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In the Wake of the Revised Payment Services Directive

*A study on how Norwegian banks are responding to PSD2,
and how their competitive relationships and roles are affected
in consequence*

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Abstract

The second payment's services directive, referred to as PSD2, recently went into force. As of April 2019, Norwegian banks are required to open their dedicated interfaces, enabling third parties to provide payment services.

This thesis investigates how Norwegian banks have responded to the recent implementation of PSD2, as well as it examines how competitive relationships and roles have changed in result. The findings achieved from this study consist of insight and knowledge about the Norwegian banking and payment market after PSD2. This has been gained through interviews with 11 key personnel within the financial sector in Norway. In total, six big Norwegian banks, three financial institutions, and a FinTech network are represented in the study.

Through a comprehensive review of the Norwegian banking market, payment sector and PSD2, we have found that most banks view PSD2 as something more than just a requirement. Several Norwegian banks are thus developing new services to utilize the directive.

Account aggregation and overview is the most popular service to develop in response to PSD2. Further, we concluded that a service for subscription management is next on the list. These are innovative services banks view as value-adding. It is a paradox, that most of the services developed by banks in response to PSD2, are not the ones actually requested by customers. As an explanation to this, we have concluded that banks are innovating at a slower pace than anticipated.

However, in order to increase innovation and stay competitive, we conclude that banks cooperate with FinTech companies. This is another important finding: the Norwegian banking and payment sector is witnessing an increasing degree of cooperative relationships and cooperation. We conclude that FinTech companies and banks benefit from collaborating in several cases, even if they are competitors in other areas.

At last, our final finding relates to what new roles banks are taking in response to PSD2. We have identified four roles: Comply, Supply, Produce and Ecosystem. We conclude that most banks seem to take the role as a producer, while exploring the role of supplier. Some banks are also barely touching upon the role as an ecosystem. However, this is the most demanding role to take, and it will therefore likely take time before we witness anyone succeeding taking this role.


Preface

This thesis is inspired by conversations with Stein Opsahl in Knowit Experience. It is written as a part of our master's degree with specialization in Finance and Business Analysis and Performance Management at Norwegian School of Economics (NHH). The study was conducted during the fall of 2019 and constitutes 30 credits. Working on this thesis for the past months have been greatly rewarding. Our choice of topic is highly relevant, and we feel fortunate to contribute to a topic continually impacting the banking industry.

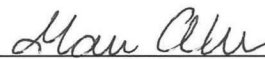
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Abbreviations

ASPSP	Account Servicing Payment Services Provider
AISP	Account Information Services Provider
API	Application Programming Interface
CSC	Common and Secure Communication
EU	European Union
EEA	European Economic Area
EBA	European Banking Authority
FSA	Financial Supervisory Authority
PSD1	The Payment Services Directive
PSD2	The Revised Payment Services Directive
PISP	Payment Initiation Services Provider
QSealC	Qualified eSeal Certificate
QTSP	Qualified Trust Service Provider
QWAC	Qualified Web Authentication Certificate
RTS	Regulatory Technical standards
SCA	Strong Customer Authentication
TPP	Third Party Provider
XS2A	Access to Account

1. Introduction

1.1 Background and actulaization

Society is in the midst of a digital change, where digitalization affects how people interact and do business on daily basis. New technology is developing, new services appear, and customer expectations are changing. Never before has innovation been more relevant, and the banking sector is no exception. However, the ongoing changes of traditional banking have only just begun.

For as long as banks have been around, consumers have had an exclusive relationship with their banks. Loyalty is passed down through generations, when parents open checking accounts for their children, at the same bank they have used themselves their entire life. This sounds nice, having one institution looking after the whole family. However, we know in reality that this is not what is necessarily best for the consumer. In fact, the truth is that there has always been very limited competition and transparency in banking. The strong customer relationship has led people to settle for less, accepting services and products that do not completely satisfy their needs.

Now, we are starting to see a power shift from the bank to the consumer. Progressive technology is fueling Open Banking, enforced by customers' changing expectations and new regulations such as PSD2. This is the new European Directive on payments, which affects both consumers and businesses. The directive has received massive attention among bankers across Europe and is often referred to as the directive that will change banking as we know it. The main purpose behind the directive is to motivate innovation and competition among European banks. PSD2 is a catalyst, causing a change in how the industry perceive, understand, and are willing to embrace Open Banking.

In the spring of 2018, we were introduced to PSD2 for the first time through the course "Strategic Management" at NHH. This sparked an interest that has kept growing, leading to a desire for obtaining a deeper understanding of the payment's directive and its implications on the banking industry. At the time, it was a consensus in the market that financial technology companies, referred to as FinTech companies, would challenge incumbent players. However, fast forward to the fall of 2019, we saw that this had not become reality. At least not yet. We

want to investigate what has actually happened in the market, by researching some of the biggest banks in Norway and their response to PSD2.

There is no shortage of industry experts or others presenting their thoughts concerning the future of banking. However, to date few academic studies have investigated the actual consequences of PSD2 on the banking sector after the final implementation in September 2019. Several studies have looked closely on how they believed the banking sector would be affected. This paper presents a comprehensive overview of how the Norwegian banking sector *actually* has responded, now that PSD2 is implemented.

1.2 Research question

The ultimate purpose of this thesis is to investigate the response by Norwegian banks on the new payment's directive. We want to gain insight into how the directive has led to a change in competitive relationships and roles among banks. This requires an extensive review of the banking sector, financial technology and PSD2 in general. We seek to utilize our findings by analyzing the measures developed by banks, consider their roles in a new ecosystem. With this in mind, we want to explore the following research question:

How are Norwegian banks responding to the Second Payment's Directive and how are their competitive relationships and roles affected in result?

1.3 Outline

This thesis was written at the same time as the Norwegian banking sector was going through perceptible changes. The final part of PSD2 was implemented simultaneously as our research began. Studying a changing industry demands insight from experts, which has been an important source of not only information and knowledge, but inspiration and guidance.

We achieved such valuable insight from a range of interviews conducted over the fall of 2019, as well as participating at an interesting and informative seminar in Bergen. The seminar, "PSD2 is implemented – what now?", was hosted by NCE Finance Innovation, Cicero Consulting and Itera in October. Participating at this event gave us additional input and ideas, and provided us with access to valuable material, such as PowerPoint slides and reports. Teachings from both the interviews and seminar have been important drivers behind the

direction of our thesis and used in most of our logical conclusions. Direct quotation is also used when beneficial.

To answer the research question, the thesis consists of nine continuous parts, in which we refer to as chapters. In the introductory chapter, our motivation and an actualization of the topic is given. The following chapter contains a description of the Norwegian banking sector, explaining the emergence of banks and the financial system. Using several different sources, we examine the traditional banking and payment sector in Norway, as well how financial technology is disrupting it. We explain the concept of FinTech, as well as provide a list of main players in Norway. As a final part of this section, we explain Open Banking as an important step into the future of banking.

Following is the third chapter, which is an elaboration of PSD2. Understanding its content and guidelines is completely necessary when later examining its effect on the Norwegian banking sector. We first discuss the background and reasoning behind the directive, including an examination of the first payment services directive. Then, we dive deeper into the actual content of PSD2. At last, a timeline of the implementation is presented together with a discussion on the status quo and the significance for Norway.

In chapter four, some relevant theory is described, which prove to be necessary when exploring the research question later in the thesis. The underlying methodology of the thesis is elaborated in chapter five.

The proceeding three chapters present a discussion on the changing conditions of the Norwegian banking and payment market. We present our findings on how Norwegian banks have responded to PSD2 in chapter six. Insight from interviews and secondary sources allow us to discuss the different measures completed by banks, seeking to understand the reason behind their developments. Together with findings from interviews, secondary sources and relevant theory, we discuss the main explanations for how their competitive relations have changed. Lastly, we provide a suggestion of what we believe are the new roles for banks, as well as a short discussion on the future of banking is given.

In the final chapter we present some concluding remarks, whereby we summarize our main findings from the discussion. Also, we provide some suggestions for future research.

2. The Norwegian banking sector

In this chapter, we start by diving deeper into the conceptual fundamentals about why banks exist and how they coexist with financial markets. Then, we elaborate on how the traditional Norwegian banking market unfolds, before discussing the concept of financial technology and its business models. At last, a discussion on the future prospects for banking, such as Open Banking, is provided. Obtaining such understanding is convenient when analyzing how Norwegian banks are responding to the implementation of PSD2 and discussing how their competitive relationships and roles are affected.

2.1 The emergence of banks

Banking has been an important part of society ever since the very first currencies were minted. When empires needed to pay for foreign goods or services, they needed something that could be exchanged easily (Beattie, 2019). This is where the history of banking began, and in the following we will elaborate on the continuance of this story.

1.1.1. The financial system

In order to discuss the emergence of banks, we need to get an understanding of how the financial system works. Any healthy or vibrant economy depends on a financial system that effectively moves funds from those who have excess funding to those who have a productive investment opportunity (Mishkin & Eakins, 2012, p. 134). Within the financial system, we can find different types of financial markets who perform this essential economic function. Examples of such financial markets are money markets and capital markets. These markets channel funds from businesses, households and governments with a surplus of funds to those with a shortage of funds (Mishkin & Eakins, 2012, p. 16).

Moreover, we can divide the financial system into two segments: direct and indirect financing. An overview of the flows of funds through the financial system is provided in figure 2-1.

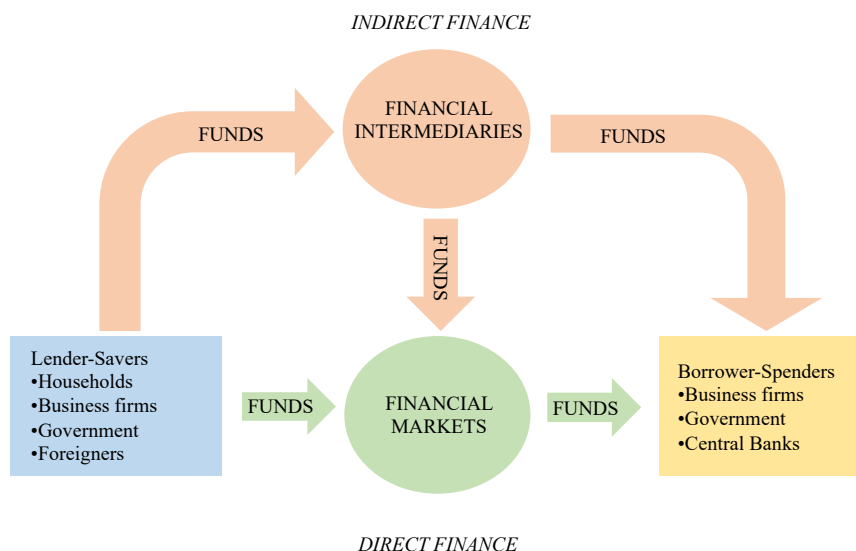


Figure 2-1: The Financial System (Mishkin & Eakins, 2012, p. 16)

Direct financing

Mishkin and Eakins (2012, p. 16) describe the concept of direct financing as the method of financing where the borrower borrows funds directly from lenders in financial markets. The borrower sells her financial instruments, which are claims on her future assets or income. This channeling of funds is important to the economy because the savers are frequently not the same people who have a profitable investment opportunity available to them. In the absence of financial markets, the saver and spender may never meet. Thus, financial markets are essential to promote economic efficiency, as it produces an efficient allocation of capital resulting in higher production for the overall economy (Mishkin & Eakins, 2012, p. 17).

The model of financial markets

A definition of financial markets, and their role in direct financing, is illustrated in Figure 2-2. In this case, the capital market is used as an example of a financial market. In the capital market, long term debt and equity instruments are traded, namely stocks and bonds (Mishkin & Eakins, 2012, p. 20).

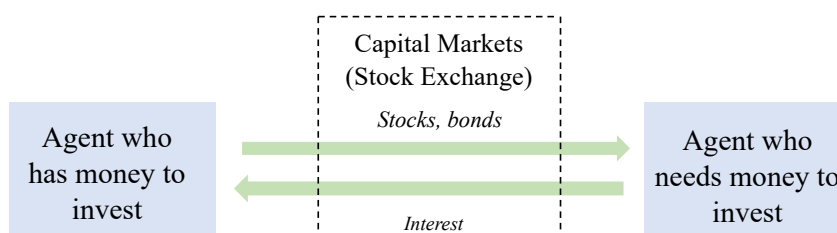


Figure 2-2: The Model of Financial Markets (Su, 2019, p. 16)

Transaction costs

Without the presence of a financial market, agents have to spend time and effort searching for the right counter party. These travelling, searching and matching costs are defined as observable transaction costs (Su, 2019, s. 3). With the presence of financial markets these costs are reduced. However, transaction costs are not completely absent and occur in all financial markets. For example, in the equity market agents face different types of brokerage fees (Ganti, 2019). The presence of transaction costs limits the agent in taking full use of the financial market.

In addition, the model also faces some challenges with unobservable transaction costs (Su, 2019, s. 4). This problem arises from information asymmetry. In centralized financial markets, savers and spenders are connected and sign financial contracts. One of the most used financial contracts is the debt contract. This involves a creditor lending money to a debtor. Then the debtor is required to repay the money, including interest, at maturity. In some cases, the borrower is not able to pay back the loan. If the lender is not compensated for this risk, she will not accept the debt contract. Thus, higher risk is linked to a higher interest rate and if the lender is not able to identify the borrower's risk, a high-risk borrower may pretend to be good. This illustrates the case of information asymmetry and induces agency costs.

Agency costs

Agency costs can occur in two states, either before or after the contract is signed. Adverse selection is the case of a market failure caused by behavior *before* the contract is written. An example is when a trading partner cannot observe the quality of the other partner. Typically, this is referred to as "hidden types", because the borrower can pretend to be creditworthy during the screening process.

Moral hazard is the case of a market failure caused by behavior *after* the contract is written. This concerns the risk that the debtor has not entered into the contract in good faith or has an incentive to take an unusually high risk in an attempt to earn great profits before the contract is settled (Kenton & Abbott, Moral Hazard, 2019). This is typically referred to as "hidden actions".

Reduced market efficiency

The presence of transaction and agency costs decrease efficiency in financial markets. This is a result of less money being lent and borrowed, leading to a lower production in the overall economy. In other words, it is important to diminish such costs to increase efficiency (Su, 2019, s. 18). This can be achieved by reducing information asymmetry, which is where authorities play an important part. In Norway, the Financial Supervisory Authority (FSA) has the role of regulating the national stock market to improve information transparency (Finanstilsynet, 2016). FSA also helps create a stable and effective financial market.

Indirect financing

As we have seen, some challenges are related to direct financing in the sense that financial markets are not a perfect instrument for running economic systems by themselves. As illustrated in Figure 2-1, funds can move from lenders to borrowers in a second route. This route is called indirect finance and involves a financial intermediary, where the financial intermediary stands between the lender-savers and the borrower-spenders. This is achieved as a financial intermediary borrows funds from the savers and then using these to provide the spenders loans (Mishkin & Eakins, 2012, p. 22).

The model of banks

An example of a financial intermediary is depository institutions. They accept deposits from institutions and individuals, as well as making loans. Such depository institutions include commercial banks, credit unions and mutual savings banks (Mishkin & Eakins, 2012, p. 28). The function of financial intermediaries is illustrated through the banking model in figure 2-3.



Figure 2-3: The Model of Banks (Su, 2019, p. 16)

The banking model illustrates how financial intermediaries operate in the financial market. Savers place their excess funds as deposits in banks and receive interest payments in return (Su, 2019, p. 2). Then, all the deposits are pooled together before the bank lend it to borrowers. In the case of lending, banks try to funnel financial capital to healthy institutions or people

with good prospects for repaying the loan. On the other side of the model, borrowers receive loans from banks, and are then obligated to pay interest payments in return.

Introducing financial intermediaries to financial markets contribute to increased market efficiency. Financial intermediaries can reduce transaction costs substantially, because they have developed expertise in doing so. Additionally, financial intermediaries are typically of large size, allowing them to take advantage of economies of scale. Furthermore, because financial intermediaries contribute to reduced transaction costs, it makes it easier for them to provide customers with liquidity services, who can conduct transactions more easily (Mishkin & Eakins, 2012, p. 24). Banks' contribution to increased market efficiency will be discussed closer in the following.

1.2.1. Why do banks exist?

In the previous, we have seen that financial intermediaries have an important function in the economy. In the following, we explain how banks provide liquidity services, promote risk sharing and solve problems related to asymmetric information.

Transaction costs and liquidity services

One of the simplest ways to justify the existence of banks is related to transaction costs. This includes both the observable and unobservable costs (Su, 2019, p. 13). Small lenders are subject to costs of searching and matching, as well as screening, negotiating, contracting and monitoring. However, when these assignments are delegated to banks, the mentioned transaction costs decrease. This is because banks form expertise over time and through repeated experience, making them specialized financial intermediaries (Su, 2019, p. 14).

Compared to borrowers themselves, banks can achieve expertise by hiring professionals in lending and borrowing practice (Mishkin & Eakins, 2012, p. 24). For example, banks can find good lawyers who can produce airtight loaning contracts. These contracts can then be used repeatedly, and thus lowering the legal costs per transaction. This illustrates how banks can take advantage of economies of scale, making it possible for small borrowers with productive investment opportunities to be provided with funding.

Additionally, lower transaction costs mean that banks can offer customers liquidity services (Mishkin & Eakins, 2012, p. 24). These services make it easier for customers to carry out transactions. As an example, banks can provide their depositors with checking accounts. Such

accounts enable customers to pay bills more easily. Also, customers can earn interest on their checking and savings accounts, and still convert their money into services or goods whenever necessary.

Risk sharing and diversification

Low transaction costs facilitate other benefits as well. For example, banks can help reduce investors exposure to risk (Mishkin & Eakins, 2012, p. 25). In more specific, banks can reduce the uncertainty related to the return investors will earn on their assets. Banks achieve this by the process of risk sharing. Risk sharing involves that banks create and sell different assets with various risk characteristics, depending on what people prefer and are comfortable with. Then, the bank uses funds acquired from selling these assets to invest in other assets with greater risk. Thus, banks are able to share risk at a low cost. This enables them to make profit on the spread between the returns earned from risky assets and the payments for assets they have sold. As a result, risky assets can be turned into safer assets.

In addition to promote risk sharing, banks use diversification as another risk management technique. Banks help customers to diversify and thereby reduce the amount of risk they are exposed to (Mishkin & Eakins, 2012, p. 25). The rationale behind this technique is that a portfolio of different types of assets, whose returns are not always correlated, yield higher returns and pose lower risk compared to any individual asset within the portfolio. As a result of low transaction costs, banks are able to pool a collection of assets together making a new asset, and then selling this to individuals.

Information asymmetry and economies of scope

An additional reason for why banks play an important role in financial markets, is the inequality resulting from asymmetric information. In the presence of imperfect information, this induces agency costs to both the contract parties and the entire society. This has the unfortunate consequence that not all good projects are financed, and markets are at risk of breaking down.

The problems caused by adverse selection and moral hazard represent a significant impediment to well-functioning financial markets. However, banks can alleviate these problems. The presence of banks enables small savers to provide their funds to financial markets. Small savers lend their funds to a bank, who will in turn lend the funds out by loans or purchasing securities like stocks and bonds. Banks are better equipped than small savers

when it comes to screening bad credit risks from good ones, resulting in higher earnings on investments. Thus, losses from adverse selection are reduced. Also, banks experience higher earnings due to their well-developed expertise in monitoring borrowers, and losses due to moral hazard are reduced as well. This results in banks being able to afford paying lender-savers interest payments or provide substantial services and yet still make profits (Mishkin & Eakins, 2012, p. 26).

Moreover, banks also enjoy information economies of scope. Unlike individual lenders, banks have access to privileged information on both current and potential borrowers with accounts in the bank. As a result of large investments in IT, banks can evaluate their customer's creditworthiness and consequently verify borrowers. Compared to individual savers, banks can complete this task and reduce agency costs as a result. Of course, it is impossible to completely avoid the situation of some customers showing opportunistic behavior, such as cheating or misbehaving. However, because banks specialize in lending and borrowing their expertise allow them to detect and monitor these customers.

2.2 A disruption of the banking industry

In the previous, we have obtained insight into why banks exist. This enables a further discussion of the banking industry in Norway. However, as we will see later in the chapter, the banking industry is going through some changes. To some extent, these changes were motivated by the consequences of the financial crisis in 2008. The crisis and its subsequent deep recession took its toll on financial systems around the world. However, according to The Banker's Top 1000 World Banks Ranking (Caplen, 2018), global assets climbed to \$ 124 trillion last year. In order to manage the increasing amounts of money, banks are now releasing new features trying to attract new customers and retaining existing ones. In addition, start-up-companies and challenger banks, are breaking the scene with their disruptive technologies (Meola, 2019).

