Norwegian School of Economics

Bergen, Fall 2018

The revised Payment Services Directive (PSD2)

Implications of PSD2 on Norwegian banks

Ida Marie Moen and Helene Hompland Helgøy

Supervisor: Xunhua Su

Master thesis, Master of Science in Economics and Business Administration, Finance

NORWEGIAN SCHOOL OF ECONOMICS

EXECUTIVE SUMMARY

This thesis focuses on the revised Payment Services Directive (PSD2), a regulation aiming to make the European payments market more integrated and efficient, make payments easier and more secure and increase innovation and competition in the industry. The core challenge for banks is that PSD2 requires them to provide third parties access to their customer data through open APIs. Consequently, the directive has implications for banks that go further than regulatory compliance. Accordingly, the main objective of this thesis is to identify the implications of PSD2 on traditional banks' competitive position in the Norwegian bank market and identify responses for how they can remain their competitive position. The thesis draws on market analysis, literature reviews and interviews.

Through an extensive review of PSD2 and the Norwegian banking and payments market, we have concluded that traditional banks will be facing increased competition from third parties offering banking services. The main threat to the banks' competitive position in light of this, is a potential loss of customer interaction and cross-selling opportunities.

Further, we identified the value that lies in a customer's financial data, and found how exploiting it can lead to a profitable business model for both banks and third parties.

However, the success of third parties will rely on the consumer's adoption rate. A customer's decision in allowing third parties access to their data is two folded. On one hand, consumers demand the innovative and personalised services agile third parties are able to deliver. On the other hand, consumers emphasize secure solutions provided by trustworthy financial institutions, the prominent strength of banks. Banks can leverage the high trust Norwegian consumers place in financial institutions to strengthen their position in a new competitive landscape.

Finally, we identified three approaches traditional banks can use for responding to increased competition: the compliance approach, the proactive approach and the Open Banking approach. Most Norwegian banks have dismissed the compliance approach by proactively engaging in initiatives through launching new products developed by themselves or in collaboration with technology companies. In a fast changing market characterised by increased competition and innovation, the two latter approaches will be more viable in order for banks to remain their competitive position.

ACKNOLOWDEGMENTS

This master thesis is written as a final part of our master's degree with a specialization in Finance at the Norwegian School of Economics (NHH). The decision to write about a subject within FinTech was motivated by the course FIE448 Banking and Financial Innovation, held by our supervisor Professor Xunhua Su. PSD2 was chosen as the topic of the thesis as we believe this regulation in particular will facilitate and accelerate the infusion of technology within the banking industry. We found it interesting to research a highly relevant topic contributing to new insights for readers. Working with this thesis has been a demanding process, but also a rewarding and exciting experience in terms of learning and developing our analytical and research skills.

We would like to express our sincere gratitude to our supervisor Xunhua Su for his provision of expertise and insights into the subject, and for his guidance and constructive feedback throughout the writing process. Furthermore, we wish to thank the invaluable industry experts for contributing with rewarding knowledge and their time spent answering our questions. Their experience enabled us to better understand a fast changing, complex industry. It would not have been possible to perform this thesis without the help and support received along the way.

Bergen, December 2018

Ida Marie Moen

Helene Hompland Helgøy

TABLE OF CONTENTS

FIGURES

ABBREVIATIONS

PSD1	The Payment Services Directive
PSD2	The revised Payment Services Directive
PSP	Payment Service Provider
PI	Payment Institution
TPP	Third Party Provider
PISP	Payment Initiation Service Provider
AISP	Account Information Service Provider
XS2A	Access to Account
RTS	The Regulatory Technical Standards
SCA	Strong Customer Authentication
CSC	Common and Secure Communication
API	Application Programming Interface
EBA	The European Banking Authority
EU	The European Union
SEPA	The Single Euro Payments Area
NBO	Norges Banks Oppgjøringssystem, The Norwegian Settlement System
NICS	The Norwegian Interbank Clearing System

1. INTRODUCTION

1.1 BACKGROUND AND MOTIVATION

Imagine ordering a table at a restaurant, paying for the meal and splitting the bill with your friends with just a few taps, all in a single application on your smartphone. Imagine the same application is offering services such as saving suggestions based on your spending habits, purchase recommendations tailored to your needs, overviews of information on all your bank accounts, instant loan applications and personalised financial advisory. A super app that assists you whenever and wherever, covering all aspects of your everyday needs, and at the same time allowing you to manage your daily financial life.

If this seems unthinkable, you do not need to travel far to make imagination a reality. China's success with the platforms AliPay and weChat, with respectively 520 million and 1 082 million active users offer such a seamless customer journey; a concept still unknown for many in the rest of the world (AliPay, 2018) (Tencent, 2018).

The services these platforms offer will assumedly be welcomed in Norway as Norwegians are becoming more accustomed to mobile payments and seamless payment solutions. In 2017, 90 million mobile payments were made in Norway and 60% of smart phone owners reported that they use their phones regularly to check their bank balance, research products and transfer money to friends (Deloitte, 2017) (Norges Bank, 2017).

Europe's first step towards facilitating the creation of platforms with integrated payment and banking solutions was made January 13 2018, as the European Union welcomed a new regulation of payment services in their law. The regulation, known as PSD2, has become a burning hot topic within the financial sector, as it brings forward change in the form of competition and innovation in an industry traditionally known for its inertia and complexity.

China might be light-years ahead of us when it comes to innovative payment solutions, but the Norwegian industry seems eager to keep up. The newly released partnership between AliPay and Vipps demonstrates the evolution of new entrants in the Norwegian market (Dagens Næringsliv, 2018). The development of innovative financial services may threaten the position of traditional banks. As PSD2 is soon to enter into force in Norway, banks are becoming aware

of the upcoming challenges. While some banks fear the change, others are tiptoeing just waiting to grab the opportunities the regulation enables.

Nonetheless, banks will in some way or another be affected by PSD2. We want to shed light on this highly relevant topic and apply it to the Norwegian market, which few have deep-dived into in previous research. We believe our research can bring insight into how the Norwegian banking and payments market will change following the implementation of PSD2.

1.2 RESEARCH QUESTION

The purpose of this paper is to study the implications of the revised Payment Services Directive (PSD2) on Norwegian traditional banks, and the strategic options established actors can consider in order to remain their competitive position. The master thesis will explore and analyse the implications of PSD2 on Norwegian banks through identifying relevant competitive strengths and weaknesses of established actors in relation to such changes. Three strategic approaches are proposed and analysed in order to give insights on how traditional banks can respond in order to remain their competitive position. Our problem definition is:

What are the implications of PSD2 on traditional banks' competitive position in the Norwegian bank market, and how can they respond to remain their competitive position?

1.3 OUTLINE

Chapter 1 contains a presentation of the thesis. In chapter 2 we include essential theory on the evolution of financial models, a study of the Norwegian banking and payment market, as well as a portrayal of current players in the industry. To be able to identify how banks are affected by the regulation, it is necessary to get an understanding of their function in the market, the current competitive situation and current customer expectations within the industry. As PSD2 targets the payment market, an assessment of the current payment value chain is needed for pinpointing where the changes will occur. We also shed light on current players that banks to a larger degree will compete against when PSD2 is implemented.

Chapter 3 outlines relevant theory used for answering the research question. To study the effects of collaboration and how taking the first step potentially can benefit the bank, theory

on coopetition and first-mover advantages are presented. As the interest of platforms has reached the banking industry, central theory covering platform business models and network effects are also presented in this section.

Chapter 4 includes the methodological approach used in the thesis, which among other things include a list of industry experts who participated in our interviews. They represent an important source of information. Their valuable insights are used for identifying threats and opportunities of the regulation for banks, determining the banks' current and future competitors, as well as contributing to our understanding on how the industry might evolve. Their input have laid the foundation for our analysis, facilitating the assessment of the most important implications of PSD2 on traditional banks.

PSD2 is introduced in chapter 5. A detailed description of its history, content and main objectives are presented. Our focus is on the objectives and details in the regulation that will have the highest impact on traditional banks' current operating mode.

Chapter 6 includes a thorough analysis of the implications of PSD2 on banks in the Norwegian market, while the following chapter presents the identified approaches for banks to respond to an industry in change. The implications and responses are based on observed trends, current movements of banks and third parties, as well as the opinion of banking executives regarding their challenges and opportunities ahead. In chapter 8, the thesis' conclusion is provided, which includes the thesis' main findings and the answer on the problem definition. Finally, we will provide the reader with possible future market scenarios.

2. BANKING IN NORWAY

2.1 THE EVOLUTION OF FINANCIAL MODELS

In order to analyse the implications of PSD2 on Norwegian banks, it is convenient to get back to conceptual fundamentals about the rationale for the existence of financial intermediaries and the reasons behind their coexistence with financial markets. An examination of the evolution of financial models is therefore provided. Banks have for a long period of time played a significant role in the society and financial system. However, the banking world today is under considerable pressure due to burdens of regulation and infusion of technology. The evolution of financial technology, commonly known as FinTech, may represent a development towards a new type of financial model, where the internet digitally replicate the features of banks and partly replace them as financial intermediaries.

Model 1: Direct finance

In economies where currencies were still linked to gold, direct financing was the only way to trade. Goods were directly transferred from the person who was in possession of it to the person who needed it. Direct financing is described as the matching of agents who have money to invest with those who need money to invest, as shown in the figure below (Su, 2018).

Figure 1: *Direct finance*

Transaction costs and asymmetric information

This model includes challenges in terms of finding the right contract partner. It requires sufficient time and effort to succeed in the searching and matching process, and this problem is defined as observable transaction costs. Other problems present in this model is information imperfection. Information imperfection involves one of the two agents having more information than the other in a financial transaction. This agent will have the ability to make a more informed decision. This problem is referred to as asymmetric information, which induces unobservable transaction costs, so called agency costs (Su, 2018).

Assume a direct financial transaction, such as a loan, between a borrower and a lender. The borrower will invest the money in a project after the loan contract is signed. Since the borrower knows more about himself than the lender, such as the possibility of defaulting on the loan, the transaction involves information asymmetry. The lender is bearing the risk of a possible default. The two agents will thus have conflicts of interests dealing with the project's risk level. Agency problems occur because the borrower act on behalf of the lender, and is thus able to take actions that benefit himself, which further induce costs of adverse selection and moral hazard (Su, 2018).

Adverse selection and moral hazard

Before the contract is signed, the lender is interested in knowing the borrower's credit quality, making him investigate the borrower's background and project carefully. However, during the screening process, the borrower can just pretend to be creditworthy. This agency problem is defined as the cost of adverse selection, since the lender cannot perfectly observe the quality of the borrower.

After the contract is signed, the lender is interested in reducing the borrower's opportunistic behaviours. He will therefore monitor the borrower in case he steals or hides money, purposely defaults on the loan or invests in a more risky project than previously agreed. This is the concept of moral hazard. The lender cannot be sure if the borrower sticks to the contract after signing it. The costs of adverse selection and moral hazard have both originated from imperfect information between the borrower and lender (Su, 2018).

Model 2: Traditional financial markets model

In the traditional financial markets model, a marketplace brings together agents who would not otherwise know about each other. The observable transaction costs related to finding the right contract partner is thus reduced in this model. The financial market connects those who need money to those who have money, making money flow to where it is needed most, as shown in the figure below.

Figure 2: *Traditional financial markets model*

Even though observable transaction costs are reduced in this model, transaction costs still exist and occur in all types of financial markets. In a stock market, trading fees are paid to the stock exchange and taxes are paid to the government. In a credit market, the transaction costs will appear as the difference between the saving rate received on a deposit and the mortgage rate that is paid for a loan (Su, 2018). In a well-functioning market, the prices are determined by aggregated information, such as the principles of supply and demand.

The problem of asymmetric information, which furthermore induces unobservable transaction costs of adverse selection and moral hazard exist in this model as well. Market efficiency will thus get reduced. The amount of lent and borrowed money in the market reduces, and the possibility of illegal insider dealing and trading manipulation increases in line with increased transaction costs (Norges Bank, 2017). It is therefore of high importance to reduce the information asymmetry, which can be accomplished by authorities. In the US, the Securities and Exchange Commission (SEC) is responsible for maintaining a fair and orderly functioning of the stock exchange, while the Norwegian government is the authority regulating the Norwegian stock market to improve information transparency (Thomson Reuters, 2018). The benefits provided by the authorities are large, but cost the society billions to obtain (Finans Norge, 2016).

Model 3: Traditional banking model

The market is not a perfect instrument to run the economic system in the sense that it cannot be omnipresent and do all resource allocation by itself. Some of its functions are therefore taken over by financial intermediaries such as banks when transactions are too costly to organize by market means (Todorova, 2014). Banks are introduced to connect borrowers and lenders. They are to a larger degree than financial markets enhancing the searching and matching process in order to find the right contract partner. This is because banks are in possession of large customer bases, and it is therefore less costly to find the right bank where various lenders have deposited their money, rather than finding the right lender. The costs of time and effort spent on travelling and contracting is therefore greatly reduced in this model. The process of borrowing funds from a financial market through a financial intermediary, such as a bank, is defined as indirect financing and is shown in the figure below.

Figure 3: *Traditional banking model*

Lenders place their deposits in the bank, and in return receive an interest from the bank. The deposited money is furthermore lent out to the banks' borrowers, who pays interest for receiving this service. In the model of direct finance, the borrower in the loan contract could pretend to be credit worthy even when planning to purposely default on the loan, and thus invest in more risky projects than agreed in the loan contract. A bank is however able to reduce the problems of information asymmetry to a larger degree than financial markets.

Banks are concentrated bases of professionals with higher expertise and more resources than the public, and are therefore able to identify borrowers' credit quality, and screen profitable loan applicants and investment projects. Banks can for example invest in technologies that allow them to manage credit ratings and credit history, they can ask for collateral, hire a credit bureau to share information and monitor borrowers ex post (Su, 2018). All these actions, unable for individuals, will help lenders gather information about potential borrowers, and consequently reduce the information asymmetry.

Banks serving as professionals in the financial market, helping in reducing information asymmetry and all types of transaction costs imply that they increase returns to scale. The concept of returns to scale is about increasing production output, such as loans in the financial market, while only increasing a limited amount of cost. Bank inputs of physical capital, human capital, technology and borrowed funds enable increasing the scale of its lending activities significantly without incurring a large increase in costs. An open market without any intermediaries is however not able to achieve such benefits, implying that banks increase the efficiency in the whole financial system compared to the traditional financial markets model (Campbell, 2018).

Model 4: FinTech

Even though banks increase market efficiency, their future is still at risk. The infusion of information technology, data and more accurate analytics is a key input into the production of today's banking services, which enables FinTech services to increase the return to scale beyond banks' capabilities. Such services are able to serve the same function as financial intermediaries, but at lower cost.

FinTech is about using technology to improve and enhance the functions of financial markets and financial intermediaries. Financial services are digitized via mobile wallets, payment apps, robo-advisors for wealth and retirement planning, equity crowdfunding platforms for access to private and alternative investment opportunities and online lending platforms (Su, 2018).

These FinTech services are not simple enhancements to banking services, but rather replacing banking services completely (Su, 2018). Peer-to-peer (P2P) loan markets are for example designed to allow borrowers and lenders to interact online without banks as middlemen, as shown in the figure below.

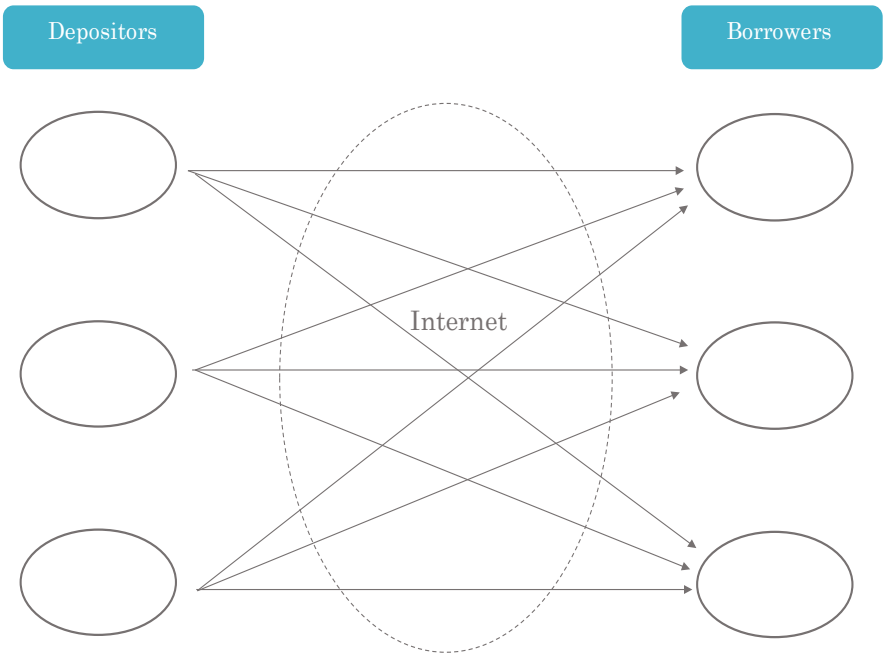

Figure 4: *FinTech model*

The internet enables direct interaction between the market players, resembling the traditional financial markets model. The challenge in model 2 was however high observable and

unobservable transaction costs, an imperfection that was corrected by the existence of banks in model 3. Partly replacing banks with the internet in the FinTech model increases the market efficiency to an even larger degree, as it drastically reduces all types of transaction costs.

Online direct interaction between players in the FinTech model makes financial transactions more accessible, and will in turn reduce the observable transaction costs of searching and matching with the right contract partner (Balyuk & Davydenko, 2018).

Xie, Zou and Liu (2016) argue that the information processing under such a financial model will be conducted on the internet, enabling significant changes in methods to collect, present and evaluate information. The availability of big data can provide a more complete picture of a borrower. Online P2P lending platforms can use a wide range of data to evaluate credit risk and screen loan applicants, as information are tied together and assessed from multiple perspectives to gain new insights, revealing who the borrowers really are (Foundation Capital, 2017).

This technology driven trend has transformed passive information retrieval into proactive big data analytics. Lenders have traditionally passively been dependent on the borrowers' provision of information about themselves, but big data enables a more complete search in the online footprints. Such relevant data may include purchases using credit cards or other online payment solutions, accounting records from business bureaus, length of time the borrower has used the same email address, the number of connections on Twitter, Facebook or other social media sites, reviews and ratings from business directories, and local and government public records (Foundation Capital, 2017). This implies a reduction in the information asymmetry beyond banks' capabilities, implying less problems of adverse selection and moral hazard, due to the ability of more accurately and reliably separate trustworthy borrowers from bad ones. Big data analytics also represents a more economic efficient method to reduce the information asymmetry compared to the traditional information processes in banking systems (Yan, Yu, & Zhao, 2016).

Technology and data will potentially drastically reduce banks' role in the financial system, as FinTechs are better able to function as the main intermediaries, since they can provide better services at lower costs. Banks will in such a scenario serve solely as the underlying fundament to enable the functionalities of FinTech services. We believe the existence of banks however will not disappear, as the need for placing money in bank accounts always will exist.

2.2 THE NORWEGIAN TRADITIONAL BANK MARKET

FinTechs emerging in financial markets are challenging the banks' position in the financial models, but as of today they still represent the most important financial institution in the economy. As our focus is on the implications of PSD2 on traditional banks, we will in the following provide an even deeper insight into banks' role and their functionalities in the financial market. In order to understand the importance and effects of PSD2 we attempt to provide the reader with information of why banks are regulated, indication of the current competitive situation among banks, and a description of what customers except from them.

As consumers in a modern world we use financial services on a daily basis, but few of us stop to think about how dependent our entire society is on stability in the financial system each time we use our credit cards or apply for a loan. Various banking and financial crisis that have occurred over the years however, such as the recent financial crisis in 2008-2009, have reminded us time and again how a breakdown in a cornerstone of the financial system can cause ripple effects throughout the whole economy. If financial stability fails, so does the economy.

2.2.1 The role of banks

Banks are the largest and most important group of financial institutions, and contributes to ensure financial stability in the economy. Banks work as intermediaries between the different players in the economy, which represents an important role for both ensuring a well-functioning financial system and for enabling economic growth.

The banks' main responsibilities are to enable firms and individuals to take up loans and place savings, initiate payments and handle cash. They are also responsible for the pricing and redistribution of risk. The Norwegian Financial Undertakings Act regulates the requirements for institutions to be established as banks, and how they should operate (Norges Bank, 2018). Opening and operating as a bank is a complex process, as it requires substantial efforts. Among other things, it involves applying for a banking license, which means having an initial capital amounting to at least the equivalent of EUR 5 million in Norwegian kroner (Finanstilsynet, 2017) (Regjeringen, 2018).

Banks distinguish themselves from other financial institutions by having the exclusive right in the market to create and receive deposits from the public. Banks also play an important role in the payment system since deposits can be used as a means of payment (Norges Bank, 2018).

Put simple, banks make money by providing loans and earning interest income from those loans. The amount of money earned by the bank is determined by the spread between the interest it pays on deposits and the interest it earns on loans, which is known as net interest income. The types of loans they can issue vary and may include mortgages, business loans and personal loans. Customer deposits, such as checking accounts, savings accounts and money market accounts provide banks with the capital to make loans (Investopedia, 2018). Customers who deposit money into these accounts effectively lend money to the bank and are paid interest.

In addition to the interest it earns on its loan book, a bank can generate revenue by charging its customers fees for mortgages and other banking services (Investopedia, 2018). Other banking services include the provision of guarantees for borrowers, storing and managing of valuables and conversion of securities. They also provide their customers with advice on financial issues (Meinich & Munthe, 2018)

Due to their importance for financial stability in the economy, banks have over time been subject to heavy regulations from authorities, which have caused banks to invest substantial resources for regulatory compliance purposes. The main objective of banking regulation is to gain economic and financial stability through correction of market imperfections, such as asymmetric information (Finans Norge, 2014). This will create an efficient use and allocation of resources, as well as create an environment which supports reliable and prudent banks and reduces excessive risk-taking. Depositors and investors cannot be expected to assess the riskiness of financial institutions they place their money with, but regulation can to a much larger degree ensure customer protection though a common set of rules institutions must oblige to (Dale, 2018).

The business model of traditional banks are concentrated on core services supporting customers' everyday needs. Demand for the core services has historically been relatively predictable in most markets and banks have to a large degree moved toward offering industry-standard services. The standardization of services in banking has led to a well-known selection of products. Organizational structure and administration in the banking sector are

characterized by a strong functional orientation, with focus on cost effectiveness and compliance within functions. The traditional banking model has historically been asset and compliance intensive, and banks have traditionally operated in many saturated markets where further revenue growth has been difficult to achieve (Angelshaug & Saebi, 2017).

2.2.2 Current players

We define Norwegian banks as banks operating in the Norwegian banking market, which could be Norwegian owned banks, subsidiary banks or branches of foreign banks. Norwegian banks can further be classified as either a commercial- or a savings bank. They offer nearly the same types of products and services, but their main difference is linked to their ownership structure. The Norwegian banking sector is characterized by a large number of banks, but with a relatively high concentration. The largest bank, DNB, has a market share on total gross lending of 30% while the remaining banks have a market share ranging from 12% and down. As a comparison, Sweden and Denmark both have three or four banks with high market shares.

The figure below shows the ten largest banks in the Norwegian market and their market share, based on total gross lending (Norges Bank, 2018).

	Banks	NOK (million)	Market share
1	DNB Bank ASA	1 237 973	28,9 %
2	Nordea Bank Norge	538 124	12,6 %
3	Danske Bank Norge	282 029	6,6 %
4	Handelsbanken	237 800	5,6 %
5	SpareBank 1 SR-Bank ASA	185 967	4,3 %
6	Sparebanken Vest	148 321	3,5 %
7	SpareBank 1 SMN	144 403	3,4 %
8	SpareBank 1 Østlandet	122 058	2,9 %
9	SpareBank 1 Nord-Norge	101 025	2,4 %
10	Sparebanken Sør	98 086	2,3 %
	Others	1 183 844	27,7 %
	Total gross lending	4 279 630	100 %

Figure 5: *The largest banks in Norway, based on total gross lending*

The Norwegian banking sector is characterized by a large number of banks, but with a relatively high concentration. The largest bank, DNB, has a market share on total gross lending of 30% while the remaining banks have a market share ranging from 12% and down. As a comparison, Sweden and Denmark both have three or four banks with high market shares.

2.2.3 The competitive situation within the industry

The high concentration in the Norwegian banking market initially dictates a low level of competition among banks. The four largest banks have major market power, as they dominate approximately 50% of the total market.

Technological development has redefined the driving forces behind banking competition. The competitive focus previously centred around having the best face-to-face customer experience, and having the best availability in terms of number and location of banks. During the last 14 years the proportion of bank customers visiting their bank once a month has decreased from 27% to 6% (Finans Norge, 2016). Digital banking solutions have brought convenience to consumers, as almost all services can be done in banks' applications or web pages, reducing the necessity of physical visits in branches. This technology trend has led to competition being centred around providing the best digital solutions to their customers, and their availability in digital interfaces.

Competing on having the best banking service in digital apps and web pages mean that banks compete at a national level. A person who lives in Bergen can be a customer in a bank located in Oslo. The bank's location is becoming irrelevant for the customer's choice of bank.

Digital solutions have also brought convenience to customers in the process of changing bank relationship, as agreements can be transferred to the new bank and contracts can be signed online (Forbrukerrådet, 2014). The speed at which customers can make a switching decision is now instantaneous. In addition, social media made has it possible for customers to share bad experiences with the world, setting the banks' reputation at risk and influencing other people's decisions on a bank change.

35% of bank customers answered in a survey conducted by TNS Gallup that they would consider to switch bank during the next 3 years (Finansdepartementet, 2014). People thus perceive a bank change as relatively uncomplicated, but statistics show that customers do not utilize this competitive situation. The actual customer mobility is in fact quite low. Only 7% of bank customers changed their bank relationship during 2017 (Finans Norge, 2018). This may imply that bank customers are not actively retained, they just remain. The Department of Finance regarded the competitive situation among banks as vulnerable and thus wanted more visibility around rules and rights in a bank change, and obligated banks to link to Finansportalen on their web pages for this purpose (Forbrukerrådet, 2014).

The digital trend towards providing the most user friendly and efficient banking solutions facilitate strong competition among banks. Technology permits banks to compete at a national level and enables the customers to regard bank changes as uncomplicated processes. Despite their efforts, customers are still not taking advantage of the competitive situation among banks.

2.2.4 Customer expectations

An increased number of better digital solutions have changed what customers expect of their bank. The development has caused fewer to choose physical attendance in their bank or choose paper-based services when the service can be performed digitally. Most of us carry our bank in our pocket, in the form of mobile phones or applications that enable execution of daily banking services, such as making payments or transferring deposits. Customers benefit from digitalization in terms of improved and low-cost services. This has furthermore led to increased flexibility and a broader spectre of offered banking solutions (Finansdepartementet, 2015).

The banks' increased focus on providing digital solutions for their customers is a result of changing customer expectations for services to be easier, faster and more user-friendly. Companies such as Netflix, Amazon and Facebook have for a long time used customer data to deliver user-friendly services customized for each individual user. Consumers have grown used to these types of services, and are to a larger degree expecting the same level of personalised services from banks (Datatilsynet, 2018).

With the increased focus on technology and the use of big data, a concern for data security and privacy has been a heavily discussed challenge both internationally and nationally. The composition of service providers are becoming more complex, and more players will be processing data on consumers' personal finances (Datatilsynet, 2018). As digitization and the use of personal data becomes a crucial part of meeting customer expectations, it has become more demanding to secure and protect privacy in a good manner, which is something consumers expect and have confidence in financial services to ensure.

Consumers willingly share personal data to companies such as Facebook and Google, and allow them to collect data when using their services. However, according to a survey about privacy performed by the Data Protection Supervisor in 2017, 79% of the respondents reported that they would not be interested in using a banking service delivered by Facebook or Google (Datatilsynet, 2018).

Another survey executed by Kantar TNS for Finans Norge, asked their respondents whether or not they would be interested in using a service that offer a single login portal to view all their accounts and their entire commitment across all their bank relationships. Over 50% of the respondents answered that they would be interested in such a service. However, when asked who they would trust the most in offering the service, over 60% answered their primary bank, while less than 10% answered they would trust Google, Facebook, Apple and Amazon in offering such a service (Finans Norge, 2016).

2.3 THE NORWEGIAN PAYMENTS MARKET

Payment services represents an important part of the financial infrastructure, where a well-functioning payment system is necessary for a stable and efficient financial system. Banks play a crucial role in facilitating financial transactions between different players in the economy. As we later on will see is new technology and changing customer preferences coming align with PSD2. As PSD2 is aiming at fostering increased competition and innovation, service providers other than banks will possibly enter the payments market and may threaten banks' role in the value chain. The financial infrastructure is complex and involves many players, and we find it necessary to give an understanding of the functioning of the system to analyse how the payment system will change in light of the new regulation.

2.3.1 The payment system

A payment system can be divided into interbank systems and customer-oriented payment systems. The latter describes a system targeting customers, allowing individuals and firms to withdraw cash from their bank accounts, use a payment card or make payments in an online bank. An interbank system is a system that makes it possible for banks to settle payments between them (Norges Bank, 2018).

