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Neo-banks versus traditional banks: A comparative study of operations and financial performance in Europe

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Master in Management

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May, 2023

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Resumo

Esta dissertação de mestrado examina o estado atual dos neo-bancos na Europa em comparação com os bancos tradicionais, analisando o desenvolvimento do seu desempenho operacional e financeiro. O estudo examina os seus modelos operacionais, delinea os fatores que influenciam os clientes a migrar para os neo-bancos e avalia a sua viabilidade a longo prazo.

A metodologia baseia-se em dados secundários e utiliza a análise dos rácios para avaliar o desempenho dos dois modelos bancários e compara os resultados com as opiniões dos peritos da indústria.

Os resultados mostram que o desempenho financeiro dos neo-bancos e dos bancos tradicionais difere significativamente. Os bancos tradicionais geraram consistentemente mais lucro, como evidenciado pelo seu desempenho superior ROAA e ROAE, enquanto os neo-bancos demonstraram rácios NIM mais elevados e CI mais baixos, indicando uma maior eficiência na geração de receitas a partir de ativos remunerados e um melhor controlo dos custos operacionais. Além disso, os neo-bancos tinham um rácio P/L médio mais elevado por empregado, apontando para o seu aumento de produtividade na geração de dinheiro por empregado. Os neo-bancos destacam as vantagens de não terem de lidar com sistemas ou agências antigas, o que permite uma escalabilidade mais fácil.

Para alcançar um sucesso sustentável no futuro, os resultados sugerem que ambos os modelos bancários devem abordar os seus pontos fracos, mantendo as suas forças principais. Este estudo contribui para o crescente conjunto de informações sobre os novos bancos e o seu impacto no sector bancário, fornecendo informações valiosas para académicos e profissionais.

Keywords: Setor bancário, Neo-bancos, Bancos tradicionais, Desempenho financeiro, Análise de rácios

JEL Classification: G21; G23

Abstract

This master's dissertation examines the current state of neo-banks in Europe compared to traditional banks by analysing the development of their operational and financial performance. The study examines their operating models, outlines the factors that influence customers to migrate to neo-banks and assesses the viability of their long-term success in the banking industry.

The methodological section is based on secondary data and uses a ratio analysis to compare the financial performance of the two banking models and examines whether the results agree with the opinions of industry experts.

The results show that the financial performance of neo-banks differs significantly from that of traditional banks. Traditional banks consistently generated more profit, as evidenced by their superior ROAA and ROAE performance, while neo-banks demonstrated higher NIM and lower CI ratios, indicating greater efficiency in generating income from interest-earning assets and better control of operating costs. In addition, neo-banks had a higher average P/L per employee ratio, indicating their higher productivity in generating money per employee. Highlighting the advantages of neo-banks in not having to deal with legacy systems or branches, allowing for easier scalability.

Nevertheless, the results suggest that to achieve sustainable success in the future, both banking models must address their weaknesses while maintaining their core strengths. This research contributes to the increasing information on neo-banks and their impact on the banking sector and provides valuable insights for academics and practitioners.

Keywords: Banking Industry, Neo-banks, Traditional Banks, Financial Performance, Ratio Analysis

JEL Classification: G21; G23

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Acronyms

AI	Artificial Intelligence
API	Application Programming Interface
App	Application
ATM	Automated Teller Machine
CI	Cost-to-Income Ratio
COVID-19	Coronavirus Disease 2019
CVC	Corporate Venture Capital
DEA	Data Envelopment Analysis
ECB	European Central Bank
ESG	Environmental, Social and Governance
FinTech	Financial Technology
GAAP	Generally Accepted Accounting Principles
IFRS	International Financial Reporting Standards
LAR	Loan to Asset Ratio
NIM	Net Interest Margin
NPL	Non-Performing Loans
P/L	Profit/Loss
PSD2	Payment Services Directive II
ROA	Return on Assets
ROAA	Return on Average Assets
ROAE	Return on Average Equity
ROE	Return on Equity

CHAPTER 1

Introduction

As the financial landscape evolves, technological innovations have encouraged and stimulated the adoption of financial digitalization, particularly due to the evolution of the internet and mobile devices. Furthermore, technology has brought new business models to life and enhanced customer engagement (A. R. D. Rodrigues et al., 2022). Meanwhile, more and more people are using digital financial solutions. Even in countries such as Germany, which is considered to be very conservative when it comes to payments, more than half of the population now does most of their banking online, according to a survey conducted by the Association of German Banks (Bankenverband, 2022).

As consumers turn to online retailers and streaming services, they are also increasingly shifting to new digital providers when it comes to everyday banking operations such as deposits and payments. Several studies show that consumers are becoming increasingly demanding in terms of the quality and availability of banking services. Given the above, highly digitalised banks, so-called neo-banks among others, are playing an increasingly important role as bank providers. Heading towards a customer-oriented financial market infrastructure, Alt and Puschmann (2012) already noticed a decade ago that "after replacing physical cashier desks by ATMs, physical deposit slips by online banking, the application of information technology could again lead to an innovative disruption of the banking industry" (p. 214). According to the study by Dehnert and Schumann (2022), which addresses the customer-centric service aspect of digital banks, traditional banks should be cautious, as customers who have switched banks less frequently in the past would consider FinTech's as new providers.

Overall, it is becoming increasingly difficult for traditional banks to keep up with their outdated systems and offer innovative functions, products or services that meet the expectations of the younger generations Y (1981 to 1996) and Z (1997 to 2012) in particular. For customers, factors such as ease of use, economic benefits and corporate reputation rank as the top priorities when choosing a bank. For this reason, low-cost and easy-to-use, purely digital banks are becoming increasingly popular (Anagnostopoulos, 2018; Windasari et al., 2022).

In the past, several studies have examined the impact of new banks entering the market after the financial crisis of 2008 and how they confront traditional financial institutions. Their findings suggest that traditional banks enjoy a high level of trust and therefore do not take digital competition too seriously, believing that investments in modernisation and digitalisation

should be sufficient to remain in demand among customers (Broby, 2021; Chiorazzo et al., 2018; Nel & Boshoff, 2020; and Nel & Boshoff, 2021). Moreover, most of these studies published so far focusing on the impact of FinTech's on the banking sector consider that neo-banks will not establish themselves competitively in the long run. However, after more than a decade in the financial market and given the pace at which they are gaining market shares globally, the main question that should be asked is whether digital-only banks (neo-banks) could become an established market leader in the future.

1.1 Research Question

When formulating the research question regarding neo-banks, it is important to consider them in relation to traditional banks, as they represent the most important financial institutions to this day. At the same time, given the competitive environment in which more and more new players are emerging in the financial landscape, it is crucial to understand the main business models in order to assess the extent to which they could become, or have already become, a threat. It is also important to identify what is preventing traditional banks from being as innovative and agile as the new era of banks. But as quickly as the fully digital banks have established themselves in our fast-moving world, they could just as quickly disappear without the support of their big investors. Or should the traditional banks not feel too secure in their market position while the neo-banks are constantly evolving? To analyse these aspects, this dissertation focuses on answering the following research question: How do neo-banks differ from traditional banks today in terms of their operation and financial performance development and what does this mean for the future?

The aim is to gain a better understanding of what differentiates a neo-bank from other market participants and how their financial performance development is compared to traditional banks. As established players in the market today, the key question is whether their business model is viable in the long term, given that they have been around for more than a decade and are often not profitable, despite their rapidly growing market share worldwide.

1.2 Objectives & Structure

To understand the differences in operating models and financial performance development of neo-banks compared to traditional banks and the implications for the future of banking, the study has the following objectives:

1. To provide a comprehensive description of the traditional banking model;
2. To examine the impact of technological advancements on the banking sector by reviewing existing academic literature;
3. To differentiate and analyse various technologically advanced bank models (digital banks, true digital banks & subsidiaries, challenger banks, neo-banks) to understand the evolution towards neo-banks;
4. To identify the key factors that influence customer intention to use neo-banks;
5. To conduct a comparative analysis of the current development of neo-banks versus traditional banks using secondary research and comparable company performance indicators;
6. To formulate recommendations for both traditional and neo-banks to enhance their business models and ensure long-term success.

The structure of this dissertation is designed to systematically achieve these objectives. The study begins with a comprehensive literature review, which provides a critical analysis of the traditional banking model and the impact of technology on the banking sector. The literature review then focuses on the new age of banking, including digital banks, challenger banks, and neo-banks. Additionally, the review sheds light on the advantages driving neo-banks growth and pressure they have as they attempt to overcome strong customer resistance.

The study then presents a theoretical model, using ratio analyses, to analyse the financial performance of neo-banks and traditional banks. The methodology section outlines the use of secondary data, specifically financial statements, to conduct the analysis.

The final aspect of the study is an analysis of the largest market players of traditional banks and digital-only banks (neo-banks), to draw a clear picture of their development and performance. Recent reports from industry experts are also taken into account in order to provide a clear picture of the overall findings.

CHAPTER 2

Literature Review

To gain a better understanding of what differentiates a neo-bank from other market participants and how its business model affects their performance, this literature review analyses the current state of research on the topic and how it sees neo-banks competing with traditional banks in the long run. Most of the published studies deal with the question of whether neo-banks can gain a foothold in the financial market at all. Yet, the challenge for neo-banks is to be profitable in the long run as a consistent market player.

2.1 Overview of the Traditional Banking Model

For a long time, traditional banks dominated the financial markets and the number of competitors was relatively small due to the difficulty of entering the industry. These include well-known banks such as HSBC, Bank of America and Banco Santander, to name a few. The main business model of banks is to collect deposits and extend credit. By doing so, they fulfil the key economic function of financial intermediaries: converting deposits (savings) into credit (investments), which involves liquidity, maturity and credit risk (Temelkov, 2020). Banks typically employ several business models, offer a wide range of financial services, and some may even concentrate on being their clients one-stop shop (bank). The clientele they serve as well as their core products determine whether traditional banks are orientated toward retail clients, commercial clients, or those operating under the universal bank model (Chiorazzo et al., 2018). Traditional banks are primarily funded by depositors, regardless of whether they specialise in retail or corporate business. Moreover, traditional banks are largely funded by interest income, while earning additional non-interest income from a wide range of secondary activities (DeYoung & Rice, 2004).

A key feature of the traditional business model is that banks have branches that allow them to have face-to-face contact with their clients. At the same time, however, high operating costs are required to maintain these branches and their ATM networks (Chiorazzo et al., 2018). Over the last decade, traditional banks have also been gradually adapting to the increasingly fast and digital market by offering services to their customers via mobile applications (apps), especially in payment processing. However, in most cases, these financial services are still provided through outdated financial systems embedded in a bureaucratic apparatus that is difficult to

update and legally revise (Anagnostopoulos, 2018). Faced with intensifying competition, their current business model, which undergoes relatively slow change, relies on retaining as large a customer base as possible to cover the considerably high fixed costs of the big banks, while at the same time optimising their overarching business structures and processes (Nichkasova & Shmarlouskaya, 2020; and Temelkov, 2020).

2.2 Impact of Technology on the Banking Industry

Technology has played a key role in strategic business decisions in the banking industry from the very beginning. Hardly any other industry is facing such lasting challenges and at same time opportunities from digitalization as the financial industry (J. F. C. Rodrigues et al., 2022). Yet the core systems still used by many banks were developed more than 40 years ago, when the requirements involved processing of business transactions and products in branches only between 8am and 5pm (Bain & Company, 2020). Due to these circumstances, modernising their core banking system has become an urgent necessity for all market participants to enable new features such as real-time payments, reduce the time-to-market of new products and services, and gain in-depth access to data. Several major banks are investing, in some cases, hundreds of millions in the modernization of their IT infrastructure (McKinsey & Company, 2020).

As new information and communication technologies have been introduced, digital transformation has taken place in the modern economy, enabling the development of entirely new forms of business and payment systems (Bataev, 2019). This is supported by the emergence of new disruptive technologies. Academic research has shown that Big Data, Application Programming Interface (API), Artificial Intelligence (AI), biometrics and mobile technology are among the most important technologies for the current development of banking (Nichkasova & Shmarlouskaya, 2020; Omoge et al., 2022). Thus, according to Broby (2021), both incumbent and challenger banks need to address the issues of liquidity transformation, data, trust, competition and further digitalisation in order to be successful in the future.

To better understand today's new banking models, it is particularly important to be familiar with the technologies that enable their effective and cost-efficient operating models, such as Open Banking and AI technologies. Open Banking is designed to make it easier to switch banks by allowing customers to delegate the power to transfer their financial data to other parties. Third-party providers can thus use the data via APIs as part of a network of closed financial data. Addressed by the European Union's Payment Services Directive II (PSD2) to improve competition and choice in the financial market. This has given rise to a wide range of data-

centric apps. Open Banking technology is giving enormous momentum to reshaping the future of banking (Broby, 2021; and Nickasova & Shmarlouskaya, 2020). In addition, AI is enabling digital banking in its current form, making it one of the most important technological drivers for the banking sector. Kaplan and Haenlein (2019) describe AI as “. . . a system’s ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation” (p. 17). This trend has allowed new entrants in retail banking sector to enter the market without having to employ a lot of staff. Consequently, AI is changing financial services, disrupting traditional intermediary practices, especially those of traditional banks (A. R. D. Rodrigues et al., 2022). New technologies that improve business models internally and externally will certainly continue to have a major impact on the further development of the banking sector.

The 2019 coronavirus disease (COVID-19) has had a huge impact on digital transformation, creating a direct need for banks to engage with their customers through digital channels at a time when social distancing was the norm. Several in-depth studies on the banking sector concluded that the payment behaviour of individual changed related to the lockdown measures of social distancing (Sahi et al., 2021; and Schmidt-Jessa, 2022). McKinsey conducted a study in 2020 that surveyed more than 20,000 European consumers to learn more about the increasing digital activity in various sectors. According to the study, there has been a 23% increase in digital adoption in the banking sector since the COVID-19 outbreak. In terms of future intentions, 82 % of the bank customers surveyed would most likely continue to use online banking services to the same or even greater extent. Given the fact that the banking sector is one of the industries with the highest satisfaction rates, explains why it enjoys the greatest confidence in its digital future (McKinsey Digital, 2020). Shahabi et al. (2020) equally concluded in their academic research, while mostly focusing on emerging markets, that the outbreak played a key role in changing social and cultural attitudes towards the acceptance of branchless banking.

