11	1.12	
C	2021	**0.41**	**0.90**	1.17	1.73	**0.97**
	2020	**0.17**	**0.89**	1.11	1.84	1.14
	2019	**0.24**	**0.94**	1.19	1.91	1.30
	2018	**0.53**	**0.97**	1.21	1.72	1.38
	2021/2020	2.36	1.01	1.05	0.94	0.85
	2020/2019	0.71	0.95	0.93	0.97	0.88
	2019/2018	0.46	0.97	0.98	1.11	0.94
	CAGR (2021/2018)	0.92	0.98	0.99	1.00	0.89

Source: compiled by author based on appendix 8

Appendix 9 continued

LHV / Swedbank efficiency matrix 2018–2021

Year/QI (in million EUR)		P	R	I	O	A
R	2021	**0.92**	1			
	2020	**0.84**				
	2019	**0.69**				
	2018	**0.62**				
	2021/2020	1.10				
	2020/2019	1.21				
	2019/2018	1.11				
	CAGR (2021/2018)	1.14				
I	2021	**0.74**	**0.81**	1		
	2020	**0.70**	**0.84**			
	2019	**0.58**	**0.84**			
	2018	**0.58**	**0.93**			
	2021/2020	1.06	0.96			
	2020/2019	1.21	1.00			
	2019/2018	1.00	0.90			
	CAGR (2021/2018)	1.08	0.95			
O	2021	**0.82**	**0.90**	1.11	1	
	2020	**0.80**	**0.96**	1.14		
	2019	**0.50**	**0.72**	**0.86**		
	2018	**0.44**	**0.71**	**0.77**		
	2021/2020	1.03	0.94	0.98		
	2020/2019	1.60	1.33	1.32		
	2019/2018	1.12	1.01	1.13		
	CAGR (2021/2018)	1.23	1.08	1.13		
A	2021	**0.87**	**0.95**	1.17	1.05	1
	2020	**0.74**	**0.88**	1.05	**0.92**	
	2019	**0.61**	**0.88**	1.06	1.23	
	2018	**0.66**	1.06	1.14	1.49	
	2021/2020	1.17	1.07	1.11	1.14	
	2020/2019	1.21	1.00	1.00	0.75	
	2019/2018	0.92	0.83	0.93	0.82	
	CAGR (2021/2018)	1.09	0.96	1.01	0.89	
C	2021	1.99	2.17	2.69	2.42	2.29
	2020	1.72	2.06	2.45	2.15	2.33
	2019	1.21	1.75	2.10	2.43	1.98
	2018	1.27	2.04	2.19	2.87	1.92
	2021/2020	1.16	1.06	1.10	1.12	0.99
	2020/2019	1.42	1.17	1.17	0.88	1.17
	2019/2018	0.95	0.86	0.96	0.85	1.03
	CAGR (2021/2018)	1.16	1.02	1.07	0.94	1.06

Source: compiled by author based on appendix 8

Appendix 10. Decomposition analysis of the matrix coefficient P/C

Profit before tax on equity decomposition analysis formula:

Formula:	P/C =	(A/C) ×	(O/A) ×	(I/O) ×	(R/I) ×	(P/R) ×
Where:	Profit before tax/Equity (ROE)	Average Assets/ Average Equity	Operating expenses/ Assets	NII/ Operating expenses	Total Income/NII	Profit before tax/Total Income
Where:	T =	a ×	b ×	c ×	d ×	e ×

Index of component "a" (T_a/T_0) =	$(a_1 \times b_0 \times c_0 \times d_0 \times e_0) / (a_0 \times b_0 \times c_0 \times d_0 \times e_0)$
Index of component "b" (T_b/T_a) =	$(a_1 \times b_1 \times c_0 \times d_0 \times e_0) / (a_1 \times b_0 \times c_0 \times d_0 \times e_0)$
Index of component "c" (T_c/T_b) =	$(a_1 \times b_1 \times c_1 \times d_0 \times e_0) / (a_1 \times b_1 \times c_0 \times d_0 \times e_0)$
Index of component "d" (T_d/T_c) =	$(a_1 \times b_1 \times c_1 \times d_1 \times e_0) / (a_1 \times b_1 \times c_1 \times d_0 \times e_0)$
Index of component "e" (T_1/T_d) =	$(a_1 \times b_1 \times c_1 \times d_1 \times e_1) / (a_1 \times b_1 \times c_1 \times d_1 \times e_0)$