Interbank systems

The central bank in Norway, Norges Bank, is the top settlement bank in the Norwegian payments system. All payments completed in Norwegian kroner is ultimately settled between the banks in Norges Bank's settlement system, Norges Banks Oppgjøringssystem (NBO). These payments include regular payments for individuals and companies, large payments in the financial and foreign exchange market as well as payments involving the public sector. The Norwegian Interbank Clearing System (NICS) is also a key figure in the Norwegian

interbank system. NICS is the banks' common system for the receiving and settlement of payment transactions. Almost all payment transactions in Norway are sent to NICS for settlement. Based on all payments individuals execute, NICS calculates what banks owe each other. The result of this settlement is sent five times a day to the NBO, where the banks' account balance on their accounts in Norges Bank are adjusted accordingly (Norges Bank, 2018).

Customer-oriented payment systems

Customer-oriented payments are mainly payments that are made in a high volume with relatively small amounts between individuals, firms and authorities.

A payment transaction involves a receivable transferred between a buyer and a seller in exchange for a good or a service. The payment transaction can be carried out directly through the use of cash, or by using intermediaries such as payment cards or an online bank for credit transfers. Cash are claims on the central bank, while bank deposits are claims on banks. Payments can also be carried out by the use of electronic money, which is money in terms of digital value units. Electronic money exist in the form of prepaid cards and credit on e-money accounts, commonly called e-wallets (Norges Bank, 2018).

The payment value chain

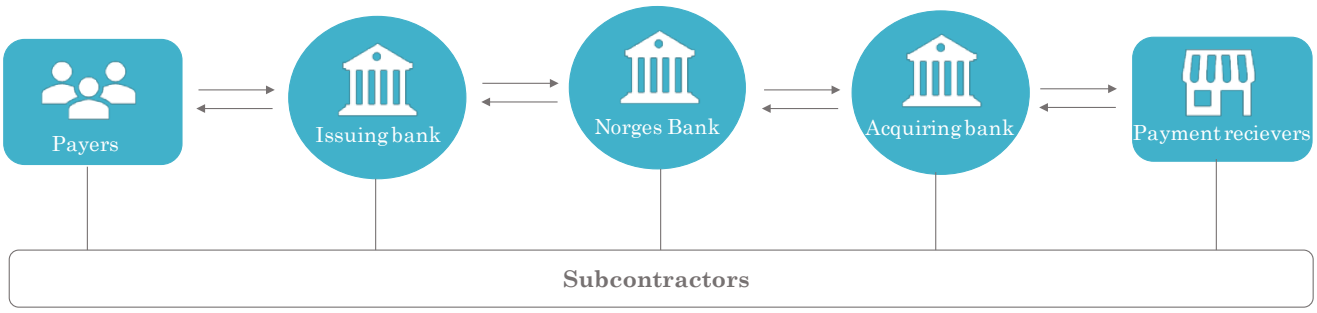

Figure 6: *The payment value chain*

The figure above presents the six players that participate in a regular payment transaction. The players are payers (individuals or cardholders), the issuing bank, the central bank, the acquiring bank, payment receivers (merchants and others), and subcontractors. For payments with cash, the transaction goes directly between the payer and the payment receiver without any intermediaries. Payments conducted with payment cards or electronic credit transfers goes

between the payer and the payee through all of the abovementioned players (Norges Bank, 2014).

Norway is among the countries where payment cards are the most commonly used intermediary in a payment transaction (Norges Bank, 2018). BankAxept is the national payment system in Norway, responsible for eight out of ten card payments in stores (BankAxept, 2018). Other card transactions are performed with cards by foreign card companies such as Visa and Mastercard.

When the customer use their card, their account information is registered on the bank terminal. The payment request initiated by the use of a payment card is then sent to a central common collection point for authorization. The payment is controlled in the collection point and the authorization request is again sent forward to the issuing bank (the bank of the cardholder). When the issuing bank has controlled that the requirements for authorization of the transaction are met, they send this information back to the terminal at the user site where the result is shown. If the requirements are met, the payment will go through (Norges Bank, 2018).

Nets Norge Infrastruktur AS (NNI) then creates transaction data which is sent to the Norwegian Bank Interbank Clearing System (NICS) for clearing and settlements between banks. After the settlements are completed in Norges Bank, NICS transmits the transaction data to the acquiring bank for crediting on the merchants account, and to the issuing bank for charging of the payer's account (Norges Bank, 2018).

2.3.2 Development within the payment system

The development in the payment system in Norway is to a large degree characterized by technology advancements, the main players' strategies and relations, as well as regulatory frameworks for the financial system determined by policy makers. The result of this development is a payment infrastructure in world class, with cheap and efficient payment solutions.

Up until the 1960's, cash was the dominating payment method for consumers in Norway. After the 1960's the use of information technology increased. The new technology laid the foundation for the technical solutions that were established in the 1970's, which improved the efficiency of the clearing and settlement system. Due to the rapid development in the payment systems, authorities found a need for management and coordination of the process. In the

1980's principles laid out by authorities, including price setting of payment services and a closer coordination between the different payment systems were set in motion. This resulted in a stagnation in the use of checks, while the use of payment cards increased.

The 1990's represents perhaps the biggest leap of progress in the Norwegian payments system in terms of cooperation between players, technical solutions and services offered for the public. The commercial and savings bank strengthened the coordination of their systems, and in 1991 the banks established the card solution BankAxept, which today is the national payment system in Norway. In the 1990's, cheaper, electronic payments solutions such as payment cards accounted for an increasing part of the market for payment systems (Haare & Solheim, 2011).

During the period from 2000 to 2010, the payment systems were subject to further technological improvements. Online banking was taken into use during this period. Payment cards continued to replace checks and cash, and together with the transition to chip cards, this increased the efficiency and security in the payment system (Haare & Solheim, 2011). In 2017, 2.2 billion transactions were executed using payment cards, and Norway is among the countries where people most often use cards to pay for goods and services (Norges Bank, 2018). Transactions with payment cards are done almost for free with the most widely used card type combining BankAxept with an international card, usually Visa or Mastercard. The average annual fee for such a payment card is as low as 234 NOK, carried by the consumer. Beyond this fee, consumers are not paying any fees per transaction. Per transaction fees are covered by banks, and the income losses from providing payment services are covered by other services Norwegian banks offer, such as income from financial advisory (Norges Bank, 2018).

Payment cards are also being used for mobile and online payments, which respectively represented 2.6% and 9.7% of total card payments. Innovation in the financial industry has been particularly visible for payment services, with the emergence of FinTechs offering brand new solutions. With the infusion of FinTech in the payment market, various types of mobile banking solutions, such as applications for smart phones, have become available for the public. These applications offer simpler and faster payment transfers than payment card transactions. The mobile payment applications also enables transactions between individuals, so called peer-to-peer (P2P) transactions in addition to payments at physical points of sale. Payments

using smart phones have increased sharply over the past years, and will likely continue to increase in the years ahead (Norges Bank, 2018).

The development also takes place within the already established financial infrastructure, where banks and other established players in the industry continuously cooperates to enhance existing systems and solutions, such as BankAxept and BankID (Det Kongelige Finansdepartement, 2018). However, considering the compliance intensive nature of the banks' business model, they have in many ways been slow to change. When it comes to technological advancements, banks have typically adopted them on their own terms as merely "add-ons" to their existing business models (Angelshaug & Saebi, 2017).

The Norwegian system for payment solutions has become more coordinated and efficient than systems in comparable countries (Haare & Solheim, 2011). According to the global Information Technology Report 2016, Norway ranks as the country with the best digital infrastructure in the world (Baller, Dutta, & Lanvin, 2016). This has resulted in fast, efficient and low priced payments for Norwegian consumers. The advanced digital infrastructure in Norway will create a good basis for the success of FinTechs, as they can build services on top of these well-developed systems (Norges Bank, 2017).

2.3.3 Current players, products and services

The emergence of pure technology firms and FinTechs offering banking services, has broadened the spectre of companies banks compete with. As the banks' list of challengers and potential competitors continue to increase in number, we find it useful to provide some insight as to what is currently happening in the Norwegian market.

A full list of current players in the Norwegian market is presented in the appendix. A shorter list of selected firms is presented in the text below. The current players are categorized as either FinTechs, BigTechs or challenger banks. These firms are either Norwegian firms or affiliates of foreign companies present in the Norwegian market, and are all in some way directly affecting traditional Norwegian banks. In our list of current players we have also included some interesting technology firms and FinTechs we believe are likely to enter the market in Norway in the near future based on their actions in international markets and the mentioning of these firms in conversation with industry experts. In the following, we include a specification of what is included in the terms FinTech, BigTech and challenger banks.

FinTechs

FinTech, short for Financial Technology, is used to describe new technology firms seeking to improve, innovate and automate financial services by using advanced technology. They operate in the intersection of technology and finance, and their services are digital and designed to improve and simplify customers and companies financial operations and processes by utilizing specialized software and algorithms. We define FinTech as any technology innovation in the financial sector, ranging from money transfers and banking to wealth management and investment advice (Investopedia, 2018).

BigTechs

We define BigTechs as the largest and most valuable technology firms in the global market. BigTechs are firms providing services relating to computers, as they are driving a large amount of growth in technology (Wikipedia, 2018).

Challenger banks

Challenger banks are new, small to medium sized commercial banks that seek to compete with larger established banks. These banks are in the possession of a banking license, but distinguish themselves from incumbents by the use of modern information technology (Investopedia, 2018). Challenger banks provide banking services solely through digital channels and do not have any physical bank branches (Oxford Dictionary, 2018).

List of players

A short list of current players is presented below. The list is based on firms we find particularly interesting and most relevant for studying the effects of PSD2. A more detailed description of chosen companies is also presented.

The identified players relevant for examining potential threats to incumbents and their competitive position is based on a variety of sources from FinTech experts and banking personnel. The list is also based on Sparebanken Vest and their perspective of who their competitors are in the new competitive landscape, presented at the seminar “PSD2, competition and cooperation”. We have also included firms that have been brought up in interviews by experts within the banking sector and the payments industry.

Both Christoffer Hernæs’ (2016) blogg and the Fintech Mundi CEO.Susanne Hannestad’s (2017) market report over Norwegian Fintech companies have helped in arriving at a list of

FinTech companies operating in the Norwegian market. The listed FinTechs operating in the market for payments or are offering savings and account information services are the companies we believe will be most affected by PSD2, as the directive targets the market for payments. A broader list of FinTechs operating in other segments of the financial industry is provided for to shed light on the width of the FinTech landscape in Norway.

While no BigTech to our knowledge has originated from Norway, many of their services are available to, and used by, Norwegian consumers, and thus relevant to include as they are developing financial services to their users. Mary Meeker's report "Internet Trends 2018" has provided insight to the largest technology firms worldwide. The report includes a list over today's top 20 worldwide internet company leaders, which are ranked based on their market valuation (Robinson, 2018). Based on this list, we identified the companies that either currently are offering payment solutions in Norway or are offering various payment solutions in other global markets. Many of these companies were also identified by several of the interviewees as potential competitors, as well as being highlighted as companies to watch in an attended seminar about PSD2.

We acknowledge that the industry is still evolving and constantly changing. Both start-ups and larger established firms are in the process of entering the financial market in Norway at the time of writing, meaning that the overview evidently will be altered with time.

FinTechs

Company name	Service
Vipps	Innovative payment solutions
Klarna	Innovative payment solutions
Payr	Payments - Innvoice payments
Dreams	Savings
Tink	Payments – Account information/Payment initation
Auka	Innovative payment solutions

BigTechs

Company name	Service
Apple	ApplePay - Mobile payment solution
Google	GooglePay - Mobile payment solution
Alibaba	Alipay - Mobile and online payment platform

Challenger banks

Company name	Service
Aprila	Digital bank
Komblett bank ASA	Digital bank
Bank Norwegian AS	Digital bank
Revolut	Digital bank

Figure 7: *List of players*

Vipps

Vipps is a FinTech who offers mobile payment solutions. The service was developed by DNB, and is currently the leading mobile payment application in Norway. Since their launch in 2015, the application has reached almost 3 million users. Vipps is now an independent company cooperating with over 100 banks present in the Norwegian payments market (Finans Norge, 2018). The cooperation and success in the market has caused other previous competitors, such as mCash and Danske Banks' Mobile Pay, to shut down, giving Vipps a monopoly on mobile payments in the Norwegian market (Andreassen, 2017). Their success can in many ways be explained by heavy marketing, network effects and DNB's ability to gather the support of competing banks around the service.

Collaboration within the industry has proven to be a successful strategy for Vipps. The company recently merged with BankAxept and BankID after obtaining permission from the Ministry of Finance in 2018. The alliance of Vipps, BankAxept and BankID makes Vipps the largest player within payment and identification in the Nordics (Konkurransetilsynet, 2018). The main objective for the merger is to compile knowledge to offer faster, improved and more cost effective solutions to users, customers and partners (Finans Norge, 2018).

Vipps offer the following services for companies and individuals:

- Payments to private individuals
- Payments to companies, clubs and associations by searching for the recipient's profile
- Payments online and in apps where Vipps is one of the payment alternatives
- Invoice payments
- Account balances (Vipps, 2018)

Vipps is most famous for its mobile P2P service, which allows individuals to transfer money fast and easy through smartphones. The service utilizes each user's telephone number to identify the recipient of the payment. Name, telephone number, and messages along with the transferred amount is shown to the payment recipient.

Previously, the service only allowed the use of payment card as the underlying payment processor. In such a payment process, the payment flow from the payer's bank account goes through the card network and the clearing system in Norges Bank (NICS) for authorisation before the payment is successfully received by the recipient.

During the spring 2018, Vipps launched immediate payments, which are payments directly from one bank account to another. This means that the registered bank account, instead of a payment card, is used as the underlying payment processor. The advantage is that the money immediately will be transferred to the recipient's bank account without any delays. In addition, banks will dodge any fees associated with card networks, such as the fees Visa charges for every transaction that is made using their card scheme. The payment flow goes directly from the payer's bank account to the payment receiver's bank account. The acquiring bank must immediately accept or reject the payment, and the settlement between banks in NICS is subsequently done in a separate settlement system (BITS, 2017). Immediate payment is set as default in the application, and payment card is offered as an optional payment processor.

Immediate payments are possible in Vipps thanks to the collaboration between Norwegian banks. As of today, other payment service providers are not able to deliver this kind of payment solution without a contractual agreement with one or more banks. However, as will become apparent later on, PSD2 will insure that all payment service providers will have the same rights as Vipps to access immediate payments regardless of any partnerships with financial institutions.

Payr

The Fintech Payr is a mobile application, introduced to the Norwegian market in 2017. The service offers customers easy and flexible invoice payments. Invoices can be paid by registering a payment card independent of bank relationship. By analysing customers' invoices, the app also provides suggestions to cheaper or better providers of the same products or services. The application also enables the customer to switch to a different supplier, such as electricity supplier or mobile subscriptions, directly in the app. Payr does not generate profits directly through invoice payments, as the service is free of charge to their customers, but instead they charge a commission from suppliers if the customers choose to change supplier through Payr (Payr, 2018).

Dreams

Dreams is a Scandinavian FinTech company that offers consumers an innovative and easy way to save and invest money by using their mobile application. Dreams is based on behavioral research and use this to identify and take into consideration what usually prevents consumers to save. The application became available in Norway in 2018 through a partnership with Storebrand. For now the application requires the use of a payment card, and the amount

of money saved by the user is placed in a savings account in Storebrand. Dreams generate income by securing a small interest rate from Storebrand on the amount the users save in the application (Dreams, 2018).

Apple Pay

Apple, which is defined as a BigTech, launched their payment solution, Apple Pay, in the Norwegian market in June 2018. Apple Pay is a mobile payment and digital wallet that enables the user to make purchases in stores, in apps and online. The service is only compatible with Apple devices (Apple, 2018).

Apple Pay requires the registration of a credit or debit card in an e-wallet, and the registered payment card works as the underlying payment processor. When making payments in stores, the Apple device can substitute the payment card, and the customer can place the smartphone directly on the bank terminal instead of using a payment card. The payment information is sent by authentication of the customer, either by using Face ID, Touch ID or a password (Apple, 2018).

Apple Pay uses Near Field Communication (NFC) technology to connect the device with the payment terminal in stores. The majority of mobile payments use the NFC technology, which accounted for 75,3% of the global mobile payment market in 2017, and the segment is likely to reach a value of US$361 billion by 2022 (Accuray Research LLP, 2018). The NFC technology is used in all contactless bank terminals and in all contactless payment cards in the market. All stores who offers the use of bank terminals with contactless payments are thus able to accept Apple Pay (Finans Norge, 2018).

When you make a purchase using Apple Pay in a store, the NFC-enabled terminal displays the amount and the consumer taps the terminal with the iPhone. The transaction is completed within one second (Holstad, 2017). NFC technology allows devices to share small bits of information over very short distances, and the short distance makes it almost impossible for any unauthorised payments to go through and hijacking attempts from third parties to succeed (Holstad, 2017).

Payments in stores using Apple Pay are treated as card transactions, meaning that the payment goes from the payer's bank account via the bank terminal and the registered payment card to the merchant's bank. Like all other transactions using a payment card as an intermediary, the

payment is ultimately settled between the issuing and acquiring bank in NICS before the recipient receives the deposit (Apple, 2018).

Apple Pay also offers a P2P payment solution called Apple Pay Cash. The service is currently only available in the U.S., but it resembles the service Vipps is offering in Norway. In Apple Pay Cash individuals can send money to each other through iMessage on their iPhone.

Apple Pay is to this date only available to customers in Sbanken, Santander Bank and Nordea in Norway. Other Norwegian banks have refused their customers to use Apple Pay, and argue that contactless payment cards is still the fastest way to pay in Norway, and refer to experience from neighboring countries where only a small number of consumers have embraced Apple Pay (Dagens Næringsliv, 2018).

AliPay

AliPay, which we define as a BigTech, was launched in 2004 by the Alibaba group and is one of the most widely used digital payment solutions in China (AliPay, 2018). The app is called a "super-app" because it is designed to offer a bouquet of services to bring convenience into the customer's everyday life. The app offers, among other things, a chat function, social media features, a marketplace, taxi services, restaurant ordering as well as offering customers the possibility of purchasing insurance, managing funds, transferring money to other users and investing in stocks and funds (Financial Times, 2017). The app is linked to a user's bank account, and payment solutions are therefore integrated in the application, ensuring quick and easy payments for the user (Kuzmina, 2018).

Alipay also lets the users make payments to merchants by using quick response (QR) codes. Consumers can use QR codes to access media, download offers or product information and the technology is to an increasing degree being used for payments. In China, it is the most common in-store payment method. A QR code is a two-dimensional code made up of black and white squares, and can be read by smartphone cameras, point of sale terminals or other devices (The Asian Banker, 2014).

When a consumer use a QR code as a means of payment, the QR code is scanned by their smartphone. When the consumer's payment card and bank account information is stored in their phone the QR enables the desired amount to be transferred directly from their account to the merchant, and there is no need for a terminal (The Asian Banker, 2014).

This is how a payment works also in the Alipay app. The merchant displays a QR on the cashier register screen. When the customer opens the Alipay app they scan the order QR code. The customer then confirms the payment amount and makes the payment. When the payment is successful, Alipay informs the merchant and the customer of the payment result. The amount is then paid to the merchant's bank account within an agreed period of time (AliPay, 2018).

For consumers, QR codes represent fast and easy ways of paying, and for merchants they represent a convenient and inexpensive payment method. It is less costly to print a QR code and displaying it in the store than purchasing a terminal for card payments. The exponential growth of QR payments in China can also be explained by the absence of payment cards. In rural places in China it may be not very common to be in possession of a payment card, and QR codes makes it easier for merchants to accept cashless payments (Technode, 2018).

AliPay collaborates with all of China's major banks, and cover many countries in the world through international card and payment organisations, such as Visa and MasterCard (AliPay, 2018). Internationally, more than 300 worldwide merchants use Alipay and their technology to sell directly to consumers in China (Marketing China, 2017).

Vipps recently announced a partnership with Alipay, which will facilitate the possibility for Norwegian merchants to accept payments through QR codes from Chinese tourists. Through the partnership Norwegians will eventually be able to use the same payment method they use at home internationally by the means of QR-codes (DNB, 2018).

3. THE REVISED PAYMENT SERVICES DIRECTIVE (PSD2)

3.1 BACKGROUND

In 2015, the EU adopted a new directive on payment services, namely PSD2, to improve the existing rules from the first payment service directive, PSD1. PSD2 came into force in EU law January 13, 2018 and will be in full effect by September 2019. The purpose of the first directive was to establish the same set of rules on payments across the whole European Economic Area (EEA), which includes the European Union, Iceland, Norway and Liechtenstein (European Commission, 2018).

PSD1 and PSD2 are called directives, which are EU legal acts that require EU countries to achieve a certain result, but leaves each country free to choose how to do so (European Commission, 2018).

The EU countries must adopt measures to transpose them into national law to achieve the objectives set by the directive. According to the EU treaties, the European Commission may take legal action if a country fails to implement EU law (European Commission, 2018). Since PSD1 are and PSD2 will be implemented into the EEA agreement, the directives are required to be incorporated into Norwegian law.

3.2 THE FIRST PAYMENT SERVICES DIRECTIVE (PSD1)

The first Payment Services Directive (PSD1) was adopted in the EU in 2007 and is seen as the most significant piece of the EU financial services legislation in relation to the payment market. The European Commission created the first directive to ensure a facilitation of an efficient and integrated market for payment services in the EU (European Commission, 2018).

In addition, a summary of the legislation states that the background for implementing the first directive is that consumers should be sure that payments through the EU are as easy, efficient and secure as national payments. To meet this, the EU set up a common framework for payment services through PSD1, which should replace each countries' national rules (The European Union, 2007).

The directive lays down rules for all payment service providers. Payment service providers (PSPs) are any providers of activities that allows people to deposit or withdraw cash on or from a payment account, to execute payment transactions on payment accounts or by electronic means, and to issue and/or receive payment instructions or execute money remittance. Payment services in PSD1 include credit transfers, direct debit payments, card payments, online payments and mobile payments (European Commission, 2018). The rules embedded in PSD1 include information requirements for payment service providers, as well as rights and obligations linked to the use of payment services (The European Union, 2007).

3.2.1 Efficient payment systems

Payment systems represents an important part of the financial infrastructure, and regulation is put in place to improve the system because it affects the whole financial system. With the implementation of PSD1 and PSD2, The European Commission is striving towards making payments safer, faster and more secure to increase the efficiency of the payments market. The Commission states that an efficient market for payment services in Europe should guarantee the following:

- The same rules all over the EU
- Clear information on payments
- Fast payments
- Consumer protection
- A wide choice of payment services (European Commission, 2018).

Several actions have taken place in the Europe in order to achieve such an efficient system. In the following, an explanation of each objective and related actions are described.

The same rules all over the EU

In the 1990's, the European Single Market was introduced, which is something the EU still is striving for to achieve and has as a core objective. The goal is to achieve a single market that guarantees free movement of capital, goods, services and labor within the European Economic Area (EEA) (European Commission, 2018).

The first step towards a single market in the EU was the launching of the euro as a single currency in 1999. To achieve a true single European market, harmonization of electronic euro transactions was also required. This harmonization process was started by the launching of the

Single Euro Payments Area (SEPA). The main goal of SEPA is to make it possible for citizens and businesses related to SEPA to pay with a single payment account or card across Europe as easily, efficiently and safely and at the same cost as domestic payments (The European Payments Council, 2018).

At the time of proposal of PSD1 however, the single market of payment services lacked harmonisation which hindered the operation of the market. The payment service markets of the Member States were organised separately, along national lines. The introduction of PSD1 facilitated the dismantlement of internal frontiers and ensured free movement of capital because the same laws now applied for all members within the EEA, instead of each country operating with their individual national rules (The European Union, 2007).

PSD1 ensures this further by requiring all PSPs to obtain an authorization to carry out its payment activities throughout the EU. The requirements for the authorization are the same across all member states, which ensures that all PSPs follow the same rules (The European Union, 2007).

Clear information on payments

One of the key elements of PSD1 is information requirements for payment service providers. According to the directive, PSPs must provide a range of clear information to the users of their services. Prior to the use of a payment service, the service provider have to communicate information related to fees, compliant procedures, and all charges payable in an easily understandable way.

After a payment transaction is executed, the service providers have to provide information to the payer regarding the reference of the payment transaction and of the payee, the payment amount, and the fees and commissions related to the transaction. They also have to communicate information to the payee right after the transaction has taken place (The European Union, 2007).

The directive implies that conditions and information requirements for payment services are put in place to ensure transparency of the payment transfer.

Fast payments

Payment systems promote economic activity, particularly for domestic and international commerce and trade. Reliable, efficient and timely payment system enable companies to conveniently acquire raw materials, pay wages and promote economic growth. A payment delay can increase intermediation costs and reduce economic welfare. The more funds are tied up in clearing and settlement processes, the less funds are available for productive use to increase economic growth (Listfield & Montes-Negret, 1994).

Fast payments are thus something the European Commission are striving for in order to ensure an efficient payment system. To promote fast payments, PSD1 includes rules for the execution time and value date for payments, and states that member states shall require the payer's payment service provider to ensure that the amount of payment transaction is credited to the payee's payment service provider's account at the latest by the end of the next business day (The European Union, 2007).

Consumer protection

In order for a payment system to work as a facilitation of trade of goods and services to enhance economic welfare, individuals need to take the available payment methods in use and should thus be able to rely on the security and trustworthiness of the payment services. Payment systems must win the user's confidence by being dependable and reliable. Consumers must therefore be protected against unauthorized access and fraud, which is ensured by regulations such as PSD1 and PSD2 (Listfield & Montes-Negret, 1994).

Consumer protection is at the core of PSD1, and even more so in PSD2. PSD1 promotes consumer protection in a number of ways. First of all, the directive laid out rules for the requirements of clear information, including information on transactions fees on payment transaction that should be easily accessible for the consumer. This aims at making the consumer more aware of charges incurred when completing a payment transaction. In addition, PSD1 provides protection of customer rights concerning unauthorised or incorrect charges to the consumer's payment account (The European Union, 2007).

For example, the directive ensures that it is the PSP and not the consumer who is liable for the correct execution of a payment transaction. When a transaction is not executed or is defected, the payer's PSP must correct it or refund the relevant amount to the payer. The directive also includes rules for refunds when payment transactions have been wrongly authorised by a PSP.

A wide choice of payment services

An efficient payment system should not only open the door to increased competition through better service and reduced transaction costs, but also enable financial institutions to develop new products which can become important sources of fee income (Listfield & Montes-Negret, 1994).

One of the main objectives of PSD1 was to generate higher competition and innovation in the European payment market (European Commision, 2018). By creating a new type of regulated firms called Payment Institutions (PIs), whom are amongst other things able to open accounts, process payments and issued payment cards, PSD1 opened the European payment services market to non-banks such as FinTechs (Gremez, 2017).

Increased competition was thus to a certain degree ensured by the directive, which to some extent reduced entry barriers and made fair market access for all market players. Furthermore, this resulted in a broader selection of payment services for consumers and thus contributed to increased efficiency (European Commission, 2018).

3.3 TRANSITIONING FROM PSD1 TO PSD2

PSD1 is regarded as a successful regulation that improved the efficiency of the payments market in Europe. However, since the introduction of PSD1 the payment market in EU has experienced significant technological innovation and developments of new types of electronic services. New players have emerged in the area of mobile and online payments, where so called third party providers (TPPs) offer specific payment solutions or services to customers. Entering the market has proven complicated for TPPs under PSD1, as many barriers were preventing them from offering different solutions on a large scale and in different member states, indicating that PSD1 is not sufficient for enabling a level playing field and strengthening competition within payment services (European Commission, 2018).

This has resulted in a proposal from The European Commission of a revised and modernised version of PSD1, called the revised payment service directive (PSD2) (European Commission, 2018). PSD2 is both a response to the development in the payment market, as well as a catalyst for the further development.

As a result of technological development in accordance with changed customer expectations there has been an emergence of many new types of online and mobile payment services which consequently either fall in part, or not at all, under the rules of PSD1. These services are provided by all kinds of payment service providers, and has brought innovation and competition, provision of more and cheaper alternatives for internet payments, but has previously been unregulated (European Commission, 2018).

An example of firms present in the market who were outside the scope of PSD1, but are included in PSD2, are providers that allow consumers to buy goods online without using a credit card, such as transactions directly from a payer account to a payee account in Vipps.

In order to maintain and contribute to competition which ensures a level playing field between various providers, these new services and service providers must also be regulated. Harmonising a fragmented European regulatory framework will then result in equal competitive conditions between PSPs both within a country and between countries. The concern of lack of standardization under PSD1 will then reduce dramatically, as all PSPs will be regulated similarly (PwC, 2016)

PSD2 is also required in the perspective of consumer protection. The payment service users need to know that the new and more complex payment services are safe to use. As electronic payments are being more technologically complicated, PSD2 contributes to ensure that the offered solutions and services are sufficiently secure.

Analysis of the impact of PSD1 has shown that development and growth within the retail payment market and the relating digital technologies since PSD1 have raised challenges from a regulatory perspective. Significant areas of the payments market, in particular internet and mobile payments, have remained fragmented along national borders and fall out of the scope of the regulation. In addition, the elements excluded in the scope of PSD1 were proved to be too ambiguous, too general or outdated, which in some cases resulted in legal uncertainty, security risks in the payment chain and lack of consumer protection. An updated version of PSD1 was thus necessitated (The European Union, 2015).

3.4 THE REVISED PAYMENT SERVICES DIRECTIVE (PSD2)

PSD2 entered into force in January 2018 in most Member States, at the same time as PSD1 was repealed. As PSD2 is not yet implemented into the EEA agreement, the directive will be incorporated into Norwegian law during 2019 (European Payments Council, 2018).