2.3 The new Age of Banking

Following the financial crisis of 2008 and the resulting discovery of several weaknesses in the banks existing business models, new regulatory changes were introduced. These changes created the opportunity for a new breed of competitors to enter the financial services market. The so-called FinTech’s refer to young financial technology companies (start-ups) that develop internet-based technologies that enable and provide innovative financial services

(Anagnostopoulos, 2018). As the FinTech industry continues to evolve, it has expanded into different parts of the banking value chain, where it is disrupting the competitive landscape. Novel, highly digital business models of banks and other financial institutions have emerged through the introduction of cutting-edge technologies that highly optimise or even replace traditional business processes.

Bömer and Maxin (2018) identify and analyse the reasons why Fintech startups and banks nevertheless cooperate with each other. Their findings indicate that the primary driver for FinTech's is support for their market entry, in the form of regulatory infrastructure, adoption of products that enable market entry, know-how and funding. In addition, their data revealed that FinTech's in need of regulatory infrastructure also rely on the expertise of their partner banks to connect their own technology to the collaborating banks IT system. Secondly, to increase their profits. And finally, to be able to develop new FinTech products that are compliant with regulatory requirements. Alongside these factors, new companies may also take advantage of the reputation effect that comes from working with an established company, reducing uncertainty about the company's reputation. The motivation for incumbents to provide such backing is undoubtedly to gain access to the innovative developments of start-ups and to use those FinTech's as an additional source of distribution or to reduce cost-intensive operations (all to increase their revenues). Accordingly, both young companies and incumbents seek mutual cooperation (Bömer & Maxin, 2018).

Considering the growing pressure on the business model of established banks, the increasing number of new competitors and the expectation of customer-oriented electronic markets in the banking sector, Alt and Puschmann (2012) already recognised more than a decade ago that these developments will have a significant impact on traditional banks.

In the meantime, established banks are in fact not only investing heavily in their own digitalisation, but also increasingly utilising corporate venture capital (CVC) to invest in innovative Fintech companies. Two different objectives are pursued with these CVC investments to maximise the value of the company. In addition to high financial returns, there may also be more diverse and complex objectives, such as access to new innovative products and technologies or expansion of the customer spectrum (Weber & Weber, 2011). However, as Bömer and Maxin (2018) mentioned in their study on the cooperation between FinTech's and traditional banks, CVC also involves a lot of non-financial support, such as business infrastructure and networks.

2.3.1 Digital Bank

The business model of a digital bank can be seen as a fusion of conventional banking operations with modern technologies and new approaches to improve operational efficiency. This has led to a transformation in the way banks communicate with their customers (Temelkov, 2020). However, whether a bank is considered a digital bank depends neither on how many branches or apps it has, nor on their users' perception of it. Consequently, the introduction of a new mobile app does not necessarily make a traditional bank a digital bank. A true digital bank offers digital products and services as part of its value proposition. Its customers expect it to be able to use digital channels for their everyday banking activities (IBM, 2015). In this context, a clear distinction can be made between three types of market players: those who completely transform their current banks' culture and technology or create/acquire a separate institution allowing for greater adaptability and those who take an independent new approach, such as challenger and neo-banks.

This is because digital banks require not only a modern infrastructure that can cope with rapid technological change, but also a culture that is optimized for both agile working and thinking outside the box. In other words, a truly digital modular end-to-end business model. Digital banks back-end systems are designed to be more flexible and modular, allowing them to offer their customers a true end-to-end experience alongside their new digital channels. In addition, the use of back-end systems enables companies to innovate and adapt more quickly and efficiently at the product level (IBM, 2015).

Many traditional banks find that their current organization does not allow for such changes or that they are simply unable to provide the necessary competencies. Larger banks may also face barriers from their rigid, isolated banking systems being incapable of running a truly digital bank. Therefore, a separate organisation will be created or acquired and set up as a new digital subsidiary to implement the streamlined approaches for the rapid implementation of innovations and experiments (Nichkassova & Shmarlouskaya, 2020). Denyes (2019) notes that this approach of a subsidiary bank has become popular in Europe and North America with newly established banks such as Tangerine, founded by Dutch bank ING in Canada (now owned by Scotiabank). Further examples can also be found in the Asia-Pacific region, such as Citi Plus in Hong Kong, which is owned by Citibank.

As a digital subsidiary of a traditional bank, it is much easier to build a customer base than new competitors in the market. After all, there is the possibility of retaining the brand of the

bank in question, which not only reduces the operating costs for the newly established subsidiary but also helps to gain the trust of existing and potential new customers.

Most agree that digital banks are those where customers interact via digital, mostly mobile-based interfaces, as is the case entirely with the so-called neo-banks such as Revolut, one of the world's leading digital banks (Statista, 2021). Even though these banks are one hundred percent digital, most new banks that have entered the market would not refer to themselves as digital banks, as this definition would imply that they are the same as transformed incumbent banks.

2.3.2 Challenger Bank

There is no universal valid definition for a challenger bank, as both fintech specialists and respected academics assign different business models to one and the same bank. Nevertheless, this description intends to clarify distinct differences between a digital bank, a challenger bank and a neo-bank. Challenger banks are digital banks operating under a full banking license. The crucial term here is the “full banking license” because a challenger bank is regulated like a traditional bank (Schmidt-Jessa, 2022, p. 2). Moreover, it is a “new” company and not an existing bank that is digitizing its business or establishing a subsidiary.

These challengers are new entrants whose name originates from their determination to stand up against conventional banks. The smaller, mostly online-based banks began to “challenge” the larger, more established banks after the 2008/09 financial crisis, when customer confidence in the industry weakened. They found their place within the industry by providing more specific and improved services seeking to address an increasing diversity of customer needs and satisfy these, occupying market niches in certain cases to this day. Like traditional banks, their primary objective is to grow their balance sheet. Challengers often lack a physical location or some standard services of a traditional bank (Schmidt-Jessa, 2022). In the field of information and communication technologies, these FinTech banks have introduced modern innovative technologies, such as online operations, which allow them to avoid costs and difficulties in conducting banking operations (Schepinin & Bataev, 2019).

Although the development period is still relatively short, the financial institutions under consideration have done quite well in a highly vibrant environment. There are now 406 challenger banks worldwide as of 2021, with most of them located in Europe. The percentage of executives who perceive challenger banks as a threat to traditional banking in the US increased from 14% in 2020 and doubled to 28% in 2021 (Statista, 2021). Despite the high

development momentum of innovative financial institutions, they still account for less than 0.1 % of the financial market (World Federation of Exchanges, 2021).

The development of challenger banks in the world will continue rapidly in the near future. In the meantime, traditional financial institutions will invest in such banks, not wanting to miss out on the opportunities offered by such innovative think tanks. Bataev (2019) concluded in his study on the efficiency of challenger banks that the number of today's independent challenger banks will decrease in the future, leaving only those that have managed to establish a strong position in the financial market by then.

2.3.3 Neo-bank

In the wake of the “Great Recession” (financial crisis of 2008), a new generation of financial service providers has emerged to compete with incumbent banks, among other challengers. The so-called “neo-banks”, also known as digital-only banks, have begun offering financial products and services over the Internet that were previously only provided by traditional banks (Schmidt-Jessa, 2022). Unlike traditional banking services, their principal focus has always been on usability, which is why neo-banks offer their customers mobile budgeting tools, user-friendly interfaces, streamlined wealth management, straightforward loans, quick availability of deposits and other such services directly on their mobile phones or other digital platforms. However, the main difference between traditional and neo-banks is the absence of physical branches. Neo-banks do not have brick-and-mortar branches, nor do they offer face-to-face customer service. This allows customers to use their services whenever and wherever they want without having to visit a local branch during business hours. Furthermore, this enables the banks business model to operate extremely efficiently and thus offer very competitive prices. Consequently, neo-banks rely solely on their technological infrastructure to cover all types of transactions and other business activities (Windasari et al., 2022).

Due to their advanced technological framework, which at the same time allows a high degree of modularity, neo-banks can be very innovative in terms of processes and products. In fact, today's most successful neo-banks typically started by targeting overlooked segments (demographically or by interest group) and gained a foothold in these markets by offering simple, customer-focused savings and checking accounts as well as a small number of enhanced financial products along the financial value chain at a much lower price. However, as these new competitors established themselves in these market niches, they moved into larger market segments and rapidly expanded their product portfolios to meet the requirements of mainstream

customers while also leveraging the advantages that had made them successful in the first place (Nichkasova & Shmarlouskaya, 2020). Hence, they have become a direct competitor to traditional banks in no time. According to Nichkasova and Shmarlouskaya (2020), the innovative approaches and technological edge of neo-banks pose a real threat to traditional banks.

There are two types of neo-banks: those with a banking license and those without. On the one hand, a neo-bank without its own banking license is, according to Schmidt-Jessa (2022), essentially a FinTech that cooperates with real banks to offer customer-friendly and convenient banking services. While this does not allow them to operate without restrictions, as they cannot, for example, offer stand-alone financial products to customers, it does provide them with an excellent opportunity to scale up, gather experience and establish themselves in the market as new entrants. On the other hand, according to a growing number of authors such as Nel and Boshoff (2021), Windasari et al. (2022) and Schmidt-Jessa (2022), neo-banks with a full banking license are considered as digital-only banks rather than neo-banks operating with a full banking license. These institutions must be independent banks and not subsidiaries of established banks created from scratch. Outside of academia, however, they are still referred to as neo-banks, even by the companies themselves. Overall, neo-banks are about creating a customer-centric organization that uses a data-driven architecture powered by Open Banking and AI. Their focus is always on solutions rather than simply providing the latest technology.

For a better collective understanding, the main distinctions between the business models described are illustrated in Figure 2.1.

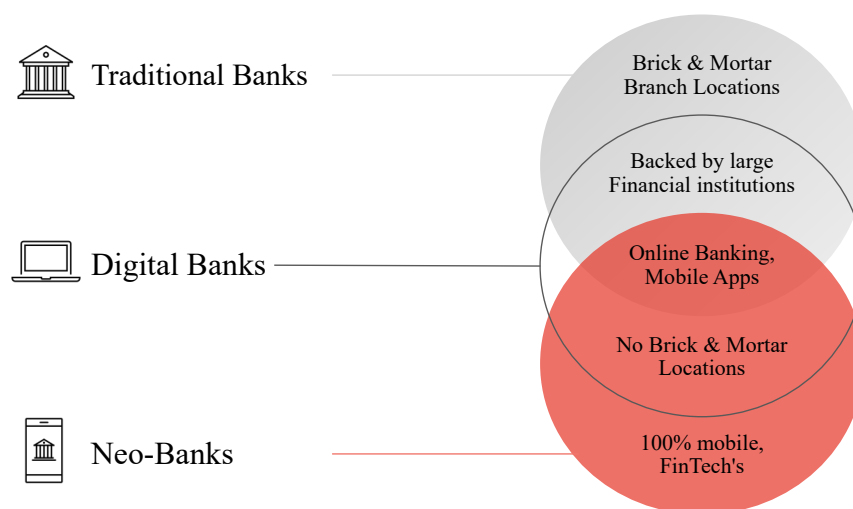


Figure 2.1 Differences between Neo-banks & Digital Banks (Adapted from: The Nielsen Company, 2019)

2.4 Neo-banks putting increasing pressure on Traditional Banks

Now that the role of the respective banking models in the new age of banking has been clarified, there is no doubt that traditional banks are going to have to adapt. In particular, the unique business model of a neo-bank, combined with their ability to evolve quickly and offer new innovative products, leaves them no room to rest. As the digital revolution accelerates and societal attitudes toward innovation shift, the activities of digital-only banks should benefit, as well as the number of consumers who embrace branchless banking. While the coronavirus outbreak accelerated digital transformation and contributed to greater adoption of technology and innovation, it also resulted in technological advances across all market participants improving their digital experience (Schmidt-Jessa, 2022). For this reason, competitive advantages are becoming increasingly important for challengers such as neo-banks to stand out from their competition. Moreover, Sahi et al. (2021) noted in their study that customers still have concerns regarding the security, privacy, use and value of digital payment technologies. In fact, overcoming customer resistance is one of, if not the biggest task for a neo-bank. Many academics have already addressed this topic and highlighted possible scenarios as well as potential changes in the banking world. Overall, this research on banking and financial services has indicated that digitalisation and the resulting customer acceptance of new offerings has been successfully established repeatedly for decades (Alt & Puschmann, 2012; and Windasari et al., 2022).

2.4.1 Advantages that enable their growth

In the constantly changing economic environment, the advantages of neo-banks become particularly apparent. Being a challenger, the bank is very innovative when it comes to thinking outside the box to achieve real change. Through its data-driven, purely digital business model, as well as its intelligent use of AI and its focus on personalised banking, the bank can offer services that other competitors struggle to match. Given the increasingly informed and demanding customers, convincing new customers will be a constant challenge for all market participants in the current years of intense competition, but at the same time an opportunity for emerging players. According to Dehnert and Schumann (2022), traditional banks should not overlook the impact of new entrants, as customers who were less inclined to switch banks in the past would today consider FinTech's as new providers.

First, neo-banks are well known for their cost efficiency, both towards financial service providers and towards their clients. By not having to bear the costs of maintaining a bank branch network and the staff required to run it, they operate with much lower operational costs. Due to the capital savings, consumers benefit from higher interest rates, cheaper financial products and usually free account offerings. In addition, they charge relatively low commissions compared to traditional providers. Resulting in a business model in which acquiring customers and increasing business volume is far less costly than for a traditional bank. Temelkov (2020) shows that neo-banks derive most of their advantages from their straightforward organisational structure, which allows for their high degree of operational efficiency, their fee structure and their ability to exploit the data they collect. Similarly, Anagnostopoulos (2018) noted this in his research, emphasising that new FinTech start-ups are free from the constraints of funding and maintaining existing business lines, as traditional banks at least must do.

While it is debatable whether neo-banks have better access to technologies from the FinTech world, the fact that most of their services are AI-powered is a real advantage. According to Windasari et al. (2022), it would be worthwhile for companies to explore further AI development, such as the development of designated services, virtual assistants, APIs, and location-based platforms to enhance customer loyalty. Although many banks are already using AI in processes such as rapid detection of suspicious activities, they are still a long way from neo-banks, who are using the technology from the start at multiple points in the value chain where it makes sense. Using AI, neo-banks services can be tailored to the personal needs of their customers to help them manage their finances. In case of problems, customers have the option to use advanced chatbots around the clock to solve questions and problems.

