PSD2: Introducing the Next Generation of Banking

An Explorative Study of the Implementation of PSD2

Master Thesis

by

Elise Solberg Hjermann -108068

Christine Marie Aanesland -107544

Supervisor: Jens Borges

Finance & Strategic Management

Copenhagen Business School

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Executive Summary

In 2007 the European Commission introduced the Payments Service Directive (PSD) to increase competition and provide a simplified set of legislations regarding payments services across Europe. However, the technological development created the need for a revised directive and in 13th of January 2018 the implementation process of the revised Payments Service Directive (PSD2) began. With PSD2 the European Commission promotes innovation, transparency, competition and consumer protection, as well as reducing costs and enabling new players known as the Third-party Payments Providers (TPPs) to enter the market. The revised directive will fundamentally change the value chain of the payments service industry and this thesis explores the strategic choices traditional banks face as a consequence of PSD2.

This thesis explores the characteristics of PSD2 to determine the potential disruptive impact in the European payments industry and how traditional banks should position itself to meet the changes. The thesis focuses on how the banks may increase their ability to be innovative to cope with the digital competition. Through analysis of the technical architecture, methodology, business areas exposed to increased competition and income and cost structure of the selected banks the thesis aims to answer the research questions of the paper. The disruptive characteristics are analyzed and complemented by innovation theory to evaluate how the banks should strategically embrace innovation through technology, open banking and collaboration to exploit the potential opportunities of PSD2.

This thesis is an explorative study with an inductive research approach, building on findings from a literature outline and interview study. The interview study is based on the experiences, knowledge and perception of PSD2 of six participants in the banking and payments industry. It is mainly based on big, traditional banks, but to gain depth to the analysis of the research question, a smaller bank, Fintech company and technological consultant company has been included in the study. The explorative study finds that banks have to make some important strategic choices to face the competitors, and that time is urgent. The banks have to improve their weak spots and focus on digital transformation to become competitive. This involves becoming responsive to changes and utilize the digital ecosystem of open banking to embrace the opportunities following PSD2.

GLOSSARY

This master thesis contains many abbreviations. Therefore, it is useful to gather all of them in one list to make the meaning of them clearly to the reader.

Abbreviation	**Term**
AISP	Account Information Service Provider
API	Application Program Interface
ASPSP	Account Serving Payment Service Provider
Bigtech	Large scale Technology Company
CSC	Common and Secure Communication
EBA	European Banking Authority
EC	European Council/Commission
EEA	European Economic Area
EU	European Union
Fintech	Financial Technology Company
IT	Information Technology
PISP	Payment Initiation Service Provider
PSD/PSD1	Payments Service Directive
PSD2	The Revised Payments Service Diretive
RTS	Regulatory Technical Standards
SCA	Strong Customer Authentication

SEPA	Single Euro Payments Area
SPM	Single Payments Market
TPPs	Third-party Payments Providers
XS2A	Access to Accounts
3DS	3-D Secure

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1.0 Introduction

1.1 Motivation

The motivation for this master thesis goes back to the subject called “Business Project”, which Elise and Christine took the first year of their master degrees, Finance and Strategic Management. The project focused on the implementation of the revised Payment Service Directive (PSD2) and how technology challenges the traditional bank's business model. This project increased the interest to how digitized competition will affect the banking sector in the future. In addition, the project also gave motivation for further research. Another aspect that is interesting is that Business Project was written before PSD2 was implemented on January 13, 2018. It was therefore a motivation to write about the subject while the directive is in an ongoing process, which will give a different perspective on the situation.

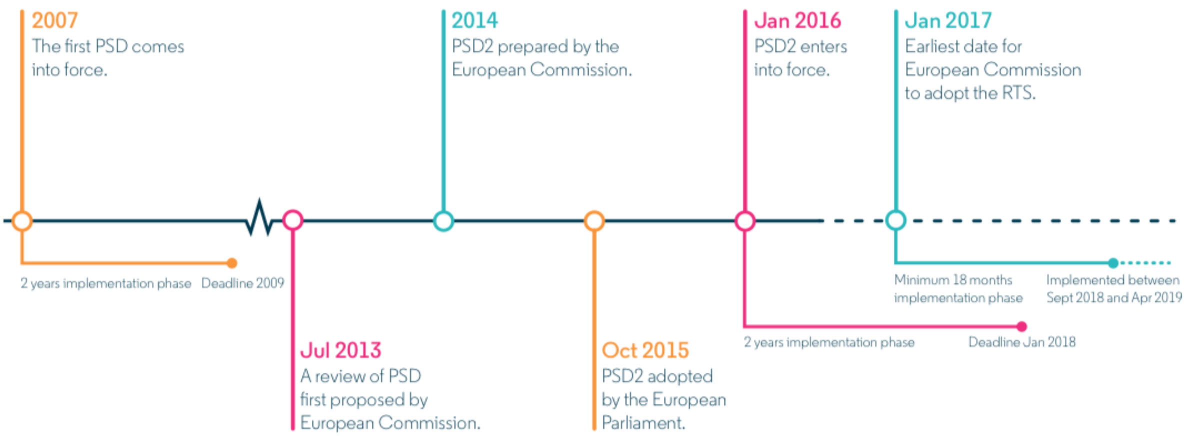
PSD2 is highly relevant to anyone who is part of the financial sector and it is therefore interesting to acquire knowledge of such an important subject. Furthermore, that PSD2 is currently undergoing a process and change, assumes that the companies affected by the directive do not with certainty have answer to what will happen in the future. It is therefore interesting and motivating to see if it is possible to find data and come up with something that banks and other companies have not thought about. Thus, this in turn can mean that the thesis may be interesting for other parties outside the school.

Furthermore, another aspect that is important is that Elise and Christine are taking a master's degree in Finance and Strategic Management. The subject of the master’s degree have provided a solid foundation for strategic and analytical thinking. It is therefore motivating to write a thesis within this field. This can also be seen in relation to the fact that since the thesis is written from a strategic perspective, there is limited insight into the laws and regulations that follow from PSD2. Additionally, the thesis aims to provide a qualitative insight into how banks can pursue different strategic choices to cope with PSD2, which means that there is no equal emphasis on the quantitative aspect of this matter.

There is a great motivation for gaining and detain sufficient knowledge and understanding of what is happening in the financial sector. Further, another interesting part is that it will be fascinating to see whether this master thesis correspond with what the banking sector looks like after PSD2 is fully implemented and has been in effect for a few years.

1.2 Purpose of the Study

Figure 1: Steps towards implementation of PSD2



(Source: Evry 2016)

In 2007 the European Parliament introduced the first Payment Service Directive (PSD1) aiming for increased trade across the European borders. The directive created the legislation and guidelines for modern payment services in the EU and opened up for other market participants than banks to provide payment services. However, the legislation did not define which type of payment services these new parties could potentially provide (Finans Norge, 2017). Over the years the digital development, as well as payment service industry has been emerging rapidly. The Internet revolution and mass adoption of cheap communication technologies have created a greater degree of convenience to customers, which has developed a demand for faster online and digital payments (Capgemini, 2017). The technological development made PSD1 insufficient and the EU parliament has therefore developed a revised PSD, known as PSD2.

The purpose of this thesis is to analyze the consequences of the implementation of PSD2, in which the thesis aim to provide an outline of strategic choices banks can follow to cope with these consequences. The implementation of PSD2 will fundamentally change traditional banking as we know it (Evry, 2017). Non-traditional players are entering the market with innovative solutions that have a quicker time-to-market, thus challenging the banks to change their business models (Capgemini, 2017). However, the implementation of PSD2 is not just a threat to the banks, it also creates great opportunities for future evolvement of traditional banking and payment services. The banks have several competitive advantages and the true challenge for the banks is to exploit this.

The digital competition will evolve and thus affect the future of banking. Traditional banks will no longer be competing only against each other , but everyone licensed to offer financial services. This forces the banks to make some important strategic decisions in order to survive in a changed marked. Traditional banks are facing different strategic options and this paper will analyze some of these options and the possible consequences of following these.

1.3 Research Question

The aim of this master thesis is to contribute to the literature of PSD2 by analyzing the consequences of banks´ different strategic choices in relation to the revised payment service directive. The implementation of PSD2 will affect banking institutions of all sizes, opening up financial services and payments markets to new competitors and service providers. PSD2 will provide new opportunities to make use of banks´ internal data and external market information in real-time and at scale, as part of delivering customer services.
Furthermore, the increased competition of customer interaction will make it difficult for banks to differentiate themselves from non-banks (Evry, 2016). This forces traditional banks to be proactive and innovative in order to survive in the market.

The strategic position they choose is crucial and the fact that there is still much uncertainty to exactly how the directive will be implemented across Europe makes it even more challenging to make this choice. No one knows exactly how or when PSD2 will affect the European market and the objective and main research question of this master thesis is therefore:

"The implementation of PSD2: How will the digital competition change and how will it affect the future of banking?"

Despite great uncertainty regarding the implementation process, consultants and the various financial institutions across Europe seem positive to the effects of PSD2. The rapid changes in the payment industry that follows the digitalization and implementation of PSD2 provides both great opportunities and challenges to banks across Europe. Furthermore, the new and improved competition aims to benefit the customers, who will experience faster, better, and safer payment systems. Changes in the digital competition and customer behavior makes the future of banking uncertain, and this paper will provide suggestions to how banks can rethink and redesign their services and business models in order to compete for their market positions.

To obtain an extensive answer, three sub questions are developed to highlight the characteristics of the implementation of PSD2 and how the directive will affect the competition and future of banking. It will also seek to give a deeper understanding of how the banks should position in order to meet the innovative and ambitious financial technology companies (Fintech companies). The implementation of PSD2 opens up for great business opportunities not only for TPPs but also for banks. Furthermore, traditional banks already possess several competitive advantages, including resources, customer relationships and compliance (Evry, 2016).

This thesis aims to outline an overview of the strategic choices the banks affected by PSD2 can make in order to utilize their competitive advantages and compete for market position. These strategies include the banks' technical architecture, methodology, business areas exposed to increased competition, cost and investment structure. Further this paper will seek to give a deeper understanding of innovation within banks and possible outcomes of the strategic choices through analysis that evaluate these strategies against each other.

To answer this the analysis will be made and formed by answering three sub questions:

"How can banks utilize their capacity and distribution power to use the implementation of PSD2 to recapture some of the lost payments revenue?"

"How can banks use open banking to innovate at pace and disrupt the disruptors?"

"How should the banks work with innovation to be competitive?"

1.4 Restrictions and limitations

The thesis focuses primarily on the implementation of PSD2 and the strategic consequences that follows for traditional banks. As a result, the thesis is written from the banks' perspective and does not go deep into the strategic choices for the other players in the markets. The opportunities and challenges related to PSD2 are many and to narrow the scope of the paper, the basis of the analysis are Nordic banks. Furthermore, banks are the most interesting part because they already possess information and market experience. Third-party payments providers (TPPs) will rather be used as a counterparty during the analysis to support the arguments for how the market will be affected by the new digital competition. However, it is essential to understand TPPs potential in order to understand the development of the payments service industry. Therefore, the thesis will thoroughly define the market participants and the technological development to illustrate why there is a need for PSD2 and how this will affect the future of banking.

The aim of this master thesis is to analyze how banks can make sure they do not get outcompeted. There are numerous potential approaches to the implementation of PSD2, but this thesis will focus on three different strategic positions banks may choose. It does not contain analysis on how to become compliant, doing the bare minimum required in order to survive and continue with business as before. Rather, it analysis how banks may implement the identified main strategies into their business plan to develop and exploit competitive advantages for the future financial landscape.

The analysis is mainly based on three sources of insight to give the study expert knowledge and valuable benchmarking for further analyze, in addition to continuous dialogue with consultants from Netlight who are experts within the field of PSD2. The entire European financial market will be affected by PSD2, which means that all countries must eventually follow. The countries are at different stages in the implementation process, and it is therefore beneficial to get information from several countries. Due to localization and personal connections the interviews are with Norwegian and Danish sources. The technological development is continuously evolving. Thus, it is possible that extensive innovations and improvements can change the digital competition in a short time. Therefore, the thesis focuses on the latest and most relevant information to develop a credible analyze. However, the rapid development could potentially lead to some shortcomings in the description of the current market competition. The thesis has a cut-off point at 1st of May due to the deadline of the master thesis on the 15th May. Thus, no new information regarding the digital competition is added after this date.

2.0 METHODOLOGY

The aim of this chapter is to provide a thorough understanding of the methodology applied in this master thesis. It highlights the guidelines for the thesis, explaining the justification behind the chosen research methods. The section explains in detail which research approaches and strategies that are used to eventually reach a reliable and valid conclusion. Additionally, this includes the research strategy, generalizations, scope and demarcations of the paper. Furthermore, the section entails descriptions of the literature outline in addition to rationalization of the interview study. To highlight potential limitations of the thesis, the validity and reliability of the methodology is included in the discussion. This way the section aims to enlighten the reader when it comes to the discussion and results desired to obtain from the thesis.

The thesis pursues an inductive exploratory research method. This method gives the researcher a better understanding of the topic through focus on the exploration of ideas and insights about the research field (Saunders et. al, 2009). It contributes to the collection of valid and reliable data relevant to answer the research question developed in this thesis, and thus it follows the objectives from chapter *1.3 Research question*. Due to the scope of the thesis it is crucial to prevent an information overflow. The chosen inductive research approach prevents this by providing the opportunity of quality data collection and a smaller sample size (Saunders et. al, 2009).

2.1. Research Approach

An interview can be defined as a purpose of discussion between at least two people (Kahn and Cannell, 1952). The explorative research approach in this thesis emphasizes on in-debt interviews with relevant participants to gain new and valuable information to the research field. It is necessary for the discussion of the research question to understand the reasons for the decisions that the research participants have taken, as well as the justification of their opinions (Saunders et. al, 2009). This will be further outlined and justified in section *2.4 The Interview Study*.

To supplement the interviews the research of the thesis is based on various written texts on the subject of PSD2, including journals, annual reports, articles and other publications from stakeholders. Publications from the European Commission are crucial in order to understand the development of the laws and regulations which are relevant to the research question.

2.2 Literature Outline

The literature search of a research paper should be a continuous process during the entire life of the project. It is an ongoing process throughout the writing process that should culminate in critically assessed literature that are linked to the relevant theories of the field (Saunders et. al, 2009). As the research topic of this master thesis is a current event it is especially crucial that the paper emphasize continuous literature search to stay on top of the topic and cover recent developments. The aim of this section is to facilitate the reader to develop knowledge and insights regarding previously conducted research and the consistent tendency in this literature. The literature should contribute to an insightful analysis and discussion to reach a reliable conclusion to the research question of the thesis. To accomplish this, the analysis should contribute to new findings or theories, which the literature has formerly neglected (Hair et. al, 2015).

To review the literature in a way that provides an effective analysis of the research questions the literature outline is complemented with strategic and disruptive innovative theory. This way both the reader and researcher will get an improved understanding of the objective of the thesis. The implementation of PSD2 are caused by the technological development and how it provokes the banks to face a wave of disruptive innovations. It is therefore useful to understand the theory of disruptive innovation as this will help analyze how banks should change their business strategy to adapt to the increased competition. Furthermore, this comprehension makes it possible to analyze how traditional banks may disrupt the disruptors and fight for their market position.

The literature chosen for this thesis are analyzed from a critical view, using a healthy skepticism to provide a reliable and valid discussion based on arguments in the literature outline. A critical eye enables the analysis to justify with clear arguments based on the discussion of supporting and opposing literature. Despite that the field of PSD2 literature is relative new, the current stream of papers on the subject is significant. However, due to the limited existence of PSD2 the academic research is narrow. To get a more comprehensive analysis, the literature outline is complemented by an interview study. This ensures large and relevant data sample for the analysis and provides insight to professionals which are currently mapping the consequences of PSD2 in their various environments.

2.3 Research Strategy

This section addresses the strategy followed in this master thesis. It will also clarify various aspects and predictions that have been used as a base for discussion through the thesis.

2.3.1 Development of Research Question

During the second semester of the master program at Copenhagen Business School the authors of this thesis wrote a business project related to the implementation of PSD2. The project increased the interest and knowledge to how technology affects the banking industry and provided the basis for the research question of this thesis. The formulation of the research question begun with careful preparation and consultation with supervisor Jens Borges. In addition, there was a dialogue with the IT-consultancy company Netlight which provided good advice and insight into formulation of the research question. Based on these conversations, the research question was formed:

"The implementation of PSD2: How will the digital competition change and how will it affect the future of banking?"

The research question is an open question. This facilitates research from the banks' perspective to how traditional banks prepare themselves for PSD2, how they will be affected in the future and how they in the best possible way can follow a strategy that makes them competitive in the digital competition. In this way, to have an open question allows for research in a broader aspect and gave the opportunity to narrow the scope down as findings were made.
As the process and the master thesis progressed, it became reasonable to produce three sub questions under the main research question. By adding three sub questions, it will provide an even deeper insight into this field. Furthermore, due to the course of data and information gathered, it prompted the formulation of the sub questions. The master thesis will aim to offer an answer to the main research question, as well as the three sub questions, through discussion and analysis.

2.3.2 Literature Review

Literature review is the first part of the master's thesis offers relevant literature about the content of PSD2, causes leading up to PSD2, and the opportunities and challenges the banks face as a result of the directive. As the implementation of PSD2 is an ongoing process and the directive is still under construction, much of the literature has been obtained from credible media in the department of financial and banking business. In addition, literature has been derived from up-to-date consultant reports, the annual reports of the traditional banks and their statements, as well as excerpts from the European Commission's sections. Furthermore, multiple legit media articles and academic reports within field of the banking industry and PSD2 provide an excellent collection of information and insight into the traditional bank's position, performance and strategy.

2.3.3. Data selection

Data in this Master's thesis has mainly been taken from the information gathered through in-debt interviews with Danske Bank, Nordea, DNB, Collector Bank, Auka and Deloitte. Furthermore, data has been obtained from the selected banks' annual reports with the intention of providing better basis for the analysis and building up discussions and statements. Thus, the data collection is used to provide evidence behind the argument for how the banks should adapt to the changes.

Based on the master's degree program Finance and Strategic Management, the assignment is written from a strategic perspective. Hence, the thesis aims to explain the banks' strategic choices and does not go into detail in the legal aspects of PSD2. The discussion and analysis of legislation and regulation in the thesis is written from a strategic perspective based on legit media, consultant tasks and annual reports. Furthermore, the thesis contains a limited amount of financial data taken from the annual reports 2015-2017. The reason for this time period is because it gives the best insight into how banks have tried to change over the last recent years. In addition, as PSD2 is in an ongoing implementation process that will affect future data, historical data that originates from far back in time, is not considered relevant to this thesis.

2.3.4 Empirical Evidence

The aim of this thesis is to evaluate how traditional banks can access innovation and thus adapt to the changes that follows the implementation of PSD2. The assessment is based on in-debt interviews, qualitative and quantitative reports. This data allows for discussion and analysis in aim to provide a reliable answer to the research question.

2.3.5 Discussion

The thesis follows a deductive reasoning approach. Thus, the basis for the analysis, discussion and different perceptions in the thesis is derived from sources of different scope.
Based on the literature review, the thesis aims to provide an understanding of what the banks' current position looks like and what their starting points are in relation to do measures to prepare themselves for PSD2. Furthermore, the banks' future strategy and process of restructuring in accordance with this strategy have been based on data from the interviews and financial data from annual reports. To achieve the best possible discussion and analysis, various predictions have been made. Thus, based on the data gathered by combining both qualitative and limited quantitative findings.

2.4 The Interview Study

The interview study is based on six participants and this is thoroughly outlined in section *4. Data.* The participants represent different banks, a Fintech company and a technology consultancy house. The big, traditional banks are represented by Danske Bank, DNB and Nordea, while Collector Bank represents the smaller, more digitized banks. Deloitte provides customers with coping with the impact of digital transformation, while Auka is a Fintech company which offer mobile payments solutions for retail banks.

The selected banks for the interview study are all operating in the Scandinavian countries. The rationale behind this selection is that they were interested in the research question and wanted to contribute to this master thesis. Furthermore, the selected banks have expressed interest in access to the final draft of the thesis. This is due to personal connections, shared language, culture and common interests in the consequences of PSD2, as well as practical limitation which follows the scope of the paper and time available. This implies that the collected data and the analysis which follows are reliable for banks in this specific region. However, much of the intention of PSD2 is to erase the borders within the Europe payments service industry. PSD2 applies to all countries in Europe, and with the digitalization there will in practice no longer be any borders because products and services gets digitized (Løverås, 2018).

Interviews with six different market participants provides the analysis with valuable data from multiple actors within the industry. Including a Fintech company and a technology consultants house in the interview study provides a broader expertise to the data collected. Furthermore, this data provides knowledge to how the different market participants approach the implementation of PSD2 and a thorough analysis ultimately leading to answers to the research questions of the thesis. The interviews are conducted with related questions, comprised in appendix 1. However, all participants are not asked the exact same questions. This is because some participants may have more technical knowledge than others, and thus the questions range in level of complexity and technical specificity to ensure that all interview participants get questions within their own field of knowledge. This ensures that the data collected from the interviews are based on solid knowledge and experience from the participants. Furthermore, it prohibits that the technical competence limits the study.

2.4.1 Interview Style

The thesis contains interviews executed on Norwegian through physical meetings or over the phone, and all interviews were recorded. To ensure the right understanding of the data collected in the interview, any follow-up questions were sent on mail in the aftermath. Furthermore, the interviews were translated and rewritten to a summary and then sent to the participant for approval. To answer the research question of the thesis, it was necessary to understand the reasons for the decisions, attitudes and opinions of the research participants, and it was therefore desired to conduct qualitative interviews (Saunders et. al, 2009). The benefit of using semi-structured and in-depth interviews is that it provides the thesis with the opportunities to explain, or build on, their responses. Because interview participants may use certain words or gesticulation in a particular way, the opportunity to probe these meanings adds significance and debt to the data obtained (Saunders et. al, 2009). The result is a rich and detailed set of data collected.

Half of the interviews were physical meetings and the other half were conducted over telephone. There are pros and cons to both interview styles and this has been taken into consideration when conducting the interviews. The advantages of telephone interview are the aspect of access, speed and lower cost. The disadvantage with such an interview style is the risk of losing the aspect of personal contact which may lead to more honest answers as well as lack of the opportunity to observe body language (Saunders et. al, 2009). However, as the study of this master thesis is conducted from Copenhagen, telephone interviews were the best medium in half the cases due to the geographical constraints and limited time.

Nonetheless, the interviews were conducted face-to-face when possible and appropriate. This interview style is highly desired because it provides not only the answers and opportunity to build personal relations, but also observation of body language which gives a new dimension to the interpretation. The risk of physical interviews is the risk of getting a too personal and informal tone which might reduce the productivity (Saunders et. al, 2009). Thus, it is beneficial to conduct both interview styles to conduct data for this thesis where the questions developed are both complex and open-ended.

2.4.2 Sampling Method

The key to a successful interview is careful preparation. This is necessary to ensure relevant interview participants, the validity and credibility of the interviews, as well as to prohibit all forms of bias. It is crucial to meet prepared to prohibit interviewer bias, which also includes the appearance of the interviewer during the interviews (Saunders et. al, 2009). Thus, it is critical to plan how to demonstrate credibility and obtain confidence of the interview participants. This implies a that a thorough understanding of the topic of PSD2 up-front is necessary to demonstrate the knowledge of the research topic and gain respect from the interview participants. Furthermore, to ensure the credibility, validity and reliability the interview participants received relevant information before the interview. This provided them the opportunity to prepare themselves for the discussion (Saunders et. al, 2009).

Interviewing is a time-consuming process, and due to the impracticality of collecting data from the entire payments service market, a sample collection is needed. The technique used in the interview study follows the non-probability or judgmental sampling proposed by Saunders et al (2009). Collecting data from few cases also enables the interviewer to gain more detailed information regarding the topic, which is desired to answer the research question of the thesis (Henry, 1990). Thus, the relevance of the interview participants was carefully considered before they were contacted. Furthermore, it is in the thesis best interest to focus on professionals with deep knowledge about the specific areas of PSD2, technology and banking, rather than a larger sample with reduced opportunity to go in-debt. This way the sample prevents the researcher to get stuck with the sampling dilemma, which is the cost and time of doing interviews across the entire population (Henry, 1990).

As the sample chosen are best suited to answering the objective and research question, all sampling processes are strategic (O'Larry, 2004). The aim of this master thesis is to get information from companies and professionals within the payments service markets, and the sample is therefore chosen on the basis of interesting and leading companies within this field. Based on their knowledge, position and experience, these companies are believed to be of interest. The companies interviewed are handpicked after careful considerations, which is a solid way to ensure a certain amount of variation within the sample and that the participants cover the desired kind of expertise and knowledge (O'Larry, 2004). Furthermore, the targeted individuals are strategically chosen within the selected companies to ensure access to the most skilled individual within the field of PSD2 (Saunders et. al, 2009).

2.5 Generalizations

There are a limited number of representatives in this master thesis. The thesis is based on companies from the Nordic region and is therefore written from this perspective. The reason for this is that interviews and conversations have been possible to carry out based on relationships and contacts in this region. Nevertheless, PSD2 is a EU directive that will affect the entire European banking market. Thus, although the thesis does not retrieve data from all countries affected by the directive, it is believed that the sample of selected companies produces a representative perspective for the rest of Europe. One must take into consideration that certain assumptions will be different in various countries due to differ in culture, business models and strategies. However, the master thesis provides a good insight into what challenges and opportunities the banks in Europe are facing as a result of PSD2.

2.6 Scope and Demarcations

The thesis is primarily focusing on the strategic choices the traditional banks can pursue in order to face the challenges and opportunities of PSD2. The EU-directive will lower the entrance barriers for third-party providers, increase the digital competition and aims to provide customers with more secure and low priced digital payment services. It is important to understand that the thesis is not aiming to state all the consequences that result from the implementation of PSD2.

Furthermore, the thesis' geographic perspective is written from the Nordic region. Hence, the companies that have been interviewed in this thesis are represented in Denmark, Norway, Finland and Sweden. Thus, the thesis does not cover the entire European market and every company affected by PSD2. However, it provides a good insight and representative perspective on what companies affected by PSD2 can expect or similar in the future. Additionally, the scope of companies selected provides an overview of similarities within the Nordic countries.

The strategic analysis of the Nordic banking sector mainly focus on the business model of the banks, however, due to such a scope of the subject, it is not possible to cover all aspects of it. Additionally, it is challenging to find new data as the directive is currently in the implementation process.

3.0 LITERATURE REVIEW

3.1 Background

3.1.1 Market

On January 13th 2018 the implementation process of PSD2 began in Europe. The purpose of the EU-directive is to regulate the payment services industry in EU and the EEA. The directive aims to promote innovation, facilitate increased competition in the market for payment services, in which their will be more options for customers and decrease in price. Additionally, PSD2 intend to strengthen the security of online payments and access to accounts (XS2A). Furthermore, the directive seeks to improve interaction between different types of actors and further correspond EU regulations. PSD2 has an implementation period of 18 months and are set to be fully implemented and thus regulated in the last half of 2019. (MuleSoft, 2018).

Reviewing the banking sector, the market is currently characterized by bank-held customer account data (Deloitte, 2018). Banks have up until now appreciated the monopoly and thus full control of the entire financial services value chain (McKinsey and Company, 2018). In this matter, European banks have been independent actors that plied their customers with financial services ranging from checking transactions to credit cards to mortgages, in addition to possess analysis of data on their habits of spending (Robinson and Henning, 2018). This signifies that well-established banks already have the advantage of access to enormous amounts of customer information that new markets entrants such as fintech companies like Auka could only dream of (Browne, 2018). In which, such monopoly of customer information and data has structured the market so that banks only have been competing with each other. However, that is about to change (Evry, 2018).

3.1.2 Digitalization in the Banking Market

Up until now, banks have been surprisingly little affected by the influence of the Internet. To the extent that banks have digitized, they have focused on the most standard customer transactions and services, such as online banking, access to bank accounts and external deposits. Looking at other services, the areas of underwriting, marketing and servicing of loans have not been prioritized (Indra Company, 2014). Having effectively a monopoly over customer information, are in position to take fees for requests of end-of-day bank account statements, as well as other services in form of transactions. However, after PSD2 is fully implemented, banks will be forced to open their APIs and thereby enable TPPs to collect bank account information on behalf of customers with permission. As a result, TPPs could produce and provide low-priced digital solutions built upon the banks' infrastructure, in which will push the fees and commissions down. (Financial Times, 2018).

Over the last 10-20 years trends in globalization, digitalization and shared economy has emerged. The banking industry are heavily affected by these trends both in terms of the evolvement of new services and products, and by replacing current manual and physical services with digital solutions. Computers are able to handle enormous amounts of data in a short time, which thereby enables the companies to provide more efficient and up-to-date products and services. Thus, new digital solutions will be more user-friendly and enhance better customer experiences. In addition, competition within various product areas will be tougher and one can expect that several of the competitors will be international actors with entirely different business models than the traditional bank. The introduction of PSD2 will make these changes escalate at a higher pace than ever before, which in turn will challenge the somewhat outdated business models of traditional banks. (Årsrapport 2014 DNB-konsernet, 2014).

Traditional banks have began to adjust their investment areas to face the increased development and demand for innovation in the market. For instance, DNB transformed their organization in 2015. This were done by bringing together the department responsible for innovation and digitization in the same support area that administer the IT developments, forming a kind of cluster. The annual report of 2014 states that DNB's "Innovation and Development" was at 3 points on the scale of the Essence Analysis. This means that this post is "less important" (Årsrapport 2014 DNB-konsernet, 2014). Nevertheless, in the annual reports for 2015 and 2016, "Innovation and Development" have increased on the scale and have become of one of the most essential investment areas for DNB. (Årsrapport 2015 DNB konsernet, 2015; Årsrapport 2016 DNB-konsernet, 2016). Further, looking at the annual report for 2017, DNB's operating expenses increased by NOK 230 million in comparison to the second quarter of 2016. This is mainly due to an increased level of activity in marketing, digitization projects and development of IT systems (Årsrapport 2017 DNB-konsernet, 2017).

Danske Bank was hit hard by the financial crisis in 2008 and struggled for years as a result of this. In 2012, the bank faced even more challenges. Thus, the bank's disreputable 2012 marketing campaign "New Normal" was perceived as very arrogant and as a result, numerous customers left the bank. Since then, Danske Bank's has recover its image. Thus, the bank's share price has increased from DKK 92 in December 2012 to a current price of approximately DKK 237 in March 2018, an increase of approximately 155% (Digit, 2018). One of the reasons for this is the bank's leading position in digital banking and mobile payment solutions. By disrupting its own industry, the bank strives to get ahead of IT companies, such as Google, Apple and Amazon.

Moreover, Danske Bank's general strategy includes adopting the digital transformation, and was one of the first banks in Europe to launch digital post for more than 10 years ago (E-boks, 2018). Like most banks, Danske Bank has managed to move its customers towards online E-Banking. Out of the bank's 3,2 million customers, 2,2 million of them are using the E-banking platform to access pension, accounts, trade stocks and pay bills. Additionally, by developing products such as MobilePay, the bank aimt to become a leader in digital payments services. The MobilePay app is a payment platform for making payments, transfers and donations with just a swipe on the phone (The Boston Consulting Group, 2018).

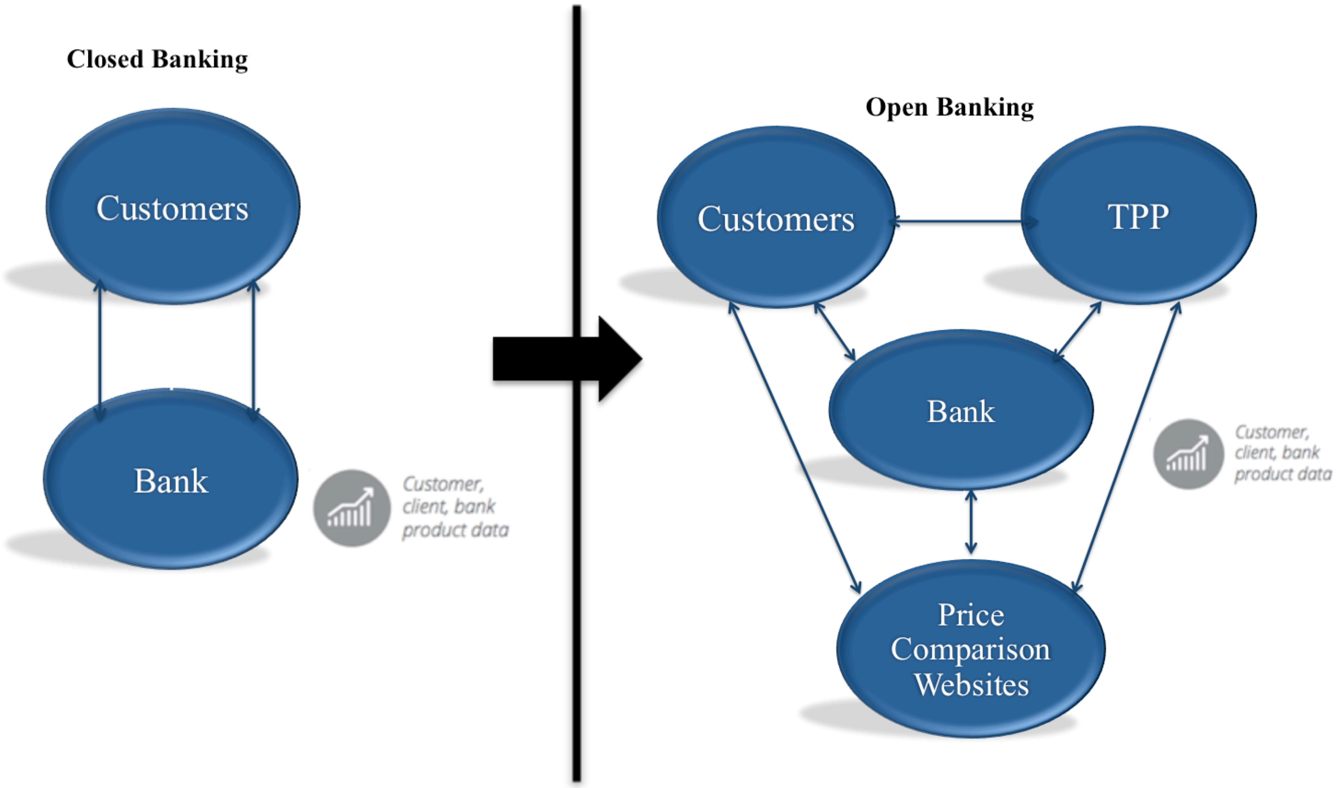
MobilePay became hugely successful which has placed Danske Bank in a leading position within the digitization (E-boks, 2018).

Digitalization is one of the major drivers for the implementation of PSD2. In Nordea's annual report of 2017 the bank stress the importance of the rapid growth in customer demand for mobile solutions (Annual Report Nordea, 2017). In order for Nordea to meet the customers needs and to become a truly digital bank, the bank is pursuing a transformation of its entire business model. The ramp-up phase of this transformation was completed during 2015-2017 and the bank is currently in the execution phase, which will continue till 2021 (Annual Report 2017 Nordea, 2017). The goal of this transformation is that Nordea's processes, infrastructure, IT, operations and channels will be up-to-date, hence enabling agile, compliant and efficient operations. Nordea has introduced several strategic initiatives to maximise value creation, enhance efficiency and align competences. For instance, Nordea focus on increasing the use of robotic, reduce and consolidate technology infrastructure complexity and applications and to provide a shared pool of services (Annual Report 2017 Nordea, 2017).