PSD2 updates and complements the EU rules put in place by PSD1. PSD2 sets out strict rules regarding security requirements for electronic payments and the protection of consumers' financial data, transparency of information requirements for payment services and the rights and obligations of users and providers of payment services. PSD2 also takes into account emerging and innovative payment services, such as online and mobile payments.

With the updated version of the directive, the European Commission seeks to further strengthen the efficiency of the market for payment services within EEA, through:

- Contributing to a more integrated European payments market
- Improving the level playing field for payment service providers, including new players who were outside the scope of PSD1
- Foster innovation and competition in the payment market
- Making payments safer and more secure
- Enhancing consumer protection (European Commission, 2018)

In the following, these objectives will be presented in more detail in addition to an explanation of how new components in PSD2 contributes to achieving them.

3.4.1 Contributing to a more integrated European payments market

PSD2 continues the work PSD1 started with integrating the internal market for safe electronic payments. The continued development is crucial for the growth of the economy within EU and for ensuring that individuals and firms can benefit from choice and transparency of payment service to fully benefit from the internal market. (The European Union, 2015).

The new rules in PSD2 should thus ensure a consistent application of the framework across the European Union. This is secured through PSD2 implementation equivalent operating conditions for both existing and new players in the market. New players entering the market will have to follow the same rules as the traditional PSPs, which should contribute to new

means of payments reaching a broader market across the Union as a whole (The European Union, 2015).

3.4.2 Improving the level playing field for payment service providers

One of the main differences between PSD1 and PSD2 is that PSD2 widens the scope of the directive by covering new services and players and extending the scope of existing services, enabling all players access to accounts (European Commission, 2018).

The revised directive aims to open up the EU payment market to companies offering consumer- or business oriented payment services based on access to information about the payment account (The European Union, 2015). By including these companies in the scope of the directive, PSD2 seeks to level the playing field for all payment service providers and thus enabling increased competition in the market, which in its turn benefits the consumer by lowering prices and expanding the service offer in the market.

The directive categorize the new service providers as either Account Information Service Providers (AISPs) or Payment Initiation Service Providers (PISPs). Both these service providers are referred to as third party providers (TPPs).

Third party providers (TPPs)

A third party provider is a payment institution which does not hold payment accounts for its customers and does not enter into possession of the funds being transferred. TPPs are service providers that can be distinguished in two categories, AISPs that serve account information services and PISPs that serve payment initiation services (The European Union, 2015).

Payment initiation service providers (PISPs)

The law defines a PISP as a "service to initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service provider" (The European Union, 2015).

We will use an example to describe the meaning of a payment initiation service. A customer is about to pay for a good online and is offered to either pay with a payment card or to pay directly from his bank account to the store through a company independent of the customer's bank. The latter payment solution is in this case referred to as a payment initiation service and is provided by a third party, referred to as the payment initiation service provider (PISP). Companies like Trustly, who offers customers to pay online directly from their bank accounts,

are by PSD2 defined as PISPs. New services like Apple Pay however, will not fall within the scope of PSD2 because their service use payment cards as the underlying payment processor.

Account information service providers (AISPs)

The law defines an AISP as "an online service to provide consolidated information on one or more payment accounts held by the payment service user with either another payment service provider or with more than one payment service provider" (The European Union, 2015).

We will also use an example to describe the meaning of an account information service. A customer downloads an application to his mobile phone to get a better overview of his consumption over time. The application, referred to as the account information service, tells the customer how much he uses on restaurant visits, phone bills, electricity bills etc. The application provides aggregated online information (payment transactions and balances) for multiple payment accounts in a single place. This helps the customer to better manage his money. The supplier of the application is referred to as the account information service provider (AISP) (European Payments Council, 2017).

Authorisation

Serving as a PISP or an AISP requires authorisation. They are required to hold a license in their home country, and get passporting rights to operate in other European host countries (HSBC Bank, 2017). PISPs and AISPs were not regulated under PSD1, but as they are included in PSD2 they will now have to follow the same rules when it comes to registration, licensing and supervision as the traditional PSPs.

PISPs and AISPs do not hold client funds when exclusively providing payment initiation or account information services (European Commission, 2018). The directive thus claims it will be disproportionate to impose own funds requirements to these new market players, but that they should be required to hold either professional indemnity insurance or a comparable guarantee to be able to meet their liabilities in relation to their activities (The European Union, 2015).

Access- to-account (XS2A)

PISPs and AISPs were able to operate in the market before PSD2 was implemented, but to be able to get information on a customer's account or to initiate a payment directly from the customer's bank account they would need special agreements with financial institutions that hold the customers deposits and thus information about their accounts in order to offer their

services. This resulted in barriers of entry for new companies and led to weak competition in the market. To ensure a level playing field for all payment services and correct the market failure, article 35 and 36 in PSD2 defines the payment institutions' rights of access to credit institutions' payment account services. The access should be given on an objective, non-discriminatory, proportionate basis, and access should be provided in a way that allows payment institutions (including PISPs and AISPs) to provide payment services in an unhindered and efficient manner. In addition, the directive says that the access to accounts should not depend on a contractual relationship between the holder of an account and the AISP or PISP, as it did prior to the implementation of PSD2 (The European Union, 2015).

As banks work as credit institutions and have all access and information on customer accounts, the access-to-account (XS2A) rule in PSD2 means that banks will have to provide third parties with access to their customers payment accounts, if accessible online. For third parties, such as FinTechs, this means that they are able to build financial services on top of the credit institutions data and infrastructure. However, banks can themselves also become PISPs or AISPs, which in that case means that they will be given access to information on competing banks' customer accounts.

Access to accounts also means that third parties will get information on banks customers' transaction data on their payment accounts and thus get insight into a consumer's consumption pattern. However, the PISP and AISP cannot use, access or store any data for purposes other than for the provision of the payment initiation service or account information service as explicitly requested by the payer or user. A PISP is not allowed to access any data other than what is necessary to provide for their service, and an AISP can only access the information from the customers registered payment accounts and associated payment transactions (HSBC Bank, 2017).

It is important to emphasize that a third party only can initiate a payment and get access to a customer's payment account if the customer gives his or hers explicit consent to the service provider. The directive lays out rules for the information service providers are required to give customers before they consent in allowing third parties access to their accounts (The European Union, 2015).

The Regulatory Technical Standards (RTS)

Banks are according to PSD2 obliged to communicate the information specified in the XS2A rule securely with third parties in accordance with regulatory technical standards (RTS). The standards are developed by the European Banking Authority (EBA) in cooperation with the European Central Bank (ECB) and all relevant stakeholders (The European Union, 2015).

The XS2A rule in PSD2 can be seen as the "what" aspect of the regulation, whereas the RTS defines the "how" aspect that explains how this is to be done. The RTS defines the technical framework for the implementation of the XS2A rule regarding communication between banks and third party providers, called common and secure communication (CSC). The RTS also ensures the establishment of adequate security measures for electronic payments through requirements of strong customer authentication (SCA) (European Payments Council, 2018)

Common and secure communication (CSC)

All banks offering online access to payment accounts will have to facilitate third parties access to customer's payment accounts to enable them to initiate payments or offer account information services. Banks will have to adjust their systems for third parties in order to comply with the specifications in RTS.

RTS suggests that banks can choose to establish an interface dedicated to this purpose, such as an Application Programming Interface (API), or let the third party apply the same interface the customers themselves use for their banks payment services, such as their online bank. Most banks wish to establish a dedicated interface by using APIs to fulfill this purpose (BITS, 2018).

As APIs have become the norm in the industry for providing access to accounts, we will provide some insight to their application in banking.

Application Programming Interfaces (APIs)

APIs are the cornerstone of the modern digital economy. Every time you use an app on your smartphone or buy something online, you are probably using an API (The Berlin Group, 2018). An API can be defined as a standardized set of protocols, routines, functions or commands that governs how one piece of software can talk to another (Techopedia, 2018).

As an example, think of Facebook or Google's login APIs. These firms use open APIs that allow other software applications to sign up new users without having to manage the user identification process themselves. Providers of applications using these open login APIs, such

as Dropbox or Instagram, need only know how to communicate with the APIs, and do not need to have any knowledge about Facebook or Google's client ID management or technology (Universal Payments, 2017).

APIs are not a new phenomenon, but have evolved in recent years from being mainly used within an organisation or with key partners to become public and open (Capgemini, 2018).

APIs can broadly be divided into three categories

1. Private APIs

Private or internal APIs have been used by banks for a long time, and were created to integrate applications and facilitate information flow within the organization. This means that both the producer and consumer of the APIs are within the same organization.

2. Partner APIs

Private APIs later developed into partner APIs, and are used by the organizations' key partners to access business functions depending on their relationship with the bank. Partner APIs can help banks achieve different strategic endpoints, including expansion of their business and adding new services.

3. Open APIs

Open APIs make the banks business data and functionality available also to third parties that are not necessarily in a business relationship with the bank. An open API is an easily accessible interface that both developers inside the organization and anyone with the right identification and authorization can gain access to. Open APIs enables third-parties to build and deliver new services on top of banks' infrastructure (EVRY, 2017) (Capgemini, 2018).

In order for banks to be compliant with PSD2, they have to use open APIs. APIs have to be open and accessible for all authorised third parties on a non-discriminatory basis. However, PSD2 only requires banks to provide third parties information (through open APIs) about customers' payment accounts. PSD2 defines a payment accounts as "an account held in the name of one or more payment service users which is used for the execution of payment transactions" Information on payment accounts will thus only include transaction history on this particular type of account (The European Union, 2015).

Information on other types of accounts are not required to be provided through open APIs. APIs for communicating with the customer's saving accounts or with banking software containing information on the customer's mortgage conditions or fund savings are not required to be open and distributed to third parties. However, banks can choose, if they wish to do so, open more of their APIs for third parties to create additional services other than payment initiation and account information services. Such APIs are to be viewed as premium APIs.

3.4.3 Foster innovation and competition

An increase in innovation and competition in the payment market is yet another objective of PSD2, and is in a large degree enabled through third parties obtaining access to the customer's payment accounts. Some PISPs and AISPs operated in the market prior to PSD2, but by providing a proper legal framework in which payment initiation and account information services can be offered, PSD2 opens possibilities for AISPs and PISPs to operate across the EU and to compete on an equal basis with other regulated players in the market, such as banks. Providing the necessary legal certainty for companies to enter or continue in the market can help stimulate increased competition in the payment market. AISPs and PISPs deliver innovative services to the marketplace, and by lowering the barriers of entry for these companies, PSD2 can contribute to accelerate the pace of innovation in the industry. Increased innovation and competition will also allow consumers to benefit from more and better choices between different types of payment services and service providers (European Commission, 2018).

3.4.4 Making payments safer and more secure

One of the most important intentions of PSD2 is to increase the security of electronic payment services in Europe, and thus prevent and limit fraud (BITS, 2018). PSD2 seeks to make electronic payments safer and more secure, through requiring payment service providers to apply strong customer authentication (SCA).

Strong customer authentication (SCA)

PSD2 requires all member states to ensure that a payment service provider applies strong customer authentication where the payer access its payment account online, initiates an electronic payment transaction and carries out any action through a remote channel which may imply a risk of payment fraud or other abuses (The European Union, 2015).

The principle of SCA is to ensure customer protection and enable safe payments through an increased level of security for electronic payments. Each time a payer accesses its payment account online or initiates an electronic payment transaction the payer must apply a safe authentication code. This authentication code must ensure that the service user is the legitimate user and therefore is giving consent to the service provider which access the account information or transfers funds (European Banking Authority, 2017). The authentication must be based on two or more elements categorized as:

- Knowledge: something the user knows, such as a PIN or a password
- Possession: something the user possesses, such as a chip card or a mobile phone
- Inherence: something the user is, such as a fingerprint or voice- or face recognition (European Payments Council, 2017).

Using at least two of the abovementioned elements should result in the generation of a unique authentication code which dynamically links the transaction to a specific amount and a specific payee. The service providers are responsible for the SCA application.

3.4.5 Enhancing consumer protection

PSD2 ensures consumer protection through strong customer authentication, but also enhance consumer rights in other ways. Consumer rights are enhanced for example through reducing the liability for the payer from €150 to €50 in cases were the payer are obliged to bear the losses relating to any unauthorised payment transaction. PSD2 also give the payer for example unconditional refund rights for direct debit transactions in euro and removes surcharges for the use of a consumer credit or debit card (The European Union, 2015).

3.4.6 Special note on Norway

As Norway already benefits from an efficient payment system compared to many other countries in Europe, certain articles in PSD2 will not be directly applicable in Norway. While many European banks charge transaction fees to their customers for payments, consumers in Norway might be unfamiliar with the concept, as the banks cover almost all the fees involved in a payment transaction for their customers. The implementation of a common payment system in Norway, BankAxept, ensures low transaction fees. Some transaction fees still exist, but are almost entirely carried by banks. These fees, in addition to the income losses from providing payment services are covered by other services Norwegian banks offer, such as

income from financial advisory. Thus, articles covering transaction fees will not be very applicable in Norway.

In addition, regulatory standards for strong customer authentication (SCA) is to a large extent already secured in Norway through the use of BankID, meaning that Norwegian banks will not have to make extreme adjustments to comply with the standards. BankID is a method for electronic identification and is used by all Norwegian banks as an authentication method for initiating payments (BankID, 2018). Nevertheless, PSD2 will have other implications for Norwegian banks, such as the provision of open APIs to third parties, which has been a so far unknown territory for Norwegian banks in the past.

3.5 PSD2 TIMELINE

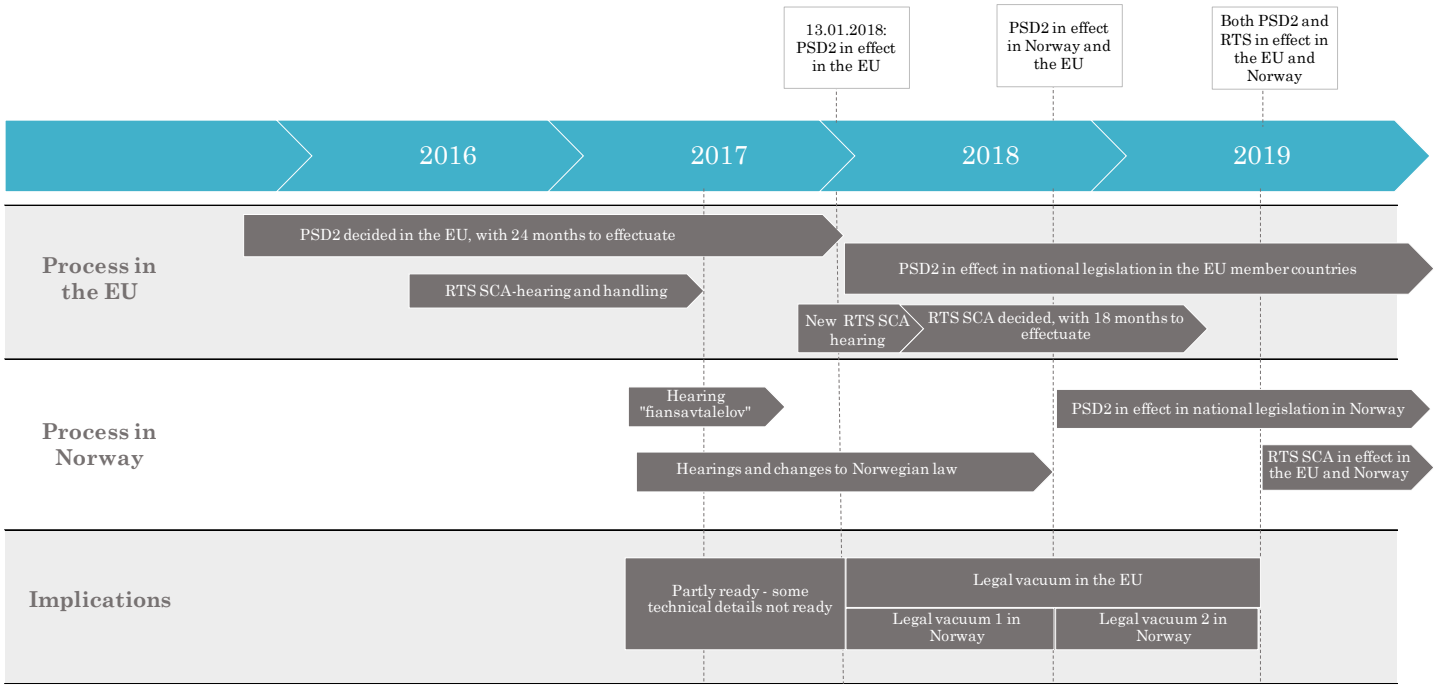

Figure 8: *PSD2 timeline*

In December 2015, PSD2 was published in the Official Journal of the EU, and came into force in the EU in January 2016. The transition period for all Member States was 24 months. By January 2018 PSD2 (with the exception of the security measures described in the RTS) was transposed and incorporated into national law in most EU Member States. This was not the case in Norway, as the regulation still is under consideration by the EEA and therefore not yet

incorporated into the EEA agreement. As of today the Norwegian government has submitted a proposal resolution for the adoption of amendments to the Act. The proposed amendments are expected to come into effect at the latest, in early 2019.

In August 2016, the European Banking Authority (EBA) published the draft Regulatory Technical Standards on strong customer authentication and common and secure communication under PSD2 for consultation. The final version of RTS was adopted by the European Commission in November 2017. The test period for the RTS starts in March 2019. At this date the specifications and test facilities should be ready and available. The deadline for compliance to the RTS will start in September 2019 (Finanstilsynet, 2018). This implies that both the PSD2 and the RTS will apply in full effect in the EU Member States, Norway, Iceland and Liechtenstein by September 2019. By this date all service providers must be ready to go, having implemented the PSD2 into national law in addition to the RTS security and functional requirements.

4. THEORY

With PSD2 aiming to level the playing field for payment service providers and lowering the market entry barriers, the possibility of new players entering the marketplace is bigger than ever. Traditional banks will have to adjust to the realities of digitalization, advanced technology and changing consumer demands driven by the regulation. Taking actions on this development could necessitate exchange of relevant competencies in collaboration with competitors or even changes towards platform-based business models to succeed in producing new and innovative banking services. Capturing the benefits from these actions could require taking the first step. This has led us to further look at the phenomenon of coopetition, platforms, network effects, and first mover advantages.

4.1 COOPETITION

The financial market has in the recent years witnessed collaborations in various forms, such as the newly released collaboration between Vipps and the Chinese giant AliPay, and the cooperation between the Norwegian bank Storebrand and the FinTech firm Dreams (Dagens Næringsliv, 2018). PSD2 will possibly accelerate collaborative measures, as explained by our interviewee Atle Sivertsen from Finance Innovation:

"PSD2 has multiple effects. It triggers a fast pace of innovation, but it also triggers a special type of collaboration. So on one hand, PSD2 creates increased competition among all players in the market. On the other hand, it also creates increased collaboration between competitive banks, and with new players. It is quite fascinating that it creates both increased competition and increased collaboration"

Generally, one could say that a relationship between firms focus on either competition or cooperation. One might think that a competitive relationship between two businesses harm or threat the possibility of a cooperative relationship, or the other way around. Interestingly, half of the cooperative relationships take place between competitors implying that competition and cooperation are not mutually exclusive (Bengtsson & Kock, 2000) (Harbison, Pekar, & Stasior, 1998). This introduces the concept of coopetition. Bengtsson and Kock (2000) suggest the definition of coopetition to be "a paradoxical relationship between two or more actors, regardless of whether they are in horizontal or vertical relationships, simultaneously involved

in cooperative and competitive interactions". This type of relationship can be regarded as the most advantageous one.

Some of the best examples of coopetition can be seen in the sports world. For example, in cycling and running, elite athletes coordinate their movements so that each can do far better than if racing alone (McCarthy, 2018). Banks can use a similar strategy. Banks in coopetition with other banks or FinTechs can in some respect help each other and to some extent force each other towards, for example, more innovative performance. In this way, they can accelerate their innovation capabilities and capacity, and may emerge from the alliance more competitive than when they entered it.

The crucial implication of coopetition for innovation is represented by the possibility to exchange relevant and complementary resources, capabilities and knowledge (Estrada & de Farina, 2016). Individual banks often do not possess all necessary resources and skills to innovate on their own. By means of partnerships with other banks or FinTechs, flows of resources, capacities and knowledge are facilitated and will moreover enhance an innovation development (Bouncken, Gast, & Kraus, 2015).

Since all Norwegian banks are affected by PSD2, they share similar contexts, threats and opportunities. Since they are operating in the same market, they possess complementary resources that are relevant to a potential coopetitive bank partner (Gnyawali & Park, 2009). These key sources represent resources and knowledge which furthermore can foster innovation processes within banks in a coopetitive relationship. This can be exemplified by the earlier mentioned close collaboration between various competitive Norwegian banks during the 1990's that resulted in a highly efficient interbank system and the establishment of the national payment system BankAxept (Haare & Solheim, 2011).

A coopetitive relationship between a bank and a FinTech share the similar exchange benefits. Since FinTech firms' challenges often are the natural strengths of banks, and vice versa, such a collaboration will enable exchanging individual strengths in order to gain synergies effects. FinTech firms are for example experts at taking advantage of customer data, and could provide this expertise in a coopetitive relationship with a bank.

Expanding the customer base is another major benefit that could result from such a relationship. Vipps will enjoy being in their first international coopetitive relationship with one of the most important payment providers in the world. Over 30 merchants in Bergen

already accept AliPay, and Vipps will in collaboration with this payment provider be able to expand their customer base as even more merchants possibly will accept this payment method in the near future. Moreover, connecting with such an important player can lead to opportunities to partner with other similar providers in disparate markets to extend their reach and breadth of services in a wider global market (Dagens Næringsliv, 2018).

It is of crucial importance to separate the two different parts of the coopetitive relationship to manage the complexity and thereby make it possible to benefit from such a relationship (Bengtsson & Kock, 2000). The relationship can represent hostility due to conflicting interests where unbalanced competition will maximize only individual benefit or destroy the relationship. Distrust and conflict may spoil the alliance and threaten its survival, e.g. if they do not share similar strategic goals (Harvard Business Review, 1989). But friendliness and common interests will on the other hand bring maximize mutual benefit. A simultaneous balance must be achieved between these forces for coopetitive relationships to be successful (McCarthy, 2018).

4.2 PLATFORMS AND NETWORK EFFECTS

The emergence of the payment platform AliPay in the Norwegian market show that platform-based business models are taking hold not only in the travel industry, pointing to the successes of Uber and Airbnb, but also in the banking industry. Potential new market entrants driven by PSD2 are not only bringing innovation into the field of payment solutions, but are also attacking banks' business models fundamentally. Due to the requirements of open APIs, it may represent a movement towards an API-based economy that paves the way for Open Banking. The phrase Open Banking is often used to describe a shift from a closed banking model, as we have witnessed up until this date, to an open ecosystem where banking data is shared between different players in the banking ecosystem through digital platforms (Deloitte, 2018).

In order to analyse the effects of such a platform based business-model, it is necessary to describe how a platform works and its potential benefits and challenges.

Consider the digital payment platform Vipps. This is a payment network which brings together online shoppers and online stores. Their benefits are dependent on participation and usage decisions of other online shoppers and online stores, which is described as the network effects. These users are the group that make the same usage decision, and are defined as the network. Vipps is the intermediary that manage the network effects, and is said to be the platform that bring these users together and make it possible for the online shoppers and online stores to interact and exchange values. Platforms provide a way for two, or more, types of participants to get together (Evans, 2016). Hagiu and Wright (2015) describe a platform as "an organization that creates value primarily by enabling direct interactions between two, or more, distinct types of affiliated customers". Other examples on platforms are social networks such as Facebook, entertainment services such as Netflix, and search engines such as Google.

Direct and indirect network effects

Network effects can be direct or indirect. The description of direct network effects is when a platform offer a product where a higher amount of users affect the products' value to the existing users. The value of joining the payment network Vipps increases when other individuals also are members of this network. The P2P service in Vipps is useless on its own. Payment transactions are only accepted if both the payer and the payee are in possession of a Vipps user account. It is therefore an invaluable transfer method between friends once

everyone else possess it. The more users on the network the more valuable the payment service.

An example of indirect network effects can be found on for example software platforms such as Google that bring together application developers and end users. Everything else given, users of Google may not care about the presence of other users on the software platform, while the developers of Google only care about the number and demand of Google users. The Google users care about participation and usage of other users only indirectly, as more Google users attract more developers to the platform, which is beneficial for each Google user (Belleflamme & Peitz, 2016).

Zero marginal cost

A platform can realize higher profit and lower per usage average cost as the platform becomes bigger and attracts more users (Zhu, Song, Ni, Ren, & Li, 2016). The ability to scale without increasing costs is the most powerful aspect of platforms. The marginal cost is near zero. Marginal cost is the cost of producing an additional unit of a good or service after fixed costs have been absorbed. Google has for example set up a software platform and gathered amounts of information at some fixed costs, connected millions of users to their service at near zero marginal cost. So connecting additional people to the Google platform represents almost no costs.

A business model based on Open Banking can similarly enjoy these benefits of zero marginal costs, as it enables to integrate all banking services into digital interfaces, exemplified by the application AliPay. This platform enables increasing the user base without simultaneously increasing the costs. Fixed costs are already absorbed in the development processes of launching the services and features on the app. Additional consumers connected to the app only represent minimal costs for the provider.

4.3 FIRST MOVER ADVANTAGE

According to the Norwegian Department of Finance, PSD2 will be implemented into Norwegian law during 2019. This means that banks are not yet obligated to follow the regulatory standards. However, market observations show that banks already have started on the process of rethinking and redesigning their services and business models. Why banks have started this process before they are obliged lies in the benefits of the novelty value. Taking actions in the legal vacuum as a first mover can bring large advantages. In order to analyse the effects of strategic actions at an early stage, it is necessary to provide some insights on the theory of first mover advantages.

Earlier research finds that the earlier a bank enters the market, the larger the market share it obtains relative to other banks (Berger & Dick, 2006). The first mover advantage refers to the benefit a company can obtain by being the first to introduce a product or service to the market. This advantage will allow a company to earn strong brand recognition and product loyalty before a later entrant (Corporate Finance Industry, 2018). As explained by our interviewee Christoffer Hernæs in Sbanken, a new functionality in a banking solution will bring a novelty value to consumers that later entrants are not able to achieve when providing similar functionality at a later stage. Lieberman and Montgomery lists three mechanisms leading to first mover advantages, namely technological leadership, preemption of scarce assets and buyer switching costs.

Technological leadership

Gaining a sustainable leadership in technology is of high value when trying to achieve first mover advantages. A bank that for example launches a service that use a new, innovative technology can obtain a sustainable cost advantage if the technology and the learning curve to acquire it can be kept within the bank. This may lead to a technological leadership in the market. Another way of achieving this advantage is when the bank's technology can be patented or kept as a trade secret. Possession of technology not generally known to the public brings large advantages when other firms are not able to replicate or copy it (Lieberman & Montgomery, 2002).

Preemption of scarce assets

The first mover firm may be able to gain advantages by preempting rivals in the acquisition of scarce assets. The first mover will thus gain advantages by controlling assets that already

exist, rather than those created by the firm through development of new technology. Such assets may be a specific advantageous location, skilled employees or key suppliers. A bank can for example partner with a valuable FinTech supplier with superior information, aiming at producing a completely new and innovative service. The first mover bank will then be able to purchase these assets at market prices below those that will appear at a later stage (Lieberman & Montgomery, 2002).

Switching costs

First mover advantages may also arise from buyer switching costs. Switching costs are the costs that a consumer incurs as a result of changing brands, suppliers or products (Investopedia, 2018).

As already mentioned, very few Norwegian bank customers change their main bank relationship. Switching costs are a possible explanation for this. Customers may have adapted to the characteristics of their bank's online web pages and applications. They will thus regard it as time consuming to become used to new services provided by the new bank. Other switching costs could include the concern of administrative costs that are tied up in the process, or the challenges in transferring special agreements to the new bank (Berger & Dick, 2006).

Presence of high switching costs means that it is harder to enter the market at a later stage as late entrants need to attract customers away from the first mover. This can be a challenge as customer preferences and perception of existing products quickly gets formed in consumers' minds. Gaining the attention of the customers could imply investing substantial resources into marketing and advertising or providing superior products (Lieberman & Montgomery, 2002) (Berger & Dick, 2006).

Disadvantages of being a first mover

Neither Google nor Apple were first-movers in their industries, and their success stories shed light on how being second movers in an industry can be beneficial. Advantages of being a late mover, or disadvantages of being a first mover, include free-rider effects, learning from the first movers' mistakes, shifts in technology and incumbent inertia.

Later entrants may be in a position to free-ride on the first mover's entry costs, such as research and development investments, buyer education and infrastructure development. All new bank entrants in the Norwegian market will for example enjoy the earlier mentioned NICS, the

common system for the receiving and settlements of payment transactions, as this system was developed by Norwegian banks decades ago.

Later entrants can also achieve a differentiation advantage by learning from the first mover's mistakes in areas such as positioning, product design and characteristics of the product (Kerin, Varadarajan, & Peterson, 1992). Followers are then able to bring to market products that are more suited to the target market. Having a deep understanding of consumer needs and wants is a more important source to success than rushing to market with an untested product (Cayanne Consulting, 2018).

Late movers may also be in a position where they can exploit technological discontinuities in the market to replace existing players. The replacement technology often appears while the old technology is still growing, so it may be difficult for an incumbent to recognize the threat and implement preventative measures fast enough.