When analyzing how Norwegian banks are responding to PSD2, it is important to understand the disruption of the traditional banking industry. This is in focus for the next part of the thesis, and we start by looking at how the traditional banking market in Norway unfolds. Second, a discussion on the Norwegian payments market is provided. Then lastly, we dive deeper into the world of financial technology.

1.2.1. Traditional banking in Norway

Because banks play a significant role in the channeling of funds between borrowers and lenders, such financial activity is essential to ensure that the economy and its financial system run smoothly. Banks provide businesses with loans, help us finance our dream home or the purchase of a car, and provide us with services like checking and savings accounts. Ever since the very first Norwegian savings bank was established in 1822, banks have played an important role in the Norwegian economy and society (Norges Bank, 2019). To understand this better, we provide the readers with a discussion concerning aspects of the traditional banking market in Norway.

The role of banks

Undoubtedly, banks are not only the most popular financial intermediaries in the world, but also perhaps the most important financial institutions. Banks differ from other financial institutions in that they have exclusive rights to create and accept deposits from the general public. Deposits are the easiest and most common form of saving, as well as the most important means of payment (Norges Bank, 2018, p. 45).

Products and services

Corresponding to their economic roles, banks offer various products and services to different agents in the economy. This includes deposits, commercial and industrial (C&I) loans, mortgages and securitization products, just to mention a few (Su, 2019).

With respect to deposits, banks offer a broad range of products, with varying interest rate terms and restrictions on withdrawals (Norges Bank, 2018, p. 45). Among the types of accounts offered by Norwegian banks, the most common are ordinary current accounts, savings accounts, high-interest accounts and home savings scheme for young people, typically referred to as “BSU”. Deposits can be withdrawn as cash in physical bank branches, from ATM’s and in some stores. Alternatively, deposits can be used directly in payments using debit cards or through transactions in online or mobile banking services. An increased prevalence of computers and smart phones has increased the use of online and mobile banking services. This has led to a simultaneous decrease in the number physical bank branches and ATM’s in Norway.

In addition to deposits, banks also provide the public with a variation of loans (Norges Bank, 2018, p. 45). This can include residential mortgages, commercial loans and consumer loans. Different loans have different conditions when it comes to interest rates (fixed or floating), length of fixed-rate periods, currency and repayment terms (annuity or serial loan). In Norway, it has become increasingly more normal to have interest-only loans, typically in the form of home equity lines of credit lines up to a maximum amount. With such loans, the borrower is free to make repayments or borrow additional money up to this limit.

Furthermore, banks offer a broad range of services. For example, banks can exchange foreign currencies and contribute to society with financial advice for customers (Norges Bank, 2018, p. 45). Some banks have chosen to only offer a limited selection of loans or services. Actually, because the consumer credit market has experienced high lending growth in recent years, a number of banks specializing on this area have increased their market share.

Main responsibilities

Banks contribute to financial stability, growth and fulfil important functions such as providing liquidity and diversifying risk. As proven by previous crisis in the economy, such as the financial crisis of 2008, the loss of financial stability can cause unfortunate ripple effects throughout the entire economy. Thus, a threat to the financial stability is a threat to the economy as a whole. This has been an important indicator of the significant function and responsibility that banks have.

1) Providing opportunities to save and borrow

As financial intermediaries, banks have an important task of providing agents in the economy opportunities to save and borrow. Savers can benefit from the bank by depositing their cash in deposit accounts and receive a certain rate of return in the form of interest payments (Norges Bank, 2018, p. 46). The savers can withdraw their deposit whenever needed. The bank transforms all the small and liquid deposits into fewer, and on the whole, larger and more long-term loans.

Another important task provided by banks is their assessment of the probability of default (Norges Bank, 2018, p. 47). If the borrower defaults, and thus is not able to pay back the borrowed means, the risk and loss will fall on the bank. Additionally, banks achieve economies of scale when gathering and processing information, issuing credit ratings, designing loan

contracts and following up on borrowers. Also, they can gain information on both existing and potential customers.

A borrower's personal identity number, degree of capability for work or income are examples of important and necessary information when establishing a contract. However, customers may be reluctant to sharing such information with "just anybody", because of this information's sensitive nature. This is where banks play an important role as a trustworthy financial institution. Consequently, owing to the costs arising from gathering information, most private individuals and small and medium-sized businesses prefer borrowing from banks rather than directly in the bond market.

2) Risk assessment

In well-functioning credit markets, banks channel savings to investment projects with an adequate level of profitability (Norges Bank, 2018, p. 49). They do so by assessing the individual investment projects, borrowers and their pledged collateral. The price of loans assessed as high risk will be higher compared to low-risk loans. However, if a borrower provides the lender with collateral, for example a mortgage on a house, the risk of losses is reduced and the price on the loan is lower. In other words, the borrower will receive a reduced interest rate in the presence of collateral. Furthermore, as previously discussed, banks also contribute to reduced risk associated with lending through diversification.

Revenue streams

In practice, banks' main tasks include accepting deposits and granting loans. Therefore, one of the primary ways to make money for banks is through net interest income (Norges Bank, 2018, p. 47). When banks accept deposits, this produces interest income. Then, banks lend a proportion of these deposits out to customers, which produces interest expense. The sum of these two figures generate the net interest income. Further, because banks pay lower interest rate on deposits from savers than the interest they receive from loans, they earn money.

In addition, banks charge fees for other services as well (Norges Bank, 2018, p. 47). This can include an annual fee for payment cards, or fees withdrawn from a customer's account every time they use an ATM. Furthermore, banks are paid fees for currency exchange, international transactions and when customers use manual services in physical bank branches, such as

opening certain accounts. Examples of this can be the opening of an escrow account, which is cheaper if done online rather than with the help at a physical branch.

Structure of the Norwegian banking sector

Compared to other European countries, the Norwegian banking sector is not particularly large relative to total GDP (Norges Bank, 2018, p. 51). In comparison, Norwegian banks hold total assets of twice our GDP, while Swedish banks hold total assets of three times their GDP. Furthermore, many countries are characterized by large banking sectors because their banks are also operating internationally. As a result of the financial crisis in 2008, a number of European countries have reduced the size of their banking sector. However, since the Norwegian banking sector primarily lends to domestic customers, the banking sector is smaller, but developments have been fairly stable.

Closed banking

Traditionally, the banking sector in Norway has been characterized by closed operating models. This entails banks' ownership over customer interfaces, through which they offer their own products and services. Customer interfaces are greatly integrated with the services banks offer, which can range from checking accounts to savings accounts, as well as borrowing and protection products (Doyle, Sharma, Ross, & Sonnad, 2017). In other words, banks have always had monopoly on customer data. The model of traditional closed banking leads to less transparent services and collaboration, which is illustrated in figure 2-4.

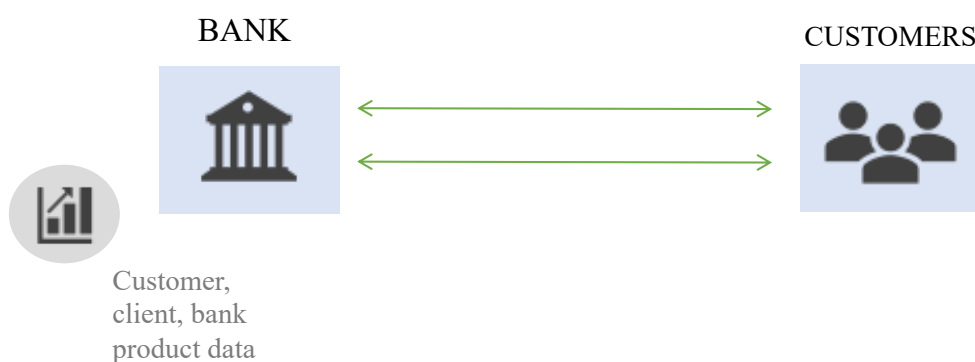


Figure 2-4: Closed banking (Doyle, Sharma, Ross, & Sonnad, 2017)

Main players

The traditional banking sector comprises several players with different functions and responsibilities. This includes a central bank, commercial banks and savings banks, as well as investment banks and other financial institutions. The main players in the banking system is illustrated in figure 2-5.

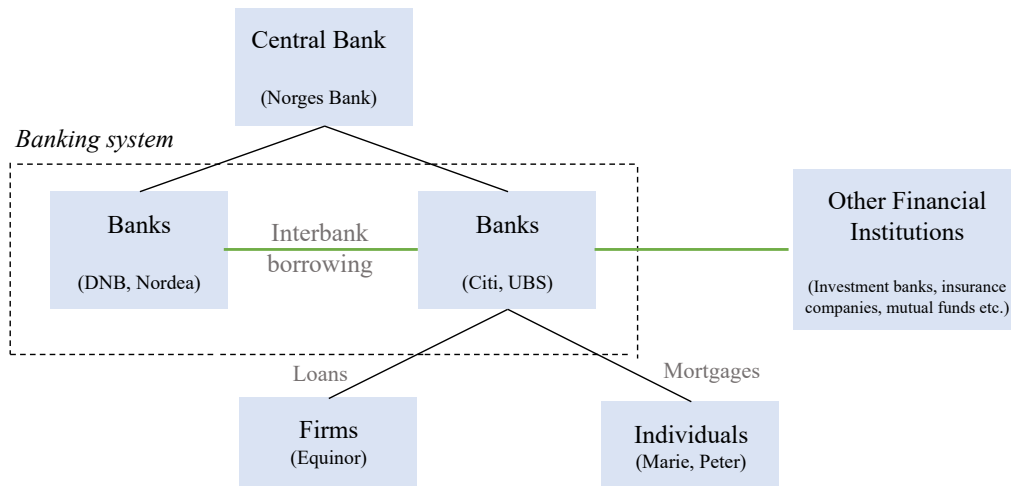


Figure 2-5: Main players in the banking system (Su, 2019, p. 2)

The Central Bank

One of the main players in the Norwegian banking system is Norges Bank, which is the central bank of Norway. This player is an important part of Norway's financial system and has the sole rights to issue coins and banknotes (Norges Bank, 2018, p. 9). In addition, Norges Bank functions as the bankers' bank, which means that banks hold their accounts at the central bank. Additionally, banks use Norges Bank to settle interbank payments. Moreover, the central bank functions as an advisory and executive body for monetary policy, for example setting the interest rate on banks' deposits. This rate is typically referred to as the policy rate and forms the basis for the general interest rate level in Norway.

In addition to this, the central bank has regulatory and supervisory responsibilities with respect to the financial system. Also, Norges Bank manages Norway's foreign exchange reserves and the Government Pension Fund Global (Norges Bank, 2018, p. 9).

Commercial banks and savings banks

In Norway, banks are classified as either commercial banks or savings banks. However, this distinction has become less relevant over time. The main difference between the two is related

to ownership structure, not to what kinds of services are offered to their customers (Norges Bank, 2018, p. 46).

With respect to ownership, a commercial bank may only be established as either a private or public limited liability company (Norges Bank, 2018, p. 47). Savings banks, however, may not be established as such limited liability companies. Traditionally, a savings bank is organized as a mutually owned foundation, with equity mainly comprised of retained earnings from previous years. A savings bank is further expected to support their local communities, even if it does not exist any legal obligations. For example, they are expected to offer reliable banking services and use some of their profits to support local activities.

In Norway, the savings bank sector comprises a large number of savings banks. Most of these banks are very small, but several have formed large alliances (Norges Bank, 2018, p. 52). Among these we can find the SpareBank 1 Alliance, which comprises 14 banks. Most of the banks in their alliance are large in their regions. Furthermore, the Eika Alliance comprises close to 70 savings banks, also small in size. In addition to these alliances, about 15 savings banks are independent and remain outside formalized alliances. However, some of these 15 have joint holdings in covered bond mortgage companies, as well as insurance companies.

Investment banks

Although financial institutions, such as investment banks, are not a direct part of the banking system, see figure 2-5, they are still constituting a primary segment of the banking industry. Also, some of the largest banking groups in Norway are players in investment banking as well. Understanding their function is therefore valuable and necessary.

Internationally well-known investment banks include Morgan Stanley and Goldman Sachs, and their main tasks include assisting individuals, corporations and governments in raising capital (Su, 2019, p. 3). They do this by acting as the underwriter and/or agent in the issuance of securities. Investment banks may also assist companies involved in mergers and acquisitions. An example of such was the merger between Statoil and Hydro in 2007, where both Morgan Stanley and Goldman Sachs assisted. Swedbank and SEB AB are two examples of investment banks operating in Norway.

The main difference between investment banks and commercial and savings banks, is the fact that investment banks do not accept deposits. Furthermore, investment banks function mainly

to serve business, and not individuals. They assist companies in the process of purchasing and selling stocks, bonds and other investments. In addition, investment banks typically assist the companies who are going public by facilitating their initial public offerings, or IPO's (Su, 2019, p. 3). For the sake of this thesis, our focus will be on commercial and savings banks.

List of banks

Banks, alongside with mortgage companies, account for approximately 80 % of total domestic credit to Norwegian businesses and households (Norges Bank, 2018, p. 51). Compared to the United States, this is a far higher share of total credit, where the bond market plays a significantly bigger role. In Norway, households borrow funds almost exclusively from mortgage companies and banks.

The banking market in Norway is dominated by Norwegian-owned banks. The remaining banks are either branches or subsidiaries of foreign banks. An example of this is Nordea or Danske Bank, which are branches of respectively Swedish and Danish banks. With respect to branches, these are not separate legal entities and face the same regulations as their home state authorities. For subsidiaries, on the other hand, these are separate Norwegian legal entities and face the same regulations as other Norwegian banks. However, for the purpose of this thesis, when discussing "Norwegian banks" in the upcoming chapters, we also include banks of foreign origin. This includes both Danske Bank and Nordea.

As of 2019, there are a total of 127 banks in Norway (Norges Bank, 2019). However, even though there is a large number of banks operating in Norway, the degree of concentration is fairly high. Table 1 gives an overview of the largest banking groups in Norway, ranged by total assets. As we can see, DNB is the largest bank and, according to Finans Norge (2018, p. 51), the bank has a lending market share of approximately 30 % in both the retail and corporate market. Furthermore, as the table illustrates, the Norwegian banking market is dominated by Nordic banks, but Santander Consumer bank, a subsidiary of a Spanish bank, also has a significant presence.

#	Banking Group	Part of	Head Office / Main area
1	DNB Bank ASA	DNB ASA	Oslo / Norway
2	Nordea Bank Norge ASA	Branch of a Swedish bank	Oslo / Norway
3	Danske Bank Norge	Branch of a Danish bank	Trondheim / Norway
4	Handelsbanken Norge	Branch of a Swedish bank	Oslo / Norway
5	SpareBank 1 SR-bank	SpareBank 1 Alliance	Stavanger / Rogaland, Hordaland, Agder
6	Sparebanken Vest	Independent savings bank	Bergen / Western Norway
7	Santander Consumer Bank AS	Subsidiary of a Spanish bank	Oslo / auto and consumer loans
8	SpareBank 1 SMN	SpareBank 1 Alliance	Trondheim / Trøndelag / Northwestern Norway
9	SEB AB Oslofilialen	Branch of a Swedish bank	Oslo / Investment banking
10	Sparebanken Sør	Independent savings bank	Arendal / Agder, Telemark
11	Sparebank 1 Østlandet	Sparebank 1 Alliance	Hamar / Hedmark / Oppland / Oslo / Akershus
12	Sparebank 1 Nord-Norge	Sparebank 1 Alliance	Tromsø / Troms, Nordland, Finnmark
13	Sbanken ASA	Independent commercial bank	Norway
14	Swedbank Norge	Branch of a Swedish bank	Oslo / commercial and investment banking

Table 1: Largest banking groups in Norway by total assets (Norges Bank, 2018, p. 51)

Regulating Norwegian banks

If a bank fails, this can cause problems for the wider economy. Individuals and business can lose their deposits, which can lead to lost confidence in banks (Bank of England, 2019). Deposits are an important means of payment for most individuals, so providing this makes the bank an important savings vehicle. Banks also perform other tasks as well, that are highly important for a well-functioning financial system. Providing payments services, monitoring borrowers and distribute risk are some of these tasks. In other words, banks have a considerable social importance, and therefore needs to be subject to extensive regulation (Norges Bank, 2018, p. 54).

The “why”

Banks can fail for many different reasons. For example, they sometimes make poor investment decisions, providing them with too small profits. Just like for companies, this can make a bank go bankrupt. Another example is the case of when individuals and businesses withdraw their deposits quicker than the bank can manage. This situation is referred to as a bank run and can happen if a large number of customers withdraw their funds simultaneously (Bank of England, 2019). Typically, this is the case when people have concerns about the bank’s solvency. Then, as more customers withdraw their deposits, the probability of default increases and thereby prompting even more people to get their money out of the bank (Su, 2019, p. 15).

When banks fail, they make it more likely that other banks go bankrupt, too. This is something that not only affects the banking sector, but also creates problems for the real economy. This was proven by the financial crisis of 2008, when problems spread from one bank to another, like a fire spreading, wreaking havoc in the rest of the economy (Bank of England, 2019).

The aim of banking regulation is therefore to promote a stable and efficient financial system. Regulations have the purpose of reducing the probability of future financial crises and ensuring that banks are able to perform their tasks efficiently. However, regulations may entail costs as financial services are reduced. As long as these costs are lower than the gains of regulation, then society as a whole benefits (Norges Bank, 2018, p. 54). Furthermore, regulations contribute to good bank management and make sure that they do not conduct investments that are too risky. It also has the intention of making it less likely that people will withdraw their deposits unexpectedly (Bank of England, 2019).

The “how”

Banks are regulated in many different ways. Among these is the regulation of deposit insurance, which is intended to reduce the risk of large withdrawals of deposits (Norges Bank, 2018, p. 54). The aim of deposit insurance is to shield retail customer deposits in the case of bank failure. Customer protection is an important element of deposit insurance schemes. This is because customers are rarely able to adequately assess a bank's risk level, for example when they are judging a bank's solvency or determining whether their deposits are correctly priced.

The first regulations had the goal of promoting stable and adequate access to banking services (Norges Bank, 2018, p. 54). As a result of the safety net that was put in place, such as deposit insurance and central bank borrowing facilities, stability was created. This encouraged risk-taking and increased the range of services provided and has in turn resulted in more regulation, primarily to curb risk-taking. In addition, owing to the increased globalization in the banking sector, problems faced by banks can quickly spread beyond borders. As a result, in the past 30 years, there have been a growing coordination of banking regulation internationally. Also, following from a banking crisis, regulations are typically tightened, and the minimum capital requirements are raised. After some time after a crisis, capital levels have tended to fall and is a tendency observed in Norway for the past 25 years.

FSA supervises financial institutions, such as banks, to ensure they are regulatory compliant (Norges Bank, 2018, p. 54). If banks or other financial institutions violate regulations, FSA

takes action to ensure compliance. A first step in this case is typically that the bank, within short time, present plans for returning to compliance. Then, FSA has to approve these plans. They may also impose other restrictions as well, such as restrictions on dividend payments to shareholders. Another example is restrictions on certain categories of debt. As a last resort, FSA can revoke the bank's license. If the bank is close to failure or the authorities decide to shut it down, crisis resolution rules is applied.

2.2.2 The Norwegian payment system

In addition to an efficient financial market, every nation also needs a well-functioning payment system. "Without fast, inexpensive and secure payments, a modern society grinds to halt" stated Deputy Governor Jon Nicolaisen (2019) in his speech at Finance Norway's payments conference in November this year. Norway's payment system is characterized by large-scale IT systems and high efficiency. However, as digitalization becomes an increasingly more significant trend, the payment system must adapt to new technologies and meet the needs of consumers and companies of the future.

Developments in infrastructure

Norway was one of the first countries to have modernized its payment system. In fact, the country still ranks at the top of international comparisons of efficiency related to the payment system (Nicolaisen, 2018). However, the country is being challenged on this area, as other countries have caught up and taken lead. One of these areas relates to real-time payments. It is not difficult to imagine that future users will not be satisfied with payment transactions that take several hours or days to complete (Nicolaisen, 2019). Therefore, the infrastructure of such payments is critical, but this is an where area Norway has lagged behind its neighbors (Nicolaisen, 2018). However, since 2016, Norges bank has collaborated with the Norwegian banking industry on improving the infrastructure of real-time payments.

Furthermore, instant payments are available through the payment application Vipps and from many online banks. Although this is a positive step, some limitations still exist, such as the fact that it cannot be used for all types of payments. Thus, the soon-to-be-launched instant payment platform, Straks 2.0, will be an improvement in infrastructure (Nicolaisen, 2019). However, this is not a permanent solution for real-time payments in Norway. One reason is that it is not sufficiently well-suited to business users.

Norges Bank has launched a project that will assess the payment and settlement system as a whole (Nicolaisen, 2019). This aims at ensuring Norway with an efficient and secure infrastructure also in the future. Some key issues include considering whether the payment infrastructure should continue to be all-Norwegian, or if it could be more international.