3.1.3 How will PSD2 affect the market?

So far, the research has revealed that several banks have begun to reorganize their business model and priority of investments due to changes that takes place in the market. The implementation of PSD2 will affect the market and the value chain of the sector, but there is great uncertainty to the complete consequences of the revised directive. PSD2 will lead to a fuller appreciation of the concept of open banking which will revolutionize the perception of banking. Current banking operating models are largely closed and characterized by secrecy (Deloitte, 2018). The concept of open banking demonstrates the shift from a closed model to a model in which information and data is shared between various members of the banking ecosystem with approval from the customers (Deloitte, 2018) . This process is illustrated in the Figure 2 below.

Figure 2: Closed and Open banking



(Source: Compiled by authors)

Open banking are based on the opening of Application Program Interface (APIs) which welcomes new market entrants. The opening of APIs enables TPPs to develop and build services based on the banks infrastructure and data, and is one of the most fundamental changes provided by the revised directive. This implies that PSD2 creates a fiercely competitive market where standard financial services such as transferring money will become a "banking-as-platform" service, which can be provided by several market players. In order for traditional banks to survive in the new market, they have to develop or built on digital capabilities to prevent from being outcompeted. In which, traditional banks must provide superior and more agile services to their consumers to be competitive (MuleSoft, 2018).

3.2 Development in Technology

3.2.1 APIs

Data exchange through open APIs is one of the key elements that enables banks and other companies to scale and exploit the network effect in the platform economy (Hernæs, 2018). Open banking are enabled by development in technology that offers equal functionality for consumers and banking entrants. The opening of APIs is the most significant development and consequence of PSD2 because it allows developers to incorporate third-party data and applications into their own services. Thus the opening of APIs has had an important role in allowing regulators to authorize the sharing of bank data (Deloitte, 2018).

In general terms API can be described as a set of certainly defined methods of communication between different software components, and includes requirements that administer how one application can interact and communicate with another (PwC, 2016). The story of Uber is accurate to illustrate the potential of utilizing open APIs. Uber grew from start-up to a global company by merging partner capabilities through open APIs. Uber used the Google Map API to track drivers and locate customers, Google's Cloud Messaging API for instant messaging, and Paypal's Braintree API for payment. Additionally, besides using TPPs APIs, Uber developed its own API and offered it to other firms to extend the reach of its services (PwC, 2016).

With PSD2 the European Commission wants to increase transparency and this requires banks to open up their solutions to other market players. A good API offers all of the building blocks required to develop a computer program, which are then combined with the programmer. Open interfaces often provides detailed information to the structure of the underlying data and application and this may reveal potential vulnerabilities, (Hærnes, 2018).The opening of APIs creates the potential of new business opportunities because it enables banks and TPPs such as Fintech companies to enter into partnership or collaboration. By doing so, traditional banks and TPPs are considered as members of a digital business ecosystem where they are dependant on each other (Payments UK, 2017). The value of this digital ecosystem increase with scale and enables the participants to acquire complementary products and services, which potentially can create higher value than the parties would have achieved on their own (Hærnes, 2018).

While new services can be developed specifically to work through API standards, all existing applications must go through an API layer. This layer in turn will manage the request and then return the necessary information to the customers or to the company requesting it. At the most basic level, the layer are on top of a bank's existing core services and process API requests from account information service providers (AISPs) and payment initiations service providers (PISPs) (Datastax, 2017). Nevertheless, implementing this is challenging for the AISPs and PISPs. This is because it is demanding to match the same volume of transactions per second that most banks receive. The customer experience of using banking services depends on security, ease and the availability of data. The evolution of Internet services and mobile apps has lead to high customer demands where anything less than 24/7/365 availability is perceived as poor. This requires up-to-date systems which implies that with existing services, it will be hard for banks to deliver customer data at a satisfying pace (Datastax, 2017).

A PwC Strategy and Study report on PSD2 from 2017 states that European banks should respond to open banking by reorganizing their business models which will allow them to collaborate with new partners and the exchange of data via APIs. This is necessary to prevent being vulnerable to service commoditization and competitive marginalization (Datastax, 2017). Open banking provides consumers with complementary products and services at the same time as they maintain total control of what information to share and which services they want to use. It creates new ways to offer banking products and services, which benefit the consumers with greater options and increased flexibility regarding payment solutions.

3.2.2 TPPs in the market

As previously outlined, PSD2 will lead to a shift in the market from closed to open banking. This shift will in turn cause TPPs to enter the market. Thus, by offering standardized access to banking infrastructure and customer data, PSD2 lowers the barriers for entrance to TPPs such as Fintech and Bigtech companies. As a result, lower barriers will prompt a wide range of new banking services and development of new business models. In this matter, PSD2 will be an incentive for both disruption and strategic renewal in the European banking markets (PwC, 2016).

Until now it has been difficult for new players to enter the payments market due to strict regulations. Hence, the high barriers prevented them from providing their services on a large scale and thus protected the banks from fierce competition. With the implementation of PSD2, the European Commision seek to develop the European market for electronic payments. This will allow retailers, other market players and consumers to exploit the full benefits of the internal market of EU and EEA, in line with the digital single market. When removing the high entrance barriers, the amount of competitors offering cheaper and more user-friendly payments solutions are expected to increase (Europa.eu, 2018).

The implementation of PSD2 involves that banks will compete against every actor who provide financial services (Evry, 2018). There is great uncertainty to how the increased competition will shape the future payments ecosystem. However, the banks have started their process of determining their further strategies to utilize the opportunities that the new payments ecosystem will generate. The competitors for PISP and AISP are companies like, Amazon, Facebook, Apple or Google. These companies are likely to provide payments services and thereby compete against or enter into collaboration with the banks (Accenture, 2016). In the near future, consumers may use social medias like Facebook to pay their bills, analyse their spendings and pursue P2P transfers, while still having their money safely placed in their present bank account. Thus, as non-banks starts to administer the customer interactions, banks may have an increasingly difficult time to be able to differentiate themselves (Evry, 2018).

3.3 Regulatory Technical Standards

PSD2 provides strict requirements which all players in the payments service market must fulfil. PSD2 empowers the Commission to adopt regulatory technical standards (RTS) developed by the European Banking Association in regard to Strong Customer Authentication (SCA) and Common and Secure Communication (CSC) (European Commission, 2017; Osborneclarke, 2017). The role of the RTS is to determine specific security measures that were only described through general principles in PSD2, and to guarantee secure and effective communication between the relevant players in the market. The RTS is therefore more concrete than PSD2 and they do not have to be transposed in national law to be applicable (Sepa for Corporates, 2018).

Moreover, the security measures described in the RTS occurs from two key objectives of PSD2; guaranteeing consumer protection and increasing competition and level playing field in a continuously changing market environment. By increasing the level of security on electronic payments the consumer protection is obtained. Thus, RTS introduces the security demands that TPPs and banks must take into consideration when they provide payment-related services or process payments (European Commission, 2017).

3.3.1 Strong Customer Authentication (SCA)

SCA are the security requirements that will reduce risk from fraud in addition to protect customer data (FinansNorge, 2018).PSD2 requires all payment service providers to apply SCA when the consumer enter its payment account information online, initiates an electronic payment transaction or pursue any action that involves risk of fraud or other exploitations (Osborneclarke, 2017).

All payment service providers must ensure that the consumer is aware of all costs that follow the transaction and who the recipient is. Additionally, the actors must ensure that the information is held confidential. Thus, if a customer uses a provider that does not require SCA, the customer is only responsible for the transaction that is subject to fraud. On the other hand, if the receiving customer's payment service provider does not accept SCA, the receiving customer must refund financial loss caused by the payer's payment service provider (Osborneclarke, 2017).

An decisive element of SCA is the two-factor authentication for situations that requires further security than username and password.In these situations, additional security related to personal identification are demanded (Gaynor, 2017). The authentication requires the use of at least two personal elements that only the user knows, and these are categorized as knowledge, possession and inherence. Examples of such two-factor authentication are additional questions that only a consumer would know, such as “what is the name of my first dog” or new approaches like fingerprint activation (Gaynor, 2017). Furthermore, within the area of card services there is already a program in place to ensure SCA called 3-D Secure (3DS). This is a function offered by providers of credit cards, which gives the consumers additional security by introducing another layer of password protection (Gaynor, 2017).

3.3.2 Common and Secure Communication (CSC)

Common and Secure Communication (CSC) is the second major principle outlined in the RTS. The goal of CSC is to boost innovation and competition in the payment market (Sepa for Corporates, 2018). In this matter, PSD2 created framework such as Account Information Services (AIS) and Payment Initiation Services (PIS) in order to provide CSC between TPPs and banks. These framework will regulate new services related to consumer payment accounts, and thus set demand for safe channels between the players in the market. European Commission, 2017).

Moreover, companies and consumers will be able to allow TPPs like PISPs and AISPs access to their payment data. This means that the banks must create a communication channel that will allow TPPs to access the information that they require (European Commission, 2017). This communication channel will enable TPPs and banks to identify each other when accessing customer data and communicate through protected systems at all times. Banks may construct this by adapting their customer online banking interface or by creating a new dedicated interface that involves all essential information for the TPPs (European Commission, 2017).

Furthermore, the legislation of CSC establish the contingency safeguards that banks have to create when they decide to build a dedicated interface. These contingency safeguards are also called “fall back mechanisms”. The purpose of such contingency measures is to ensure continuity of services as well as fair competition in the market (European Commission, 2017).

3.4 The Payment Service Directive

With the implementation of PSD2 the European Commission aims for increased transactions across the European borders. Thus, the intention is to make payments easier and cheaper for the consumers due to increased competition between the banks and TPPs The implementation of the first payment service directive (PSD1) in 2007 had the same purpose, but due to the rapid technological developments this directive is now outdated. As mentioned above, PSD2 will introduce new types of market participants. In essence, this includes account assemblers (AISP) and those who initiate payment services (PISP) (Høye and Nordahl, 2018). The following section will discuss PSD1 and PSD2, differences between the two directives, and how open interfaces affects the market competition. Further, this section introduces the two new industry players AISP and PISP.

3.4.1 The Payment Service Directive (PSD1)

The ambition of PSD1 was to create one single market for payments within the EU and EEA. The Single Payments Market (SPM) has in fact existed since 1992 and since 2002 Europeans have been able to buy and sell in cash using euros. However, before the implementation of PSD1, the market was significantly fragmented, with lack of cost-efficient and/or user-friendly payment services. Additionally, There were no standard rules or legislations within the payment service industry of Europe, which made the existing SPM inefficient for the consumers (European Commision, 2007).

Accordingly, the EC established a modern and harmonized legal framework for payments services. Such a framework creates an integrated payments market which enables electronic payments to be produced at higher pace within all of the European countries (European Commision, 2007). The directive is designed to help the SEPA to develop common standards for terms to regulate payment institutions to encourage non-banks to enter the market and thereby boost the competition (EESPA, 2007).

As illustrated, PSD1 has two main objectives; First, the directive aims to lower the entrance barriers and thereby promote increased competition and better options for the consumers (SEPA for Corporates, 2017). Secondly, to provide a simplified set of legislations regarding the information requirements, rights and obligations linked to the use of payment services across the EU and EEA (European Commision, 2007). This brings the legal platform for SEPA and simplifies payments made in euro currency across Europe (SEPA for Corporates, 2017).

The rules of the directive only applies to payments in EU currencies where both the payer and the recipient of payment service provider are located in the EU or EEA (European Commision, 2007). PSD1 creates the guidelines for modern payments across the whole EEA, which in addition to the EU countries includes Iceland, Norway, Switzerland, Monaco and Liechtenstein. The directive emphasize payment efficiency, innovation and reduced costs for consumers within this area and applies to all electronic and non-cash payments.(European Commision, 2014).

This should benefit the consumers in various ways such as lower prices, better security, improved service performance and more innovation. Furthermore, it brings substantial benefits like cross-border direct debits, use of card anywhere in the Euro area, faster payments, immediate use of payments received, enhanced consumer protection and limited liability (European Commision, 2007).

When PSD1 was introduced in 2007 the EC presented the potential savings associated with efficient payment services to billions of euros. In 2007 EU handled 231 billion payments a year, which represented a total value of EUR 52 trillion per year (European Commision, 2007). This is based on the difference in transaction fees. Electronic payment services cost only a few euro cents, while the cost of a cash transaction ranges between 30 and 55 euro cents. This makes the overall cost due to inefficient cash payments the main cost driver and account for almost 70% of total costs of the payment system in 2007 (European Commision, 2007).

To sum it all up, the purpose of PSD1 was to guarantee equal legislation and rights for payments all over the EU, including transparency, fast payments, consumer protection and an extensive choice of payment services. The goal was to create a SPM where cross-border payments are as easy, cheap and safe as domestic payments (European Commision, 2014). This established the legal platform for SEPA and is the foundation for what is today known as the revised Payments Service Directive, PSD2.

3.4.2 The Revised Payment Service Directive (PSD2)

PSD2 has been expected for quite a while and the revised directive has been attracting a lot of attention and debate. Thus, it has been discussed over the last years and the potential purpose, regulations and scope of a revised directive has been subject to speculations. PSD2 will fundamentally change banking as we know it, and as of today there are still a great deal of uncertainty regarding the implementation, regulations and the consequences. The intention of this chapter is therefore to outline what PSD2 is and thereby clarify why there is so much hype and excitement surrounding the directive.

Both PSD1 and PSD2 emphasize opening up the market to new types of organization and market participants, as well as defining common standards that encourage interoperability (Boden, 2015). As with PSD1, the scope of the directive is payment systems. It is therefore useful to clarify what can be acknowledged as a payment service within the scope of the directive. In this matter, a payment service includes electronic services offered to consumers and businesses mainly to handling payments and get an overview of their own finances (FinansNorge, 2018). As outlined in chapter 3.1.1, PSD1 comprise electronic payments and non-cash payments. The intention of PSD2 is to widen the scope of the regulatory framework of PSD1 to cover new services, players and additional geographies and currencies. Thus, the revised directive probably has significantly more relevance for consumers (FinansNorge, 2018).

The aim of the directive is to provide the legal foundation to secure further development of a more integrated internal market for electronic financial payments services across Europe (European Commission, 2017). PSD2 introduce comprehensive rules for payment services and includes account emerging and innovative payment services. The directive introduces regulations of (European Commission, 2017):

- **Strict security requirements** for electronic payments and the protection of consumers´ financial data;
- The **transparency** of conditions and information requirements for payment services;
- The **rights and obligations** of users and providers of payment services

PSD1 created a solid foundation for a legal framework, but the commission identified loopholes that needed to be fixed to enhance customer protection and improve transparency (SEPA for Corporates, 2017). After the implementation of PSD2 consumers are enabled to make transactions in any currencies across the borders of Europe. This also includes reducing entry barriers for new payment service providers and thereby accelerate the digital competition and digital disruption within the industry.

PSD1 opened for other players than banks to offer payment services, but the directive did not define the exact types of payment services these new market participants potentially could provide. This made the legislation ineffective and created the need for a revised directive. Thus, the big difference between PSD1 and PSD2 is that the revised directive does not exclusively regulate the banks and their payment services. It also regulates other payment service providers and the services they can provide based on the customer information in the banks´ account systems (FinansNorge, 2018). This introduces a new type of market participants, the Third-Party Payments Providers (TPPs).

With the implementation of PSD2, the 18 month implementation period from January 2018 will involve compelling changes for the personal customer market in banking operations. Until now, banks have basically possessed monopoly on customer account information and payment services but with the implementation of the new directive this will cease. Banks have to give other payment service providers access to customer data through open APIs. This means that banks must share their information safely with all licensed companies that are interested in making use of it. This will enable TPPs to build their financial services on top of the banks existing data and infrastructure. This implies that TPPs can develop and provide their services more rapidly and innovative than banks are able to do today. This in turn will fundamentally change the value chain within payment services (FinansNorge, 2018). As of today, the banks follows a product strategy, but with the digital development and implementation of PSD2 the banks are pushed toward a platform strategy to utilize the potential value creation created in the new digital ecosystem (Hernæs, 2018).

This implies that the directive will cause ripple effects and have consequences for both authorities, banks, TPPs and bank consumers all over Europe. PSD2 is driving new technologies and innovations and thereby tries to meet the changing trends that comes with digitalization. In line with the technological development banking has advanced from traditional branch banking to online banking and now mobile banking. PSD2 invites non-bank players to the banking market and enables them to provide a full spectrum of financial services if they fulfill the legal requirements. This constitutes what has been known as the "FinTech Revolution" (PwC, 2014). It is a technology-driven innovation and forces traditional banks to keep up with the rate of change.

In addition to the increased competition banks are also facing considerable financial challenges, mainly due to the expected reduce in income and increase of IT costs due to new safety requirements and the opening of APIs. With open interface the risk for potential fraud increase and the banks have to invest to improve and prepare their systems for the new digital competition (Hærnes, 2018).

Furthermore, financial services should be less formal, more personalized and easier accessible for consumers (Evry, 2016). A competitive advantage for the banks has until now been their unique and loyal relationship with customers . However, the consumers are slowly getting comfortable with using non-banks for financial purposes, for example, PayPal has existed for over 15 years and has gained high confidence in consumers.

Banks have to become more proactive and innovative to face the new and increasing competition. However, this is challenging because banks have a lot of legacy and it is not natural for them to be innovative at such fast pace. PSD2 do not care about legacy, rather it is all about being first, best and fastest. The question is therefore how the banks should approach innovation internally. It is not given that banks have the necessary qualities needed to be innovative. While TPPs such as start-ups and Fintech companies can release products and services on a try/fail culture, banks do not have the same opportunity. Banks are characterized by lot of legacy and dependency and they do not have the capabilities needed to develop and release services as fast as for example app-developers. They have too much to lose and big projects evolves to projects that are too big to fail (Netlight, 2018). The process is costly, takes too long time, there is a lot of prestige and they do not want to release anything until the product of service is 100% ready. The risk is that the innovation gets killed in the process (Netlight, 2018).

Historically, well established actors like banks have triumphed in the battles of sustaining innovations, while entrants have triumphed when disruptive innovations have emerged (Christensen, 2006). A disruptive innovation is characterized by its focus on different features of the product than the features most valued by the current mainstream customer (Christensen, 1997). TPPs are expected to rethink financial payments services through open APIs and develop innovative services that will disrupt the payment services industry. The difference between sustaining and disruptive innovations is how the innovation evolves a product. A sustaining innovation can be described as evolutionary and a disruptive innovation as revolutionary (Christensen and Overdorf, 2000). The implementation of PSD2 will introduce disruptive innovations through open APIs to the payments service market and both new markets participants and the banks may potentially gain from this. While a sustaining innovation improves the performance of a product in ways that are valuable to existing customers, a disruptive innovation creates an entirely new market (Christensen and Overdorf, 2000).

PSD2 provides great uncertainties and challenges, but the directive also provides compelling opportunities for banks to redefine their business and operating models to create new value and revenue streams through development of innovative customer services. The banks possess several competitive advantages, which in a resource-based view is caused by distinctive processes shaped by the firm’s assets and the path they have adopted or inherited (Teece et. al, 1997). The definition indicates that the advantage is in the combination of the banks’ competencies and resources, because this combination is hard to imitate (O’Reilly and Tushman, 2008). In other words, banks competitive advantages are not the core competencies or the enormous resources, but the combination of this.

As previously outlined banks are characterized by a lot of legacy and have adapted a set of routines, processes and values through history that in turn complements the company’s culture (Christensen and Overdorf, 2000), which are perceived as core capabilities, as they differentiate the bank strategically (Leonard-Barton, 1992). Each bank has individual core competencies and competitive advantages, but there are some competitive advantages most banks possess facing TPPs. One major competitive advantage is the banks distribution power and core competencies because they have had close to monopoly on customer data until now. This has enabled them to build a well-established relationship with the customers based on long-term trust, which is hard to imitate (O’Reilly and Tushman, 2008).

3.4.3 Third-Party Payments Providers (TPPs)

The revised Payment Service Directive will introduce open banking through open APIs and thereby invite new players into the payment services market. Until now, all transactions have gone through the traditional bank channels. With open banking, any party are enabled to have access to an account to complete a transfer, as long as they fulfil the security requirements (Long, 2017). This will open up to more providers and create a greater level of free-market competition, and the directive aims to do so in a more secure way. To ensure consumers´ safety when introducing open banking, PSD2 has prepared strict requirements that these players must fulfill in order to operate in the payments market. The two elements that European law generally consists of are the need to encourage competition among financial services providers, as well as the need to enhance consumer protection (Gaynor, 2017).

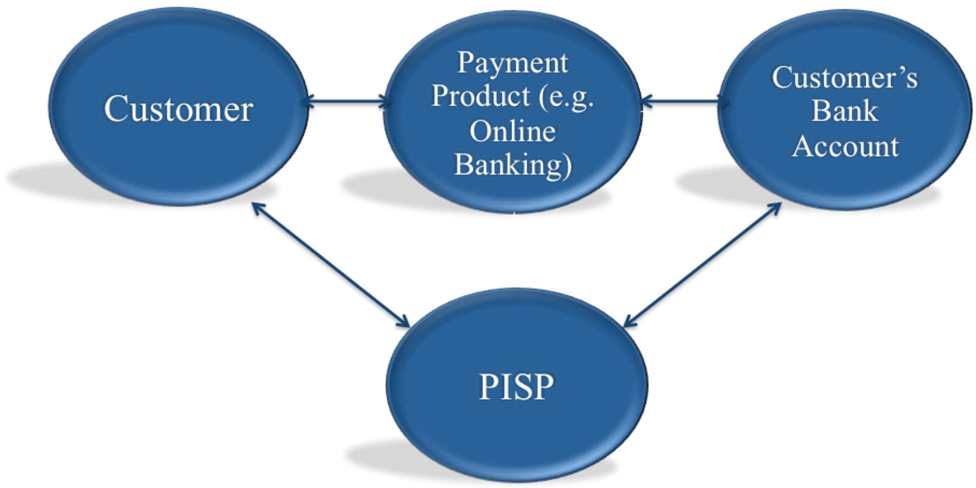
PSD2 is driven by the continual rise of e-Commerce and technological innovation in the payments services sector, and a key area of the directive is the regulation of TPPs which potentially can help stimulate a significant growth of financial players (Gaynor, 2017). The directive introduces two new players to the market, known as the Payment Initiation Service Provider (PISP) and the Account Information Service Provider (AISP).

The first player, PISP, manages the payment initiation, while the latter, AISP, manages the account. This access is called Access to Accounts (XS2A) and it is potentially the most powerful technological innovation in retail banking since the internet (Boden, 2015). PISP is a payments service provider who initiate an online payment on behalf of the user, and it may both be a bank and a TPP (FinansNorge, 2018). Examples of PISP services that are likely to appear when PSD2 is implemented is P2P transfers and billing payments. While PISP provides *payments* service, AISP is a provider of online account *information* services. Such service providers have access to the bank customers´ account information and manage to analyze the customers´ spending patterns or collect account information from multiple banks in a single overview. As with PISP, an AISP may be both bank and TPP (FinansNorge, 2018).

Figure 3: Current situation (before the implementation of PSD2)

(Source: Compiled by authors)

Figure 4: Example of Payment Initiation Service Providers (PISP)

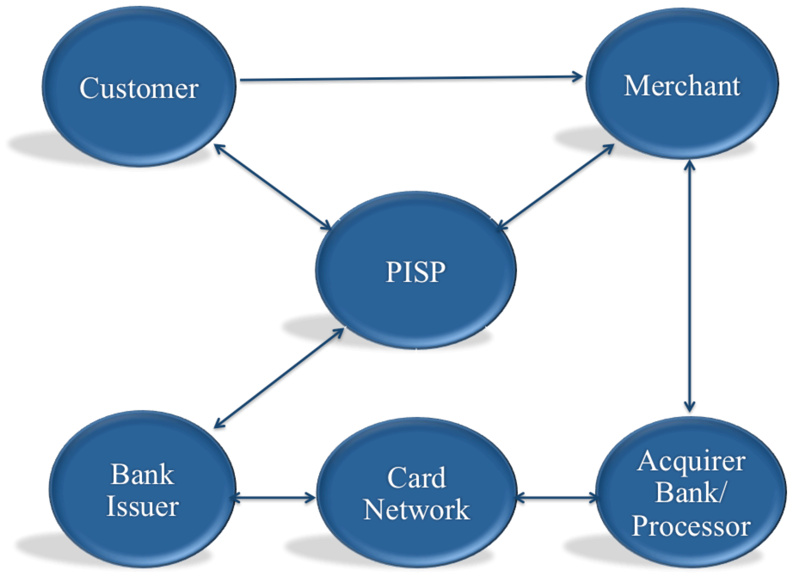


(Source: Compiled by authors)

Figure 5: Example of Account Information Service Providers

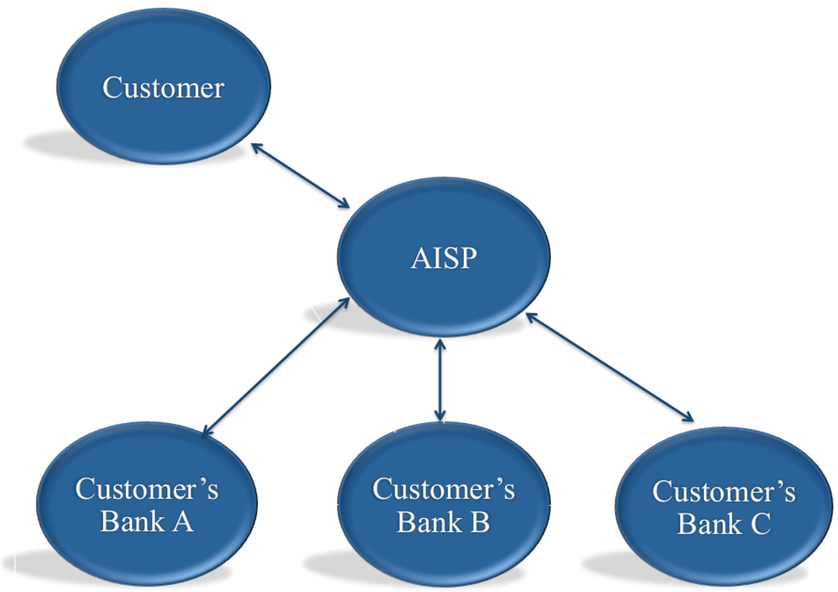
(Source: Compiled by authors)

Figure 6: An updated payment model including a Payment Initiation Service Provider (PISP)



(Source: Compiled by authors)

Figure 7: An updated interaction model including an Account Information Service Provider (AISP)



(Source: Compiled by authors)

(Compiled by authors, how PISPs and AISPs will change existing interaction models between customer and banks. Source: Homemade illustration inspired from table from Accenture.)

The radical change of open APIs will enable PISPs to launch innovative, safe and easy-to-use payments services. This aligns with the European Commission's desire to promote increased competition and innovation in the industry.The facilitation and support for TPPs is expected to increase competition and thereby benefit the consumers. Furthermore, the goal is to give consumers greater control and flexibility as they will be able to centralize all their personal account information and payment options on a single device (Gaynor, 2017).

3.5 Basis for further research

To summarize, there is much leading up to the implementation of PSD2, however the main reason is the rapid development in digitalization and use of the Internet. In which, the first payment directive (PSD1), implemented in 2007, is no longer sufficient (Høye and Nordahl, 2018). PSD2 aim to promote further innovation, facilitate increased competition, as well as strengthen security and access to customer information (Mulesoft, 2018). This in turn means that PSD2 will lead to a fuller appreciation of the concept of open banking. As a result, information and data is shared between various members of the banking ecosystem with approval from the customers (Deloitte, 2018). With open banking comes consequences which will have a ripple effect for both authorities, banks, TPPs and bank customers all over Europe (PwC, 2014).

The first aspect is that new players that fulfil the legal requirements can provide a full spectrum of financial services (PwC, 2014). Thus, this will challenge banks in their ability to deliver product and services at a satisfying pace (Datastax, 2017). This in turn raises the question to whether traditional banks possess up-to-date systems that enables them to do so. In addition, the competition for margins will be harder, in which banks can expect reduce in income and increase of IT costs. With open interface there will be a greater possibility to be exposed to fraud (Hærnes, 2018). Thus, the banks must therefore prepare their systems for new digital competition and improve security, if what they currently possess is not sufficient enough.

Furthermore, TPPs will challenge the banks' relationship with customers. Banks have for a long time lived well on a customer base built on long-term trust, which is hard to imitate. However, as anticipated, financial services will become less formal, more personalized and easier to access (Evry, 2016). Additionally, customers are getting more comfortable with using non-banks for financial services. This means that banks needs to make initiatives to retain their customer base, as well as attracting new customers. Furthermore, from another point of view, open banking creates the potential of new business opportunities because it enables banks and TPPs to enter into partnership and collaboration. By doing so, traditional banks and TPPs are considered members of a digital business ecosystem where they are dependant on each other (Payment UK, 2017). This requires that banks have the right capabilities to enter such partnerships and be susceptible to TPPs technology.

Indeed, PSD2 will change the banking as we know it, and there is currently a great extent of uncertainty and unanswered questions regarding which strategic choices the banks should follow to cope with the result of directive. This in turn gives a great bases for further research. Thus, in the following sections this thesis will provide more data and analysis in order to answer the posed research question.

4.0 DATA

This section will provide data collected through interviews and annual reports to build up the discussion and analysis. The majority of the data is interviews conducted with Danske Bank, Collector Bank, DNB, Nordea, Auka and Deloitte. As this thesis is written from a strategic perspective, a qualitative method has been used to collect data. In addition, the data focus on the Nordic region.

Regulations and supervision have been drawn from a strategic perspective, not a legal perspective, and therefore the thesis do not go into detail of the scope of the regulations. Regulation and supervision is based on legit media and parts from European Commission paragraphs. Furthermore, the regulation resulting from PSD2 are under construction, and it is therefore challenging to go into depth with no specific details to refer to.

The financial data are limited and conducted from the banks annual reports in the period 2015-2017. The reason for this is because, as PSD2 is in an ongoing process and the directive will affect future data, historical data from a long time back is not relevant to this thesis. Data from the period 2015-2017 illustrate the most conspicuous changes the banks have made for preparing for PSD2.

This section is to provide a basis for further discussion and analysis in the assignment.

4.1 The Interview Study

4.1.1 Participants of the Interview Study

The thesis addresses a number of companies based on their differs in characteristics. The companies differ in position in the market, strategy, structure and technological development. The majority of the interview participants are big, traditional banks, but to gain debt to the thesis it is useful to acquire knowledge and information from other market participants as well. Therefore, the interview study includes a smaller bank, a Fintech company and a consultant house.

The aim of analysing a multitude of various companies is to illustrate the market in the best possible way. The analysis also gives a better depth, in which a variety of actors provide a better insight in both banks' and TPPs' perspective. Furthermore, the employees that have been interviewed in each of the companies have different roles, variety in backgrounds and various degrees of experience. This in turn, provides a diversity to the analysis, as well as a variation in mind-set.

Deloitte

Deloitte is a market-leading company providing audit, lawyer services, financial advisory services, risk analysis and consulting services. Deloitte focuses on helping customers realize their ambitions and create a positive difference in society. In this matter, Deloitte has spent a lot of time and resources on how the digital development has a significant impact to how customers perform daily tasks. In addition, Deloitte adress how the banks have a unique opportunity to leverage the growing interest. This makes Deloitte a relevant participant for the analysis. The interview was held at Deloitte's offices in Oslo on April 3. from 09.30 pm – 10.30 pm and both Elise and Christine participated in the meeting. The employee that was interviewed in Deloitte was Phu Le Duong. Phu Le Duong's current role is director of financial services. Earlier in his career, he worked as Senior Consultant, Head of Product and Head of innovation and "future banking" in DNB. Thus, with Phu Le Duong's experience in both banking and consultancy industry, his participation offers a broad mind-set.

Auka

Auka was nominated as the "Fastest Growing Fintech" by Deloitte Fast 500 EMEA. Auka work with banks and offer their expertise to enable banks to become leaders of technology-driven innovation. The company has a platform that allows for retail banks to offer innovative services and products to business and consumers without the overhead from legacy IT. A Fintech's perspective gives an insight into what banks can expect from TPPs, which makes Auka highly relevant to the analysis. The interview was held at Mesh in Oslo on April 3. from 11.30 pm – 12.30 pm and both Elise and Christine participated in the meeting. The employee that was interviewed was Martin Braaten Grina. He currently works with user experience lead in Auka. He has previously worked as consultant for Netlight. Martin Braaten Grina has a long experience within the Fintech industry, in which he offers a different point of view than a banker.

Nordea

Nordea is the largest bank in the Nordic region and one of the largest banks in Europe. Nordea is also one of the top ten providers of financial services in Europe, measured by market value. It is therefore interesting to see how such a large bank converts to PSD2. The interview was held on Skype on March 26. from 14.00 pm – 14.35 pm and both Christine and Elise participated in the meeting. The employee that was interviewed was Njål Stene, who currently works as Business Developer in Nordea. He has been working in Nordea since he graduated, at the department of Corporate Strategy and Development. Njål Stene provides a good insight into how Nordea operates and what strategy the bank are following in order to prepare themselves for PSD2.

Danske Bank

Danske Bank is the largest bank in Denmark and the third largest bank in Norway. Due to its strong position in Denmark and strong roots in Norway, it is interesting to see how PSD2 will affect the bank's progress. As a desire to be the leading bank in the north, it is beneficial to analyse what strategy the bank is to follow to meet a digital future. The interview was held at Danske Bank’s offices in Copenhagen on April 9. from 4.00 pm – 4.30 pm and both Elise and Christine participated in the meeting. The employee that was interviewed in Danske Bank was Bent Eidem, Head of Business Development. He has a long experience within Danske Bank, both in Denmark and Norway. Thus, Bent Eidem offers unique expertise to how the bank plan to develop and reach future goals. Additionally, further insight into how the bank is working to get ready for PSD2.

DNB

DNB is Norway's largest bank and one of the Nordic region's largest financial groups, offering a complete range of financial services through mobile, online banking, banking and international offices. The bank focuses on creating an easy everyday life for its customers. It is useful to analyse how DNB operates compared to its competitors in the Nordic market, in order to prepare themselves for PSD2. The interview was held over the telephone on April 13. from 11.00 am – 12.30 am and both Elise and Christine participated in the meeting. The employee that was interviewed in DNB was Christian Løverås. He currently works in open banking with technology (Strategic partnerships/new business) in DNB. He has over 25 years of experience with web, digital technology and digitalization. Combined with his experience within banking, offers a broad perspective on how banks are changing towards a digital future.

Collector Bank

Collector Bank is an innovative digital niche bank offering financial solutions for private and corporate customers. The bank's head office is located in Gothenburg, but also has offices in Stockholm, Helsinki and Oslo. In contrast with the other banks in the interview study, Collector Bank is a newer, smaller and more digitized bank. It is interesting to see how such a bank is pursuing its strategy in relation to other players in the Nordic market. The interview was held over the telephone on April 16. from 07.00 pm – 08.00 pm and Christine participated in the meeting. The employee that was interviewed was Henrik Bendiksen Jordal, who is currently working as Client Executive Coordinator at the offices in Oslo. He has worked in Collector Bank since he graduated and offers a good insight into how the bank operates. He works with collaborators and customers, and it is therefore interesting to see how Collector Bank attracts such cooperation.