Even though consumer preferences quickly gets formed in their mind, consumer needs are often dynamic. This creates opportunities for later entrants, especially if the first mover suffers from incumbent inertia. Incumbent banks are often organizationally inflexible, making them unable to recognize and take actions to changes in the market (Lieberman & Montgomery, 2002). Later entrants can thus utilize the incumbent inertia by adopting new and efficient processes in order to better respond to the customers' demands (Boulding & Christen, 2001).

5. METHODOLOGY

This chapter will describe the methodology used to answer the research question outlined in chapter 1. The research method, the collected data and data analysis are presented.

5.1 RESEARCH METHOD

A research approach involves how a topic is studied, in other words, how the collected data and analysis is approached. Due to the chosen research question, a qualitative research method is a natural fit. PSD2 has not yet been implemented, and the effect of the regulation is therefore currently not present, which limits the data available. As a consequence, non-numerical data had to be used, and the selected appropriate data collection technique was considered to be in-depth interviews. Another argument in favor of a qualitative method is the absence of previously performed and reported quantitative and qualitative analysis in the PSD2 context, due to the future perspective of the topic.

A qualitative research method serves the purpose of diving deep into a chosen topic while providing flexibility for the researcher (Saunders & Thornhill, 2016). It gives a flexible structure to permit changes of the research emphasis as the research progresses (Saunders & Thornhill, 2016), which was useful in order to have an interactive process by going back and forth between the data gathering and the research question. In addition, flexibility in terms of open-ended questions in the interviews was helpful in regards to the participants' freedom to respond in their own words, rather than only giving answers of 'yes' and 'no' which provide less content and meaning.

The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue (Mack & Woodsong, 2011). However, complex descriptions can present both advantages and challenges. As the effects of PSD2 must be analysed through anticipations of the future, complex descriptions can be a proper approach to get a detailed portrait of how banks will be affected. On the other hand, descriptions containing levels of high complexity can represent challenges due to the possibility of losing or misunderstanding information. Consequently, a systematic and precise execution of the research approach was required.

Support of the alternative option, a quantitative method, also exists, but in a limited degree. One can argue that a changed banking landscape is already observable at present, and that effects of PSD2 already can be seen due to the fact that newcomers already challenge banks. This means that numerical data on the topic is available. Consequently, a quantitative method could be used. However, in order to get significant results to analyse, an effect should be analysed possessing a clear distinction between two periods of time, one period representing "before" the change, and one period representing "after" the change. As PSD2 is not yet implemented, the time period that is available to analyse is too short, only representing the "before" period. This argues against a quantitative method in this thesis, and we have therefore applied a qualitative method.

5.1.1 DATA AND ANALYSIS

The thesis is built upon two sources of data, namely secondary documents and primary data from interviews. Additionally, inspiration was obtained through participation on the academic conferences "PSD2, competition and collaboration" arranged by Finance Innovation, PwC and The Norwegian School of Economics, and "The Cash Management Conference 2018" arranged by Danske Bank. This chapter presents the processes of data gathering associated with each of these sources.

Document analysis

Using secondary data means reanalysing data that has already been collected for some other purpose (Saunders & Thornhill, 2016). Secondary data was collected from relevant documents, researches and articles. Only documents we found reliable were used in this thesis. A critical approach was used when selecting relevant documents and reports, which is important due to the fact that secondary data is created for some other purpose, having the intention to give insights not specifically towards this thesis' topic and objectives.

A review of the literature was necessary in order to develop a thorough understanding of, and insight into the bank market and PSD2 as a regulation. Gaining knowledge about PSD1 and reasons for the extension of this regulation was essential in order to understand the importance and relevance of PSD2 in the banking industry. This enabled a better understanding of how banks potentially will be affected by the regulation, and subsequently enabled suggestions of possible responses. Overall, the critical literature review provided significant knowledge about PSD2 and the bank market, creating directions for further data collection.

Reports from consultancy companies and other relevant companies were researched to gain inspiration and creative ideas about possible topics on the master thesis. After choosing the topic of PSD2, the inspiration and general knowledge gained from these documents was used to brainstorm and specify a concrete problem formulation. In order to analyse the implications of PSD2 on Norwegian banks a systematic review of the directive was necessary. Official reports from the European Banking Authority (EBA), the European Commission and Norges Bank were studied to gain knowledge about the regulation in addition to the function, importance and current situation in the Norwegian bank market and payments market.

Qualitative studies

Primary data was gathered through analysis on semi-structured interviews. A semi-structured interview is non-standardized, which means that we as researchers had a list of themes and questions to be covered, although these varied from interview to interview, and where new issues were allowed to emerge for exploration. This type of interview is referred to as "qualitative research interviews" (Saunders & Thornhill, 2016).

The interviewees were chosen in order to gain both an incumbent bank perspective, and a more neutral market perspective of the topic. All the participants had worked with PSD2 in some way, and consequently brought huge value to this research. The interviewees were as follows:

- Johanna Herbst, Chief Digital Officer in Danske Bank
- Christoffer Hernæs, Chief Digital Officer in Sbanken
- Svein Ove Langeland, Head of Strategy in Sparebanken Vest
- Brian Herring, Cash Management Sales and Lasse Aaseng, System Manager Online Banking, BankID and Payments in Handelsbanken
- Ina Gjerstad, Senior Business Developer within Open Banking in Nordea
- Thea Melsbø Aarseth, Legal Advisor and Brynjel Johnsen, Principal Advisor in BITS
- Atle Sivertsen, Chief Executive Officer in Finance Innovation
- Daniel Næsse, Lawyer in PwC

The interview questions were individually adjusted to the participants' position, company and industry, and had the intention to focus on different aspects of PSD2 and banks' future competitive position dependent on the interviewees' background and competence. In addition, this enabled us to be flexible, ask follow-up questions and move into concepts and topics not planned to touch upon, and thereby allowing valuable insights that else would not have been

brought up. In this way, as much information as possible was gathered. Note that quotes from the interviewees used throughout the thesis is not the companies' official opinions. The interview guide is attached in the appendix.

6. IMPLICATIONS OF PSD2 ON BANKS

PSD2 is not just another regulatory framework for banks to comply with. It comes with both strategic challenges and possibilities for traditional banks, and marks perhaps the first step towards an Open Banking ecosystem. For the first time since banks entered the financial market as intermediaries, they are required to open up their value chain for third parties. Inevitably PSD2 will have implications for traditional banks that go beyond regulatory compliance. The traditionally asset and compliance intensive traditional banking model will be challenged and banks are forced to think in new ways. Innovation, competition and collaboration are keywords in this disruption process. Will PSD2 in fact lead to increased competition in Norway and will banks have the ability to change and remain their competitive position in the market?

In this section, the implications of PSD2 on Norwegian banks will be discussed. Banks are first of all affected in terms of compliance efforts, which will be discussed in the first section. Secondly, the aspect of providing access to customer payment accounts will have particularly high implications for banks, and these are analysed in this section. An examination of banks' changed value chain will later on raise questions on the role of banks in the payment system. Finally, the possibility of increased competition and banks' ability to innovate and keep up with an increased pace of innovation is discussed. A summary of the identified implications of PSD2 on Norwegian banks are presented in the figure below.

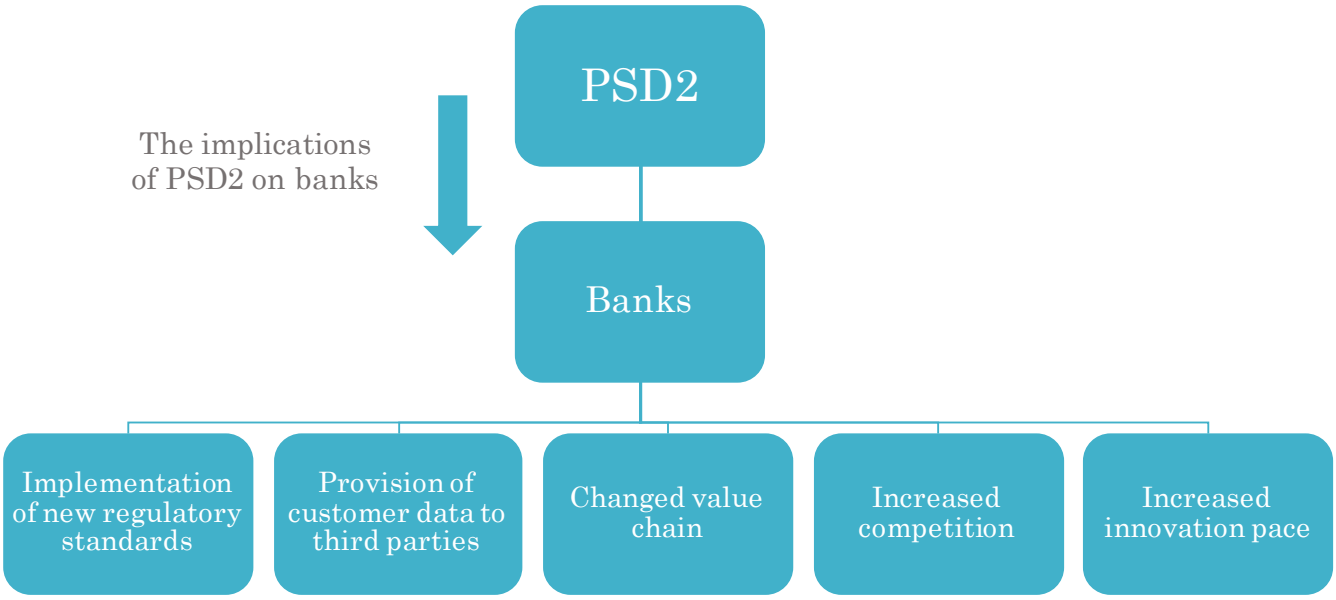

Figure 9: *The implications of PSD2 on banks*

6.1 IMPLEMENTATION OF NEW REGULATORY STANDARDS

Complying with PSD2 requires banks to implement new standards in their banking system, mainly dictated by RTS. A research conducted by EY suggests that most financial institutions within Europe consider the regulation of Access-to-Account (XS2A) to be the most critical aspect of PSD2 in terms of expected implementation efforts, technical impacts and risk mitigation efforts (EY, 2018).

Compliance

The XS2A rule states that banks are obliged to create a set of open APIs offered to third parties applying for such access. These APIs should satisfy several needs and demands. Some of the most important tasks directly associated with XS2A compliance is explained in the following.

Banks should create an API function through which a third party can grant access and retrieve data from bank customers' payment accounts. The provision of APIs should include payment initiation APIs and account information APIs.

A development environment should be created within the bank to ensure that sufficient security measures and safety of their new API services are met. Banks should therefore test their API offerings by using test data to ensure the correctness and robustness of their new API services.

When security measures are in place, banks should create a deployment process to make new functions available publicly in live environments. This also includes creating a process where third parties can apply to get an API key, and creating an API authentication process which verifies the client application and the user making the request. Lastly, banks should create an API load balancing to ensure that the API scales effectively with unpredictable demand. In addition, banks will have to consider how their API services relate to data privacy, such as the relationship between XS2A and General Data Protection Regulation (GDPR) (Difitek, 2018).

The NextGenPSD2

Making a secure and standardized set of open APIs require banks to have technical competence, especially since PSD2 does not state how the APIs should look like in detail. APIs can be created in different ways, as there exists different types of APIs.

To help banks in creating interfaces that comply with the technical standards, the Berlin Group has established The NextGenPSD2 Initiative. Participants in NextGenPSD2 are working together to create an open, common and harmonised European API standard to enable TPPs to access banks account under PSD2. They have created a detailed "Access-to-Account Framework" based on the RTS in PSD2. Various banks in the Norwegian bank market such as DNB, Danske Bank, Swedbank and SEB are participants in this association (The Berlin Group, 2018).

The framework, NextGenPSD2, provides an implementation guideline for banks. Using this guideline, the complexity and effort associated with XS2A will be reduced. NextGenPSD2 promises a "modern, open, harmonised and interoperable" set of APIs. So relying on these API standards, the banks will know how they create the APIs, in addition to be sure that they share their data in a secure and efficient way (The Berlin Group, 2018).

An important note is that the safety requirements of the RTS, referring to Strong Customer Authentication, will not cause any big implications for Norwegian banks. This is because they already use an authentication method that is sufficiently safe, as BankID satisfy the directive's requirements.

Investment costs

The Access-to-Account rule also has an economic aspect. The implementation of open APIs require investment costs, which imply that banks need to use a substantial amount of resources to become compliant. Investment costs include upgrading technical systems and acquiring necessary competence. These costs will reduce if banks use the abovementioned guideline according to the Berlin Group (The Berlin Group, 2018).

Summarized, in order for banks to manage PSD2 compliance they need to invest in new technical solutions that enable offerings of a standardized set of APIs. The NextGenPSD2 developed by the Berlin Group could be a helping hand in this process, as it provides a framework for how the APIs can be developed, in addition to reduce the costs related to this development process.

6.2 PROVSION OF CUSTOMER DATA TO THIRD PARTIES

Convenience, user-friendliness and availability are elements that often appear at the top of the list when consumers choose their services, whether it comes to travelling, entertainment or any other industry. Due to new technology and innovation, consumers are to an increasing degree engaging in online platforms that offer services catered to their needs. PSD2 and the XS2A rule is at the forefront paving way for such personalised and innovative services to be offered also in the banking world. Many of these services are based upon insights into customers' personal data, which is facilitated through the implementation of PSD2. Access to customers' payment account and consequently getting data on their purchase history requires customer consent and acceptance of sharing financial data with service providers.

This section starts off with a discussion of the value that lies in the customer data, followed by possible services to offer by embracing the value that lies in getting access to data on a customer's transaction history. As customers find financial data particularly sensitive, they might not uncritically share their data. The last part of this section will consequently analyse the willingness of consumers giving third parties access to their payments accounts.

Customer data is a valuable resource

Norwegian consumers conduct all payments for free, whether the transaction is executed by a using a payment card or through a mobile application service. A payment transaction is therefore not a revenue gaining processes for the service provider. One can thus question why any firm intend to establish themselves as a PISP or an AISP in the Norwegian payments market. The answer lies in the value of customer data.

When using a PISP or an AISP service, the service user must allow the service provider to access data concerning transaction history on the service user's payment accounts. Consequently, any consumer that uses a TPP to provide payment or account information services is at the same time giving away data on consumption patterns. The PISP and AISP will get data on their account balances and transaction history including the amount, content and time of their purchases. This data can be used in various ways, and represents an invaluable resource for the service provider. In today's digital economy, data is becoming the new oil. Control over data can contribute to enormous power.

Most of us make payments on a daily basis. In eight out of ten times customers choose to pay by using a payment card (Finans Norge, 2018). This means that banks are in possession of

long transaction histories on all their customers. The systems and processes in place throughout most banks are generating more data than ever before, and it is only growing (Deloitte, 2011). However, they have not been good at commercialising on it or exploiting it. Technology firms, such as Google have to a larger degree generated revenue streams by becoming experts in benefiting from customer data. Google's users perform over 3.5 billion searches daily, and Google has leveraged their users' online search history, creating advertisement tailored to individual preferences. Their current market value is reaching US $ 1 trillion, implying customer data is a valuable resource (Techrunchs, 2018). Technology companies are eagerly waiting for PSD2 and XS2A to be implemented, as they consequently are able to gain access to and take advantage of this customer data.

BigTechs that provide e.g. social media networks on their platform and later on combine the service with payment initiations are able to gain even more insights on their customers than they already possess. Such a combined service could provide information like weather conditions and personal mood at the payment execution, what publications that were done on social media before and after the purchase, and where the consumer had been before the purchase. It could also include search history on the Internet, who the consumer spent time with during the purchase, what goods or services the other people bought and so on (PwC, 2017). Norwegian consumers are eager to use their smart phones, implying that there is enormous insights to gain. In particular, 29% of smart phone users look at their phone at least 50 times a day, and 62% of smart phone users use social networks on their mobile phone at least once a day. Harnessing deep customer insights imply that businesses can enhance customer experience by providing superior personalised products and services (Deloitte, 2017).

6.2.1 How to benefit from and capitalise on customer data

Players in the financial market can benefit from the access to customer data in various ways. Based on interviews and own analysis we have categorised different products that AISPs and PISPs can offer to their customers, and how the services can generate revenue streams. These services are presented below. We also emphasize that banks themselves can become AISPs or PISPs, meaning that the presented services can apply for banks.

AISPs

When customers explicitly consent to an AISP accessing their payments accounts, the AISP can exploit the information from the payment transactions.

Account overview

An account overview service could aggregate the consumers' different accounts in one place. Keeping track of different bank accounts, pensions and loans with various logins, apps and portals could be time-consuming. Getting a single overview of all of them could help the consumer to never worry about losing track of their spending. Various banks with related prices on bank loans, pensions and deposits could also be listed, which would enable an easy bank comparison for the consumer. In this way, the consumer would more easily get an overview of all the possible banks and thereafter choose to switch to the best bank. The provider of the service would earn money if the customer changes main bank, pension agreement and so on through using the service.

Budgeting and saving

Another possible service for an AISP to provide is help with budgeting. With access to the customers' data, an AISP is able to provide the consumer with insights into spending habits and guidance around budgeting and saving. The service could calculate how much the person would afford to save on a monthly basis, then automatically transfer that cash into a separate account. The AISP can generate profits through e.g. agreements with a certain bank to open a savings account for the consumer in that particular bank and charging a fee to the bank depending on the amount the customer saves in the account. Likewise, the AISP can advertise saving products offered by various banks in their application, and charge the banks fees for advertising or charge an amount for the customers who registers to use the banks' advertised service.

Purchase recommendations

With access to transaction history, an AISP could advise people on purchase decisions before consumers even have looked for a particular good or service. Examples could be recommending travel insurance while the consumer is at the airport, suggesting new cycling clothing after a bike is purchased, or recommending restaurants the consumer might like based on previous choices. Other suggestions could be recommending a new mobile phone subscription or electricity deal that is better suited for the particular customer compared to the existing agreement the customer has contracted.

The AISP can earn money on such a service by charging the suppliers fees for advertising their services and charge fees for the customers who choose to switch suppliers based on the recommendations the AISP gives the customers.

Additionally, such a service can ultimately benefit banks as well. Through collaborating with an AISP that analyses the customers' consumption pattern, a bank can get to know their customers better and be able to offer them personalised services. Our interviewees from Handelsbanken exemplified it as follows:

"When you are logging into your online bank service today, you will probably, independent of your age, get heavily informed about offerings such as BSU (Boligsparing for unge), Residential Saving for Youths. This loan agreement is however only applicable to people younger than 34 years. If banks start using their customer data, they are able to inform and advertise only relevant people, making their advertisement more personalised, appropriate and relevant."

Consumers will expect to get relevant advice and product information while they go about their daily lives. For example, they may want banks to send them information about the best mortgage deals when they are in the process of buying a property, contextual information that many banks currently do not provide (Accenture, 2017).

PISPs

When a customer explicitly consents to a PISP accessing their payments accounts, the PISP will be able to initiate payments on behalf of the customer. This will facilitate the creation of innovative or integrated payment solutions. It allows companies such as Facebook to offer customers new ways to pay, through for example providing an easy platform for friends to make payments to each other through instant messenger.

Innovative payment solutions

Service suggestions for PISPs could be to offer innovative in-store payments through the use of mobile phones. Such a service could enable a seamless customer journey where customers do not need to take any physical payment actions. An example of an existing service offering such a payment solution is Amazon and their cashier-less Go stores. The store use hundreds of cameras and sensors to keep track of what people are buying. People simply need to use their Amazon Go app to enter the store, pick up what they need, and leave. The items get charged to their Amazon account automatically as they are exiting. The service does not

require customers to wait in line, manually check out, or even any registers, implying a time efficient process for both consumers and merchants. Such a simple service is possible by the use of computer vision, deep learning algorithm and sensor fusion, a just walk out technology according to Amazon (Amazon, 2018).

A payment service solution has four components that must be in place in order to gain success. These are price, simplicity, trust and availability (Danske Bank, 2018). Due to already low priced payment solutions, consumers do not want to pay for transactions. The solution should therefore be offered for free. Simplicity means that the service should be experienced as an enhanced product, and as a simplification compared to the existing services. In addition, the service must be seen as a secure payment method and a service that could be used for various operations, not requiring different apps to be opened. As we later on will explain, the product's safety is of high importance.

For a company offering payment initiations as merely add-ons to their existing services, such as Amazon and Facebook whose main business activities are not payments, they can profit from combining the insight they get from their user's consumption habits with the data they already possess on the user. As an example, Google can get a lot of information on you from what you search for in their search engine, but what you actually spend money on will say a lot more about you. Combined, this information can be very valuable and contribute to profit increasing activities for Google.

PISPs may not be able to charge transaction fees to Norwegian customers for initiating a payment, since Norwegian customers do not pay fees for any type of payment transaction. Generating profits might thus be difficult for a PISP operating solely as a payment initiating service. However, if customers embrace their service, an increasing number of merchants may want to offer their service as a payment method in their stores or online. This means they can charge the merchant an amount for offering their customer's the possibility of using the PISP's payment service. However, their success might depend on direct network effects, and could mean operating at a loss in the company's early stages.

6.2.2 Consumers' willingness to share customer data

BigTechs and FinTechs have proven themselves of being experts at benefiting from customer data in order to create personalised products and services that consumers to a larger degree are demanding. However, financial data is sensitive for many consumers, implying customers

require high trust to technology companies in order to make use of their fancy products. Norwegian consumers have a high confidence and trust in banks to handle their financial data, and their general trust to banks have proven to be much higher than their trust to technology companies. When third parties gain access to the banks' customer data, it is still each individual's choice to allow them access. The big question is: When PSD2 is in place, will we see consumers willingly sharing their transaction data to enrich their choices of banking solutions, or will they confide only in banks to deliver such services?

High confidence in banks among Norwegian consumers

On one hand, consumers place great importance on the security and trustworthiness of the banking services they use. The strict requirements and continuous regulation of the banking sector over time has contributed to robust institutions that individuals, investors and companies trust in handling their money and financials. Consumers expect and have confidence in financial services to be secure and to protect privacy in a good manner (Det Kongelige Finansdepartement, 2018).

The Norwegian Data Protection Supervisor have pointed out in a recent report that Norwegians consider details on personal finances particularly defensible, and that they confide in banks and insurance companies in particular to handle this type of data (Datatilsynet, 2018). In a survey performed by Deloitte, the second most common reason for not using in-store mobile payments was that customers did not think they were secure enough (Deloitte, 2017).

The high consumer confidence in Norwegian banks to handle customers' financial data, could result in consumers being more reluctant in adopting payment services or other banking services provided by players outside the financial sector, and thus reduce the impact the entry of new competitors will have on incumbents.

Furthermore, in another survey performed by Finans Norge in 2018, the respondents answered that they have most confidence in banks to deliver the new types of services PSD2 opens up for, and have the least confidence in social media (Finans Norge, 2018). The reason for this could lie in the nature of the data they are asked to give out and the fear of this data shared in unwanted places. In conversation with Svein Ove Langeland from Sparebanken Vest he argued that:

"Personal economy is the last taboo. It is maybe the last thing people like to talk about, how much they earn and how much debt they have"

This indicates that consumers might not be willing to embrace new solutions due to the way they perceive the sensitivity of their financial data.

By taking advantage of the trust Norwegian consumers assign to incumbents, banks can strengthen their competitive position against FinTech companies and technology firms that may enter the market when PSD2 is implemented.

When asked which competitive advantages banks can benefit from when facing increased competition, Atle Sivertsen from Finance Innovation stated:

"Trust is the most valuable asset banks possess, and should be listed in their balance sheet. They have to use that trust for all it is worth"

Customer adoption of PISP and AISP services

However, consumers are to an increasing degree demanding highly innovative and personalised services also from their banking and payment service providers. The value the customer place in using smart and convenient financial services offered by FinTechs, social media or BigTechs could ultimately surpass the value they place in trusted services from banks. If the level of convenience, availability and user-friendliness of a service is high enough, the aspect of trust in the user experience, which banks are offering, may fall short. If banks fail to provide their customers with services that are innovative enough, customers might look elsewhere. The result could be higher customer adoption of financial services offered by third parties.

A large number of articles addressing the effects of PSD2, as well as all our interviewees, identified large technology firms such as Apple, Microsoft, Google, Amazon and Facebook to be the ones to watch when PSD2 opens up for third parties gaining access to customer data. These global firms are massive with enormous user bases, enabling them to reach a large number of customers with new products and services. Facebook as an example, which is a social network website, has as of June 30 2013 2.23 billion monthly active users worldwide (Newsroom, 2018). Most Norwegians are already using the services of these firms, or are in some way or another connected to them. A banking service offered by these firms would be convenient for the customers in the sense that they would not need to go through many steps in order to use the service. It would be very convenient for a customer to be able to perform their banking services in an application they are already using on a daily basis.

In addition, the population in the years to come will to a larger degree consist of technology born generations used to perform many of their everyday tasks on mobile devices and on the internet. There is a common understanding that both Millennials and younger generations tend to embrace digital solutions, the use of social media and innovative services to a larger extent than older generations.

These factors suggests that it is likely that consumers will embrace innovative solutions from third parties rather than only trust their bank to provide for their financial services. The possibility of customer adoption to such new and technology advanced services and products is however, highly dependent on the evolution of consumer trust to these companies.

Security concerns

The fear of data leakage could influence consumers to not embrace payment services or other banking services offered by firms in this category. The recent Cambridge Analytica Scandal is one example of how customer data could be exposed without consent. In 2018 it became known that Facebook had exposed the personal data of up to 87 million users without their consent, to an analytics firm called Cambridge Analytica (Fortune, 2018). Situations like these can explain the distrust consumers place in social media or players outside the financial sector to provide banking services.

While there lies an opportunity in the trust Norwegian consumers assign to banks, security breaches or faults committed within the systems of the TPPs could ultimately have a negative effect on Norwegian consumers existing confidence in their bank. In a possible case of fraud or other complications in a payment transfer initiated by a PISP, banks could be faced with challenges in terms of settlements for the customer. According to PSD2, the PISP is responsible for any discrepancies in the execution of the service, but with relatively low requirements for capital for a PISP, banks could ultimately be forced to bare the risk in case of bankruptcy. Customers could in such a situation also approach their bank directly seeing that banks are the one holding their deposits. If these situations occur frequently it could pose a threat to consumer confidence in the whole financial system, if they hold their bank accountable for errors or security breaches in money transfers initiated by third parties.

Trust is not a persistent competitive advantage

Norwegian banks are for the time being enjoying a high level of trust from consumers. Banks have an opportunity in leveraging this valuable asset to create a competitive advantage when

facing new competition from third parties outside of the financial sector with lower levels of customer trust. However, Atle Sivertsen emphasized that customer expectations are continuously changing, and trust, which can shift over time and across generations, may not be a persistent competitive advantage. Customer expectations and patterns are changing rapidly. People tend to be inconsistent, implying a vulnerability of the trust advantage for banks, as explained by our interviewee Christoffer Hernæs from Sbanken:

"Even though Norwegian customers express an exceptionally low level of trust to technology companies compared to their high confidence in banks, there is a big difference in what people say, compared to what they do"

The severity of the risks banks are facing when third parties enter the market however ultimately lies in the hands of the consumer. A customers' decisions in allowing third parties access to their data will to a large extent depend on the weight customers place on the perceived value and convenience of the provided service compared to the potential level of risk the use of the service entail. Risks include not only exposure to breaches in security measures in e.g. money transfers, but also the risk of personal data being exposed in unwanted places or to unwanted people.

On one hand, consumers demand the innovative and personalised services agile third parties are able to deliver. On the other hand, consumers emphasize secure solutions provided by trustworthy financial institutions, the prominent strength of banks.

6.3 CHANGED BANK VALUE CHAIN

Payments services are to an increasing degree being digitized through mobile wallets and innovative payment applications in smartphones and online. Payment services are no longer only offered by traditional banks but also by FinTechs and players outside of the financial sector. Services like Vipps and Apple Pay offer consumers new and more convenient ways to pay.

The previously presented payment value chain in section 2 described a payment flow where the underlying payment processor was a payment card issued by the bank. However, through the XS2A rule and the provision of payment initiation APIs, PSD2 facilities payments executed directly from one bank account to another. If these payment methods are heavily adopted by consumers and FinTechs and third parties gain the consumers' confidence, they can alter the role banks and card networks play in the payment value chain.

This section will describe how the XS2A rule in PSD2 affects the payment value chain and the potential consequences this will have for banks.