Participants

A common infrastructure for all payments has provided Norway with an important competitive advantage, facilitated interaction across the banking sector and provided economies of scale. However, the way consumers make payments is changing, and new services and operators constantly appear. Some of the main participants in the Norwegian payment system, in addition to banks, are now explained in further detail.

Vipps is Norway's most popular payment application for mobile phones and has 2.4 million users (DNB, 2019). The payment application offers solutions for invoice, in-store, e-commerce, and on-site payments for businesses operating in the Norwegian market. Vipps was established in 2015 by Norway's biggest bank, DNB (Gram, 2019). In February 2017, the SpareBank 1 Alliance, the Eika Alliance, Sparebanken Møre and 15 other independent savings banks, a total of 106 different banks, became shareholders together with DNB. Up until then, Vipps had been a part of the DNB Group, but now it became an independent company where DNB received 52 % ownership. Vipps later merged with BankID and BankAxept (BankAxept, 2018). However, both BankID and BankAxept are still operating under their own brands and company names. One of the objectives of the merger is to be better positioned to compete with global companies (Nicolaisen, 2018).

BankAxept was launched in the 1990s and is the Norwegian payment system, tasked with developing new payment solutions for a constant changing world (BankAxept, 2019). Eight out of ten card payments in Norwegian shops use a card with BankAxept, and it can be used for both digital and physical transactions. Payments are approved in real time through the use of a PIN or chip, using either contactless NFC technology or a mobile phone. Then, a check is carried out on the user's bank account, checking authentication and that the user has sufficient funds. Thereafter, the purchase sum is immediately debited from the cardholder's account. Ever since its launch, the company has been owned and managed by Finance Norway. However, in 2014, BankAxept AS was established in response to challenges posed by new operators and new payment solutions. The company had Norwegian banks as shareholders, and their task at present is still to develop and maintain new payment solutions.

The process of developing **BankID** as a common infrastructure began in 2000, and the first customers received their BankID in 2004 (BankID, 2019). Ten years forward, in 2014, BankID Norge AS was established with responsibility for communication, branding, operations and sales. Electronic identification with BankID fulfill government's requirement for ID- and identity verification, as well as binding electronic signatures. Today, close to 4 million Norwegians have BankID, which is used by all the Norwegian banks, digital services in the public, and an increasingly large number of firms in different industries.

In addition to the mentioned payment market participants, the Norwegian payment industry is experiencing an increase in new players. One of the drivers behind the emergence of new operators and companies, is the newly implemented EU directive, PSD2. This will be explained in further detail in the next chapter. In short, PSD2 is both a response to developments in payment markets, as well as a catalyst for future developments. The implementation of PSD2, together with increased digitalization and an increased focus on Open Banking, has led to the development and emergence of financial technology.

2.2.3 Financial technology

Financial technology brings about a new model in which information technology is driving innovation in the financial industry (Lee & Shin, 2018, p. 35). It is touted as game changing and disruptive innovation with the capability of shaking up traditional financial markets. This part of the chapter introduces a historical view of FinTech and explains the ecosystem of the FinTech sector. Lastly, we provide a map of the Norwegian FinTech market, including selected FinTech companies in which we encounter throughout the thesis. Understanding the FinTech market and companies are necessary when we later discuss why banks and FinTech companies work together to achieve their goals.

Defining FinTech

According to Lee and Shin (2018, p. 35), FinTech is recognized as one of the most significant innovations in the financial industry. It evolves a rapid speed, driven partly by the sharing economy, favorable regulation and information technology. Scholars argue that FinTech promises to reshape the financial industry by improving quality of financial services, cutting costs, and creating a more stable and diverse financial landscape.

Anything that can be relevant for the finance industry, that can optimize it, improve it, innovate it, that is disrupting the industry and the insurances, payment solutions and retailers – all of this goes under the umbrella of FinTech. (Raja Skogland, The Factory)

Technological developments in big data, mobile devices, infrastructure and data analytics allow FinTech start-ups to disintermediate traditional financial firms (Lee & Shin, 2018, p. 35). This is achieved with unique, niche and personalized services. According to PwC (2016), 83 % of financial services institutions believed that part of their business was at risk to FinTech start-ups. Furthermore, Lee and Shin (2018, p. 35) argue that because FinTech companies already have a significant impact on the financial industry, all financial firms should build capabilities to leverage and/or invest in FinTech in order to stay competitive.

The emergence of FinTech

Financial markets worldwide were deeply affected by the internet revolution in the 1990s, where one of the major effects was the lowering of costs for financial transactions (Lee & Shin, 2018, p. 36). Furthermore, the internet revolution drove technological advances, which changed the face of the financial services industry. This led to the development of electronic finance (e-finance), which refers to all forms of financial services, including banking and insurance performed through electronic means. E-finance enables businesses or individuals to access accounts, transact business, and obtain information on financial products and services without physical contact with financial firms. E-finance business models, such as online banking and mobile payment, emerged in the 1990s. This contributed to the downsizing and reduction in number of physical locations for banks.

Internet technology had impacts especially obvious in the banking industry (Lee & Shin, 2018, p. 36). From the bank's point of view, lower operational costs, shorter turnaround time, smoother communication within the organization, provision of value-added services such as access to professional knowledge in financial management, are only some of the potential benefits of online banking. Furthermore, growth of the smartphone user base in the mid-2000s facilitated a growth of mobile finance, including mobile payment and mobile banking, as an extension of e-finance. Financial institutions such as banks have enabled their customers to access bank account information and make transactions via their mobile devices.

FinTech innovation emerged after the worldwide financial crisis in 2008, and was a result of the advances in e-finance and mobile technologies for financial firms (Lee & Shin, 2018, p.

36). The innovation combines the e-finance, internet technologies, social media, artificial intelligence, and big data analytics. Start-ups in the FinTech sector differentiated themselves from traditional financial firms by offering personalized niche services, having data-driven solutions and an innovative culture. Generally, FinTech is considered a threat to traditional financial firms. However, it also provides ample opportunities for these firms, such as banks, to gain competitive advantages over competitors. The majority of financial firms have begun taking FinTech seriously, thus developing strategies to compete, coexist and collaborate with such start-ups.

The FinTech ecosystem

An explanation of the FinTech ecosystem is key to understanding competitive and collaborative dynamics in FinTech innovation, which will be discussed later in the thesis. Researchers (2018, p. 37) have identified five elements of the FinTech ecosystem, illustrated in figure 2-6. Scholars suggest that these elements symbiotically contribute to the innovation, stimulate economy, facilitate collaboration and competition in the financial industry, as well as benefit consumers.

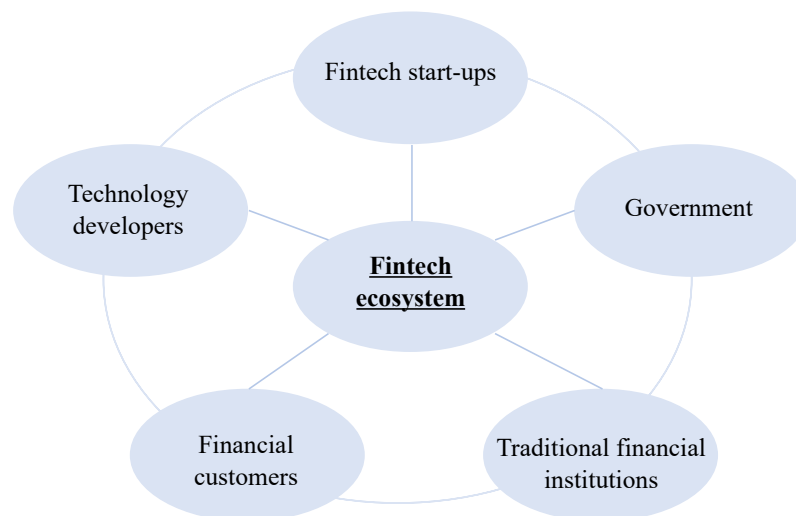


Figure 2-6: FinTech Ecosystem (Lee & Shin, 2018, p. 37)

FinTech start-ups are at the center of the ecosystem. This includes companies that are mostly entrepreneurial and have driven major innovations within different areas. Examples of areas are wealth management, lending, crowdfunding, and more. The innovations involve reducing operating costs, targeting niche markets, as well as providing more customized services than traditional firms (Lee & Shin, 2018, p. 37). FinTech start-ups are driving the phenomenon of

unbundling financial services, and their ability to do this is one of the major drivers of growth in the FinTech sector.

Lee and Shin (2018, p. 37) argue that technology developers “create a favorable environment for FinTech start-ups to launch innovative services rapidly”. Developers provide digital platforms for social media, big data analytics, artificial intelligence, and more. For example, the latter may be used to create unique and personalized services, while social media can facilitate the growth of communities in the person-to-person lending services and crowdfunding.

According to Terry, Schwartz and Sun (2015), governments have been providing a favorable regulatory environment for FinTech since the financial crisis of 2008. However, different governments have different levels of regulations. This depends on the national economic development plans and policies they have for FinTech companies to facilitate global financial competitiveness and stimulate innovation (Lee & Shin, 2018, p. 37). On the other hand, traditional financial institutions have been subject to increasing rigorous regulation, and stricter capital requirements since 2008. Therefore, looser regulatory requirements imposed on FinTech start-ups enable them to provide more customized, inexpensive, and easy-to-access financial services than traditional institutions.

Moreover, financial customers are the source of revenue generation for FinTech companies (Lee & Shin, 2018, p. 38). Although large organizations are important sources of revenue, the predominant revenue source for FinTech companies are small and medium sized companies and individual customers. Furthermore, scholars have found that early FinTech adopters tend to be younger, urban and tech-savvy. Today, people between the age of 18 and 34 constitute a large portion of FinTech consumption in most countries.

Lastly, a major driving force in the ecosystem is traditional financial institutions, who have been reevaluating their business models after realizing the disruptive power of FinTech (Lee & Shin, 2018, p. 38). Additionally, a dwindling window of opportunities to blunt FinTech impact on the market, financial institutions have been developing strategies to embrace FinTech innovation. Furthermore, traditional financial institutions have competitive advantages in financial resources and economies of scale in comparison to FinTech start-ups.

The Norwegian FinTech map

Throughout the last four years, FinTech has had an enormous growth in Norway, with 30 FinTech start-ups in 2016 growing to almost 150 in 2019 (The Factory, 2019). There has been an increasing interest in crowdfunding platforms, payment solutions, insurance technology and wealth tech companies. These are adapting quickly to changing customer demands to access more user-friendly and cost-effective financial solutions.

Furthermore, Norway seems to gather conditions that are in favor of positioning the country on the international FinTech scene, which may explain the rapid growth in FinTech companies (The Factory, 2019). According to The Factory, Norway is a particular trust based and transparent culture with a population of tech savvy and early adopters, allowing the country to be a great market for FinTech companies. Also, a high-quality lifestyle, good social benefits and safety have the ability to attract and retain talent.

Several incubators and accelerators, such as The Factory, as well as investors and public institutions are supporting the ecosystem (The Factory, 2019). An early adoption to the PSD2 directive is also creating a favorable legal environment for FinTech start-ups to test new and innovative financial services. In 2018, over 600 million NOK was invested in FinTech start-ups in Norway, indicating that the Norwegian FinTech industry is attracting several investor networks. Lastly, a proactive traditional financial sector, that is forward thinking and interested in the start-up scene, have been key.

Business models

With the emergence of their existence, FinTech companies redefined how people store, save, borrow, invest, spend, move, and protect money (Lee & Shin, 2018, p. 38). There are several business models for FinTech companies to adopt, as new technology offers endless opportunities. The business models relevant for this thesis relates to the FinTech companies we have encountered in our research, illustrated in figure 2-7. Now, we provide a short explanation of a selection of these companies. This provides valuable insight as to what is currently happening in the FinTech market in Norway. A full list of Norway's top FinTech companies is provided in Appendix 1.

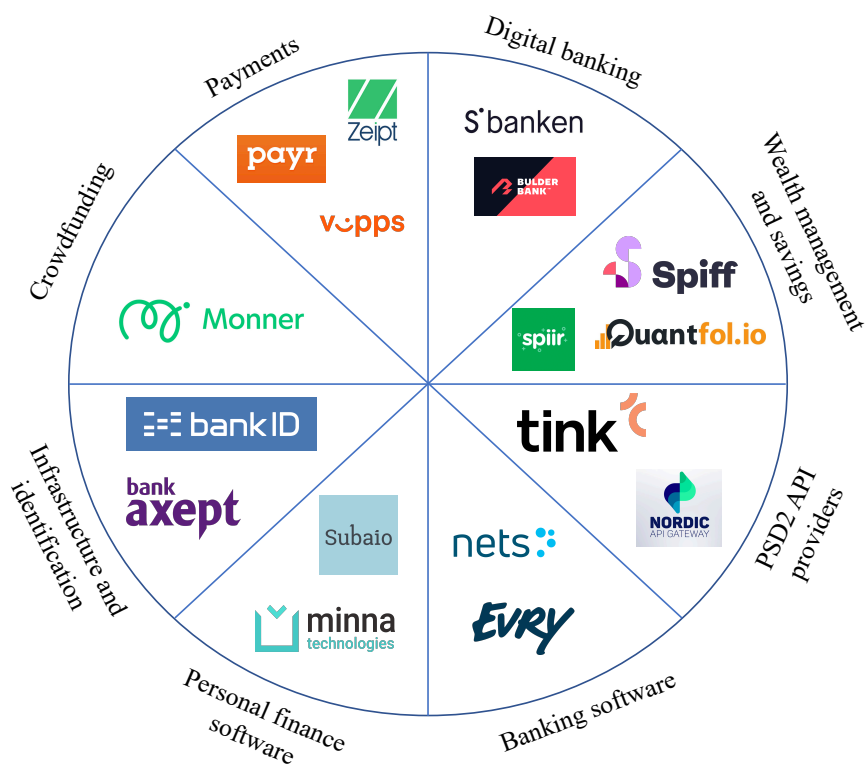


Figure 2-7: FinTech map

Payr was launched in 2017 as an application for mobile phones, offering scanning and payment of invoices (Bucher Johannessen, 2019). At the beginning of 2019, Payr also launched a marketplace for phone services, electricity, refinancing, and insurance where customers can compare cheaper and better alternatives after paying their invoice. The application has a userbase of 15,000 active users and has developed all the technology used in their application from scratch. This has aroused interest among banks. Previously this year, Payr merged with Hudya Group (Bucher Johannessen, 2019), with the main goal of expanding their horizon and enter new markets in other Nordic countries. Another reason for their merger was Payr's issues with financing, which the merger with Hudya was supposed to solve.

Zeipt is an omni-channel for receipts and was established in 2016 (Zepit, 2019). The company enables digital receipts to transactions, which is a service delivered to several Norwegian shops, such as Høyer and Bohus. Zeipt has two ways of operating, either involving cashiers or applications. With respect to cashiers, Zeipt helps companies reach their buyers digitally. The customer inserts the card, and the card's reference is sent to the cashier system. Then, the customer types the PIN, before the cashier checks if the customer is registered at Zeipt. If this is the case, the cashier knows that the digital receipt can be delivered. Alternatively, Zeipt target those developing applications, and offer a platform for their digital receipt-API.

The Danish company **Spiir** was established in 2010, and is an intelligent mobile application aimed at helping customers become more financially aware (Spiir, 2019). Spiir operates in countries across the Nordic, with over 340,000 users. The company helps customers receive help to manage their budget, monitor spending and find less expensive alternatives for fixed expenses (Danske Bank, 2018). Spiir takes use of behavioral science to raise financial awareness without the user realizing it (Mai, 2019). Furthermore, the company launched their application in Norway earlier this year, with 3,000 users so far and aiming for 200,000 users by the end of 2020 (McDonald Gerhardsen, 2019).

The history of **Sbanken**, formerly known as Skandiabanken, began in 2000. It emerged as the first solely digital bank in Norway (Sbanken, 2019). Until 2015, Skandiabanken was a subsidiary of Swedish Skandiabanken AB and a part of Skandia. However, in 2015 this changed, when Skandiabanken in Norway became an independent company. In fact, it was publicly listed on Oslo Stock Exchange in November of 2015. It was not until November of 2017, however, that the bank changed its name to Sbanken. Today, the bank has over 450,000 customers and their main office is located in Bergen, Norway. Sbanken is still an online bank only, best known for their no-fee products, competitive prices, and pleased customers.

Bulder Bank is a service provided by Sparebanken Vest and operates under the banking license of this specific bank (Bulder Bank, 2019). In other words, Bulder Bank is not an independent financial institution, but has their own brand. This was the result of an innovation project where the consulting firm Knowit Experience contributed (Opsahl, 2019). Moreover, Bulder Bank is considered the first pure mobile bank in Norway, meaning that they do not have any physical branches or an internet bank (Bulder Bank, 2019). Bulder Bank was made available for all users the fall of 2019. They offer services such as payments accounts and cards, as well as recognizing subscriptions, upcoming payments and income streams.

Nets is the leading provider of digital payment services and related technology solutions in Europe (Nets, 2019). They have headquarters in Denmark, but is represented in 20 countries across Europe, and trusted by over 250 banks. The company operates a deeply entrenched network which connects financial institutions, corporate consumers and merchants, allowing them to make and receive digital payments. Nets enables customers to utilize value-added services in order to help improve their respective activities.

Nordic API Gateway is built on the foundation of Spiir. They aim at helping companies create innovative digital solutions, making complex innovation simpler. To achieve this, they offer a plug-and-play solution, where a single API connects users to all the Nordic banks and provides accounts and transaction data from real users. Their access-to-account APIs have been used by large scale enterprise customers in production on Nordic markets since 2018, including several Norwegian banks (Mai, 2019). To support their clients to launch safely and with 100 % operational stability, Nordic API Gateway has developed fallback and PSD2 interface access.

Minna technologies was founded in 2016 and is a leading European FinTech company based in Gothenburg, Sweden (Minna Technologies, 2019). Their aim is to help retail banks deliver the next generation of digital customer experiences. With the subscription economy as a megatrend in society, Minna Technologies believe that subscription management is an area where banks have major opportunities to meet customer needs and add new revenue streams. By delivering a service for subscription management to clients, their clients can give customers an improved overview of their finances.

Founded in 2014, **Monner** is a Norwegian FinTech company whose aim is to connect entrepreneurs and investors (Monner, 2019). The company was provided with a license from FSA in January 2018 and was at the same time approved as a registered lender (Finanstilsynet, 2019). They thus have the permittance to deal with customers' money. By operating a digital platform, the company enables entrepreneurs' access to capital through crowdfunding. The aim of operating a platform is to enable growth for companies in the startup phase, as such companies struggle to get the same help from traditional banks (Monner, 2019).

2.3 The future of banking

Every aspect of a consumer's life is transforming into a digital experience in this era. As the previous part of the chapter indicates, the Norwegian payment market is in the process of being more digitized through the emergence of FinTech. Everything is becoming easier, faster and better. The ability to access, edit and share data easily and fast has now become a matter of course. Not surprisingly, customer preferences are changing in line with the emergence of new technologies. So, to be successful in this new environment, banks have to embrace emerging technology, put customers at the center of every strategy, and remain flexible to adopt evolving business models (Deloitte, 2019).

The future of banking is the topic of this part of the thesis. We begin by explaining the concept of Open Banking, before we elaborate how this can be achieved through application programming interfaces. Obtaining such knowledge is necessary when we later discuss how banks are responding to EU's new payment services directive, as well as analyzing how their competitive relations are changing in result.

2.3.1 Moving toward Open Banking

Open Banking can be defined as collaborative model (McKinsey, 2017). The phrase is used to describe the shift from a closed model, to one in which data is shared between members of the banking ecosystem with authorization from customers (Doyle, Sharma, Ross, & Sonnad, 2017). This is illustrated in figure 2-8.