4.1.2 Interview Study Results

The results of the interview study reveal both similarities and differences regarding the selected banks´ strategic approach to the implementation of PSD2. This section provides insight of the results aiming to create a simple and clear picture of the current situation. The overall result is that the three big, traditional banks DNB, Danske Bank and Nordea, have some similarities to their approach of PSD2, while the digital bank Collector Bank want to continue being a niche bank and thus have a different strategic approach. The data collected from Deloitte and Auka provides valuable insight from other market players and will be important in further analysis. The qualitative data are gathered through personal meetings and the results will be further analyzed in section *5. Analyze.*

The interview study emphasizes the issue of how to become a winner in the technological competition. The overall approach in the Nordic market seems to be that banks must manage to start thinking about innovation much more open and that the digitalization is pushing the banks to transition from a product to a platform strategy, where value will be created by the interactions between platform participants. DNB focus on utilize new technology and dare to experiment, even when it is difficult to predict the effect in advance. To utilize new opportunities, they focus on being an attractive employer and acknowledge the value of collaboration. Danske Bank emphasize on developing solutions that are best for their customers. As a digital bank, Collector Bank aims to be the leading digital niche bank in the Nordic region. Their focus is on continuous development and providing new ideas.

To become an innovative bank, Auka highlights the importance of being forward-looking. This is because the competition is increasing and will within the next years become extremely high, no longer just from other banks, but now also from TPP such as Fintech companies like Auka. This includes not only having good ideas, but the ability to actually put something into life. To do so, DNB believes in learning from their mistakes and always be open to learn something new. Danske Bank on the other hand, aims to be open to how innovation will improve and evolve. Nordea approach innovation through collaboration with other companies, both small and big. The very foundation of Collector Bank is to be innovative and come up with new ideas at all times. Furthermore, Collector Bank emphasize on keeping up with the changes in the market and try to find simple and good solutions for the customers.

The interview study results reveal that there is a lot of work to do to ensure that there is enough room for technical development in the banking and finance industry. The selected banks have different strategies, but both Nordea and DNB emphasize in building the right culture internally. This is done through their own internal initiatives like Nordea Accelerator and DNBs own internal digital lab. The similarity between these initiatives is that they aim to develop initiatives like lean start-up, design thinking and design sprint to drive the innovation work. As a digital bank, IT is the core of Collector Bank and the IT-department is the largest one in the bank. They have a slogan called "Believe in the idea", which is incorporated in the company culture.

Deloitte states that the key for the banks is to give as much responsibility as possible down the organization and changing the organization's risk profile, and that this is one of the greatest challenges the banks face today. Furthermore, the consultancy company stress the fact that innovation is not equal creativity. It is not about providing the most creative ideas, but the ability to implement and execute on it. This means that in order to ensure that there is enough room for technical development in the bank, the bank must also make sure that there is room for agility.

All the interview participants are concerned about the structure of the decision-making process is the banks. The interview study results identify an industry struggling with old-fashioned organizational culture based on leadership at the top. Compared to TPPs the banks possess strict internal hierarchies, which makes the banks decision-making processes way too slow.All the banks approach this issue through restructuring into smaller teams. Through this strategy they aim to push the decision-making power further down the organization and thus become more agile and efficient.

The interviews reveal that all the banks are characterized by a project-based allocation of people.Thus, the banks assign employees to various projects in the very beginning of the year, in which the employee work on the project throughout its lifetime. This classic waterfall model has been successful until now because it makes the employees well prepared for relevant projects, but with the digital transformation of the banking industry, it is no longer sufficient. The banks seem to be well aware of this issue, and aims to change toward a more agile setup. This is closely connected to what can be defined as the banks biggest challenge, namely the struggle of heavy and slow processes. These slow processes are caused by both inefficient allocation of internal resources and the technical architecture of the traditional banks.

During the interview study, it became clear that the banks have different approaches to handling their technical architectures. All the banks have acknowledged that they have to change or adjust their technical architecture in order to meet the challenges of digital competition in the future. However, their strategic approaches differ. Nordea are doing a great update of the entire core system, which means they will change their entire platform. It involves complicated processes and extremely high costs. Until now, no banks have found it profitable to make the investment of changing their entire system. Danske Bank and DNB are too concerned whether such a huge investment will be worth it in the long run and states that their approach is upgrading their current IT-systems. DNB will do so bit by bit, and thus aim to pack the old systems in such a way that it will be possible to change it in the long run. Danske bank has a similar approach, where they intend to build on and modernize the existing platform with APIs.

The biggest challenge identified through the interviews are the legacy and technical debt traditional banks have to cope with. Collector Bank was founded in 1999 and thus has less legacy and technical debt than DNB, Danske Bank and Nordea. Collector Bank have from the beginning focused on being an innovative bank and thus have systems that are up-to-date and less technical debt. Traditional banks have extremely high technical debt because they have existed for many years and thus have old and outdated solutions. Auka highlights this issue because existing solutions may not be compatible with technology needed to offer innovative solutions that relate to innovative systems.

The data collected from the interview study announce that the most important strength of the big, traditional banks is the customer base they possess. Due to huge customer bases, these banks possess enormous amount of data. Indeed, they possess extremely valuable information about their customers that can be used to create other services tailored to their needs. Furthermore, both Danske Bank, Nordea and Collector Bank address the value of one platform across the Nordics. Even though the platforms are outdated in some areas, the banks states that this is a strength that brings them closer to their customers and potential partners.

All the banks states that it is difficult to predict which business areas that will be most exposed for increased competition in the future. However, there is consensus to the probability of everything in banking which involves transactional services, as well as payments solutions, which involves currency and interests, will be affected. In addition, the banks believe classic services like loan and deposits will be exposed for increased competition. However, despite the increasing competition, none of the banks plan to change their strategy or pull out of certain business areas.

The interview study results reveal that all parties which participated in the interviews believes the implementation of PSD2 will contribute to fundamental changes in the financial sector and future of banks. Danske Bank believes that the future of bank will be affected by the combination of new technologies and that the industry is becoming increasingly digitized will affect the perception of bank. Collector Bank emphasize that competition and innovation will result in customers becoming indifferent between whether a bank or non-bank handle their finances. Furthermore, Collector Bank believes that there will be fewer, but larger, banks in the market. DNB believes that the banking brand will survive for a long time, but that there will be more collaboration with players outside the banking industry. DNB states that in addition to a reduced staff, there will also be quite different types of people because everything will be about data and technology programs.

4.2 Regulation and Supervision

Due to the strategic and financial perspective of this thesis, it does not go into depth or specific details of the legal regulation following PSD2. Nevertheless, the regulations are still a part of the strategic aspect and will be one of the fundamental factors in forming the banks' future. Hence, the banks must adjust to the new requirements that are set. For this reason, section below will discuss the strategic prospects for changes in EU regulations as a result of PSD2.

The conclusive version of the European Banking Authority's (EBA) Regulatory Technical Standards (RTS) on Common Standards of Communication (CSC) and Strong Customer Authentication (SCA) was presented by the European Commission on 27th November 2017. The regulation is offering a solution that should focus on the interest of all market participants. Altogether the EU regulation became operative on the 13th January 2018, however, the provisions proposing the TPPs' interface have been held up due to disagreement between the European Commission and the EBA over its content. The implementation period for the revised directive are stated to be eighteen months. Thus, the banks' readjustments and change of RTS are still under progress, in which the proper arrangements of PSD2 are presumably to become applicable around September 2019 (Finextra Research, 2017).

As the regulations are still under discussion, there may be changes during the implementation period, which in turn will have consequences for the banks. Both previous and current events during this process may have an impact to how the final regulation will look like. For instance, a recent event that has been widely displayed in the media is Facebook's scandal with political consultancy Cambridge Analytica. Data of approximately 87 million people has been shared with Cambridge Analytica without the permission from Facebook users (Time, 2018). Such an occurrence can in turn have an influence on the requirements that will be set for sharing of data. Thus, the European Commission and the European Banking Authentication may see it necessary to impose even higher requirements for TPPs to maintain security for both banks and customers.

Several questions arise during the examination of RTS. For example, who will choose to exempt from SCA to which other parties are subject. Since customers will have direct contact with TPPs one would assume that the exemption will be TPPs. However, looking at different outcomes, for example, if TPPs rely on authentication from banks (also referred to as account serving payment service providers, ASPSP). Furthermore, another scenario, if TPPs choose to exempt from SCA Strong and ASPSP's internal mechanisms find SCA mandatory. In both of these cases there is no clear answer to the question.

Another aspect of is this is that banks have built relationships with their customers based on trust and loyalty, through secure systems and good information management over time. Thus, if TPPs do not use SCA when retrieving information from banks, and the information is not handled properly, it may backlash for the banks. Even though the customers have approved the data sharing, the customer may still give some of the blame to the bank that was part of the process. Hence, this may in turn damage the relationship between the bank and the customer. On the other hand, banks can gain an advantage of this situation. From a customer's point of view banks may seem more secure than a TPP which does not want to provide SCA. Indeed, banks can strengthen their position as a trustworthy keeper and provider of data.

Furthermore, with increased digitalisation comes greater exposure to fraud. Another question that arise is whether banks (ASPSPs) will have the permission to estimate the fraud rate by channel. Or another matter, if there is room for more unique calculations, for instance, creating individual fraud rates if the computation have the ability to do so. PSD2 promotes open banking with better security for customers. Thus, it is important for banks to uncover fraud early on and prevent it to the extent possible. In matter of regulation and security, banks must have determined guidelines to follow in a situation where the customer is exposed to fraud. Another aspect is that banks may also be exposed to fraud. Thus, banks must have appropriate channels and systems to administer sharing of data to avoid abuse. The consequences of fraud for a bank can be extremely damaging in terms of losing customer loyalty, damage to bank brand, loss of profits and increased costs as a result of damage control. In a market with increased competition and digitalisation at such a fast pace, this could thus mean the end of a bank.

4.3 Annual Reports

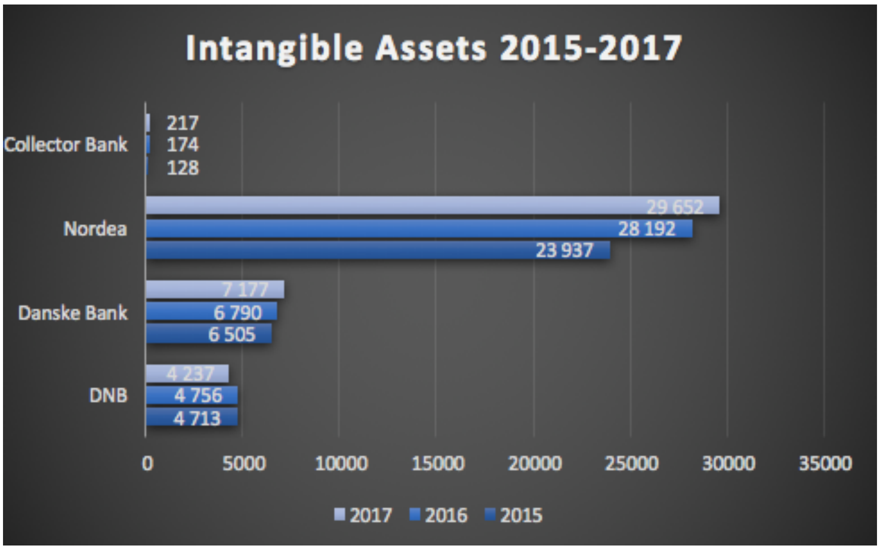
This section emphasis on data gathered from the annual reports of DNB, Danske Bank, Nordea, Collector Bank and Handelsbanken. However, due to differences in the size of the banks, the thesis does not seek to compare the banks´ financial numbers. The data collected are used with the aim to produce an image of the previous and current market situation. This selection of banks are made, not to compare the banks with each other, but to illustrate a representative selection of the banking industry in the Nordic countries. They might not be representative for the entire European market, however they can be acknowledged as sufficient examples. This section focuses on giving the reader a solid overview of the financial situation and the trends that can be identified. In order to clarify the trends, the section also includes graphs that are compiled based on key numbers.

The years of 2015, 2016 and 2017 are identified as the most relevant for the financial analysis of this master thesis. PSD2 is a current event and will have an impact on the financial markets in the future, and it is therefore not useful to analyze historical data far back in time.
In this matter it is therefore not useful to analyze historical data far back in time. The financial consequences of the directive are still uncertain. The banks have already made some adjustments in order to meet the requirements, but this is not identified until the recent years. Thus, there are not identified any significant changes in the annual reports prior to 2015, which is why the thesis do not include more historical data than the years 2015-2017 in the analysis. Furthermore, the annual reports have been currency adjusted into DKK million in order to have equal currencies for the market. The annual reports provide the thesis with relevant numbers which will be used for further analysis in section *6. Analyze*.

4.3.1. Intangible Assets

In the annual reports, intangible assets are stated to include relevant information regarding the strategic choices through development of IT-systems and computer software, customer data, acquisitions and goodwill. PSD2 has been developed as a consequence of the rapid changes in technology. As repeatedly outlined in the thesis, the technological changes have heavily affected the banking industry over the years. Radical technological developments imply that the banks have to make investments in intangible assets to keep up with the market. In their annual reports the banks characterizes intangible assets as identifiable, non-monetary assets without physical substance. Figure 8 illustrates the total value of intangible assets from the selected banks in this thesis. To simplify the reading process, these banks will from now on be referred to as "the market".

Figure 8: Intangible Assets of the selected banks 2015-2017. Numbers in DKK million.



(Source: Compiled by authors, based on number from banks' annual reports 2015-2017).

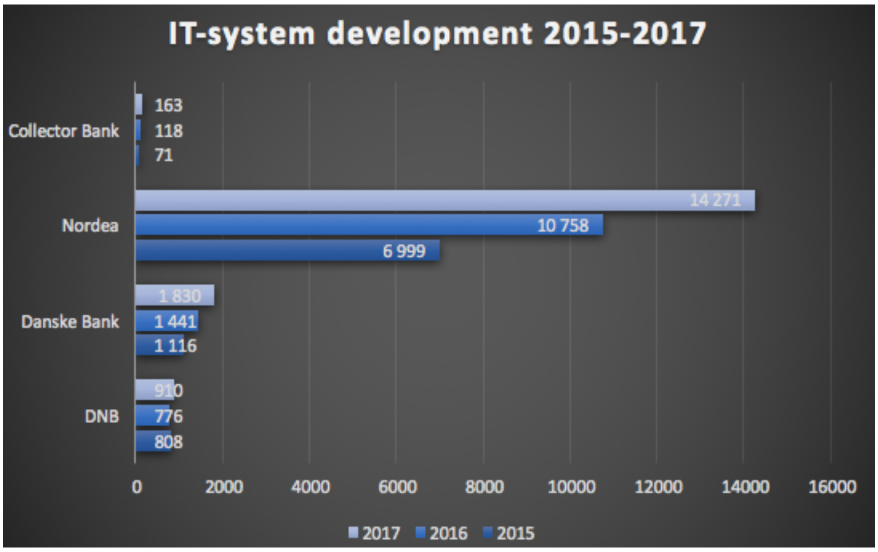
4.3.1.1 IT-development

The overall trend in the market seems to be that the value of intangible assets has increased every year. This implies that the importance of investments in intangible assets is increasing, which includes development of IT-systems. The exception is DNB, where the total value was a bit reduced in 2017, from DKK million 4756 in 2016 to DKK million 4237 in 2017 (Annual Report DNB 2015; Annual Report DNB, 2017). It may be several reasons why most banks have increased the value of intangible assets, and why DNB has not. This may be due to the accounting principles and differences in how the banks handle intangible assets which may also influence the value. For example, capitalized software expenses are amortized on a straight-line basis over the expected life, which DNB defines as usually five years while Danske Bank usually defines the expected life of software acquired to be three years. Other sales and investments may also influence the value of the banks' intangible assets.
Thus, it is favorable to look into the different values that are included in the total intangible assets. To analyze the trends of investments in IT-systems and software development it is useful to put those numbers in a separate figure to make it clearer.

Figure 9 illustrates the value of total intangible assets that arise from IT-system and computer software developments from 2015-2017. As the figures illustrates, all the selected banks have increased the value of their IT-systems development during this period. Regardless the size of the bank, the importance of improving the technical architecture seems to be the focus for everyone. In the annual reports, intangible assets are the costs that are directly associated with significant computer software development investments, with the capability to generate future economic benefits. Table 1 shows that the cost of development of IT-systems has increased every year in all five banks.

This implies that the market has adjusted to the technological changes and prepared for the implementation of PSD2 over the past three years. The amount of costs that have been invested vary between the banks, which is a natural result of their differences in size, market position and strategic choices.

Figure 9: IT- system development of the selected banks 2015-2017. Numbers in DKK million.



(Source: Compiled by authors, based on number from banks' annual reports 2015-2017).

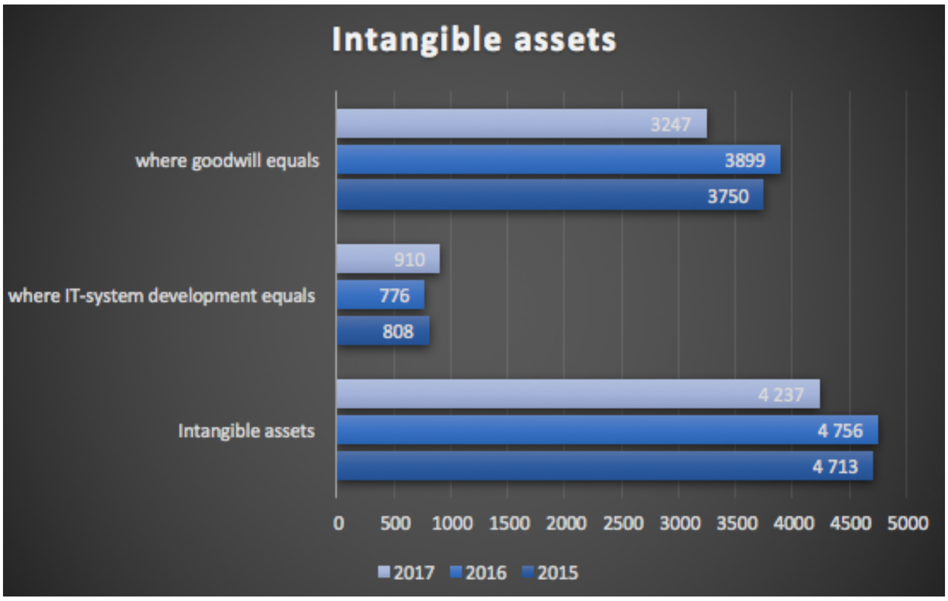
Table 1: Cost of IT-system development of selected banks 2015-2017. Numbers in DKK million.

	DNB	Danske Bank	Nordea	Collector Bank
2015	3 750	5 363	16 192	58
2016	3 899	5 349	16 705	56
2017	3 247	5 347	14 845	54

(Source: Compiled by authors, based on number from banks' annual reports 2015-2017).

For example, even though the value of intangible assets in DNB has decreased from 2016 to 2017, the cost of development of IT-systems has increased. In percent of total value intangible assets, cost of IT-system developments have increased from 17,14% in 2015 to 21,48% in 2017 (Annual Report DNB, 2015; Annual Report DNB, 2017). Furthermore, as figure 10 illustrates, they have reduced the amount of goodwill over the same period, which explains the decline in total intangible assets. This constitutes a reduction of goodwill in percent of intangible assets from 79,57% 2015 to 76,63% in 2017 (Annual Report DNB, 2015; Annual Report DNB, 2017). This implies that DNB's strategy emphasize on developing their technical architecture rather than goodwill, as of right now. The rest of the selected banks have also experienced an increased value in intangible assets over the past three years. As figure 8 and 9 illustrates, this is due to increased costs related to development of IT-systems and computer software. Thus, the trend seems to create a picture of an industry that is changing more and more towards digitalization.

Figure 10: Intangible assets from DNB 2015-2017. Numbers in DKK millions.



(Source: Compiled by authors, based on number from DNB's annual reports 2015-2017).

Traditional banks may struggle with legacy and a severe amount of technical debt. Due to the rapid technological development the systems are old and outdated, which makes it difficult to keep up with the rapid technological changes and the increased competition in the market (Grina, 2018). The implementation of PSD2 and new regulation of the Basel requirements enables changes to happen at a faster pace and thus require banks to change faster and quickly adapt. This is some of the main reasons why the banks have increasingly invested in IT-development in recent years. The costs of developing the computer software and IT-systems is an investment they make today because they believe it will generate revenue and strengthen their position in the future or that the banks has postponed the investment earlier. Either way, an increased investment in development of IT-systems increases the value of the intangible assets.

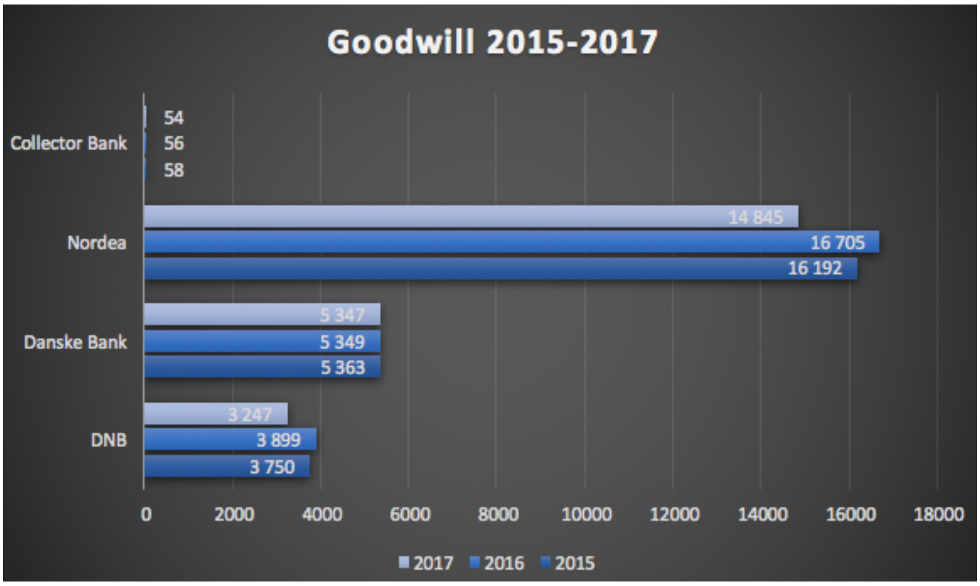
The first of the larger banks that really has approached the issue of technical debt and outdated IT-systems is Nordea. As table 1 illustrate, Nordea have invested a huge amount in development of their IT-systems over the last years. Only in two years, they more than doubled the investment from DKK million 6.999 in 2015 to DKK million 14271 in 2017 (Annual Report Nordea, 2015; Annual Report Nordea, 2017). This means that in 2017, 48,13% of the total value of intangible assets came from investments in IT-system development (Annual Report Nordea, 2017). The high cost may be a result of the banks different IT-systems in the different countries and the enormous investment they have made by rebuilding their entire IT-system from scratch. This process is complex and expensive, but they have chosen to do that investment now to increase their position in the long term.

PSD2 provides great opportunities for the banks if they approach it the right way, in addition opening of their APIs can create great value and enable production of better products. One of the biggest obstacle for innovation in traditional banks today are the existing IT-systems. PSD2 forces banks to deal with TPPs, and to do so in a good way, they need better systems. However, PSD2 also represents increased risks related to security. Without appropriate security, weak aspects of API can cause unauthorized actors to achieve access to customer data, backend system and even monetary systems. This introduces increased operational risk to both systems and businesses as a whole (Hernaes, 2018). The banks relies on the trust of the consumers, which implies that the risk increases with open customer interface. Thus, security are extremely important for the banks when approaching open banking and such security measures are included in the investments of IT-system developments. It is difficult to define exactly what is under these investments, but it is rational to assume that it can be linked back to the implementation of PSD2.

4.3.1.2 Goodwill

Another part of intangible assets is goodwill. In the annual reports, goodwill is stated as the surplus of the cost from an acquisition. In which over the fair value of the bank's share of net identifiable assets from the acquired group associated joint/undertaking venture at the date of acquisition (Annual Report Nordea, 2017). It is important to understand that goodwill is not related to PSD2, however, it is relevant to this thesis in order to illustrate the emphasis the banks make when it comes to investments. Figure 11 shows that the overall value of goodwill in the market have fallen over the years 2015-2017, with the exception of DNB. This illustrates that when the banks have allocated resources to intangible assets, investments in IT-development have come as the expense of goodwill.

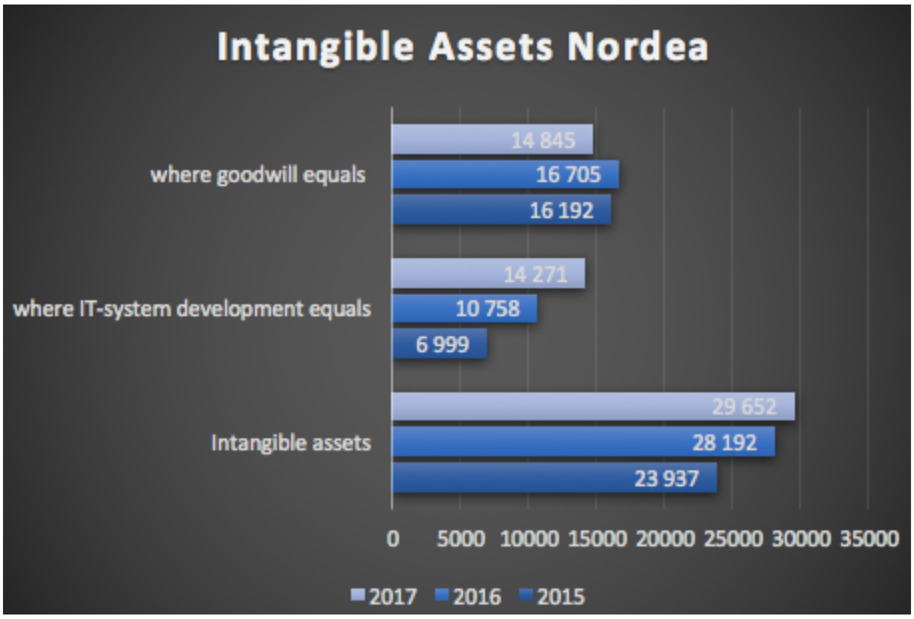
Figure 11: Goodwill selected banks 2015-2017. Numbers in DKK million.



(Source: Compiled by authors, based on number from banks' annual reports 2015-2017).

Examining the banks' annual reports, numbers shows that while the values of IT-system development have increased, it has compromised with the value of goodwill that has decreased. For instance, looking at Nordea's numbers, in 2015 the bank had a value of goodwill of DKK million 16 192, while in 2017 the value was of DKK million 14 845.
In contrast, while the value of goodwill is higher than the value of IT-system development, the value of IT-system development has increased over the years (Annual Report Nordea, 2017). This is illustrated in figure 12 below:

Figure 12: Intangible assets from Nordea 2015-2017. Numbers in DKK million.



(Source: Compiled by authors, based on number from Nordea's annual reports 2015-2017).

A similar development can be seen in several banks. This can illustrate a change in the banks' focus, in which they invest more in areas where they believe will be important for them in the future, namely IT development.

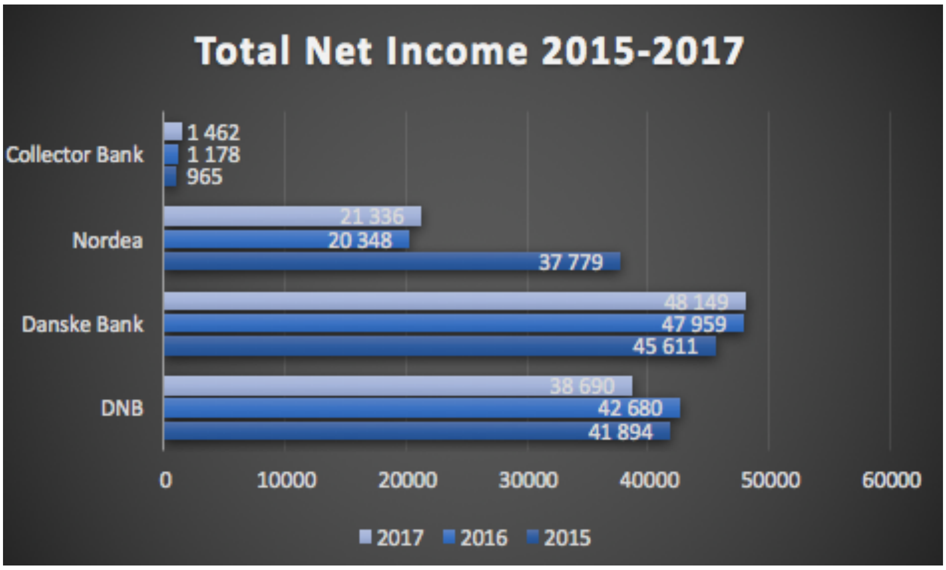
4.3.2 Total Net Income and Operating Expenses

PSD2 will be a stimulant for renewing the strategic mind-set and disruption in Europe's banking and financial markets (PwC, 2017). In general, the reaction of Europe's bankers towards PSD2 are of uncertainty. Statistics from PwC's report "The strategic implication of PSD2 for Europe's banks"(2017), show that 68% of banks fear losing control of their client connection. Furthermore, 44% of banks intend to implement open banking the next five years. Additionally, 32% expect to provide new solutions that are vital for current ecosystems. As a result of PSD2, 84% anticipate changes in their strategies (PwC, 2017). Hence, banks are taking various measures to cope with the challenges that come with the directive. This in turn, may have an impact in both annual total net income and total operating expenses.

4.3.2.1 Total Net Income 2015-2017

The analysis of the market shows that some of the banks' total net income has decreased over the years 2015-2017. This is illustrated in figure 13.

Figure 13: Total net income selected banks 2015-2017. Numbers in DKK million.



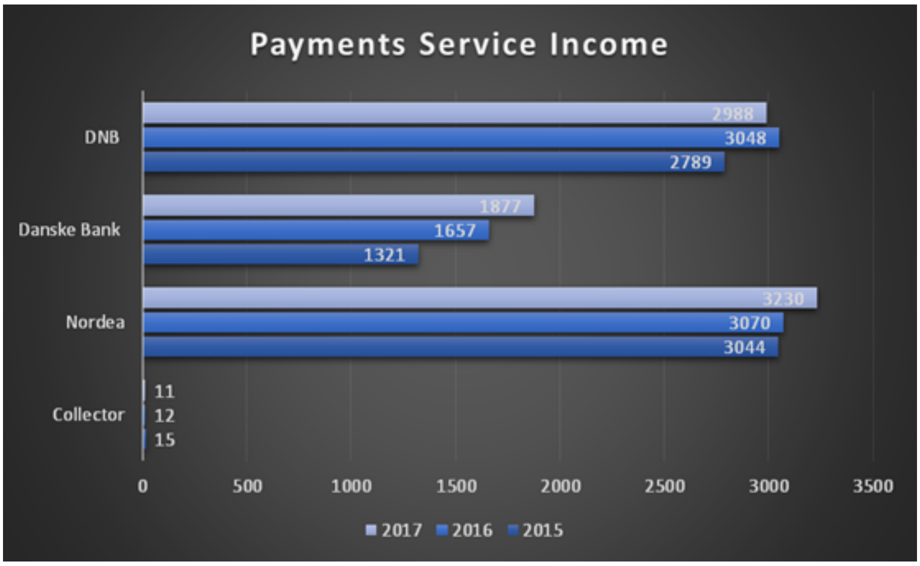
(Source: Compiled by authors, based on number from banks' annual reports 2015-2017).

An explanation for this may be that the banks try to position themselves in the market in order to be prepared for a highly digital future. Consequently, to find the right position they are exploring which business areas that would be worth investing in. Thus, which business areas will generate profit and provide best potential for the future. As a result, some investments will fail and not make any profits, while other investments will be successful and offer a stream of cash flow. This in turn, will have an effect on the total net income of the bank.

Moreover, a number that is interesting to examine is the "net fee and commission income" because it provides an insight into which business areas that may be the most exposed following PSD2, both in terms of increased competition and lack of focus. One can also see which areas generate the most income, which in turn can indicate which areas banks want to invest and specialize in. Net fee and commission income described in the selected annual reports includes payment services, brokerage and securities services, advisory services, sales of insurance products, loan, guarantee and other commission income.

The interesting item to look at and that is also highly relevant to this thesis is payment service income. The examination of the net fees and commission income shows that payment service income is one of the posts that generate the most income. Moreover, PSD2 opens doors for basically anyone who are able to offer payment solutions, which can be a challenge to the banks. This in turn, indicate that this business area will become the most exposed to increased competition. Thus, by looking at the various banks' net fees and commission income, it appears that payment services have increased for the majority of the banks throughout the years 2015-2017. This may indicate that banks have shifted their focus and are, in a much greater extent, offering payment service solutions. By doing so the banks aims to readjust themselves and be more robust in order to face the competition from other payment service providers in the future. This is illustrated in figure 14 below:

Figure 14: Overview Payment Service Income selected banks 2015-2017. Numbers in DKK million.



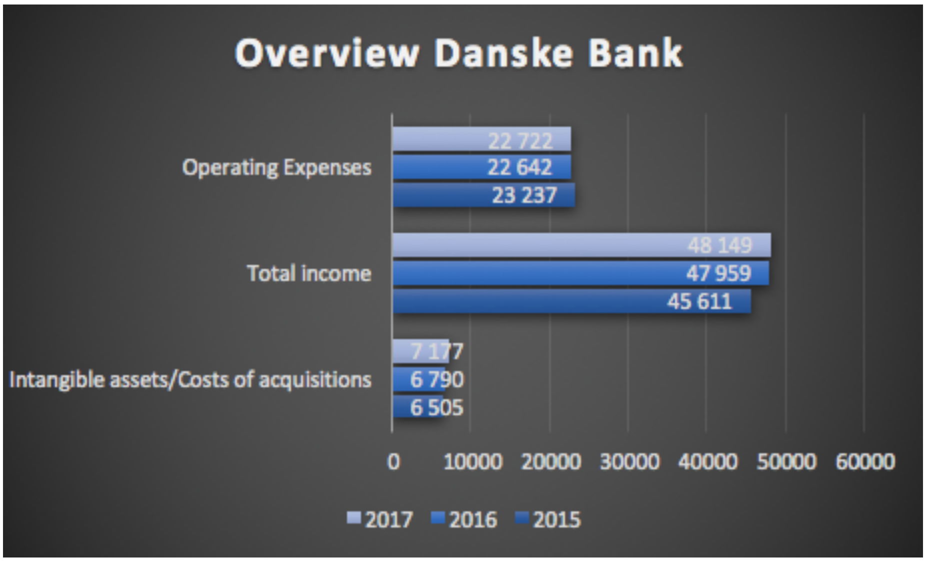
(Source: Compiled by authors, based on number from banks' annual reports 2015-2017).

For instance, seen in relation with DNB's launch of mobile payments solution Vipps. By 2016, Vipps gain two new users every minute (+/- 3000 a day). Vipps entered the year 2016 with nearly 1 million users and ended the year with approximately 2 million users in December 2016 (Dalsbø, 2017). Customers can transfer and receive money free of charge up to NOK 5000, while companies, teams and associations pay 1,75% of the purchase amount. No establishment fee or monthly fee (Vipps, 2018). As many bank customers will use payment services such as Vipps, the income of payment services will increase. This in turn may display that there are other areas that are more at risk of losing investments and will generate lower income, which in turn cause a decrease in Total Net Income.

In this matter, by examining net fee and commission income, it shows that income from both brokerage, securities and advisory services has decreased for some of the banks. This can be an explanation of the decline in total net income. In this matter, this can be an indication that banks experience competition from broker firms which forces the banks to lower their commission. Another aspect may be that customers may not necessarily have the same need for contact with banks as they used to or that they find other ways to perform trading than through the bank, i.e using broker firms. Also, banks may wish to specialize themselves in other areas, and therefore invest more resources in them. This in turn may display that when PSD2 is fully implemented and the competition within various business areas increases, the banks sees the necessity to invest more. Further, other areas such as brokerage and securities services, as well as advisory services where the banks need to readjust themselves in order to compete with TPPs.