6.3.1 Changed payment flow

Payment flow before PSD2

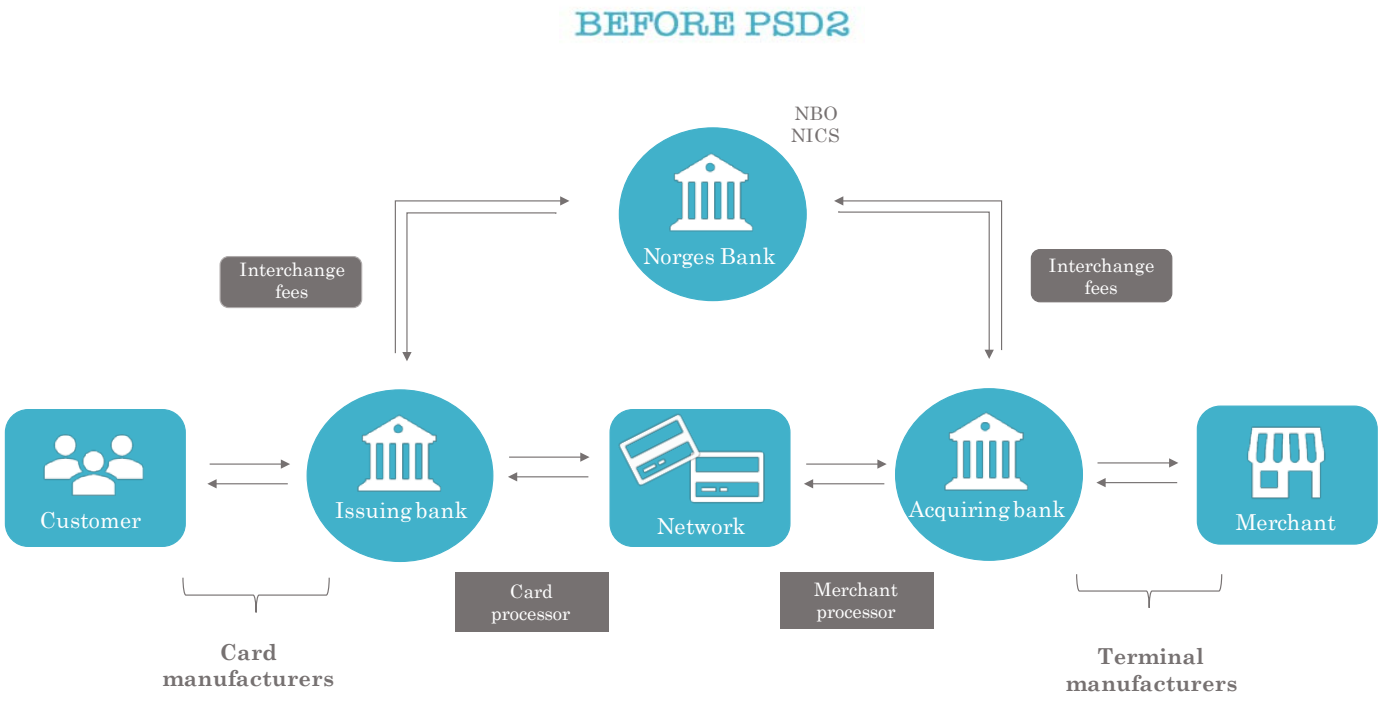

Figure 10: *Payment flow before PSD2*

The figure above shows how a payment value chain can look like before PSD2 is implemented. It is an example of how a payment can be executed, when a payment card is used as the underlying processor. As previously explained, the payment request goes from the customer's bank to the merchants bank through a payment card network, such as Visa, Mastercard or BankAxept, provided by the issuing bank. The payment is processed through a terminal provided by the merchant. The transfer of the deposit from the customer's bank account to the merchant's bank account is completed in Norges Bank and its clearing system NICS. Only the customer's bank can authorize and transfer the payment to the acquiring bank on behalf of the customer. To initiate this process, the customer use his payment card which is connected to the bank account.

Payment flow after PSD2

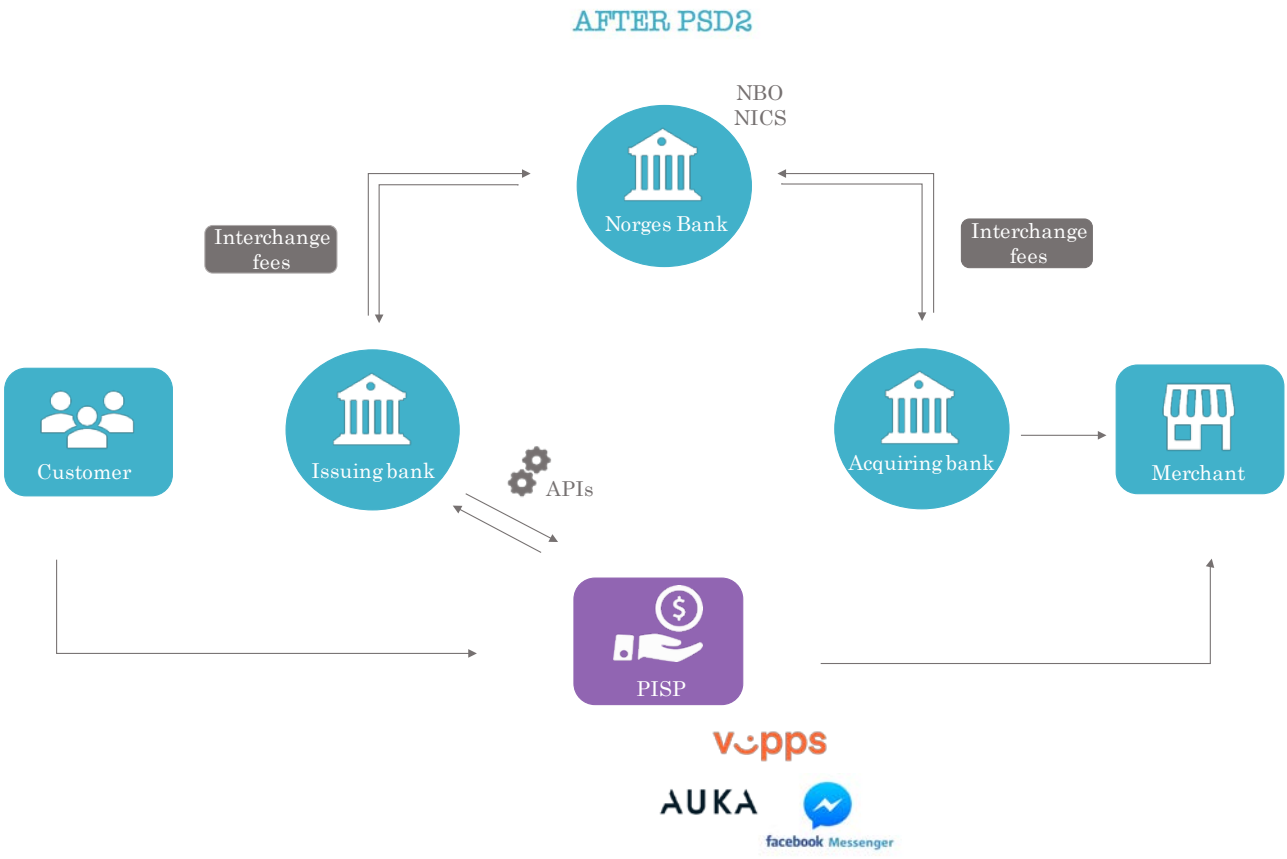

Figure 11: *Payment flow after PSD2*

When PSD2 is in place, it opens up for transfers directly between the customer's bank account and the merchant's bank account, without having to go through card schemes and other processors. As shown in the figure above, the payment initiator is now the PISP, who can

initiate payments directly from the issuing bank to the acquiring bank without needing a contractual agreement with the banks to enable such a transfer. According to PSD2, the banks are required to give third parties access to the customers payment account through an interface, such as open APIs.

The payment process begins with the customer logging in to a chosen third party (PISP) application where identification and bank account information has been registered. The customer can then choose to initiate a payment to the merchant in the PISP. The PISP is in no circumstances allowed to hold the customers' deposits in the process, and it only works as the intermediary between the customer and the merchant. Through an API, the PISP sends information to the customer's bank about the customer's intent to make a payment from the bank account. The issuing bank then sends information to the acquiring bank about the payment, who immediately increases the merchant's disposable balance.

The payment is ultimately settled between the issuing and acquiring bank in the settlement system in Norges Bank (NICS) only after the payment is delivered.

During this process the customer does not communicate directly with the bank. The communication goes between the PISP and the bank, through APIs that send the information back and forth. The communication process is categorised in five steps, and works as follows:

1. Payment request

The payment flow begins with a consumer consenting to a payment being made, and the payment request is sent through the PISP via an API to the bank. The request data from the PISP includes information about the customer's bank and bank account details.

2. Payment initiation

After the request is made by the customer, the PISP connects to the customer's payment account in the issuing bank who creates a payments resource. The API is allowing the PISP to ask the issuing bank to create the new payment resource. This informs the bank that one of its customers intend to make a payment. The bank responds back to the PISP with an identifier code for the created payment resource.

3. Authorisation

The customer consents to the payment being executed in the PISP application through strong customer authentication (SCA), with such as a password and a fingerprint. The API allows the

PISP to send a copy of the consent to the issuing bank to authorise for the payment. The credit transfer is initiated only after authentication.

4. Payment delivery

Once the issuing bank has authorised the payment, the PISP creates a payment delivery resource to indicate that the payment created in the steps above should be submitted for processing. This is carried out by making a request through an API to the payment delivery resource. The issuing bank returns the payment delivery resources identifier to the PISP.

5. Payment delivery status

If the bank provides a status API, the PISP can check the status of the payment with the identifier for the payments resource or the identifier for the payment delivery created by the bank. This is carried out by making a request through an API to the payment or payment delivery resource (Michael, 2017).

Transactions with payment flows directly between bank accounts ensure fast and cheap payments. No money is tied up in the settlement system during the process, as the payment receiver immediately receives the funds in their payment account. The money can thus immediately be put in efficient use and contribute to sustaining the activity level in the economy. In addition, in this payment flow there are no card networks or terminal processors involved, which leads to a reduction of transaction costs associated with the payment.

As card networks are not involved in the payment process at all, it inevitably pose a threat to the future of companies such as BankAxept, Visa and MasterCard. However, it is important to emphasize that PSD2 does not mandate the use of instant payments. Transactions that use a payment card as the underlying payment processor will not disappear when PSD2 is implemented. The continuous existence of card networks will thus depend on consumers' adoption rate of services offering payments initiations directly from one bank account to another.

In Vipps' case, the payment flow that PSD2 facilitates means that they can initiate the transfer to a merchant or an individual directly from the customer's account, instead of going through a card scheme. Thanks to the cooperation between the Norwegian banks, Vipps is already offering payment transactions directly between accounts. However, the opening of the banks payment value chain, also enables third parties that do not have any association with either the customer's nor the merchant's bank to initiate payments from the customer's bank account on

behalf of the customer. The process is made possible through the provision of the bank's payment initiation APIs, which any third party with the right authorization can access. This means that players such as Auka and Facebook Messenger can initiate payments that goes directly from the customer's bank account to the merchant's bank account.

Account information services before PSD2

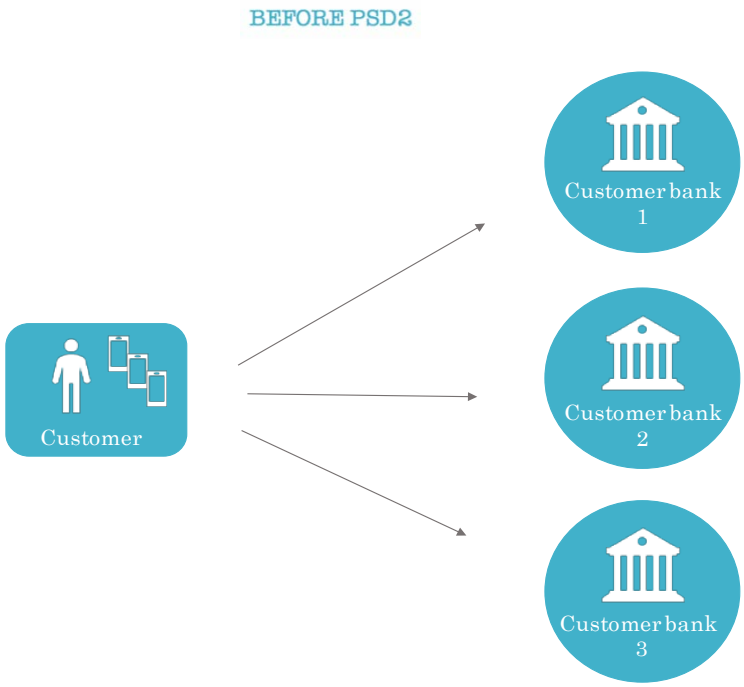

Figure 12: *Account information services before PSD2*

The figure above shows how a customer can access information to his accounts in different banks. In the pre-PSD2 era, the customer would need to login to each of the banks online bank or mobile application to get informed about account balances and spending.

Account information services after PSD2

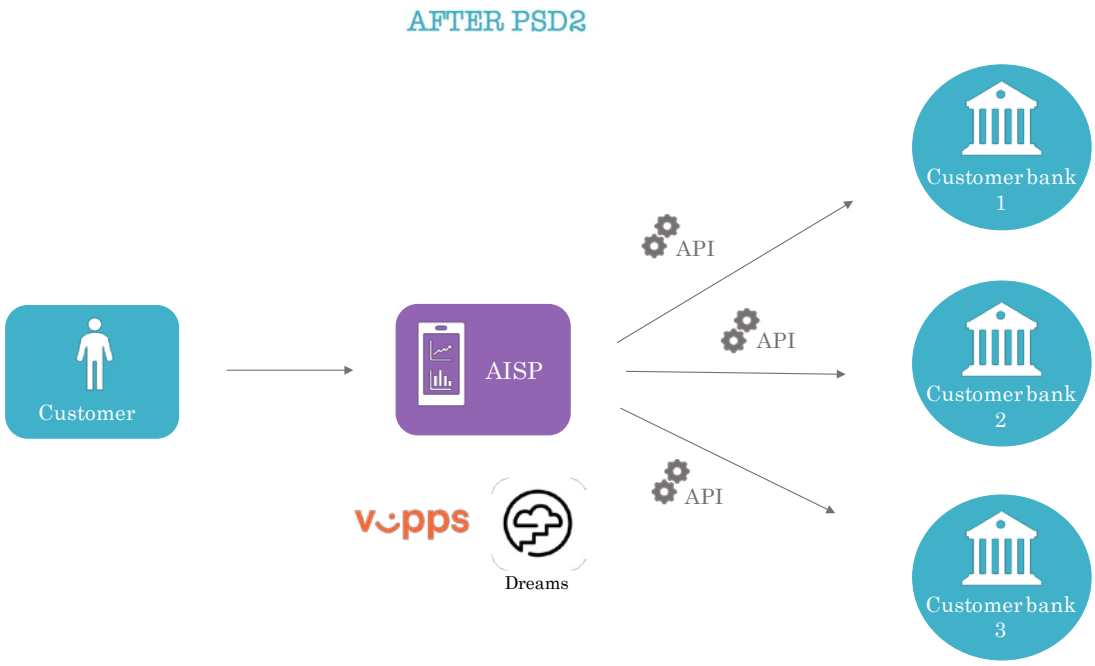

Figure 13: *Account information services after PSD2*

The figure above shows how opening the banks' customer payment account information to third parties through APIs can make it easier for the consumer to get an overview of the financial data. When PSD2 is implemented, an AISP can collect data by gathering information from all the accounts the customer keeps in different banks, through each of the bank's account information APIs. This enables the AISP to aggregate all the payment account information the consumer wishes to see in one place. In this case, the customer does not have any direct contact with each of the banks. The customer's bank account information is communicated between the AISP and each of the customers' banks through API specifications, which PSD2 requires all banks to have available for the AISP.

In Vipps' case, PSD2 opens for the possibility of adding a new feature to their application that enables their users not only to initiate payments but also to view their account balances across different banks. This service is already available as a new feature in Vipps as of 2018, but is for now limited to the customers of certain banks. Banks that allow this service to their customers have either made a special agreement with Vipps or have already prepared and started using open APIs. Banks can for the time being decide not to grant Vipps or other third

parties access to data that makes an account overview service possible to offer. When PSD2 is implemented however, the banks will not have the power to dismiss such a request from third parties.

Dreams is previously presented as an innovative savings app. The difference between how Dreams can function before and after PSD2 is in regard to how the application is allowed to manage the customers' accounts. In a pre-PSD2 era, the application cannot manage the customer's savings account in their preferred bank without a specific agreement with the bank in question. Hence, Dreams entered into a partnership with Storebrand, and was able to place the saved money in a Storebrand savings account. When PSD2 is implemented however, Dreams will be better able to give an overview of the customer's savings, and manage the customer's account regardless of which bank the customer previously has committed to, thanks to open APIs. Dreams would then be allowed to e.g. initiate the transfer of money between the customer's existing accounts and provide an overview of all the customer's savings deposited in different accounts.

6.3.2 Consequences of banks' new role in the payment system

If financial services provided by third parties gain the essential consumer trust, it may lead to a high adoption rate among consumers, which further will lead to a changed payment flow as described in the previous section. The payment flow in the post PSD2-era will affect banks' role in the payment system, as their importance may reduce due to other players partly taking over their role. Customers making payments through PISP services instead of using payment cards issued by banks imply that the economic aspect of card transactions disappear for banks. However, customers make their card transactions almost for free, as banks do not charge any high fees for this execution. Banks not engaged in the payment process will thus not directly pose any big threat for them economically, as card transactions do not represent any revenue gaining process for banks.

Banks' challenges of not participating in their customers' payment processes lies however in the value of customer interaction. Banks' altered role in the payment system might harm their possibilities of engaging in a near customer relationship. In the following, we analyse the challenges of losing customer interaction.

Reduced customer interaction

If customers migrate from banking services provided by their main bank, to new, more innovative and preferable channels provided by third parties, it may lower the customers' engagement with the bank. Johanna Herbst in Danske Bank clearly expressed this concern during the interview:

> *"Our sustainability lies in the customer interface, either the communication is over telephone, digitally in our applications, or when the customer pay bills in our banking services. This is how we get data on our customer, and this is how the customer see our brand name, and thus choose us. If too many steps occur between us and the customer, we would need a completely new strategy in order to survive in such an environment"*

Banks offering their customers a choice of contact points is important in order to develop trustworthy and close relationships. Channels like online platforms, mobile communications, tweets, blogs and Facebook updates are just some of the communication methods banks can use to remain such relationships with their customers. The communication can happen anywhere, anytime because we are living in an "always-on" world (Wipro, 2018). These customer interactions help banks to increase their customers' perceived value, loyalty and trustworthiness. Utilizing these communication channels mean that banks can form meaningful, ongoing relationships with their customers.

New competitive players entering the market mean that banks' interaction with their customers may disappear. Using an AISP or a PISP service means that consumers do not get exposed to the brand of the bank. The communication between the customer and the bank, initially aimed at strengthening the customer relation, will then disappear. Reduced customer interaction will fundamentally alter the way banks generate revenue, profits and business value.

Reduced cross selling

The broad definition of cross selling is the opportunity of selling products and services to an already existing customer, exemplified by selling a credit card to an existing checking account customer, or selling a mortgage to an existing credit card customer (Girish, 2010). Decreased customer interaction may impact banks' opportunities for this type of marketing.

When customers daily check their account balance or execute payment transactions in a bank's mobile application or online web page, this is a great opportunity for banks to promote other services or products and thereby improve sales. Exposing and introducing customers to other

banking options is an effective technique for profit increase and represents a great opportunity to generate revenue from lower cost targets and develop customer relationships. The stronger the relationship a bank has with a customer, the more loyal the customer will be. A strong customer relationship will further affect the banks' opportunity to assess improved credit quality checks on its customer. Losing the opportunity for cross-selling due to a reduction in customer interfaces will undoubtedly harm banks, both in regards to revenue and customer loyalty.

Balance-sheet providers

The worst-case scenario if third parties initiate all payment transactions and become the main operator for banking services is that banks' role will be reduced to pure balance-sheet providers. This would imply a conversion from being a relation bank to serve as a back office provider with current account transactions limited primarily to incoming salary deposits and outgoing payments to fund transaction accounts at another service provider (McKinsey&Company, 2018). Operating solely as balance-sheet providers and only serving other financial industry players such as FinTechs, means that they will be detached from the end user.

This would mean that customers would be more unaware and ignorant of their personal bank relationships. If the customer never gets exposed to the bank brand, there is a higher possibility that the bank relationship gets less important for the customer. This means that the consumer will be more eager about getting the lowest price on services such as loans, pensions and deposits, and having the most user-friendly banking solutions, rather than being bound by loyalty when choosing bank. This will further make it easier to switch bank, since the loyalty to the bank is considered less important.

Banks are under considerable pressure due to the threat of competitors taking their place in the payment system. As a consequence, banks' role in the payment system may be reduced, implying that banks' interaction with their customers is more important than ever for remaining their competitive position. Staying relevant to their customers should thus be the banks' main focus. A worst case scenario if customers adopt to various types of AISP and PISP services to large degree, is that banks will become balance-sheet providers, almost unable to reach their customers at all.

6.4 INCREASED COMPETITION

Today, Norwegian consumers can use Payr to pay their invoices, Dreams to save for their vacation, Vipps to pay their friends after a restaurant visit and Apple Pay to pay for groceries in supermarkets. The spectre of companies offering payment services have broadened with the emergence of FinTechs and BigTechs. With PSD2 functioning as a catalyst for increased competition and lowering entry barriers for new players, the market expects to see an even higher number of firms competing to win the customer's attention in the payments market.

Although PSD2 facilitates increased competition, market factors such as customer adoption, strategic alliances and time to market ultimately decide if the objective of PSD2 is met. This section discuss the possibility of increased competition in the payments market, as well as potential benefits banks can enjoy from head starting the possible new competitive landscape.

6.4.1 The possibility of increased competition

Before the implementation of PSD2, banks alone have had a monopoly on customer's financial data and the banks' main competitors have, up until recent years, been established players within the financial sector. After PSD2 and the technical standards have been implemented however, this opens up for new players gaining access to customers' payment account information. New players will be able to deliver banking services without needing a banking license and the heavy compliance that come with it. Banks could thus be facing increased competition from established banks but also from new players such as FinTechs, BigTechs and non-banks as a result of PSD2.

However, increased competition is dependent on new players wanting to enter the market which in its turn depends on the attractiveness of the payments market. Likewise, increased competition will rely on sufficiently low barriers of entry and the customers' willingness to adopt services from new players. By observing the evolution of the market for payments during the past years and especially during the fall of 2018, we find certain elements that can indicate that the objective of increased competition in PSD2 will be reached in Norway. These elements include the observation of FinTechs already present in the market, low barriers of entry due to obtaining access to a customer's transaction data and the possibility of exploiting the efficient payment system in Norway.

New players are already present in the Norwegian market

The banking market has already witnessed new players entering the market. FinTechs offering payment services such as Klarna, Vipps and Tink, and innovative saving apps such as Dreams are already present in the market. These players have only posed a limited threat to banks so far, since their access to banks' data have been limited, due to the necessity of negotiating deals directly with banks in order to get access to the customer data. In order to use Dreams for example, you would need a savings account in Storebrand, and Klarna requires the use of a payment card.

PSD2 facilitates superior user experience for new services, and the presence of players offering such services indicates increased competition on customer interfaces.

Access to customers' transaction data

Access to accounts means that third parties will get information on banks customers' transaction data on their payment accounts and thus get insight into a consumer's consumption pattern. This enables third parties to compete at the same level as banks. Insight into a customer's payment account is perhaps the most attractive aspect for entering the payments market when PSD2 is implemented, if the player knows how to exploit and generate revenue from it.

We have previously discussed how some of the most powerful companies in the world excel at taking advantage of aggregated data, and they definitively exceed traditional banks when it comes to data volume and processing. They are experts in cloud computing, customer-facing artificial intelligence, data analytics, and they deliver low-cost personalised products (F10, 2017).

As technology firms already have a particular ability to leverage data and consumer insights, they know how to offer a unique and personalised user experience to fully engage consumers (Disover.Jackhenry, 2018). The possibilities for tech companies to break into banking without actually becoming banks are after the implementation of PSD2 and XS2A bigger than ever before.

Although big technology companies such as Amazon and Facebook are not present in the Norwegian market offering banking services yet, PSD2 opens the possibility for these companies, with millions of customers and users, to enter it. Their presence in the payments market is more visible internationally, where examples include Facebook obtaining an e-

payments license from the Central Bank of Ireland, and Amazon offering payment solutions such as Amazon Pay, a digital wallet for consumers and a payments network for both online and merchant payments (Business Insider, 2016). As of today, the global mobile payments market has grown 24% from 2015, implying that technology companies are eager to capture market shares from banks (Accenture, 2018). The possibility of players entering the Norwegian payments market is relatively high, as accessing and monetising on customer transaction history results in low entry barriers.

During the time we have worked with our thesis we have also seen Apple and Google launching their payment services, Apple Pay and Google Pay in the Norwegian market, indicating that BigTechs are highly interested in entering the market.

However, in order to get access to data also new players will have to comply with the regulatory requirements under PSD2. Our interviewees in BITS explained that this could represent a challenge for newcomers:

"One of the main challenges when establishing as a third party will be to deal with regulatory authorities, as it requires a lot of reporting and submissions of documentations, and this is an area in which they do not have much experience"

Compliance effort could therefore represent a barrier to entering the market, as this is something newcomers potentially are not familiar with. However, this aspect is not expected to be emphasized as much as the factors in favor of entering the market.

Nonetheless, as the access-to-account rule will able new entrants to operate with many of the same prerequisites as banks, their entry will mean increased competition for banks.

Exploiting an efficient payment system

The Norwegian payment system is previously described as the best in the world, meaning that the well-established distribution infrastructure is highly effective, efficient and secure. FinTechs who want to enter the market are able to develop services built on top of this highly efficient payment system. Banks have already invested large resources in building a high quality infrastructure. Technology companies will thus not be burdened with high-capital expenditures associated with conventional infrastructures as they can connect to the banks' efficient systems.

Another reason for low entry barriers in the Norwegian payments market is Norwegians' high level of technology adoption. Norway has the second most advanced digital economy in Europe. 94 % of the Norwegian population pay their bills online, compared with 59 % in the EU (European Commission, 2018). Norway is a highly digitalized country where customers already consume online content and use online banking services to a high degree. This speaks in favour of Norwegians' consumers embracing AISP and PISP services.

Norwegian authorities are also facilitating the entry of FinTechs in the industry through a newly launched initiative of a 'regulatory sandbox' where startups can test their ideas in a controlled environment on real customers (Shifter, 2018). This is yet another example of low entry barriers.

PSD2 and the XS2A rule, will make the already existing services more accessible to a larger number of consumers. The directive will facilitate the entrance of new players such as big technology companies. Banks can therefore expect more competition on new areas and from unconventional players as a result of the regulation requirement of opening up bank data. The presence of FinTechs in the Norwegian market as well as BigTechs' advancements in the payments area internationally indicate that we can expect to see a changing competitive landscape in the market for payment services.

6.4.2 Will banks benefit from a head start in the new competitive landscape?

As the regulation will facilitate increased competition, banks should be aware of the challenges that lie ahead. Norway is still waiting for PSD2 to be implemented. This means that banks still have several months left with monopoly on their customer data, and can head start the preparations for PDS2. Head starting the new competitive landscape can be beneficial, but may also bring disadvantages and challenges.

Our interviewee Atle Sivertsen from Finance Innovation explained the importance of utilizing a head start on competitors by arguing that banks should start already now to offer new solutions to customers in order to reduce the possibility of attacks from future competitors.

We have already witnessed several initiatives done by Norwegian banks to prepare for increased competition, in the form of cooperation within the industry or by collaborating with

FinTechs and BigTechs to offer their customers innovative services. These initiatives work both as a defence strategy and as an attack strategy.

One example is the merger between Vipps, BankAxept and BankID, that made Vipps AS the largest player within payment and identification in the Nordics. According to Jan Digranes, Director of payments and digitization in Finans Norge, the merger represents an important step towards preparing for increasing competition from global players in the payments market (Finans Norge, 2018).

Another form of cooperation already present in the banking market, is the collaboration between Sbanken, Sparebanken Vest, Sparebanken Sogn og Fjordane and Sparebanken 1 where customers will be able to view their account information across the competing banks. This type of service will probably be made available by many service providers when PSD2 is implemented, but is however not offered by many banks today. Bjørg Marit Eknes, Vice President of Innovation and Customer Experience in Sparebanken Vest, claims in an article that the collaboration represents a way for them to get started well before international players can enter the Norwegian market. Christoffer Hernæs, Chief Digital Officer in Sbanken, further explains that by opening up early, Norwegian banks will be in a stronger position once the directive comes into force. If Norwegian bank customers are used to seeing their accounts across different banks in one place, the entry barrier for international players will be significantly higher (Hernæs, 2018).

However, FinTechs and other third parties who are considering to enter the market can monitor the banks' actions and potentially bypass them by learning from their mistakes and take advantage of their inertia and investment costs before they enter the market themselves. Thus, it remains to see if being early entrants in the new market with such actions really will result in a persistent competitive advantage for banks. In the following we present an analysis of potential advantages and disadvantages for banks of being early entrants in the new competitive landscape.

Benefits of being the first mover

Theory on first-mover advantages suggest that, by being the first ones to actualize initiatives or launch products or services that are possible for TPPs to offer with the implementation of PSD2, banks could gain significant benefits over later entrants in the market. We have identified two main reasons for why the bank could benefit from preparing for PSD2 before

the regulations enters into effect: the learning value for customers and the learning value for traditional banks.

The learning value for customers

Actively preparing for PSD2 by offering new products represents a learning effect for the bank's customers. It gives the bank a chance to make their customers familiar with the types of services PSD2 facilitates, before third parties have the opportunity to offer similar services. The customer will then get the novelty value from the bank instead of other third parties. Customers could be less willing to adopt new services offered by TPPs if their bank already offers the same service.

When customers become used to a service and learns how to use it, their switching costs will increase. Thus, by testing the market during the transition period, banks could gain a first-mover advantage through buyer switching costs. The vast majority of the interviewed bank representatives identified switching costs to be the main advantage of being an early entrant. If e.g. a new FinTech firm establish themselves as an AISP, customers might be less interested in switching to a new brand if they already can see account information across their banking relationships through their trusted main bank. New players seeking market entry might have to invest extra resources in order to attract customers away from the first-mover, and especially new FinTechs might see the need to either enter into partnership with established players or invest sufficient resources into advertising to obtain sufficient market share in such cases. Resources that otherwise could be used for product development and value creation.