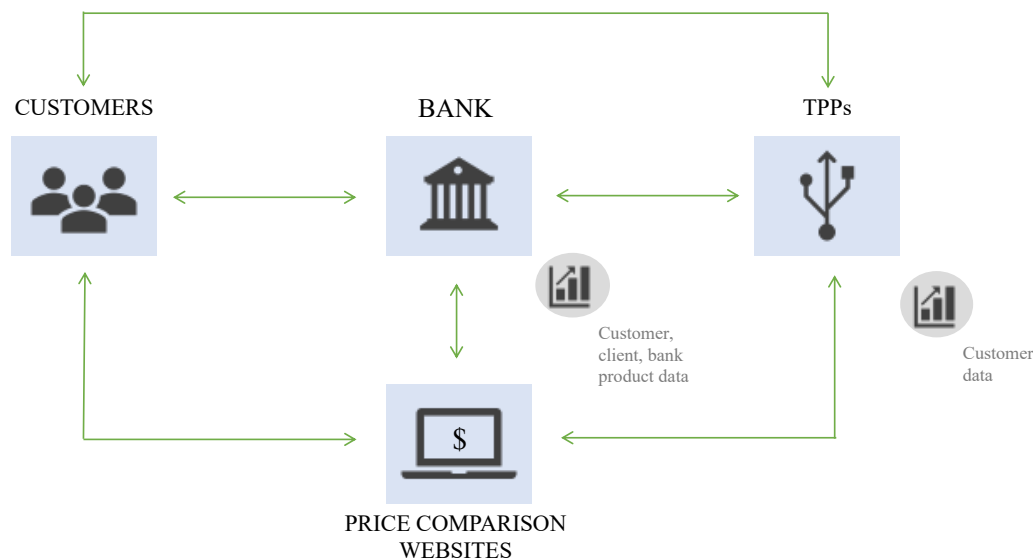


Figure 2-8: Open Banking

Open Banking involves data being shared through application programming interfaces, referred to as APIs, between two or more unaffiliated parties to deliver enhanced capabilities to the marketplace (McKinsey, 2017). Moreover, Open Banking enables third-party financial service providers access to consumer data on banking, transactions, and other financial information from both banks and non-bank financial institutions (Chappelow, 2019). Third parties are typically tech start-ups, such as FinTech companies, and customers are normally required to grant consent to let the bank allow these firms access to their financial data.

Open Banking stands to benefit end users and foster innovations, as well as new areas of competition between banks and non-banks (McKinsey, 2017). According to McKinsey, there are substantial potential benefits of Open Banking. This includes improved customer

experience, a sustainable service model for traditionally underserved markets, and new revenue streams. Even though increasingly more FinTech companies are emerging, incumbents still hold the keys to the vault in terms of rich transaction data, as well as trusted client relationships. However, banks tend to view the opening of these data flows as a bigger threat than opportunity. After all, it is newcomers, such as FinTech companies, who have demonstrated market traction thus far. These are presenting data in new forms and have gained valuable new customer relationships.

2.3.2 Application programming interface (API)

To fully grasp the business potential of Open Banking, it is necessary to gain some insights into the technical concepts defining its paradigm. As mentioned, Open Banking entails financial institutions to open up and share their data. Often, data-sharing is accomplished through an API, which is an intelligent conduit that enables the flow of data between systems in a controlled and seamless fashion (McKinsey, 2017).

When it comes to APIs, the level of openness determines potential reach, and it is often distinguished between three types of models (McKinsey, 2017). Public APIs are used by external partners and developers who build innovative applications and products. Partner or business-to-business APIs are used by business partners, such as suppliers, providers, resellers and others for tighter partner integration. Internal APIs are used by developers within the enterprise, leading to cost reduction and enhanced security.

APIs have been leveraged in banking settings for years (McKinsey, 2017). At its core, an API can be described as a documented set of connecting points that allow an application to interact with another system. Breakthroughs in advanced analytics and the market traction for numerous non-bank FinTech companies are giving APIs renewed attention. In specific, APIs are becoming a way of enhancing the delivery of financial services, both to retail consumers and business customers.

To enable data-sharing, PSD2 explicitly empowers account holders with the authority to share data, thus removing the financial institution's role as the gatekeeper. As a catalyst for the Open Banking movement, PSD2 is the topic of the following part of the thesis.

3. The revised payment services directive

PSD2 has been on “everyone’s” lips for the last few years. What does the directive actually mean? This will be the topic of the following chapter, which provides a valuable tool for our discussion later in the thesis. First, we start by explaining the European financial markets before PSD2, which is important in order to understand the need for a revised payment services directive. Following that, we provide a detailed explanation of what PSD2 entails, as well as its main goals and a timeline for the implementation. Lastly, we comment on the significance of PSD2 in Norway.

3.1 European financial markets before PSD2

“In all its diversity, the European Union is one of the most advanced and productive economies in the world”, stated The European Commission in 2007 (European Commission, 2007, p. 17). Furthermore, Levine (2005, p. 921) have presented empirical evidence that economic growth is strongly correlated with the functioning of the financial system. In other words, the European economy is dependent on a functioning financial sector for further economic growth. As seen in the previous chapter, a functioning financial sector is able to efficiently allocate economic resources, and thus facilitate the real sector to grow optimally.

3.1.1 Fragmentation and differences in development

Throughout the 20th and 21st century, the EU experienced an increasingly divergence between the real sector and the fragmented financial sector (European Commission, 2007, p. 212). In the years leading up to 2007, the European economy had progressively become more integrated. The real sector was to a greater extent operating across borders. This was in contrast to the financial sector, which was still mostly operating on a national basis.

As the financial sectors in each member state reflected national conditions, they were functioning well within each country. However, the fragmented financial sector constrained the increasingly integrated economy and limited the overall performance in the EU (European Commission, 2007, p. 152). High transaction costs related to cross-border payments, as well as high risk, led to limited financial activity across borders. This prevented an efficient allocation of resources (European Commission, 2007, p. 212).

The fragmented financial sector within the European area was not the only issue. Another challenge was the major differences in financial development across member states (European Commission, 2002, p. 50). The European Commission (2002, p. 50) stated that the big gaps in national financial development affected the economic growth as well. Aghion, referred to in European commission's review of the European economy (2007, pp. 152-153), stated that banks outside the EU tended to operate more efficiently. They were also found stimulating competition better.

3.1.2 Financial integration

It became clear that the financial sector in the EU did not function properly. Therefore, the European Commission increasingly focused on financial integration between member states. Financial integration became an EU policy, which was supposed to strengthen the efficiency of the financial system in the European area (European Commission, 2007, p. 212).

The increased focus on an integrated financial sector in the EU begun in the late 1990's. The introduction of the Euro in January 1999 was an important move toward a more integrated financial market (European Commission, 2007, p. 67), as it stimulated cross-border financial activity (European Commission, 2007, p. 212). Furthermore, The Financial Services Action Plan was created later that year. Also, when The Single Euro Payments Area was fully implemented in 2014 (European Central Bank, 2019), it aimed at harmonizing electronic payments in Europe. It was created with the ultimate goal of changing how currency is transferred within EU borders.

3.1.3 The introduction of the first payment services directive

The need for a greater integration of the financial sector in the European area led to the implementation of the payment services directive, also known as PSD1. The directive was issued by the European Commission in January 2007, and the rules applied from November 2009. The directive provided a legal foundation for an integrated payment market within the EU (European Commission, 2018). It regulated payment services and payment services providers within the internal market of the EU (iBanFirst, 2018). PSD1 opened up the possibility for non-banks to offer payments services to consumers. In the past, the responsibility to provide financial services had been restricted to banks only (iBanFirst, 2018).

The directive had three main goals, where the first was aimed at stimulating competition in the payment markets (iBanFirst, 2018). The second goal was to foster innovation, and the third was to strengthen consumer safety. The overall intention of the directive was to increase cross-border trade within the European area and to foster economic growth (Finans Norge, 2019), by making cross-border payments as easy and secure as payments within each country (European Commission, 2018).

3.1.4 The need for a revised directive

The implementation of PSD1 had various effects on the European economy and financial sector. PSD1 resulted in payment services providers increasing their information about fees and execution times, leading to more transparency. Also, the directive resulted in faster executions of transactions across the European area. Payments were often finished and found in the recipient's account within a day (European Commission, 2018). Furthermore, the directive led to increased competition, as it enabled new operators to enter the payment market. PSD1 led to the emergence of new business models, new market operators, as well as new technology.

There were a couple of problems related to the implementation of PSD1, resulting in the directive not having the desired effect (Finans Norge, 2019). PSD1 was introduced without any further description of what types of payment services were covered by the regulation. Therefore, the payment directive did not cover all the types of payment services that could potentially be offered to consumers. For example, a payment that was made directly from a payment account, without using a card or online banking, was not regulated by the directive. Furthermore, the market quickly realized that PSD1 did not facilitate innovation and product development for payment services as predicted. The new entrants and technology that did emerge, however, contributed to changes in market conditions. This made it necessary for a revised and updated payment services directive (European Central Bank, 2014, p. 49).

The European Commission discovered how parts of the directive were being interpreted in different ways across countries. This led to legal inefficiency and uncertainty. In the worst cases, the directive even led to distortion of the competition, as well as weakened protection of consumers (European Commission, 2018). This was the opposite of what PSD1 aimed to achieve. The European Commission realized they had to rethink the directive.

3.2 Introduction and implementation of PSD2

The European Commission began the revision of PSD1 in 2013, which resulted in the revised payment services directive, namely PSD2 (European Commission, 2018). The new directive was adopted in the EU November of 2015 and entered into force in January of 2016. PSD2 replaces PSD1, in which it takes the directive a step further by adding new regulations (Regjeringen, 2019). Its main goals and purpose, as well as the actual implementation of the directive is explained in the following.

3.2.1 Main goals and purpose

The main goals of the revised payment services directive are the same as for the first directive. PSD2 aims for further integration of the financial sector within the EU. It also aims to provide and foster innovation, competition and consumer protection (European Commission, 2018). Each of these goals are presented in more detail in the following.

An integrated European payment market

During the 21st century, the EU made considerable improvements toward a more integrated financial market (European Commission, 2007, p. 8). However, a lot of work still remained. By 2012, the EU actually found themselves moving toward an even more fragmented financial market. Still, the financial sectors were mostly operating on national basis (European Central Bank, 2013, p. 9).

Similar to PSD1, the purpose of PSD2 is to facilitate further integration of the financial sectors within the European Economic Area (EEA). It aims to create a harmonized regulatory framework for a single market (Regjeringen, 2019). The European Commission defines an integrated financial market as:

A market where prices for similar products and services converge across geographical borders and where supply and demand can react immediately to cross-border price differences. An integrated market should enable all market participants (consumers, financial institutions, etc.) to buy and sell financial instruments and/or services, which share the same characteristics, under the same conditions, regardless of the location of origin of the participant. (European Commission, 2007, p. 8)

The European Commission (2007, p. 8) states that an integrated financial market that fits the definition above, should have more diversification of risk, as well as better allocation of capital and more economic growth. By facilitating for an increasingly integrated financial market, the European Commission hopes to see a reduction in transaction costs related to cross-border payments. Cross-border transactions is today linked with high transaction costs, due to extra fees and charges. The high level of costs for international transactions limit trade across borders. By implementing PSD2, the European Commission hopes to achieve seamless international transactions.

Innovation and competition

The European financial market has been characterized by high card fees and banks with monopoly positions when it comes to customer data. By implementing PSD2, the goal is to motivate development toward more competition and innovation in the payment market, which will benefit consumers. According to Sjøholm Knudsen (2019), there are three roles under PSD2 that deserves more attention, which either contribute to increased innovation or is affected by it. These roles are explained in the following.

Account servicing payment services provider (ASPSP)

The first role is referred to as ASPSPs, and includes account providers, such as banks and financial institutions (Sjøholm Knudsen, 2019). These are required to offer at least one interface to third parties. In other words, PSD2 will entail that ASPSPs have to provide access to let trusted third party providers initiate payments and access account information.

Third party providers (TPPs)

PSD1 made it possible for non-banks to offer payment services. PSD2 takes the directive a step further and regulates these new entrants, which are so-called third-party payment services providers, referred to as TPPs. PSD2 requires banks to give TPPs access to their customers' account information and transaction history. This is evident from the access-to-account rule, typically referred to as XS2A, which is one of the most spoken-about rules in PSD2 (Brynjel, 2017).

To achieve XS2A, all banks must offer at least one dedicated interface to TPPs, which is further explained in the regulatory technical standards later in the chapter. This enables a TPP to build new services based on the information they receive from banks. One way that banks

can share data with TPPs is through APIs, as previously explained in the chapter on Open Banking. TPPs can be divided into two categories (Regjeringen, 2019), which is now explained in further detail.

1. Payment initiation services providers (PISPs)

PISPs are services providers who can initiate payment transactions at the request of customers. For example, a PISP can withdraw money directly from a customer's account if the customer has given consent. Any organization offering an online solution for accepting electronic payments to companies, retailers or merchants can be referred to as a PISP (GoCardless, 2017).

Before PSD2, when a consumer made a purchase from a retailer, the retailer collected the customer's payment card details. Then, the retailer requested and received the payment through the bank, a card scheme and the customer's own bank. However, after the implementation of PSD2, a PISP typically takes the form of a software-as-a-service model, which can connect a website with the online banking platform of the customer's bank, enabling a credit transfer to be enacted and completed. Put differently, the PISP creates a "bridge" between the retailer's account and the customer's, where the necessary information is exchanged to enable the transaction.

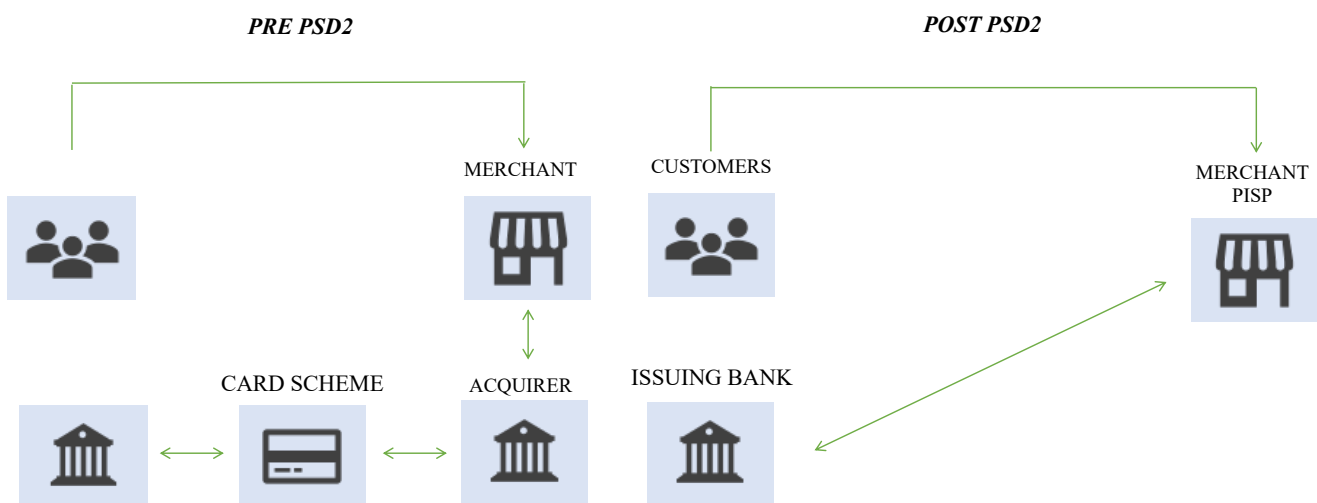


Figure 3-1: The payment flow before and after the introduction of PISP

An illustration of the payment flow before and after the introduction of PISP is provided in figure 3-1. As illustrated in the figure, other organizations, such as retailers, can offer their own payment platforms, and thus become a PISP. This leads to fewer involved parties and reduced commission fees, as well as potentially strengthen customer relationships.

By using a PISP, customers do not need to access their online bank to pay invoices. The PISP gains access to all bank details on the customer and can pay all invoices on behalf of their customers with the customer's chosen bank account. Another possibility is to use a PISP to pay for products or services in a physical store, application or web shop, given that these have an agreement with the customer's preferred PISP. In the future, increasingly more PISPs will likely enter the market. In Norway, Vipps is currently the most used PISP (Compello, 2019).

2. Account information services providers (AISPs)

An AISP is a market participant utilizing customers' account information to create new advisory and information services for customers (Compello, 2019). Consumers can grant AISPs full access to their account information, regardless of how many accounts they may have. However, the AISP has no agreements with the consumer's bank. Before PSD2, these services were not regulated, but now the directive provides a framework on how these organizations can access customer account details and transaction history (GoCardless, 2017).

Before the implementation of PSD2, customers had to interact directly with their banks, in which they had an account (Sjåholm Knudsen, 2019). In other words, a customer with four accounts in four banks also had four different online banks. The customer had to log in separately for each of them. This made it difficult to have a complete overview of individual's net worth. However, in the post-PSD2-world, account holders can offer payment and account APIs to TPPs. If the user gives consent, the TPP can aggregate account information on the user's behalf.

This enables TPPs, such as some FinTech companies, and incumbent banks to build a tool that aggregates the data from all the consumer's banks in one single interface. This is illustrated in figure 3-2. Furthermore, the information can also be used in a way to provide consumers advice on other, and perhaps better, ways of using their funds (Compello, 2019). An example of a Norwegian start-up FinTech firm working as an AISP is the company Bill Kill (Compello, 2019). Bill Kill works to further simplify the invoicing process, and as we can see from Appendix 1, the company is on the list of Norway's top FinTech companies.

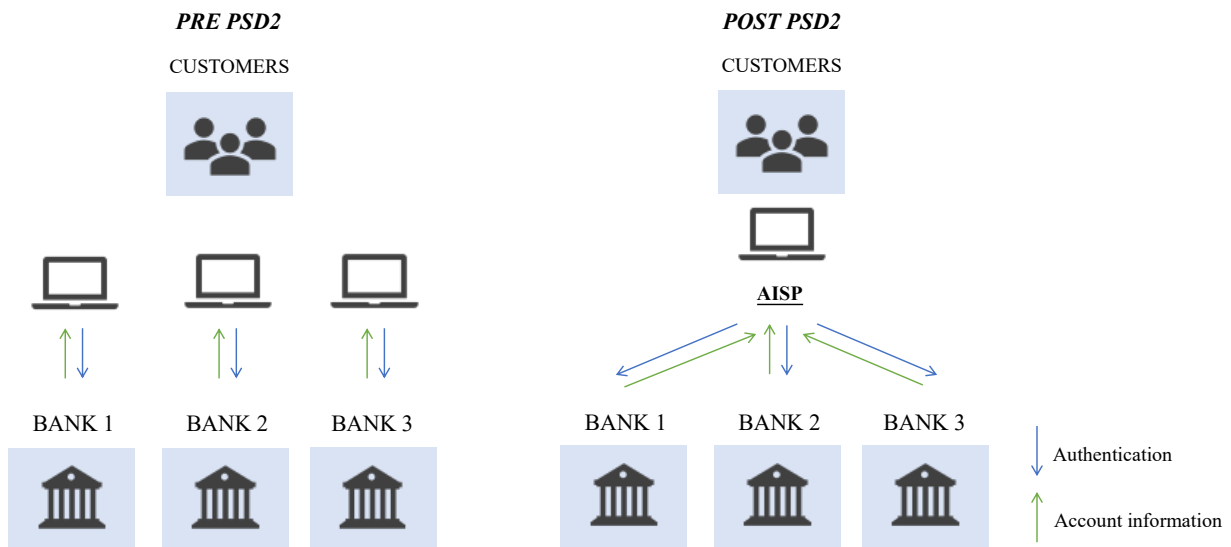


Figure 3-2: Before and after the introduction of AISP

An important thing to stress, is that TPPs must be PSD2-approved by the FSA in order to gain access to banks' APIs. Also, even though most TPPs are FinTech companies, not all FinTech companies are PSD2-approved.

Users

Users is the third role under PSD2 that deserves attention. This can be defined as those who have to give consent to PISPs and AISPs in order for them to access account information and initiate payments (Sjåholm Knudsen, 2019). PSD2 was designed to transfer value from established players to users, by lowering entry barriers and increase competition. Increased focus on consumers will direct the banks' focus toward becoming the preferred daily bank.

Increased competition and innovation will lead to more and better options in payment services and providers (European Commission, 2018). In the past, consumers have been charged extra fees when using their debit or credit card. In the light of PSD2, the European Commission banned all surcharging related to use of debit and credit cards in 2018 (European Commission, 2019). New technological developments and business models have led to a shift from a product- and service centric world-view, to one that is user-centric (Sjåholm Knudsen, 2019). This is a trend that have been further strengthened by PSD2, by giving a broad access to bank accounts.

Focus on customer protection

In line with the emergence of new technology, the risk associated with electronic payments for customers also increases. Electronic payments are becoming increasingly complicated, and more payment services are being developed.

PSD2 direct the focus to the increased risk. It emphasizes that secure payment services are a prerequisite for a well-functioning payment services market. PSD2 therefore introduces enhanced regulations on security and risk management of consumers' information (Regjeringen, 2019). The regulations apply to all payment services providers. This includes banks, TPPs and all payment institutions (European Commission, 2018). This is to strengthen consumer protection and help ensure that the solutions offered are secure. In the light of PSD2, customers will be better protected against fraud and hacking (European Commission, 2018).

3.3 Standards and timelines

The implementation of PSD2 is in full swing across European countries. In this section of the chapter, we provide information on the status of the implementation in the Norwegian banking sector. We start by discussing the regulatory technical standards related to PSD2. Furthermore, we present a timeline of the implementation of the directive. Lastly, we present the directive's significance for Norway.