Nevertheless, the whole market does not illustrate a decrease in total net income from 2015-2017. Using another example of a large bank, which indeed has taken a step towards the digital direction, is Danske Bank with its payment solution MobilePay. In 2016, MobilePay was used 19 397 times per hour. These transactions have in total transferred DKK 43 billion (Birkeslund, 2016). In contrast to DNB, Danske Bank have had an increase in total net income from 2015-2017 (Annual Report Danske Bank, 2015; Annual Report Danske Bank, 2017), which may be a result of increase in all of the business areas of net fees and commission income. This is illustrated in figure 15 below.

Figure 15: Overview Danske Bank 2015-2017. Numbers in DKK million.



(Source: Compiled by authors, based on number from Danske Bank's annual reports 2015-2017).

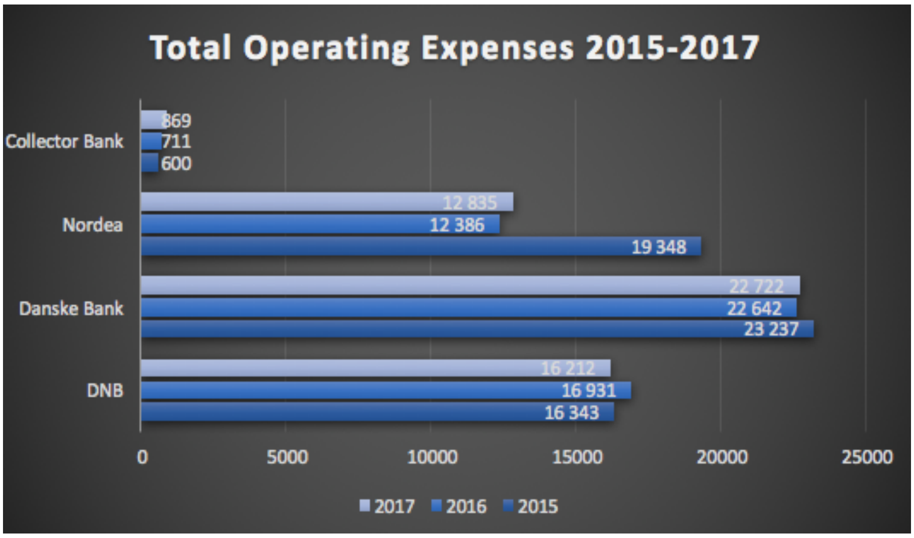
This may indicate that not all banks have begun investing in a specific business areas. Several banks may want to be more of a all-rounder to have several doors open. Thus, they continue to use time and resources in several business areas to maintain customer demand in all of them. And thus, when time is right, they may eventually want to specialize in some of these business areas. Whether it pays off to narrow down the bank's focus before PSD2 is fully implemented, or to wait and observe which areas the bank should focus on, is debatable. However, this can be a good indication that banks are preparing for PSD2 in very various ways.

4.3.2.2 Total operating expenses 2015-2017

Another aspect that is important to examine to understand the strategic directions of the banks is the cost side. From Accenture's report *Converting cost to growth* (2016), research shows that many banks do not have the ability and perceptibility to create a strong continuous connection between where to reduce costs and where to invest (Accenture, 2016). Statistics shows that only 24% of the banks have a clear approach and business-wide strategy to channel cost savings into development initiatives (Accenture, 2016).

Moreover, figure 16 shows the market, where most of the banks have had a decrease in total operating expenses over the years 2015-2017.

Figure 16: Total operating expenses selected banks 2015-2017. Numbers in DKK million.



(Source: Compiled by authors, based on number from banks' annual reports 2015-2017).

Cost numbers provide an insight into how the overall market picture looks. The purpose is therefore not to compare the different banks but to show in which direction most banks are heading towards. Thus, comparing the banks becomes misleading as the banks differ in size and structure.The variation, as well a decrease in the overall cost picture may imply that banks are carrying out various measures and embrace strategic cost reduction. It is about being able to create a balance between reducing costs and the processes, resources and investment activities that creates value. The cost structure is something a bank already have within the company. Indeed, becoming cost-efficient is possibly easier than anticipating the right investment areas. This may indicate that the banks are starting with themselves, and are looking at what initiatives they can do internally, before making any external changes. Thus, by doing so, if the banks are able to find their potential and exploit their capabilities, they can promote new streams of development and restructure their operations to reach new levels of business competitiveness.

Another aspect is to look at what exact costs that are increasing. Operating expenses described in the various annual reports include pension costs, travel expenses, salaries and other personnel costs, provisions for financial taxes, IT expenses, other expenses and other non-recurring items. By evaluating the selected annual reports, it is seen that all banks have increased IT costs through 2015-2017. This in itself affects the total operating cost. Thus, it also indicates that banks focus more and more on digitization.

4.3.3 The focus of the banks´ annual reports

The annual report aims to give shareholders, and other people that are interested, information about the business' activities, focus and financial performance throughout the prior year. A report like this gives banks the opportunity to promote their vision to external players. For instance, looking at the annual report for DNB 2017, DNB's framework conditions states "Over the last few years, DNB has adapted to a number of new regulations and requirements that go a long way in changing the banks' business models. This occurs at the same time as the financial industry is hit by a technological revolution and radically changed customer behavior, which in turn entails new regulations and requirements"(Annual Report DNB, 2017).

In the matter of PSD2, looking at a selection of annual reports it gives an impression on the bank market's focus on the directive. The research shows that on average, PSD2 was mentioned 13 times more in annual report 2017 than in report 2015. This can illustrate how banks may want to show that they are getting prepared for the digital future. However, not all banks show a similar focus. For instance, looking at Collector Bank's annual reports, the bank has not mentioned PSD2 once, neither in its annual report for 2015, 2016 or 2017 (Annual Report Collector Bank, 2015; Annual Report Collector Bank, 2016; Annual Report Collector Bank, 2017). This may indicate that smaller banks want to aim attention towards a different aspect than larger banks, as they may have other capabilities they want to exploit.

5.0 ANALYSIS

5.1 Introduction

The analysis is based on findings that have been conducted through financial data, legit media and interviews with Danske Bank, Collector Bank, DNB, Nordea, Auka and Deloitte. The analysis is carried out with consideration of certain assumptions. As previously mentioned, PSD2 is a directive that is in an ongoing process. This means that nobody possesses a final answer to what is the right or wrong approach. In this matter, it also means that the data collected through this thesis may have a different meaning in the future. Thus, the analysis is written based on the current data and knowledge.

Furthermore, the banks and TPPs possess internal information that they do not want to reveal to their competitors. For this reason, all information during the interviews may not be fully complete, which in turn limits the access to detailed data. Based on this, further interpretations of the information gathered have been made to obtain a sufficient analysis.
The analysis is written from a strategic perspective, which aims to present the strategic choices that banks can pursue to prepare themselves for a future with PSD2.

5.2 Technical Architecture

Current Technical Architecture

As of today, the banks have a lot of technical debt due to their existence over several years. The technical debt is based on mastodon and outdated systems. Over the years banks have been forced to renew themselves as a result of the digitalization. Therefore, some of the current banks' platform is a combination of systems that goes back to the 60's and new modern systems built on top of this (Duong, 2018). This makes these banks' technical architecture extremely complex. A common factor that emerge through the research is that the majority of banks have one single platform that is shared between the countries in which they operate. This means that the platform is well connected across multiple systems and serves. This may be positive given that data and information are gathered and stored in one place, which makes it easier for banks to manage. On the other hand, it may be difficult to make any changes on one part of the system without changing other parts. Thus, if the banks want to modernize or exchange various parts of their system, they must possess enough knowledge and expertise to know how it will affect the rest of the bank. Hence, skilled employees that can manage such large and complex systems might be difficult to find.

Moreover, examining the banks' technical architecture, research of this thesis shows that not all banks have outdated systems that are only modern in certain areas. Thus, this is largely the case for bigger banks; conversely, in smaller banks the technical architecture is relatively up-to-date. This can be drawn to the assumption that smaller banks may be newer or that they have less complicated systems due to the size, which makes the process of continuously updating the IT-systems less demanding and time-consuming. Compared to bigger and older banks, smaller and newer banks like Collector Bank have had a focus on digitalization from its very founding. This is due to the fact that they were established in a more modern age. As a result, the smaller banks may possess less technical debt and their systems may be better digitized all the way back to the start-up point and thus easier to modernize over time.

Record of Information and Data

Furthermore, having a long lifetime and large size of the bank is not necessarily negative. This shows that the larger banks are well equipped with a lot of historical data and information, as well as having accumulated a great customer base built on trust and loyalty. Thus, customers may find it more secure to use banks for their financing, as they are familiar with the bank's systems and processes. The larger and older banks have had, up until now, an advantage. Thus, with all the information and data they possess, they can anticipate market trends and customer preferences. For a bank to predict customers' future behavior is very crucial in order to develop good digital products and services that meet the customers' demands. Thus, if the banks are able to combine this data with efficient processes to produce such solutions, they will be extremely competitive.

Nevertheless, customers' preferences continuously change over time. As there is an increase in production of flexible payment methods and online platforms, it means that customers do not have the same need for bank branches today as before. Looking from the banks' perspective, this is positive as they can spend more time and resources in other areas. In addition, customers require that banking services shall be fast and make their everyday life easier. Banking has become a hygiene factor, meaning it is something you just have to do. This implies that consumers want to pursue banking on-the-go and perform banking services while they have the time, for example when you are on the bus. In this matter, for banks to create good relationships with customers, the electronics solutions must be user-friendly so that customers can conduct their banking services without the involvement of bank employees. This is also very beneficial for banks as they can offer financial services that are more accessible than ever before. Thus, as this is as positive for customers as it is for banks, it suggests that self-service banking solutions are both supply-driven and demand-driven.

Moreover, it is especially the younger and middle-age consumers who want faster and more up-to-date products. Good electronic solutions for this group will therefore be crucial. Thus, this suggest that banks must understand that customer relations do not last for years anymore, but rather months at a time. This means that they need to launch new products and services much faster than before or the consumer will move on to another provider. Banks can no longer spend several years on the development process for products. Consequently, it requires that the banks possess adequate systems and servers that keep up with the process. For banks to be innovative does not necessarily mean being creative and having the right ideas, but rather how fast they actually can develop and implement these ideas. Thus, banks that do not possess sufficient systems will not have an effective development process, which in turn may cause them to fall behind. As a result, banks can lose customers and their position in the market in favor of other TPPs.

Outdated systems

Looking at the data, the research of this thesis shows that several of the banks believe that their legacy affects their way of running innovation. This may indicate that they have a technical architecture that is not fully complete for PSD2 and that they have to use the implementation period to get ready. Another aspect that built up this assertion is that historical financial data show that investment in IT systems among banks has increased over the years. This can be interpreted in two ways: On one hand, banks seem to have too much legacy, which means they are not sufficient to compete in the digital race. Systems that go back to the 60's will slow down their innovative processes and are not sufficient to produce small simple solutions. For example, DNB explains that some of their solutions require start up all the way down to the frame system to eventually end up in an iOS app (Løverås, 2018). This means that those who work with such solutions must understand the entire technical architecture. This can be difficult and take a long time, which again delays product development. Over the years, banks have mainly used their systems to work with large-scale projects. The problem that follows the increased competition is that the time-to-market of such projects takes too long and they are already irrelevant when they enter the market. This may display that today's banking systems are not designed to create small, simple products and services and therefore the best solution would be to exchange the entire banking system if needed.

However, on the other side; The fact that banks acknowledge that they do not have modern and fast enough systems and that they are investing in IT, are promising. That is, they are continuously working on renewing themselves and prepare for the consequences of PSD2. For example, Danske Bank believes that they are sharp and ready to adjust their strategies to the digital competition (Eidem, 2018). One can interpret this in such a way that the banks are changing towards a more open-minded approach. Hence, they are open to change and they are willing to take any action to be competitive in the digital race.

Moreover, it is possible that banks are able to find solutions and modernize their systems. Hence, there are great opportunities within the company in the form of specialists and well-educated employees who knows how to approach innovation. For example, the research of this thesis shows that more banks have begun with a production development called design sprint. That is, the banks try to identify a challenge or idea they want to test. Further, they try to break down and recognize all the small details that are needed to find a solution to the idea. In the final phase, banks make prototypes and test the ideas for a short period of time, i.e. a few weeks. This in itself is a much more effective way of running innovation, compared to older approaches. It may seem that banks have come far to figure out how to perform production development in the most efficient way, in which fits their technical architecture and business model. Nevertheless, it is extremely demanding for banks to make these changes in practice because it takes a long time to change the processes, culture and structures of such large and hierarchical organizations.

The Advantage of Customer Base

The collected data of this thesis shows that the banks have started to actively use existing customers through the product development process by testing the product on a few customers. This approach largely resembles the agile way TPPs like Fintech companies work when developing products and services. This way, they can capture the customers´ reaction and use it in further development. Such an agile product development process is therefore more efficient than the process of most banks today because it allows the bank to release a service early and make adjustments to improve them along the way.

However, changing towards becoming corporate agile may be somewhat an easier process for a new and smaller bank like Collector Bank. This is due to the fact that they have more willingness to change because of a culture that foster innovation. This implies that changing the structure is less demanding than in a bank that is pervaded by old processes. However, the larger banks possess a huge advantage in their enormous customer bases. This display that these banks are better suited to capture the customers´ response than smaller banks. Banks like Nordea has large customer bases in different countries, which provides data and information that allows them to test of many customers in different segments (Stene, 2018).

This implies that these banks may become extremely competitive if they manage to implement a combination of efficient and profitable approach of innovation processes.

As mentioned earlier, it seems that banks are working to acquire a more open mind-set. This does not only apply to realizing that they do not have adequate systems and technical architecture, but also realizing in which areas they need external help and may gain from collaborating with other players. Nevertheless, the data of this thesis shows that banks want to produce their own solutions and services in-house in the future if they have the size to do it. On the other hand, banks begin to realize that where their systems are not good enough they need TPPs, such as Fintech and Bigtech companies, in order to offer good solutions. This applies not only to the largest banks with great amount of legacy, but also to the smaller more digital banks need digital transformation to stay relevant. This may again indicate that banks are looking at PSD2 as an opportunity, rather than a challenge, and begin to see the potential value of the digital development.

Is a Strong Position Enough?

The collected data shows that the banks want to promote very different capabilities to the outside world. In this context, one would assume that promoting a certain image would also be an indicator to facilitate collaboration with TPPs in the future. This in turn, demonstrates that banks have a very different perception of how to attract partners and which kind of collaborators they seek. Some of the traditional banks want to emphasize that they are digital and that the focus is on the customers´ needs. For example, both DNB and Collector Bank stress that they want to be where the customers are; namely online (Løverås, 2018; Jordal, 2018). Consequently, this may attract TPPs who desires working in an agile environment that gives them allowance to work flexibly with technology. This may also indicate that these banks do not rely on their current position with large customer base and resources, but that they rather emphasize to adapt and develop to the changes of consumer behavior. The fact that a bank places emphasis on a digital focus can also promote the ambition of attracting new customers digitally.

On the other hand, there are other banks that emphasis that they have gained a strong position in the market and accumulating a large scale of loyal customers. This may be a risk, because such complacency may prevent innovative and proactive measures that are necessary to ensure long-term competitiveness. However, this can also be interpreted as self-confidence which may cause the bank to pursue a more aggressive approach to utilize its position. The result of such strategy may be that this self-confidence makes both consumers and future collaborators feel even more confident that the bank is ready and in control.

The fact that the banks feel confident in their position may originate from having a solid banking brand. Consumers recognize the banking brand and associate with security and/or feel a belonging to it. However, research of this thesis shows that several believe that the bank as a brand will less important in the future because consumers will have relationships with multiple operators at the same time. Hence, the importance adherence to the bank is decreasing and user-friendly available solutions become more important.

In this matter, if a bank believes that a strong position and loyal customer base today ensures the banks position in the long term without doing any changes, it will most definitely lose. They will not survive in the long run if they rest on the laurels because they will quickly be passed by competitors. This is the biggest mistake they can make because they will lose in the increased competition (Grina, 2018). Therefore, they must make use of the current position to attract skilled TPPs and continuously work for new, innovative solutions.

Collaboration with TPPs

Moreover, the research of this thesis display that banks see the great opportunities that comes with the new directive. As mentioned earlier, a built-up large customer base has been considered as positive as it allows banks to offer solutions over a larger scale and they have the opportunity to test different ideas on a smaller number of people without causing too much damage. Nevertheless, the fact that they want to get Fintech companies to test out ideas that they consider to be too risky indicate that banks are still afraid that great changes will affect their customers negatively.

Furthermore, banks also emphasize that they only want to outsource parts of the innovation process, which may display that if the technology from TPPs becomes too modern, banks may have major problems plugging it back to their platform. For example, Danske Bank emphasizes that they can outsource the part of the innovation process involved in design and customer experience (Eidem, 2018). This in turn does not necessarily require highly complex technology and can therefore be more easily retrieved to the bank.

This rise question to whether the banks actually have a sufficient technical architecture to collaborate or form partnerships with TPPs. Moreover, TPPs like Auka states that they want to work with so-called neo-banks, in which do not have large amounts of technical debt and thus manage to turn around quickly (Grina, 2018). For TPPs, such banks may seem more responsive to their technology. Additionally, more digital banks are also considered more ambitious in the sense that they want to be a first-mover. For example, Collector Bank emphasize the fact that they are a smaller bank that manages to turn around quickly and work efficient towards a solution (Jordal, 2018). This may indicate that although large traditional banks entice a lot of capital and large customer base, the smaller banks may be more attractive to TPPs. This in turn, display that the smaller banks can be more advantageous if the future brings competition for collaboration with Fintech companies.

TPPs, such as Fintech companies, often use a product development process which involves that they produce, test and retrieve the product from the market. A so-called "produce- and learn" approach. In comparison, this approach can remind of the production development approach that banks have started to try out. This in turn could be an explanation for why banks have begun to pursue design sprint, due to the fact that this type of methodology is very attractive to Fintech companies. In addition, based on the fact that financial data show increased investment in IT systems over the years, built up the notion that traditional banks are working actively to make themselves attractive for future collaboration with TPPs. The banks are aware of the opportunities of open interface and that the potential for success is bigger than the bank is able to create on its own, and therefore seek to become more attractive for TPPs.

How to change the technical architecture

A common factor that emerges throughout the data is that the banks are working continuously to improve their platforms to meet the requirements. Considering the complexity of the technical architecture, it may be a desired solution to erase the entire system and build a new one from scratch, like Nordea does. However, this process requires enormous amount of time, money and resources, which in turn demonstrate that the digital competition will be fierce in the future. This can also be attributed to the fact that Fintech companies like Auka are skeptical towards banks who wants to renew their total core system. Thus, they may be concerned that those banks will spend more time and resources on internal development, rather than working effectively and forward thinking in partnership.

In contrast, other banks are working on this process by renewing parts of their systems. For example, DNB is working to camouflage old systems with modern systems. Such banks find it more beneficial to change the systems on a smaller scale, step by step. The reason for this may be that they believe that such a strategy makes them more adaptable, while giving them the opportunity to change in line with market changes. However, since their platform is very large and complex, this requires banks to have experts who know the technical architecture in and out. This also indicates that banks must have employees who constantly only work with this process. This can, just as renewing its overall core system, be very expensive and time consuming. On the other hand, such a process can allow the bank to be more flexible when it comes to partnering with TPPs. As long as the bank is clear about where they need assistance when their system is not adequate, there are grounds for good development opportunities for both parties.

Furthermore, the fact that the banks prepare themselves in different ways shows that they have a different perception of what makes a bank attractive and competitive. They have different opinions about what they regard as their strongest capabilities, resources and strategy. This illustrates that the digital competition not only increases between banks and TPPs, but also in between banks. As it appears in the collected data, banks are fully aware that the future market image will contain fewer but larger banks. They emphasize that they are looking for a future with great collaboration and that global players will become even more important. In this context, one can look at the digital contest as "survival of the fittest". Those banks that utilize their properties in the best possible way and make changes efficiently will also be the banks that survive in the long run.

5.3 Methodology

The efficiency of banks is heavily affected by the strategic and structural nature of the banks. Furthermore, the organizational issues cause an inefficient allocation of internal resources. Every bank, nearly without any exception, are very central and run by top management (Duong, 2018). This leads to a sector characterized by old-fashioned organizational culture based on strong hierarchies. With the digital disruption, both old, traditional banks and newer more digital banks need digital transformation to stay relevant. The digital landscape is ever-changing, and to successfully navigate in it leadership is the key ingredient for success. This section analysis the issue of the banks methodology and organizational structure behind decision-making authority. Furthermore, this section analysis how the banks can become more corporate agile and whether the corporate culture encourage risk-taking and innovative thinking.

Waterfall

The interview study results revealed that all the selected banks are based on the methodology of waterfalls, a hierarchical organizational structure based on top-down leadership. This creates time-demanding processes and a huge waste of time in bigger banks. This is because the people who actually possess detailed knowledge of the issues and solutions have to explain it to people higher up in the hierarchy, because they are the ones who are entitled to make the decisions. Such a hierarchic structure provokes slow processes and can be identified as one of the biggest challenges the bigger banks are facing today. However, the effect of such methodology depends on the size of the bank. The size of the waterfall depends on the size of the bank, meaning the bigger the bank, the bigger the waterfall structure will be. Nevertheless, this means that for smaller banks there will be less steps towards a solution. To increase the efficiency, it is crucial to have as few steps as possible in the product development and decision-making process to minimize the time-to-market. This implies that for smaller banks like Collector Bank, the methodology of waterfall may be the most efficient. The bank stresses the importance of approaching a methodology of few steps to be competitive in the market.

To cope with the increasing competition which emerges from the implementation of PSD2 the banks have to restructure their organizational structure to become more efficient. For a bank to increase its efficiency, it has to decrease the steps in the decision-making processes of innovation and for bigger banks, this may be to get rid of the methodology of waterfall in certain business areas. However, risk-management is one of the most important areas of banking, especially in areas such as loan where it is crucial that the decision-maker possess the right knowledge and there is little room for mistakes. This implies that in these business areas, the methodology of waterfall may still be the most efficient. Regardless, the implementation of PSD2 forces the banks to approach innovation and in these areas the bigger banks needs to increase their competitiveness through a more agile methodology. In comparison, new market entrants like TPPs such as Fintech companies have a more efficient methodology of allocating internal resources, and thus are able to manage processes in a shorter amount of time.

Leadership

A key realization for the top-management is that digital change differs from traditional change management approaches by illustrating an extended state of change rather than a one-time transition from A to B before it is bank to business as usual (Hernaes, 2018). This requires top-management to challenge the existing ways of thinking of leadership, and embrace new methodologies and innovative mindsets achieved in constructing sustainable change over time. However, it is compelling to understand that organizational change is the result of behavioral change at the employees and not a result of technology alone. This implies that the leaders need to acknowledge that they need to promote the desired change and adjust behavior accordingly to establish an agile and innovative corporate culture. Furthermore, change management need to be embraced by middle management as well to secure sufficient communication across the organization. To succeed with organizational change, communication is key.

To meet the emerging competition, the banks should approach let-go management (Løverås, 2018). Those who work closest to the problem are the ones who have the expertise needed to make the decisions, thus the banks should work on pushing the decision power further down the hierarchy. This way, the ones who possess the best knowledge of the relevant problem can make a decision consecutively. However, this assumes that the banks attracts and hires talented people with the right capabilities and that they work in smaller teams. These employees should be given the freedom to work efficiently and independent within their fields of expertise. Furthermore, this requires that the banks provide them with the decision-making authority needed to solve the problems efficient and with decision systems that can help them to make the decisions that are coordinated with the bank policy.

Agile allocation of resources

The banks should approach agile methodologies and step away from the project-based allocation of people they use today. Project-based allocation implies that the employees are allocated to projects up-front and then they are locked to the project for the lifetime of the project. This may create a very rigid and inefficient allocation of people. As of today, all of the interviewed banks are still stuck with such a methodology of waterfall, which has been identified as a weakness for the bigger banks. This includes a lot of overhead and strict control on projects. Control is associated with being used to running waterfalls on projects where you are used to having all the specifications in advance needed to stick to the original plan. Such a method has been successful until now, however, it is no longer sufficient for the bigger banks. The increased competition forces the banks to approach a more agile methodology based on continually learning and thereby improving solutions to provide innovative services at a higher pace to their customers.

Flatter organizations

All the selected banks in this master thesis states that they seek towards a structure consisting of smaller and more specialized teams. TPPs like Fintech companies possess such structures and gain great efficiency from it. However, as banks are very compliance and governed, they should be aware of copying the exact same corporate structure with flat organization and small teams as TPPs. Even though an open and flat organization seems ideal due to decision-making efficiency and innovative thinking, equivalent structure is extremely demanding in such large organizations as the big, traditional banks sampled for this thesis. Thus, the banks may gain from approaching it with healthy skepticism and rather customize it according to the bank's premises than simply copying it. However, it is important to emphasize that there is little doubt to the fact that it may be beneficial for the banks to learn from the TPPs and make slightly smoother approach to flatter organization with smaller teams.

By seeking a slightly flatter organization structure the banks can reduce the problem of slow processes. TPPs like Fintech companies can create new services, test them in the market and withdraw in order to adjust the services, a so-called build, measure and learn method (Ries, 2017). With the combination of slow, expensive processes and a lot of prestige at stake, it is hard for the banks to produce and deliver at the same pace as the new competitors. Moreover, the banks should look at new entrants as an opportunity to learn. Thus, the banks should examine the competitors' methodology, learn from it and adapt some of it to their business model. By focusing on a more agile methodology the banks will face the emerging competition with the ability to produce, deliver and adapt at a higher pace.

Agile Methodologies

None of the banks interviewed for this master thesis emphasizes on approaching lean-methodology as of today. However, they acknowledge that they need to become corporate agile, and that they plan to approach this through smaller and more specialized teams and collaboration with Fintech companies. Despite the danger of trying to act like a start-up, the bigger banks can gain huge advantages by approaching lean-methodology instead of waterfall. To stay competitive, the banks must approach a dynamic and agile strategy. The industry is facing ever-changing external environments, and the banks should therefore develop guiding principles rather than focus on balanced scorecard approach.

Through the principles of lean, the banks are enabled to focus on continuous improvements when deliver a product or service. For the banks to execute at sufficient pace, decision processes must be agile in order to make tactical choices along the way. The principles of lean enable the bigger banks to reduce the steps of the process. Such an agile methodology focus on iterative development and continuous deliveries, not just delivering an end product.

By approaching an agile methodology, banks can shorten their time-to-market on products and services by introducing an iterative development cycle. Today, time-to-market is way too long for big, traditional banks. The banks of this interview study states that is a consequence of outdated systems and processes, internal resources and skills, and experience. Furthermore, there is a lot of prestige at stake and the banks have the habit of not wanting to release anything until the product or service is 100% ready. This is because the banks invest huge amounts of time and resources in developing successful services and products, and fear that unfinished products, or unsuccessful products, can affect the brand or the customers perception of the bank, which in turn may affect customer loyalty. However, the risk of the methodology the banks are currently following is that the innovation gets killed in the process. By shorten the time-to-market the banks may strengthen their innovation process and the opportunity to be a fast-follower, or even being the first-mover.

Lean-methodology

In the book “The Startup Way” (2017) Eric Ries focus on the principle of lean production within start-up companies, but this can also be applied to the analysis of banks methodologies in this thesis. According to Ries, the method follows the three steps of build, measure and learn. By following these three steps in an iterative process the bank approach innovation and corporate agility in a more efficient way. An example of organizational structure the banks can approach are top-management and under the management they may have small teams which are responsible for only one exclusive business area, in which they control everything in that area. This way, the structure of hierarchy maintains in the bank, but in an agile matter.

These teams should have the authority to build and release a minimum viable product to cover the customer´s vital needs. When this product or service is launched, it can be tested further together with the customers. Such a process can provide the bank with valuable feedback related to the customers preferences and needs. This way the bank can continuously develop the product or service together with the customers until the perfect result. This is a more efficient way to approach innovation for bigger banks than the waterfall methodology used today. There is no longer time to develop a product 100% perfect before launching it, and thus it is beneficial to focus on what’s most urgent and then get the product or service out in the market before adjusting it. However, according to Eric Ries (2017) there are some measures which are necessary to succeed with such an agile methodology:

- Building expertise of the Lean Start-up model in the company
- Anchoring the methodology in top management
- Build entrepreneurship as a separate line function
- Continuously improve processes using experimentation and iterations.

In order to succeed with approaching such an agile methodology, it indicates that it is crucial to have a corporate culture which encourage innovation and risk-taking. With the implementation of PSD2 the technological development will escalate further, which implies that the importance of an innovative culture is emerging. The banks should let the smaller teams operate independently in order to encourage innovative thinking in an environment which operates detached from conventional thinking and which cultivates creativity and entrepreneurial spirit.

Furthermore, with innovative thinking, there must also be room for error. As of today, corporate culture does only allow this to a small extent. A TPP such as a Fintech that are using the "produce-test-learn" method, has room to learn from its mistakes. This illustrates that in order for banks to achieve an agile methodology, employees must be allowed to fail without damaging their career. This also implies that major changes must be made to top management. The boss must have a more open-minded attitude towards their employees where, if the employees fail but learn from his/her mistakes, the boss will believe that the employee will succeed in the end.

As a smaller, all-digital niche bank, Collector Bank stands out in this matter. The bank is characterized by a hierarchical structure, but the top-management stress continuously product development and the importance of being innovative. This creates a great pressure to think new and generate new ideas and enables Collector Bank to stay attractive for both customers and TPPs and the other banks can learn from this structure.

5.4 Business areas exposed for increased competition

PSD2 opens doors for new players to the banking market. In other words, this means that business areas within the banking sector will be more exposed than ever. Until now, the banks have only competed with each other. The changes that follows PSD2 may indicate that certain business areas will be approached in a different way than before. This poses questions to which business areas are actually most exposed to increased competition.

Business areas attractive for TPPs

The collected data of this thesis shows that most of the banks consider business areas such as payment services and transaction services to be most sensitive to competition. The reason why may be that such services do not necessarily require too much balance but rather IT features. In other words, the collected data indicate that business areas that are most exposed, are those areas where TPPs can profit as much as possible from their IT-expertise. Namely, in the areas they can make simple solutions without demands for heavy infrastructure. The fact that banks consider these areas most relevant to TPPs can be interpreted in two ways. Firstly, increased competition will force the banks to provide not only the best, but also the cheapest solutions in these business areas. The banks perceive that customers will choose the simplest, most modern and innovative solutions regardless of who offers them. Put it differently; with increased competition comes more options for customers, which makes it difficult for banks to hold on to them if they do not meet their demands.

Secondly, from a more optimistic perspective, banks can look at increased competition as an opportunity. In the same way as they are afraid of losing customers, rather maintain current and attract new customers can be a motivation for partnership with TPPs. For example, Danske Bank puts it forward "if we cannot beat them- join them" (Eidem, 2018). Indeed, data of this thesis shows that all banks emphasize that they want to be where the customer is, in which they want to be relevant to the customer. If this means investing in the areas that TPPs are focusing on, it can indicate that banks can try to turn to TPPs in order use them to their advantage.

A niche bank or an All-Rounder?

Furthermore, regarding strategy, research of this thesis shows that in matter of exposed business areas, the banks wants to face the competition. This demonstrates that in those areas, where the banks believe that the TPPs will get involved, is where the customers are and where the banks need to be. Nevertheless, it does not only come down to whether the banks decide to fight for the customers or not, but also whether they have the expertise and resources in order to do so. Several banks have acquired major market shares over the years as a result of little competition. Nevertheless, TPPs like Fintech companies are usually experts within specific fields, which implies they possess extremely high skills and knowledge in these areas. This in turn can display that TPPs can easily obtain market shares where they are invested. Banks on the other hand, are more full-scale suppliers as they offer solutions within several different areas (Jordal, 2018). This implies that it might be favorable to collaborate with Fintech companies when approaching their specific fields of expertise, as the bank might not have all the expertise needed in-house in these areas. Furthermore, approaching a more all-rounder strategy enables the banks to approach a hedging-strategy where they invest in several areas and thus spread the risk.

This can in itself be a good business model, as it attracts different customers to various areas. In one way, one can also assume that TPPs are insufficient to get involved with as many business areas as the banks, as they are not equally equipped for it or have the amount of experience. On the other hand, this can also indicate that the banks must eventually specialize in certain business areas to compete. The reason for this is that being specialized within one or a few areas display that the bank know how to work efficiently in the specific areas. However, this requires that the banks acquire the expertise and skills needed in-house. Competing with experts in certain business areas can be really hard and it may therefore be beneficial for the banks to enter into collaboration.

Income

To become a winner in the digital competition, the bank need to develop products and services at lower costs than its competitors, in addition to provide it at the lowest cost. This implies that the banks need to continuously work to become cost-efficient and cut costs in all business areas. As a result, banks may lose much of their income from cutting of certain areas and it will therefore be crucial to become increasingly cost-efficient. Combined with the fact that competition for earnings gets harder in the few areas they choose to invest in, it can look very challenging for the banks' future.

Nevertheless, financial data of this thesis show that banks' income from payment services, under net fee and commission income, has steadily increased over the past three years. In addition, income from other areas, such as security services and advisory services have declined over the years which may be caused by lower prices. This indicates that banks will also face strong competition from investment companies that offer online trading of stocks, mutual funds and individual bonds, retirement planning tools, exchange-traded funds and advisory services. The investment companies may require lower fees and commissions for these services, which forces banks to do the same to stay competitive. As a result, banks' commission income will decrease.

Another aspect is that more players, such as investment firms who are experts within this business area, increase the opportunity for new ideas and innovation. This makes the competition for the banks even harder than before. An example of such a competitor is the Danish bank Saxo Bank. Saxo Bank offers an online trading platform that enables customers to invest across the global financial markets (Saxo Bank, 2017). Thus, Saxo Bank has different fees for various transactions. For instance, if shares are traded in a currency other than the account balance, an automatic currency swap will occur and an exchange fee of 0.3% of the total transaction amount will be added to the purchase and sale of shares. Thus, trading expenses where the exchange rate is the market price at the time of trading. Furthermore, for currency options, the exchange rate is plus / minus 0.1% and for all other asset classes, the exchange fee is 0.5% of the total trade amount, including trading expenses where the exchange rate is the market price at the time of trading. All other currency transactions (including transfers to / from and between the customer's Saxo Bank accounts) are based on the current spot rate plus / minus 0.15% when the amount is credited or debited from the customer's account (Saxo Bank, 2017). Moreover, if the traditional banks are to compete with companies like Saxo Bank they must either specialize in those areas to be competitive or withdraw and focus on other areas.

Another thing that appears in the interview study is that most of the players in the market believe that transactions related to currency will face great competition. This can be a major challenge for the traditional banks, as of now some of the banks are requiring a relatively high fee to make foreign payments via online banking. They cannot continue to do so in the future, as other providers will be able to offer cheaper and better solutions to the customers. For instance, TransferWise is one of the largest Fintech start-ups in London and challenges the banks in this business area. Transferwise remove high bank fees from overseas exchanges by matching its customers' currencies, meaning what the customer has and what he/she require. In which the company only charge low transparent fees for each transfer and inform about them upfront.