The absolute impact of component "a"	$\Delta T(a) = T_a - T_0 = (a_1 - a_0) \times b_0 \times c_0 \times d_0 \times e_0$
The absolute impact of component "b"	$\Delta T(b) = T_b - T_a = a_1 \times (b_1 - b_0) \times c_0 \times d_0 \times e_0$
The absolute impact of component "c"	$\Delta T(c) = T_c - T_b = a_1 \times b_1 \times (c_1 - c_0) \times d_0 \times e_0$
The absolute impact of component "d"	$\Delta T(d) = T_d - T_c = a_1 \times b_1 \times c_1 \times (d_1 - d_0) \times e_0$
The absolute impact of component "e"	$\Delta T(e) = T_1 - T_d = a_1 \times b_1 \times c_1 \times d_1 \times (e_1 - e_0)$

Compiled by author

Appendix 10 continued

Swedbank ROE decomposition analysis

Indicator	2018	2019	2020	2021
T	0.15	0.14	0.13	0.13
a	6.28	6.53	7.62	9.03
b	0.01	0.01	0.01	0.01
c	1.55	1.40	1.36	1.34
d	1.82	1.87	1.81	1.79
e	0.68	0.61	0.56	0.55

Index	2019/2018	2020/2019	2021/2020
Index of component "a" (T_a/T_0) =	1.04	1.17	1.18
Index of component "b" (T_b/T_a) =	1.09	0.88	0.88
Index of component "c" (T_c/T_b) =	0.90	0.97	0.98
Index of component "d" (T_d/T_c) =	1.03	0.97	0.99
Index of component "e" (T_1/T_d) =	0.90	0.92	0.99

Impact (ΔT)	2019/2018	2020/2019	2021/2020
The absolute impact of component "a"	0.0059	0.0238	0.0232
The absolute impact of component "b"	0.0136	–0.0206	–0.0177
The absolute impact of component "c"	–0.0164	–0.0038	–0.0023
The absolute impact of component "d"	0.0043	–0.0046	–0.0012
The absolute impact of component "e"	–0.0163	–0.0113	–0.0019
ΔT	–0.0090	–0.0165	0.0002

%	2019/2018	2020/2019	2021/2020
(ΔT(a)/ΔT) × 100%	–66%	**–144%**	**14499%**
(ΔT(b)/ΔT) × 100%	–151%	125%	–11051%
(ΔT(c)/ΔT) × 100%	**182%**	23%	–1419%
(ΔT(d)/ΔT) × 100%	–47%	28%	–744%
(ΔT(e)/ΔT) × 100%	**182%**	68%	–1185%
Total	100%	100%	100%

Compiled by author based on appendices 2 and 3

Appendix 10 continued

SEB ROE decomposition analysis

Indicator	2018	2019	2020	2021
T	0.09	0.11	0.10	0.11
a	6.14	6.44	6.81	7.28
b	0.01	0.01	0.01	0.01
c	1.73	1.88	1.87	1.84
d	1.57	1.54	1.49	1.52
e	0.63	0.68	0.58	0.66

Index	2019/2018	2020/2019	2021/2020
Index of component "a" (T_a/T_0) =	1.05	1.06	1.07
Index of component "b" (T_b/T_a) =	0.98	0.98	0.93
Index of component "c" (T_c/T_b) =	1.08	1.00	0.98
Index of component "d" (T_d/T_c) =	0.99	0.97	1.01
Index of component "e" (T_1/T_d) =	1.08	0.86	1.14

Impact (ΔT)	2019/2018	2020/2019	2021/2020
The absolute impact of component "a"	0.0047	0.0064	0.0067
The absolute impact of component "b"	–0.0016	–0.0029	–0.0067
The absolute impact of component "c"	0.0080	–0.0003	–0.0018
The absolute impact of component "d"	–0.0015	–0.0038	0.0014
The absolute impact of component "e"	0.0085	–0.0161	0.0131
ΔT	0.0181	–0.0167	0.0126