If the banks succeed in creating and launching services that meet the customer needs and earn strong brand recognition during this period, their market share might persist. This will make it considerably harder for later entrants, such as so far unknown FinTech firms, to gain customer reach and market share. If customers prefer using the abovementioned examples, Vipps for P2P payments and the account overview service stemming from the collaboration between Sbanken, Sparebanken Vest, Sparebanken Sogn og Fjordane and Sparebanken 1, new entrants may have a harder time attracting users and will have to develop even more innovative and convenient services to succeed in capturing the consumer's attention.

In the market for payment services, and especially for P2P transfers, the presence of network effects may further increase the first-mover advantage. Transferring money through for example Vipps is dependent on the counterparty also having the mobile application and being

registered (Vipps, 2018). There is no doubt that Vipps, having outperformed both mCash and MobilePay and obtaining monopoly in the market for mobile payment services in Norway, has enjoyed the advantages of being a first-mover. Introducing a new P2P mobile payment service in the Norwegian market will be very challenging in light of Vipps' high market share, network effects and substantial switching costs.

The learning value for traditional banks

Svein Ove Langeland from Sparebanken Vest highlighted the learning value for the bank as one of the main reasons to why his bank could benefit from actively preparing for PSD2 before the regulation enters into effect. By offering new services in the transition period or by letting third parties offer payment initiation services or account information services to the banks' customers, they have the opportunity to test the potential success of new services before new entrants are able to do the same. By testing the market during the transition period, banks can identify the services they should exploit, consequently capturing an even larger customer base. It will also enable banks to make sure security measures and functionalities are safeguarded before international players and large technology firms will be given access to their APIs.

Disadvantages of being a first mover

However, Hagiu and Rothman (2016) argues that the importance of first mover advantages for marketplaces is overstated and that the winning marketplace is the first one to figure out how to enable mutually beneficial transactions between suppliers and buyers - not the first one out of the gate. There are many examples of marketplace leaders who were not first movers. Airbnb came after VRBO and Alibaba entered after eBay in the Chinese market. An argument for why first mover advantages may be less than first assumed is that chasing early growth before a marketplace has proved its value to both buyers and sellers leaves the business valuable to competition from later entrants (Harvard Business Review, 2016).

Learning from mistakes

Although launching new products early on to their customers represents a way for banks to strengthen their position and reduce the attack from new competitors, TPPs entering the market after the implementation of the regulation might learn from the banks' experiences and mistakes. FinTechs can learn from possible mistakes in how the account information services from the alliance between Sbanken, Sparebanken Vest, Sparebanken Sogn og Fjordane and Sparebanken 1 was designed, how it functioned and how it was advertised in the market.

An example of how later entrants can benefit from the first movers experience can be seen through the launch of Apple Pay and Google Pay in the Norwegian market. Apple Pay was the first of the two to launch their payment service in Norway during the summer of 2018, while Google launched the same service in October 2018. One of the biggest problems Apple Pay has faced in Norway is that the service is not compatible with loyalty programs at supermarkets. By observing this limitation, Google was able to adapt their way of approaching this problem by allowing payment cards to be directly linked to the supermarkets' loyalty programs (E24, 2018).

Free rider effects

AISPs and PISPs looking to enter the market will be benefiting from free rider effects since they are able to build services on top of banks' already existing infrastructure. They are thus able to avoid some of the banks' entry costs. In addition, third parties will enjoy the benefits of an effective payments infrastructure and low transaction costs in Norway. This could reduce banks' advantages of being first movers.

Incumbent inertia

Our interviewee Johanna Herbst, CDO in Danske Bank, claimed that while banks are heavily regulated and need to invest substantial time and resources just to be compliant, FinTechs have the ability to move faster. Historically, FinTechs have been more agile than traditional banks in responding to customer needs. This can threaten banks, as they may become too slow and will not be able to feel the pulse of the customers, and thus loose customer interfaces to new FinTechs. The conservative nature of banks may increase their vulnerability when acting as first movers in the market, as more agile third parties can faster respond to changing customer needs and could easier exploit technological discontinuities.

PSD2 will lead to increased competition in the payments market. Since PSD2 is not yet incorporated into Norwegian law, banks are currently in a position where they can take advantage of being first-movers in the new competitive landscape. Through the existence of switching costs and network effects in the marketplace, and depent on their ability to create a long-lasting impression on their customers, banks can increase the barriers of entry for new competitors.

However, not all banks view early entrance as their best option. In conversation with Handelsbanken on this topic, they suggested that an early entry and a wait-and-see approach

needs to be weighed against each other. They explained that it is not necessary for them to always be the first mover, but they always need to stay relevant.

6.5 ÏINCREASED PACE OF INNOVATION

Innovation and development of new solutions that take advantage of data through advanced analytics, digital technologies and new delivery platforms is more important than ever. The practices that once were the domain of FinTech startups are maturing and becoming incorporated into the banking industry.

As discussed in the section above, the banking sector is becoming more digitally advanced as new market players that excel at data analytics are increasingly capturing large parts of the payment market. PSD2, aimed at fostering increased competition and more efficient and innovative solutions accelerates this development by letting third parties access valuable resources. The possibility of discovering deep customer insights, as well as building services on top of banks' infrastructures are making the banking industry an attractive market to enter.

Technology companies excel at responding to consumer needs, while consumers at the same time expect their needs to be satisfied. This foster a customer oriented banking industry. New enhanced products and solutions, along with new players can potentially replace traditional services offered by banks completely. Consumers embracing such innovative services may lead to a disrupted banking sector, putting banks' role at risk. FinTechs and BigTechs undoubtedly challenge banks' pace of innovation. To remain competitive, banks should engage in initiatives aimed at expanding their offerings to target customer preferences. But do banks have the necessary abilities to change?

6.5.1 Banks' ability to change

Banks are large and complex organizations subject to heavy regulations, making them slow moving, risk averse and constrained from the ability to innovate. In addition, Norwegian banks have traditionally remained solid institutions with high earnings, understandably not eager to change. Banks' peculiarities can potentially restrict their capability to adjust and adapt to a new environment. However, banks can take advantage of their long experience within the payment system, as they are experts in this area compared to new players.

Compliance making banks slow moving

Referring to banks as large and complex organizations with high focus on compliance, Johanna Herbst in Danske Bank, explained how big organizational changes would represent a difficult task:

> *"It is a challenge for us as a big organization to develop and transform in large-scale. We can work agile and make changes when working in small project, but to change large projects or even the organization as a whole would be a big challenge"*

Changing a culture is a large-scale undertaking, especially due to banks' organizational size and compliance issue. Regulatory compliance is the biggest challenge for banks in Europe, and is the most important factor shaping banks today (PwC, 2017). Strict regulatory standards that have to be met reduce banks' flexibility, which further make banks struggle to keep up with the innovation speed of FinTech firms. The effort on compliance requires substantial time and resources, which consequently give less priority to implementation of new technology and transformation.

Compliance making banks risk averse

Regulatory burdens such as strict minimum limits of capital and liquidity also reduce banks' ability of risk-involving operations. According to a CEB research, banks remain constrained from doing all they should by their perception of the risk involved (Bloomberg, 2015). Banks have been practicing risk management ever since there have been banks, and due to their importance in achieving a stable financial system, the industry could not have survived without it (Meyer, 2000). The strong risk averse culture can be exemplified by the common statement "secure as the bank" used by our interviewees in Handelsbanken to explain the importance of risk management.

Banks are nevertheless facing a so called innovation paradox. The main message from regulators to banks, especially after the financial crisis of 2008, was to take less risk. But with the fast-evolving financial landscape with increasingly digital customer expectations and disruptive newcomers, the main message from the public is to innovate. Banks are expected to both innovate and take less risk while, at the same time, innovating will always involve risk to some extent (EVRY, 2017).

Lack of experience of innovation

The financial industry can to some extent represent a traditional and conservative sector, pointing to the lack of innovation in the industry. Many of our interviewees supported this view of the banking industry, explaining it with banks beeing in possession of enormous amounts of customer data without utilizing it. The banking trend of not transforming and making changes can be explained by regulatory burdens as discussed above, in addition to banks' traditionally high profitability and solidity. When banks are doing well, they understandably have little reason for concern. Norwegian banks have since the financial crisis had sufficient capital buffers, met all capital requirements and solid profitability (Norges Bank, 2017). Additionally, banks have not been incentivized to innovate, as they always have enjoyed high loyalty from their customers.

Another reason of low focus on innovation in banks could be that other less traditional and less conservative industries are absorbing much of the IT talent that banking providers require to be innovative. Job seekers with the relevant talent are understandably more attracted to industries with a high innovation pace where developments within data analytics or AI are made on a regular basis, rather than to the traditional banking industry where there have been little room for disruptive mind-sets.

Experience in the payment system

On the other hand, banks are in possession of certain peculiarities that could be utilized as competitive advantages. Banks have a long experience in regard to operating in the payment system, something they could take advantage of. The Norwegian payment infrastructure is highly effective, efficient and secure, and the Norwegian payment market already provides well developed digital payment services (Norges Bank, 2017). Banks have deep insight into how the payment system works due to a long operating time.

Critical to develop effective payment systems is to understand how the forces at play in the industry affect all corners of the value chain. If newcomers in the financial market start to serve as PISPs, banks could take advantage of their understanding in existing payments capabilities and business priorities. Banks should view their payment infrastructure as the key to future front-office product development. The Norwegian payment infrastructure has facilitated the offering of free payment services to customers. While banks have become accustomed to not competing at price, third parties must adapt to this. New service providers

are not able to charge transaction fees to generate income, and will have to find other ways to profit from their services.

PSD2 can potentially lead to the emergence of new innovative players disrupting the banking sector, forcing banks to follow the trend in order to remain competitive. Banks are however subject to strict regulations that absorb time, costs and efforts. It could be quite challenging for slow moving and risk averse organizations to make changes when they do not have experience with it. They are fortunately able to utilize their long experience as experts in payment systems with low priced payment solutions against the new competitive players.

7. RESPONSES TO PSD2

The identified implications of PSD2 on traditional banks indicate that banks' competitive position in fact will be challenged by FinTechs and players outside of the financial sector. Together with an increased pace of innovation in the financial industry, these market changes will mandate banks to think in new ways. Ultimately, PSD2 will require strategic measures to be taken by banks in order to remain their competitive position.

During our interviews, it became clear that all respondents were well aware of the fact that PSD2 comes with both challenges and opportunities for banks. There are many ways to respond to the challenges banks are facing, and in the market we have so far seen it through collaboration within the industry, through banks partnering up with FinTechs or BigTechs and through introducing their customers to exiting new products. Overall, banks could choose to play offense or defence, and they should carefully consider both the compliance sides and the business sides of PSD2.

Banks can choose to view PSD2 as a regulation they are forced to comply with, which is defined as response 1, the compliance approach. Banks can also view PSD2 as an opportunity to fundamentally reconstruct their business models. Response 2 and 3 is therefore defined as the proactive approach, and the Open Banking approach, respectively. The possible responses we have identified for Norwegian banks can be categorized as presented in the figure below.

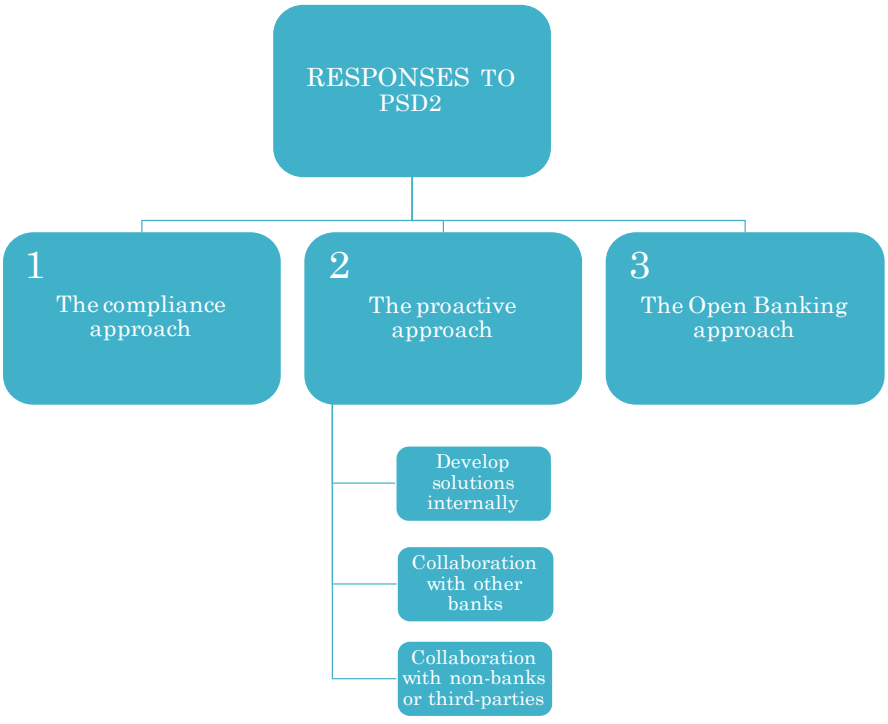

Figure 14: *Responses to PSD2*

7.1 RESPONSE 1: THE COMPLIANCE APPROACH

If response 1 is chosen, PSD2 is treated as a regulatory compliance issue, where banks solely focus on implementing the regulatory necessities, such as a basic set of APIs. This can be a reasonable short-term tactic which enables narrowing the focus of their business model towards the provision of liquidity and infrastructure services in order to maintain their core business. This strategy represents having no initial ambitions to leverage the industry-wide change at a competitive level. Implementing the regulatory minimum will bring costs, but no new revenues, and is therefore bringing some possible downsides.

A compliance approach requires the least effort. However, it increases the risk of banks becoming utilities, as innovative competitors leverage the directive to take control over and own the customer interface. In the long run, this option will most likely lead to incumbents becoming infrastructure providers of underlying banking infrastructure. Third parties will be able to utilize bank data to create and deliver new products and services to consumers, and in turn, they can potentially occupy the banks' customer interface. If the primary bank relationship disappears, banks will be left with the role of balance sheet providers with limited cross-selling opportunities and shrinking margins.

The market landscape can change rapidly, and choosing to only comply may lead to banks not being able to keep up with the speed in the market, and thus fall behind the rest of the market participants. If they choose this option, banks can get bypassed by players who see PSD2 as an opportunity and already capitalise on it.

However, a compliance approach could be a good option due to the uncertainties of the market changes. Failing fast to achieve innovation could be a risky notion. Starting to innovate in an immature market could potentially lead to unnecessary use of resources, time and effort. It is possible that consumers will not trust new fancy and innovative banking solutions offered by third parties. In such a view it may be better to wait and see how the market landscape eventually develops before starting to actively make strategic actions.

Nonetheless, a compliance approach will be risky for banks who wish to strengthen or maintain their competitive position. None of the interviewed banking executives had considered this options as a strategic response to PSD2, which imply that this seems to not be a viable option.

7.2 RESPONSE 2: THE PROACTIVE APPROACH

The second possible response is a more proactive approach, which we have defined as banks providing new, value-added and aggregated banking services themselves. In this approach, PSD2 is regarded as an opportunity rather than a mandatory regulation they are obliged to comply with. Offering competitive services in the TPP field thus require customer data to be utilized and allow banks to increase customer relevance and provide superior user experience. This enables banks to maintain the customer interface, and reduce the possibility of banks becoming balance sheet providers.

We have identified three possible options within the proactive approach. One option is to develop solutions internally, a second way is to collaborate with competitive banks, and the third option is to collaborate with non-banks, such as FinTechs.

The latter two options containing collaboration is defined as coopetition, which depends on whether the partner can be regarded as a competitor to the bank. This is the case if the collaborative partner provides services within the same market as banks, for example in the market for payment services.

Option 1: Develop solutions internally

Development of solutions internally within the particular bank is one approach to expand the product catalogue. This requires development of digital skills and the bank becoming a relatively technical advanced organization. Capital and resources must be provided for investing in internal IT divisions for acquiring the relevant knowledge and know-how needed to support the path towards the desired positioning in the market. In this way, the bank is able to take the role as a TPP, such as a PISP and/or an AISP, and thus provide a wide selection of products to their customers.

Gaining the specific knowledge and competence needed could represent very high investment costs that capture large parts of the banks' resources. Always being updated on the technological development and having the relevant technological understanding in the organization at all times is quite demanding. However, banks hold huge capital holdings and are therefore suitable organizations to perform such large investments.

The major advantage of developing services internally within the bank and without any partnerships is the reduced possibility of being subject to business partners acquiring the

banks' customer base. When solutions are developed as an integrated part of the banks' activities, the bank is the only brand named in the service solution, and thus the only brand name the customer gets exposed to. The bank can thus benefit from maintaining the customer relationship.

Option 2: Collaboration with other banks

Providing new types of services can also be accomplished through direct collaboration with other banks. As banks operate in the same industry and compete at the same level, such a partnership is considered as coopetition. The participants in the coopetitive relationship compete and collaborate simultaneously. This type of collaboration entails both benefits and challenges for the collaborative partners.

Two heads are better than one

Exchanging knowledge and innovative technologies can be an essential part in order to be successful in the process of developing and providing new types of services. In collaboration with other familiar financial institutions that have the same background and complementary resources, the partners can thus share experience and exchange capabilities, and consequently gain a better innovation process than they would have on their own. Since banks share similar peculiarities such as high trust and are large and complex organizations, they can more easily combine their knowledge and resources. This can further accelerate innovation.

Gaining a strong position against newcomers

Additionally, having established a powerful and mutually beneficial coopetitive relationship can strengthen their competitive position against new market entrants such as FinTechs. This was the intention behind the already mentioned collaboration of 100 Norwegian banks that have jointly acquired a stake in Vipps. Banks joined the collaboration to make Vipps the single provider for mobile wallets for Norwegian customers, and consequently built a solid competitive advantage against new entrants in the payments market. A coopetitive collaboration aimed at strengthening market position against potential new entrants was also the intention behind the collaboration between Sbanken, Sparebanken Vest, Sparebanken Sogn og Fjordane and Sparebanken 1.

Risks of coopetition

A coopetitive relationship between two competitive banks may also represent some challenges. Competing banks have some conflicting interests, as both participants in the

alliance want as large customer bases as possible. Banks could potentially steal customers from each other, which could result in a vicious circle where both parts will suffer in the end. Unbalanced competition will therefore be harmful for both parties. Separating the two different parts in the coopetitive relationship, namely the competition part and the collaboration part, is of crucial importance.

Option 3: Collaboration with non-banks or third parties

Collaboration with non-banks is the third option within the proactive approach. FinTechs and banks have symbiotic sets of competitive advantages and challenges, making collaboration a win-win situation for both entities.

The value of exchange

FinTech firms' challenges are often the natural strengths of banks, and vice versa. They have a different set of competitive advantages, and through collaboration, mutual needs are identified and strengths swapped for a mutually-beneficial arrangement. Out interviewees from Handelsbanken argued that

"Banks have the money, FinTechs have the ideas"

A survey performed by PwC reveals that FinTechs' unique strengths are new technology, agility and providing enhanced customer experience. At the same time, banks are characterised with having secure infrastructure, existing customer base and customer familiarity as their greatest strengths (PwC, 2017). Exchanging these values can pave the way for new processes, where one party can influence the other party's way of thinking, whether applicable to areas such as business models, customer targeting or innovation processes.

Digital expertise and agility

Digital expertise and knowledge about advanced analysis of client information is a critical success factor for the development of new products and services, which is an area FinTech firms are experts in. A bank collaborating with a FinTech will thus gain positive outcomes, such as reduced development and innovation costs.

At the same time, the FinTech will have the opportunity of building their services on top of the bank's secure infrastructure, which implies less investment costs for the FinTech and helps them to focus on their core competencies. Due to relatively low regulation burdens on FinTechs compared to banks, and their possession of an innovative culture, FinTechs are able

to be more agile. Consequently they are able to experiment with new technologies and business models. This enables testing out new products, and hence develop products that have the best customer experience, and introduce the winner product through the partnership with the bank. These synergies will eventually foster better cross-selling opportunities for the bank. New clients can thus be covered, and new innovation processes can be developed.

Coopetition as the only way to survive

Collaborating with FinTechs in a coopetitive partnership can in some cases be seen as the only way to survive in the market. If a solution by a FinTech firm succeeds, implying high customer adoption and in turn reduced customer interaction for the bank, the bank can to some extent be forced to enter into a coopetitive partnership with the FinTech. Since banks' biggest threat is losing their customer interface, they must listen to customer needs, and thereby team up with those players that provide the most popular solutions among customers.

Coopetition is the most common action taken by financial institutions in the market for payments solutions (Deloitte, 2018). Nordea has as an example partnered with their FinTech competitor Tink, a firm operating in the field of payment systems, and Nordea is thus able to give their customers enhanced customer experience in their mobile application. The service functionalities developed by Tink is incorporated in Nordea's mobile app, and thus appears as though it has been developed by Nordea. Danske Bank is another example of a bank that has leveraged this opportunity by investing in and partnering with Spiir. In this coopetitve relationship, Spiir has developed functionalities that is incorporated in Danske Bank's online application.

Another coopetitive partnerships within the payments market is Sparebanken Vest and the FinTech firm Folio. The bank invested 25 million NOK in Folio to build an accounting and payment system for small and medium-sized enterprises, aimed at staying relevant for their customers (Sparebanken Vest, 2018).

Finding the right partner

Building a solid coopetitive relationship can also involve some challenges. As there are thousands of FinTech firms in different life stages and sizes, finding and choosing the right one can be an uphill battle. A bank that wants to collaborate should therefore focus on finding a partner which contains the right set of people, has a solid financial foundation, meets their

business needs, and provides secure technical solutions that is built to last and scale (Capgemini, 2018).

Risks of coopetition

Challenges may be encountered if the FinTech partner get a bad reputation due to a mistakes that are made. The collaborative third party could thus induce a negative impact on customers' trust to the bank and the brand name. This could be very harmful for the bank, as this is one of their most important strengths. Furthermore, this could impact the whole financial system in a negative way.

For a coopetitive partnership to become successful, commitment from both partners are required. Dissimilar business goals and interests can erode collaboration, which indicate that coopetition with a FinTech does not come without risk. One could imagine a situation where a FinTech profit from the bank's broad customer base to a large degree, consequently gets really big, and eventually establishes itself as a bank. A FinTech acquiring a banking license due to benefits harvested from coopetition with a bank could harm the bank, as the new established bank then could have the ability to steal customers from the bank. However, this is not a likely outcome, because bank establishment is a complex process and requires substantial capital investments.

Building mutual trust among partners in order to build a successful partnership is of high importance. They must constantly communicate about issues, goals and interests to constantly be sure that they both can foster a fruitful collaboration. Communication is also important for finding out who owns the customers, and how the revenues from the partnership should be distributed.

Similar to all options within the proactive response is the disruption of banks' existing business models and partnerships, and that customer needs are responded through new business ideas. This can strengthen their ability to maintain the customer interaction, and thus reduce the possibility of primarily becoming balance sheet providers.

7.3 RESPONSE 3: THE OPEN BANKING APPROACH

A third option for banks to respond to the changing competitive landscape and to remain their competitive position is to go beyond the scope of PSD2 and towards even more openness than is mandated by the regulation.

Together with changing customer expectations and technology advancements, PSD2 is said to be the main driver for Open Banking, as it forces banks to open parts of their banking data to third parties. However, PSD2 is limited in the sense that it only regulates the market for payment services, and the banks are only obligated to share data concerning their customers' transaction data. Although payment services and account information services act as important interfaces towards banks' customers, they are only the tip of the iceberg. Banks also offer their customers a wide variety of other banking services such as mortgages, managing of their valuables, conversion of securities and personalised advice on financial issues. Under PSD2, customer data on these services remain under the banks control, but nothing prevents banks to share also this data to third parties, given consent from the customer. In the following we will present an analysis of such an Open Banking response.

More openness

A first step towards what is known as Open Banking is banks opening more of their APIs, allowing third parties to gain access to more customer data and offer products related to banking services beyond payment initiation and account information services. This means that banks will be able to offer their customers even more innovative services through third parties.

Trends towards platfrom based business models

The final step for banking to become a completely open ecosystem is through banks enabling a platform-based banking system. During the last decade we have witnessed the emergence of platform-based economies in many industries. Look for example at the travel industry, where people through an intermediary such as Airbnb can find an available room in a different city, or they can compare and book hotels online through websites such as hotels.com. People no longer need to contact a hotel for accommodation when they, to a lower price and more conveniently, can find it with just a few clicks online or by using a mobile application. Such a business model has yet to be seen integrating banking services in Norway, but as customer expectations and regulations pushes change forward, banking as a platform has become a viable option to consider (EY, 2018).

Due to lack of examples in the Nordics and in Europe, it may be difficult to imagine how such a platform can look like and how banking fits into all of this. However, a quick glance towards Asia might help in understanding the possibilities of platform-based models and integrated banking services. The earlier described service AliPay and Tencent's WeChat in China represents excellent objects to study in this case. These platform based business models have a particular aspect that make them specifically powerful and sought. Apart from being a super app that brings convenience into the customer's life, the platforms are developed with a fixed investment costs and normally operate at near zero marginal cost. This makes them an attractive business model, as long as the customer base is large enough. As more people connect to the platform, the value of the platform increase, without increasing costs. When the platform is fully developed in the phase of forming the platform, it will not generate any costs at a later stage if more people get attracted and connect to it.

Platform monopoly

Customers have undisputedly embraced platforms in other industries, as we have seen from success stories like Uber, Airbnb, Facebook, Google and Microsoft. All these companies share one similar characteristic, their tendency of becoming sufficiently large, eventually evolving into platform monopolists. These platform businesses have come to dominate their respective markets through generating massive direct and indirect network effects which have created invaluable services (Platformed, 2018).

Assuming the evolution of platform based business model gets widely prevalent in the banking industry, an interesting question is whether also the banking industry will tend to one platform monopolist. Various arguments exist in favor of such an outcome. Having one major platform monopolist will drastically reduce problems of asymmetric information. The bigger the platform the more likely it is that a borrower will find a lender and vice versa. There is no doubt that transaction costs of searching and matching in order to find the right contract partner will be reduced in such a scenario. Furthermore, one major platform will have a range of products and services available, thereby matching a wider set of tastes (Refus Pollock, 2018). All financial products and services, such as all types of AISP and PISP services, offered at one place will make it possible to serve all kinds of customer needs and preferences. This will enhance customers' daily lives, as they no longer have to connect to many different brands, products and services. This creates a strong pressure on the market to just have one platform that provides all the customers' financial needs.

However, an outcome with one monopolist with major market power is a quite strange paradox, as one of the main objectives of PSD2 is to increase competition in the market. The introduction of PSD2 is aimed at fostering increased competition, but in the long run it may instead foster platform monopoly.

This paradox can partly be explained by the industry consolidation life cycle. Most new industries are first fragmented where many start-ups and new entrants quickly arise, trying to capture a market share. Eventually, industries will tend to being left with just a few players that have reached the critical mass that other competitors find it too hard to compete with. Industries will thus consolidate as they mature, resulting in a few dominant players (Harvard Business Review, 2002). Only the future will tell if we are to expect an evolution towards an Open Banking based business models in the financial market in Norway, and whether the tendency will be one dominating platform with major market power.

Advantages of more openness

First mover advantages

After studying relevant literature, reading articles from leading consulting firms and conversing with bank executives and industry experts, it has become clear that Open Banking is a concept that will not cease to exist in the near future. Atle Sivertsen from Finance Innovation explained clearly how he sees PSD2 as a first step towards Open Banking:

> *"The reason I think PSD2 is so important, is that it is not only relevant for viewing account information or initiate payments, which represents only a narrow part of banking. PSD2 is just the beginning of what we think about as Open Banking, which is so much more. Open Banking is about being able to combine value chains and service offerings in a completely new way. PSD2 is kick starting Open Banking and redefining what it means to be a bank."*

While the outcomes of Open Banking may be uncertain at this time, many experts claim that banking will in any event evolve into some form of an open ecosystem. PSD2 paves the way for the possibility of Open Banking, and the banks that start preparing for such a scenario could create a significant head-start over other banks on something that might be unavoidable in the near future.

First-mover advantages are also applicable in this case. Once a developer community and a base of end users have adapted a given platform, it becomes harder for competing platforms to achieve progress or even enter the market. As more users adapt the platform, the more

valuable the platform becomes and the first platform will in that way gain substantial direct and indirect network effects. Furthermore, having achieved a large customer base where customers have adapted to the platform's characteristics and functionalities will make it harder for new entrants to achieve a market share, as customers will regard it as time and cost consuming to change to a new platform. Being later to the market does not prevent a bank from succeeding, but it increases the burden on all the other conditions for platform growth (Medium, 2018).

New and innovative services

As customers to a larger degree are expecting real-time, personalised and seamless user experiences, and as competition within the banking industry is increasingly focused on delivering the best products to their customers, banks could use Open Banking as a means to meet customer needs and create additional distribution channels to their customers. By offering selected startups and FinTechs access to open APIs that go beyond what PSD2 require, banks will be able to offer even more innovative and customer oriented services. Banks will be able to introduce new services into the marketplace and profiting from them while being liberated from the possible costs and problems that the front-facing elements of retail banking contain (Capco, 2017).

By opening up more of their APIs, banks can appeal to their existing customers who see that their bank is moving beyond what traditional banks are expected to offer and are providing their customers with the newest and most innovative services available. Banks can also attract prospective customers if they are unable to use the newest and latest technology because their current bank is not embracing Open Banking APIs and thus are unable to provide such products (Mulesoft, 2018).