For example, GPB to USD requires a fee of 0,5% of the amount transferred. In comparison, Danske Bank has a standard fee of up to 250 kroner for normal transaction to foreign account (at the recipient's bank after two days)(Danske Bank, 2018; TransferWise, 2015). Hence, for example, if the customer want to transfer 500 kroner to a foreign account, this will correspond to 25 kroner in costs through Transferwise. If the transaction is proceed through Danske Bank, the minimum costs will be of 250 kroner. Indeed, it is a total of 225 kroner more in cost. In other words, this indicate that a big challenge for the banks will be to adjust the fee they require for international money transfer according competitors. As a result, this will affect the banks' income generated from such fees. However, as of today the TPPs depends on corresponding banks or a SWIFT for clearing of foreign transfers, which is expensive and difficult. The bigger banks have the advantage of local presence or corresponding banks which provides the needed infrastructure. For instance, Nordea states that they possess an advantage in operating in various countries. This can be seen in relation to having corresponding infrastructure on a international scale, which enables such bank large bank to transfer money in foreign currencies efficiently.

Moreover, banks may have already begun to specialize in certain areas and thus allocate more resources and time in certain areas. The fact that they have started to focus on fewer business areas even before PSD2 is fully implemented, may demonstrate that they try to build customer relations within these areas early on. To illustrate, payments services of both DNB and Danske Bank have increased a lot over the years. Both banks have developed and launched their own mobile payment solutions, namely Vipps and MobilePay. Among other things, Danske Bank earns money to sell MobilePay business solutions to Danish companies, which they can use to receive payments in which companies pay a fixed fee to use as well as a transaction fee (Nyheder.dk, 2016). This implies that these banks have invested in being early-movers within developing innovative payment solutions. This in turn may be positive when banks come up with new ideas in the future. Hence, as customers know that the bank already has launched a good payment service it can create a sense of security and customer relations will continue to be strong.

Looking at it from another perspective, not all banks that have increased their income in payments. They have tried to keep a stable income through all areas of net fee and commission income. This may indicate that they do not want to specialize in certain business areas before PSD2 is fully implemented. This way they can keep more doors open and close them as they consider certain areas not to be beneficial to invest in. On the other hand, these banks will face extremely hard competition from other companies that have specialized within these areas.

Consequently, it appears that the banks have two different choices; they can either decide early on for which areas they want to emphasize on. By doing so, the bank pursue a niche strategy which will enable the bank to target its resources to the selected areas. In turn, the bank may increase its competitiveness against other banks and TPPs within these fields. The second way to go forward will then be to wait for the situation, thus continuing to maintain sufficient income in all business areas. Hence, banks that approach this strategy may have more opportunities and can adjust their approach in line with the market. This hedging strategy may be desired for risk-averse banks which values diversification of investments. This in turn may be a favorable hedging strategy for the larger banks, as they can afford to make some unsuccessful investments.

5.5 Cost structure

Cut Costs or Increas Investments?

With increased digitization and competition, there is valid reason to believe that the income and cost picture will change for the banks. In this context, data of this thesis shows that banks have different understanding of how this image will change. It appears that there are two approaches the banks want to follow; either cut costs or increase investment. Nevertheless, there must be a balance between investments and cutting costs. It can be put this way; a bank cannot invest in large IT projects and yet cut down costs in the form of employees and experts for such projects. Another way to look at it is that banks cannot bypass on investments they need to make, to be competitive. Thus, hiring the people they believe possess the skilled properties and knowledge for further development does not help if their systems do not interfere. This demonstrates that banks must take changes to both aspects into consideration to construct a plan for the future.

Most banks have an understanding that it will be an expensive affair, as they want to increase their investment in IT systems and opportunities, in order to participate in the digital competition. This can be interpreted that it does not only mean investments in the development of IT systems, but also investments in the form of capital to TPPs. Hence, where the bank's system is insufficient, they want to spend money to acquire the help they need. Banks with a mind set to largely increase their investments can be seen in the way that they understand that the investments they make today may generate income and opportunities in the future. For example, 186 banks came together, mainly Danish and Norwegian banks, to invested in the IT group NETS. NETS primarily provided payment solutions in Denmark and Norway, which gave these banks a general system for money transfer on a regular basis, as well as wage payment and calculating system.

However, the banks saw that earnings expectations were uncertain due to the threat of other digital solution providers, in which they sold NETS to Advent International, ATP and Bain Capital in 2014 (Christensen, 2015; E24, 2014). The reason for the sale was that NETS's management model was not optimal and that the company needed clearer management and decision making in the implementation of necessary IT and technology investments. Thus, NETS does not only compete with banks, but also to TPPs in the digital competition.This may indicate that the banks had very different strategies to how NETS would develop, and it was therefore difficult to find a satisfactory solution for all 186 banks. Instead, the banks earned 19 billion from the sale and could continue their own digital development individually (Christensen, 2015; E24, 2014).

Furthermore, this can also be seen in the context of that several banks asserts that they want to "go for the competition", in which they have various opinion in how to do so. Additionally, it means that they must have the right systems and experts to do so. Thus, not only to be a part of, but also to be a leader in the digital competition, they must have the best resources. It goes without saying that this will be expensive if they do not already possess such resources. As investments in IT systems have increased over the years, this indicates that they are working on gaining a competitive platform.

Today's Investment Equals Tomorrow's Income

Moreover, some banks states that they seek to increase their investments today to reduce costs in the long run. For example, Collector Bank stated that they have pressure from their shareholders to meet the expectations of a growth rate of 30% each year (Jordal, 2018). It is therefore more convenient for them to rather focus on doing good investments which promotes growth opportunities, than constantly look for places to cut costs. In comparison, large banks may display more obvious areas to cut costs, such as redundant employees or unprofitable business areas. In this matter, some banks see the possibilities that lie in cutting costs and consider this a better strategy for them. Increased focus on cost reduction, as well as more digitalization, also indicates that companies need fewer resources in terms of employees. For example, Nordea has been one of the major banks that has portrayed a great focus on cost reduction and are in the ongoing process of terminate 6,000 employees (Stene, 2018). This way they release resources that enable them to invest in projects such as the reconstruction of their entire platform.

The main objective for many of the companies that cut costs is to manage innovation in the most cost-effective way. Too many steps correspond to increased costs in form of employees, systems and, not least, time. Moreover, cost-effective and fast processes make the length of time to market shorter. Thus, the process from the point where the idea of a product is conceived until it is out on the market is adequate. In this matter, the product will still be relevant and attractive when customers are going to use it.

However, cutting costs also provides disadvantages and new challenges. If the bank is forced to cut costs to become cost-efficient, this may be at the expense of other operations in the bank. Cutting costs may force the bank to be more risk-averse, because it does not have resources to diversify its investments. This may cause the bank to miss important opportunities that could lead to huge returns in the long turn. Furthermore, it may force the bank to terminate employees who still are valuable to the company and this may create distrust among the workforce. Nevertheless, a risk of cutting costs is the uncertainty to how the shareholders will respond. Cutting costs usually insulates that there are bad times and that the company has to take action. This can be perceived as negative in the market and the stock price may therefore fall, which will reduce the value of the bank.

Resource Allocation

Moreover, data of this thesis show that the traditional banks come from a project-based allocation. This means that the allocation of resources within the company will be undertaken at the beginning of the year. Hence, banks are working to predict early which areas that will require most money and resources in the future. The financial research of the thesis identified that the value of intangible assets in the banks has increased over the last years, which implies that the banks have predicted this area as increasingly important and valuable. Furthermore, the financial analysis reveals that within the intangible assets, the banks has allocated resources to investments in IT-development at the expense of goodwill. This suggests that the banks have determined that this should be the focus-area from the very beginning of the operating year.

However, allocating resources this early on may indicate that resources are largely locked. As a result, for larger projects that appear along the way throughout the year, it may be difficult to obtain enough resources as these resources are disposed for other purposes. This can again make it difficult for banks to work agile in the extent as they wish. Another aspect is that if they were to take resources out of other areas to build another project, this could have a negative impact on the areas that are being taken from. On a large basis, this could have an even greater negative impact than what it would have had to not possess resources for a project.

On the other hand, if the banks are good at allocating their resources correctly, they will be both more transparent and save time searching for sufficient resources. As the financial data of this thesis shows, banks have started with increased investment in IT development already in 2015, 3 years before the introduction of PSD2. In addition, research of this thesis show that the banks have set up individual investment groups where they invest large amounts of capital in order to invest in TPPs. This indicates that banks have captured the shift in the market and have a good insight into what they invest in.

Changed Competition

The banks in the interview study were secretive when it came to revealing too much of their cost structure. Nevertheless, the response from Deloitte gave a better perspective on how some banks can follow a strategy if they are not sufficient themselves. For example, new TPPs place themselves in between consumers and banks, and it is these players who stand for innovation. Thus, they offer solutions within both payment, loan and insurance. For example, internationally, players like Amazon and Chinese Alibaba have taken up the competition with the banks on loans (Aftenposten, 2018). For a smaller bank, which may not be as specialized within the business area of loans, they may face a huge challenge. Nevertheless, instead of offering the loan themselves, they may choose to cut out their entire loan service. Instead, they can make a price comparison service, where they can guarantee customers the lowest loan on the market (Duong, 2018).

Another change that is observed in the market is that retail companies offer customers their own apps and payment solutions. For example, the grocery chain Coop's own Coop Bank offers their members a combined membership and payment card with Visa. The customer automatically receives a 1% purchase return when using the card. Savings and membership discounts from partners are automatically credited to the customer's member account and through an app the user will always be in control over his/hers spending. In addition, customers who have a Coop member and debit card can subscribe to a payment insurance (EnterCard, 2018). The fact that such companies offer their own payment solutions to customers is a challenge for the banks. Such apps are very accessible and adapted to customers, as everyone is shopping in grocery stores approximately every day. In addition, the banks face competition in that retail companies can acquire information and data that they can use to detect trends and preferences among customers. That is, the banks will face a big challenge when it comes to tailoring solutions for their customers.

5.6 SWOT

Through section *5 Analyze* the thesis has developed analysis based on data from legit media, the banks' annual reports and results from the interview study. This has led to analysis regarding the issue of the banks legacy and technical architecture, the methodology and organizational structure, which business areas that are most exposed for increased competition and how the cost structure will look in the future. Through analysis the thesis has revealed important areas within the selected banks' business models which needs to be renewed or improved to meet the increasing competition emerging from the implementation of PSD2. The implementation of PSD2 was drafted as a consequence of the digital developments in recent years. The EU Commission identified the need for a revised payments service directive that took into account digitalization and, through increased competition, focused on the customer's needs.

The implementation of PSD2 has led to fundamental changes of the value chain of the future ecosystem in the payments service industry. As new players enter the market, traditional banks have to change their strategies to meet the new and increased competition. The analysis in this master thesis are done based on data and interview studies from banks in the Nordic region, but with the implementation of PSD2 there will in practice no longer be any borders within the Europe payments service industry. PSD2 applies to all countries in Europe. Even though the thesis is written from a Nordic perspective, the results from this analysis are likely to illustrate similar consequences for all the banks in the EU, which will be affected by PSD2.

The thesis have analyzed the banks' current position and strategies related to innovation, and thus aim to provide insight into what measures can be done to be competitive in the future. Based on the SWOT, this section aims to provide an answer the research question of this thesis. Thus, it is crucial to analyze how the different aspects of the SWOT-analyze will affect the strategic choices of the banks and thus the future of banking.

Model 1: SWOT-Analyze of the selected banks

(Source: Compiled by authors)

5.6.1 Strengths

Large Customer Base

Through analysis this master thesis has identified the most significant strengths of banks to be their customer base, market share, resources and their reputation. The absolute greatest strength the big banks possesses is that they have an extremely large customer base. This means that through data they have access to a lot of customer information and customer history, which enables them to analyze the trends and needs in customer behavior. Furthermore, scale increases the value of a digital ecosystem and a large customer base creates network effects for the consumers. This helps the bank attract more complementary offerings which in turn brings in even more users which in turn increases the value of the banks' services.

In addition, a large customer base also give banks the opportunity to provide digital solutions over a great scale. This information is extremely valuable because it can be used to create services tailored to their customers' needs. Thus, banks like DNB, Danske Bank and Nordea can gain an advantage in creating highly relevant solutions, however, the question is whether they can do it quickly enough in order to get in forehand of new players entering the market.

Big Market Share

The second identified strength of the banks is the fact that they have a big market share, due to the recent monopoly they have possessed within some financial services. Thus, they have the ability to run a slightly bolder strategy and invest in many more areas than start-up companies can. This implies that the banks may use a hedging strategy where they diversify their investments into different business areas. While start-ups specialize in specific areas, banks can afford to approach a wider strategy at the beginning and then find their position in the market along the way. Thus, they have a good position in the market and this can be exploited by daring to try to be innovative and proactive.

Reputation

The third strength identified are the banks reputation. As a traditional bank, it has a unique position because of the reputation of banks as a safe and loyal place. Historically, banks have been associated as the safest place for your finances. To some extent, they have obtained customer loyalty just by being banks. Thus, banks already have created a well-known brand and a large customers base who trust the company. Based on the disruption in the market, the banks have currently a window for 1-2 years where they can utilize their brand in becoming innovative and act proactive in order to retain their customers.

Financial Resources

The analysis identified the fourth strength of the selected banks to be their financial resources. Banks have a lot of money and resources, which enables them to explore new things. Combined with the large amount of customer data, strong financial resources enable the banks to develop desired products and services for the customers. Furthermore, the banks can afford to take the risk of investing in various areas without all the investments being a success. They have the ability to use a lot of resources to change their business models in order to cope with the consequences of PSD2. This is a huge strength because it may give the banks a head-start to the TPPs, if they use their resources wisely. This gives the banks the opportunity to change their business models and become more agile in the future, despite the outdated legacy and methodology they struggle with today.

5.6.2 Weaknesses

Through thorough analysis, this master thesis has identified important weaknesses for the banks. By acknowledging their weaknesses, the banks can adjust their business model and make strategic choices to strengthen their weak-spots and thus approach the consequences of PSD2 by being proactive. The analysis reveals that the benefits of being a first-mover or fast-follower is very situational. It is not always necessary or beneficial to be the first-mover, but to survive the rapid competition it is crucial to avoid getting left behind. Competitors operates at a very fast pace, which highlights the importance of staying sharp and continuously adapt to changes in the market. The analysis has identified the most significant weaknesses to be the banks legacy, methodology, internal resources and that they have a lot of prestige at stake.

Legacy

To cope with the consequences of PSD2, it is compelling for the banks to handle their legacy. The analysis revealed that except from Collector Bank, all the selected banks struggle with legacy and significant amounts of technical debt. Because traditional banks like DNB, Danske Bank and Nordea have existed for many years, the banks have extremely high technical debt and thus a lot of legacy. This is a weakness because these existing systems may not be compatible with technology in order to offer innovative solutions that relate to innovative systems. Thus, the legacy and technical debt makes it challenging for the banks to drive innovation at the same pace as TPPs such as Fintech companies or other start-ups because it requires more effort, time and money. However, the banks are constantly working to get rid of technical debt and to acquire newer coding technology, but it takes time. In addition, many banks will seek opportunities in partnership and collaborations with TPP, by outsourcing parts of their innovation process or retrieving TPP's technology solutions. In doing so, they must have platforms that accommodate TPP technology. However, if the banks' systems are too outdated and slow, it can be very challenging to plug TPP technology back onto the banks' platform. In which makes it difficult to conduct collaboration between the parties.

Methodology

The second weakness identified within the bigger banks organization is the methodology. As determined in the analysis, all the selected banks are today characterized by the methodology of waterfalls. This kind of organizational structure creates hierarchy and inefficient allocation of employees, which results in slow decision-making processes in the bigger banks. In smaller banks like Collector Bank, such a methodology may be desired because as a smaller bank it has a smaller waterfall. However, in bigger banks like Danske Bank, DNB and Nordea the methodology of waterfall in innovation process involves many unnecessary steps. This is an inconvenience because the digitalization which led to PSD2 opens doors for companies that develop and launch products and services at an extremely fast pace. This means that processes within the payments service industry will evolve at higher pace once the implementation of PSD2 is completed. With the methodology of waterfalls, the internal innovation process in the bigger banks are at risk of being inhibited. To cope with this weakness, the banks must learn more effective and agile organizational models. That seems to be the only way to face the increasing competition and shorten the time-to-market.

Corporate Culture and Internal Resources

The third weakness identified in the analysis is the corporate culture and internal resources of the banks. Outsourcing of projects works if the project is time-limited, such as a system upgrade. However, with the implementation of PSD2 the focus should be on continually learning and the ability to quickly respond to changes in the industry, and this creates the need for having the right people with the right skills and experience internally. Furthermore, the culture of the selected banks is still characterized by leadership at the top and fear of failing. It is challenging to change a business model and mindset which have been well-implemented in the company culture for a really long time. In order to succeed with innovation, it must be allowed to make mistakes, as long as the employee learn from them. The management have to get rid of the fear to failure and dare to give responsibility further down in the hierarchy.

A lot of prestige at stake

The fourth identified weakness of the bigger banks is that they have a lot of prestige at stake and thus become risk-averse. Due to the methodology innovation processes costs a lot of time and money, and the risk is that the innovation gets killed in the process. This is because the banks fear they have too much to lose if they release incomplete services or products, both in prestige, resources and money. The banks must be willing to make tough choices. Hence, they must relinquish the prestige and this is closely connected with the corporate culture. The management must show willingness to sacrifice the income they have today in order to have resources to invest in new projects. Furthermore, the banks have to take the risk of investing heavily today in order to earn money in the long run. And lastly, the top management must be more open minded towards their employees. The employees must have the allowance to fail and learn from it without damaging their future career.

5.6.3 Opportunities

The implementation of PSD2 provides both great challenges and opportunities for the banking industry. The analysis of this master thesis has identified the most significant opportunities for the banks which arise as a result of PSD2. This includes that the revised directive opens up for new business opportunities, collaboration with TPPs and digitalization. All of these opportunities are closely connected to each other and may provide great revenues for the banks if they manage to exploit them.

New Business Opportunities

No matter which strategic direction the banks choose to pursue, PSD2 opens up for great business opportunities. If they approach it properly, they can use open interface to create a lot more value and much better products for the customers. Just as the TPPs gets access to the banks platforms and data, the banks get access to theirs. Data exchange through open APIs is one of the key ingredients that enables the bank to scale and exploit the network effect in the platform economy (Haernes, 2018). This means that through open interfaces the bank can connect to an external ecosystem to associate complementary products and services. Furthermore, this means that the potential for success thus becomes greater than the bank would manage to create on its own.

This includes that the banks can build their own services based on other players information, maintain the role as a full-scale supplier they have today, find their niche within the industry or be the one who offers a solid infrastructure with very good APIs, which allows TPPs to do exciting things with the data the banks possess. Furthermore, as the banks already possess a valuable reputation and resources, banks may have unique opportunities because their position enables them to get a head-start to create and develop innovative products and services in an agile way.

Potential Collaborations with TPPs

The perhaps the biggest opportunity PSD2 creates for the banks is potential collaborations with new market entrants, being all types of TPPs, i.e. Fintech, Bigtech and start-ups in the new payments ecosystem. The banks may have a lot to gain from entering into partnerships or collaboration with TPPs to deliver a quality product or service within a timeframe. A key element in the value of a digital ecosystem is directly linked to the value of third parties. Furthermore, collaborating with other players may increase the value of the consumers´ user-experience. Thus, the analysis of this master thesis reveals that banks can take advantage of the increased competition in that they can use TPPs where their own systems are not sufficient enough. Even though the competition for margins will be harder, if the banks enables to exploit such collaborations they will be able to maintain their current customers, as well as retrieve new ones.

Digitalization

In addition to opening up the market and encourage increased competition, the revised directive embraces digitalization. The digitalization provides endless opportunities for the banks in the future, either by offering their own services through their own interfaces, or if they enter into collaboration with Fintech companies which are experts within specific areas of digitalization. Through exploiting the digitalization and being proactive, the banks can develop desired services for their customers. Computers are able to analyze enormous amount of data in a short time, which may contribute to faster and better services in the future. The banks have to analyze the costs today versus what they will get for it in a long-term perspective. The banks must be willing to change and move in line with the changes in the market, or even faster. This requires that they pay attention to both the changes in the market and in customer needs. To utilize the digitalization, the banks may have a lot to gain from entering into collaboration with TPPs in order to deliver their services at a sufficient pace.

5.6.4 Threats

Increased Competition

The most fundamental threat following the implementation of PSD2 are the increased competition due to new market entrants. Beside payment systems, which is a low income product, banks can also expect strong competition from investments companies that provide the customers with advice and lower commissions. In addition to this, open interface creates complete transparency. The increased competition will be beneficial for the consumers because they get more informed and have more options, which means that banks must be able to offer the best services at the lowest possible price. This creates an extreme cost pressure in the market. The research of this thesis states that the increased competition is a threat because PSD2 will rise the competition for margins which in turn will reduce income. Thus, it is therefore crucial for the bank to identify where it have a competitive advantage on the cost side and then pursue this.

Losing Customer Loyalty

Another important threat following the implementation of PSD2 is the possibility of banks losing their customer loyalty. Until now, the banks have basically possessed monopoly in parts of the market and thus they have received a lot of free loyalty and trust due to lack of other providers. When PSD2 are enforced, the consumers can evaluate all the payments service providers and choose the one providing the best offer. Consumers will no longer feel obliged to stay loyal to their banks, because they will rather seek the best solutions available. However, the banks are likely to have a gap of 1-2 years now until the majority of their consumers are comfortable to let other actors handle their finances. Thus, the banks need to act quickly if they want to maintain the customer trust and loyalty.

Security Risk

Lastly, an important threat for the banks is the security risk that PSD2 represents. While open interface creates opportunities for innovation, it comes with a risk. Unless security is taken seriously and the TPPs have a solid security system, data can easily be lost or misused. This is because the challenge with open interfaces is that they often provide detailed recipes that can be misused. This includes information of how the underlying data is structured and how the applications behave which may provide insight into potential vulnerabilities that were previously buried in the systems. As the banks rely on customer confidence, it it will be a disaster for the banks if the TPPs abuses or loses the data. With open user interface, this risk increases. This is the disadvantage of PSD2 forcing the banks to open their platforms and sharing their data. To prevent this, the bank should think as a hacker in the development of secure digital services. As identified in the analysis, this security is included in the increased IT-costs of the selected banks which implies that the banks are aware of this risk.

5.7 Strategic Choices

With the implementation of PSD2 the banks are facing numerous strategic opportunities, and the strategic choices they make in their business models will heavily affect their future positions. The interview study results revealed that time is urgent and in order to survive in a market of increased competition the banks have to make some important strategic choices promptly. The analysis has laid the foundation for preparing four strategic choices the banks face now. In this section, these choices will be outlined and analyzed based on previous analysis and the results from the SWOT.

1. Compete or collaborate with TPPs

In order for the banks to be able to think about innovation more open, they need to get rid of technical debt and approach a more agile methodology. The banks' legacy heavily affects their capacity to drive innovation, because they struggle with technical debt which makes it difficult for the banks to operate at the same pace as the new market entrants. Furthermore, this makes the banks unattractive to potentially collaborators. Therefore, the banks need to acknowledge their weaknesses and realize which areas they need help and thus may gain to collaborate with the TPPs. However, the banks need to allow flexibility in their structure and change to become more attractive for TPPs. This includes adapting their platform to become responsive for the technology that the TPPs offer.

Instead of entering into partnerships with TPPs, the bank may rather choose to do everything internally and utilize open banking to disrupt the disruptors. If this is desired, the bank may become compliant through investing in restructuring their platform and systems, in addition to focusing on attracting people with the desired skills and expertise to work for them. Furthermore, the bank may acquire the skills and knowledge needed through mergers and acquisitions.

2. Advance or replace top-management

To become corporate agile the banks could make the strategic choice of changing from project-based allocation of resources toward a more agile methodology which enables the banks to do smaller, internal projects. Such a sprint-strategy involves working intensively over a short period of time in a dedicated team, then try and fail their way to the best solution. If the top-management let this team focus on that specific task only, they can develop a good and innovative product without worrying about what is happening in the rest of the bank. Furthermore, making this strategic move leads to the necessity of either ensure that the agile methodology is solid anchored in the top-management or simply replace them with managers which embrace such strategies. It is crucial to build the expertise of lean internal to acquire knowledge and change the corporate culture of the bank to make sure there is room for agility. The process of innovation starts internal in the bank, and this has to start with the top-management.

3. Being a customer front or to become a clean product supplier

The greatest challenge for banks are the strategic choice of whether to change from being a customer front or to become a clean product supplier. As previously outlined, there will be an extreme cost pressure in the market due to the increased competition. These clean customer fronts will always work to provide the most low-priced products to customers. Thus, the two obvious strategic choices the banks then face is to either become incredible cost effective and be able to deliver the most low-priced products, or they must become a clean customer front who uses TPPs to provide customers with the best product. To make this choice, the bank has to decide whether to face the competition by specializing within specific business areas today or if they would rather diversify and thereby evaluate their specialization options on a continuous basis to hedge.

4. Invest and/or cut costs

With the expectations of reduced earnings in the future, banks need to make some strategic choices to be as cost-efficient as possible. With improvement of methodology and legacy the banks face major opportunities to become increasingly time – and cost-efficient. However, the bank has to analyze which strategy that fits their current business model the best. The strategic choice they have to make is whether to invest heavily today, aiming to gain from this in the long term, or to focus on reducing costs today to become more cost-effective. Nevertheless, when pursuing either of these strategies, the banks must keep in mind that it has to be a balance between the two. For instance, when investing in large IT projects, they cannot cut out skilled employees required for such projects.

6.0 PROPOSAL

6.1 Strategic Choices

Based on the collected data and the analysis, this section provides the strategic choices the thesis propose for the banks. The previous analysis revealed that the bank has to rethink how they approach strategy when facing digital transformation and some choices the banks face as a consequence of the implementation of PSD2. The most urgent choice the banks have to make is whether it wants to keep developing and producing their own services or become a platform/partner for TPPs. This depends on the strengths and weaknesses of the bank. PSD2 is all about providing better and cheaper services for the customer. Thus, they must identify the banks' competitive advantage on the cost side and then choose what to pursue.

If a bank chooses to continue to be in the customer-front, it may choose to collaborate with other players to acquire necessary technology and expertise. Thus, they can exploit the strength they have in terms of their brand and customer base, while developing new and innovative solutions for the customers. However, this requires solid financial investments to cope with the issues of legacy, technical debt and methodology because the bank has to prepare and facilitate for collaboration with TPPs. This strategy demands that the bank acquire the expertise needed in-house, either through acquisitions of smaller companies or internal employment. Thus, the next strategic choice is whether to change their entire platform from scratch, like Nordea are doing today, or invest in updating the systems bit-by-bit like DNB have chosen. This must be done based on assumptions to what the expected revenue of such investments will be. Furthermore, the banks has to choose between either become incredible cost effective and be able to deliver the most low-prices products, or they must become a clean customer front who uses TPPs to provide customers with the best product.

If a bank chooses to become a supplier for TPPs it has to cope with some of the same issues. To become a supplier for TPPs, the bank must change the structure of the bank toward a more agile methodology. Furthermore, it has to emphasize on promote innovative thinking and experimenting to provide a solid platform and APIs which the TPPs may utilize to develop innovative services. Thus, as the first strategic choice, it is necessary to cope with the issues of legacy, technical debt and methodology. However, the financial investments are likely to be lower because the bank does not aim to acquire the expertise and knowledge required to create new services in-house. The bank becomes the supplier which has to provide the TPPs with infrastructure and APIs which the TPP may build their own services on-top of.

6.2 Future Research

The strategic implications following the implementation of PSD2 is still an uncertain area of research. There is still great uncertainty to exactly how the directive will be enforced in the payments service industry. This master thesis only analysis the potential strategic consequences of the directive, and it would therefore be interesting to study the impact of PSD2 after its actual implementation phase of 18 months. It may be easier to identify the characteristics of PSD2 after the implementation phase. Furthermore, it may be interesting to include the other market participants in a study to capture the whole market. Because of more inputs and performance data from both the new market entrants and the banks it may be easier to measure the disruptive potential of PSD2 to a higher degree after the implementation phase. In a long-term perspective, studies regarding the potential of PSD3 could be carried out in the payments service industry.

There has been written a lot of potential of the use of technology in the payments service industry. In the years to come, the technological development is likely to happen at an even faster pace due to the implementation of PSD2. As TPPs are entering the market, there is potential for development of a wide spectrum of services and products for the customers, which could be interesting for further research. Furthermore, as other players are able to handle the customers' finances, the security and risk aspect increases for both customers and banks. By embracing the TPPs and their impact on the industry, these studies could make it easier to analyze and understand the strategic choices of banks.

7.0 CONCLUSION

The conclusion aims to answer the main research question presented at the very beginning of this thesis:

"The implementation of PSD2: How will the digital competition change and how will it affect the future of banking?"

The conclusion is based on findings and research highlighted through discussion and analysis in this thesis. Furthermore, the three sub questions developed in section *1.3 Research Question* are used to highlight the characteristics of the implementation of PSD2 and how the implementation will affect the digital competition and future of banking.

The thesis reveals that it is crucial for banks to rethink and evaluate how they approach strategy when facing digital transformation. The two obvious choices banks face when considering open banking is whether to facilitate collaboration with TPPs or pursue most of the innovation process on its own. Open banking illustrates how the financial institutions are pushed to transition from a product to a platform strategy. When deciding to facilitate collaboration with TPPs, the bank seek to create value through the interactions between the other platform participants and in this way innovate at pace and stay competitive.

This requires that the banks get rid of technical debt and make their platform attractive and accessible for potential partners. The banks must make the platforms responsive to the technology the TPPs provides, which may be especially challenging for the big, traditional banks which possess a lot of technical debt. To develop sufficient platforms and systems the banks may choose either replacing the entire system or modernize parts of it. Both strategies are expensive and time-consuming, but the potential return of investing in collaboration with TPPs and participate in an external ecosystem are significant. By enhancing collaboration with TPPs the banks face greater potential for innovation and growth than they can generate alone as a single product-oriented firm. This in turn enables the bank to develop complementary products and services which will increase the value of the ecosystem for both the consumers and businesses.

In addition to having a solid platform, the management of the banks must pursue a dynamic strategy to increase the corporate agility of the bank and thereby be attractive to potential collaborators. As TPPs work with agile methodologies and have a shorter time-to-market, the management of banks must approach an efficient structure to be competitive. This implies that they adopt agile decision processes where tactical choices are made along the way, and to make the bigger banks move away from the waterfall methodology commonly used today.

To cope with the identified issues of waterfall decision-making, the bigger banks may approach an agile methodology where they create small, dedicated and autonomous teams. This will speed up the process of innovation and product development. The structure are inspired by start-ups and may contribute to make the bank more attractive for potential collaborators. The key to succeed with such organizational changes are communication and this responsibility rests on all levels of the organization.

The second identified choice for the banks is to do most of the innovation internally. As with the first option, the banks needs to increase the efficiency of product development and decision making to stay competitive. To face the digital competition these banks should invest heavily in IT-system development to be compliant. Furthermore, following this strategy the bank must focus on attracting the right employees to ensure that the bank possess the needed skills and knowledge in-house to drive the innovation process. The bank may outsource the parts of the innovation process which the bank are not capable of in-house. Thus, it may be beneficial to outsource the parts that do not require too much balance but rather IT-features, such as design and consumer experience, which can be easily retrieved back to the bank.

With the implementation of PSD2, the competition for margins will be tougher due to the new market entrants. The thesis has identified some strategic choices for the banks to utilize their competitive advantages of capacity and distribution power to recapture lost income. As PSD2 is all about providing better, cheaper and safer services for the consumers, the banks must provide cheaper and more user-friendly digital solutions than its competitors. The analysis of this thesis concludes that to there is two strategic choices the banks face in this matter. The first choice is to become extremely cost effective and thereby have the opportunity to offer low-price products to its customers. As the banks have acquire a large customer base over the years they can offer this low-price services at a large scale. Alternatively, the bank may chose to become a clean customer front. This way the banks will enter into partnerships with TPPs to produce digital solutions, in which the banks can offer to their customers.

With the implementation of PSD2 the value chain of the payments service industry will fundamentally change, and banks may have to choose in which business areas to best compete with to face the new competition.The different areas will be exposed to major competition which forces the banks to decide whether to specialize in certain areas or to continue as a full-scale supplier. By specializing in a few business areas the banks can become highly skilled and efficient in these processes, which in turn will make them competitive in these specific areas. Furthermore, they can join forces with experts within other areas and thereby create one huge consultation to deliver a service under one brand. However, it may be beneficial to see innovation in a portfolio-perspective and start to think as an investor diversifying its portfolio. This implies that the ability to invest in several projects and business areas parallel instead of placing all the resources in one post may reduce the overall risk. The outcome of PSD2 is highly uncertain, which implies that it would be wise to follow such a hedging strategy.

The thesis has identified the potential benefits of adapting to some of the structures of the TPPs to promote efficient innovation processes and thereby become competitive. The conducted research shows that several banks have begun to test design sprint, a similar approach to the product-testing-learning strategy of the TPPs. This way the banks approach innovation in a more efficient way because it enables small teams to work intensively with one idea over a short period of time. Furthermore, it enables the banks to test, product and release services on a continuous basis. To succeed with such a innovation strategy, the management must encourage the employees to dare to fail and thereby learn from their mistakes.

One of the most important strengths of the banks is the customer base. It provides the bank with enormous amount of information and data which can be utilized to predict future trends and customer demands in the market. Data exchange through open interfaces is one of the key ingredients that enables the bank to scale and exploit the network effect in the platform economy. This implies that strategical utilization of open banking to promote innovation may cause the banks to reach a higher potential of success. However, it is crucial that banks are aware of the fact that in addition to promote opportunities for innovation, open interfaces also entails increased risk.

With the implementation of PSD2 the digital competition will radically change. There will be more players in the market and these players will challenge the bank's current business models. The new market entrants will be both smaller and larger players competing to provide the most innovative and user-friendly services to consumers all over Europe. The banks must be responsive to the changes and utilize the opportunities of open banking to provide the best services. Furthermore, the banks must develop, produce and release services at a lower cost and higher pace than its competitors.

The digital competition will shift from focusing on which bank makes the customer´s funding to who produces the best digital solutions. The digitalization has made banking a hygiene factor that becomes integrated in the everyday lives of customers. The consumers will experience a wider range of providers of cheap and smart solutions, which forces the banks to adapt to the changes to stay competitive. The loyalty and customer trust that the banks have benefited from up to now will disappear. With so many players, the customer will simply choose the player who offers the best service for each specific task.

The research of this thesis states that the majority of the market participants believes that there will be fewer, but larger, banks in the future. Some banks will be sufficiently lucky, smart and collaborative to innovate at pace and thus survive as a bank. The rest of the banks are likely to either be acquired or enter into partnerships with other banks or simply not survive due to bad luck and bad strategic choices. In other words, the banks are likely to pursue the saying of "If you cannot beat them, join them". This will lead to a future market consisting of a few banks of big size and numerous smaller players that act like Fintech companies which forms the basis for an expanded digital ecosystem. The value of this ecosystem will increase with scale because it enables the participants to develop complementary services which both consumers and businesses may benefit from.

The most important realization for the banks when approaching digital transformation is that this is not a one-time activity, but rather the new normal for all the banks in the payments service industry. The bank must acquire the right internal culture and mentality and challenge existing practices. Top management must promote adaptability and an agile workforce.
The employees must acquire new skills, but it is just as important to focus on unlearning old habits which prevents innovative thinking. To cope with the digital competition the management has to represent a continuous state of change, and both old and new banks need to focus on digital transformation to stay relevant. The banks has to improve their legacy, technical debt and methodology to increase their efficiency and thereby face the digital competition. Based on the analysis of this thesis, it is not the banks with the biggest customer base and resources that survives, but the ones most responsive to change.