3.3.1 Regulatory technical standards

After PSD2 was first introduced in the European banking sector, it became clear that some clarifications were needed. The European Banking Authority (EBA) began the process of developing supplementary standards to PSD2 already in 2015 (European Banking Authority, 2019). At the end of 2017, EBA adopted the regulatory technical standards (RTS) on strong customer authentication (SCA) and common and secure open standards of communication (CSC), hereafter referred to as RTS. The RTS was supposed to apply from 14th of September 2019, but have been postponed until 31st of December 2020 (Cocoman & Godement, 2019).

RTS has the purpose of defining the technical regulatory standards which are already provided by PSD2 (European Payments Council, 2018). It constitutes as a supplement to the payment services directive; where PSD2 describes *which* regulations to comply to, the RTS provides a detailed explanation on *how* the directive should be implemented technically. The two

principles explained in detail in the RTS, include strong customer authentication and common and secure communication.

Strong customer authentication (SCA)

SCA is presented in PSD2 and is further explained in the RTS, which explains what security measures firms must take. SCA is an identification process and entails that customers must identify themselves with at least two of the following: something only the user knows (e.g. PIN, password), something only the user possesses (e.g. payment card, mobile phone), and something only the user is (e.g. fingerprint, face recognition). Remote transactions, such as remote internet and mobile payments, require a unique authentication code as well. The code dynamically links the transaction to the specific payee and amount (European Payments Council, 2018).

The RTS provides details about when SCA must be applied. Customers must identify themselves every time they access their online payment accounts. Furthermore, once the customers go through with an electronic payment or do something in a remote channel that may pose a risk of payment fraud, they must identify themselves once again (European Payments Council, 2018).

To ensure that electronic payments are made as convenient and frictionless as possible, RTS provides an overview of preapproved exemptions. This is to make sure of a better user experience, and therefore low-risk payments are exempted from the regulations (Cocoman & Godement, 2019). This typically includes payments under a certain amount of money.

Common and secure open standards of communication (CSC)

The other principle described in RTS is the need for common and secure communication in the payment market. Now that PSD2 opens up for TPPs to access account information and to initiate payments on behalf of consumers, there must be common standardizations on how this is carried out. RTS regulates the communication between ASPSPs and the PISPs and AISPs (European Payments Council, 2018).

Before TPPs can conduct their services on behalf of the customers, there are certain steps that need to be completed. First, the customer must give their consent that they accept the AISP to access their payment information, or the PISP to initiate a payment on behalf of them. Next, the ASPSP must enable the AISP and the PISP to conduct their services. This is done when

the ASPSP provides TPPs with access to a secure communication channel (European Payments Council, 2018). The secure communication channel could either be through a dedicated communication interface, or through adaption of the customers' online banking interface (European Payments Council, 2018).

The RTS does not provide a set of rules for how the dedicated interface technically should be developed. However, RTS does present some abilities the dedicated interface should entail. For example, the dedicated interface should at all times offer availability and performance to the same extent as the customer's online interface (European Payments Council, 2018). The dedicated interface must be successful in enabling TPPs to conduct their services. The ASPSP must in addition provide a "fall back mechanism", to be prepared for a situation where the dedicated interface suddenly is not available for TPPs. This involves necessary measurements that enables TPPs to restore access to the customers' accounts. However, if the dedicated interface already has been successfully tested, meets the quality criteria, and is approved by the national authority, the ASPSP do not need a fall back mechanism.

The second choice of secure communication channel is through adaption of the customer's online banking interface. The TPPs use their own interface and their personal security identification to identify themselves as a legit TPP at the customer's bank. From there, the TPP gets access to the customer's account, and is able to conduct services on behalf of the customer, through the customers' online bank.

3.3.2 Timeline and status quo

PSD2 was first introduced in 2015 and was implemented in the EU on the 13th of January 2018, three years after the directive was first introduced by the European Commission. The implementation of PSD2 has been a long process. An overview of important deadlines and dates is presented by figure 3-3.

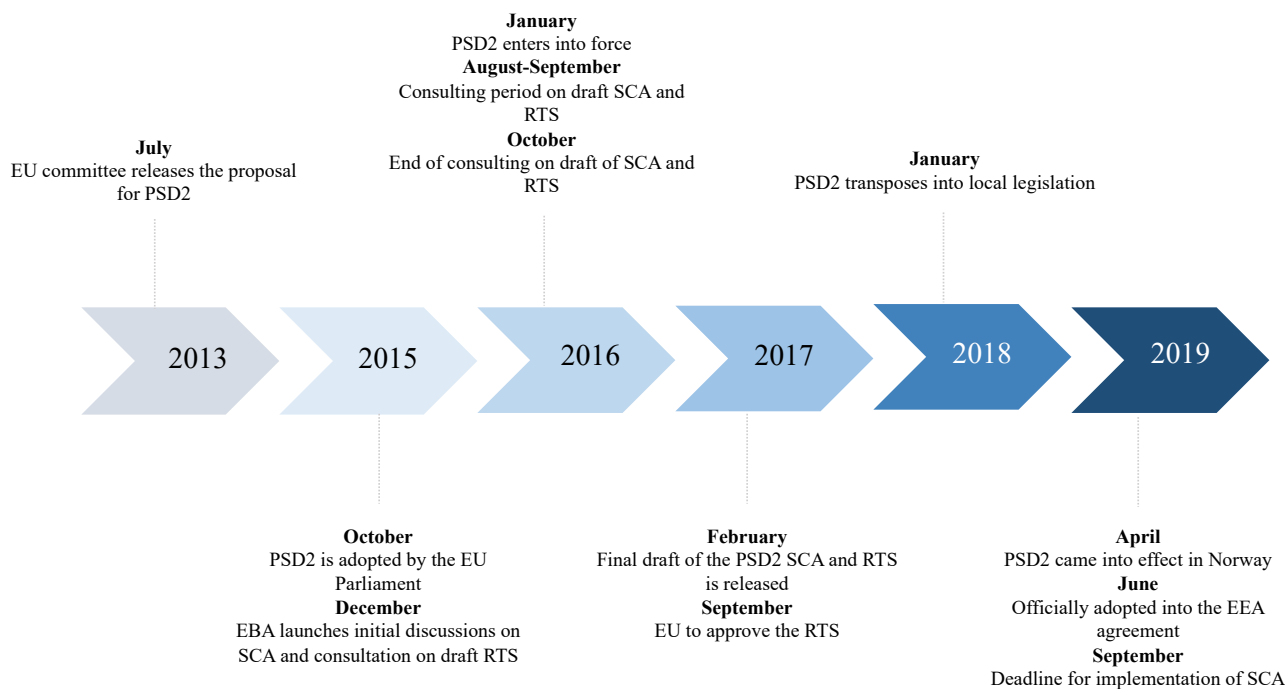


Figure 3-3: Timeline of the implementation of PSD2

As figure 3-3 illustrates, PSD2 was only recently incorporated into the legislation of the EEA. In spite of this, Norway began the work to implement the directive already shortly after it was introduced. Norwegian authorities implemented parts of the directive into Norwegian law on their own initiative, in anticipation of PSD2 to be implemented in the EEA agreement. These parts are the rules that came into force in Norway on 1st of April 2019 (Arvidsson & Digranes, 2019).

However, the directive is not yet fully implemented in Norwegian legislation. The Department of Justice is still working on completing the remaining parts of the legislation proposal. This has been a complex and time-consuming task, as it is important to limit possible mistakes and misinterpretations. This means that PSD2 is only halfway regulated in Norway so far, and that cross-border activities between other countries are not yet regulated. In spite of the directive not being fully implemented in Norwegian legislation, banks and businesses in the Norwegian banking sector have prepared and implemented PSD2 into their business models. The Norwegian banks are in the process of opening up their dedicated interfaces and TPPs are developing services to become PISPs and AISPs. Furthermore, companies are in the process of implementing SCA in their services.

3.3.3 Significance for Norway

To fully comprehend why Norwegian banks are responding in a certain way to PSD2, it is necessary to first understand the directive's significance for Norway. In fact, the post-PSD2-situation in Norway is slightly different compared to other European countries. This is because Norway enjoy a high technological adaption, strong digital infrastructure and a bank sector far along on its digital journey (Gundersen, et al., 2019, p. 2).

Due to the presence of BankAxept, Norway is already subject to low transaction costs. Fees in the BankAxept scheme are very low for both merchants and cardholders (Konkurransetilsynet, 2012). In several other countries, credit card companies like Visa, Mastercard and Amex are widely used for electronic payments, which induce high transaction costs. PSD2 thus ensures that such transaction costs are reduced in countries where these tend to be high. This objective of the directive has little significance for Norway, as Norway has quite low transaction costs. Moreover, using a payments card, paying an invoice or transferring money, within Norway, are services that is free of charge already.

In general, one of the perhaps most impactful parts of PSD2 is the requirement for SCA. However, in Norway, the requirement for two-factor-authentication for banks was implemented into law in 2016, through the use of BankID. In other words, the SCA requirement has been implemented and widely used among Norwegian consumers and banks since 2016. Therefore, this part of the directive has had little significance for the Norwegian banking sector. However, SCA has some impact on non-banks. For example, online stores must implement SCA for when customers pay for their products. Many of such companies have applied for postponement.

However, there is no doubt that PSD2 has had, and will continue to have, a great impact on the Norwegian banking sector. One of the most significant impacts has been that of the XS2A-rule, which forces banks to open up customer data and share this with TPPs. This contributes to a new competitive landscape, with the establishment of increasingly more FinTech companies. This can lead to a faster pace of innovation in the market, which can potentially lead to a radical change of the Norwegian payment sector as we know it. Exactly what PSD2 has meant for the Norwegian banking sector is the first topic of the discussion in this thesis, where we focus on specific measures taken by banks. First, some relevant theory is presented.

4. Theory

In order to successfully analyze the research question of this thesis, some theoretical framework will be both helpful and necessary. In this chapter, we begin with an explanation of strategic alliances. Then, we provide an explanation of competitive relationships, including competition, cooperation and cooptation. This will provide a helpful tool when we later discuss the new competitive conditions in the Norwegian banking and payment market after PSD2.

4.1 Strategic alliances

Strategic alliances are collaborative organizational arrangements between two companies to undertake a mutually beneficial project (Kenton, Strategic Alliance, 2019). These alliances have three important characteristics (Inkpen, 2001, p. 409). First, the two (or more) companies partnering retain their independence subsequent to forming the alliance. Second, strategic alliances have the feature of ongoing mutual interdependence, which leads to shared control and management. This contributes to complexity of the alliance management and can lead to significant coordination and administrative costs. Third, as a result of each firm keeping independence, there is uncertainty regarding what one party expects the other party to do.

4.1.1 Objectives

Companies form strategic alliances for a variety of reasons. Examples of such can be expanding into new markets, developing an edge over a competitor or improve a product line (Kenton, 2019). By pooling together resources, the companies can create greater value than what could be achieved if acting alone (Inkpen, 2001, p. 411). Value creation is obtained by combining the resources and capabilities of the partners. According to Inkpen, each alliance partner must gain some benefits in order for the alliance to be a preferred option. The different objectives for forming an alliance is explored in the following.

Speed

Speed is an increasingly important objective for collaboration (Inkpen, 2001, p. 411). This comes as a result from today's fast-moving competitive environment. Firms typically face the choice of internal development or alliance, where many firms choose to form alliances because

this can allow for faster strategy implementation. The option of entering the market alone has proven to be slower than entering via alliances.

Moreover, Inkpen (2001, p. 411) points to the fact that a go-it-alone strategy may not be the best alternative in a world moving at “internet speed”, because it may not allow firms to capitalize on new opportunities. Market access, complementary skills and technology can be obtained quickly via a partner. Therefore, a competitive position can be established more rapidly through an alliance rather than through internal development or replication. According to Inkpen, this implies that alliances are more likely to occur in industries that face rapid structural change.

Economies of scale and reducing risk

A second objective for entering into a strategic alliance is related to economies of scale. This can be obtained by pooling economic activities such as manufacturing, materials supply and distribution and marketing (Inkpen, 2001, p. 411). Internet is also making it easier for small companies to collaborate, which can facilitate scale economies in distribution and purchasing.

There is also an objective that relates to the reduction of risk and promoting stability (Inkpen, 2001, p. 411). Forming an alliance may be an attractive option for a risky and large project. This is because neither involved partner bears the full cost of the venture activity. Also, alliances may be a good option when there is a certain degree of technological uncertainty. In these situations, firms may be unwilling to proceed on their own and thus form alliances.

Legitimacy and access to knowledge

A fourth objective concerns legitimacy (Inkpen, 2001, p. 412). Companies may pursue established partners in order to capitalize on their partner’s reputation. Legitimacy is an objective that may be prevalent in cases where smaller companies engage in cooperative relationships with larger companies. An example of this can be taken from the software industry. In this industry, it can be observed that large companies such as Microsoft have established several relationships with smaller software developers. This creates an important industry legitimacy for small firms when partnering with companies like Microsoft.

Another important objective for strategic alliances is gaining access to another firm’s knowledge (Inkpen, 2001, p. 412). This can also relate to accessing their ability to perform an activity where skill asymmetries are present between firms. Alliances can be used to enter foreign markets or as a tool to bring foreign products into local markets. This can help firms

access resources that would otherwise not be available if the firm attempted to enter the market alone. Companies may also use alliances to gain access to knowledge that let them seek new technology in their core business area.

Sometimes, alliances may be used as a means of learning about potential synergies that could be obtained in an acquisition (Inkpen, 2001, p. 412). Such acquisitions have proven to be a lot more successful than others. Other objectives for strategic alliances can include blocking competition, co-opting and vertical quasi-integration, to mention a few.

4.2 Relationships between companies

In the first part of this chapter, we explored different objectives for strategic alliances. According to Kenton (2018), coopetition is a type of strategic alliance. When explaining this form of alliance, Czakon (2010) also finds it important to mention the additional three options for possible relationships with other players: 1) coexistence, 2) competition, and 3) cooperation. The relationships are illustrated in figure 4-1.

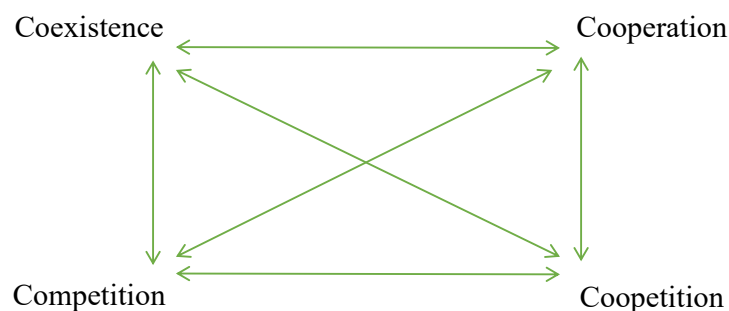


Figure 4-1: Relationships between firms and their possible dynamics (Czakon, 2010)

Czakon (2010) explains coexistence as the situation where two firms do not have any direct relationship with, nor significant influence on each other. Competition, on the other hand, he describes as the pursuit of similar goals, where one player can gain value at the expense of the other. Czakon refers to this as a zero-sum game. Furthermore, cooperation is explained as the opposite behavior and consists of coordinated pursuit of common benefits and mutual interests. Coopetition is described as a deliberate strategy of mixing cooperation and competition at different stages and arenas. The purpose is to achieve better collective and individual results.

As illustrated in figure 4-1, firms can tie complex, multidimensional and dynamic relationships to one another (Czakon, 2010). Competing firms may engage in close cooperation, which they subsequently leave and choose cooptation instead, or even abandon direct relations in favor of operating independently. In specific, cooptation is explained as the simultaneous pursuit of cooperation and competition (McCarthy, Carleton, Krumpholz, & Chow, 2018). If we look to the sports world, we can find some excellent examples of cooptation and the value it offers. In cross country skiing, running, cycling or ice skating, for example, elite athletes coordinate movements so that each contestant is able to perform far better than if racing alone.

As explained by Czakon (2010), cooperative arrangements are voluntarily initiated between firms. These arrangements involve sharing, exchange or co-development and can also include contributions by partners of technology, firm-specific assets or capital. This can be described as interorganizational relationships and firms that form these generally aim at collaborative advantage, cooperative advantage or relational rents. Prior research provides some valuable insight into such motives, which include efficiency improvement, transaction cost reduction, learning, uncertainty reduction and access to valuable assets.

The study done by Czakon (2010) points to a two-staged process of cooptation: value creation and value appropriation. Players form partnerships, where partners cooperate to “expand the pie”, but then compete for the biggest slice of it. His study then concludes that the strategy of cooptation has been defined as a deliberate use of cooperation and competition. The goal of this strategy is to achieve a positive-sum game and better performance for the involved partners.

McCarthy, Carleton, Krumpholz and Chow (2018) agree with Czakon (2010) on the definition of cooptation and explain it as a blend of the forces cooperation and competition. With respect to this, the concept of cooptation has been described as a “double-edged sword”. On one hand, we have the imperative of unbalanced competition, which would be to maximize only individual benefit. On the other hand, we have the opposing force of cooperation, which would preferentially maximize mutual benefit. According to McCarthy, Carleton, Krumpholz and Chow, there has to be a simultaneous balance between forces for cooptative relationships to be successful.

5. Methodology

This chapter of the thesis has the objective of explaining different aspects of the methodology used to discuss, analyze and answer our research question. First, we begin to describe the research approach. Then, the research design of the thesis is explained, before the collection and preparation process of the acquired data is presented.

5.1 Research approach

The objective of this master thesis is to gain a deeper understanding of PSD2 and to analyze how it has affected the Norwegian banking sector so far. Before conducting the study, it is important to decide how to approach the research. The Norwegian banking sector is a complex field. Moreover, so is PSD2 and the FinTech environment. Due to the complexity of the relevant field, it is difficult to predict in advance what findings we will get. We find an inductive approach suitable for this thesis, which involves starting with a topic of investigation before narrowing it down by research questions. It enables us to collect data from the market, make observations, and to develop a theory based on the findings. The choice of research approach provides further guidance for the choice of research method and design (Saunders, Lewis, & Thornhill, 2019, p. 157).

5.2 Research design

For the purpose of this thesis, a clear research design is key. This helps us specify what sources to collect data from, how to collect these, as well as how to analyze them. This is further explained in the following.

5.2.1 Research method and strategy

The social science's literature about research methodology distinguishes between qualitative and quantitative methods. When researching PSD2 and its effects on the Norwegian banking sector, we find a qualitative research method to be the most suitable procedure. PSD2 has just recently been implemented. There is limited data available to tell how the Norwegian banking market has been affected by the directive. However, there is a large number of companies working directly with PSD2 who are willing to speak about their experiences. A qualitative method enables us to get a clear understanding of the consequences from PSD2.

Science literature further distinguishes between qualitative data collected through interviews and through observations (Johannessen, Christoffersen, & Tufte, 2011, p. 104). It is a demanding task to solely gather data through observing the Norwegian banking sector. This is why our primary source of data is interviews. Furthermore, our secondary sources consist of published reports, books, and web sources. In addition, we introduce a dataset delivered by Norstat with the purpose of gaining deeper understanding of why banks have reacted as they have. The dataset constitutes as a quantitative supplement for our secondary sources of data.

With respect to research strategy, we have conducted an explorative multi case study, which can help us understand the connection between PSD2 and the current change in the Norwegian banking sector. An explorative study involves asking open questions to understand and gain insights about the relevant topic (Saunders, Lewis, & Thornhill, 2019, p. 186). A multi case study will make us able to compare findings from different players across the Norwegian payment market.

5.3 Data collection through interviews

We have decided to let interviews be our primary source of data. As both the Norwegian banking sector and PSD2 are complex fields, we do not know what findings we will get through the study, neither do we know what the correct questions are to ask. Therefore, in-depth interviews allow us to adapt to the conversation.

Sampling

A crucial part of the preparation is deciding who and how many to interview (Johannessen, Christoffersen, & Tufte, 2011, p. 107). We have chosen respondents based on strategic selection. This implies to think through what target group is important to be represented, and to choose interviewees based on this (Johannessen, Christoffersen, & Tufte, 2011, p. 110).

It is important that the interviewees have insights and knowledge about the relevant topic (Johannessen, Christoffersen, & Tufte, 2011, p. 107). Our sample consists of prominent figures within the Norwegian banking sector, as well as important personnel within emerging FinTech environments. All the interviewees we have talked to is working either directly or indirectly with PSD2, and they all have meaningful insight into the ongoing changes of the Norwegian banking sector. In total, we have interviewed six people with key positions in Norwegian and Nordic banks. Furthermore, we have interviewed four people who works

within other organizations related to the financial market in Norway. Lastly, we have conducted an interview of a person related to the FinTech environment in Norway.

The sample of interviewees is summarized in table 2. Generally, it is regarded an advantage the more interviewees that are included. It is more accepted with smaller samples when having an inductive research approach rather than a deductive approach. This is because the research is more likely to be concerned about the context and underlying relationships, something that can be investigated with a small sample of interviewees (Saunders, Lewis, & Thornhill, 2019, p. 155).