Considering that banking transactions today are primarily conducted via mobile platforms, Windasari et al. (2022) recommend, based on their research findings, that in the future banks should focus more on the overall digital user experience and mobile interfaces to associate their brand with a positive user journey. Neo-banks have reinforced this from the beginning by providing straightforward user interfaces and easy accessibility to their services, making banking easier and more convenient for users compared to traditional banks. Among the features they offer are sub-accounts for budgeting and organising money, automatic categorisation of expenses and monthly overviews. To this day, they focus on making their products as user-friendly as possible to stand out from their competitors. This is facilitated by the fact that the short-term goal of most neo-banks is to make some money with many customers, just like most start-ups. Coupled with providing a seamless and easy way of opening a bank account, they attract new customers quickly. With no appointment necessary, customers

can set up an account from anywhere within a few minutes. Especially tech-savvy customers are thus encouraged to try out the new banks. According to Anagnostopoulos (2018), it seems that challenger banks and FinTech's resolve people problems first and foremost and banks only resolve banking problems that are isolated from everyday realities.

2.4.2 Overcoming customer resistance

Probably the most challenging task for digital-only banks is overcoming the resistance of traditional bank customers to switch banks. Despite many positive developments, they have not yet managed to remove all existing barriers for potential users. As Schmidt-Jessa (2022) noted, events such as the corona pandemic have not only brought positive effects for neo-banks, but rather the fear of change and the need for security have been reinforced by this crisis. The European Central Bank (ECB) also believes that events such as the insolvency of Wirecard (formerly listed on the German index DAX) have led to customers being suspicious and cautious when it comes to switching to new service providers (European Central Bank, 2022). Nel and Boshoff (2021) confirmed in their study that the theoretical negative attitude towards digital-only banks is an important determinant of traditional bank client's intention to reject.

In contrast, new bank customers and the younger generations Y and Z, who have already grown up with modern technology, are more open-minded towards the newer providers. Founded by people who have also grown up with the internet, these innovative start-ups are aimed at people who have already abandoned visiting physical branches and ATM networks altogether. These products and services are designed to meet the expectations of those new mobile generations who will live in a world where there are more and more remote services. Windasari et al. (2022) concluded in their recent research that for these customers, factors such as user-friendliness, economic advantages and the company's reputation are the top priorities when choosing a bank. With this in mind, low-cost and easy-to-use digital-only banks are becoming increasingly popular. Anagnostopoulos (2018) argued years ago that the changing society will lead to a digital customer base that is very tech-savvy, which will only further accelerate the transformation of the economy and the adoption of FinTech's.

Then again, for these banks it is still important to improve their corporate reputation. According to Windasari et al. (2022), the factor that has the greatest influence on the negative attitude of traditional bank customers towards using a digital-only bank is the image barrier. Nel and Boshoff (2021) recommend that to reduce this perceived barrier, digital-only banks should communicate more information about how their banking model is used for different

financial transactions to minimise stereotypical thinking. In other words, they should strengthen their marketing communication about their use cases to provide a clear understanding of the company rather than letting preconceptions speak over them. Furthermore, Windasari et al. (2022) found in the interviews conducted for their study that customers distrust of digital-only banks is broken when they know that credible institutions are financially vouching for the neo-bank. For example, this is the case with all licensed private banks in Germany. These private banks are legally obliged to join the Compensation Scheme of German Private Banks, which guarantees each depositor up to 100,000 euros per bank. N26, one of the leading neo-banks in Europe, is also part of this mechanism and thus strengthens the trust of its customers (N26, 2020).

Based on the analysis of 193 academic articles on this topic, Sahi et al. (2021) concluded that in markets with strong network effects, fierce competition between all payment providers is an example of the winner-takes-all phenomenon, a scenario that leads merchants and users to adopt the platform with the largest number of current users, causing the smaller platform to shrink and the larger one to grow. For this reason, payments service providers need to put more effort into retaining existing customers and encouraging their continued use, rather than making it easier for users to switch between banks.

After all, there is growing trust in the digital industry, decreasing customer resistance. People get used more with services through digital channels only. At the same time, the focus on customer experience could likely be the main driver for the shift to Fintech's in the future. Dehnert and Schumann (2022) state that banks should currently focus on improving friction points in customer interactions. Traditional banks are currently poorly positioned to win back FinTech customers, as these customers are looking for the opposite of traditional banking services with innovative digital current accounts. Looking further ahead, it will be crucial for both types of providers to develop trustworthy digital innovations that meet the subjective norms of increasingly digitally oriented customers.

CHAPTER 3

Theoretical Framework

Having discussed the various business model approaches taken by banks, it is now important to assess them against real performance indicators. This chapter examines the most relevant theories and methods for comparing the performance of traditional and neo-banks, specifically data envelopment analysis (DEA) and ratio analysis.

In the literature, there has been a growing interest in measuring the comparative efficiency, productivity and profitability of a bank. Ahmad et al. (2020) show that after the financial crisis, the trend of annual publications assessing the efficiency and performance of the banking sector increased rapidly from 14 to 134 publications per year (from 1965 to 2018). Over time, these publications have presented and improved a variety of performance indicators developed specifically for banks (Ahmad et al., 2020). However, no comparison has yet been made between the financial performance of two different business models operating in the same banking sector.

Using the Scopus database, close to 3000 literature documents were found on a variety of topics related to the performance measurement of banks. After narrowing the search to retail and commercial banks, which is the scope of this master's dissertation, the most relevant cited publication to date is Halkos and Salamouris (2004), which has been cited 184 times. This study used a non-parametric analytic technique DEA and financial accounting ratios to measure the efficiency of Greek banks and make an empirical comparison. Their analysis shows that when used to assess an organisations performance, DEA can serve as a substitute for or an addition to ratio analysis.

Already in the late 1990s, Thanassoulis et al. (1996) compared the two methods DEA and ratio analysis on bank branches and schools to assess organizational performance outcomes. The study finds that while the two approaches generally agree on the overall output of units, they may differ in their assessment of individual units' performance. Ratio analysis, which compares one resource to one output, is not effective for setting efficiency improvement targets. The findings in Thanassoulis et al. (1996) suggests that DEA and ratio analysis can be used together, with ratios providing useful information about specific aspects of performance and helping to communicate DEA results to non-experts when the two methods agree on performance.

In another study, Van der Westhuizen (2014) examine the performance of South Africa's largest banks using DEA, which used financial ratios as performance assessment tools. The author argues that each ratio measure alone is partial, in the sense that it is calculated using only a subset of the data available on the firm. Therefore, Van der Westhuizen (2014) uses DEA to analyze all the input and output data available on the firm. The results demonstrate that this approach is effective for evaluating the performance of banks operating in the same environment and with the same business model. Additionally, the study finds a positive correlation between bank efficiency and profitability, however, it emphasizes the need for further research to fully understand this relationship.

El Mehdi (2018), in his review of multiple analytical methods, also notes that the results obtained can sometimes be contradictory due to the metrics used. Therefore, when evaluating individual banks, special attention should be paid to the respective accounting regulations. Consequently, El Mehdi 2018 suggests that banks in countries with a uniform regulatory framework are best suited for a comparison.

In summary, the reviewed articles above provide a thorough examination of the two common methods being used in assessing the performance of banks. All highlight the importance of considering a variety of different ratios or inputs to improve reliability. The literature has consistently shown that DEA and ratio analysis have their own strengths and weaknesses and that neither approach should be considered better in general, but rather better or more accurate for answering specific research questions.

3.1 Ratio Analysis Model

As previously mentioned, the financial efficiency of a bank is a key factor that drives and motivates its activities. Considering this, this study aims to compare the corporate financial performance of two different business models within the same banking sector using data-driven performance indicators developed specifically for banks. After having conducted a thorough review of several bank-specific studies and their methodologies (e.g., El Mehdi, 2018; Gazi et al., 2021; Halkos & Salamouris, 2004; and Thanassoulis et al., 1996), it was determined that financial ratio analysis is the most suitable approach for this study. Firstly, in the banking sector, financial ratios are commonly used to evaluate and compare the performance of individual banks. Banks use specific ratios that are tailored to their business operations and these ratios can be calculated and compared based on the bank's annual financial statements. This allows analysts and investors to gain a clear understanding of a bank's profitability, efficiency,

liquidity and solvency. Halkos and Salamouris (2004) give an important reason for their decision to include ratio analysis in their study, which is equally relevant later when it comes to comparing the business of traditional and neo-banks. This reason is that the analysis allows a comparison between banks of different sizes.

Financial ratio analysis has faced criticism over the years for its lack of consideration of a bank's current market value and potential failure to reflect economic value-maximizing behaviour (Kohers et al., 2000). Nevertheless, the method remained a popular choice for evaluating and comparing individual bank performance over time, as evidenced by the studies by Li et al. (2001), Tarawneh (2006), and Kumbirai and Webb (2010), which all employ financial ratio analysis to examine Chinese, Omani, and South African commercial banks, respectively. Furthermore, these studies highlight the significance of using multiple ratios to achieve reliable performance evaluations. This study will also employ multiple ratios based on the findings of a 2010 European Central Bank (ECB) report, which focused on measuring bank performance, particularly return on equity (ROE) and its limitations. The report showed that various indicators were preferred by different market participants, such as bank analysts, consultants, and rating agencies. However, they all tended to use several traditional performance metrics, including return on assets (ROA), ROE, and cost-to-income (CI) ratios. The report also highlights the importance of monitoring the net interest margin (NIM) in the banking sector, given the critical role of intermediation (European Central Bank [ECB], 2010).

In line with this, Nuhiu et al. (2017) examine the determinants of commercial banks profitability in Kosovo and how they affect the financial performance of commercial banks. The performance of commercial banks is assessed in their study using financial performance metrics including Return on Average Equity (ROAE), Return on Average Assets (ROAA) and NIM. The study examines the key variables that influence the profitability of commercial banks using regression analysis, financial time series, and panel data of the banking industry in Kosovo. The study concludes that internal variables including capital sufficiency, asset quality, and managerial effectiveness are primarily responsible for commercial banks profitability in Kosovo, whereas macroeconomic factors have an insignificant impact on financial performance of commercial banks.

Another study conducted by Gazi et al. (2021) examines the financial performance of converted commercial banks in Bangladesh using financial performance indicators such as ROAE, ROAA and NIM. Through a case study of Bangladesh Commerce Bank Limited and the use of descriptive statistical tools and panel data regression model, the authors find that the

banks financial position is not strong, with profitability driven mainly by internal factors, while macroeconomic factors have minimal impact.

The most recent bank comparing study was written by Afriyie and Aidoo (2022). They examine the financial performance of local and foreign commercial banks in Ghana, because of the increased competition due to the Financial Sector Adjustment Program. They study use a sample of commercial banks and employs financial ratios to perform the analysis. The results show that foreign commercial banks performed satisfactorily in ratios such as ROA, ROE, cash deposit (CDR) and many more. On the other hand, local commercial banks perform better in loan to asset ratio (LAR), non-performing loans (NPL) and NIM. Afriyie and Aidoo (2022) conclude that, on average, foreign banks are more profitable than local banks and recommends that local banks should be allowed to hold less minimum capital requirement to enable them to have sufficient capital to invest to compete with their global competitors.

Lastly, Ali Abebe (2022) examines the impact of International Financial Reporting Standards (IFRS) on the financial ratios of 17 Ethiopian commercial banks. He employs a comparative analysis of financial ratios computed under Ethiopian Generally Accepted Accounting Principles (GAAP) and IFRS from 2016 to 2020, utilizing the Wilcoxon Signed Rank and Normality Test methods. His findings reveal that IFRS has a significant effect on the liquidity ratio, ROE and leverage ratio. The study concludes that investors and financial analysts should pay close attention to these as they are significantly affected by the adoption of IFRS.

In summary, the aforementioned studies all employed financial ratio analysis and used various financial performance indicators such as ROAE, ROAA, NIM, Debt to Assets and others to evaluate the performance of banks in different regions under different circumstances.

3.2 Selected Indicators

In this section, a comprehensive examination of the specific financial ratios selected for the analysis of the performance of the two business models under investigation -traditional banks and neo-banks - is provided. The study focuses on performance measured with an output vector consisting of six financial-banking ratios and no inputs.

The financial ratios that will be employed in this study include return ROAA, ROAE, NIM, Profit/loss per employee (P/L per employee), CI and debt-to-assets. These ratios are widely used in the banking sector and provide a comprehensive understanding of a banks profitability, efficiency and solvency.

Return on average assets (ROAA) is a measure of a banks profitability and is calculated by dividing the banks net profit for the year by its total assets, typically taken as the average over the year by now (ECB, 2010). This ratio provides a comprehensive assessment of a banks profitability and is thus crucial for assessing its overall performance.

$$\text{ROAA} = \text{Net Income} / \text{Average Total Assets} \quad (1)$$

Among the most popular performance measures is return on average equity (ROAE), which is an internal measure of shareholder value. The ratio is calculated by dividing the banks net income by its average total equity and can be compared between different companies or different sectors of the economy (ECB, 2010).

$$\text{ROAE} = \text{Net Income} / \text{Average Total Equity} \quad (2)$$

Debt-to-assets is a widely used performance indicator in the banking sector that measures a banks solvency. The ratio is calculated by dividing the banks total liabilities by its total assets. This ratio reflects the bank's ability to repay its debts and is thus crucial in assessing its overall financial strength and solvency, especially in the banking sector. It is particularly significant for banks as they are required to maintain a certain level of solvency to operate (Gazi et al., 2021).

$$\text{Debt-to-assets} = \text{Total Liabilities} / \text{Total Assets} \quad (3)$$

The cost-to-income ratio (CI) is a measure of a banks efficiency in generating profits from its revenue. The ratio is calculated by dividing the banks operational expenses by its gross operating profit or loss. A lower CI ratio indicates that the bank is more efficient in covering its financial and other expenses with its profits and losses (ECB, 2010). Researchers such as Gazi et al. (2021) also refer to the CI ratio as the operating efficiency ratio, as it reflects a bank's ability to generate income from its operations in relation to its expenses. The use of this ratio allows for a comprehensive evaluation of a banks operating efficiency and is thus crucial in assessing its overall performance.

$$\text{CI} = \text{Total operating expenses} / \text{Gross operating profit} \quad (4)$$

The net interest margin (NIM) is a performance indicator that serves as a proxy for the income generation capacity of a bank's intermediation function. The ratio is calculated by dividing the bank's net interest income by its total assets. The NIM ratio reflects the income generated by the bank through its intermediation activities, such as lending and borrowing, and can be used as a proxy for its overall income generation capacity (ECB, 2010).

$$\text{NIM} = \text{Net interest income} / \text{Total Assets} \quad (5)$$

Profit/loss per employee this ratio represents the banks labour productivity. Using the banks average employee headcount per year, the ratio is calculated by dividing its profit or loss before taxes by the total average employees. An increase in the ratio indicates an increase in productivity as well as the opposite. It is important to keep track of the employee numbers, not that only those the ratio rises (Halkos & Salamouris, 2004).

$$\text{P/L per employee} = \text{Net income} / \text{Average Total Employees} \quad (6)$$

Collectively, the financial ratios that will be examined in this study will present a comprehensive understanding of the different performance of traditional banks and neo-banks.