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APPENDICES

Appendix 1: Summary of Interviews

Interview with Njål Stene

Corporate Strategy and Business Development in Nordea

Njål Stene works in the department of corporate strategy and business development in Nordea. The interview was held on Skype on March 26. from 14.00 pm – 14.35 pm and both Christine and Elise participated in the meeting. The research question of the paper, introduction and literature review were sent to Njål Stene in advance. He thought the thesis looked interesting and wanted to have a meeting with us. The interview was held in Norwegian as this is the native language of all three participants and has been translated into English afterwards. The interview has been rewritten to a summary containing the most relevant information for this master thesis. In order to ensure the validity and reliability of this interview to the master thesis, Njål Stene has read and approved the translation.

"What does innovation mean to Nordea and how do you approach it?"

Being innovative can mean a lot, but the most recent changes in PSD2 reveals that we do not have all the skills needed internally in the company, meaning we need an externally workforce as well. This implies approaching smaller players who are a bit more focused on niche activities which they are typically good at. Nordea cooperates a lot with smaller companies, but also with other big players. A typical example of such cooperation is Nordea Runway where we have invited many smaller companies to pitch their ideas. We pick out the best ideas we want to work with further and help sponsor them so that they have the opportunity to work on developing their ideas. We have to see what we eventually end up actually using, but nevertheless this strategy gives us a lot of valuable input.

"How does Nordea ensure that there are enough room for technological development?"

In large companies, there are many joints who will approve things before you are allowed to move on in the process, which means that internal processes take a long time. So, what we discover now is that Nordea, which has over 30,000 employees, is not suited to drive all kinds of innovation. To ensure that there are enough room for technological development, we therefore simply arrange smaller groups, preferably with external companies. These groups get specific responsibilities and get to drive the innovation work themselves. We have small workshops and give input on what we think is important. We simply hire them as external consultants and the result is that the time-to-market for the service will be reduced. This is simply because this makes it possible to skip the approval of every little thing in all joints of the company. Instead, you go directly to a smaller company and get approval from only one person and then you are ready to start the process right away.

Our main program is Nordea Accelerator. Our strategy is to say that we have an accelerator program where we want all the sharpest to set up. It is a win-win situation because it´s precisely this kind of platform that these smaller companies are looking for; simply an opportunity to promote themselves. Another thing we arrange is hackaton, where companies can settle down for example a weekend to develop a prototype that can be presented. This way we quickly get an idea of who has many good thoughts and ideas about the process.

"How does Nordea distribute resources internally? Do you have the qualities needed to drive innovation? If so, what are the characteristics of this?"

In Nordea, we have departments that are responsible for certain specific areas. For example, the area that I´m in, corporate strategy and development, is a relevant department in this area. I have actively applied to this department because this is what I want to work with. The employees have to identify the players and analyze what´s typically needed to deliver to make the customer happy. What I typically do is approaching customers/consultants and ask what is demanded in the market. They may respond that they want a more automatic credit process for example. Then I go back again to Nordea and see if we have the resources needed to solve this. Then I may discover that in this process or area we have a big hole, and then it´s about finding a TPP who can fill this gap.

In order to be innovative, it is necessary for the banks to possess the right capabilities.

"Is Nordea in possession of the right qualities and how do the company utilize these? And conversely, what capabilities do the other players have and how do you think they can utilize these?"

As the largest bank in the Nordic region, Nordea has a large customer base. This means we have access to very much data and many customers, which of course provides the big scale advantage. We are able to test on all types of customers, an opportunity not all banks possess. Another quality is that if it becomes a success, we have the possibility to scale up on a Nordic level and that is big advantage we have versus smaller and more focused banks. Nordea on the other hand, has to be a little more house bank that meets the entire customer´s needs. This creates a difference, because it is not possible to ensure that everyone is equally satisfied with all the solutions. We do simply not have the opportunity to tailor it to everyone´s best needs, and that can be acknowledged as the disadvantage of being a big bank.

I think the best way to exploit other player´s capabilities are to enter into cooperation. Let them do what they are good at, after all that is why we are interested in teaming up. Nordea would give the guidelines and say what we are looking for, but we do not want to micromanage a whole lot and demand what we want. I think that better solutions rise when Nordea reports a wish for an idea. This may e.g. mean that we want to forecast future cash flow, and then it is up to the other player to come up with a solution. The people we work with can either work in-house where we offer them a seat at our office for a year, but in most cases, they prefer to continue to work from their own space.

Like the rest of the market, we work a lot in sprint form. This means being agile and work for periods of e.g. 6 weeks at the time before presenting what they have come to. Then Nordea provide feedback and then they continue to develop based on it.

In a marked under constant development it can be crucial to be the first mover in order to succeed.

"Is this a strategy Nordea tries to follow?"

Not in all aspects. I believe our focus is to be a first-mover to arrange types of things like Nordea Runway or Nordea Accelerator program in order to get the most skilled heads and to buy their solutions. We do not have the opportunity to do all work in-house due to capacity and lack of knowledge. Thus, we see that the best thing we can do is bring in other players in smaller accelerator programs, for example, to acquire their knowledge and get them on board on our team. This is the strategy we have chosen. It remains to see how successful it will be, but so far, we have received good feedback on this implementation.

"How do you recruit the right people and which capabilities should they possess? Do Nordea recruit from within the company or externally?"

We recruit both internally and externally, based on which skills that are needed. I would say that almost all banks today have job announcements that require technological skills and passion. Technology is very important, now it is all about digital banking and open banking, and this is simply because this is the future. That is why this is the competence we need.
We are looking for people who have the right drive and who are interested in being up to date on the market and the recent developments. This is perhaps the most important thing we are looking for today. A lot of people can do standard banking tasks, but what we seek is people who actually come up with new innovative solutions and have the implementing power to go through with it.

"What does Nordea do to attract the right employees?"

The single most important thing as I see it, is that we get the people who are motivated to do this. In the past, we have had some mixed success just delegating tasks. The most important thing for us is therefore to arrange a dedicated team to perform specific tasks. Then the follow-up is important to ensure that the project is on the right track. But the most important factor is by far having motivated people to do the tasks, and then I believe the consequence will be that the bank gets better results as well. In order to attract motivated and skilled employees we want to present a company which are technology-focused and provide opportunities for greater responsibility due to smaller, more specific teams.

"What kind of image does Nordea want to present?"
As all the other banks, we want to be a digital bank. We want to be a bank that are available anywhere, anytime. We are accessible, fully updated on the digital solutions and we want to have a lot of self-service in the future as well. This is simply because most of the customers are in the medium segment. Furthermore, we have a lot of focus on speed and hygiene factor and that bank services can be done on-the-go. We want to present a digital bank where everything can be done digital, meetings with the bank for example should be offered online. We want to be where the customers whish us to be, and we believe that in the future this is digital.

"How will you describe Danske Bank's technical architecture? Are you ready to meet the challenges of digital competition in the future? Are there anything you are missing?" We are getting there. Given the fast changing competitive environment we have to build a little along the way and improve it based on feedback. Customer's expect more and faster deliveries than earlier, so the traditional waterfall model may not be the most appropriate anymore.

"Does Nordea have too much legacy to approach such a strategy? Does Nordea have too much legacy to drive innovation?"
As the biggest bank in the Nordic region, we have access to many different customers in all possible countries, so if we want to test segments in special countries we have the opportunity to do so. It is obvious that the access to customers are an advantage, but our systems are a disadvantage. Our systems are somewhat old and outdated in some countries, which of course are not optimal. It is therefore challenging to get the different systems to talk together. For example, it is not given that there is the same system in Norway and Finland, and thus it can be challenging to send pilots across the countries. Thus, our legacy is both an advantage and a disadvantage, but at least we have a good starting point and an opportunity that not all other banks have.

The legacy increases the risk that different processes take too long time. Time-to-market means that the idea may not be relevant anymore or that some of the employees' power will disappear as it takes so much time to accomplish the tasks. This is a severe risk for us. That is why we get to the smaller companies because they typically get through this a little faster. Then we ensure that it is actually done and that the driving force is there from start to finish.

"How can Nordea utilize their position with customers and build on the trust they have gained? Do the bank have any additional advantages over Fintech companies?"
Our biggest strength is that we have very much in-house expertise. With more than 30,000 employees there is a high probability that you will find the solution in-house, or at least you will find a person who will guide you in the right direction.

"What do you see as Nordea´s biggest weakness/challenge? What are the company lacking?"
I would say that in general the main difference is the ability to turn around if the market changes, simply because of systems. We are dependent on systems that work on a complete customer base, and it may not be possible to specify it to a specific customer segment. It is very expensive for us to develop systems that only work on e.g. medium sized companies in Finland. This may be exactly what a Fintech company aims at, that their target group is as specific as medium-sized companies in Finland. So, I would say the biggest difference really are having systems in place. Versus Fintech companies, this is our weakness.

"How does Nordea work to become corporate agile"?
This is an important question. That´s one of the reasons we approach the Fintech companies. We do not want to spend a lot of time and money, and maybe not put Nordea´s name on all the smaller things. We would rather make smaller pilots. What becomes increasingly important with the implementation of PSD2 is testing, simply the importance of receiving feedback. In the past, it was common to launch the solution when it was 100% finished and everything was in place. Today, the customers require much faster solutions.
Now you simply have to try to develop a solution and launch it when it might be 80-90% complete and then get feedback. In Nordea, we say that if you launch a solution that is 100% complete today, then you´ve launched it too late. I think that is very important.

In today´s market, one cannot rely on everything being perfect from launching, even though this of course is desired. It is not realistic because everyone is competing for the same customers.

For example, when Vipps was launched in Norway, MobilePay already existed in Denmark. However, Danske Bank had not yet launched it in Norway. The moment Vipps entered the Norwegian market it was in principle already too late for Nordea, Danske Bank and others to launch own mobile payment solutions. DNB had already taken the entire market share and thus we had to join the DNB team. There was no longer much to fight for us. Quite simply, being first-mover has become increasingly important.

One of the questions I asked myself at the start was whether all the customers are equally keen on getting quick solutions at the expense of quality. What we believe matters is to ask the customer if this is something that they are willing to participate in. In fact, many customers are very keen to participate in the development because they feel they help develop future solutions. As long as you are clear, we believe that many are positively tuned on this.

This is where TPPs come into play. TPPs are usually smaller companies which will pitch different solutions for us. TPPs would like to get Nordea as customer because such a big company involves a lot of money. They come to us with a starting point and as they are smaller companies, they are willing to let Nordea help prioritize and affect what will be further developed. It is kind of like if we say “jump”, they jump. This is how it works. Sometimes they sign up through our different programs and then we discover them through it, and others promote themselves at seminars etc. Therefore, it is crucial to always keep track of the market and we need for example people at seminars to discover new players.

"How does Nordea plan to position in order to maintain the customer base? How are you going to claim in the new and increased competition?"
It´s a big discussion here and it´s not sure everyone agrees with me, but as I see it´s not so much a threat that all these new players enter the market, but rather a great opportunity. We must cooperate with them. The customers will now get much more insight into, for example, how much they pay in interest rates. Until now, customer A could order a product and pay 2.2% in interest rate while customer B could order the exact same and get half in interests. With the new system, the customer gets a much better insight into what they actually pay and this force us to be transparent to the customer.

We have much less power now than before. Before it was easier to negotiate to earn money for the bank, now it is even more important to get the new TPPs in place. It will be a big fight to get the best Fintech companies on our team. That´s why I look more at it as an opportunity than a threat, I do not believe they are a threat that will steal major market shares. This is simply because they do not have the most important element of banking, which is trust. If you are about to place your money, you are interested in placing them in a safe place, even if you can get better deposit elsewhere.
Therefore, I think it is more realistic that TPPs are also interested in teaming up rather than trying to take big market shares.

"Which business areas does Danske Bank believe will be most exposed for increased competition?"
There are most likely many different views on this. I personally think the payment areas will be heavily impacted given the introduction of PSD (i.).

"How does this affect your strategy? Do you tend to stay in the business area or back down?"
Given the importance of this area, we will work to remain competitive within this field.

"In terms of costs, what do you see as your biggest challenges in the future and how will you approach it?"

Increased focus on cost reduction leads to cut in the number of employees. Nordea aims to cut 6000 employees (whereof 2000 being external consultant), this is work in progress and will happen over de next years. Being able to deliver more and faster with a smaller workforce puts pressure on having automated and effective processes.

"How do you believe the digital competition will change as a consequence of the implementation of PSD2? How will this affect the future of banks?"

I really want to say that the competition image is that you have to put all the cards on the table. The customer will have insight into how much they pay for the various services. It is no longer possible to negotiate different deals. I also think that there will be even greater momentum ahead. The development of the banking sector has been quite uneventful until the last couple of years. For a long time, bank was only a place you placed your money.
Now, customers are increasingly demanding and digital solutions will be important. Customers want to do banking on-the-go. The customers do not want to use a day to go to the bank, but rather perform banking services while they have time, for example, when you are on the tram. Bank is a hygiene factor, it´s something you just have to do. Therefore, user-friendly solutions that are easy to relate to are important.

It is a bit early to say what costs PSD2 will cause, we have to wait a bit longer. Clearly, we see that TPPs have an opportunity to demand higher payments than before because they see the value of themselves. They know that banks are more dependent on collaborating now than before. There will also be bad opportunities to pay for services, which means that there will be less revenue. Thus, I believe that reducing costs are the most relevant aspect in the future.

The bank of the future will probably look quite different. It will be full transparency, everyone can see what everyone is paying, and as a consequence there are simply some positions that are lost because they are not relevant anymore. There will be even more focus on costs, which will affect the bank to a large extent. There are simply fewer people who want to do more because of the digital solutions.

Interview with Bent R. Eidem

Global Head of Group Process Development/Executive Vice President Danske Bank

The interview was held at Danske Bank's offices in Copenhagen on April 9. from 4.00 pm – 4.30 pm and both Elise and Christine participated in the meeting. A brief summary of the thesis and the research question were sent to Bent Eidem in advance. He thought the thesis and theme looked interesting and wanted to have a meeting with us. The interview was held in Norwegian as this is the native language of all three participants and has been translated into English afterwards. The interview has been rewritten into a summary containing the most relevant information for this master thesis. In order to ensure the validity and reliability of this interview to the master thesis, Bent Eidem has read and approved the translated summary.

"What are most important for Danske Bank in order to be a winner in the technological competition?"

It is to be sure that we develop solutions that are best for our customers. As simple as that, but also so difficult.

"What does innovation mean to you?"

We believe that it is important to always be at the forefront of what solutions we believe our customers wants. Especially, in the financial sector with the severe regulation as a result of PSD2, it is highly important to know how to find our position in how financial services will be offered in the future. It may not necessary be that the classic bank, which delivers absolutely all financial services, will do so in the future. In some cases, we will develop everything ourselves and other times it will be in partnership with fintechs and bigtechs. We want to be open to how innovation will improve and evolve, and in this matter, we will focus on the Nordic region.

"How does Danske Bank ensure that there is room for technological development?"

It is as simple as when we have recognized that we also want to be competitive in 2,3,4 and 5 years ahead, and that we know we operate in a sector that will be heavily affected by new technology and new ways in which customer will ask for financial services, it goes without saying that we must create room for technology. This can happen in form of (bold) projects. Additionally, we will also do what we can to pursue continuous improvement, which means that we are constantly carrying out implemental development. Thus, we do both radical design and ongoing improvements for periods of time.

"How is the process of innovation in Danske Bank?"

It depends on how you look at it, however, in terms of how we gain knowledge we work closely with our customers to retrieve and define what we think will be the best solutions for the future. We are highly customer-infiltrated in the way are developing. In addition, we also have eyes and ears open in relation to what is happening elsewhere. We try to position ourselves as the leader in driving ”tomorrow's development”. On the other hand, we must also be careful not to ”run away” from our customers. We must take in consideration that there are differences in our customer base. Thus, some customers are conservative people, while other customers expect the newest and most up-to-date products and services.

"How are the structure of decision making process of innovation in Danske Bank?"

We are trying to push the decision-making power further down the organization. When we work agile we try to let the teams, at the various aggregated levels, be responsible for making their own decisions. The benefit of agile projects is that the process cannot go too far before you realize if you are on the right track or not. We try to educate and develop product owners to constantly think about where they will be 3 or 5 years ahead. Nobody has the perfect insight; however, the mind-set and aspiration must be that they are able to see where they are heading. By doing so, it is easier to divide the process into many sequential steps in an agile set-up.

"How does Danske Bank work to become corporate agile?"
We are in the middle of changing the way we are going to drive development. We have begun pursuing an agile way of working with cross-functional teams, interacting with customers and working in sprints. We have in scope mostly of the change organization, both on the business side and the IT side. We follow a sequential role, in which we are currently in the midst of the change, from being the classic waterfall model to a business agile; transforming the bank-develop new solutions. So that is our current situation. In addition, we try to build competent teams who will be in charge of understanding what kind of solutions, services and products we need to offer in the marketplace and how we can deliver them in the most efficient digital way.

"How does Danske Bank distribute resources internally?"
We come from a project-based allocation in relation to business cases etc. However, we are now heading towards an agile set-up with bucket funding, where we allocate money to regular teams creating the new solutions. That is in the making.

In order to be innovative, it is necessary for the banks to possess the right capabilities.
"Is Danske Bank in possession of the right capabilities now and how do the company utilize these? And vice versa, what capabilities do the other players have and how do you think Danske Bank can utilize these?"
The answer is that we have developed a lot of capabilities in terms of how we build new solutions and we actually have proven to succeed at it. However, you can say that "tomorrow's bank people do not necessarily go dress up with tie", and what I mean with that saying is that the kind of people that needs to be employed in banking is people who understand the market, the customers, the products and how it should be presented right for the customers as solutions. However, they must also have a greater extent of understanding how we make products and services much more digital, both presented and delivered digitally. It requires that we also gain other types of knowledge and competences that will be part of the agile set-up that drives development. I would say we are currently in that process, but it is a new game that PSD2 came on January 1st, where it opens up the banking infrastructure. That is a new reality for the whole financial industry.

We have a clear strength that we have our great customer base, which is a good starting point, however, it must not be a complacency that we fully rely on. If there are brand new areas where we need to develop new knowledge, we may use external consultants or external expertise environments. In order to find competency needed, we will search worldwide and try to retrieve what we think is best. To start with, we want to do most of our development ourselves, based on internal qualities in order to run our own "change agenda". By doing so, we will gain knowledge of what it takes to be a leading competitor in 3, 4 or 5 years ahead. But we also say that we believe that the future will involve much more collaboration with third party providers; It may be with FinTech, BigTech or other actors such as accounting firms, generally others who see that industry diversions occur. Thus, we must be able to collaborate in areas where we think the development is heading.

There are many other players, such as FinTech companies, who are good at producing very smart business ideas, which in turn, will make good sense for our customer base. Their solution can be really elegant. Thus, it would be very beneficial to be able to deploy these solutions on our customer base in one form or another. What we often see is that such companies come from a background where they understand digitalization on a "next level", therefore they have a good knowledge in order to create digital and delighted solutions for the customers. Hence, not only in product characteristics but the process behind them as well, i.e. how it is done. That is something many of these companies have been very good at and they are clearly very attractive to us.

"What do you see as your biggest weaknesses/challenges?"

It must be that we have to be open enough for how financial services will be offered in 3, 4 and 5 years ahead of time and that we may not have a good scope. On Friday (06.04.2018) we announced a new and clear strategy that involves for us to be the "Nordic Integrator for Banking". In that matter, it is also an expression that we want to be the one who takes care of our customers and our customers' processes, whether it concerns our environments or whether it concerns the direction of third party providers. We believe it is extremely important for us to be able to do so.

In a marked under constant development it is crucial to have a clear business approach.

"What kind of strategy does Danske Bank approach?"

We try to be the best one in relation to the customers. It is about being number one today, as well as being number one in 3, 4 and 5 years ahead. If what is required to be number one in 3, 4 and 5 years is changing, we must change as well. For instance, if the way customers make a payment or the way customers finance a transaction such as buying a car or house, changes, we must be able to position ourselves in the way financial services become a part of something else. And vice versa, if our services become "leaders" for other actors' delivery of services. This is what we call the future ecosystems.

We are committed to try to be good at our own position, but we are also open to collaboration with third party players, for instance such as FinTechs.

MobilePay has shown that it is important to be a first-mover. In Denmark, it was a huge success, while in Norway we came out 77 days late because there were some others who copied us. It is about utilizing the fact that in a digital world, being a first mover can actually be an advantage. However, sometimes it is also about being a fast-follower. It really depends on the situation.

"How does Danske Bank plan to position itself in the market in order to gain/maintain competitive advantage?"

We are developing a so-called open-banking strategy as a result of PSD2, which takes account for requirements set and to go beyond the requirements of new regulations. By pursuing this strategy, we try to take it even further and to be good at attracting third party players to help us take it to the next level. Hence, to the benefit for all parties.

"Does Danske Bank plan to outsource whole or parts of the innovation process? Is it possible to outsource the whole process?"

One could say that it is possible for us to outsource the entire process, but we must also deploy it on our platform in one way or another with some digital connection. So, it must be brought back again. We can certainly outsource the aspects of design and what the customer is going to experience. However, we have more confidence in collaboration's.

For us, it is not desirable to outsource the entire process, as it must be brought back to our own customers. Still, we have to be much more open to the fact that development is done by third party players in a much greater extent than before, which indeed is very good. Nevertheless, we think that collaboration is a good enough strategy in the way this process happens, and then again, we have to be able to plug it back into our IT platform

"What kind of image does Danske Bank want to present to the outside world?"
For today's and future partners, we would like to present ourselves as "the Nordic integrator", which really can help our customers in the Nordic dimension. Regarding the international dimensions, we want to help partners to think Nordic, both of those who already are in our market, but also those who enter the Nordic market. This applies to all types of collaborators, whether they are large or small companies, whether they are FinTechs or BigTechs.

"How will you describe Danske Bank's technical architecture? Are you ready to meet the challenges of digital competition in the future?"
We have one bank, a platform across the Nordics. It does not mean that the platform is modern in all areas, but the platform works across the north. This is one of our strongholds, that has lasted for years. We will develop it further, which will bring us even closer to our customers and potential partners. We intend to build on and modernize the platform that we have with APIs.

"Are you ready to meet the challenges of digital competition in the future? Are there anything you are missing?"
We realize that there are some demands out there that we need to follow, therefore, we work hard to customize our platform in terms of APIs. By doing so, our platform may be open to third party providers, not just in terms of form requirements, but also as a much more partnership perspective for the future. However, are we ready to meet the challenges of digital competition? The answer to that is yes. It does not mean that we are complacent, but it means we are very sharp.

"Is the size of the bank or the size of the IT department more important in the future?"

The advantage of having a great size of our bank is that we have many customers, so we are able to make solutions for a large customer group. It is also a matter of spreading costs. However, there is no doubt that the combination of business design to promote customer needs and make IT, not only make IT isolated, but to create business design that becomes qualified and made for solutions to customers. That is where the magic happens.

"In what matter does Danske Bank's legacy affect its ability to drive innovation?"

We come from a world where the majority of competition took place between banks. Now that there is a competition between banks, FinTech, BigTech and other players, it certainly sharpens us. We must therefore step-up in order to compete with them. Nevertheless, we are ambitious in this way and the internal logic is at least in place. The platform is based on previous technology choices, but there is no doubt that we are modernizing the platform in terms of robustness up to date and speed so that we are able to receive traffic and future requirements. It is an important part of our strategy; It does not help to make the world's best customer solutions if the systems are down for 30% of the time. The customers will not appreciate that.

"Which competitive advantages does Danske Bank possess over Fintech companies?"

Our three biggest advantages are that we are 1) a common platform across the Nordics, 2) we have a credible present in all four Nordic countries with large enough market output, and 3) as I mentioned earlier, we have a great customer base, which gives us a good starting point for how we should operate with future developments and how to become an attractive partner.

"Which business areas does Danske Bank believe will be most exposed for increased competition?"

Everything in banking that has to do with transactional services, as well as payments, which involves currency, interest etc. We may also see it within any of the classic service areas like loan and deposits. However, we believe that most of the competition will increase in the transaction areas that do not require too much balance but more IT features. Thus, areas where it provides opportunities for third party players to profit. It is already possible to see this in investment products.

"How does this affect your strategy? Do you tend to stay in the business area or back down?"

We do not back away, definitely not- we go for the competition. Sometimes we will compete and sometimes we will follow the saying; "if you cannot beat them- join them". We are very keen to be the leading bank who has relations with its customers and offer the financial services that our customers need. It is important for us to stay relevant in front of the customer.

"How will this affect your future revenues?"

If we do not grow, it is clear that increased competition, everything else the same, indicates that the earnings opportunities are becoming more distributed, which in turn will affect us. However, for that reason, we hope that with our growth strategies in the Nordic region, we will win more than we lose. Then hopefully such a type of logic through competition will strengthen us.

"In terms of costs, what do you see as your biggest challenges in the future and how will you approach it?"

It will be to move customers over to far more digital solutions and digital deliveries, while changing the current business areas we have to become less manpower oriented. Customers will move at different pace; therefore, we must develop for those who are frontrunners, but we must also take care of customers and employees in the way financial services will be delivered in the future. It will definitely cost us a lot to change the part of the infrastructure we need, in order to make the right solutions. So, it will cost a lot, however we do so to create an even more solid and robust platform, and not least, to provide better products and solutions to customers. I believe that investment in technology is going to increase.

"How do you believe the digital competition will change as a consequence of the implementation of PSD2?"

New players will enter the market. We have spent decades developing our entire infrastructure in terms of customer information, customer relationships, use of the infrastructure in the way transactions are both informed and balance accounts are being informed. Due to PSD2, this information and completion of transactions will be open for everyone. Furthermore, the competition will increase. Nevertheless, this will also allow us to act as a disruptor and be the provider who produces and offer solutions, thus, uses this as an opportunity.

"How will this affect the future of banks?"

We believe the financial sector will look different in 5, 10 and 20 years ahead, precisely because of the combination of new technologies entering the market and in which can easily be used. In order to use a bank, you do not need to interfere with physical interaction. You may need advice from a competent advisor in matter of housing or investment, however, all deliveries, both ordered and the way they are provided, is heading towards the direction of being fully digital. This indicates that it will affect how we will look like as a bank. It will also change the value chains for how efficient we are. It is the "heavy" services that now are really impacted by radical re-design.

"Do you believe there will be fewer banks in the future?"

I am going to be careful about what I am saying, however, what I can say that it is a lot to be involved in the race of development, so I guess time will show who has the prerequisites to compete.

Interview with Christian Løverås

Open banking with technology (Strategic partnerships/new business) in DNB

Christian Løverås works in open banking with technology (Strategic partnerships/new business) in DNB. The interview was held over the phone on Friday April 13 from 11.00 pm – 11.30 pm and both Christine and Elise participated in the meeting. Information about the paper were sent to Christian Løverås in advance. He thought the thesis looked interesting and wanted to have a meeting with us. The interview was held in Norwegian as this is the native language of all three participants and has been translated into English afterwards. The interview has been rewritten into a summary containing the most relevant information for this master thesis. In order to ensure the validity and reliability of this interview to the master thesis, Christian Løverås has read and approved the translation.

"What are most important for DNB in order to be a winner in the technological competition?"

Utilize new technology. This means that we must experiment with new technology where it is difficult in advance to know what will work. We have to actively seek out new opportunities and attract skilled technicians. In order to take advantage of new opportunities, we must be an attractive employer for those who can do this. We must cooperate, because we can do a lot of good internally but we cannot be best at everything. We must make sure that people want to work with us and then it must be easy to work with us. It can be anything from building a development platform, which I am working on with the Open Banking team, to actively act as a technology company even if we are a bank.

"What does innovation mean to you?"

To put something into life. There must be more than one idea or just talk, one must be able to actually build or deliver something. Inverted ingenuity. It is a matter of daring to take chances. You may fail, as long as you learn from it. Innovation is challenging yourself and technology, and always be open to learning something new.

"How does DNB ensure that there is room for technological development?"

In this area, there are a lot to do in banking and finance. It has been a very protected industry without many competitors. Now there is competition from other players. I work in something called digital floor, which is kind of an internal digital lab. We are 15 team who work on developing lean start-up, design thinking, design sprint etc. to develop products and services easily and efficiently. Most initiatives never get realized, but this is crucial to achieve success. We say that one out of 20 initiative succeeds. As long as you learn from it, it should not cost anything to try. In order to succeed, it is very important to have the right culture internally. This implies it should not be negative for the career that you may have participated in five projects that have not become a success. It is extremely valuable for the organization that you constantly try to get better and test out opportunities, and then you should of course reward those initiatives even if they do not matter.

In DNB, we have something called NewTech lab, which consists of 5-6 employees. Their only job is to test new technology that may be interesting for DNB. It may be language technology, robots as customer guides in branches, blockchain etc. They are working closely with the business areas to see if this can be used in any way. There are no research projects, but it is about taking something that is relatively mature and trying to create new value.

"How are the structure of decision making process of innovation in DNB?"

It is the same in DNB overall. It is an old-fashioned organizational culture based on leadership at the top, hierarchy, and thus often heavy and slow processes. This is something we work on. The problem is that if you compare DNB with a start-up company, we are way too slow. Rune Bjerke has repeatedly written about let-go management and providing the knowledge the technology companies appreciate. Hiring good people and giving them the freedom to work efficiently. To do so, you cannot have the old business-model with routing from the top. This means that those who work the closest to the problem are the ones who are best suited to make the decisions. This again means that the company must give authority to people far down in the hierarchy.

On this area, we have quite a long way to go. We waste a lot of time because people who can do things well have to explain it to people higher up in the hierarchy, because they are the ones who are entitled to make the decisions.

"How does DNB work to become corporate agile?"

This is a very good question. We have regularly restructured ourselves. Now we are working on IT transformation, which is a team of about 50 who will modernize the working methods and all the processes we have internally. It is, for example, going from time-limited projects where everyone goes their separate way afterwards, to a permanent and self-supporting product team. This means that we will never be finished with the deliver to a customer, we are learning and improving all the time in a long-term perspective. It is no longer a matter of phases of projects anymore, it is about doing delivers as quickly as possible and prioritizing right all the way.

To become corporate agile, we have a lot of courses all the time and employed our own agile coach who will help project managers and people throughout the organization to work in modern ways. There is still a lot to do, but a lot has started to happen.

"How does DNB distribute resources internally?"

In this area, I think there is extremely much improvement potential. It is related to projects. Today we had a meeting where we planned everything to be done during the year, and then everyone tries to get most money and then you implement the big plan. This means that very much locks early and it becomes a very rigid allocation of people.

Combining it with not interrupting projects along the way, even if it fails, it becomes very ineffective allocation of people. This is one of the areas we have the most to learn. Resources for the entire year are distributed now.

There are waterfalls allocation of people. There are a lot of overhead for putting people on projects, coordinating this across projects. With a slightly smoother approach and flatter organization, we can earn a lot. An open and flat organization is very demanding in such a large organization, but the IT transformation team are trying out a very flat way of structuring as a test.

"Is DNB in possession of the right capabilities now and how do the company utilize these? And vice versa, what capabilities do the other players have and how do you think DNB can utilize these?"

I want to say no. There is a lot of outsourcing, much of the programming and the job that needs to be done when things are definitely are done by partners. It works if the time required for the project is limited, such as an upgrade of a system. But when you work smoothly, build on things and constantly respond to things that happen, you must have the right people internally. They must be permanent in team that is responsible for some sort of user experience, such as a saving-app.

We are now working on employ more internally and fetching much of the expertise we need. So, you can say we have access to the right capabilities, but it is through these outsourcing partners today. But we are working to get these in order to actually work in DNB.

"What do you see as your biggest weaknesses/challenges?"

Our biggest challenge is that we have many heavy, slow processes. We have extremely overhead and much control on projects. Control is associated with being used to running waterfalls on projects where you are used to having the specifications in advance to make sure you stick to original plan. Now that we move over to continually learning, re-prioritize and take the most important first, this does not match all of these frameworks to do the job. It is of course both the processes, but also the people, skills and experience. But if I am only going to say one thing, obviously slow processes.

In a marked under constant development it is crucial to have a clear business approach.

"What kind of strategy does DNB approach?"

A new strategy was presented last autumn, which includes innovation contact and competence lift. It includes thinking outside the box we are in. Be open to the fact that technology, customers and regulations affects us, and that it is just increasing. We must operate in a completely different way than we have done before. Cooperation is extremely important. All the time learning new things. People are responsible for being up to date and keeping track of developments everywhere, there is continuous education all the time.

"Does DNB plan to outsource whole or parts of the innovation process? Is it possible to outsource the whole process?"

Yes, and no. Some parts of innovation scale through collaboration or partnership. It may be that we have a cooperation with a startup investing in someone we can learn with while they can try for us something that may be too risky for DNB. Or that we collaborate with former or new competitors like AliPay, Facebook, etc. There are all variants of this.

So, we have an accelerator program where we have just started working with hubs home and abroad, we have dedicated team that only works with strategic partnerships. We learn and develop with people outside DNB. We have a mentorship fund where we will invest in companies that are strategically interesting for DNB.

We are working to stop doing everything ourselves. We have no ambitions or believe we can do everything well, so we want to facilitate cooperation. We design our platform to make it so flexible and open that people can create things we can profit from.

"How will you describe DNBs technical architecture? Are you ready to meet the challenges of digital competition in the future?"

We are working a lot with it. We have everything from systems that were written back to the 80´s to very state-of-the-art systems where we are world leading. We are now modernizing and trying to hide the old systems so that you do not have to deal with them. This way, others can make use of the systems without knowing the old, complex systems that were.

We have 900 different systems. These are closely connected, which means that a change in one system can affect the other systems.

Nordea is doing a great update of the core system, which will cost around 20 billion NOK. DNB will not do this. We will pack the old systems in such a way that it will be possible to exchange them in the long run. But we put a layer in between which means that if you make a change, it will not have consequences you are not aware of.

"In what matter does DNB's legacy affect its ability to drive innovation?"

Very much, and this probably applies to most banks. There are some solutions that are built from the mainframe and up to the iOS app. That is, if you are going to make any changes that a user sees on his phone, it requires someone who knows the whole architecture and technology tray to detail. Thus, we are working to build a team much higher up, making it possible to create a savings app for example without relating to back-end cabinet solutions. The systems are very old, and it is about either replacing it or packing it into something that is more modern.

"Which business areas will be most exposed for increased competition?"

It is very hard to know, but if something can be automated, it will be automated. Even areas we previously thought required human understandings are now being automated because machines are better. This is because computers can handle very much larger amounts of information.

This applies, for example, to loans. DNB has extremely much data and has enough defaulted loans to see the pattern when defaulted loans start to cause trouble or when it is likely that a customer will leave us in one way or another. There we have done a lot and made several models that manage to predict such things, which in practice are completely impossible for a person to cope with. These are models that are constantly improving as more data are available.

"How does this affect DNBs strategic choices?"

We are very committed in these areas. DNB still has a very solid economy and has decided to invest in selected areas. This is good, but it also means that a lot of human work is being streamlined. The fact that we focus more on technology can mean that either people get more interesting tasks or maybe there is not much need for them anymore.

We are not planning to wind up due to technology development. People expect machinery and self-service and that the same help will be provided with much more data. The personal contact may be more important in other contexts than when it comes to sharing and providing information.

"How will this affect future revenues?"

There will be much tougher battle for margins. Banking and finance has been under strict regulation and it has been difficult to get in. Now with PSD2 and open banking, it will be much easier for people outside the industry to either build new banking and financial services or simply use banking and financial services as part of their business.

The banks have been very well protected and made good money through strict regulation and little competition, but this is changing now. If the customers discover that there is a better alternative out there, they will choose it.