Name	Sector	Title	How
Ulf Bjørnhaug	Nordea	Head of Cash Management Sales	Phone call
Christoffer Hernæs	Sbanken	Chief Digital Officer	Phone call
Johanna Herbst	Danske Bank	Chief Digital Officer	Phone call
Jan Digranes	Finans Norge	Executive Director Policy Area Payments, Digitalization and Guarantee Schemes	Phone call
Svein Ove Langeland	Sparebanken Vest	Head of Strategy	Office
Waseem Rashid	DNB	Head of Platforms	Phone call
Kristine Ursfjord	SpareBank 1	Product owner Open Banking	Skype
Olav Johannessen	Finanstilsynet	Head of Section supervising IT and Payments	Phone call
Raja Skogland	The Factory	Head of FinTech	Phone Call
Brynjel Johnsen	Bits	Principal Advisor	Skype
Thea Melsbø Aarseth	Bits	Legal Advisor	Skype

Table 2: List of interviewees

Preparation and execution

Preparation is an important next step after selecting the interviewees. Importantly, the interviews are semi-structured. In line with Saunders et al. (2019, p. 437), we made a list with topics for discussion beforehand, as well as suggested questions. This constituted our interview guide, which is given in Appendix 2. It was made to provide guidance for the execution of the interviews. As the interview guide was semi-structured, we did not plan to follow the questions strictly.

Research was another important step in the preparation phase. We did research on each interviewee, their area of expertise, as well as the organization they represented. We adapted the questions in the interview guide beforehand, depending on the person we were talking to. This was to make sure we got the most out of each interview, and their unique experiences and knowledge.

Thereafter, the next step was to schedule time and date for the planned interviews. When scheduling the meetings, we aimed to conduct the interviews in person whenever possible. However, many of the interviewees were located in Oslo. Due to difficulties related to the distances, several of the interviews had to be conducted over skype (video chat) or telephone.

At the beginning of every interview, we asked the interviewees for their approval to record the conversation. All the participants agreed to this, which enabled us to transcribe the interviews afterwards. We aimed to transcribe the interviews as soon as possible after the interview was completed. This was to make sure we still had the conversation fresh in memory, as well as to provide further guidance for how we could interview the next interviewee even better. Also, we sent all the interviewees our transcribed notes for approval after every completed interview. Additionally, we contacted every interviewee for approval concerning any direct quotation. In this way, we gave the interviewees the opportunity to clarify any misunderstandings.

Bias and validity

Related to a semi structured in-depth interview, there are three sources of bias we had to consider (Saunders, Lewis, & Thornhill, 2019, p. 447). The first potential source of bias is the interviewer. We made sure to formulate questions in a way that would not bias answers. For example, we avoided asking leading questions. In addition, as some of the interviews were conducted using Skype, and one were even conducted at the interviewee's office, body language was another thing to consider. We tried having an open body language, neutral tone of voice and not make comments that could potentially bias the way interviewees responded. Thus, we made sure that our own beliefs would not impose the interviewee.

The second potential source of bias is the interviewee. How the interviewees perceive us might bias their answers (Saunders, Lewis, & Thornhill, 2019, p. 447). Furthermore, the interviewee might also bias the topics of discussion through the interview (Saunders, Lewis, & Thornhill, 2019, p. 448). The non-structure of the interview allows the interviewee to direct the

discussion. The interviewee might refrain from mentioning certain things, to avoid talking about unpleasant truths. To avoid this from happening, we made great use of our interview guide.

The last potential bias is participation bias. Saunders et al. (2019, p. 448) argues that there is a risk for the sample to be biased. Due to limited time frame and resources, we have a limited sample of 11 interviewees. The interviewees represent a good selection of banks and operators across the Norwegian banking sector. However, the selection is too small to represent the experience of the entire industry. Importantly, we have mainly interviewed one person from each company. Because of this, there is a probability that the interviewee speaks their own subjective opinion, instead of the companies' objective experience.

5.4 Data collection through dataset

A part of our secondary sources is a dataset provided by Cicero Consulting. The Norwegian data solutions provider, Norstat, conducted a research on behalf of Cicero the fall of 2019. The research was a country-representative survey aimed to address Norwegian consumers' view on personal finances and bank services. The main findings from the survey relates to what types of services customers prefer, as well as what services providers they would be most comfortable to receive these services from. We have decided to include this dataset as a secondary source of data, to gain further understanding of the banking and payment market after PSD2. This enables us to understand customers' demands and expectations from banks.

Sampling

The survey consists of a sample of 1016 respondents. When conducting a sample survey, it is important for the sample represent the composition of different characteristics in the population (2011, p. 259). For example, if the population consists of as many women as men, it is important that the sample also does so (Johannessen, Christoffersen, & Tufte, 2011, p. 259). The survey conducted by Norstat consists of 510 women, and 506 men. Furthermore, the respondents are approximately normally distributed with regards to age, region and income. The distribution of respondents according to gender and region is illustrated in Appendix 3.

Preparation and execution

The survey consists of 10 questions, which are a combination of category questions, list questions, as well as ranking questions. The different types of questions provide a

comprehensive understanding of the respondents' opinions. Importantly, the survey is pre-structured. Options for answers are provided for any given question beforehand. Providing pre-given answers to the questions make it easier, and perhaps less time consuming, for the respondents to conduct the survey (Johannessen, Christoffersen, & Tufte, 2011, p. 279). However, the disadvantage is that a pre-given answer does not provide further information beyond the already provided alternatives.

We received the finished dataset from Cicero in three different Excel files, as well as one Word file concerning the questions asked. Thus, we did not take an active part in the execution of the survey, nor the structuring of the data. However, by carefully examining the findings, we form our own analysis based on the responses. This is done by thoroughly reading the different files Cicero sent us. By creating figures and illustrations based on relevant numbers, we are able to disclose and interpret interesting trends and results.

Bias and validity

The validity of the survey is largely dependent on the design of the questions, as well as the structure of the questionnaire (Saunders, Lewis, & Thornhill, 2019, p. 516). There is a risk that the respondents misinterpret questions. Respondents might misunderstand the instruction given by the question, and answers in violation of the question. There is also a risk of lexical misconception, which involves misinterpreting the question because the respondent interpreted a word differently than intended.

As Norstat is a highly used and trusted quality data solutions provider for the research industry in Norway, it is likely to believe that they have considered these biases when preparing and executing the survey. However, the sample itself can also be a source of bias. There are 1016 respondents, which might not be a representative number of the Norwegian population. Also, despite the respondents being normally distributed, they might overrepresent a certain part of the population. For example, with regards to profession. Therefore, we must be careful drawing conclusions based on the survey.

6. Responding to PSD2

In addition to be a regulatory framework, PSD2 can also be turned into a digital opportunity that unlock new values. As a result of the new directive, banks are for the first time required to open up their value chain for TPPs. This has some important implications for the traditional banking sector. An interesting question is therefore, how are Norwegian banks responding to PSD2, and what new services are emerging as a result?

In this section, we shed light to this question with a discussion on the status quo in the Norwegian banking sector. First, we discuss what being regulatory compliant to PSD2 entails for banks. Then, the second part of the chapter is dedicated to a discussion on what value-adding services incumbent banks are developing in response to PSD2. In the third part of the chapter, we provide an analysis of whether such measures are actually creating value for customers. Lastly, a discussion on the pace of innovation in the banking sector is provided.

6.1 Regulatory compliance

PSD2 forces banks to make several measures in order to meet its requirements. This includes implementation of strong customer authentication and to ensure a common and secure communication. The perhaps most impactful and debated part of PSD2, and the focus of this part of the chapter, relates to the introduction of new payment initiation and account information services, operated by TPPs (The Berlin Group, 2019). According to the XS2A rule, banks are obligated to create and offer at least one dedicated interface to TPPs.

However, as pointed out in the chapter three, neither PSD2 nor the RTS offer a detailed explanation of what this exactly entails. How banks have decided to respond to the requirements is thus the objective of the following discussion. First, we discuss what different choices banks face when complying to PSD2, such as either developing a customer facing interface or to rely on modified screen scraping. Then, we discuss how banks enable ways for developers to explore banks' APIs through different developer portals.

6.1.1 The challenge of choice

To ensure compliance to PSD2, banks have two options. The first alternative is to allow TPPs to use the bank's existing online customer interface, in which case the interface would need

an upgrade in order to integrate identification of TPPs. The second alternative is to provide a dedicated interface for TPPs. However, this would generate huge costs and network complexities, if every and each European bank would develop, document, test, maintain and operate its own proprietary XS2A interface (The Berlin Group, 2019). This complexity is illustrated in figure 6-1.

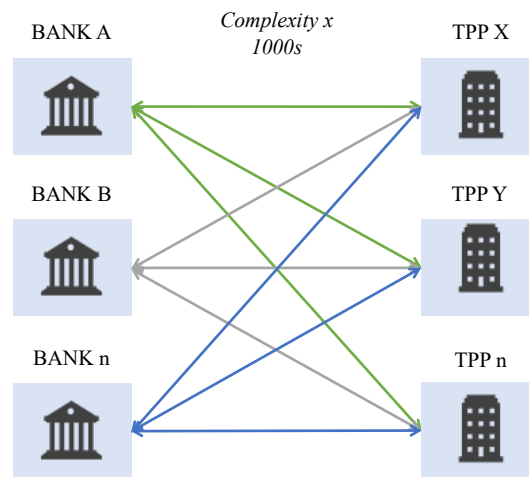


Figure 6-1: Network complexity (The Berlin Group, 2019)

Screen scraping

As mentioned, banks can decide to offer an upgraded version of their existing online customer interface to TPPs, which can be referred to as modified screen scraping. Traditional screen scraping is banned under PSD2, as it does not meet the directive's security requirements (CTMfile, 2017). In specific, screen scraping is something that can happen when consumers are doing online payments. Then, a TPP requests access to credentials, including special bank account codes that belongs to the consumer. The TPP subsequently impersonate the consumer when contacting the consumer's bank. This gives the TPP access to the consumer's online bank accounts on behalf of the consumer.

However, the problem is that this TPP gets to see *all* the data in the consumer's online bank accounts. Including information about their loan accounts, salary, savings, insurance, pension and other information. This is viewed as problematic from a consumer protection point of view. Therefore, European authorities decided to ban these screen scraping services. Importantly, however, banks are allowed to offer a *modified* version of this service. This require an integration of identification of TPPs. In other words, complying to PSD2 enables TPPs to access only limited customer information through modified screen scraping.

According to Brynjel Johnsen, a few Norwegian banks have decided to continue the use of screen scraping, but with an updated version that is compliant to PSD2. He argues that these banks wanted to “buy time” due to what they experienced was too many unresolved questions related to PSD2. However, most of these banks are planning to develop a dedicated customer facing interface very soon. As we see in the following, the majority of Norwegian banks have decided to do this, and some therefore keep modified screen scraping as their fall back mechanism instead.

Standards and frameworks

Because neither PSD2 nor the RTS provide an established set of rules of what dedicated customer interfaces should look like, players are left with a room for interpretation. Thus, banks face a freedom to choose their own path for technological implementation, which can be challenging. The most common way of implementing such an interface, however, is through the use of APIs. With respect to this, different standards and frameworks have been initiated to help banks create interfaces that are compliant with the RTS.

The Berlin Group, a European standards initiative, has created an API standard that all European banks can make use of when implementing their dedicated interfaces. This standard is called “NextGenPSD2” and aims to create a common, open and harmonized European API standard to enable TPPs to access banks’ accounts under PSD2. It consists of a task force with participants from different players in the European banking sector, such as our interviewee company Bits. This has resulted in a framework that provides European banks with an implementation guideline.

By making use of NextGenPSD2, the Berlin Group believes this can reduce the PSD2 XS2A complexity and fragmentation risks tremendously (The Berlin Group, 2019). Also, a uniform and interoperable XS2A communication would provide TPPs with uniform access to the market and optimal reachability. Saving costs and reduce risk on development, implementation, as well as on maintenance, testing and operations are additional benefits. It would also generate better, cheaper, more and faster time-to-market services for banks’ customers. This is illustrated in figure 6-2.

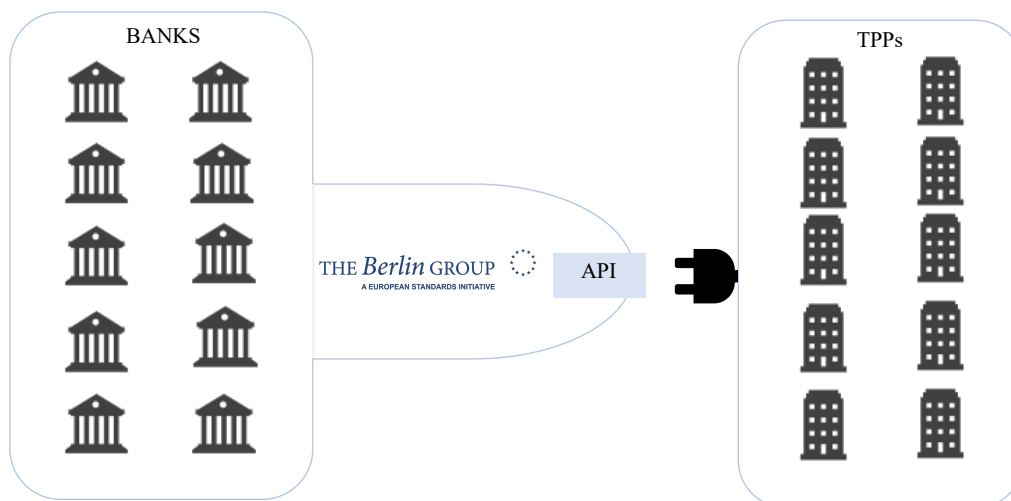


Figure 6-2: Reduced complexity with Berlin Group and NextGenPSD2 (The Berlin Group, 2019)

The preferred standard

According to Johnsen, approximately 75 % of all European banks have decided to use the standard created by the Berlin Group. A number of banks have decided to use the UK Open Banking Standard, while STET is applied in France (Next Digital Banking , 2019). Additionally, some banks have decided to develop their own APIs. Most players operating in Norway, however, have decided to implement the Berlin Group NextGenPSD2 framework (Johnsen, 2019). Johnsen estimates that approximately 80 % of all Norwegian banks follow this standard.

Some of the exceptions include Nordea and Danske Bank. The former has decided to develop their own, while the latter is following the UK Open Banking Standard. Danske Bank decided to make use of the British standard because this was developed earlier than the Berlin Group standard. They implemented the standard early on in their branch in Northern Ireland. Therefore, Danske Bank wanted to reuse competency from this experience when implementing a standard in their Norwegian branch as well. However, the UK Open Banking standard is not yet 100 % compatible to PSD2, but according to Johnsen it will be so soon.

An important thing to mention is that DNB is the only Norwegian bank directly participating in the partnership with Berlin Group. The other Norwegian banks are represented through Bits, which is tasked to maintain the interest of all Norwegian banks. However, as DNB is the biggest bank in Norway, they have decided to be an individual member themselves.

6.1.2 Developer portals

Whether banks choose to develop a dedicated interface or base it on their existing customer facing interface, they have to make the interface documentation and a testing facility available for TPPs (Bits AS, 2019). This information must be published to the banks' public websites. Most Norwegian banks enable this through developer portals.

How does it work?

TPPs gain access to PSD2 APIs through developer portals made public by the respective banks. By providing access to banks' data through PSD2 APIs, developer portals allow developers making useful and innovative services for consumers. The developer portals often consist of two separate environments, explained in the following.

Production environment

The main environment of the developer portal is the production environment. This allows TPPs access to live PSD2 APIs of the bank in question. By connecting to the APIs of the bank, TPPs can thus develop and launch their own services based on the bank's customer data. An important thing to stress, is the fact that banks will never share customer data unless the customer gives explicit consent.

In the production environment, the PSD2 APIs made available relates to accounts, transactions and payments. The former gives developers an overview of customers' accounts, along with their available balances (DNB, 2019). With respect to transactions, developers can gain access to an overview of transactions completed using a payment account within the bank. Lastly, APIs related to payments enable developers the possibility to initiate both domestic and international payments for customers' accounts.

In order for developers to access the available APIs and production environment, they must become licensed TPPs, which involves being PSD2-approved by the FSA. In addition, the TPPs must have a certificate to identify themselves as a registered TPP (QuoVadis, 2019). With respect to this, banks typically require either of the two different types of certificates: A Qualified Web Authentication Certificate (QWAC) or a Qualified eSeal Certificate (QSealC). These certificates are provided by qualified trust service providers (QTSP). Some of the largest banks in Norway have gained a qualified status as an QTSP, including DNB and Danske Bank (Norwegian Communications Authority, 2019).

The sandbox

In addition to the production environment, Norwegian banks also offer a sandbox. This is a copy of the production environment, defined as a testing environment where software can be tested and developed, without risking adverse effects on operating systems (Bartnes, 2019). The sandbox delivered by banks consists of simplified and mocked example APIs, providing synthetic test data (DNB, 2019). In the sandbox, TPPs are allowed to experiment with their development of new services. In addition, they are given the opportunity to test the integration of APIs to their own online applications, without actually launching them to end users.

In contrast to the production environment, access to the sandbox does not require developers to be PSD2-approved by the FSA. However, the TPPs must have either a QWAC or QSealC test certificate in order to identify themselves as registered TPPs. Additionally, the certificate used must highlight the fact that the TPP is only approved for the purpose of testing.

Taking it a step further

With the intention of preparing for Open Banking, some Norwegian banks have decided to take their developer portals to the next level. Through separate developer portals, APIs beyond PSD2 requirements are published to utilize the talent of external developers. Some Norwegian banks have developed such portals for registered TPPs, while others have developed portals for end users themselves. The two initiatives are now further discussed.

APIs for TPPs

Some Norwegian banks have decided to provide registered TPPs with access to more APIs than what is required by PSD2. This is often done through a second developer portal. In similarity to the PSD2 developer portals, these portals enable TPPs to test their ideas and develop prototypes in a virtual banking environment. However, as TPPs can access even more APIs, it may result in more and better services being developed.

The main objective behind providing developer portals beyond PSD2, is to encourage and foster innovation. By enabling creative and talented developers to explore different APIs, it can enable banks to get in touch with potential partners. Some of the developers might have interesting ideas that can provide value for the bank. This can lead to new partnerships and collaborations, empowering the bank's competitive position in the banking market.

SpareBank 1 is one of the few banks who has published a second developer portal, only available for strategic partners of the alliance. DNB has announced to soon launch a second developer portal beyond requirements of PSD2 too. Furthermore, Danske Bank has launched their “Developer Playground”, with the intention to strengthen the bank’s engagement in the Nordic FinTech environment. They want to continue the development toward becoming a “bank of the future” and is thus willing to share more APIs with a selected few in order to get innovative service suggestions (Danske Bank, 2019).

To selected partners, we can offer APIs that go beyond the requirements in PSD2. We are not going to do that for all licensed TPPs, but to selected partners, to create some innovative solutions that can give us some competitive advantages. (Johanna Herbst, Danske Bank)

Nordea has also decided to open more APIs than what is required by PSD2. As they are looking to become the go-to hub for banking APIs in the Nordics, they have decided to go beyond PSD2 in order to strengthen collaborations with FinTech companies (Nordea, 2019). Importantly, Nordea has commercialized their APIs, thus differentiating themselves from other banks.

APIs for end users

A few Norwegian banks have also decided to launch developer portals for the purpose of the consumers. This third option for portals allows the end user itself to access the banks’ APIs, thus enabling the consumers to develop their own financial services.

These portals have two important objectives: encourage innovation and obtaining an understanding of what customers want. By enabling creative and talented developers to explore different APIs, banks can get valuable feedback as to what their customers expect, prefer and demand from their banks’ online interfaces. Also, the bank can get suggestions for value-adding services to provide all their consumers, thus strengthening their competitive position.

Sbanken has launched such a developer portal, with the intention to stimulate more innovation. Furthermore, SpareBank 1 has launched a similar service, named “Personal Client”. Ursfjord argues that it enables customers with developing skills to explore their APIs and build an application for themselves. Furthermore, she suggests that this does not necessarily give direct value to the bank, but it offers the possibility for potential partnerships and collaborations.

We cannot see what the developers are doing. However, if they report to us with a very good idea, then this is something we could take a look at with that person. (Kristine Ursfjord, Sparebank 1)

6.2 Value-adding services

PSD2 offers opportunities beyond regulatory compliance. Norwegian banks have recognized some of these opportunities and have already begun developing new services. In other words, requiring banks to open up their APIs and share valuable customer information with TPPs have nudged them to innovate in a greater extent. This is benefitting their customers, who are now receiving more innovative and user-friendly services aimed at satisfying yet uncovered needs.