3.3 Research Hypothesis

This study aims to examine the performance of traditional banks and neo-banks, with a focus on financial-banking ratios. The following hypotheses have been formulated to guide the research and provide a framework for analysing the data.

Hypothesis 1: "The net income margin of neo-banks is higher than that of traditional banks".

This first hypothesis assumes that neo-banks, with their digital and technology-driven approach, may have a higher income generating capacity compared to traditional banks. Schmidt-Jessa (2022) partially supports this hypothesis, as her study found that during the COVID-19 pandemic, digital-only banks experienced an improvement in higher interest income than interest expenses.

Hypothesis 2: "The ROAA of traditional banks is higher than that of neo-banks".

This hypothesis is predicated on the belief that traditional banks, with their established reputation and long-standing experience in the banking sector, may have a higher ROAA compared to neo-banks. Nichkasova and Shmarlouskaya (2020) support this assumption, highlighting that traditional banks have not only successfully navigated various global challenges, but have also diversified their revenue sources, which will contribute towards a higher ROAA.

Hypothesis 3: “The efficiency ratios of neo-banks are better than those of traditional banks”.

This hypothesis assumes that neo-banks, with their digital and technology-driven approach, may have a lower CI ratio than traditional banks in terms of cost efficiency as well as a higher P&L per employee, demonstrating their ability to generate profit with fewer staff. This is supported by Temelkov (2020), who points out that the simplified organisational structure and thus leaner operational design of neo-banks allows for greater efficiency.

Hypothesis 4: “The overall performance growth of neo-banks is higher than those of traditional banks”.

Lastly, this hypothesis is based on the belief that the digital and technology-driven approach of neo-banks may contribute to a higher growth rate in terms of overall performance. Windasari et al. (2022) support this hypothesis, highlighting the potential of neo-banks to rapidly scale-up and penetrate markets due to their technology-driven business models.

The above hypotheses will be tested by analysing the financial-banking ratios of traditional banks and neo-banks. The findings of this analysis will provide insight into the performance of these business models and contribute to the existing literature on the overall subject.

CHAPTER 4

Methodology

The methodology chapter of this dissertation outlines the research design and approaches employed to investigate the differences in financial performance between neo-banks and traditional banks and the implications of these differences for the future of the banking industry. In addition, the perspectives of industry experts were evaluated and compared with the empirical results of the ratios to provide a deeper understanding of the possible future. To date, there has been no specific research on this topic, only comparisons of the impact of FinTech on traditional banks.

4.1 Research Design

The research design for this study falls under the deductive level, which involves using existing theories and hypotheses as a foundation to guide the collection and analysis of data. The quantitative research method is employed, where numerical data is collected and analysed using statistical methods, to test hypotheses and draw conclusions (Rahi, 2017).

In addition, a qualitative approach was employed to see if the obtained quantitative results match with the outcome of the reports from industry experts (Rahi, 2017). This involved analysing non-numerical data, from leading consultancies, to gain a more comprehensive understanding of the future of the research topic.

The choice of mixed methods research was guided by the aim of comparing the growth of financial performance ratios of neo-banks and traditional banks and the need to have trustworthy data and information to achieve this aim (Johnson & Onwuegbuzie, 2004). The data was collected directly from the banks, to ensure its reliability and validity.

Overall, this research design and approach allowed for a comprehensive examination of the current differences in financial performance between neo-banks and traditional banks and the implications of these differences for the future of the banking industry. The aim was to contribute to quantitative research on neo-banks in relation to traditional banks.

4.2 Data Collection and Credibility

The data collection for this paper focused on quantitative research to perform ratio analysis. Using Statista's statistical database, the top three traditional banks in Europe by assets in 2021 were identified and are presented in Table 4.1 (Statista, 2022a). At the same time, the most valued neo-banks in the same year, based on their valuations, are also displayed in Table 4.1 (Statista, 2022b).

Table 4.1 Leading European Traditional and Neo-Banks by Assets and Valuation

Type of Bank	Bank Name	Assets (B\$)	Valuation (B\$)
Traditional	HSBC Holdings	2.954	-
Traditional	BNP Paribas SA	2.906	-
Traditional	Crédit Agricole Group	2.674	-
Neo-bank	Revolut	-	33
Neo-bank	N26	-	9
Neo-bank	OakNorth	-	5
Total	=	8.534	47

Statista's research department gathers data from primary sources collected by its own research teams and secondary data from its partners (Statista, 2022a; and Statista, 2022b). The data used to analyse the banks consists of primary sources, including annual financial reports from key players in the banking industry, industry reports, third-party reports and publicly available databases. Rahi (2017) emphasizes the significance of primary data in quantitative research methods, and as such, audited primary Annual Financial Statements were utilized whenever possible. These statements were in accordance with IFRS Accounting Standards, except for N26, whose statements were retrieved from the Bundesanzeiger using German GAAP.

The ECB (2010) highlights in its report on ratio analyses that data availability and comparability are key factors in achieving a comprehensive analysis. To ensure the accuracy of the data, the impact of the COVID-19 outbreak and the changes in the market caused by the Russian-Ukrainian war are considered in the observation timeframe.

The process of obtaining financial statements was straightforward for traditional banks, with the most recent financial statement being from 2021. However, for digital-only banks (neo-banks), the process was slightly more complex as these banks are relatively young and may not have held a bank license from their beginning. For example, N26 Group (formerly Number26

GmbH) acquired an own bank license in 2016. As a result, the N26 Group prepared two sets of financial statements in 2016, one for N26 GmbH and one for N26 Bank GmbH, with no explicit set of a consolidated financial statement for the Group until 2017 (N26 Bank GmbH, 2018). Therefore, the period of the financial ratios under consideration was set from 2016 to 2021.

It is important to note that the financial ratios provided in the bank's reports are not used in this study. This decision was made to avoid information bias, as these ratios are based on different data input and may have been altered to make them more meaningful for their investors, resulting in incomparable data.

To provide a comprehensive understanding of the current market and outlook of the potential market environment, external data was obtained in addition to the primary research. This data was collected directly from the websites of some of the major consultancies, such as McKinsey & Company and Simon-Kucher & Partners and consisted of reports such as the Global Banking Annual Review (Dietz et al., 2022) and the Future of Neobanking (Stegmeier & Verburg, 2022). These reports were carefully selected as they provide the most recent and academically recognized expert opinions and market analyses, considering all relevant market influences. To ensure that the data obtained is most suited for the research, the reports and articles were sourced from the year 2022, with most of them being published during the course of this research investigation.

4.3 Data Analysis

In this study, a mixed method approach combining both quantitative and qualitative research was employed to analyse the development of neo-banks in comparison to traditional banks. The data collection process involved verifying the accuracy and scope of the data and identifying and resolving any missing information. Prior to the analysis, any gaps in the data were addressed, as some banks had presented their financial statements in a format different from that which was required for this analysis. For example, the total assets and total liabilities for Revolut Bank were derived using the available variables, the total operating expenses for OakNorth were calculated and the total liabilities, total operating expenses, gross operating income and revenue for N26 were calculated. For the purposes of analysing the P/L per employee ratios, all values were converted into euros using historical exchange rates.

The selected reports of various consultancies were analysed thematically and in terms of their content. Although they all addressed the future of the banking sector, some focused on the business of neo-banks such as their profitability or boosting competitive advantages. The findings were summarised in a spreadsheet using keywords to capture the current state of traditional and neo-banks and the developments they should make to maximise their performance as the market evolves. The results of the quantitative analysis were then compared with the qualitative findings to determine if there is an alignment between the development of neo-banks and the expert opinions.

CHAPTER 5

Results

The results chapter of this dissertation presents the findings of the study which aimed to investigate the differences in financial performance between neo-banks and traditional banks and the implications of these differences for the future of the banking industry. The mixed methods approach used provides comprehensive insights to answer the hypothesis and research question.

5.1 Quantitative Findings

In this analysis, neo-banks and traditional banks were compared based on their average bank ratios between 2017 and 2021. The findings revealed significant differences in the financial performances.

Table 5.1 Descriptive Statistics for the ROAA & ROAE ratios

ROAA	Mean	Median	Min	Max	Stdev.s
Traditional	0,40%	0,40%	0,21%	0,59%	0,09%
Neo-bank	-3,46%	-4,51%	-12,20%	3,00%	5,20%
ROAE	Mean	Median	Min	Max	Stdev.s
Traditional	6,56%	6,84%	3,07%	8,24%	1,51%
Neo-bank	-58,57%	-36,96%	-249,61%	17,34%	83,23%

As shown in Table 5.1, the low standard deviation of the ROAA and ROAE ratios suggests that traditional banks have had a relatively stable performance. In contrast, neo-banks display a high degree of variability, particularly in the ROAE ratio, indicating a more volatile performance.

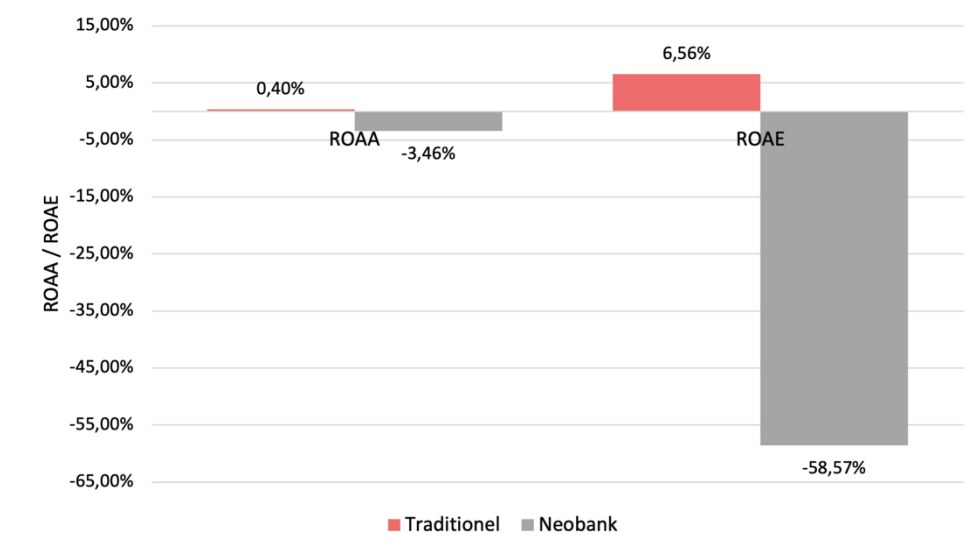


Figure 5.1 Average of the ROAA & ROAE from Tradition vs. Neo-banks

Figure 5.1 illustrates that regarding the ROAA, the traditional banks average was 0.40%, while that of neo-banks was -3.46%. Similarly, the average ROAE for traditional banks was 6.56%, while neo-banks reported an average ROAE of -58.57%. These findings suggest that traditional banks had a higher return on average assets and equity than neo-banks during the period under review.

Table 5.2 Descriptive Statistics for the NIM & CI ratios

NIM	Mean	Median	Min	Max	Stdev.s
Traditional	0,97%	0,98%	0,67%	1,19%	0,14%
Neo-bank	1,33%	0,37%	-0,29%	4,56%	1,79%
CI	Mean	Median	Min	Max	Stdev.s
Traditional	236,19%	206,11%	167,97%	479,55%	84,62%
Neo-bank	95,99%	44,63%	-279,99%	1450,36%	404,28%

In Table 5.2, for traditional banks, the NIM and CI ratios demonstrate a moderate degree of stability, as evidenced by the low standard deviation for NIM and high standard deviation for CI. In contrast, the NIM ratio of neo-banks shows the most significant differences, with a large standard deviation for both NIM and CI.

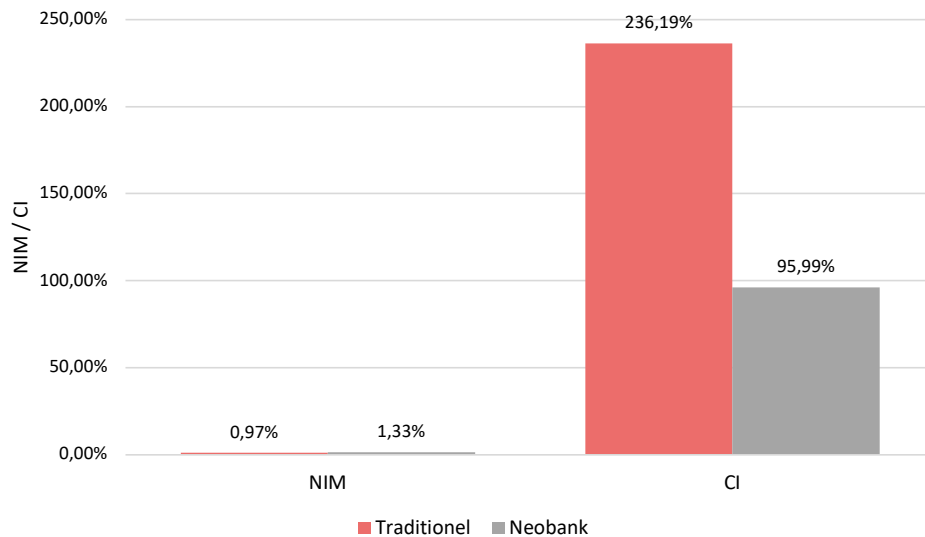


Figure 5.2 Average of the NIM & CI ratios from Tradition vs. Neo-banks

As depicted in Figure 5.2, the average NIM for traditional banks was 0.97%, while that of neo-banks was 1.33%. Moreover, the average CI ratio for traditional banks was 236.19%, while it was only 95.99% for neo-banks. The higher NIM for neo-banks suggests that they were more efficient in generating income from interest-generating assets. Similarly, the CI of neo-banks was less than half as high, indicating that they were much more efficient in terms of operating cost management.