"In terms of costs, what do you see as the biggest challenges in the future and how will you approach it?"

We must be very much more cost effective. If our processes require more resources than others, we can never win. There will be a balance between investments and cost cuts. Fortunately, there is a good understanding for this. One has to make the investments needed today in order to survive in the long term. So, all the investments that are made now are in order to cope with that transition.

"How do you believe the digital competition will change as a consequence of the implementation of PSD2?"

It is suddenly not just the banks that offer financial services. There will be many good and inventive people who do things the banks have not done. PSD2 is important, but you have to have a lot more than PSD2. If DNB had just opened up for basic services like paying and checking the balance, then it would be limited what other players could develop. But if we offer more complex services, we are able to cooperate better with other players.

We have to open up much more than just what PSD2 requires. The fact that it is an EU directive means that you have to do it. It has opened the eyes of everyone in the sector, even the boards have now acknowledged platform strategy, technology and everything.

Very much is powered by PSD2, but today it is really openness and platform strategy that is important. This means that all other technology companies can compete with the banks. It will be much better to be a customer. Everyday tasks become much better because there will be a bunch of companies competing to deliver the best products and services.

"How will this affect the future of banks?"

Rune Bjerke said last year that out of the 10,000 employees today, we are lucky if we are 5,000 in 3-5 years. I think there will be both fewer employees but also quite different types of people. There are limits to how many people you need with economics education when all tasks are about data and technology programs. Many employees will be superfluous, both because processes disappear and because the banks' role will be less important. For example, Blockchain technology could remove us as a third party in some transactions. We will become more similar to other companies that are not banks.

I think the banking brand will survive for a long time. In Norway and Western Europe, we trust the banking system. For example, there has not been any recent banking crisis in Norway and there is a reason why the state owns 34% of DNB. I think people still have a lot of confidence in the bank, people think it is safe. But most people have more confidence that technology companies can develop the best and most user-friendly solutions. It would be profitable for DNB to collaborate with people outside the banking industry, so you may not want to see the banking brand or know what is happening in the back often, because you are just dealing with a service like Snapchat or HBO for example.

I do not think the banking brand will disappear, but there will be more cooperation and global brands will be more important. When everything is online, there are really no borders. When Europe in many ways becomes one banking market, things will change. Suddenly, DNB gets competition of, for example, Alipay. Alipay can roll out all over Europe as one, and then DNB face a very tough competitor as customers can choose a supplier that can help worldwide.

Interview with Henrik Bendiksen Jordal

Client Executive Coordinator in Collector Bank

Henrik Bendiksen Jordal works as Client Executive Coordinator in Collector Bank. The interview was held over the phone on Monday April 16 from 07.00 am – 08.00 am and Christine participated in the meeting. Information about the paper were sent to Henrik Bendiksen Jordal in advance. He thought the thesis looked interesting and wanted to have a meeting with us. The interview was held in Norwegian as this is the native language of all three participants and has been translated into English afterwards. The interview has been rewritten into a summary containing the most relevant information for this master thesis. In order to ensure the validity and reliability of this interview to the master thesis, Henrik Bendiksen Jordal has signed and approved the translation.

"What are most important for Collector Bank in order to be a winner in the technological competition?"

We are a digital bank and our goal is to be the leading digital niche bank across the Nordic region. Collector Bank, we constantly focus on continuously product development and our top management stress the importance of being innovative. Hence, there is great pressure to think new and to generate new ideas. The largest department in our bank is our IT department, so we have spent a lot of money on that department and we have many good employees working with IT.

"What does innovation mean to you?"

The very foundation of Collector Bank is that we have to be innovative and to generate new ideas all the time. Innovation for us is also to keep up with the changes in the market and try to create and provide simple and good solutions for our customers. It is the customer who is in focus and not our infrastructure.

"How does Collector Bank ensure that there is room for technological development?"

Within Collector Bank we have a culture where everyone working at the bank has a mind-set that says that we must think new and that no ideas are stupid. We have a slogan called "Believe in the idea". IT is the core of Collector Bank and those who sit on IT work together in small teams and communicate very closely with the other departments. If there are any other departments that come up with something new, then the idea is sent to the IT department, which then tries to develop the idea further.

"How is the process of innovation in Collector Bank?"

You can talk to anyone in the bank. For instance, you can go straight to the boss with an idea. Our boss is open to anyone, no matter what department that comes up with new suggestions. And so, if the idea is good, it is sent down to the IT department that is working on production development. Thus, the IT department examines the idea and sees if it is possible to implement it. Hence, they are taking different tests, for example, testing the idea in the market, further, they are taking the idea back in order to see how the response is. In the end, the top management takes the decision.

"How is the structure of decision making process of innovation in Collector Bank?"

It depends on how big the projects are. For example, upon entering into a new partnership, or if there is a new customer (depending on whether it is a major customer or not), then the decision must be made through the board. We are an AS, so the board must accept the changes. However, if it is a smaller matter, then the Credit Committee can take the decision. In Norway, we have a credit committee consisting of two people and they can make decisions for a certain amount. But, in essence, the board takes decisions regarding innovation. We also have a separate investment group called Collector Venture. Collector Venture invests in Fintech companies and they are making their own decisions within their area.

"How does Collector Bank work to become corporate agile?"
We have invested a lot of resources in Collector Venture. This in turn is very positive, as we then use Collector Venture to invest in Fintech businesses. Thus, instead of portraying PSD2 as a problem, we have accepted it and see it as an opportunity. The solutions that we are not able to offer to our customers, we get them by investing capital via Collector Venture in other companies. And as a result, we use their solutions.
We work in many different departments and teams, so if someone is stuck or has any problems within their team, they will move on to other departments and teams to get assistance to make the process go as efficiently as possible.

"How does Collector Bank distribute resources internally?"
At the beginning of the year, we plan where to distribute all of our resources. For instance, before 2017, we spent a lot of money preparing for PSD2. Thus, we therefore feel that we are very well equipped for the future market. Hence, we invested in a lot of new IT systems and we provided all the details for how they should function.

"Is Collector Bank in possession of the right capabilities now and how do the company utilize these? And vice versa, what capabilities do the other players have and how do you think Collector Bank can utilize these?"
Yes, I would say we have. As well as focusing on skilled employees, we hire people who are creative and good at innovation. We are very focused on people that are able to think new. The average age in our bank is relatively low, so we believe it is a correlation between hiring young and up-to-date people, which in turn makes us good at innovation. We are taking advantage of the fact that we have an image of being innovative and new to the market. Additionally, we are not like all other traditional banks. Thus, we believe in our own ideas and we dare to go our own ways. We are what you can call a NEO bank in a way; we are a new bank bold enough to invest in new areas. In addition, we try to get everything digitally, because that is the future direction for all banks.

We try to exploit the fact that we are a smaller bank, in the sense that we are a bank that pushes forwards and dare to generate new ideas. Of course, there are some IT solutions that we are not able to offer to our customers. As a result, we use other companies, like Fintech companies, to acquire these solutions. Such solutions can be ideas that small Fintech companies already have managed to get in place, and of course that is an opportunity for us.

"What do you see as your biggest weaknesses/challenges?"
It may be that we are smaller bank. There are many who know about Collector Bank in Swede. However, in Norway, there are not so many people who have heard about us. So while it may allow us to try out a lot new things, it may also be a weakness. The fact that we are not so well-known means that we must invest more in marketing, compared to the bigger banks. We cannot live on or exploit our bank brand as well as other major banks.

"What kind of strategy does Collector Bank approach?"
We have invested a lot in Fintech companies and thus we would like to cooperate more with Fintech companies in the future. I believe we are actually one of the companies in the Nordic region that have invested the most in Fintech businesses.
However, in essence, we want most of the ideas and solutions to come from us, clearly. We work intensively with product development at our IT department, as well as generally in all departments. Hence, we constantly look at what we can do better. For example, when it comes to payment solutions; we have our own Collector Check-out solution, which is very good. Indeed, we prefer that most of the production will take place within the company. However, we also think that it is positive to invest Fintech companies for future opportunities.
I would say we are a first-mover, rather than a fast-follower. We always try to go our own ways and dare to invest in new areas. We also always try to bring the customer along with us and listen to their demands.

We actively use our customers through product development. For example, we had a new methodology in factoring, a new format solution, and so we tested it on a slightly smaller customer. Then we got feedback and used that feedback further. We also have own demo systems as we call it, where we can do general tests and see what the response is. We can use a produce-test-learn strategy more actively, as we are a smaller bank.

However, we do not throw anything into the market, it must be thorough products and services. We always try to go our own ways and dare to invest in new areas. We also always try to bring the customer along with us and listen to their demands.

"How does Collector Bank plan to position itself in the market in order to gain/maintain competitive advantage?"

We also try to focus on Corporate Social Responsibility, by investing in small companies to help those with capital. Thus, that is a win-win situation; they get capital and we get digital solutions that we are not able to offer ourselves.

Regarding our position in the market. As I mentioned earlier, we are not as known among people in Norway compared to other banks, so we try to create as much "awareness" as possible.

"Does Collector Bank plan to outsource whole or parts of the innovation process? Is it possible to outsource the whole process?"

We do not want to outsource the entire innovation process. We want to come up with our own innovative solutions. When it comes to core business and product development, we do it ourselves, but then we set off infrastructure and servers to other companies. By doing so we are not locked. Many larger banks are locked with their servers and infrastructure. And many big banks outsource to other countries, but we do not.

"What kind of image does Collector Bank want to present to the outside world?"

We want to bring the customer with us. Thus, we want to promote that we move along with the customer. As I mentioned earlier, we try to be innovative and listen to the customer. For instance, if the customers think that something should be better or have different demands.

We also manage to turn around quickly; since we are a smaller bank we do not have a heavy infrastructure. We want to promote that we are a new bank, which is able to redirect fast, perhaps compared to what older banks are able to. We also emphasize that the processes within our bank have to be efficient, thus, there should not be many steps to a solution. And of course, that we are a digital bank.

"How will you describe Collector Bank technical architecture? Are you ready to meet the challenges of digital competition in the future?"

We have one platform that is used in Finland, Norway and Sweden. For example, when something needs to be changed here in Norway, it must also be changed in Sweden and Finland. We have a proprietary platform and it is relatively new. In addition, we spent a lot of resources on it in 2017.

"Is the size of the bank or the size of the IT department more important in the future?"

I would say the IT department. Collector Bank has one of the foremost IT departments in the Nordic region. Thus, we always try to work with the latest technology, and be early on when it comes to IT. Everyone wants systems and processes as simple as possible; of course, you have to have people who contribute to customer service for example. However, having a platform as simple as possible digitally is of great importance. Hence, here we have an advantage, as we are a smaller bank with a large IT department.

"In what matter does Collector Bank's legacy affect its ability to drive innovation?"

We do not have old systems that are slow. From the very beginning, in 1999 when Collector Bank was founded, the main focus has been innovation. We have therefore tried to have systems that have always been up-to-date throughout the years.

"Which competitive advantages does Collector Bank possess over Fintech companies?"

We are probably more all-rounder than many Fintech companies. We have many good solutions when it comes to loans, factoring, payments etc. We also have our own app; we do not have an account like the savings banks, but via the app, customers can apply for loans up to 500,000 kroner. The app also helps to manage the money in a good way, and helps with investments. As I said, we are more all-rounder than a Fintech company, in which a Fintech is focusing on being good at a specific product or service, and we have many various solutions in different areas. We also have an existing customer base and we are putting a lot of time and resources in taking care of our customers.

"Which business areas will be most exposed for increased competition?"
It is difficult to say which areas are going to be most exposed. However, it is likely that it will be increased competition in for example payment solutions. And of course, transactions and processes that have to do with currency.

In matter of the areas of competition, we will invest in those areas. Thus, we will go for the competition. Customers will not only use one bank, so it is important that we have different solutions we can offer customers. It is probably the customers' needs that will be in focus when it comes to which areas we will invest in or not

"How will this affect future revenues?"
I think that the biggest banks have more to lose than the smaller ones. The reason for this is that traditional big banks have always had regular customers who have been with them for years. However, now it is more about the fact that all customers are on the mobile phone and everyone wants the easiest solutions, which in turn means that they will switch to operators offering these solutions. Customers will no longer use one bank and they will not be loyal to only one bank. Therefore, in the long run, we will probably be able to keep up or even be ahead of the biggest banks. Of course, it will be tougher in that there will be increased competition, so we must be able to grow. But there we have also ensured ourselves by using a lot of resources in Collector Ventures, and are, on a large scale, investing in fintech companies. By doing so, we can specialize in even more areas.

"In terms of costs, what do you see as the biggest challenges in the future and how will you approach it?"
We are thinking of investing more in IT to get even better and faster systems, rather than cutting costs elsewhere. Our focus is to have a continuous development. We have promised our shareholders a growth rate of 30% each year, so we cannot cut down. Instead, we must continue to invest. Thus, I will think it will be quite expensive for us to participate in the competition.

"How do you believe the digital competition will change as a consequence of the implementation of PSD2?"

The customer will have the ability to choose between more than just banks. The customer will be offered more platforms to make transactions on, i.e. greater choice of solutions. Everyone are getting more and more digital, so there are probably many customers who will choose non-banks, such as Facebook. I also believe that payments and funding will be less formal. Digital solutions will be even more infiltrated in everyday life than it is now.

"How will this affect the future of banks?"

I think that the importance of bank brand is going to change. There is great pressure from competition and innovation in the market in general. So I think customers are going to lose the strong ties they have with their banks today. I think people will have at least as much confidence in "non-banks". In the long run, I think there are going to be some bigger banks in the market. Thus, I think there will be fewer, but bigger banks, where the largest banks will merge. And of course, everything will be online.

Interview with Phu Le Duong

Director - Financial Services in Deloitte

The interview was held at Deloitte's offices in Oslo on April 3. from 09.30 pm – 10.30 pm and both Elise and Christine participated in the meeting. A brief summary of the thesis and the research question were sent to Phu Le Duong in advance. He thought the thesis and theme looked interesting and wanted to have a meeting with us. The interview was held in Norwegian as this is the native language of all three participants and has been translated into English afterwards. The interview has been rewritten into a summary containing the most relevant information for this master thesis. In order to ensure the validity and reliability of this interview to the master thesis, Phu Le Duong has read and approved the translation.

"What are most important in order to be a winner in the technological competition?"

The strategic choices are quite clear. The direction for most is that they must manage to start thinking about innovation much more open. Earlier, banks have profited from having "you" as a customer, which makes it a very closed system. All banks have until now tried to keep the customers to themselves and sell as much as possible to them. However, we could already start to notice the changes in the market when banks shifted from physical distribution to digital. People stopped using bank branches and banks gradually lose customer contact. This will happen in the next phase as well, when the PSD2 is fully implemented, it will be open to anyone who wants to manage customers' online banking.

As a result, the greatest challenges for banks are to decide whether to change from being a customer front or to be a clean product supplier. What we believe in Deloitte, like many others, is that these clean customer fronts will always try to provide the most low-priced products to customers and in which there will be someone behind the bank to deliver those products.

What is difficult with this is that it completely disrupts the universal business model of banks. In practice, they must cut out one of the things they are doing. Hence, that is what everyone is struggling with at the moment; in which direction should they continue to pursue. The simplest perspective, is that all banks reduces costs, and they do so because they have to choose one direction. The price competition is hardening and it is no longer an advantage to

be a large actor with a lot of existing customers, it is about making the lowest possible costs. Thus, there is an extreme cost pressure in the market.
The two strategic challenges can be divided into; 1.) Reduce costs faster than anyone else or 2.) Decide whether to be a product vendor or customer front.

Earlier on, banks have tried to bring “non-digital customers" on board, however, as of now banks are starting to change their focus. DNB has given up on this. They have realized that they cannot prioritize those who are not digital now. When major banks make those choices, digitization will happen at a much faster pace. They are no longer trying to pay attention to absolutely everyone anymore and as a result the race will be harder for players who compete on offering the best solutions.

The best illustration of the bank's business model may be the savings area. Banks have always made new products frequently to have something new to sell. Usually, it is just the same products, twisted together in different ways. Hence, it is a systematic way of trying to make something new at all times. Banks have had to give up this type of method. The products are moving towards being much clearer and simplified, e.g. loans are loans and saving products are saving products. The area of finance that is best to examine when it comes to development is fund investments. In this area, everything is pushed down to the lowest prices possible, which in theory is marginal cost. I believe that will be the result for all other products as well.

“How can banks make the process in developing new services and products more efficient?”

On one hand, there is the strategic and structural nature of a bank and on the other, it is organizational issues. Every bank, nearly without any exception, are very central and run by top management. I think there will be an enormous transformation in relation to how banks will operate, thus, they have begun to change the way they are organized internally. Keep in mind that banks are very compliance and governed. That part must still be in order, however, what happens now is that banks will have to make so-called independent smaller teams who are fully responsible for a product or service area, as well as taking all the decisions in that area.

On the other hand, several banks are starting to make more acquisitions, thus, they buy smaller companies. Hence, there are two strategies one can pursue; 1) To bring companies into the environment of an existing bank 2.) Or, let them continue without being admitted to the company. Taking a bank from being very manufactured shaped, almost as a factory, to suddenly deal with new environments and unfamiliar decision-making approaches are the major organizational challenge. One thing is that the banks themselves have to struggle to adapt, the other interesting thing is that there are other traditional industries that gains an interest in financial services as well. A bank wants to have an online bank in order to serve its customer and to sell more products and services, other companies may have different reasons for building an online bank. For example, Google and Facebook can gain knowledge of their customers transaction data that they find in their ad algorithms, which makes them extremely much more accurate. They are not interested in banking, but they are interested in offering banking services because it will be very valuable to them.

"How does banks ensure that there is room for technological development?"

The key is to give as much responsibility as possible down the organization. I believe that changing the technical platform, changing the way people work in the organizations and getting more decision-makers are two main prerequisites for increasing innovation agility and power. You must also change the organization's risk profile. If there is a leader on top that demands very strict frames for what you can do then everything stops. When you first get these things done, you are able to start to analyze what services the bank is going to launch and what the bank is going to invest in. For example, should the bank cooperate with other external players, or purchase Fintech businesses. In my opinion, the banks have to carry out changes within the organization first, by doing so the bank will be able to handle and collaborate with others. For instance, if you buy a company and hope that it will match with the old-fashion business model, it usually does not go well. There is always someone in an organization who feels that the new company is an intruder who take their jobs and so the new company will face resistance.

Many associate innovations with creativity. It is very rare that creativity prevents innovation. Most banks have all the good ideas that Fintech businesses have started with. However, it is about the ability to implement and to execute on it. In order to be more innovative, banks must make sure that there is room for agility. It is the key to success with innovation. The ideas are simple, the complexity is not in the idea, it is just about how to implement it quickly enough on a large scale.

"Are banks in possession of the right capabilities and how do the company utilize these? And vice versa, what capabilities do the other players have and how do you think they can utilize these?"

You've probably heard a lot about producing and failing; agile methods that are tested all the time. The most important feature for managing that is "to be bold" and have the ability to take risks. It is very contrary to the culture of a bank. Thus, in a bank, risk should be under control at all times and there are always large units that monitor risk. The banks that are able to solve these structures, which will make people take more risks more frequently, they will win. It is a challenging balance as there are a number of areas consumers do not want banks to experiment with. There are several security aspects that must be in order, therefore, the banks must be very aware of the type of risk they are taking and what they are experimenting with. They cannot experiment with everything because then they might lose credibility.

Current banking systems are mastodon systems of the combination of old 60's systems with new systems added on the top, therefore, the architecture is very complex. The reason why the processes in the banks are slow is because if you make a small change you have to know how it will affect the rest of the system. This in turn, rises the attention towards, for instance, Google. If Google releases something new, it will be processed amazingly fast because they have built an architecture that allows them to make changes and create new things without affecting anything else. It is called microservices, where you create completely separate small servers that provides a much looser architecture, rather than large scale systems that are complex. This is the kind of technical architecture needed to experiment faster and launch product and services faster. Hence, while trying something new, if it goes wrong, it will not have a negative effect on everything else.

What is needed for banks to be faster? One is; mind-set and willing to take risks, the other is; technical architecture that supports efficient processes without compromising security.
How should the banks meet the competition from Fintech businesses? Banks have to become faster in every way possible. Additionally, they have advantage in having a well-known brand and slow movement in their customer base. There are many approaches to achieve competitive advantage, but overall, the focus lies on being faster. The banks are looking at what measures they can take to speed up development. Giving more responsibility to smaller devices that make all decisions themselves seems to be the most effective way. By doing so, the banks replicate the fintechs' business model, which is agile and have no restricted frames.

"Is this a strategy banks should try to follow?"
It depends on who you ask. For a start-up, it is almost the only way. However, there is some start-ups that manages to be a fast-follower and succeed with that strategy as well. I do not think it is necessary for banks to be a first-mover. Let me explain; For example, Vipps was not the first mover because mCash and some other services were first on the market. But what was important for DNB was to launch Vipps before Danske Bank launched MobilePay. Hence, in that aspect they were the first of the biggest banks. I do not believe any strategies that say that you should be first-mover on everything, or fast-follower on everything, or wait and observe so to invest all that you have of resources, it is very situational. Banks must have the ability to change quickly when needed. It is also very important to consider each individual event and whether to be first or not in that situation.

"How can banks attract the right employees?"
There are very few people who start working in a bank believing that they are going to be there for over 20 years and work their way up through such a long period of time. People wants responsibility from day one, as well as having the opportunity to learn along the way. Hence, it is just about giving roles that allow employees to make their own decisions. By doing so, as early as possible, I think it will attract a lot of ambitious and strong people. That is why it is important for a bank to have more teams, for example, one team can manage the technical along with the business and they have the power to make every decision concerning that area. It requires for the bank to have a technical architecture that allows the bank to do so,

and so it will increase the efficiency and make the bank more attractive. Thus, the key is to give as much responsibility as possible down the organization.

"In what matter do banks' legacy affect its ability to drive innovation?"

Normally people are afraid to change too much. Thus, banks are afraid that customers will react negatively to changes. However, it turns out that customers are positive to new services that simplifies the everyday life. The best example in Norway is Vipps. It is all about having sustainable security on one hand, and on the other hand, provide services that simplifies people's lives. If you manage to do that, then there is nothing that prevents people from trying new things. In this matter, Vipps is extremely strict, hence, they do not pursue anything that does not help to make things easier. For instance, quite consciously, they chose not to launch payment in stores because they found that compared to a card, there were no fewer steps to pay with the mobile on a payment terminal.

"Do the banks have any additional advantages over Fintech companies?"

In the extension of a customer base, the banks also have a lot of customer information and customer history. It is basically very useful as they will know a lot about preferences and other aspects early on. Banks have the advantage that customers know that all their information is held by the bank. If the banks had been able to create useful tools that make everyday life easier in order to plan economics, then they have all the information needed. If my bank had done this today, then it would have reduced the chance of me switching to another service.

When PSD2 opens, banks must retrieve all information that exists on their customers in other banks and then create these services. The question is whether they can do it quickly enough in order to get in forehand of new players. If they are able to do that they have a greater chance of retaining their customers. This is because the banks already have created a well-known brand and a large customers base who trust the company. My point is that banks have a time-window now in 1 or 2 years, where they can survive if they manage to turn around quickly enough. However, will everyone be able to do it? Absolutely not.

"What do you see as banks' biggest weaknesses/challenges? What are they lacking?"

It is really not that much the banks need to learn. I will explain more thoroughly what I mean; I do not think that the challenge lies on the aspect of idea creation, nor is it in marketing or the customer base. But what they have acknowledged and what they must learn is how to get the idea out into the market and manage to iterate and adjust it until they have a service or product that is good. The banks can learn a lot from the way they establish themselves in a market. Further, something else banks can learn from fintech businesses is to be willing to sacrifice the income they have today in order to have resources to invest in new projects. They must also learn effective organizational models, especially the organizational models of fintech businesses.

"How do banks work to become corporate agile?"

The banks I am skeptical towards are those banks that take their current systems and tries to modernize just that, completely identical. You have heard of Nordea, which is running an enormous core system. They have spent approximately 8 billion on replacing their whole core system. This was a massive project over 7-8 years. For Nordea, there is a logic in it, since they have to merge five banks, however, beyond that, they try to make the most state-of-the-art version of the old bank. I am a bit unsure whether that is a smart approach.

If the banks are going to be able to make corporate innovation, they must enable people to innovate, and then instead of spending 8 billion on one a giant system, they should spend 100 million here and there which will result in 8 different projects. Some of these projects are going to fail, some of these projects are going to succeed and some projects will have an average outcome. This in turn will be the right method instead of placing all the resources in one post. The ability to have many parallel projects at the same time and to tolerate that some of them are going to fail without destroying the employees' careers, is one of the major changes the banks need to work on. It must be allowed to make mistakes.

"There is a lot of prestige at stake for the banks. How can they change that?"

The banks must be willing to make the tough choices, but then again everyone is really afraid that things will go wrong. Hence, the banks must be able to relinquish the prestige. What makes people to try and fail up to 3 times is certainly not a prestige, however, it is the motivation to succeed in the end. Standard corporate culture is not open for such mindset, simply explained, you are not allowed to fail too many times. Therefore, it is important to look at how business executives can become more patient. It may mean that as a leader, you must observe a number of other features, such as the motivation and the learning ability of the employees. As a leader, one should assume that, as long as employees do not repeat their mistakes, their employees will eventually succeed. In this way, management and the perspective on how to lead people will change. Modernizing traditional management is also part of the challenges that banks face as a result of PSD2.

"How can banks position themselves in order to have competitive advantage and maintain the customer base?"

It depends on the current position of the bank. DNB have a big market share in most areas and thus have the ability to run a slightly bolder strategy. In my point of view, I had invested in many more areas. I had created a bank outside the existing DNB that was allowed to compete with DNB. This bank should be allowed to pursue whatever it wants. In this way, DNB competes with itself. The reason for this approach is that I do not know how long the process will take. Things can happen overnight or it may take 10 years. By running this strategy, the challenges of technical architecture had been solved as you could have built something new and thereby increase agility. If this new bank succeeded, lots of customers would have transferred to the new bank and DNB would have lost a majority of its existing customers. Thus, it would have been ok. As a result, they can shut down the old bank and go forward with the new bank. Doing so, they get a bank with a lower cost base, new organizational model, much more agility and the right services at the customers demand. However, if the new bank fails, they can live well on the old bank for a while. So, for DNB, I had chosen a hedging strategy, where you run a bank in parallel and "kill the loser" in the end.

When it comes to a much smaller bank, they may not be as good at, for instance, mortgage loans. In this case I would have made a price comparison service. This strategy involves that the bank stops their own service for mortgages. Thus, instead they promise their customers to provide them with the very cheapest mortgage available on the market, no matter what.
In which, they can use their position to "shop" in those banks willing to deliver the cheapest mortgage loan.

The competition increases which will be very beneficial for consumers, and that is basically the whole purpose of PSD2. Increased competition leads to lower prices for the consumer. It is all about getting better and cheaper services for the customer. Therefore, you must look at what the bank is good at and where the bank has a competitive advantage on the cost side and then choose what to pursue. I think that as a result of PSD2, the long-term consequences are that banks will still exist; however, I believe there are very few banks that will focus on everything they currently do. Banks will be forced to specialize. In that process, someone will fail in terms of what they choose to pursue, they will go bankrupt or be acquired. Others will have luck or succeed and they will live for many years to come.

"What do you think are the biggest challenges when it comes to cost?"
Obviously, old-fashion IT systems are heavy and intertwined. However, I think the most challenging part is to determine which area the bank should focus on and strive in, and then it is really to figure out how to be best and end everything else. It applies to technology as well.

"How do you believe the digital competition will change as a consequence of the implementation of PSD2?"
I thought 2 years ago that the process was going to go a little faster, so I am a bit uncertain whether it will take 1, 2 or 5 years. However, I think consumers will get a lot more choices of services they can use as a substitute for what we consider as online banking today. It is heading in the direction where everyone gets better prices, thus, financial services will become cheaper. In addition, I think consumers will eventually stop paying attention to who the providers of these services are. "Which bank do you have?" Is not a question anymore. I believe that the bank brands will be gone. DNB means less in 10 years than what they do today and that is a big change in the society as well. Banks have been very important for the

business sector to function well and I think the banks' role in business society is declining. The reason for that is that there are a lot of providers who will offer the services that banks offer today. As a result of the effect of PSD2, you get a completely different financial services market than it has been up until now.

Interview with Martin Braaten Grina

User Experience Lead at Auka

Martin Braaten Grina works with user experience lead in Auka, a FinTech company which develops mobile payment solutions for banks. The interview was held at Mesh in Oslo on April 3. from 11.30 pm – 12.30 pm and both Elise and Christine participated in the meeting. A brief summary of the thesis and the research question were sent to Martin B. Grina in advance. He thought the thesis and theme looked interesting and wanted to have a meeting with us. The interview was held in Norwegian as this is the native language of all three participants and has been translated into English afterwards. The interview has been rewritten into a summary containing the most relevant information for this master thesis. In order to ensure the validity and reliability of this interview to the master thesis, Martin B. Grina has read and approved the translation.

"What does innovation mean to you and how does Auka approach it?"

From a bank's perspective, it is extremely important to be forward-looking because the competition is extremely high, no longer just from other banks, but now also from third-party players like FinTech companies such as Auka. Traditionally, banks have generally had a monopoly on everything that has to do with money transfers. As a consumer, you have had no other institutions to go to in order to manage your finances, whether it is transfer or payments. The customer is experiencing that everything is done through their bank, even though there are a number of systems and companies behind which in a way process transactions.

In Auka we aim to help banks become innovative and create a competitive edge by launching their own mobile wallet by offering P2P payments using mobile phone numbers.

You only need a phone number and then it will be linked to a debit card, Master/Visa. Now it also includes account to account transactions where the amount is deducted directly from one bank account to another bank account without having to go through a card scheme.

"How should traditional banks approach innovation and ensure that it does not take too long time?"

I mean that in order to become innovative, big banks should change their business models and do smaller, internal projects. Vipps is a good example of that. DNB established their own hub in which exclusively worked with Vipps and developing P2P with mobile phones. It exploded and became uniquely successful, and today it is a separate and independent company. This type of strategy is something that can be seen in other banks and organizations as well. You can identify projects in other banks as well, where it starts in small project groups of about 20 pieces. This may include project managers, designers and developers who test ideas. They work lean and agile in a small team where they avoid noise from other parts of the large organization and thus work in isolation.

"Which capabilities does the FinTech companies possess and how do you think traditional banks should utilize these?"

It all depends on what kind of FinTech company you are and what you do. However, FinTech companies are extremely skilled. They are smaller, more specialized companies which can move faster and be more effective. They have no legacy and have a clear goal of why they do this and what they should achieve. It is also seen that both larger and smaller companies enter into consultations. For example, Company X promotes on its website that they provide PSD2 hosting, customer service, etc. However, if you dig a little, you will see that the whole platform is a collaboration between several players. Several FinTechs and other companies are experts within their own specific areas and join forces in a huge consultation to deliver a service under one brand.

Sometimes we look for banks and other times banks are looking for us. We have a clear idea of what kind of banks we want to cooperate with. I cannot say which banks it is, but it is very exciting to work with what we call Neo-banks. It involves newer banks that do not have much legacy and who are basically trying to be a little like start-ups. They are small and relatively new banks that are able to move fast in the market and not inhibited by tons of legacy. For us, it is very exciting to work with them because they are more ready to implement the technology we offer. This type of banks is also more ambitious and wants to be first-movers and create precedents. An example of this is Skandiabanken in Norway with zero branches, where everything is digital, which gives much less technical debt.

"In your opinion, which capabilities does the banks need in order to become innovative?"
Just do it. Banks must dare to invest. They must dare to try and fail and look at it as part of the process. Banks are old-fashioned organizations and now they try to step away from being a bank and towards become technology companies. To do so, they must change their entire organization; everything from how they think to how they create products. The entire product development process has changed radically from waterfall where they work step-by-step. This process does not work in today's technological communities where you work user-centered and try to make the optimal product for the customers. Then you have to work interactively and try and fail along the way. Things are definitely changing, and the banks are not used to this.

Banks have a lot of money and resources and do have the capabilities to do exciting things, but they also have a risk assessment of everything they do due to the big potential losses they are facing. However, they will win nothing if they do not start to act now. PSD2 is an example of it. They just have to throw themselves on that train, because in some ways, that train has already left the station. If traditional banks just sit and rely on what they have today, with many customers and a solid market position, they lose.

With the implementation of PSD2, banks have eventually begun to understand what actually happens in the payments market. They have started to show willingness to change and looks for TPPs that can deliver the solutions needed to help them keep their competitive edge or create new competitive advantages. It is crucial that they do something to keep their customers because the competition is increasing. There will be many new players in the payments services market, so if the traditional banks do not act proactive they will lose their customers. People are not loyal to their banks, and they will choose the best solutions available in the market.

In a market under constant development it can be crucial to be the first mover in order to succeed.

"Do you believe this is a strategy many banks choose to follow, or do they choose other strategies?"

Over the past ten years there has been a lot of exciting developments in the mobile payments landscape. Thus, if a bank approach mobile payments solutions now, I will not say they are first-movers. However, it is now things really start to happen because it will be regulated by PSD2. Banks are forced to open up and with the TPPs entering the market competition will increase. As mentioned earlier, the biggest mistake banks can make are thinking they have a safe position. It will be crucial to approach innovation and be proactive in order to survive, and that has to happen now. I believe it is a good thing to be an early mover and be a part of the changes.

"Do you think traditional banks have too much legacy and too much to lose (financial and reputation) to approach such a strategy?"

Technologically, they have a lot of legacy. Traditional banks have extremely high technical debt because they have existed for many years and thus have old and outdated solutions. The existing solutions may not be compatible with technology in order to offer innovative solutions that relate to innovative systems. Then they must rewrite the code in the existing system to support it. However, as a FinTech company, we provide a technology solution, a transactional engine that can be added to the bank's existing infrastructure as a thin layer that allows banks to accept mobile payment. That is our business model and it is a way to help banks create innovative solutions that simplifies the process for the consumers.

I am sure there are many different approaches to how to deal with legacy, but my previous experience of working as consultant have taught me that banks are constantly updating old code to new code, removing things that they no longer need. It is a constant and time-consuming work, and there are hundreds of developers who only works with this in the traditional banks.

“To what extent does traditional banks´ legacy affect their ability to drive innovation?”
A lot has happened. The banks are constantly working to get rid of technical debt and to acquire newer coding technology. They try to implement the very latest, but it takes time. Much can be changed through changing the process of development, methodology etc. As of today, many banks are still stuck with the methodology of waterfalls, which is ineffective in today’s market. Such a method does no longer make sense when working digitally. The banks have to approach agile methodologies, meaning testing against users, and thus understand the problems and challenges that exists. Learning by doing and dare to make mistakes can make a big difference for the banks.

An increasing number of banks are beginning to explore what is called design sprint. It is a form of product development where one tries to identify a challenge, problem or an idea they want to test. Regardless, they focus on it for a week trying to identify what the problem/idea is. Then they attempt to unbox it and identify all the small things needed to find a solution. Then they make prototypes, do testing and an iteration for a week where they include important stakeholders. The legacy makes it challenging to drive innovation, but I believe they are able to do so if they approach more agile methodologies.

“How can banks utilize their customer relations?”
Traditional banks are in a position where they have a lot of customers, they know the payments landscape and what they are doing. To some extent, they have a kind of loyalty that they get for free simply by being banks. Consumers consider the bank as a safe place for their finances. However, there are many banks that do not run only with bank services. Many large banks in Europe and elsewhere in the world carry a lot of other services, ranging from crowdfunding and insurance, sales and other services. They possess extremely valuable information about their customers that can be used to create other services tailored to their needs. This implies that as a bank with many customers, you have a good position in the market and this can be exploited by daring to try new things and try to be innovative and proactive.