This section of the chapter consists of a discussion on what specific services Norwegian banks have developed as a response to PSD2. First, we introduce a table illustrating an overview of the current development in the Norwegian banking market, thus describing which banks have developed what services. Then, a more detailed discussion on the implementation of the respective services is provided.

6.2.1 Overview of current development

Table 3 provides an overview over potential services that could be developed by banks, in either direct or indirect response to PSD2, focusing on the retail market. Furthermore, we include our findings regarding which of the banks represented in our study have developed what service. Green symbolizes that the particular bank is offering the service to its customers, while yellow symbolizes that the service is under development, but not yet launched. Red, on the other hand, indicates those who have not developed the particular service.

Service	Dnb	Sparebank1	Danske bank	Nordea	Sbanken	Sparebanken vest
Account overview	✓	✓	✓	✓	✓	✓
Subscription management	✓	✓	✓	✓	✗	✓
Personal budget	✗	✗	✗	✗	✗	✗
Automatic categorization of spending	✗	✗	✓	✓	✓	✗
Durability of current balance	✓	✗	✗	✗	✗	✗

Table 3: Summary table and overview of the market

6.2.2 New services provided by banks

As we can see from table 3, most Norwegian banks have prioritized developing the same services. In specific, close to all the included banks are offering a service for account overview. Several also offer an automatic categorization of spending, and subscription management is under development for three out of the six and already launched in two. Personal budget and durability of current balance are functionalities banks have not prioritized, at least not yet. The five mentioned services are further discussed in the following.

The majority of these services are developed in cooperation with FinTech companies and other banks, which will be further elaborated in chapter seven. However, before elaborating what the collaborations entail, this chapter focuses on the services provided. These are now further discussed.

Account aggregation and overview

PSD2 provides banks the opportunity to consolidate information from external financial accounts in their own interface, and in turn provide a new service for their customers. This is typically referred to as the service of account overview, which can be delivered by either banks

themselves or TPPs. To enable account overview as a service for customers, the provider must successfully complete an account aggregation. Usually, account aggregation occurs within a single financial institution, such as a bank. However, with the implementation of PSD2, most banks are leveraging the new directive to provide multi-account aggregation across banks. This has been considered as a natural next step on the journey toward providing increased value to customers. In practice, the service allows a customer in bank A, who also holds an account in bank B, to view their bank B-account in the online interface of bank A. An important thing to stress, is the fact that PSD2 only require “payment accounts” to be made available for TPPs.

In order to perform an account aggregation between banks, it is a prerequisite that the respective banks have opened up their APIs. Account aggregation involves one bank connecting to another bank’s APIs, which can be a demanding task. Essentially, if their customers have a variety of different banks, the original bank must connect to all these banks’ respective APIs in order to offer the service to all customers. Needless to say, this is time-consuming and requires extensive competency. Yet, the majority of Norwegian banks are either already offering this service to customers or are planning to do so. Our interviewees argue that account aggregation and overview is more or less interpreted as a requirement from PSD2. In other words, even though the directive only actually requires them to open up their APIs, a consensus in the Norwegian banking market is to also provide a service for account aggregation and overview.

Implementation in the Norwegian banking market

This service was first introduced in the Norwegian banking market when the SpareBank 1 Alliance implemented the service across all their banks in the spring of 2018 (Weldeghebriel, 2018). Subsequently, Danske Bank followed shortly after and implemented the service later that same year. This made Danske Bank the first Norwegian bank to enable account display from non-associated banks through account aggregation (Byberg, 2018). Sbanken, Sparebanken Vest and Sparebanken Sogn og Fjordane entered a collaboration and followed shortly after. Later, additional banks have developed account aggregation and overview services as well. This includes DNB, and the SpareBank 1 Alliance is now also offering their service from non-associated banks. Nordea has not yet launched the service. However, the bank has announced that it is scheduled to be implemented soon.

So far, it is only possible to view a limited number of other banks in the account overview service. This means that not all Norwegian banks across the country have opened up their APIs and enabled account aggregation yet. However, this development is provided by most large Norwegian banks, as well as neobanks, as we have seen in this part of the chapter. Nevertheless, it has been announced by several banks that all Norwegian banks will be included in their service soon.

Subscription management service

To further leverage opportunities emerging from PSD2, several Norwegian banks are developing a service for subscription management. The subscription economy is rapidly growing, and Nordic consumers have currently between eight and twelve subscriptions on average (Nets, 2019). Thus, the need for a helping tool has emerged among Norwegian consumers, as it is increasingly difficult for consumers to keep control over their subscriptions.

To address this, a subscription management service can be valuable. The service involves collecting payment information in the purpose of providing customers with a total financial overview of their subscriptions. This can include subscriptions related to streaming services, such as Spotify and Netflix, as well as gym memberships, electricity and other monthly payment subscriptions customers may have.

Implementation in the Norwegian banking market

As illustrated in table 3, five out of six interviewed banks are already either offering a subscription management service, or in the process of developing it. This includes some of Norway's biggest banks, such as DNB, Danske Bank, SpareBank 1 and Nordea as well as Sparebanken Vest.

DNB and Sparebanken Vest

DNB and Sparebanken Vest are the only Norwegian banks to already have launched this service to their customers. The service is now implemented in each of the banks' mobile applications. However, the first version of the service only provides an overview of subscriptions connected to payment cards issued by the respective bank. Another limitation to the service is that the overview only consists of subscriptions that has been paid in the last few months. Furthermore, only a selected few subscriptions are included in the service. DNB has

announced that an upgraded version of the service will arrive soon, and it is likely to believe that Sparebanken Vest will do the same.

Danske Bank

With respect to Danske Bank, table 3 indicates that the bank has not yet launched a subscription management service. However, their branch in Denmark has developed and implemented the service, which is currently offered to their Danish customers. This was done in 2018, while their branches in Finland and Norway are supposed to follow in 2019 (Danske Bank, 2018). They refer to the service as “Subscription Manager”, and the service will be gradually implemented in both countries. The first version will give customers access to a simple overview of their subscriptions. Eventually, customers will be able to use the service as a tool to save money by improving the terms of their subscriptions (Danske Bank, 2018). Their Danish customers can already request help from the “Subscription Manager” to search for cheaper options for their mobile phone subscriptions. Over time, it is also intended that the solution can help customers save money on other types of agreements as well.

This gives Danske Bank a value-adding functionality in our mobile app, which has helped our customers a lot. For example, they can notify a family with four different Netflix subscriptions that one family subscription is enough. (Johanna Herbst, Danske Bank)

Nordea and SpareBank 1

Furthermore, a similar service is also under development in both Nordea and SpareBank 1. With respect to Nordea, the service is scheduled to be implemented in their mobile application by 2019 (Øyvann, 2019). In similarity to Danske Bank, the management subscription service is also already offered to Nordea’s customers in Denmark. In this version, all kinds of subscriptions that have been paid by a payment card appear. This includes everything within music, software, food or phone services (Nordea, 2018).

On October 29th, it was announced that SpareBank 1 will develop the service as well. In the first release, the service will be made available to customers of SpareBank 1 Østlandet (Lindvoll, 2019). Customers of the remaining banks in the alliance will get access to the service shortly after. It is still uncertain when customers can be expected to have the service available.

Durability of current balance

Norwegian banks are not only utilizing PSD2 by developing account aggregation or subscription management services. Providing a service illustrating the durability of current balance can also provide additional value to customers. This service entails an overview of how long the balance a customer currently has, will last. For example, if a customer holds 500 NOK in her account, the bank can inform how many days this sum will last, based on expected and planned payments and revenue streams.

Implementation in the Norwegian banking market

However, most Norwegian banks have decided *not* to develop such a service. Only a few Norwegian banks have decided to provide their customers with an overview of the durability of their current balance, and DNB is one of them. The fact that only a few banks have done so, indicates that there are different opinions related to whether this is a value-adding service or not. Importantly, our interviewees argue that this is a demanding service to develop successfully. The service relies on advanced technology and enormous amounts of data to be able to predict the correct durability. If providing wrong predictions, the banks fail to deliver additional value, and may end up with frustrated customers. In other words, it is only when this service is developed accurately that it actually provides value.

Personal budget and automatic categorization of spendings

As table 3 suggests, none of the interviewed banks have decided to offer personal budgets to their customers. A personal budget could have the potential of illustrating how much money customers can spend based on their revenue stream and both variable and fixed payments. Thus, allowing them to understand what costs they should cut back on. However, such customized financial help is difficult to develop in a successful manner. In order to provide a well-functioning personal budget, banks depend on categorization of necessary data. This requires use and development of extensive intelligent data solutions.

Placing things in the correct category is not actually that easy. This is often the fundament for succeeding with a personal, financial advisor; differentiating between expenses. Grouping such transactions is a basic basis that everyone has to achieve but is really challenging. (Kristine Urfsjord, SpareBank 1)

An example of this was put forward by Johanna Herbst. She states that because some stores sell a variety of different products, it is difficult to determine what the customer actually

bought in each store. Thus, it is difficult to accurately categorize payments based on transaction history. For example, when a customer has purchased something from H&M, who sell everything from shampoos and make-up, to sheets and plates, their purchase is still most likely to be automatically categorized as a clothing item. This in despite of the fact that the customer might not have bought clothes, but kitchen supplies. Therefore, the result is misleading, thus leading to confusion for customers instead of increased value.

To summarize this part of the chapter, Norwegian banks have begun developing a variety of different services in response to PSD2. However, it is needless to say that development of new services requires time, the right competency and enough capital. Importantly, banks must develop knowledge regarding what services customers find interesting, something banks seem almost oblivious to at the current state. This, together with the fact that development is time-consuming and resource exhaustive, can explain why some banks have decided to focus on developing only a selected few services. As we will see in chapter seven, collaborations can sometimes lighten this burden for banks. However, whether these services are actually creating value for customers or not will be discussed in further detail in the next part of this chapter.

6.3 Creating additional value for customers

With objectives like increased innovation and competition, there is no doubt that PSD2 was introduced with consumers in mind. As discussed in the previous part of the chapter, Norwegian banks are responding to the directive by developing a variety of new services. These are developed on the idea that they satisfy yet uncovered needs, thus creating additional value for customers. However, is this actually the case and do the new services respond to actual customer demand?

The dataset provided by Norstat and Cicero Consulting presents an overview of customer demand, and thus forms the basis of this part of the chapter. The survey gives some interesting findings, especially put in context to what services banks have decided to develop. This part of the chapter is introduced with an analysis of what services customers actually expect from their banks. The objective of the analysis is to provide insights to understand why banks have developed services that customers have limited interest in.

6.3.1 Customer demand and conflicting interests

The survey conducted by Cicero aimed to identify customer habits, needs and expectations related to management of personal finances. The participants were asked, among other things, how interested they were in getting access to certain financial services through their online interface. Figure 6-3 illustrates which services customers are most interested in.

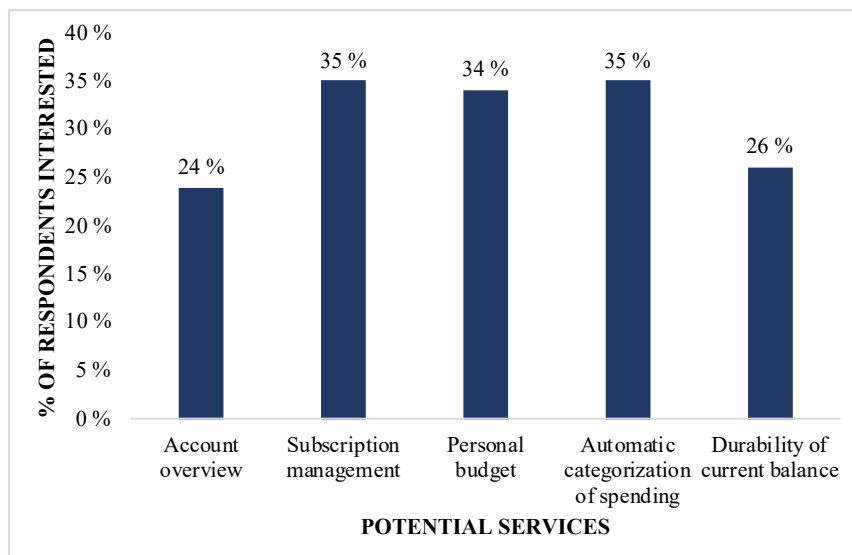


Figure 6-3: Interest in potential financial services

As illustrated in figure 6-3, customers are generally not too interested in new financial services. However, the most requested services include subscription management and an automatic categorization of spending. Even though these are the most demanded services, only 35 % of the respondents were actually interested in such services. Furthermore, the least requested service is account overview.

With the previous part of the chapter fresh in mind, the figure illustrates a conflict of interests between banks and consumers. In fact, most banks have focused on developing new services even though their consumers apparently do not seem to care. This conflict of interest is elaborated in the following. The discussion is separated in two parts, first discussing the most requested services offered by banks, following a discussion of the least requested ones.

6.3.2 The most requested services

As illustrated in figure 6-3, customer demand is highest for services delivering subscription management, automatic categorization of spending, and personal budgets. The value these services offer to customers, is elaborated below.

Subscription management

Importantly, a high request for subscription management can be related to the emergence of the subscription economy. Nowadays, it is not unusual for Norwegian consumers to have over ten subscriptions each. It is not hard to imagine that maintaining control over each and every one of these is a difficult task. Customers risk forgetting they have signed up for certain subscriptions, and they can find themselves paying for subscriptions they do not use. Furthermore, the vast majority experience cancelling of unwanted subscriptions both time-consuming and difficult (Pettersson, 2019).

Creating value

As for now, the banks who have implemented the service in their operation, have only released a limited version. We have seen in the previous that DNB and Sparebanken Vest only includes subscriptions that are paid with a card issued by themselves. Furthermore, the subscriptions must have been paid within the last months to be included. Lastly, only a limited number of subscription providers are included in the service so far. With such important limitations, the service at its current state provides limited value for customers.

These limitations may, however, open up new opportunities for banks. In fact, subscription management is a service that has the potential of providing financial help to users. This requires that the service is further developed from today's current state. As increasingly more consumers' expenses are paid through subscriptions, an improved version of the subscription management service can provide a comprehensive overview of personal finances. For example, banks can add all their customers' subscriptions related to other banks' payments cards as well, enabled by account aggregation.

In addition to provide customers with an overview of their subscriptions, banks should also ensure that the service allows for further administration. This includes both the possibility to cancel current subscriptions, add new ones, or switch out existing subscriptions to cheaper alternatives within the application. Actually, The Norwegian Consumer Authority requires it to become easier for consumers to cancel their subscriptions (Forbrukertilsynet, 2019).

Through services for subscriptions management, banks can also potentially provide their customers with digital and automatic advice. In specific, one way to utilize the service further, is by enabling notifications with automatic and updated financial advice. In this way, the customer does not have to deal with the struggle of contacting the bank themselves to receive the same financial guidance. Today, banks are successful in providing their customers with

physical consulting. However, there are still several opportunities not yet exploited in the area of digital consulting, whereby artificial intelligence can be a helpful tool. By automatically notifying the customers whenever they pay for unused subscriptions, or providing them with suggestions for cheaper subscriptions, banks can help customers reduce unnecessary costs.

Personal budget and automatic categorization of spending

Among the most requested services are also personal budget and automatic categorization of spending. In specific, figure 6-3 presents the fact that 34 % of the respondents request a personal budget, while 35 % would like to be provided with categorized spending.

However, banks have not yet prioritized developing these services. None of the banks included in our interviews have implemented services for personal budgets. Only Nordea, Sbanken and Danske Bank provide their customers with an automatic categorization of spending. This is a paradox, as banks seemingly fail to deliver value-adding services at the request of customers.

When talking to Christoffer Hernæs about the mentioned services, he disagrees to some extent with the high customer demand for personal budgets. He does not believe that customers will neither use nor benefit the services once they are presented with them. Hernæs argues that even though consumers claim to request budgets, they do not actually follow the budgets provided to them.

Even though Norwegian banks are seemingly not prioritizing services for personal budgets and automatic categorization, some FinTech companies are. By developing successful services for budgets and categorization, some emerging FinTech companies have decided to compete against banks by delivering value-adding services for customers. The competition of the respective FinTech companies are discussed in chapter seven.

6.3.3 The least requested services

In contrast, services for account aggregation and overview, as well as services providing information on durability of current balance are the least requested services among consumers. Yet, the service of account aggregation and overview is provided by most Norwegian banks. The rationale for this is discussed in the following.

Account overview

Figure 6-3 illustrates that only 24 % of the respondents are interested in using a service that provides them with an account overview. As the figure shows, this is the least demanded service. It is interesting to understand then, why most Norwegian banks have spent time, effort and money on developing this service. Some of our interviewees argue that the reason being a wrong impression of customer interests, resulting in a failed attempt.

Originally, we thought that thousands would sign up for this immediately and wanted to try out this service. (...). However, surprisingly few actually did. (Svein Ove Langeland, Sparebanken Vest)

Herbst agrees with this. She believes that it is a paradox that the first thing all the banks do in response to PSD2, which was created with consumers in mind, is something most customers do not consider material. Herbst suggests that the low participation can be explained by the fact that it does not necessarily provide new or significant additional value for customers.

We have seen that this service has limited value to some of our customers. Most of us do not have a lot of money in different banks that we have to manage on a regular basis. Perhaps some have a savings account one place, while the rest is organized in the same bank. And that other account is something you do not really use every month. (Johanna, Danske Bank)

This statement can be supported by findings from the Norstat survey, which shows that 80 % of the participants use less than three banks. This constitutes an average of 1.9 banks per participant and is illustrated in figure 6-4. If customers do not actually use more than one bank, they do not either need a service allowing them to view their accounts and balance across different banks. Thus, the service fails at providing additional value for most customers.

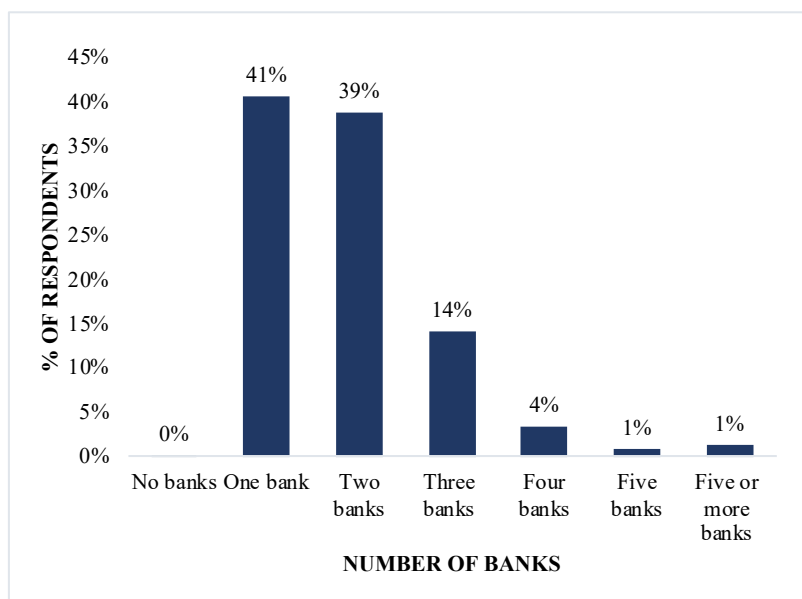


Figure 6-4: Number of banks among Norwegian consumers

Svein Ove Langeland further argues that the low demand for account overview can be explained by the fact that it is already very easy to get an overview of daily finances without this type of service. Most Norwegian banks already provide an online interface, both as a mobile application and an internet bank. This means that customers using several banks most likely have downloaded such applications. Switching between the different ones is rarely a time-consuming task, as most only require consumers to log in using touch identification.

Payment accounts

One possible explanation for why the banks are witnessing limited demand for account overview, is the fact that “payment accounts” are the only accounts covered under PSD2. This entails that banks are only obligated to open up data concerning such accounts. A definition of “payment account” is that it constitutes the ability to perform daily payment transactions from such an account (CJEU, 2018). Technically, this means that because savings accounts, for example, are not typically used for day-to-day payments and transfers, they do not qualify as an account that TPPs can gain access to under PSD2 rules.

In Norway, however, it is quite common that savings accounts are accessible for payments. Therefore, some savings accounts are also included in the account overview service provided by Norwegian banks. This is because different banks have different definitions regarding what should be covered in the term “payments account”.

This is probably one of the reasons to why an account overview is not so interesting for customers, nevertheless. I can use myself as an example; I have a salary account and a billing account, as well as some savings accounts somewhere else. In that respect, I do not get as much use out of how my bank facilitates this, because my savings accounts are not defined as a payments account. (Olav Johannessen, Finanstilsynet)

Enabling new opportunities

Because PSD2 enables TPPs to gain access to information only from “payments accounts”, they are not able to access information regarding loans or securities (Sbanken, 2018). Eventually, a broader definition and interpretation of the term is likely to be applied, and the service is then expected to create additional value for customers. Furthermore, our interviewees also argue that developing a service for account aggregation and overview is a necessary step to take in order to be fully PSD2 compliant. They suggest that this service is key in order to still be a part of the tightened competition.