Table 5.3 Descriptive Statistics for the Debt-to-asset ratio

Debt	Mean	Median	Min	Max	Stdev.s
Traditional	0,940	0,940	0,921	0,961	0,012
Neo-bank	0,833	0,875	0,187	0,976	0,197

Table 5.3 presents the debt-to-asset ratio of traditional banks, which shows a relatively low standard deviation, indicating a stable financial structure. The debt-to-asset ratio for neo-banks exhibits the highest degree of variability among all financial ratios, indicating a less stable financial structure.

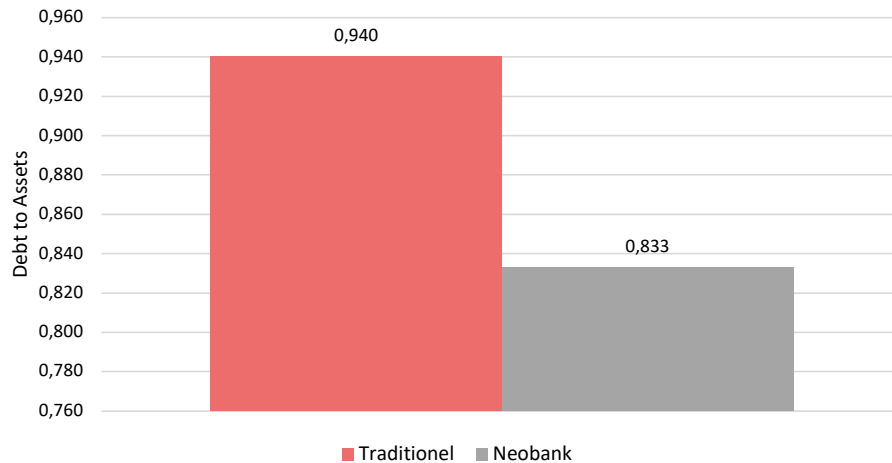


Figure 5.3 Average of the debt-to-asset ratio from Tradition vs. Neo-banks

Figure 5.3 reveals that traditional banks had an average debt to asset ratio of 0.940, while neo-banks had an average of 0.833. The lower debt to asset ratio for neo-banks suggests that they relied less on traditional sources of funding or were more cautious about debt and risk management over the period.

Table 5.4 Descriptive Statistics for the P/L per employee ratio

P/L in €	Mean	Median	Min	Max	Stdev.s
Traditional	42.852	42.221	21.495	60.014	12.122
Neo-bank	119.430	- 119.290	- 355.320	1.162.350	443.984

As displayed in Table 5.4, profitability per employee for traditional banks is quite variable and has a relatively high standard deviation. However, the median for traditional banks suggests a consistent ability to generate steady profits over time. On the other hand, profitability per employee for neo-banks is also highly variable and has a very large standard deviation. This indicates an exponential change in the bank's ability to generate profits.

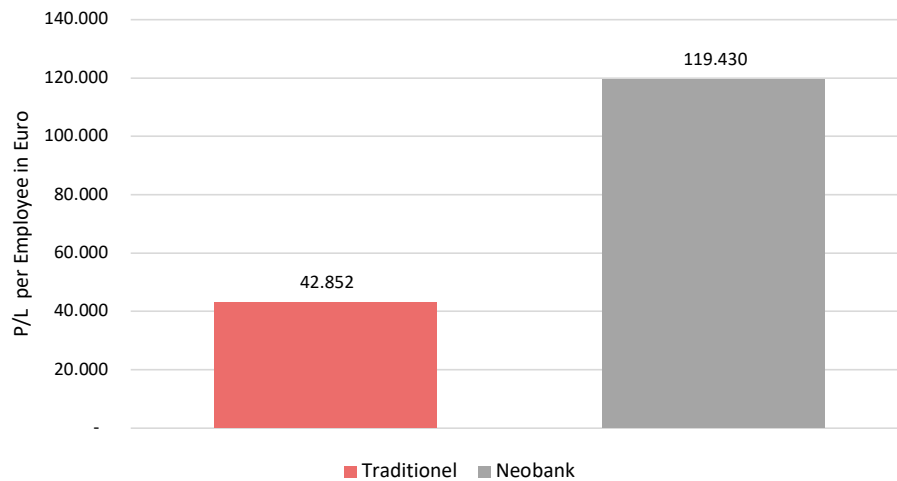


Figure 5.4 Average P/L per employee in Euro ratio of Tradition vs. Neo-banks

Figure 5.4 shows that the average profit/loss per employee for traditional banks was €42,852, while neo-banks reported an average of €119,430. The higher profit/loss per employee for neo-banks may suggest that they were more productive in generating income per employee than traditional banks.

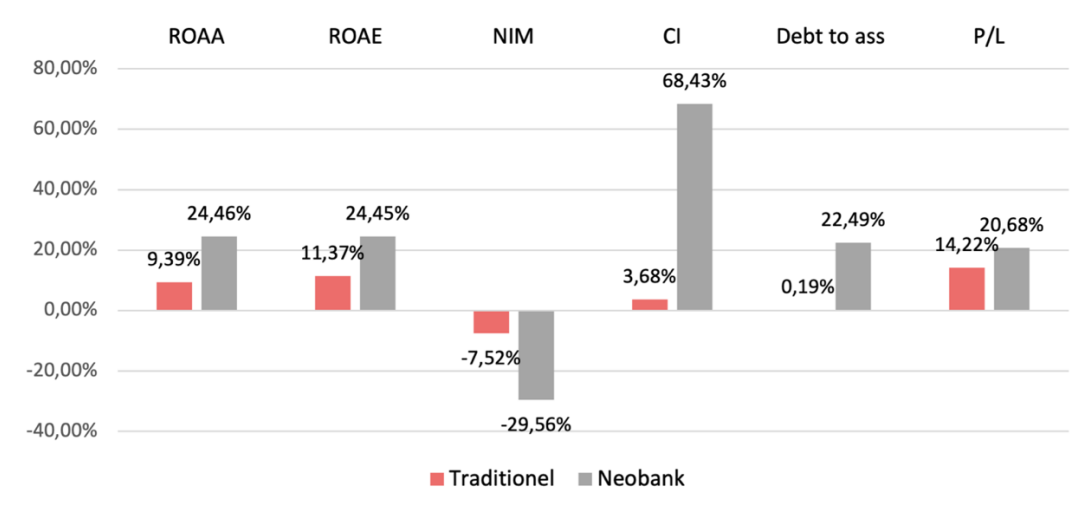


Figure 5.5 Trend Development of Financial Ratios

The trend analysis in Figure 5.5 demonstrates the growth development of traditional and neo-banks from 2017 to 2021, showing that both types of banks have experienced changes in their financial performance. Traditional banks have shown positive growth in their ROAA and ROAE of 9.39% and 11.37% respectively, indicating that their profitability has increased.

However, their NIM has fallen by 7.52% and their CI ratio has risen by 3.68%, which suggests that their operational costs have increased, affecting their profitability.

Neo-banks have experienced a significant increase in their ROAA and ROAE by 24.46% and 24.45% respectively, indicating that their profitability has also increased and their equity has grown in proportion to their assets. However, their NIM has decreased by 29.51%, indicating that they are earning less interest income from their loans and investments. In addition, their cost to income ratio has increased by 68.43%, indicating that their operating costs have increased significantly. Interestingly, their debt-to-equity ratio has increased by 22.49%, indicating that they have borrowed more funds to finance their operations. Moreover, the profit/loss per employee of the neo-banks has remained stable, with an average growth of 20.68%.

5.2 Qualitative Findings

The various expert reports provide a qualitative overview of the current situation and future development of both neo-banks and traditional banks. These reports highlight the strengths and weaknesses of both banking sectors and offer recommendations for their future success. According to Stegmeier and Verburg (2022), the neo-banking industry has grown to become a 300-billion-dollar market with close to 400 neo-banks operating globally. However, only 5% of these banks have reached breakeven. The authors recommend that neo-banks should focus on profitability and monetize their large client base by offering a wider range of products. They also suggest that neo-banks can add value to established banks that aim to improve their digital offerings, whether through acquisition or building from the ground up.

Capgemini (Capgemini Research Institute, 2022) places a strong emphasis on customer-centric strategies and highlights the growing interest in Environmental, Social and Governance (ESG) issues and digital transformation. The authors recommend that banks should adopt to new business models, offer diverse digital portfolios, measure and communicate the impact of their ESG initiatives and leverage technology to engage deeply with customers.

McKinsey & Company (Dietz et al., 2022) presents a comprehensive overview of the global banking sector in their 2022 annual review 2022. The report states that traditional banking institutions account for half of the market valuation of 14.5 trillion dollars, with FinTech and specialists representing the other half. The authors recommend that banks take advantage of this opportunity by building resilient balance sheets, enhancing their technological infrastructure and embracing sustainable finance.

The Deloitte Center for Financial Services (O'Reilly et al., 2022) outlines the outlook for the banking and capital markets in 2023, recommending that commercial banks prioritize developing a data-driven customer experience, turning data into a strategic asset and focusing on niche segments or evolving markets. McKinsey & Company (Adarkar et al., 2022) also highlights the importance of data and analytics in their report. They recommend that banks target profitable businesses and operate like technology companies.

Another report by McKinsey & Company (Bhattacharjee et al., 2022) states that neo-banks challenge traditional banks by offering lower prices, more transparency in their operations and fewer hidden fees. The report recommends that neo-banks embed data and AI extensively to strengthen their competitive advantage and become customer centric, operationally efficient and profitable at scale.

Additionally, Deloitte (2023) highlights the challenges faced by traditional banks due to outdated products and long implementation times of legacy systems. Deloitte recommends value-driven business transformations and a plug-and-play approach for speed and flexibility to address these challenges.

The expert reports all agree that the future success of both neo-banks and traditional banks depends on their ability to prioritize the customer experience, leverage technology and data effectively and focus on sustainability, risk management and talent acquisition and retention. Additionally, both types of banks must be proactive in adapting to changing market and customer demands to succeed in the next digital age.

In conclusion, the qualitative results of the expert reports emphasize the need for both neo-banks and traditional banks to embrace technology and data to enhance the customer experience and remain competitive. They must also focus on sustainable finance and building resilient balance sheets to prepare for the future. Both neo-banks and traditional banks can reshape the industry and succeed in the next digital age. However, they must act swiftly and effectively to stay ahead of the competition and meet changing market demands.

The findings of the expert reports are summarised in Table 5.5, which lists their main recommendations and keywords.

Table 5.5 Opinions of Expert in 2022

Company & Author	Title	Current Situation	Recommendations for the future	Key Words
Simon-Kucher & Partners (Stegmeier & Verburg, 2022)	The Future of Neobanking: How can Neobanks unlock profitable growth?	There are now close to 400 Neobanks worldwide < 5 percent of Neobanks have reached breakeven. Neobanking is a 300-billion-dollar industry (based on 2021).	Moving from a Get rich to a Get rich mindset. Monetize sizeable client base. Increase product offering to boost profitability. The profitability of neobanks should now be the focus of all important decisions. Neobanks add value to larger, established banks, looking to strengthen their digital propositions. Two oppositions either purchased or built.	Profitability, Internationalizing, Customer experience, Neo-banking Lifecycle, Product Offering: Buy Now Pay Later, Digital Investments, Crypto, Digital Mortgages
Capgemini 2022	Customer-First Strategy: Putting the client at the heart of wealth management	Growing Interest in ESG & Digital. New customer segments from the technology sector. Post-pandemic: digital channels, niche offerings and self directed digital tools HSBC launched portfolio with focus on the metaverse & enhances in investments for 18 to 25 year olds.	New business models and delivering services. Create diversified portfolio of digital offers (emerging assets: NFTs & Crypto) - 70% HNIWs invested. Measure and communicate ESG impact. Address middle- and back-office modernization and automation. Leveraging technology to drive deep customer engagement.	ESG & Digital, Customer engagement, Leverage technology (Cloud, AI), Expend Products, Move digital assets to portfolios, Next Generation, Data driven strategy
McKinsey & Company (Dietz et al., 2022)	Banking on a sustainable path: Global Banking Annual Review 2022	Decade of rather dull predictability (market cap. \$14.5 trillion in may 2022) Traditional banking institutions account for half of this valuation, while specialists and fintechs represent the other half - up from a 30 percent share five years ago. Fintech expand globally. (Scaling success stories Revolut, Nubank. Step-by-step). Specific segment revenues are moving (such as age).	Bank have now the opportunity for laying the ground for long-term growth. (Resilient balance sheets, capital positions, build risk management, technological infrastructure (resist cyberattacks) + industry shaping growth trends. New Era of Sustainable Finance. Banks likely to see slowdown in volume growth, higher costs, greater outstanding payments.	Sustainable finance, ESG, Customer engagement (emotional connection), Dual challenge (managing the present and preparing for the future), Data & strategy analytics, Risk management, retaining talent
Deloitte Center for Financial Services	2023 banking and capital markets outlook	—	Commercial banks: upcoming needs include financing for liquidity and capital. Prioritize developing data driven customer experience. Use Data (+ESG data) effectively for better credit decisions or new business opportunities. Transform data into a strategic asset. Bigger exchanges become one-stop-shops - focus on nich segments or evolving markets.	Data driven, ESG, Customer engagement, Wallet share, Data - strategic asset, Nich segments (crypto trading)
McKinsey & Company (Adarkar et al., 2022)	Reshaping retail banks: Enhancing banking for the next digital age	Next digital age. Retail banking is healthy. Challengers have taken first bites of traditional revenue streams (now 45 % of gross revenues from payments & handling 25% of assets in the mass-affluent segment of \$250,000 to \$2 million). Fintechs & Big Tech (will) continue to threaten incumbent banks. Demand for digital is growing 44% of global bank customers purchasing personal loans via digital channels in 2020. Daily banking revenue per customer now equal the cost per customer in china and emerging asia where digital first have reached maturity.	Consider how recent winners have added value! (simplifying and improving the customer experience, leveraging data and analytics) Target profit pools in specific businesses. The new winners will operate like tech companies. Extract full value of data assets for customer engagement and use existing data. Work like tech companies to win on the digital battlefield (customer perspective, design the transformation to deliver measurable business outcomes).	Digital demand (personal loans 44%), customer experience, Data & analytics, Mobile app (all tasks), Specialise target business (gains outweigh the forgone revenue), Extract Data advantage against Bigtechs, Speed (Core Competitive Advantage)
Deloitte	Composable banking: The transformational approach that treats change as a constant	Legacy systems (long implementations, outdated products) Increasing pace of change in three factors: Customers (Globalization, shorter product life cycles), Technology (AI constantly become smarter, neo-banks offer more and more competitive products), Environment (flexibility to changes).	Value-driven business transformations (differentiating customer experiences and setting up a future-proof, flexible and cost effective IT). Plug and play approaches necessary for the future (delivering results in days/weeks rather than years).	Business transformation, Customer experience, IT landscape (Solution for legacy systems), N26, plug-and-play for Speed & Flexibility
McKinsey & Company (Bhattacharjee et al., 2022)	Building a winning AI neobank	Neo-banks challenge traditional banks (lower prices, transparency, fewer hidden fees). The challenge for neo-banks is to strengthen their competitive advantages.	Embedding data and AI extensively: customer centric, operationally efficient and profitable at scale. In all aspects of operation. So that AI and analytics led decisioning layer. Digital trends will keep digital banking industry relevant and appealing.	Competitive Advantage, AI, Customer centric, Operational efficiency, Profitable at scale.