This could be approaching PSD2 and mobile payments, or become a go-to bank that is forward-looking and modern. I do not think that there will be so many different banks in each country that survives the evolution. I believe there will be 2-3 competitors, who are the ones who are able to exploit PSD2 best. They are the ones who are able to think of how they can win customer relations by connecting to other banks through open APIs. An example of collaboration a bank can enter into are with Spotify, and develop a solution where you pay through Spotify and not by card. Because banks operate access to account (XS2A), which is what PSD2 is about to a large extent, banks have an extremely big advantage compared to those who deal with cards.

"What do you see as the banks biggest weakness/challenges? What are they lacking?"
The biggest challenge may be that they possess a lot of legacy. It requires more effort, time and money for them to throw themselves around in order to adapt to the changes. It is challenging to change a business model and mindset which have been well-implemented in the company culture for a really long time. In contrast, FinTech companies have been founded with a fairly clear vision and purpose of what they should get as a company, what services to sell etc. Banks are heavily affected by what is happening in the market now, especially with the new EU directives. This is challenging because they must choose between adapting versus being innovative and trying to be the first ones with new solutions.

"How should traditional banks plan to position themselves in order to achieve competitive advantage and maintain the customer base?"
It depends on what kind of strategy the bank follows. For example, several of the bigger banks run several business areas. This may include bank, insurance, savings, crypto or whatever. Everyone who deals with bank believes that mobile payment is the future. Card payments is not the future, it will die out in one way or another. Banks must at least try to be innovative in one way or another by tapping on the mobile payments train. They must retain the customers they have, acquire more customers and make sure they are a mobile payment provider that offers P2P payments via phones. This way they can get a lot of users, like Vipps did in Norway. It is all about recruit users first and get a solid customer base where they focus on one service only. When you begin to reach the critical mass, you can start offering other additional services. This is "The Scandinavian Way", and Danske Bank did the same thing

with MobilePay for instance. Once you have built up a solid customer base and a product that works, you can start offering other products and services that tap into other areas of the customer´s everyday life. Then you can start resolving more problems.

"How should banks work to become corporate agile?"

To become corporate agile costs money in terms of resources. But as a general answer, it is a necessity to get rid of technical debt and change the methodologies. However, I also think they have a lot to gain from entering into partnerships/collaboration with TPPs in order to deliver solution X within a timeframe. By doing it all alone, it takes more time and becomes more expensive for the bank. One has to analyze the costs, what does it cost the bank today versus what they will get for it in a long-term perspective. They have to look at the value of it in the long-term. What can they earn from this and what should they invest in it now of both money and resources. Traditional banks must be willing to change and move in line with the changes, or even faster than what is happening in the market. They have to pay attention to the changes in the market and in customer needs.

Also, banks have to develop new services and decide which way they want to go. They have to decide whether they want to be the one who offers a solid infrastructure with very good APIs, which allows FinTechs/TPPs to do exciting things with the data banks offer – or if they want to be a full-scale supplier as they are today and offer their own exciting services via their own interfaces. If they want to revolutionize their online banks to be as good as a mobile payment platform or if they want to be the one serves other banks.

"How should traditional banks and FinTech companies act to attract the right employees?"

For FinTech companies like Auka, it is important to emerge as an innovative company that works with cool, new and cutting-edge technology. It´s quite difficult to recruit the best people because graduates from the well-known universities only want to work with the most exciting technological developments. Thus, generally speaking for all new companies, it is popular to offer good perks adapted to the digital era of engineers and designers.

In order to attract the right peoples, traditional banks should promote that they work with innovation and new technology. An advantage they have is that they can promote that the organization possess extremely much competence and that there are huge learning opportunities. As a bank, you are dependent on offering new, cool, innovative, up-to-date things. The graduates want to work with mobile payments, APIs, PSD2, and that is what the banks should promote.

"How do you believe the digital competition will change as a consequence of the implementation of PSD2? How will this affect the future of banks?"
There is a lot of new competition coming up. In the media, there is a lot of talk about the biggest players like Facebook, Google, Apple, Amazon and AliPay who do not really work with payments, but who have acquired this E-money license and are now waiting for the doors to open up Europe. These are important and interesting players that will enter the payments market. They are waiting for the banks to put their APIs in place so that they can start tapping into the banks´ customers with the customer´s consent.

It will be interesting to see if these players actually manage to make people realize it is okay that they manage their finances. Facebook will certainly implement P2P in Facebook Messenger, and Apple will do the same. Payments are going to be more all over the place and I believe it is all about gaining visibility in the market and becoming the bank that has a reputation of being forward-looking and proactive in order to survive.

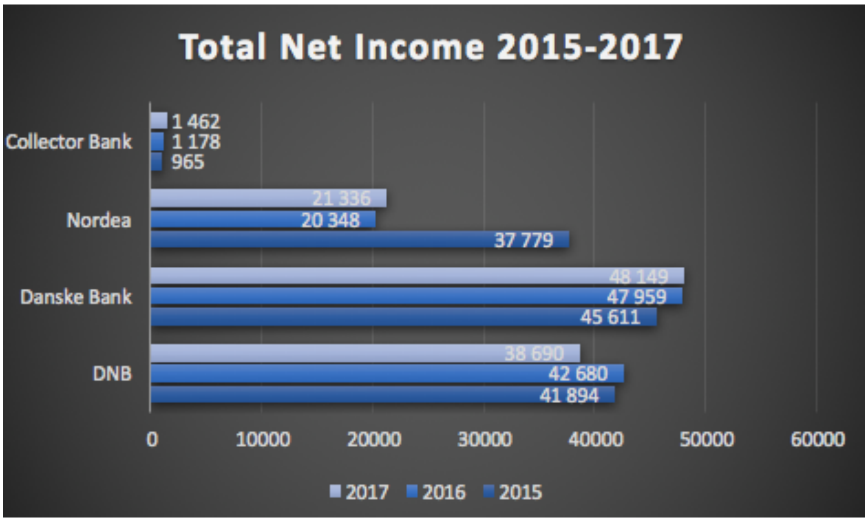
When it comes to the future of banks, I do not think that much will change for the first five years, but over the next 10 years much will change. Far into the future, I think there will be one gigantic central bank in the world and there will be a lot of neo-banks around the world that are lucky, modern and innovative, competing in the same way as different FinTechs. Some banks will definitely die because they have not managed to move fast enough. They will either drop down or merge with other banks. That is what happened to Vipps, where almost all Norwegian banks have realized that they cannot compete with them and therefore have entered into partnerships. If you can not fight them, join them.

Appendix 2: Key numbers and figures based on the banks financial reports

1) **Overview of the selected banks.** *Numbers in DKK million based on the banks annual reports 2015-2017.*

	DNB	Danske Bank	Nordea	Collector Bank
2015	41 894	45 611	37 779	965
2016	42 680	47 959	20 348	1 178
2017	38 690	48 149	21 336	1 462

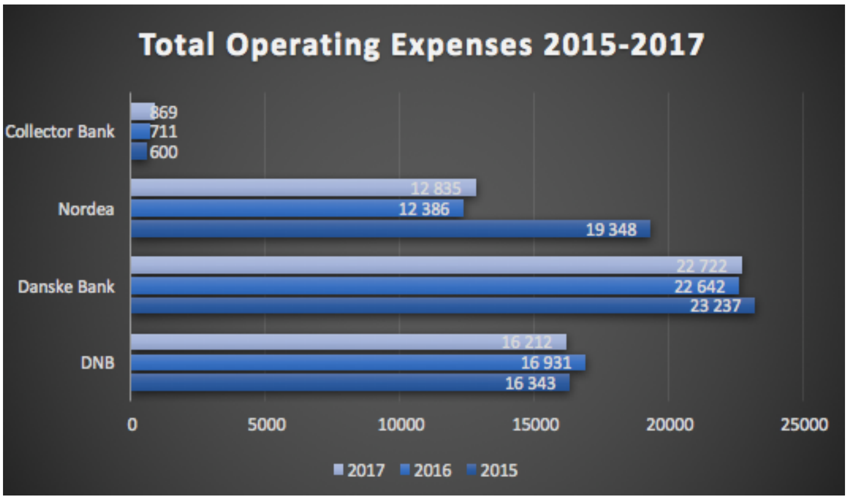
Total Net Income 2015-2017



Total Net Income 2015-2017.

	DNB	Danske Bank	Nordea	Collector Bank
2015	16 343	23 237	19 348	600
2016	16 931	22 642	12 386	711
2017	16 212	22 722	12 835	869

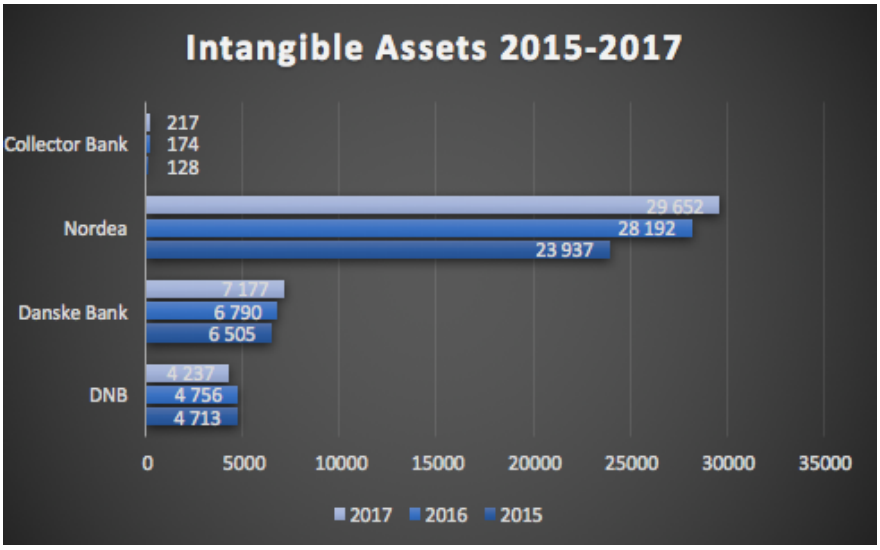
Total Operating Expenses 2015-2017.



Total Operating Expenses 2015-2017.

	DNB	Danske Bank	Nordea	Collector Bank
2015	4 713	6 505	23 937	128
2016	4 756	6 790	28 192	174
2017	4 237	7 177	29 652	217

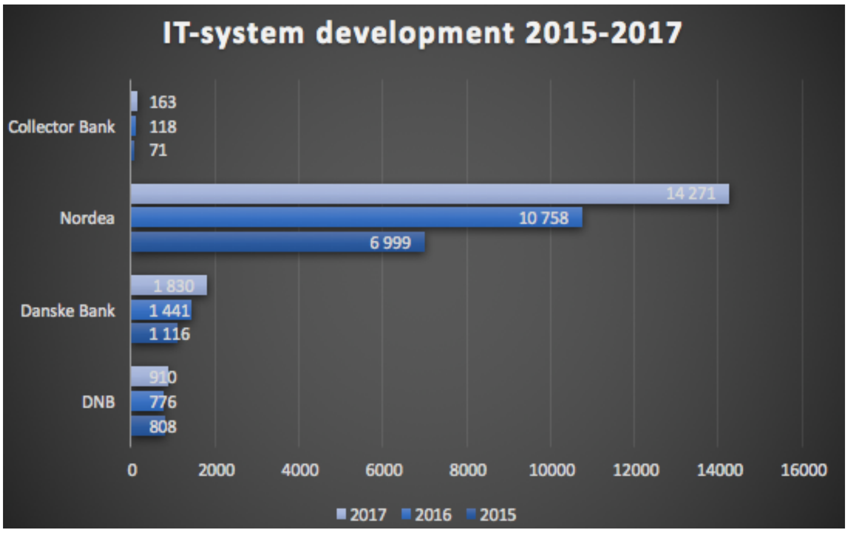
Intangible Assets 2015-2017.



Intangible Assets 2015-2017.

	DNB	Danske Bank	Nordea	Collector Bank
2015	808	1 116	6 999	71
2016	776	1 441	10 758	118
2017	910	1 830	14 271	163

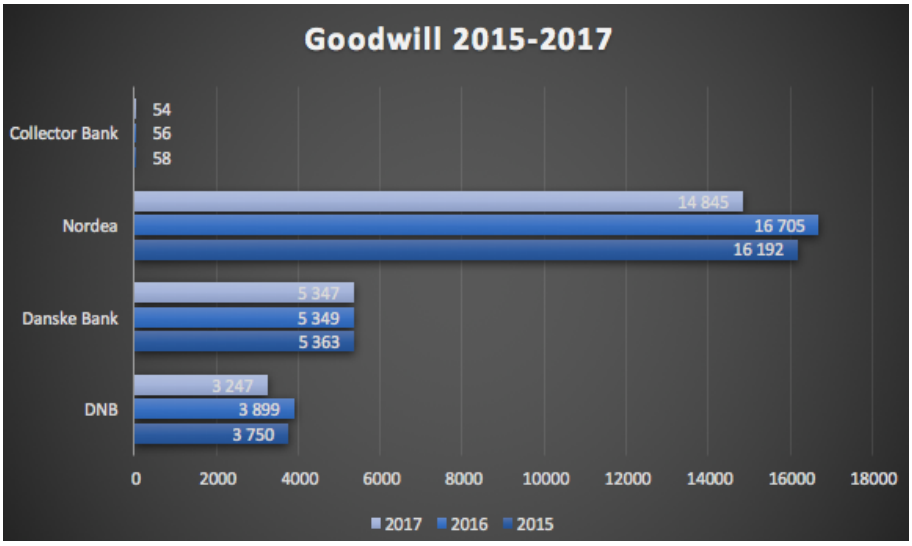
IT-system development 2015-2017.



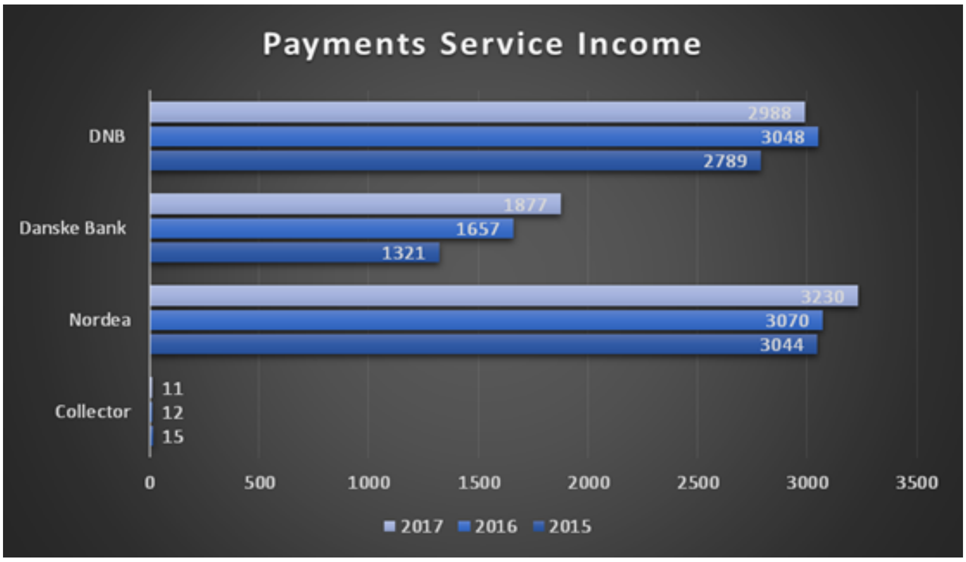
IT-system development 2015-2017.

	DNB	Danske Bank	Nordea	Collector Bank
2015	3 750	5 363	16 192	58
2016	3 899	5 349	16 705	56
2017	3 247	5 347	14 845	54

Goodwill 2015-2017.



Goodwill 2015-2017



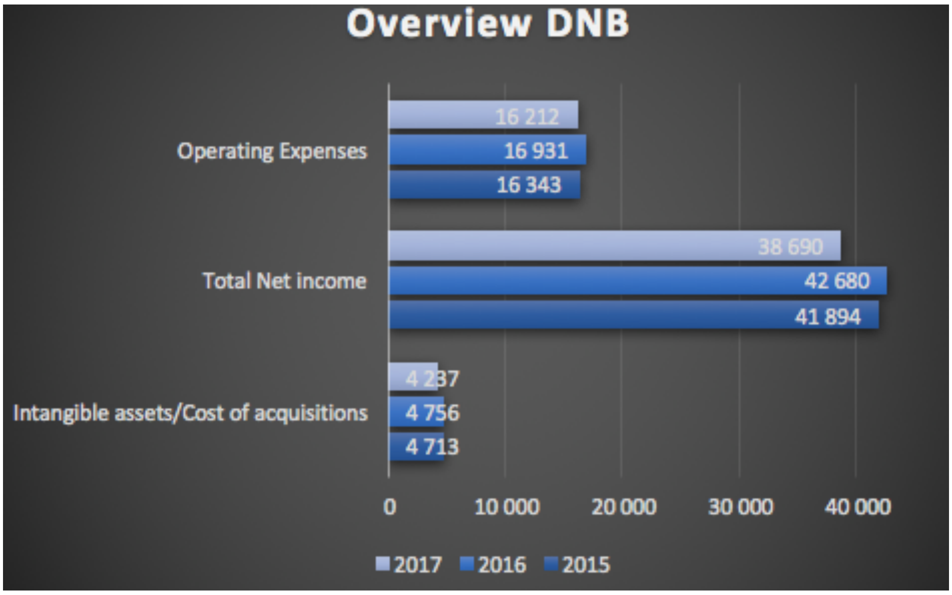
Payment Service Income 2015-2017

	2015	2016	2017
Collector	15	12	11
Nordea	3044	3070	3230
Danske Bank	1321	1657	1877
DNB	2789	3048	2988

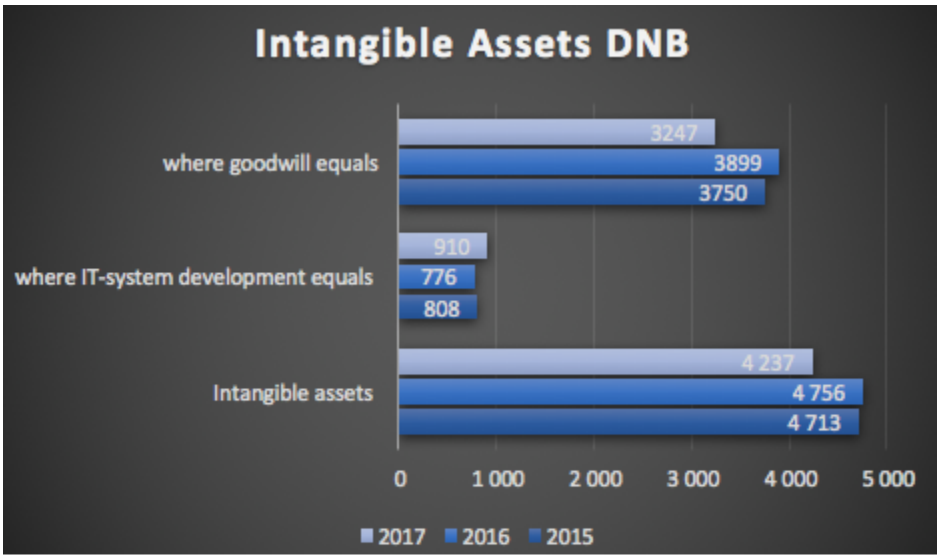
Payment Service Income 2015-2017

2) Key numbers DNB 2015-2017. *Numbers in DKK millions based on the bank's annual reports 2015-2017.*

	2015	2016	2017
Intangible assets/Cost of acquisitions	4 713	4 756	4 237
Total Net income	41 894	42 680	38 690
Operating Expenses	16 343	16 931	16 212

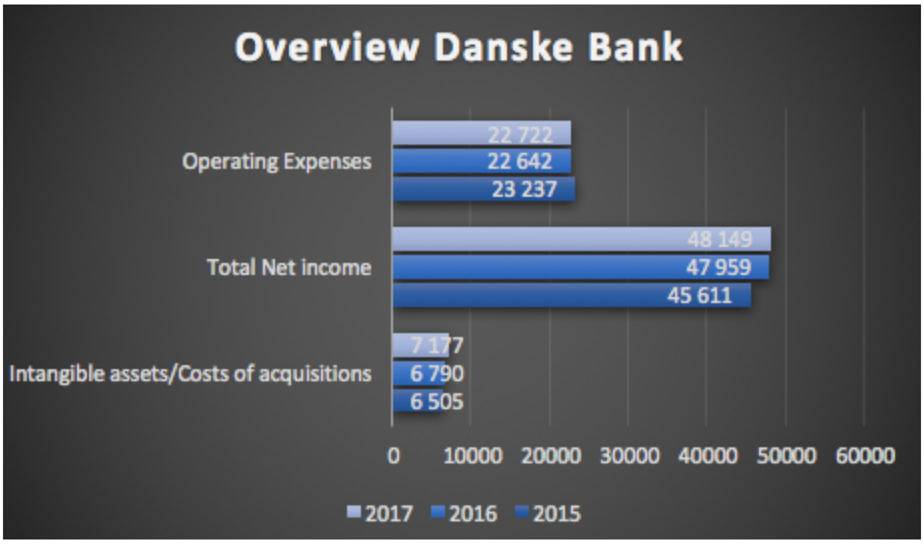


	2015	2016	2017
Intangible assets	4 713	4 756	4 237
where IT-system development equals	808	776	910
in percent of intangible assets	17,14 %	16,32 %	21,48 %
where goodwill equals	3750	3899	3247
in percent of intangible assets	79,57 %	81,98 %	76,63 %

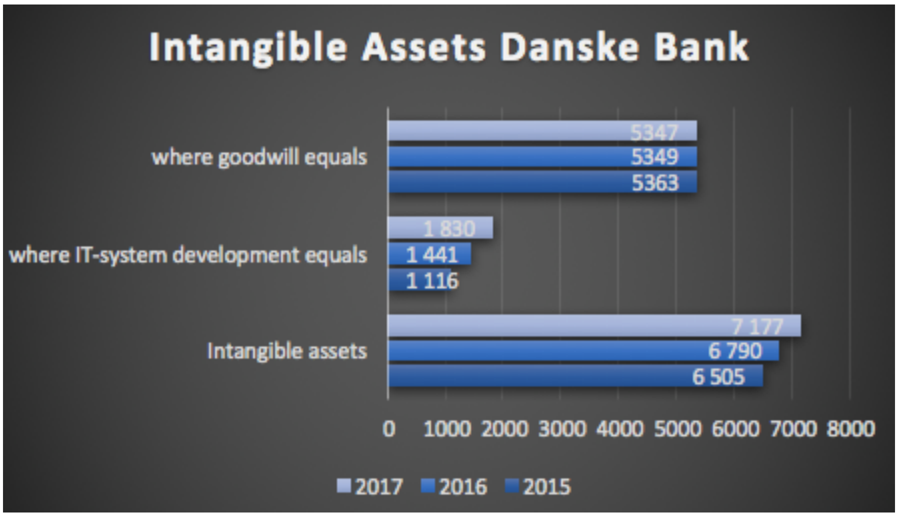


3) Key numbers Danske Bank. *Numbers in DKK millions based on the bank's annual reports 2015-2017*

	2015	2016	2017
Intangible assets/Costs of acquisitions	6 505	6 790	7 177
Total Net income	45 611	47 959	48 149
Operating Expenses	23 237	22 642	22 722

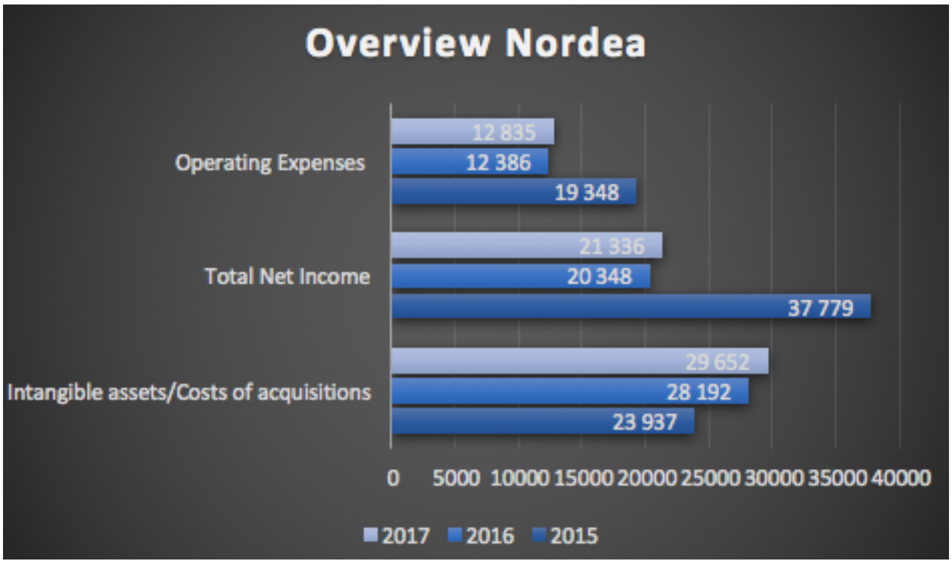


	2015	2016	2017
Intangible assets	6 505	6 790	7 177
where IT-system development equals	1 116	1 441	1 830
in percent of intangible assets	17,16 %	21,22 %	25,50 %
where goodwill equals	5363	5349	5347
in percent of intangible assets	82,44 %	78,78 %	74,50 %

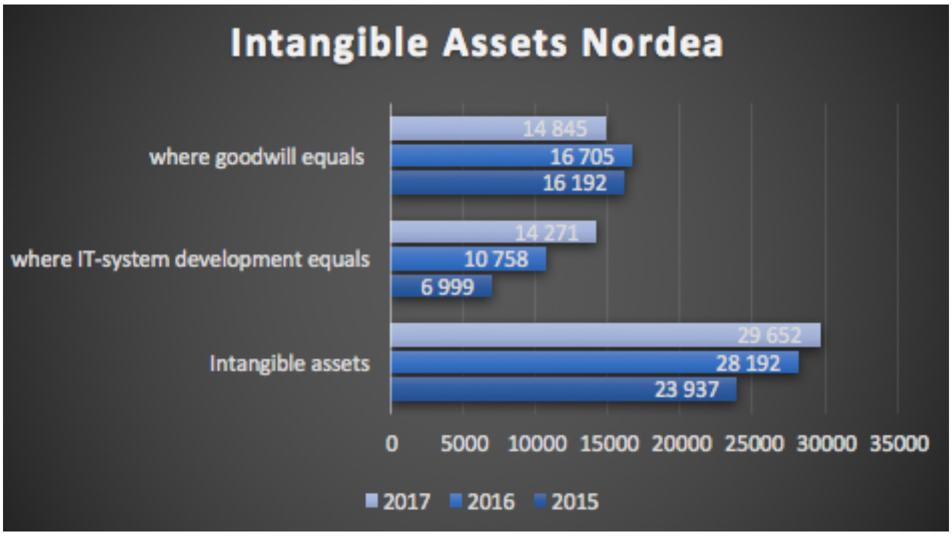


4) Key numbers Nordea. *Numbers in DKK million based on the banks´ annual reports 2015-2017.*

	2015	2016	2017
Intangible assets/Costs of acquisitions	23 937	28 192	29 652
Total Net Income	37 779	20 348	21 336
Operating Expenses	19 348	12 386	12 835

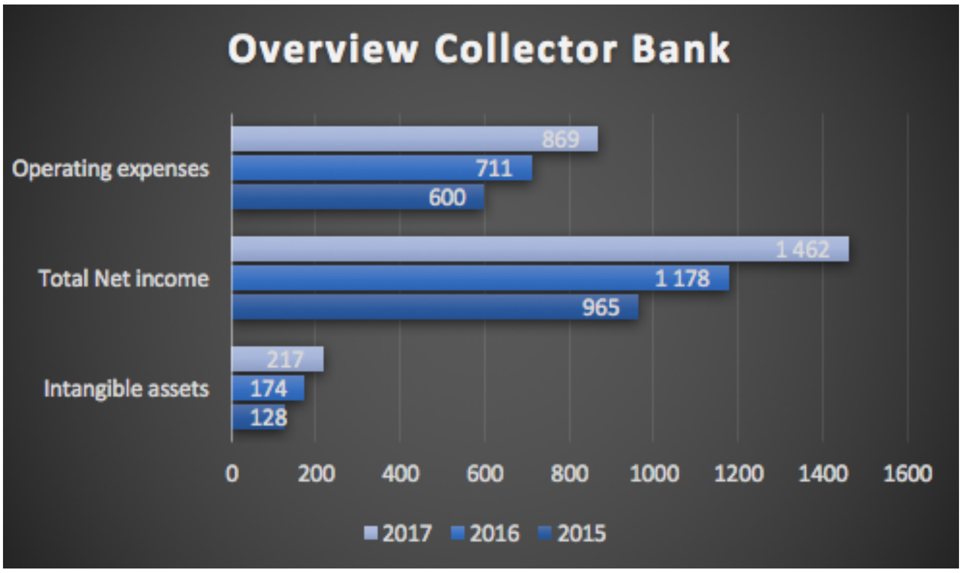


	2015	2016	2017
Intangible assets	23 937	28 192	29 652
where IT-system development equals	6 999	10 758	14 271
in percent of intangible assets	29,24 %	38,16 %	48,13 %
where goodwill equals	16 192	16 705	14 845
in percent of intangible assets	67,64 %	59,25 %	50,06 %

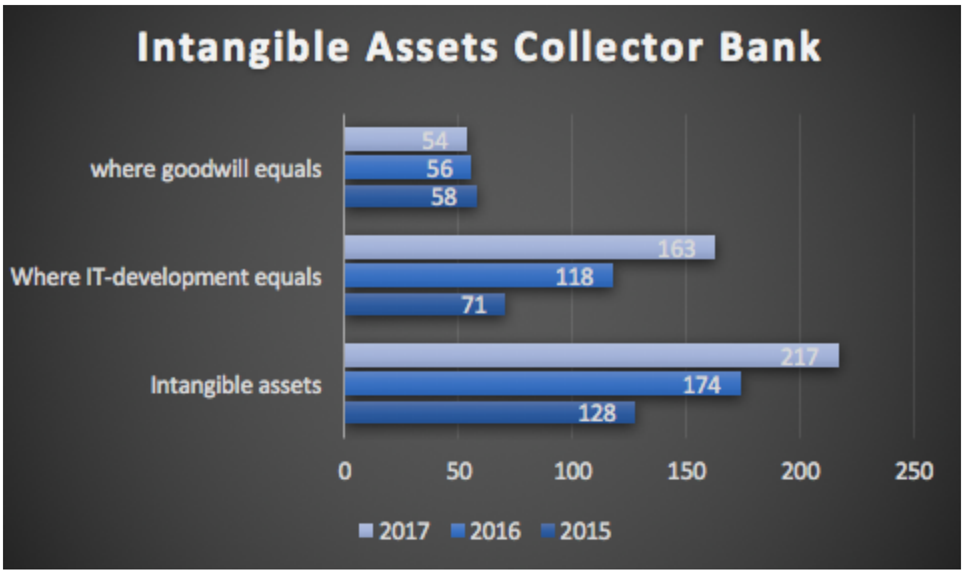


5) Key numbers Collector Bank. *Numbers in DKK million based on the banks' annual reports 2015-2017.*

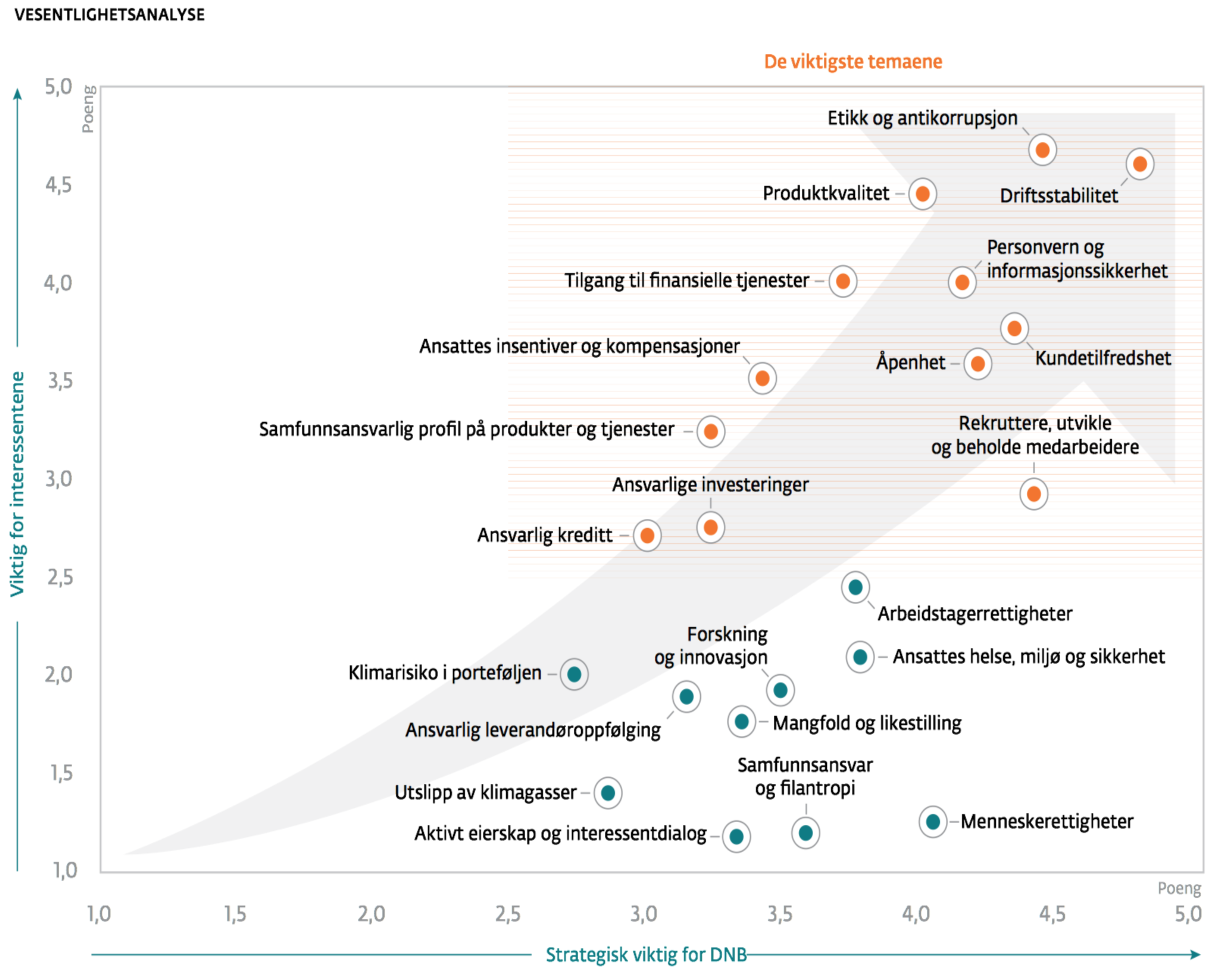
	2015	2016	2017
Intangible assets	128	174	217
Total Net income	965	1 178	1 462
Operating expenses	600	711	869



	2015	2016	2017
Intangible assets	128	174	217
Where IT-development equals	71	118	163
in percent of intangible assets	55,47 %	67,82 %	75,12 %
where goodwill equals	58	56	54
in percent of intangible assets	45,31 %	32,18 %	24,88 %



Appendix 3: Essential-Analysis DNB



Source: Annual Report DNB, 2014

Source: Financial Report DNB, 2014