Monetising on premium APIs representing new revenue streams

Apart from creating new revenue streams from offering new product, banks could also monetise from their existing capabilities by offering open APIs as products to the marketplace. Ina Gjerstad from Nordea was the first to introduce us to the concept of viewing the banks' APIs as products that can be sold and profited from. Nordea has launched their own Open Banking developer portal, where developers can use the banks' APIs for retrieving account information details and initiating payments. During a pilot period, selected third parties will build applications on the APIs. The developer portal is currently limited to Sweden and Finland, but will be launched in all Nordics countries shortly (Nordea, 2017). SpareBank 1

Alliance's Developer Portal is yet another example of a bank who has launched an Open Banking developer portal (Sparebank 1 Gruppen, 2018)

An example of how APIs can be monetised is a credit reporting agency that has an internal API for assessing credit scores and other measures of consumer credit history. The potential of the API is limited when it is only used internally, but if it is introduced to the market place it could be used by other companies such as banks, loan companies or insurance companies in exchange for money to the credit reporting agency. This would mean a new stream of revenue for the agency and other firms would get access to valuable information and could incorporate new functions in their applications without having to develop the APIs and the systems themselves. Applying this to banking, banks can monetise from offering APIs other than those third parties are entitled to according to PSD2. Systems for creating revenue streams from APIs include a "data for data" based system, a transaction model where the receiver pays for each transaction the API enables, a per call payment structure that generates income for each time a third party use their APIs or a subscription based system (Capco, 2017).

As PSD2 requires non-discriminatory access to account information, Nordea's APIs used for accessing account information and initiating payments are free of charge to developers. However, they also present a Forex API, named FIX API, on their website that enables users of the API to execute Foreign Exchange (FX) spot, forward and swap trades automatically from the companies own systems (Nordea Markets, 2018). The FIX API represents a way for Nordea to monetise from APIs by introducing a premium product where developers need to pay a fee to gain access and thereby create possible new revenue streams for the bank.

Disadvantages of more openness

Losing customer interfaces

Similar to the threats of giving third parties access to the banks customer data, banks could lose part of their customer interfaces and lose important functions for retaining and attracting customers when they let third parties take care of their customer interactions. By letting FinTechs or other players access to more of the banks APIs, such as premium APIs, third parties will be able to make innovative solutions that banks currently are not offering. Such a solution could be a mobile application where customers can budget their finances, manage their debt, and get real-time investment and financial advice through a chat function. None of the Norwegian banks today offer such a service to their customers, which means that the banks would have enabled a start-up to fulfil an existing gap and creating distance between the bank

and the customer by opening up the API. Shifting customer interactions from their own platforms also means that cross selling opportunities for the banks can disappear (Mulesoft, 2018).

Risk exposure and security concerns

As mentioned, Open Banking is a new phenomenon meaning that the outcomes are still uncertain. Technical modifications and security issues are areas that pose a threat to the success of opening up more of their banking data. As it does for the required open APIs by PSD2, banks' risk of exposure to fraud, data leakage, identity theft or other security breaches still exist if they choose to open up even more of their data.

The response approach Open Banking goes a lot further than regulatory compliance. The feasibility and applicability of the concept in the Norwegian market, necessary technical and structural modifications as well as strategic advantages or disadvantages should be carefully examined before pursuing this course.

8. CONCLUSION

The implementation of PSD2 is set to accelerate the pace of competition and innovation due to new technology and the entry of third party service providers. Through an extensive review of PSD2 and the Norwegian banking and payments market, we have in this thesis identified the most important implications of PSD2 on traditional banks' competitive position. We have also identified three approaches for responding to the changes that follows from PSD2.

First of all, all Norwegian banks must comply with PSD2 and thus need to adapt their technical systems to satisfy the requirements in RTS. Based on our interviews with bank executives and industry experts, regulatory compliance and ensuring efficient and safe solutions is the banks' main focus in the time before PSD2 enters into force in Norway.

The far most discussed element of PSD2 is the access-to-account rule, which opens up the bank's value chain and lets third parties build services on top of the bank's infrastructure. By studying the payment flow before and after PSD2 is implemented, we have shown how this can alter the role banks play in the payments value chain.

The access-to-.account rule in PSD2 also marks the end of an era where banks have had a monopoly on customers' transaction data. Due to a lack of profit generating activities in the payments market in Norway, many of the industry experts we have talked to have questioned the ability of AISPs or PISPs to offer profitable services in the market. However, we find access and insight to a customer's consumption pattern to be the most attractive revenue generating aspect for entry to the payments market.

Access to customer data and FinTechs and BigTechs presence in the payments market are the strongest argument for PSD2 resulting in an increased pace of innovation and competition. With FinTechs' and BigTechs' ability to offer innovative solutions and taking advantage of customer data, their chances of success are without doubt high. Banks on their hand, who have been subject to heavy regulation and have evolved into large and complex organisation, might be less able to keep up with the increased pace of innovation PSD2 is paving the way for.

The main implication for banks regarding third parties' access to the customer's payment accounts and thus increased competition is the loss of customer interactions and third parties taking over their cross-selling opportunities. In a worst-case scenario banks can be reduced to solely function as balance-sheet providers.

However, we have seen how the implications of PSD2 will ultimately be decided by the consumer's adoption rate of solutions offered by TPPs. The big question is whether they will embrace new solutions from FinTechs and BigTechs or if they still will rely on, and only trust established players in the financial industry. On one hand, customers demand innovative and personalised services, which technology firms specialise on. On the other hand, our research has shown that consumers in Norway have a particularly high confidence in banks to provide for their financial services. Trust will thus be weighed against the enhanced value of the provided service.

An increased pace of competition and innovation resulting from PSD2 indicates a necessity for strategic measures. Through conversations with bank executives and witnessing most Norwegian banks being proactive in their approach to PSD2, we find our identified compliance approach to be risky for banks who wish to maintain or strengthen their competitive position. Being proactive through developing innovative solutions internally or by collaborating with other banks or third parties will be more effectful in the purpose of remaining competitive. As PSD2 paves way for an Open Banking ecosystem and customers expect a more seamless digital customer journey than ever before, an approach facilitating the creation of platforms with integrated banking solutions can prove a viable strategic option for banks.

While the implications of PSD2 to this date are uncertain, working with this thesis has made it clear that the banking industry will undisputedly be subject to many changes in the upcoming years, and banking as we know it today will not be the same five to ten years from now. With reference to the famous quotation made by Bill Gates; it may be true that banks are not necessary, but banking is, and will continue to be.

8.1 OUTLOOKS FOR THE FUTURE

As PSD2 and the technical standards are yet to be implemented in Norway and the evolution of the new competitive landscape is still in its early stages, the future of banking and payments is difficult to predict. Based on the current movements of banks, FinTechs and BigTechs so far observed in the market, and the opinions of banking executives and industry experts we can still provide some insight into how the market might evolve in the upcoming years.

RTS is expected to enter into force around one year from now, but we have already witnessed actions being taken by banks, FinTechs and other players that can indicate what we might expect ahead. The innovation and technology advancements in financial services we have seen until now is not a result of PSD2 but a result of changing customer expectations and innovation in the financial industry. However, we do expect PSD2 to further accelerate the pace of innovation and increase the provision and diversity of products and services in the market.

FinTechs

While we have seen startups and FinTechs emerge in the market for some years now, entry barriers have been high. As PSD2 enters into force however and lower some of these barriers, we expect to see even more startups enter the market, testing their services in the marketplace and offering new and innovative ways for the consumer to perform their everyday banking services.

What we are witnessing today and that we expect to see for some time to come is a fragmented market where several FinTechs compete with each other and against incumbents to attract customers - without any of them having enough influence to move the industry in a certain direction. After a while there might be a market consolidation where there first is a shake-out of successful FinTechs from unsuccessful, and later a consolidation of the firms emerging from an aspiration of growth and increased market share.

As many of the services' success depends on direct network effects, customer reach and engaged users, the benefits for FinTechs in being first movers in the industry are many. The battle of attracting users has already begun, and we see that FinTechs are either collaborating with established banks to gain customer reach or trying independently to create a strong brand for themselves. We have seen how FinTechs can benefit from entering into partnerships with incumbents and leveraging their trust and existing customer bases, and expect to see more collaboration between FinTechs and banks in the time to come.

Banks

While banks do not have much say in whether they want to give third parties access to customer data or not and must comply with regulation, we have seen banks take action that go beyond compliance in order to stay relevant and to be able to compete against both current and new competitors. Interviews with executives in large Norwegian banks have also led us to the conclusion that Norwegian banks are taking the implications of PSD2 seriously and are already addressing the need for adjusting to the forthcoming changes.

We have observed banks introducing several initiatives concerning Open Banking, such as SpareBank 1 Alliance's Developer Portal and Nordea's Open Banking Developer Portal. Many banks are also exploring and entering into partnerships with FinTech companies, and we suspect the banks will continue to launch new and more innovative solutions as a result of collaboration with startups.

Collaboration with existing players within the industry is yet another strategic approach banks are looking at to respond to increasing competition and as an effort to reduce the threat of BigTechs and FinTechs taking over their customer relations.

Vipps and the merger with BankAxept and BankID is a further measure many Norwegian banks are using as a means to withstand increasing competition. Their success and strength in the Norwegian market combined with current direct network benefits and further plans for innovation and expansion leads us to believe that they will not be outcompeted by FinTechs in the near future.

BigTechs

Both Apple Pay and Google Pay were launched in Norway during 2018, indicating that Norwegian banks will likely not escape the intrusion of Big Techs in financial markets. Although many banks have been able to diminish the threat by not collaborating with them and not allowing their customers to use their services, we do not think this is the last we will see of BigTechs offering financial services in Norway. Valuable insight can be derived from a customer's consumption pattern based on transaction data, which is likely something these firms are interested in getting their share of the pie of. Even though they have not disrupted the industry quite yet, their huge resources for innovation, large amounts of customer data and direct network benefits suggest that they do not need to be the first ones to enter the market in order to obtain a significant market share in a short amount of time.

We thus believe they still represent a real threat to incumbents, and we expect to see BigTechs delivering more payment services and banking services to their users during the next few years.

Services

The common denominator for what banks, FinTechs and BigTechs all are aiming to offer their customers is faster, easier and a more seamless payment experience. Payments have always been important and will presumably continue to be important in the future, but the actual exchange of money will likely become more invisible. We believe the industry is moving in a direction where payments are frictionless and only make up a small and simple step of a customer journey. We might first observe an acceleration in the use of mobile payment solutions and digital interfaces for handling financials both for firms and individuals, before we see a move towards an unmitigated integration of financial services which finally could evolve into an open banking ecosystem. We do not believe change will happen overnight, but we do see that change is happening as we speak and that PSD2 is considerably contributing to the cause.

Will Open Banking set foot in Norway?

There is no denying that PSD2 facilitates the concept of Open Banking and to an evolution towards a platform-based banking model where payments and financial management is merely an integrated part of a frictionless customer journey.

Realizing that AmazonGo and AliPay was brought up in almost every conversation we had with industry experts and in the seminars we attended, made it clear that the industry is looking towards Asia and the U.S. for inspiration on how a seamless customer journey, where payments is but an integrated part of it, can function. The previously described service of AliPay represents an example of the extremity we can expect the market to evolve into.

However, we see no indication in the Norwegian market that a bank or a player outside of the financial sector will evolve as the Norwegian response to AliPay, weChat or AmazonGo in the near future. We might see AliPay or other BigTechs moving into international markets and gaining market share in Norway in a few years if there exists no substitute for it in Norway. But acknowledging again the high trust Norwegian consumers place in banks and the benefits of a free and well-functioning payment system consumers are currently enjoying, it might

prove difficult for players both outside of the financial industry in Norway and international players such as AliPay to pass the threshold in the Norwegian market.

What will the banks position look like in the future

In light of the high trust Norwegian customers have proved to place in banks to handle their financials, we believe that FinTechs to some extent will struggle in obtaining the support of the consumers. Consumers might need some time to adapt to the changes and explore the landscape of new services available, giving also the banks more time to adapt and respond to what the customers are demanding. Even though innovation in finance is gaining increasing attention, it is not a given that consumers will jump on the bandwagon right away. Many will be sceptical of letting other than the banks handle their money, but we do expect younger generations to be more open to adapt and try financial services from third parties. In any case, what has become inevitably apparent, is that the consumers respond to the changes will be the key to how the market evolves when PSD2 is in place.

The joker for the banks in this game are the BigTechs. The banks are to our understanding paying close attention to their moves in the financial industry in international markets, and is viewed to be a bigger threat to banks than FinTechs. As they are in possession of enormous economic resources and large user bases, they are likely to have the largest impact on the possible loss of the banks customer interfaces if they choose to enter the market.

At last, many of the reviewed articles have deliberated on the probability of banks ending up as utilities after PSD2 is in full effect. As we have seen many of the largest Norwegian banks being proactive to the changes that will follow from the regulation, and due to the fact that it is likely that the consumers trust in banks will persist at least for some time to come, we see it as unlikely that Norwegian banks will become utilities in the near future, if they do not wish to be. While it may be true that banks are not necessary, we do not believe they will cease to exist in the near future.

8.2 FUTURE REASEARCH QUESTIONS

During the period of time we have worked with this thesis, it has become clear that the competitive landscape in the payments market in Norway is in its early stages and still taking form. Third party service providers such as Dreams launched their savings app in the Norwegian market during the fall of 2018. Danske Bank launched their account overview service, the partnership between Vipps and Alipay was announced, and Sbanken, Sparebanken Vest, Sparebanken Sogn og Fjordane and Sparebanken 1 reported their cooperation on account overview services. These initiatives are only a few examples demonstrating the rapid development in the industry, even before PSD2 has entered into force in Norway. As we expect competition and innovation to further accelerate in the next few years, banks could be faced with other implications than those identified in this thesis and the market could take other directions than what we have predicted here. Hence, it would be interesting to answer a similar research question after PSD2 has been implemented and after the market, relevant players and customers have had time to adapt to the changes PSD2 entails. Furthermore, it would be interesting to explore the actual effects of PSD2 for banks, and see if their competitive position has been significantly changed, looking at e.g. potential declines in profit, customers or market share. Additionally, one could look at which banks have succeeded in the new competitive market, which strategies have worked and why they have been successful.

In this thesis we have emphasized the importance of customer preferences for the success of both banks and new players. As of this date, it seems Norwegian consumers have a particularly high trust in banks and the financial systems to take care of their financial needs. Customer expectations are however dynamic and can change over time, thus another interesting approach can be to investigate and test consumer's response to third parties offering financial services. To find the future market potential of payment initiation services and account information services, a deeper look into customer preferences of payment services may contribute to valuable insight.

Moreover, in our conversation with experts within the banking sector, concerns about the security of payments when third parties are involved and the potential risk of sharing customer data has been brought up. It can thus be relevant to address these concerns, and research if banks have faced a larger risk level when opening up their APIs to third parties. Equally, with the EU General Data Protection Regulation (GDPR) implemented in 2018, a focus on data privacy has gained increasing attention. As the access-to account rule involves sharing of

customer data, it could thus be interesting to view PSD2 in light of GDPR and study the implications of PSD2 on data privacy and consumer protection.

Finally, this research has opened our eyes to what is happening in the rest of the world, and especially China where the success of platforms, such as AliPay and weChat, is particularly visible. In this thesis, we have only touched upon the subject and have not extensively deliberated on the potential in Norway. It can thus be interesting to study the possibilities of a platform based banking system in Norway and look closer at the implications for banks if the market evolves into an increased use of platforms integrating a wide range of financial services.

Inevitably, PSD2 and its potential implications for the relevant players in the industry appears as a field of study with significant potential for future research.

REFERENCES

Accenture. (2017). *Beyond Digital: How can banks meet customer demands?* Retrieved December 18, 2018, from https://www.accenture.com/t20170125T114252Z__w__/us-en/_acnmedia/Accenture/next-gen-3/DandM-Global-Research-Study/Accenture-Banking-Global-Distribution-Marketing-Consumer-Study.pdfla=en

Accenture. (2018). *Payments Models for the Digital Age*. Retrieved December 19, 2018, from https://www.accenture.com/t20180717T083406Z__w__/us-en/_acnmedia/PDF-81/Accenture-Payments-in-the-Digital-Age.pdf

Accuray Research LLP. (2018). *Global Contactless Payment Market Analysis & Trends-Industry Forecast to 2027.* Retrieved December 13, 2018, from https://www.reportbuyer.com/product/5143291/proximity-mobile-payment-market-global-industry-analysis-size-share-growth-trends-and-forecast-2017-2022.html?fbclid=IwAR3bZdtmFfuDfCZTPcR55TaEoVna4KvGuUoFinSXVH8dGU_c5SHFtjSJqMM

Aftenposten. (2018, June 20). *Norske bankkunder får tilgang til Apples betalingstjeneste*. Retrieved November 6, 2018, from https://www.aftenposten.no/okonomi/i/21evzv/Norske-bankkunder-far-tilgang-til-Apples-betalingstjeneste

AliPay. (2018). Retrieved October 19 2018, from https://intl.alipay.com

AliPay. (2018). *QR Code Payment*. Retrieved December 13, 2018, from https://intl.alipay.com/open/product-transaction-qr.htm

AliPay. (2018). *Supported Merchants*. Retrieved December 12, 2018, from https://intl.alipay.com/ihome/home/about/buy.htm?topic=supportedMerchants

Amazon. (2018). Retrieved November 4 2018, from https://www.amazon.com/b?ie=UTF8&node=16008589011

Andreassen, T. W. (2017, November 20). Vipps mot verden. Retrieved November 6, 2018, from https://www.nhh.no/nhh-bulletin/artikkelarkiv/2017/november/vipps-mot-verden/

Angelshaug, M., & Saebi, T. (2017). *The burning platform of retail banking.* The Norwegian School of Economics. The European Business Review. Retrieved September 10, 2018, from https://l.facebook.com/l.php?u=https%3A%2F%2Fwww.nhh.no%2Fcontentassets%2F0a486fcc94e645dd8b145d27dd8eb908%2Fthe-burning-platform-of-retail-banking.pdf%3Ffbclid%3DIwAR058tETLwTi96RoblSjHH2BaHaLl9bPVxQvNId1izNmC_tfeaGROIbkCag&h=AT3_eMfBS16_3BgEGqB6uT9g82mP

Apple. (2018). *Apple Support*. Retrieved December 13, 2018, from https://support.apple.com/en-us/HT203027

Apple. (2018). *ApplePay*. Retrieved December 13, 2018, from https://www.apple.com/apple-pay/

Baller, S., Dutta, S., & Lanvin, B. (2016). *The Global Information Technology Report 2016.* The World Economic Forum and INSEAD, Geneva. Retrieved October 15, 2018, from http://www3.weforum.org/docs/GITR2016/WEF_GITR_Full_Report.pdf

Balyuk, T., & Davydenko, S. (2018). *Reintermediation in FinTech: Evidence from Online Lending.* Retrieved December 9, 2018

BankAxept. (2018). *Om oss* . Retrieved October 19, 2018, from https://bankaxept.no/om-oss/

BankID. (2018). *Om Oss*. Retrieved December 13, 2018, from https://www.bankid.no/privat/om-oss/

Belleflamme , P., & Peitz, M. (2016). *Platforms and network effects.* Retrieved September 22, 2018

Bengtsson, M., & Kock, S. (2000). *"Coopetition" in Business Networks- to Cooperate and Compete Simultaneously.* Retrieved September 10, 2018, from https://ac.els-cdn.com/S001985019900067X/1-s2.0-S001985019900067X-

main.pdf?_tid=61f78903-6158-40ad-b3aa-9733cd7f171d&acdnat=1539858117_e62a391bbc8bcd2d465a072de4442ac1

Bengtsson, M., & Kock, S. (2000). *"Coopetition" in business networks: to cooperate and compete simultaneously* . Ind Mark Manag.

Berger, A., & Dick, A. (2006). *Entry into Banking Markets and the Early-Mover Advantage.* Retrieved September 10, 2018, from https://www.jstor.org/stable/pdf/4494273.pdf?refreqid=excelsior%3A12c87bfcc98f7642909ec6ce5fa88f60

BITS. (2017). *Regler om straksbetalinger.* Retrieved December 13, 2018, from https://www.bits.no/document/regler-om-straksbetalinger-2/?fbclid=IwAR3nwX17I3MSI--EZ90Hhwtxt5RTNnnU9xMyNkOa143OR89EZyf4OIgdCMU

BITS. (2018, April 4). *PSD2-kravene om sterk kundeautentisering og kommunikasjonssikkerhet ble publisert i EU-tidene 13. mars*. Retrieved December 12, 2018, from https://www.bits.no/psd2-kravene-om-sterk-kundeautentisering-og-kommunikasjonssikkerhet-ble-publisert-i-eu-tidende-13-mars/

Bloomberg. (2015, November 17). *Banks too slow to modernize core systems*. Retrieved September 12, 2018, from https://www.bloomberg.com/professional/blog/banks-too-slow-to-modernize-core-systems/

Boulding , W., & Christen, M. (2001, October). *First-Mover Disadvantage*. Retrieved September 13, 2018, from http://ged.insead.fr/fichiersti/inseadwp2001/2001-03.pdf

Bouncken, R., Gast, J., & Kraus, S. (2015). Coopetition: A review, Synthesis, and Future Research Directions. In *Review of Managerial Science* .

Business Insider. (2016, December 8). *Facebook Payments are coming to Europe*. Retrieved September 26, 2018, from https://www.businessinsider.com/facebook-quietly-secures-an-e-money-license-in-ireland-2016-12?r=US&IR=T&IR=T

Campbell, S. (2018, August 16). *FsForum*. Retrieved December 19, 2018, from When Bigger is Beneficial: Scale Economies in the Banking Industry:

https://www.fsforum.com/types/press/blog/blog-when-bigger-is-beneficial-scale-economies-in-the-banking-industry/

Capco. (2017). *The future of open banking: Monetize your bank's APIs*. Retrieved October 11, 2018, from https://www.capco.com/Intelligence/Capco-Intelligence/The-future-of-open-banking-How-to-monetize-your-banks-API

Capgemini. (2018). *World Fintech Report 2018.* Retrieved September 29, 2018, from https://www.capgemini.com/wp-content/uploads/2018/02/world-fintech-report-wftr-2018.pdf

Capgemini. (2018). *World Payments Report 2018*. Retrieved December 12, 2018, from https://worldpaymentsreport.com/wp-content/uploads/sites/5/2018/10/World-Payments-Report-2018.pdf

Capgemini. (2018). *World Retail Banking Report 2018.* Retrieved December 13, 2018

Cayanne Consulting. (2018). *The Fallacy of First Mover Advantage*. Retrieved December 10, 2018, from https://www.caycon.com/blog/2014/02/the-fallacy-of-first-mover-advantage

Central banks guide. (2015). *Banking Industry Regulation.* Retrieved September 29 29, 2018, from http://centralbanksguide.com/banking+industry+regulation/

Corporate Finance Industry. (2018). *What is the First Mover Advantage?* Retrieved September 11, 2018, from https://corporatefinanceinstitute.com/resources/knowledge/strategy/first-mover-advantage/

Dagens Næringsliv. (2017, February 13). *Over 100 banker inngår Vipps-samarbeid med DNB*. Retrieved December 17, 2018, from https://www.dn.no/marked/dnb-dnb/vipps/over-100-banker-inngar-vipps-samarbeid-med-dnb/2-1-41067

Dagens Næringsliv. (2018, June 20). *DNB takker nei til ApplePay*. Retrieved November 6, 2018, from https://www.dn.no/teknologi/mobilbetaling/fintech/apple-pay/dnb-takker-nei-til-apple-pay/2-1-361698

Dagens Næringsliv. (2018, December 10). Vipps-sjef Berit Svendsen hjelper Kina-gigant inn i Norge. Retrieved December 10, 2018, from https://www.dn.no/marked/vipps/sparebanken-vest/mobilbetaling/vipps-sjef-berit-svendsen-hjelper-kina-gigant-inn-i-norge/2-1-497597?_l

Dale, R. (2018). *Regulating the New Financial Markets*. Retrieved September 30, 2018, from https://www.rba.gov.au/publications/confs/1996/pdf/dale.pdf

Danske Bank . (2018, November 16). *Cash Management.*

Danske Bank. (2018, September 18). *Lar deg samle alle dine bankkontoer i èn app*. Retrieved September 11, 2018, from https://danskebank.no/stories/teknologi-og-innovasjon/lar-deg-samle-alle-dine-bankkontoer

Datatilsynet . (2018). *Personlige finanser* . Retrieved October 15, 2018, from https://www.datatilsynet.no/globalassets/global/om-personvern/rapporter/personlige-finanser_rapport2018.pdf

Deloitte. (2011). *Finally: Customer Analytics for Banks.* Retrieved October 16, 2018, from https://www2.deloitte.com/content/dam/Deloitte/us/Documents/process-and-operations/us-cons-customer-analytics-102711.pdf

Deloitte. (2017). *More than just a phone- A study on Nordic mobile consumer behaviour.* Retrieved December 16, 2018, from https://www2.deloitte.com/content/dam/Deloitte/fi/Documents/technology-media-telecommunications/GMCS%202017_digital_nordic_cut_final.pdf

Deloitte. (2018). *FinTech in the Nordics.* Retrieved November 30, 2018, from https://www2.deloitte.com/content/dam/Deloitte/se/Documents/financial-services/FinTech_Publikation_A4_WEB_FINAL.PDF

Det Kongelige Finansdepartement. (2018). *Finansmarkedsmeldingen 2018.* Finansdepartementet. Retrieved from Regjer: https://www.regjeringen.no/contentassets/82cd2c146891461e9ac8a3aec2a5e6f5/no/pdfs/stm201720180014000dddpdfs.pdf

Difitek. (2018). *PSD2 Compliance Checklist*. Retrieved December 18, 2018, from https://www.difitek.com/psd2

DinSide. (2018, February). *Nå kan penger endelig bli morsomt igjen*. Retrieved November 19, 2018, from https://www.dinside.no/okonomi/na-kan-penger-endelig-bli-morsomt-igjen/69349560

Disover.Jackhenry. (2018, May 2). *FinTech vs. BigTech and What Community FIs Should Know*. Retrieved October 8, 2018, from https://discover.jackhenry.com/strategicallyspeaking/fintech-vs.-bigtech-and-what-community-fis-should-know

DNB. (2018, December 13). *Samarbeidet med AliPay gir Vippserne nye muligheter*. Retrieved December 13, 2018, from https://www.dnbnyheter.no/privatokonomi/samarbeidet-med-alipay-gir-vippserne-nye-muligheter/

Dreams. (2018). *Om oss*. Retrieved November 6, 2018, from https://www.getdreams.com/no/om-oss/

E24. (2017, September 6). *Verdens største betalingsløsning lanseres i Norge- men ikke for nordmenn*. Retrieved November 7, 2018, from https://e24.no/naeringsliv/teknologi/verdens-stoerste-betalingsloesning-lanseres-i-norge-men-ikke-for-nordmenn/24133447

E24. (2017, September 6). *Verdens største betalingsløsning lanseres i Norge- men ikke for nordmenn*. Retrieved December 13, 2018, from https://e24.no/naeringsliv/teknologi/verdens-stoerste-betalingsloesning-lanseres-i-norge-men-ikke-for-nordmenn/24133447

E24. (2018, October 30). *GooglePay lanseres i Norge*. Retrieved November 1, 2018, from https://e24.no/naeringsliv/google/google-pay-lanseres-i-norge/24475843

Estrada , L., & de Farina, P. (2016). Coopetition and product innovation performace: The role of internal knowledge sharing mechanisms and formal knowledge protection. In *Industrial Marketing Management.* Industrial Marketing Management.