5.3 Discussion

The quantitative results of this study show that the average financial ratios of traditional banks and neo-banks, as well as their growth trends, differ greatly from each other. Looking at the trend development of the ratios, neo-banks have improved significantly over the past few years, while traditional banks have continued to make more profits, but whose performance remains stagnating, as indicated by the modest improvement or decline in their ratios. The neo-banks, on the other hand, are showing enormous progress and change, suggesting that their business models and approaches are effective. Furthermore, the analysis of the economist's reports and their comparison with the results of the ratio analysis revealed recurring patterns.

The ratio analysis shows that the negative ROAA (-3.46%) and ROAE (-58.57%) for neo-banks may be cause for concern, indicating that not all the represented banks have been profitable for a while. In fact, N26 did not even achieve profitability within this period (see

Appendix A & B). This might be explained by the fact that neo-banks are still relatively new in a highly complex industry and have not yet built up a sizable clientele that generates enough profits as well as developed a variety of profitable revenue streams.

In terms of efficiency, neo-bank banking models have shown that they are able to generate more net interest income (NIM) from their assets (1.33% vs. 0.97%) and have significantly lower operating costs to run their banks than their counterparts due to their innovative business model using technology to automate processes and streamline operations. Traditional banks are showing a higher CI ratio (236.19% vs. 95.99%), perhaps because their operating model simply cannot achieve such a low ratio due to their necessity to maintain a branch network and still maintain a number of legacy IT systems.

Traditional banks higher debt ratio (0,940 vs. 0,833) raises additional questions, as it shows that these institutions have a high level of debt relative to their assets, which could make them more vulnerable to interest rate changes or other economic shocks. Despite this, traditional banks have been able to manage their risks effectively over a long period of stability and crises by increasing ROAA, ROAE and their P/L per employee ratio. Compared to this, neo-banks have lower Debt-to-Asset Ratios probably due to their business model and growth stage. For example, they often rely less on traditional sources of funding and continue to invest heavily in technology and customer acquisition. Moreover, in their early stages, neo-banks tend to have more conservative products and finance some of their assets with equity rather than debt.

The higher average Profit/Loss per employee ratio of neo-banks (119.430€ vs. 42.852€) can be attributed to their less capital-intensive digital infrastructure and processes because of their innovative business model and extensive use of technology. Compared to traditional banks, this gives neo-banks a potential competitive advantage as they can use their human resources more efficiently, offer better prices along with providing their clients with a seamless digital banking experience.

Overall, the key ratios show a clear distinction between traditional and neo-banks in terms of their financial results. Neo-banks were more effective at generating income and minimizing operational costs, whereas traditional banks were more lucrative and showed having a more stable financial structure. Furthermore, neo-banks were able to achieve higher productivity in terms of income per employee than traditional banks.

Looking at the trend analysis addressed in this study, it becomes obvious that there are significant differences in the evolution of both banking models. The average growth in the ROAA and ROAE ratios of traditional banks demonstrates indicative that their profitability has expanded steadily. Nonetheless, its NIM has declined, suggesting that they have struggled to

preserve their interest income and their CI ratio has grown, indicating a rise in their operating expenses. However, considering the pandemic outbreak (COVID-19) that occurred during the period under review, traditional banks still performed very well, maintaining a stable debt to assets ratio.

Similarly, the ROAA and ROAE ratios of the neo-banks have risen significantly, suggesting that their profitability has become much healthier. Despite this, they have also seen a significant fall in their growth in NIM and experienced a huge rise in the development of their CI ratio, suggesting that their costs are rising as they grow their customer base and make a profit from their operations. In addition, there has been an upturn in the growth of their equity, which may indicate that they have borrowed more money to run their businesses more profitably (see Appendix A & B).

The trend analysis of traditional and neo-banks reveals notable differences in their financial performance growth. Traditional banks have enjoyed a steady increasing trend in profitability, while neo-banks have grown substantially but are experiencing what it means to sustain a growing customer base with revenue generation and increasing operating costs. Looking more closely at their average cost rise, this is primarily because the cost of generating income grew for the Revolute bank by 844.83% from 2020 to 2021 (see Appendix B). Overall, the findings suggest that adapting to market changes is crucial for traditional and neo-banks to remain competitive and profitable, as the competition does not sleep.

Having considered all quantitative results, they provide revealing information about the financial performance of traditional and neo-banks development. Neo-banks have shown higher efficiency but decelerating their exponential growth streak in generating revenue and controlling operating expenses, whereas traditional banks have shown higher profitability but lower efficiency. Because of this, to remain competitive and successful, both kinds of banks must adjust to changing market conditions and customer expectations. To assess whether the business models of traditional and neo-banks in the digital era are long-term viable, more research is however required.

As the quantitative findings discussed earlier in the study highlighted the banks' past financial performance, while the qualitative findings from the expert reports, based on a wider range of recent data, provide a broader perspective on the strengths and weaknesses of both types of banks, as well as their outlook.

The publications emphasise the significance of technology, data and sustainability in determining the direction of the banking sector going forward. Neo-banks are viewed as disruptors that pose a threat to conventional banks, yet they also have difficulty making a profit

and being viable. However, traditional banks must adjust to changing client and market demands despite having legacy systems and the benefit of long-lasting financial stability. The expert assessments suggest that both kinds of banks prioritise the client experience and use technology and data to accomplish their objectives. To get ready for the future, they also stress the significance of risk management, sustainable finance and hiring and retaining people.

When combining the quantitative and qualitative findings, it is evident that both types of banks need to focus on profitability and sustainability, but they have different strengths and challenges. Conventional banks may have a financial stability edge, but they must change to meet changing customer needs and market conditions by utilising technology and data to improve client experiences. Neo-banks, on the other hand, benefit from being innovators and driven towards increasing profits, but will eventually have to monetise their untapped customer base to become a sustainable competitor.

Having outlined the main arguments, the combination of qualitative and quantitative findings highlighted the importance of a balanced approach for both types of banks to succeed in the next digital age. Both have experienced changes in their financial performance and need to adapt to remain competitive in the industry. However, the results do not provide information on the sustainability of the business models of both types of banks in the long term, which is an area that requires further investigation. In addition, the results do not address the impact of ESG issues on banks financial performance, which is an area that requires further research.

To conclude the discussion of the research results, the four hypotheses presented in the study are evaluated. The main objective of this study was to compare the financial performance of neo-banks and traditional banks based on various financial ratios. The findings of the study are reviewed and interpreted in the light of the hypotheses presented as part of the deductive level of this research.

Hypothesis 1: The first hypothesis states that neo-banks NIM is higher than traditional banks. The study's findings demonstrate that neo-banks NIM (1.33% vs. 0.97%) is indeed higher than traditional banks. This result supports the hypothesis because neo-banks may be better able to generate income than traditional banks because of their digital and technology-driven business models. As a result, the data are consistent with hypothesis 1.

Hypothesis 2: According to the second hypothesis, the ROAA ratio of traditional banks is higher than that of neo-banks. The results of the ratio analysis show that the average ROAA of traditional banks is consistently significantly higher than that of neo-banks (0.40% vs. -3.46%). The outcome thus reinforces the notion that conventional banks, who have a solid reputation

and extensive banking industry knowledge, provide a greater ROAA than neo-banks. As a result, the results also support hypothesis 2.

Hypothesis 3: The third hypothesis postulates that the efficiency ratio of neo-banks is better than that of traditional banks. Based on the research, neo-banks have excellent P/L per employee and CI ratios compared to traditional banks. In this case, the average CI was 95.99% compared to 236.19%, and the average profit per employee was 119,430€ compared to 42,852. In support of Hypothesis 3, neo-banks, with their technology and digitally driven strategy, can achieve better outcomes in terms of cost efficiency and profitability than traditional banks when using fewer employees.

Hypothesis 4: The study reveals that neo-banks have a lower overall performance growth than traditional banks. Although the growth rates of neo-banks ROAA, ROAE, debt-to-assets, and P/L per employee ratios are higher than those of traditional banks, their average growth rate of NIM is significantly lower. Additionally, the average CI ratio of neo-banks increases extremely over the years, which offsets their positive development gains. This indicates that even with an increasing number of customers, their growth trend is not as high as before. Consequently, the steady increase of traditional banks ratios is overall higher. Thus, hypothesis 4 needs to be rejected.

In summary, the study's findings validated three of the four hypotheses stated in the previous chapters. In particular, the study discovered that whereas conventional banks had a greater ROAA, neo-banks have a higher NIM and better efficiency ratio. Contrary to the fourth hypothesis, the study found that traditional banks have higher overall performance growth than neo-banks, given the steady increase of traditional banks ratios in comparison to the decline in neo-banks exponential growth streak in generating revenue and controlling operating expenses. These findings suggest that conventional and neo-banks each have their own strengths and problems, and that it is crucial for them to adapt and evolve.

In an ever-changing financial world, both traditional and neo-banks confront unique difficulties and possibilities, according to the research findings. To be competitive and profitable, each type of bank must continue to adapt to market developments and consumer needs by capitalizing on its strengths and addressing its limitations.

Traditional banks should prioritize investments in technology and digital solutions that streamline their operations and save costs, while also enhancing the customer experience, to maintain their client base. In addition, conventional banks should aim to diversify their revenue streams and reduce their reliance on interest income to combat the observed fall in NIM.

Neo-banks, on the other hand, should concentrate on expanding their customer base and developing diverse revenue streams to improve their profitability. To prevent the erosion of the efficiency advantages they presently possess over traditional banks; they must also manage operational expenses properly as they continue to grow. In order to effectively compete with traditional banks on the market, neo-banks should also prioritise establishing a solid reputation and consumer confidence, as well as maintaining their long-term financial health.

5.4 Research Contribution

This dissertation has made several significant contributions to the existing knowledge of the financial performance of traditional banks and neo-banks, and their potential implications for the future of the banking industry. These contributions have been made using a number of different research methodologies. This research was able to identify important differences in the financial performance of these banks and their development trends because it used a mixed-methods approach and carried out a full ratio analysis.

First, the findings of this study significantly expand the understanding of the major differences between traditional banks and neo-banks. The ratio analysis showed that conventional banks had greater profitability ratios (ROAA and ROAE), while neo-banks have shown stronger efficiency ratios, such as NIM and CI ratios. Neo-banks also have higher CI ratios. This suggests that neo-banks have been effective in earning higher interest revenue and reducing operating expenses because to the novel business models that are technology-driven that they utilize. This is a significant contribution to the existing body of knowledge since it elucidates the domains in which neo-banks have been able to beat their conventional competitors.

Second, the findings of this study cast doubt on the idea that neo-banks cannot be maintained or operated profitably over the long term. Although while the findings demonstrate that neo-banks, on average, have negative ROAA and ROAE, this does not necessarily indicate that their business models are not viable. According to the data, neo-banks have undergone tremendous expansion over the past few years, which has been accompanied by improvements in financial performance measures. This demonstrates that these financial institutions have the potential to one day become successful and sustainable market rivals, which runs counter to the view that they are faulty or unviable on a fundamental level.

Finally, by analysing the evolution of conventional and neo-banks financial performance, this research sheds fresh light on the nature of the connection that exists between the two types

of financial institutions. The trend analysis shows that conventional banks have had a consistent rise in profitability ratios, but their efficiency ratios (NIM and CI ratio) have either decreased or remained the same. This contrasts with the growth in profitability ratios that only online banks have seen. On the other hand, neo-banks have demonstrated significant development in their financial ratios, which suggests that their business models are successful in the current hostile environment for competition. When evaluating how to adapt and advance in the rapidly transforming banking business, it is important to take these outcomes into consideration.

Furthermore, the findings contribute to a better understanding of the management implications, which are applicable to both traditional and neo-banks. To remain market leaders in the face of competition from digital-only banks, traditional financial institutions are required to recognize the significance of innovation and alter their operational models. By investing in technology, enhancing the customer experience and streamlining operations, businesses can reduce their CI ratio. Even though they are seeing rapid growth and increased efficiency, most neo-banks must prioritize becoming profitable as soon as feasible by monetizing their client base and exploring new revenue streams. Both types of banks must consider the importance of risk management, sustainable finance and attracting and retaining talented staff.

The findings of the dissertation also offer important and insightful information for decision-makers and regulators working in the financial industry. To inform regulatory actions and contribute to the establishment of a playing pitch that is level for both conventional and neo-banks, it is necessary to have an understanding of the disparities in financial performance that exist between the two types of institutions. Neo-banks have their own set of unique difficulties and possibilities, which should be taken into consideration by policymakers, who should then work to create a regulatory framework that encourages innovation, competition and financial stability.