%	2019/2018	2020/2019	2021/2020
(ΔT(a)/ΔT) × 100%	26%	–39%	53%
(ΔT(b)/ΔT) × 100%	–9%	17%	–53%
(ΔT(c)/ΔT) × 100%	44%	2%	–15%
(ΔT(d)/ΔT) × 100%	–8%	23%	11%
(ΔT(e)/ΔT) × 100%	**47%**	**97%**	**104%**
Total	100%	100%	100%

Compiled by author based on appendices 2 and 3

Appendix 10 continued

Luminor ROE decomposition analysis

Indicator	2018	2019	2020	2021
T	0.08	0.03	0.02	0.05
a	8.66	8.47	8.69	8.79
b	0.02	0.02	0.02	0.02
c	1.09	0.88	0.82	0.91
d	1.45	1.47	1.45	1.38
e	0.37	0.16	0.11	0.25

Index	2019/2018	2020/2019	2021/2020
Index of component "a" (T_a/T_0) =	0.98	1.03	1.01
Index of component "b" (T_b/T_a) =	1.28	0.96	0.97
Index of component "c" (T_c/T_b) =	0.80	0.94	1.10
Index of component "d" (T_d/T_c) =	1.01	0.98	0.95
Index of component "e" (T_1/T_d) =	0.43	0.69	2.30

Impact (ΔT)	2019/2018	2020/2019	2021/2020
The absolute impact of component "a"	–0.0017	0.0009	0.0002
The absolute impact of component "b"	0.0217	–0.0013	–0.0007
The absolute impact of component "c"	–0.0197	–0.0021	0.0022
The absolute impact of component "d"	0.0009	–0.0005	–0.0012
The absolute impact of component "e"	–0.0461	–0.0099	0.0289
ΔT	–0.0449	–0.0128	0.0296

%	2019/2018	2020/2019	2021/2020
(ΔT(a)/ΔT) × 100%	4%	–7%	1%
(ΔT(b)/ΔT) × 100%	–48%	10%	–2%
(ΔT(c)/ΔT) × 100%	44%	16%	8%
(ΔT(d)/ΔT) × 100%	–2%	4%	–4%
(ΔT(e)/ΔT) × 100%	**103%**	**77%**	**98%**
Total	100%	100%	100%

Compiled by author based on appendices 2 and 3

Appendix 10 continued

LHV ROE decomposition analysis

Indicator	2018	2019	2020	2021
T	0.19	0.17	0.22	0.25
a	12.07	12.94	17.73	20.73
b	0.02	0.02	0.01	0.01
c	1.19	1.21	1.56	1.49
d	1.69	1.56	1.51	1.44
e	0.43	0.42	0.47	0.51

Index	2019/2018	2020/2019	2021/2020
Index of component "a" (T_a/T_0) =	1.07	1.37	1.17
Index of component "b" (T_b/T_a) =	0.89	0.66	1.00
Index of component "c" (T_c/T_b) =	1.02	1.29	0.96
Index of component "d" (T_d/T_c) =	0.92	0.97	0.95
Index of component "e" (T_1/T_d) =	1.00	1.11	1.08

Impact (ΔT)	2019/2018	2020/2019	2021/2020
The absolute impact of component "a"	0.0139	0.0638	0.0364
The absolute impact of component "b"	–0.0219	–0.0805	0.0009
The absolute impact of component "c"	0.0033	0.0451	–0.0104
The absolute impact of component "d"	–0.0148	–0.0059	–0.0112
The absolute impact of component "e"	–0.0005	0.0208	0.0185
ΔT	–0.0200	0.0434	0.0343

%	2019/2018	2020/2019	2021/2020
(ΔT(a)/ΔT) × 100%	–69%	147%	**106%**
(ΔT(b)/ΔT) × 100%	**109%**	**–185%**	3%
(ΔT(c)/ΔT) × 100%	–16%	104%	–30%
(ΔT(d)/ΔT) × 100%	74%	–14%	–33%
(ΔT(e)/ΔT) × 100%	2%	48%	54%
Total	100%	100%	100%

Compiled by author based on appendices 2 and 3

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