European Banking Authority. (2017). *Final Report: Draft Regulatory Technical Standards*. Retrieved October 3, 2018, from https://www.eba.europa.eu/documents/10180/1761863/Final+draft+RTS+on+SCA+and+CSC+under+PSD2+%28EBA-RTS-2017-02%29.pdf

European Commission. (2018). *Infringement procedure*. Retrieved December 13, 2018, from https://ec.europa.eu/info/law/law-making-process/applying-eu-law/infringement-procedure_en

European Commission. (2018). *Payment services*. Retrieved December 13, 2018, from https://ec.europa.eu/info/business-economy-euro/banking-and-finance/consumer-finance-and-payments/payment-services/payment-services_en#eu-rules-on-payment-services

European Commission. (2018, February 19). *Payment Services Directive: Frequently Asked Questions*. Retrieved October 1, 2018, from http://europa.eu/rapid/press-release_MEMO-07-152_en.htm?locale=en

European Commission. (2018). *The European Single Market.* Retrieved December 11, 2018, from https://ec.europa.eu/growth/single-market_en

European Commission. (2018). *Types of EU law*. Retrieved December 13, 2018, from https://ec.europa.eu/info/law/law-making-process/types-eu-law_en

European Commission. (2018). *USe of Internet and Online Activities*. Retrieved December 19, 2018, from https://ec.europa.eu/digital-single-market/en/use-internet?fbclid=IwAR0vGqca12080o4bejTLbWWo0UzE0gAo1RP7_zUItWpUICTIzqftA3-aOJE

European Payments Council. (2017). *Understanding the Financial Regulatory Technical Standards.* Retrieved October 6, 2018, from https://www.europeanpaymentscouncil.eu/sites/default/files/infographic/2018-02/EPC%20infographic%20on%20the%20RTS%20on%20strong%20customer%20authentication_February%202018.pdf

European Payments Council. (2018). *SEPA timeline*. Retrieved October 2, 2018, from https://www.europeanpaymentscouncil.eu/about-sepa/sepa-timeline

Evans, D. S. (2016). *Multisided platforms, dynamic competition, and the assessment of market power for internet-based firms.* Retrieved September 21, 2018, from https://poseidon01.ssrn.com/delivery.php?ID=963020092123087104013084125074029073033078047010022006094075112002102116011024117007006058039044111113028124005083125067003100123082069048092107122072093105095031035093015123098103127110065009126126100113086126 1

EVRY. (2017). *Open Banking Transformation.* Retrieved December 13, 2018, from https://www.evry.com/globalassets/files/financialservices/final-open-banking-f170214_webb.pdf

EVRY. (2017). *PSD2- Strategic opportunities beyond compliance.* Retrieved October 1, 2018, from https://www.evry.com/globalassets/bransjer/financial-services/bank2020/wp_psd2/psd2_whitepaper.pdf

EY. (2018). *A vision for platform-based banking*. Retrieved October 12, 2018, from https://www.ey.com/Publication/vwLUAssets/ey-a-vision-for-platform-based-banking/$File/ey-a-vision-for-platform-based-banking.pdf

EY. (2018). *The revised Payment Services Directive (PSD2).* Retrieved October 17, 2018, from https://www.ey.com/Publication/vwLUAssets/Regulatory_agenda_updates_PSDII_Luxembourg/$FILE/Regulatory%20agenda%20updates_PSDII_Lux.pdf

F10. (2017, December 21). *BigTechs- The New Banks?* Retrieved November 20, 2018, from https://www.f10.ch/bigtechs-the-new-banks/

Financial Conduct Authority. (2017). *Guidance on the scope of the Payment Services Regulatins 2017.* Retrieved November 10, 2018, from https://www.handbook.fca.org.uk/handbook/PERG/15.pdf

Financial Times. (2017). *Blurring the lines of banking in China*. Retrieved November 3, 2018, from https://www.ft.com/content/ef39e678-632f-11e8-90c2-9563a0613e56

Finans Norge. (2014, November 10). *Behov for bedre regulering*. Retrieved September 30, 2018, from https://www.finansnorge.no/aktuelt/nyheter/2014/11/behov-for-bedre-regulering

Finans Norge. (2016, March 15). *Finansregulering koster oss milliarder*. Retrieved December 8, 2018, from https://www.finansnorge.no/aktuelt/nyheter/2016/03/finansregulering-koster-oss-milliarder/

Finans Norge. (2016, March 8). *Vi blir stadig mer digitale i vår bankbruk*. Retrieved October 1, 2018, from https://www.finansnorge.no/aktuelt/sporreundersokelser/dagligbankundersokelsen1/dagligbankundersokelsen-2016/vi-blir-stadig-mer-digitale-i-var-bankbruk/

Finans Norge. (2018, July 2). *Apple hindrer konkurranse*. Retrieved December 13, 2018, from https://www.finansnorge.no/aktuelt/nyheter/2018/07/les-hele-apple-hindrer-konkurranse/

Finans Norge. (2018). *Forbruker- og finanstrender 2018.* Retrieved October 2018, from Finansnorge.no: https://www.finansnorge.no/aktuelt/sporreundersokelser/forbruker-og-finanstrender/forbruker--og-finanstrender-2018/forbruker--og-finanstrender-2018/

Finans Norge. (2018, March 13). *Hvorfor bytter ikke flere kunder bank?* Retrieved October 5, 2018, from . https://www.finansnorge.no/aktuelt/sporreundersokelser/forbruker-og-finanstrender/forbruker--og-finanstrender-2018/hvorfor-bytter-ikke-flere-kunder-bank/

Finans Norge. (2018, June 15). *Ja til fusjon mellom Vipps, BankID og BankAxept*. Retrieved November 6, 2018, from https://www.finansnorge.no/aktuelt/nyheter/2018/06/ja-til-fusjon-mellom-vipps-bankid-og-bankaxept/

Finans Norge. (2018, June 15). *Ja til fusjon mellom Vipps, BankID og BankAxept*. Retrieved September 15, 2018, from https://www.finansnorge.no/aktuelt/nyheter/2018/06/ja-til-fusjon-mellom-vipps-bankid-og-bankaxept/

Finans Norge. (2018, March 29). *Kortbetaling trumfer kontantbetaling*. Retrieved October 19, 2018, from https://www.finansnorge.no/aktuelt/sporreundersokelser/forbruker-og-finanstrender/forbruker--og-finanstrender-2018/kortbetaling-trumfer-kontantbetaling/

Finans Norge. (2018, March 23). *På bare tre år har tre av fire nordmenn tatt i bruk Vipps*. Retrieved November 4, 2018, from https://www.finansnorge.no/aktuelt/sporreundersokelser/forbruker-og-finanstrender/forbruker--og-finanstrender-2018/pa-bare-tre-ar-har-tre-av-fire-nordmenn-tatt-i-bruk-vipps/

Finansdepartementet. (2014). *Innstilling til Stortinget frå finanskomiteen*. Retrieved October 5, 2018, from https://www.stortinget.no/globalassets/pdf/innstillinger/stortinget/2013-2014/inns-201314-214.pdf

Finansdepartementet. (2015, January 27). *Digitalisering av finansbransjen- Er Norge klar for den?* Retrieved October 12, 2018, from https://www.regjeringen.no/no/aktuelt/digitalisering-av-finansbransjen---er-norge-klar-for-den/id2364061/

Finanstilsynet. (2017). *Banking and finance* . Finanstilsynet .

Finanstilsynet. (2018). *PSD2.* Retrieved October 10, 2018, from https://www.tu.no/filer/EVENT/FinDig18/Olav_Johannessen_-_Finanstilsynet_-_PSD2.pdf

Forbrukerrådet. (2014, April 25). *Endelig skal det bli enklere å bytte bank*. Retrieved October 1, 2018, from .https://www.forbrukerradet.no/pressemelding/endelig-skal-det-bli-enklere-a-bytte-bank/

Fortune. (2018, April 10). *Facebook Cambridge Analytica Scandal: 10 Questions Answered*. Retrieved November 1, 2018, from http://fortune.com/2018/04/10/facebook-cambridge-analytica-what-happened/

Foundation Capital. (2017). *A Trillion Dollar Market By the People, For the People.* Retrieved December 9, 2018, from https://foundationcapital.com/assets/whitepapers/TDMFinTech_whitepaper.pdf

Girish. (2010, January 6). *Cross Selling at Banks:Adopting the Right Strategy for a Healthy Bottom Line*. Retrieved December 18, 2018, from

http://customerthink.com/cross_selling_at_banks_adopting_right_strategy_for_health_bottom_line/

Gnyawali, D., & Park, B. (2009). Co-opetition between giants: Collaboration with competitors for technological innovation. In *Research Policy.*

Gremez, B. (2017, October 22). *How regulations can increase competition and innovation in the banking sector: the EU example*. Retrieved December 12, 2018, from Medium: https://medium.com/@brunogremez/how-regulations-can-increase-competition-and-innovation-in-the-banking-sector-the-eu-example-329fb1394db9

Haare, H., & Solheim, J. (2011). *Utviklingne av det norske betalingssystemet i perioden 1945-2010, med særlig vekt på Norges Banks rolle.* Retrieved November 11, 2018

Hagiu, A., & Rothman, S. (2016). *Network Effects Aren't Enough.* Harvard Business Review. Retrieved September 22, 2018, from https://hbr.org/2016/04/network-effects-arent-enough

Hagiu, A., & Wright, J. (2015). *Multi-sided platforms.* Retrieved September 10, 2018, from https://poseidon01.ssrn.com/delivery.php?ID=570005095083086100014005102064019104100051081067090053088027117105127023070073087070039012044061104010048120014112100088087120019053041013058003000006001089070031020022037105117083118073110021118102023022101094O

Hannestad, S. (2017). Fintech in the Nordic. Retrieved November 13, 2018, from https://www.finansnorge.no/contentassets/19974285919543ecb0ab0ee98777d143/susanne-hannestad-fintech-mundi.pdf?fbclid=IwAR13h4C4Sd4uJ2tGKLFXCpiBE23_7-yM-AIDz_kgFujDeQKQI9BGHgmIpQs

Harbison, J., Pekar, P., & Stasior, W. (1998). *Smart alliance: a practical guide to repetable success.* San Francisco: Jossey-Bass.

Harvard Business Review. (1989, February). *Collaborate with Your Competitors- and Win*. Retrieved December 8 2018, from https://hbr.org/1989/01/collaborate-with-your-competitors-and-win

Harvard Business Review. (2002). *The Consolidation Curve*. Retrieved December 10, 2018, from https://hbr.org/2002/12/the-consolidation-curve

Harvard Business Review. (2016, April). *Network Effects Aren't Enough*. Retrieved September 13, 2018, from https://hbr.org/2016/04/network-effects-arent-enough

Heimler, A. (2006). *Competition policy, antitrust enforcement and banking: Some recent developments.* Retrieved September 30, 2018

Hernæs, C. (2016, April 17). *The ultimate guide to fintech in Norway*. Retrieved November 13, 2018, from Hearnaes.com: http://hernaes.com/2016/04/17/the-ultimate-guide-to-fintech-in-norway/

Hernæs, C. (2018, August 8). *Banker i Finance Innovation-klyngen starter PSD2 i forkant av hva som er påkrevd*. Retrieved September 19, 2018, from https://hernaes.com/2018/08/08/banker-i-finance-innovation-klyngen-starter-psd2-i-forkant-av-hva-som-er-pakrevd/

Holstad, K. (2017, OCtober 4). *Mobile payments technology explained*. Retrieved December 13, 2018, from https://blog.nordicsemi.com/getconnected/mobile-payments-technology-explained

HSBC Bank. (2017). *Payment Services Directive 2 (PSD2).* HSBC Bank. Retrieved December 16, 2018, from https://www.hsbc.com.mt/content/dam/hsbc/hbmt/docs/PSD2-brochure.pdf?fbclid=IwAR0ZsFM1ERlwD6HMeZyXExj6cctk8sexKKnd8HVNbBwrxEP3QbyD1w53lbY

Investopedia. (2018). Retrieved November 27, 2018, from https://www.investopedia.com/terms/a/atm.asp

Investopedia. (2018). *Basel* |||. Retrieved September 30, 2018, from https://www.investopedia.com/terms/b/basell-iii.asp

Investopedia. (2018). *FinTech*. Retrieved November 6, 2018, from https://www.investopedia.com/terms/f/fintech.asp

Investopedia. (2018). *Investopedia*. Retrieved from Commercial Bank: https://www.investopedia.com/terms/c/commercialbank.asp

Investopedia. (2018). *Niche banks*. Retrieved November 3, 2018, from https://www.investopedia.com/terms/n/niche_banks.asp#ixzz5WvdRRsYX

Investopedia. (2018). *Switching Costs*. Retrieved December 10, 2018, from https://www.investopedia.com/terms/s/switchingcosts.asp

Jarvinen, R. A. (2015). *Consumer trust in banking relationships in Europe.* Emerald Insight. Retrieved September 22, 2018, from https://www.researchgate.net/profile/Raija_Jaervinen/publication/265969491_Consumer_trust_in_banking_relationships_in_Europe/links/5549daec0cf205bce7ac42bf/Consumer-trust-in-banking-relationships-in-Europe.pdf

Justis- og beredskapsdepartementet. (2018). *Høringsnotat.* July. Retrieved October 4, 2018, from https://www.regjeringen.no/contentassets/fb4a02515aed4b5f8c270293b4885c9a/horingsnotat---forskrift-om-betalingstjenester.pdf

Kerin, R., Varadarajan, R., & Peterson, R. (1992). *First-Mover Advantage: A Synthesis, Conceptual Framework, and Research Propositions.* Retrieved September 14, 2018, from https://www.jstor.org/stable/pdf/1251985.pdf

Khan, F. (2018, June 15). *Evolution of Fintech- A timeline*. Retrieved November 27, 2018, from Data Driven Investor: https://www.datadriveninvestor.com/2018/06/15/evolution-of-fintech%E2%80%8A-%E2%80%8Aa-timeline/

Klarna. (2018). *Om oss*. Retrieved November 6, 2018, from https://www.klarna.com/no/om-oss/

Konkurransetilsynet. (2018). *Vedtak V2018 - offentlig versjon - Vipps AS - BankAxept AS/BankID Norge AS.* Retrieved November 7, 2018, from https://konkurransetilsynet.no/decisions/vedtak-v2018-18-vipps-as-bankaxept-asbankid-norge-as/

KPMG. (2016, December 9). *PSD2 and the power of APIs*. Retrieved October 10, 2018, from https://home.kpmg.com/xx/en/home/insights/2016/12/psd2-and-the-power-of-apis-fs.html

Kuzmina, A. (2018, August 28). *AliPay & WeChat Pay: history and strategy*. Retrieved December 13, 2018, from https://medium.com/what-the-money/alipay-wechat-pay-history-and-strategy-af1b19d66556

Lieberman, M., & Montgomery, D. (2002). *First-Mover Advantages.* Retrieved September 10, 2018, from http://www.anderson.ucla.edu/documents/areas/fac/policy/FMA1-SMJ1988.pdf

Listfield, R., & Montes-Negret, F. (1994). *Modernizing Payment Systems in Emerging Economies.* Retrieved December 11, 2018

Mack, N., & Woodsong, C. (2011). *Qualitative Research Methods: A data collector's field guide.* FHI 360. Retrieved September 23, 2018, from Qualitative Research Methods: A Data Collector's Field Guide

Marjamaa, R., & Kreutzer, I. (2017, May 23). Finansbransjen fremstår often som konservativ- nå kommer de nye digitale løsningene. (J. M. Moberg, Interviewer)

Marketing China. (2017, January 31). *A beginners guide to AliPay*. Retrieved December 13, 2018, from https://www.marketingtochina.com/beginners-guide-alipay/

McCarthy, C. (2018, March). *Accelerating Innovation Through Coopetition*. Retrieved October 15, 2018, from https://journals.lww.com/naqjournal/Fulltext/2018/01000/Accelerating_Innovation_Through_Coopetition__The.5.aspx

McKinsey&Company. (2018, January). *PSD2: Taking advantage of open-banking disruption*. Retrieved October 16, 2018, from https://www.mckinsey.com/industries/financial-services/our-insights/psd2-taking-advantage-of-open-banking-disruption

Medium. (2017, May 9). *Open Banking & Screen Scraping*. Retrieved December 7 2018, from https://medium.com/@davidgtonge/open-banking-screen-scraping-98ef5bf9f463

Medium. (2018, June 28). *Do you really want to be the next big banking platform?* Retrieved October 23, 2018, from https://medium.com/apis-and-digital-transformation/do-you-really-want-to-be-the-next-big-banking-platform-4be0d0b9f228

Meinich, P., & Munthe, P. (2018, December 13). *Store Norske Leksikon*. Retrieved October 3, 2018, from Bank: https://snl.no/bank

Menon Economics. (2018, September). *Evaluering av Finansportalen*. Retrieved October 10, 2018, from https://www.regjeringen.no/contentassets/48002fbfca204aaf9b4e48238e3b8a2a/menon-evaluering-av-finansportalen.pdf

Meyer, L. H. (2000). *Why risk management is important for global financial institutions.* Retrieved October 8, 2018, from https://www.bis.org/review/r000904b.pdf

Michael, C. (2017, November 30). *Open Banking Developer Zone*. Retrieved December 17, 2018, from Payment Initiation API Specification - v1.10: https://openbanking.atlassian.net/wiki/spaces/DZ/pages/5786479/Payment+Initiation+API+Specification+-+v1.1.0

Mulesoft. (2018). *Financial Service Firms Can Benefit from Open Banking APIs*. Retrieved November 19, 2018, from https://www.mulesoft.com/resources/api/open-banking-apis-benefits

Newsroom. (2018). *Stats*. Retrieved November 20, 2018, from https://newsroom.fb.com/company-info/

Nordea. (2017, December 13). *Open Banking i dag*. Retrieved September 20, 2018, from https://www.nordea.com/no/presse-og-nyheter/nyheter-og-pressemeldinger/press-releases/2017/12-13-09h35-nordea-open-banking-i-gang.html

Nordea. (2018). *Nordea Wallet- din mobile lommebok*. Retrieved October 20, 2018

Nordea Markets. (2018). *FIX API*. Retrieved December 18, 2018, from Nordea Markets: https://nordeamarkets.com/nb/produkter-tjenester/fx-money-markets/fix-api/

Norges Bank. (2014). *Kostnader i det norske betalingssystemet.* 07 MEdia AS. Retrieved November 7, 2018, from https://static.norges-bank.no/contentassets/c6ed2ec861034f47afb5ea233363a5d3/norges_bank_memo_5_2014.pdf

Norges Bank. (2017). *Det norske finansielle systemet* . Retrieved December 8, 2018, from https://static.norges-bank.no/contentassets/b61eb85db69a4a5aaf298f57cea0972b/det-norske-finansielle-systemet_2017.pdf?v=08/02/2017130908&ft=.pdf

Norges Bank. (2017). *Finansiell Stabilitet 2017.* Retrieved November 30, 2018, from https://www.norges-bank.no/contentassets/f3a45cb94d334c4cb619cc549952d553/fs_rapport_2017.pdf?ft=.pdf

Norges Bank. (2017). *Retail payment services 2017.* Retrieved December 16, 2018, from https://static.norges-bank.no/contentassets/acf2fe440bc6483393bda6d66acc29fa/nb_papers_2_18.pdf?v=05/24/2018083314&ft=.pdf

Norges Bank. (2018). *Det norske finansielle systemet.* Norges Bank.

Norges Bank. (2018). *Kunderetta betalingsformidling 2017.* Retrieved October 16, 2018, from https://static.norges-bank.no/contentassets/acf2fe440bc6483393bda6d66acc29fa/nb_memo_2_18.pdf?v=05/24/2018084221&ft=.pdf

Oxford Dictionary. (2018). Oxford University Press.

Oxford Dictionary. (2018). *Challenger bank*. Retrieved October 29, 2018, from https://en.oxforddictionaries.com/definition/challenger_bank

Payr. (2018). *Funksjoner i appen*. Retrieved December 13, 2018, from https://www.payr.no/funksjoner

Platformed. (2018). *The Dark Side of Platform Monopoly*. Retrieved December 6, 2018, from https://platformed.info/the-dark-side-of-platform-monopoly/

PwC. (2016, September). *PSD2 in a nutshell*. Retrieved October 2, 2018, from https://www.pwc.com/cz/en/bankovnictvi/assets/psd2-nutshell-n01-en.pdf

PwC. (2017). *Bankene er ikke klare for PSD2.* Retrieved October 27, 2018, from https://www.pwc.no/no/publikasjoner/psd2-bankene-venter-til-siste-minutt.html

PwC. (2017). *Retail Banking 2020: Evolution or Revolution?* Retrieved September 20, 2018, from https://www.pwc.com/gx/en/banking-capital-markets/banking-2020/assets/pwc-retail-banking-2020-evolution-or-revolution.pdf

PwC. (2017). *Venter til ellevte time.* Retrieved November 29, 2018, from https://www.pwc.no/no/publikasjoner/psd2-bankene-venter-til-ellevte-time.pdf

Pymnts. (2018, September 18). *AliPay has 700M Active Users*. Retrieved November 3, 2018, from https://www.pymnts.com/news/mobile-payments/2018/alipay-users-ant-financial-blockchain-ai-iot/

Refus Pollock. (2018, February). Retrieved December 6, 2018, from https://rufuspollock.com/ubernomics/

Regjeringen. (2018). *Hvordan sikre finansiell stabilitet.* (S. Jensen, Performer)

Robinson, M. (2018, May 30). *Business Insider*. Retrieved October 7, 2018, from Everything happening on the internet in 2018: https://www.businessinsider.com/mary-meeker-internet-trends-2018-full-slide-deck-2018-5?r=US&IR=T#-217

Saunders , M., & Thornhill, A. (2016). *Research Methods for Business Students.* Harlow: Pearson.

Shifter. (2018, November 12). *Nå får fintech-grunderne sin lekegrind: - En stor seier for hele bransjen*. Retrieved November 19, 2018, from https://shifter.no/na-far-fintech-grunderne-sin-lekegrind/

Sparebank 1 Gruppen. (2018). *SpareBank1*. Retrieved November 24, 2018, from Open APIs: https://www.sparebank1.no/nb/bank/bedrift/open-api.html

Sparebanken Vest. (2018, June 23). *Sparebanken Vest går sammen om SMB-satsning med start-up selskapet Folio*. Retrieved September 16, 2018, from https://www.spvnyheter.no/teknologi/sparebanken-vest-gar-sammen-om-smb-satsning-med-start-up-selskapet-folio/

Su, X. (2018). *Topic 2: The Role of Financial Markets*. Retrieved from FIE448 Banking and Financial Innovation.

Su, X. (2018). *Topic 4: Agency Problems of Debt* . Retrieved from FIE448 Banking and Financial Innovation.

Su, X. (2018). *Topic 8: Fintech*. Retrieved from FIE448 Banking and Financial Innovation.

Technode. (2018, March 16). *Why QR codes trump NFC in China*. Retrieved December 13, 2018, from https://technode.com/2018/03/16/qr-codes-nfc-china/

Techopedia. (2018). Retrieved December 11, 2018, from https://www.techopedia.com/definition/24407/application-programming-interface-api

Techrunchs. (2018, July 23). *Google joins the race of $1 trillion*. Retrieved December 19, 2018, from https://techcrunch.com/2018/07/23/google-joins-the-race-to-1-trillion/?guccounter=1

Tencent. (2018). *Tencent Announces 2018 Third Quarter Results.* Retrieved December 13, 2018, from https://www.tencent.com/en-us/articles/8003541542193986.pdf

The Asian Banker. (2014, October 13). *QR code payment system, a game changer?* Retrieved December 13, 2018, from http://www.theasianbanker.com/updates-and-articles/qr-code-payment-system,-a-game-changer

The Berlin Group. (2018, November). *A European Standard for XS2A*. Retrieved December 12, 2018, from https://docs.wixstatic.com/ugd/c2914b_e05c90dbfe4447149e36d48e1dd08339.pdf

The Berlin Group. (2018, October 5). *PSD2 Access to Bank Accounts*. Retrieved October 13, 2018, from https://www.berlin-group.org/psd2-access-to-bank-accounts

The European Commission. (2018, October 26). *The Digital Economy and Society Index*. Retrieved September 23, 2018, from https://ec.europa.eu/digital-single-market/en/desi

The European Payments Council. (2018). *Introducing the EPC*. Retrieved September 30, 2018, from https://www.europeanpaymentscouncil.eu/about-us/introducing-epc

The European Union. (2007). *Directive 2007/64/EC on payment services in the EU's internal market* .

The European Union. (2015). *Directive (EU) 2015/2366 on payment services in the internal market.*

Thomson Reuters. (2018, September 1). *Stock exchanges and regulatory authorities by jurisdiction*. Retrieved December 8, 2018, from Practical Law: https://uk.practicallaw.thomsonreuters.com/8-518-3383?transitionType=Default&contextData=(sc.Default)&firstPage=true&comp=pluk&bhcp

Todorova, T. (2014). *The Transaction-cost Roots of Market Failure.* Retrieved December 8, 2018, from https://mpra.ub.uni-muenchen.de/66757/1/MPRA_paper_66757.pdf

Universal Payments. (2017). *Open APIs: Seize the Opportunity*. Retrieved December 11, 2018, from https://www.aciworldwide.com/-/media/files/collateral/trends/open-apis-present-financial-institutions-with-choice-tl-us.pdf

Vipps. (2018). *Spørsmål*. Retrieved September 14, 2018, from https://www.vipps.no/sporsmal

Vipps. (2018). *Vipps Terms and conditions*. Retrieved December 13, 2018, from https://www.vipps.no/vilkar/vipps-terms-and-conditions

Wikipedia. (2018). Retrieved December 17, 2018, from https://en.wikipedia.org/wiki/Big_Four_tech_companies

Wipro. (2018). *The importance of customer interaction.* Retrieved December 18, 2018, from https://www.wipro.com/blogs/rahul-koul/the-importance-of-customer-interaction/

Xiaoming Zhu, Bingying Song, Yingzi Ni, Yifan Ren, & Rui Li. (2016). *Business Trends in the Digital Era: Evolution of Theories and Applications.* Shanghai Jiao Tong University Press.

Xie, P., Zou, C., & Liu, H. (2016). *Internet Finance in China* . New York : Routledge.

Yan, J., Yu, W., & Zhao, J. (2016). *How signaling and search costs affect information asymmetry in P2P lending.* Retrieved December 9, 2018, from https://jfin-swufe.springeropen.com/track/pdf/10.1186/s40854-015-0018-1

9. APPENDIX

9.1 A1 – LIST OF PLAYERS

FinTechs

Segment: Innovative payment solutions	
Company name	**Service**
Vipps	Mobile payments
Klarna	Online payments
Payr	Invoice processing
Tink	Payment initation and account information
Trustly	Online payments
Strex	Mobile payments
Aera	Payments and identification
Auka	Mobile payments
MeaWallet	Mobile payments and e-wallets
Prego	Online payments
Link Mobility Group AS	Mobile payments/mobile subscriptions
24sevenfinans	Invoice payments

Segment: Crowdfunding/Crowlending
Company name
Aparto AS
Bidra.no
FellowFinance
Spleis
Kameo
Monner
Perx Folkefinansiering
Sparkup
FundingPartner

Other	
Company name	**Service**
Dreams	Savings
Spiir	Account information
Kron	Savings
LiQvi	Account information
Risk-Partner	Risk management
Spiff	Savings
Zeipt	Digital reciept application

Segment: Asset management
Company name
Edgefolio
Huddlestock
Fronteer solutions
Quantfolio

Segment: Authentication
Company name
BankID
BuyPass
Cypod
DSafe
Encap
ForgeRock
Promon
Protectoria
Signicat
Zwipe

Segment: Investment advisory/data analytics for finance
Company name
Aksjeservice
Enin
InFront
KolibriFX
Oslo Market Solutions

BigTechs

BigTechs		
Company	**Banking service**	
Facebook	Payment initiation	*Not available in Norway
Amazon (Amazon Pay/Amazon Go)	Online payments/in-store payments	*Not available in Norway
Google (Google Pay)	Mobile payments/online payments/e-wallets	
Apple (Apple Pay)	Mobile payments/online payments/e-wallets	
Alibaba (Alipay)	Mobile and online payment platform	*Not available in Norway
Trencent (WeChat Pay)	Platform/mobile payment/e-wallet	*Not available in Norway
PayPal	Online payments	

Challenger banks

Challenger banks	
Company	**Service**
Revoult	Digital bank (buy/sell cryptocurrency)
Aprila Bank	Digital bank (SMB market)
Komplett Bank ASA	Digital bank (consumer lending)
Bank Norwegian AS	Digital bank (credit card, consumer lending, savings)
Easybank	Digital bank (consumer lending, deposit accounts, financing)
Instabank	Digital bank (savings, loans, assurance, consumer lending)
Pareto Bank	Digital bank (financing)
Monobank	Digital bank
yA Bank (will become Resurs Bank december 2018)	Digital bank (credit card, assurance,consumer lending)
Sbanken	Digital bank

9.2 A2 – INTERVIEW GUIDE

Subject	Potential interview questions
Introduction	• Can you tell us about yourself and your role in the company? • In what way do you work with PSD2? How is PSD2 affecting your daily tasks?
The Revised Payment Service Directive (PSD2) - How PSD2 is affecting the way banks operate	• What do you consider the main reasons for the adoption of PSD2? • In what way is PSD2 visible to your company and how is it affecting the way your company work? • On a scale from one to ten, how important do you consider the process of implementing regulatory compliance measures in accordance with PSD2 is for Norwegian banks? • How do you think current players in the payments market have prepared for the implementation of PSD2? • Which threats and opportunities do you imagine PSD2 will have for Norwegian banks?
Banks - Competition and collaboration within the industry - Competing with third parties	• In what way can increased competition in the payments market challenge the banks' current position in the market? • What challenges are the banks facing if third parties take over the banks role in the payment process and why is this challenging? • What are the benefits for PISPs and ASIPs of entering the market? Why is this an attractive market and how can they generate profits from these services. • Which competitive advantages do you think banks can utilize facing the changes that lies ahead? • In what way does the efficient payment system in Norway and the collaboration within the industry place obstacles for new entry in the market? • What are your opinions on customer preferences regarding financial services from third parties? Moreover, how can banks adapt to retain their customers when the competitive landscape is changing?

Industry/market - Developments in the banking and payments market	• How do you view the competitiveness between Norwegian banks? • What characterises the players who will succeed and the ones who will struggle in the new market? • What are the main challenges for players who want to establish themselves as PISPs or AISPs? • In what way is technology, innovation and new services enabled by PSD2 important for your company? • How do you consider the benefit for banks of being the first to offer such services? Will many banks try to take advantage of the potential benefits of being first-movers?
Strategy - Strategic responses to PSD2	• Which strategic responses have you considered concerning the changes that will follow from PSD2? • How do you think your competitors will position themselves in the market as a consequence of PSD2?
Outlooks for the future - The future of the payments market and the future of banks	• What concrete measures do you think banks will do to remain competitive when PSD2 is implemented in the Norwegian market? • What do you think payments market will look like when PSD2 is implemented? - What will it look like in 5 years? • Some articles have argued that PSD2 will reduce banks into becoming balance-sheet providers. Do you consider this to be a realistic scenario in the future? • How do you view large technology firms, such as Google/Facebook/Apple, abilities to offer financial services in the Norwegian market?