In addition, the findings of this research point to areas that require more examination. Because the results do not give conclusive answers, the question of whether it is possible for conventional and neo-banks to sustain their business models over the long run is still unanswered. Future research may look at the elements that determine the viability of these banks in the digital age, as well as the impact of ESG concerns on their financial performance.

In conclusion, this dissertation has made a significant contribution to understanding the differences in financial performance between traditional banks and neo-banks and the potential implications of these differences for the future of the banking industry. These differences may have significant effects on the future of the banking industry. Both the mixed-methods approach and the thorough ratio analysis have offered extremely helpful insights into the primary

domains in which neo-banks perform and the primary domains in which conventional banks need to improve to remain competitive. These discoveries have significant repercussions not just for the administration of these establishments but also for the formulation of policies governing regulatory oversight. This research provides a basis for future examination into the long-term viability and sustainability of both conventional and neo-banks in the era of digital technology by shining light on the changing environment of the banking sector.

As the financial environment changes rapidly, it is important to consider the potential impact that disruptive technologies might have on the industry's competitive dynamics. The potential of blockchain technology, AI, crypto currencies and other new technologies to shape the future of banking, as well as the consequences these technologies have for financial performance and sustainability, might be the subject of more research in the future.

In addition, the influence of the behaviour and preferences of increasingly younger customers on the performance of both traditional banks and neo-banks might be another potential subject of investigation. Both sorts of financial institutions may benefit from a more in-depth understanding of consumer expectations, trust and loyalty in the digital banking era. This would allow them to better adapt their offers, increase customer satisfaction and ultimately improve their financial success.

The influence of regulatory frameworks on the expansion and maturation of neo-banks is another significant facet that warrants more research because of its importance. The possibility for regulatory arbitrage might also be investigated by researchers, along with the link between shifting regulatory requirements and the level of success seen by neo-banks in various countries.

Overall, the role that conventional and neo-banks play in collaborating with one another within the context of open banking efforts could be an additional intriguing field for future research. An investigation into the possible synergies and collaborations that may exist between these different sorts of institutions may give useful insights into how the banking industry can adapt to meet the difficulties and capitalize on the possibilities presented by the digital era.

This dissertation has produced several major advances to modern knowledge of the financial performance of neo-banks and traditional banks, as well as their possible implications for the future of the banking sector. This research has produced crucial insights for both management and policymakers by analysing the major distinctions in their financial ratios and growth patterns. These ratios and growth trends have been examined. Nonetheless, this is just the beginning of the investigation into the competitive environment of the new age of digital banking. In the face of increasing technological disruption and shifting client preferences, future

research attempts should continue to investigate the aspects that will ultimately decide the sustainability, profitability and success of both traditional and neo-banks.

CHAPTER 6

Conclusions

6.1 Main Findings

The primary purpose of this dissertation was to compare the financial performance of traditional banks and neo-banks and to analyse the implications of these differences for the future of the banking industry. In order to answer the research question and validate the hypothesis, the study employed a mixed-methods strategy that included both a quantitative examination of financial ratios and a qualitative review of reports written by experts of the industry.

The quantitative data showed that traditional banks and neo-banks had very different financial performances between 2017 and 2021. The ROAA and ROAE performance of traditional banks was consistently better than that of neo-banks, indicating that traditional banks consistently generate more profit. Neo-banks, on the other hand, have a higher NIM, suggesting that they are more effective in generating income from interest-earning assets and had a lower CI ratio, indicating a better control of operating costs. Finally, neo-banks had a higher average P/L per employee ratio, indicating that they were more productive in terms of generating money per employee.

The qualitative findings from the reports of industry experts emphasised how important it is for traditional banks as well as neo-banks to place a priority on providing excellent customer service, making effective use of technology and concentrating on ESG issues. According to the consultancy's, financial institutions should implement new business strategies, broaden their digital product offerings and increasing customer centricity and share the results of their efforts to improve ESG factors. Both traditional and neo-banks must be proactive in their adaptation to the changing needs of the market and their customers if they want to be successful in the new digital era.

6.2 Theoretical Implications

This study contributes to the current literature on neo-banks and traditional banks by analysing their financial performance and what this is indicating for the future of those. This research employs a mixed-methods approach that not only gives a full knowledge of the variations in

financial performance between the two types of banks, but also shines light on the possible future success factors.

The results of this research have a few different theoretical ramifications. When analysing the performance and potential of banks in a changing financial landscape, it is important to examine both quantitative ratios and qualitative elements, as the results show. First, the results illustrate the relevance of this consideration. This highlights the need of taking a comprehensive approach when evaluating the possibilities for the banking industry in the future.

Second, the research highlights critical criteria that separate conventional banks from neo-banks, such as a greater NIM ratio, a lower CI ratio and a lower debt-to-asset ratio. These findings provide a contribution to the discussion that is now taking place on the competitive advantages and drawbacks of traditional banks and neo-banks in terms of their future position in the market.

To sum up, the findings of the qualitative research stress the importance of sustainability, customer-centric strategies and technology in the process of forming the future of banking. This underscores the need for more study on how banks can effectively adopt these tactics to prosper in the next digital era and maintain their position as market leaders.

Overall, the findings of this study provide insightful information on the disparities between the financial performance of traditional banks and neo-banks, as well as the significance of these discrepancies for the future development of the banking models in the industry. According to the findings, both varieties of banks have their own distinct advantages and disadvantages and to stay competitive, they need to adjust to the growing requirements of their customers and the shifting conditions of the market. Neo-banks and traditional banks both have the potential to alter the sector and be successful in the next digital era if they continually adopt to technology advancements, put an emphasis on providing excellent customer service and place a high priority on environmental responsibility.

But, in order to maintain a competitive advantage and keep up with the ever-shifting requirements of the market, businesses will need to move swiftly and efficiently.

In conclusion, the findings of this study add to a more in-depth knowledge of the possibilities and problems that both traditional banks and neo-banks confront in the dynamic banking market. The findings of this research can provide information that might be useful to industry decision-makers and other stakeholders as they work to adjust their strategies to the digital era.

Further research in this area could investigate the impact of regulatory changes on the financial performance of new banks and the competitive environment in the market. In addition,

the impact of technological developments such as blockchain, AI and big data on the future of banking could be investigated in future research. Research could provide valuable insights for the banking industry by further exploring the parallels and differences in the development of traditional banks and neo-banks. These insights could help the banking industry meet the challenges of the digital age, further increase collaboration and foster innovation and growth.

6.3 Limitations and Future Recommendations

This study, while providing valuable insights into the financial performance of neo-banks and traditional banks, has certain limitations. Since the research is based on data from a certain time period, it is probable that it does not effectively depict the dynamic nature of the banking industry. This is one of the study's drawbacks. In addition, the study does not go into the precise explanations for the negative ROAA and ROAE for various neo-banks and their business focus, which may be the subject of future research but is not addressed in this study.

Traditional banks should not be underappreciated since they hold considerable prospects thanks to the strong equity share that they maintain and the support that they get from key investors. They can leverage their resources and embrace digitization, which will allow them to adapt to the market and compete with neo-banks. The impact of digitalisation on the profitability of traditional banks could be the subject of more research in the future, as could the question of whether traditional banks can remain competitive with neo-banks in the long term.

Neo-banks have garnered a significant amount of interest all around the globe, as seen by the expanding number of companies in the industry, investments in independent neo-banks and quick expansion in client base. They provide a workable option for tech-savvy customers who place a premium on affordable prices, the ease of use and quick online service. Having said that, it is very necessary to have a solid understanding of the viability of their business models and the aspects that contribute to their financial success.

In terms of future research, it would be beneficial to investigate the reasons for the still negative ROAA and ROAE for some neo-banks and to determine whether these results are temporary or indicative of systemic problems. This would help to determine whether these results are indicative of a larger problem. By gaining an understanding of the aspects that contribute to the financial success of specific neo-banks, one can more easily identify areas that might need improvement as well as prospective prospects for expansion.

Further study might also investigate the impact that developments in technology, such as blockchain, AI and big data, would have on the foreseeable future of the banking industry. Researchers can provide the banking industry with valuable insights to assist it in navigating the challenges presented by the digital age and fostering innovation and growth by investigating the impact of these innovations on the financial performance and competitive landscape of both neo-banks and traditional banks.

In summing up, this research presents a detailed review of the financial performance of neo-banks as well as traditional banks, illuminating the problems and possibilities that are confronted by both models of bank organizations. Future research can contribute to a deeper understanding of the rapidly evolving banking industry and inform decision-makers and stakeholders as they develop strategies to adapt and thrive in the digital age by addressing the limitations of this study and building upon its findings. This can be achieved by addressing the limitations, particularly through the increasing availability of comparable and reliable data and using this dissertation to build on its findings.

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Appendix

Appendix A: Banks Financial Statements Data from 2016 to 2021

Table 8.1 Financial Statements Data from 2016 to 2021

Data for the Financial Ratio-Analyses:									
(Consolidated Statments)									
Description	2016								
Balance Sheet & Annual Report	HSBC (\$m)	BNP-PARIBAS (€m)	Crédit Agricole (€m)	Revolute (€t)	OakNorth (€t)	N26 (€t)			
Total Assets	2.374.986	2.076.959	1.722.800	256.910	291.922	153.151			
Total Equity	182.578	105.220	98.600	3.400	210.561	22.516			
Employees	241.000	192.000	137.871	32	50	136			
Traditional Banks:									
HSBC Holdings									
<i>in millions of dollars</i>									
Description	2017		2018		2019		2020		2021
	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount
	in USD		in USD		in USD		in USD		in USD
Income Statement	\$		\$		\$		\$		\$
Revenue	63.776	100,0%	63.587	100,0%	71.024	100,0%	63.074	100,0%	63.940
Interest income	40.995	64,3%	49.609	78,0%	54.695	77,0%	41.756	66,2%	36.188
Interest expense	12.819	20,1%	19.120	30,1%	24.233	34,1%	14.178	22,5%	9.699
Net Interest Income	28.176	44,2%	30.489	47,9%	30.462	42,9%	27.578	43,7%	26.489
Gross operating profit	17.315	27,1%	17.354	27,3%	10.993	15,5%	7.180	11,4%	15.860
Total operating expenses	34.884	54,7%	34.659	54,5%	42.349	59,6%	34.432	54,6%	34.620
Net Income	11.879	18,6%	15.025	23,6%	8.708	12,3%	6.099	9,7%	14.693
Balance Sheet									
Total Assets	2.521.771	100,0%	2.558.124	100,0%	2.715.152	100,0%	2.984.164	100,0%	2.957.939
Average Total Assets	2.448.379	97,1%	2.539.948	99,3%	2.636.638	97,1%	2.849.658	95,9%	2.971.052
Total Liabilities	2.322.206	92,1%	2.363.875	92,4%	2.522.484	92,9%	2.779.169	93,1%	2.751.162
Total Equity	197.871	7,8%	194.249	7,6%	192.668	7,1%	204.995	6,9%	206.777
Average Total Equity	190.225	7,5%	196.060	7,7%	193.459	7,1%	198.832	6,7%	205.886
Annual Report (in exact number)									
Employees	228.687		235.217		235.351		226.059		219.697
Total average Employees	234.844		231.952		235.284		230.705		222.878
BNP PARIBAS SA									
<i>in millions of euros</i>									
Description	2017		2018		2019		2020		2021
	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount
	in Euros		in Euros		in Euros		in Euros		in Euros
Income Statement	€		€		€		€		€
Revenue	43.161	100,0%	42.516	100,0%	44.597	100,0%	41.779	100,0%	43.762
Interest income	33.566	77,8%	35.723	84,0%	37.327	83,7%	31.169	74,6%	29.518
Interest expense	12.375	28,7%	14.661	34,5%	16.200	36,3%	10.280	24,6%	11.883
Net Interest Income	21.191	49,1%	21.062	49,5%	21.127	47,4%	20.889	50,0%	17.635
Gross operating income from continuing activities	13.217	30,6%	11.933	28,1%	13.260	29,7%	13.274	31,8%	14.296
Total operating expenses	29.944	69,4%	30.583	71,9%	31.337	70,3%	28.505	68,2%	29.466
Net Income	8.207	19,0%	8.005	18,8%	8.583	19,2%	7.415	17,7%	9.880
Balance Sheet									
Total Assets	1.952.166	100,0%	2.040.836	100,0%	2.164.713	100,0%	2.488.491	100,0%	2.634.444
Average Total Assets	2.014.563	103,2%	1.996.501	97,8%	2.102.775	97,1%	2.326.602	93,5%	2.561.468
Total Liabilities	1.844.957	94,5%	1.935.110	94,8%	2.052.868	94,8%	2.371.142	95,3%	2.511.937
Total Equity	107.209	5,5%	105.726	5,2%	111.845	5,2%	117.349	4,7%	122.507
Average Total Equity	106.215	5,4%	106.468	5,2%	108.786	5,0%	114.597	4,6%	119.928
Annual Report (in exact number)									
Employees	196.000		202.000		199.000		193.000		190.000
Total average Employees	194.000		199.000		200.500		196.000		191.500
Crédit Agricole Group									
<i>in millions of euros</i>									
Description	2017		2018		2019		2020		2021
	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount
	in Euros		in Euros		in Euros		in Euros		in Euros
Income Statement	€		€		€		€		€
Revenue	32.108	100,0%	32.839	100,0%	33.297	100,0%	33.596	100,0%	36.700
Interest income	33.411	104,1%	33.110	100,8%	33.509	100,6%	31.500	93,8%	31.634
Interest expense	13.734	42,8%	14.594	44,4%	15.512	46,6%	12.710	37,8%	11.851
Net Interest Income	19.677	61,3%	18.516	56,4%	17.997	54,0%	18.790	55,9%	19.783
Gross operating income	11.197	34,9%	11.385	34,7%	11.485	34,5%	11.768	35,0%	13.741
Operating expenses	19.699	61,4%	20.266	61,7%	20.088	60,3%	19.921	59,3%	21.169
Depreciation, amortisation and impairment of property, plant & equipment and intangible assets	1.212	3,8%	1.188	3,6%	1.724	5,2%	1.907	5,7%	1.912
Total operating expenses	20.911	65,1%	21.454	65,3%	21.812	65,5%	21.828	65,0%	23.081
Net Income	7.010	21,8%	7.369	22,4%	7.704	23,1%	5.193	15,5%	9.953
Balance Sheet									
Total Assets	1.764.543	100,0%	1.854.763	100,0%	2.010.966	100,0%	2.175.000	100,0%	2.323.557
Average Total Assets	1.743.672	98,8%	1.809.653	97,6%	1.932.865	96,1%	2.092.983	96,2%	2.249.279
Total Liabilities	1.658.031	94,0%	1.742.575	94,0%	1.889.432	94,0%	2.091.038	96,1%	2.189.842
Total Equity	106.512	6,0%	112.188	6,0%	121.534	6,0%	126.474	5,8%	133.715
Average Total Equity	102.556	5,8%	109.350	5,9%	116.861	5,8%	124.004	5,7%	130.095
Annual Report (in exact number)									
Employees (S.A)	73.707		141.000		142.000		142.000		147.000
Total average Employees	105.789		107.354		141.500		142.000		144.500

Gross operating income						
Consolidated income statement N26 GmbH						
	2017	2018	2019	2020	2021	
1. Zinserträge	849	5.117	9.334	14.775	31.017	
2. Zinsaufwendungen	0	-46	-12	0	-1.273	
3. Provisionserträge	10.018	37.650	83.084	97.582	142.958	
4. Provisionsaufwand	-9.864	-23.835	-35.570	-40.247	-52.327	
5. Sonstige betriebliche Erträge	367	5.895	1.893	8.817	8.029	
Total operating expenses	-33.417	-97.962	-275.838	-245.358	-301.760	
Gross operating income	-32.047	-73.181	-217.109	-164.432	-173.356	
Revenue						
Consolidated income statement N26 GmbH						
	2017	2018	2019	2020	2021	
1. Zinserträge a)	870	3.753	6.436	9.276	20.595	
1. Zinserträge b)	748	1.543	5.027	8.032	10.422	
3. Provisionserträge	10.018	37.650	83.084	97.582	142.958	
5. Sonstige betriebliche Erträge	367	5.895	1.893	8.817	8.029	
10. Erträge aus Zuschreibungen zu Beteiligungen	0	36	174	13.656	566	
2. Laufende Erträge aus a) Aktien				151	417	
Gross operating income	12.003	48.877	96.613	137.513	182.987	

Appendix B: Ratio Analysis and Growth Development of Ratios in Percent

Table 8.2 Ratio Analysis and Growth Development Percentages

Ratio Analysis: Traditional Bank vs. Neo-banks									
Return-on-average-assets (ROAA)									
	2017	Development Percentage	2018	Development Percentage	2019	Development Percentage	2020	Development Percentage	2021
HSBC	0,49%	21,92%	0,59%	-44,17%	0,33%	-35,20%	0,21%	131,07%	0,49%
BNP-PARIBAS	0,41%	-1,58%	0,40%	1,80%	0,41%	-21,92%	0,32%	21,03%	0,39%
Crédit Agricole	0,40%	1,29%	0,41%	-2,12%	0,40%	-37,75%	0,25%	78,34%	0,44%
VS.									
Revolute	-8,42%	44,39%	-4,68%	-15,75%	-5,42%	15,69%	-4,57%	106,18%	0,28%
OakNorth	1,79%	17,17%	2,09%	6,08%	2,22%	-9,83%	2,00%	49,95%	3,00%
N26	-11,06%	15,26%	-9,38%	-30,12%	-12,20%	63,04%	-4,51%	31,40%	-3,09%
Return-on-average-equity (ROAE)									
	2017	Development Percentage	2018	Development Percentage	2019	Development Percentage	2020	Development Percentage	2021
HSBC	6,24%	22,72%	7,66%	-41,26%	4,50%	-31,85%	3,07%	132,65%	7,14%
BNP-PARIBAS	7,73%	-2,69%	7,52%	4,94%	7,89%	-17,99%	6,47%	27,32%	8,24%
Crédit Agricole	6,84%	-1,41%	6,74%	-2,17%	6,59%	-36,48%	4,19%	82,69%	7,65%
VS.									
Revolute	-46,48%	40,65%	-27,59%	-166,88%	-73,63%	2,53%	-71,77%	103,67%	2,63%
OakNorth	4,08%	123,00%	9,10%	37,22%	12,49%	-6,13%	11,72%	47,93%	17,34%
N26	-196,78%	-26,85%	-249,61%	33,92%	-164,95%	59,00%	-67,63%	45,35%	-36,96%
Net-interest-margin (NIM)									
	2017	Development Percentage	2018	Development Percentage	2019	Development Percentage	2020	Development Percentage	2021
HSBC \$	1,12%	6,67%	1,19%	-5,87%	1,12%	-17,63%	0,92%	-3,10%	0,90%
BNP-PARIBAS	1,09%	-4,93%	1,03%	-5,43%	0,98%	-13,99%	0,84%	-20,25%	0,67%
Crédit Agricole	1,12%	-10,48%	1,00%	-10,35%	0,89%	-3,47%	0,86%	-1,45%	0,85%
VS.									
Revolute	0,01%	561,68%	0,10%	-127,87%	-0,03%	-980,08%	-0,29%	22,06%	-0,22%
OakNorth	3,24%	-6,53%	3,03%	15,80%	3,51%	19,86%	4,21%	8,31%	4,56%
N26	0,20%	126,33%	0,45%	-18,28%	0,37%	-5,98%	0,35%	29,96%	0,45%

Ratio Analysis: Traditional Bank vs. Neo-banks									
Cost-to-income ratio (CI)									
	2017	Development Percentage	2018	Development Percentage	2019	Development Percentage	2020	Development Percentage	2021
HSBC	201,47%	-0,87%	199,72%	92,89%	385,24%	24,48%	479,55%	-54,48%	218,28%
BNP-PARIBAS	226,56%	13,12%	256,29%	-7,79%	236,33%	-9,13%	214,74%	-4,02%	206,11%
Crédit Agricole	186,76%	0,90%	188,44%	0,78%	189,92%	-2,33%	185,49%	-9,44%	167,97%
VS.									
Revolute	-185,14%	-51,23%	-279,99%	9,04%	-254,67%	23,54%	-194,72%	844,83%	1450,36%
OakNorth	62,58%	-30,25%	43,65%	-15,52%	36,87%	21,03%	44,63%	-37,64%	27,83%
N26	104,28%	28,37%	133,86%	-5,09%	127,05%	17,45%	149,22%	16,66%	174,07%
Debt-to-assets									
	2017	Development Percentage	2018	Development Percentage	2019	Development Percentage	2020	Development Percentage	2021
HSBC	0,921	0,35%	0,924	0,54%	0,929	0,24%	0,931	-0,13%	0,930
BNP-PARIBAS	0,945	0,33%	0,948	0,01%	0,948	0,48%	0,953	0,07%	0,953
Crédit Agricole	0,940	-0,01%	0,940	0,01%	0,940	2,32%	0,961	-1,97%	0,942
VS.									
Revolute	0,829	0,18%	0,830	16,28%	0,966	-4,64%	0,921	-4,96%	0,875
OakNorth	0,670	-72,14%	0,187	343,65%	0,828	0,31%	0,830	-0,80%	0,824
N26	0,976	-0,59%	0,971	-4,40%	0,928	3,77%	0,963	-6,74%	0,898
Profit/loss per employee (P/L)									
	2017	Development Percentage	2018	Development Percentage	2019	Development Percentage	2020	Development Percentage	2021
HSBC (\$)	50.583	28,06%	64.776	-42,86%	37.011	-28,57%	26.436	149,37%	65.924
BNP-PARIBAS (€)	42.304	-4,91%	40.226	6,42%	42.808	-11,62%	37.832	36,37%	51.593
Crédit Agricole (€)	66.264	3,59%	68.642	-20,68%	54.445	-32,83%	36.570	88,35%	68.879
VS.									
Revolute (£)	- 133.333	12,68%	- 116.422	-6,88%	- 124.435	13,50%	- 107.633	105,37%	5.785
OakNorth (£)	169.179	138,05%	402.727	59,09%	640.718	1,51%	650.378	53,59%	998.925
N26 (€)	- 315.517	80,35%	- 62.004	-245,50%	- 214.222	48,39%	- 110.565	-12,06%	- 123.895

Table 8.3 Trend Development of the Financial Ratios

Trend Development Percentage from 17-18 to 19-20 and 20-21							
Average of:	ROAA	ROAE	NIM		CI	Debt to ass	P/L
HSBC	18,41%	20,56%	-4,98%		15,51%	0,25%	26,50%
BNP-PARIBAS	-0,17%	2,89%	-11,15%		-1,95%	0,22%	6,56%
Crédit Agricole	9,94%	10,66%	-6,44%		-2,52%	0,09%	9,61%
Average =	9,39%	11,37%	-7,52%		3,68%	0,19%	14,22%
VS							
Average =	24,46%	24,45%	-29,56%		68,43%	22,49%	20,68%
REVOLUTE	37,63%	-5,01%	-131,05%		206,55%	1,71%	31,17%
OakNorth	15,84%	50,51%	9,36%		-15,59%	67,75%	63,06%
N26	19,90%	27,85%	33,01%		14,35%	-1,99%	-32,20%

Appendix C: Descriptive Statistic

Table 8.4 Descriptive Statistic of the Results

ROAA	2017	2018	2019	2020	2021			ROAE	2017	2018	2019	2020	2021
HSBC	0,49%	0,59%	0,33%	0,21%	0,49%			HSBC	6,24%	7,66%	4,50%	3,07%	7,14%
BNP-PARIS	0,41%	0,40%	0,41%	0,32%	0,39%			BNP-PARIS	7,73%	7,52%	7,89%	6,47%	8,24%
Crédit Agricole	0,40%	0,41%	0,40%	0,25%	0,44%			Crédit Agricole	6,84%	6,74%	6,59%	4,19%	7,65%
Revolute	-8,42%	-4,68%	-5,42%	-4,57%	0,28%			Revolute	-46,48%	-27,59%	-73,63%	-72,22%	2,63%
OakNorth	1,79%	2,09%	2,22%	2,00%	3,00%			OakNorth	4,08%	9,10%	12,49%	11,72%	17,34%
N26	-11,06%	-9,38%	-12,20%	-4,51%	-3,09%			N26	-196,78%	-249,61%	-164,95%	-67,63%	-36,96%
ROAA	Mean	Median	Min	Max	Stdev.s			ROAE	Mean	Median	Min	Max	Stdev.s
Traditional	0,40%	0,40%	0,21%	0,59%	0,09%			Traditional	6,56%	6,84%	3,07%	8,24%	1,51%
Neo-bank	-3,46%	-4,51%	-12,20%	3,00%	5,20%			Neo-bank	-58,57%	-36,96%	-249,61%	17,34%	83,23%
Cost-to-income ratio (CI)													
CI	2017	2018	2019	2020	2021			NIM	2017	2018	2019	2020	2021
HSBC	201,47%	199,72%	385,24%	479,55%	218,28%			HSBC	1,12%	1,19%	1,12%	0,92%	0,90%
BNP-PARIS	226,56%	256,29%	236,33%	214,74%	206,11%			BNP-PARIS	1,09%	1,03%	0,98%	0,84%	0,67%
Crédit Agricole	186,76%	188,44%	189,92%	185,49%	167,97%			Crédit Agricole	1,12%	1,00%	0,89%	0,86%	0,85%
Revolute	-185,14%	-279,99%	-254,67%	-194,72%	1450,36%			Revolute	0,01%	0,10%	-0,03%	-0,29%	-0,22%
OakNorth	62,58%	43,65%	36,87%	44,63%	27,83%			OakNorth	3,24%	3,03%	3,51%	4,21%	4,56%
N26	104,28%	133,86%	127,05%	149,22%	174,07%			N26	0,20%	0,45%	0,37%	0,35%	0,45%
CI	Mean	Median	Min	Max	Stdev.s			NIM	Mean	Median	Min	Max	Stdev.s
Traditional	236,19%	206,11%	167,97%	479,55%	84,62%			Traditional	0,97%	0,98%	0,67%	1,19%	0,14%
Neo-bank	95,99%	44,63%	-279,99%	1450,36%	404,28%			Neo-bank	1,33%	0,37%	-0,29%	4,56%	1,79%
Debt-to-assets								P/L currency adaptation to Euro					
Debt Ratio	2017	2018	2019	2020	2021			Euro €	2017	2018	2019	2020	2021
HSBC	0,921	0,924	0,929	0,931	0,930			HSBC	42.221	56.634	33.043	21.495	55.264
BNP-PARIS	0,945	0,948	0,948	0,953	0,953			BNP-PARIS	35.311	35.170	38.219	30.761	43.250
Crédit Agricole	0,940	0,940	0,940	0,961	0,942			Crédit Agricole	55.311	60.014	48.609	29.735	57.741
Revolute	0,829	0,830	0,966	0,921	0,875			Revolute	- 150.153	- 129.182	- 145.676	- 119.290	6.731
OakNorth	0,670	0,187	0,828	0,830	0,824			OakNorth	190.520	446.866	750.089	720.814	1.162.350
N26	0,976	0,971	0,928	0,963	0,898			N26	- 355.320	- 68.799	- 250.790	- 122.539	- 144.164
Debt	Mean	Median	Min	Max	Stdev.s			P/L in €	Mean	Median	Min	Max	Stdev.s
Traditional	0,940	0,940	0,921	0,961	0,012			Traditional	42.852	42.221	21.495	60.014	12.122
Neo-bank	0,833	0,875	0,187	0,976	0,197			Neo-bank	119.430	- 119.290	- 355.320	1.162.350	443.984
Profit/loss per employee (P/L)								Currencies !					
P/L	2017	2018	2019	2020	2021								
HSBC	50.583	64.776	37.011	26.436	65.924								\$
BNP-PARIS	42.304	40.226	42.808	37.832	51.593								€
Crédit Agricole	66.264	68.642	54.445	36.570	68.879								€
Revolute	- 133.333	- 116.422	- 124.435	- 107.633	5.785								£
OakNorth	169.179	402.727	640.718	650.378	998.925								£
N26	- 315.517	- 62.004	- 214.222	- 110.565	- 123.895								€