Some things are done because other banks are doing it. While other things are done because they believe it is necessary in order to compete, as well as to be the preferred daily bank and not just a raw material supplier. And some think they can build value-adding services around this. (Olav Johannessen, Finanstilsynet)

Regarding such value-adding services, Herbst suggests that developing a subscription service “on top” of this can give additional value. By this, she means that account aggregation by itself may not provide significant value. However, it can enable additional value when developing a subscription service that utilize account aggregation. As of today, banks offering subscription management services only include subscriptions paid with the respective bank’s payment cards. However, account aggregation could potentially enable including subscriptions paid using other bank’s payment cards.

Moreover, Herbst argues that banks should utilize artificial intelligence better, which can nudge customer behavior. For example, banks can create customized services to provide financial advice to individuals on how they should save, consume and invest each month. Such services gain additional value when banks can utilize customer data from other banks as well, enabled through account aggregation. However, as only some accounts are required to open up under PSD2 rules, utilizing artificial intelligence may be a task for the future. In order to

do this in a value-adding and useful way, banks are dependent on significant amounts of information, which includes data beyond that of payment accounts. According to Ursfjord, PSD2 is not enough to provide a comprehensive overview of personal finances to customers. In order to achieve this, banks have to open up more than what is required by PSD2. However, account aggregation as used today is at least a step in the right direction.

It will be exciting to see if it changes, and if we actually have to include a larger number of accounts than what we do today. (Kristine Ursfjord, SpareBank 1)

Durability of current balance

According to the survey done by Norstat, durability of current balance is the second to last requested functionalities by consumers. Figure 6-3 illustrates that only 26 % of the respondents expressed interest in using a tool that would give insight into the durability of their current balance. This underpins the fact that most Norwegian banks have decided *not* to develop such a service.

Creating value

Hernæs argues that their most visited function in their online interface is the customers' overview of future payments. This does not indicate that future payments themselves are interesting, but that the customers are interested in information about how much of their money is disposable at the moment, and until the next payday. It turns out that customers are in fact interested in information related to the durability of their current balance. However, somehow customers do not seem to realize this.

If banks are able to successfully develop a service that predicts the accurate durability, they have the potential of providing customers with additional value. However, this requires banks to actually manage the difficult task of gather and structure huge amounts of customer data. This is a demanding task, relying on comprehensive digital systems, technology and competency. Nevertheless, if banks do succeed, they have the potential of covering a need that customers do not even realize they need covered. In other words, banks have the opportunity of solving a problem before it actually arises. Successfully providing this service, customers can obtain better and more accurate control over personal finances.

Some customers are interested in looking in the rear-view mirror to see what they have spent. However, this is money that has already left the account, and is thus unattractive

(...). But what I am interested in, is what we can afford to use right now. If I buy something on impulse today, will I manage until the next payday? These are questions that banks do not help answer today. (Christoffer Hernæs, Sbanken)

6.4 The pace of innovation after PSD2

To this point, the chapter has explored what different services banks are developing in response to PSD2. To some extent, it can seem as if banks are not intentionally focusing on providing services required by customers. Instead, they develop services that are not yet offering additional customer value. This raises the interesting thought, that when the main idea behind PSD2 gives limited utility and usefulness, it may indicate that banks are not successfully solving their customer's problems.

This part of the chapter is dedicated to a discussion on why banks are not leveraging opportunities under PSD2 to a greater extent. We shed light to the fact that banks are not innovating as fast as expected. With respect to this, difficulty related to interpretation of PSD2 is an important explanatory element.

6.4.1 Expectations versus reality

PSD2 was predicted to radically change traditional banks' business models over the next few years (Hermansen, 2018). People expected the increased competition in the payment market to result in a higher pace of innovation. In turn, it was expected that this would lead to new services for customers (Framstad, 2018). Hernæs claims the industry was excited for the directive to be implemented. However, he argues, that nearly nothing changed when it finally was. Langeland describes the wait for PSD2 to hit the market as "watching paint dry".

In general, Norwegian banks have showed a slow response to the directive, with respect to both compliance and development of value-adding services that goes beyond PSD2. The FinTech company Tink have tested the APIs provided by banks, and claims that none reaches the expected level or meet the quality requirements given by PSD2 (Tink, 2019). This underpins the statement of slow implementation. Furthermore, Cicero (2019, p. 4) argues that the Norwegian payment market is behind European banks with regards to pace of innovation.

A possible explanation is the fact that some banks have experienced difficulties implementing the directive. For a while, there was uncertainty in the market whether PSD2 would actually

be a reality or not. In fact, it took several years from PSD2 was first introduced to it was actually implemented in the Norwegian payment market. Obviously, this gave banks plenty of time to develop the necessary measures and services. However, some banks found it necessary to await and see how others would react. Furthermore, there was an 18 month wait for the RTS, which had the purpose of providing some necessary clarifications to PSD2.

When the directive was finally introduced, challenges related to the interpretation of PSD2 and RTS arose. Our interviewees claim that there were a lot of room for interpretation within the directive. Ursfjord argues that: “I do not think the EU had thought through how incredibly challenging it is to translate a legal text into something involving computers talking together”. She adds that most banks have different interpretation of how the directive should be technically implemented. This makes it difficult for TPPs, who rely on connecting to banks’ systems. This has contributed to a slow development of the payment market.

As we have seen in previous parts of this chapter, banks have not only opened up their APIs, but most have also developed services for account aggregation and overview, as well as subscription management. However, the banks have not yet introduced any groundbreaking new services.

I think the banks have been too slow. All the banks have been working too slow, they have not yet managed to discover the potential of the APIs they have set aside time to make. Things have gone too slowly, and this is due to lack of knowledge. (Waseem Rashid, DNB)

Waseem Rashid elaborates, and states that the technical implication of the directive has led to banks mainly focusing on being compliant to the legislation. Most banks have not yet been able to think about the commercial possibilities that exist in the technical implication they have carried out. Furthermore, Ursfjord notes that several banks have waited for as long as they could to implement the changes required by PSD2. She speculates that some banks did not want to do anything before they absolutely had to. In addition, she adds that the directive has led to a challenging alteration in the way of thinking within banks.

6.4.2 The “iPhone moment”

The Norwegian payment market is witnessing a slow development after the introduction of PSD2, but the banks promise to deliver results. “Currently, most banks are a bit late – so are we. But we most certainly have the intention to deliver on the directive”, states Ulf Bjørnhaug.

Some of the biggest banks in Norway have made it clear that they will look at the opportunities following the directive. They will not sit still and stop at compliance. Langeland believes the changes following PSD2 were not supposed to arrive the 15th of September but will arrive gradually over time.

Bill Gates summarizes it well; that we tend to overestimate change in the short term and underestimate it in the long term. We believe that something should happen immediately – and when nothing does happen immediately, we think “yeah, but then it was nothing”. But then the reality is that it just takes a little more time. (Svein Ove Langeland, Sparebanken Vest)

Hernæs describes the situation after PSD2 as the “iPhone-moment”. He is referring to what happened in the telecom market after the introduction of the iPhone. The smartphone was first introduced in 2007, but the radical change of the telecom market did not happen before some years later when mobile applications began attracting customers. Therefore, he argues that if PSD2 is going to radically change the banking and payment market, it will probably happen a couple of years later than expected. He notes that it is important not to lower their shoulders yet, just because little has happened so far. Banks should embrace, and prepare for, change. Classic banking products will probably not be sufficient in the future.

To summarize this chapter, we have discussed what different services banks are developing in response to PSD2. However, both becoming compliant as well as taking it a step further and leverage new opportunities from PSD2, seem to be a demanding task to perform. This has contributed to a slower pace of innovation than anticipated. To face these challenges, and not only ensure compliance but also speed up innovation, it is an idea that banks should team up with other participants to make this happen. In the next chapter, we discuss this by analyzing new competitive relationships. Among other things, we suggest partnering with FinTech companies as a possible solution that can utilize new opportunities.

7. Competitive relationships

When PSD2 was first introduced, an uncertainty for how it would affect the European banking market quickly spread. However, with the fear of the unknown also came new opportunities, especially for TPPs and banks who were willing to embody the new regulatory change. As banks were facing new competitors the need for innovation became increasingly more important. Excited and optimistic about the future, new FinTech companies spoke loudly about how they would challenge incumbent banks. However, fast forward to 2019, banks have not yet been replaced by new FinTech companies, as some might have initially believed. So, why is this not the case?

In this chapter, we discuss potential explanations to this question, by analyzing how competitive relationships among banks and FinTech companies have changed after the implementation of PSD2. As it turns out, operating alone is difficult not only for banks, but for FinTech companies as well. First, we consider the value of collaboration between incumbent banks and FinTech companies, where speed, economies of scale and access to knowledge are important key words. The second part of this chapter is dedicated to a discussion of the competitive characteristics of the Norwegian banking and payment market, and how these have changed in response to PSD2. In specific, we consider different aspects related to competition, cooperation and cooptation.

7.1 The value of partnerships

In consequence of PSD2, the Norwegian payment market is witnessing a change in collaboration behaviors. As discussed in the previous chapter, Norwegian banks are developing new services, both in order to be compliant as well as to leverage new opportunities. However, as this is a demanding task to perform alone, the market is experiencing an increase in collaborations between incumbent banks and emerging FinTech companies. Several aspects can help us understand why some payment market participants decide to cooperate and form strategic alliances. Essentially, companies collaborate because both parties can gain value from doing so, resulting in mutual exploitation.

First, we go deeper into the objectives of strategic alliances, including speed, economies of scale and reducing risk, as well as legitimacy and access to knowledge. When discussing each objective, we examine how it creates value for both involved parties.

7.1.1 Speed

Today's society is generally characterized by fast-moving competitive environments, and the banking sector is no exception. New regulations and emerging technology results in disruptive changes to how banks operate. Therefore, it is highly important for incumbent banks to adapt and respond quickly. However, due to their limited agile structure, banks are sometimes prevented from reacting as quickly as desired. Partnering with a fast-moving FinTech company may therefore lead to increased speed.

Value creation

Partnering with a FinTech company can resolve some of the constraints faced by banks. The value such partnerships creates, and the impact it has on speed, is discussed next.

Regulatory constraints

Regulatory challenges are something both banks and FinTech companies face. This includes regulations concerning capital requirements, privacy, security and anti-money laundering, to mention a few (Lee & Shin, 2018, p. 44). However, regulatory requirements faced by firms depend on what type of financial services they provide. Therefore, banks and FinTech companies typically face different regulations. With respect to this, banks are subject to massive regulations, standards, supervision and bureaucracy. This can prevent them from reacting quickly to new changes.

In contrast, FinTech companies are not subject to the same extensive amount of regulations as banks, at least not for the time being. Nevertheless, regulatory changes lag behind the innovation of the industry (Lee & Shin, 2018, p. 44). So, FinTech companies need to be aware of potential changes that may impact them and figure out how to deal with those changes. With that said, at the current time, FinTech companies are less bounded by compliance. Consequently, they do not have to spend time and resources reporting their actions to the same extent as banks. This enables them to develop and respond faster to changes in the environment. Thus, collaborating with a FinTech company may help banks speed up their innovation, by gaining access to a less regulated segments of the banking and payment sector.

The biggest advantage FinTech companies have – which banks do not have – is speed. The fact that they do not have to comply to laws and regulations enable speed. We [banks] cannot run as fast because we are subject to a regime that does not allows us

to move fast enough. FinTech companies do not have the same regime, and they can move superfast. (Waseem Rashid, DNB)

Willingness to develop

Moreover, collaborating with a FinTech company offer access to complementary skills, such as employees and developers with an innovative mindset and motivation to develop new things. This can provide banks the opportunity to tear away from their traditional path, enabling them to be more innovative with development of products and services, thus increase their speed. Also, as most FinTech companies specialize in development of selected services, collaborating with them can provide banks with cutting edge competency regarding specific service. Banks, on the other hand, have to perfect a broad range of products and services, which is much more time consuming and resource exhaustive. As a result, FinTech companies enable incumbent banks to speed up their innovation process.

Marked by past failures

In contrast to most FinTech companies, most banks have been around for decades. Therefore, banks typically have accumulated a burdensome legacy, preventing them from being agile enough to innovate at a high pace. In addition, banks are to some extent marked by past failures. As pointed out by some of our interviewees, banks have already carried out different innovative projects with sometimes limited success. In light of past failures, banks may be reluctant to try new things. This is a constrain emergent FinTech companies do not face.

Collaborating with banks may therefore encourage them to not only try new things, but perhaps retry some previous and failed projects, that may have new success in a more mature market. Such strategic alliances provide value for FinTech companies as well. A go-it-alone strategy may not be the most optimal option for a FinTech company, because it can be more difficult for them to capitalize on new opportunities. To be able to do this, they at least need access to the market. This can be obtained quickly via partnering with a bank, who typically already has a significant customer base.

7.1.2 Economies of scale and reduced risk

Additional objectives for strategic alliances include economies of scale and reduced risk. These will be discussed separately in the following, focusing on the Norwegian banking and payment market.

Economies of scale

The Norwegian banking and payment market is characterized by cases of demand-supply relationships between banks and FinTech companies. In this case, the FinTech company acts as the supplier, while the bank acts as the demander. Thus, FinTech companies produce and deliver services to banks. This enables banks to spend valuable resources on development of other services, while receiving some selected services from external suppliers through partnerships. The involved participants consolidate their positions in their respective sectors, leading to economies of scale and a proportionate saving in costs.

Value creation

As we saw in chapter six, account aggregation services are something that most Norwegian banks have implemented in response to PSD2. However, it can be challenging for banks to integrate new applications and services with existing legacy systems (Lee & Shin, 2018, p. 44). According to Lee and Shin, banks should therefore create partnerships with FinTech companies to enable this. Purchasing an aggregation service from an external supplier can be value-adding for banks because it often leads to reduced costs compared to internal development. In order to successfully develop and implement an aggregation service themselves, banks rely on extensive IT-competency and expertise. However, the use of substantial resources come with a significant cost. Because FinTech companies often specialize in the development of specific services, it can be both easier and cheaper for banks to partner with a FinTech company in the development of new services.

In addition to aggregation services, some Norwegian banks utilize the opportunities from PSD2 by incorporating other innovative services as well. In addition to a service for subscription management, as discussed in chapter six, this also includes invoice scanners. These are additional examples of services banks have found creating value by partnering with FinTech companies who have existing knowledge and expertise in the field. Pooling economic activities in this way does not only provide value for banks. It also provides significant value for FinTech companies. Collaborating with a bank enables an initially small FinTech company to scale up rapidly at a lower cost, as a result of gaining access to industry knowledge and a large customer base. Our interviewees suggest some FinTech companies have found delivering niche services to banks, instead of offering their services in a stand-alone mobile application, to be more profitable.

Reduced risk

Partnerships can also lead to reduced risk. The digitalization of the payments market is facing a certain degree of technological uncertainty. Market players have different perceptions of what they predict will break through as the next market leading service. This increases risk, which can be reduced through partnerships between banks and FinTech companies.

Value creation

As pointed out by our interviewees, partnerships between FinTech companies and banks may lead to reduced risk for both parties, as well as increase the value created.

Reduce the risk of failure

Banks are generally set in their ways, less entrepreneurial and with less insight into technological trends. In contrast, FinTech companies typically work within a technologically and digitally enhanced environment. This enables them to more successfully and accurately predict in what direction the technological development is heading. Such valuable insight can be acquired by banks through partnerships with a FinTech company, thereby reducing the risk of failure.

However, if the FinTech company ends up failing, the downside is much bigger for them compared to banks. Banks can bear the cost of a failed attempt, but a new market entrant may risk losing their entire business and all their investments, as well as lose trust among stakeholders. This risk can also be reduced by partnering with an incumbent bank. Moreover, FinTech companies face challenges related to risk management, such as financial risk and regulatory risk. The degree of financial risk varies and depends on what niche the FinTech company operates in. However, some of this risk may be absorbed by a financial institution, who typically has large amounts of capital (Lee & Shin, 2018, p. 45).

7.1.3 Legitimacy and access to knowledge

The next objectives for strategic alliances we will discuss includes legitimacy and access to knowledge. These will now be discussed separately in light of the Norwegian banking and payment market after PSD2.

Legitimacy

In the market for banking and payments, somewhat small FinTech companies are observed engaging in cooperative relationships with incumbent banks. Partnering with a well-established and trusted bank creates important industry legitimacy for small FinTech companies.

Value creation

As illustrated in figure 7-1, Norwegian consumers are generally less trusting of FinTech companies in comparison to banks. The Norstat-survey illustrates that less than one out of ten Norwegian consumers trust FinTech companies as stand-alone account-aggregators. One potential explanation of this, may be the fact that FinTech companies rely on accessing critical information, which is then often stored on mobile devices (Lee & Shin, 2018, p. 44). Sometimes, these are stolen, lost or hacked, whereby users worry that sensitive data has gone astray. A collaboration with banks can therefore increase the level of trust related to the FinTech company. Relying on the good reputation and well-known brand name of banks can provide positive spillover effects for the FinTech, who can capitalize on this.

When a bank collaborates with a new market entrant, such as a FinTech company, it can be perceived as a testimony that the FinTech company is a trusted player. Often, such partnerships involve incorporation of the FinTech service within the bank's mobile application. This means that customers do not have to deal with a new and unfamiliar interface provided by someone they do not trust with personal data and information.

It probably feels a little bit scary for a customer to download something they have never heard of or never used before, and then suddenly you must enter lots of details, log in, retrieve info, etc. Versus having exactly the same service, but in your bank's app, where they already have 300,000 customers. It's all about taking the service to where the customer already is. (Svein Ove Langeland, Sparebanken Vest)

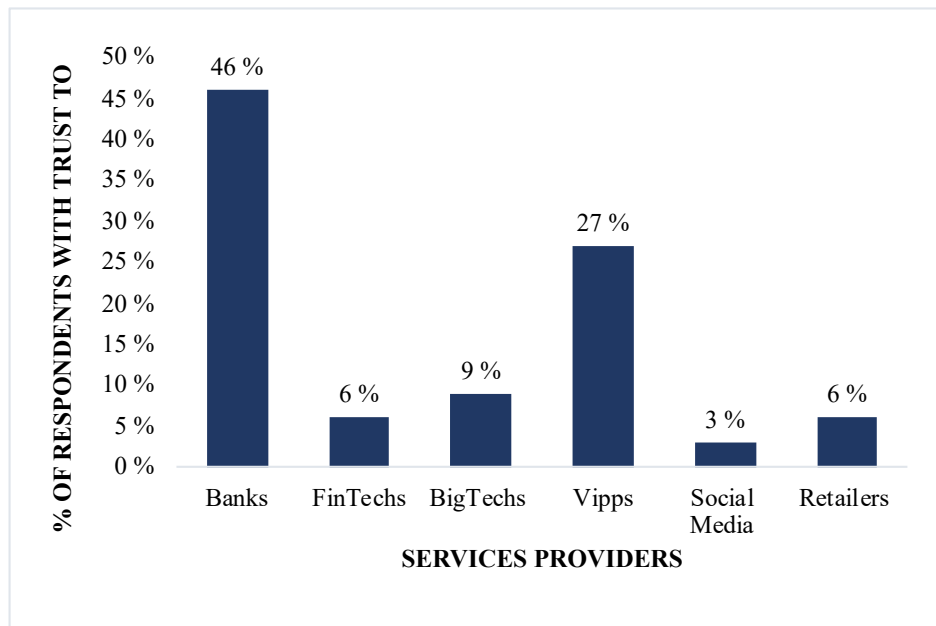


Figure 7-1: Trust in services providers

Access to knowledge

Moreover, access to knowledge is another important objective for strategic alliances between FinTech companies and banks. This allows both parties to access each other's knowledge. Banks have valuable industry knowledge from conducting business in the banking sector, as well as skills related to operating a large organization. FinTech companies, in contrast, are typically new entrants to the market, with less experience and knowledge related to these areas. However, they often have more knowledge about disruptive technology, development and important IT-expertise.

Value creation

These asymmetries related to knowledge and ability to perform activity can be exploited by strategic alliances. Banks can utilize alliances with FinTech companies to gain access to knowledge that enable them to seek new technology in their core business area. Our interviewees argue that lack of relevant knowledge and competency among banks are some of the most important explanations to the slow pace of innovation in today's payment market.

There is a lot of talk about banks struggling with old legacy and old IT systems. But those are only the symptoms, while the underlying causes are legacy culture and a particular way of thinking. So that is why banks got stuck in a track where things could have been better. (Christoffer Hernæs, Sbanken)

Access to specialized expertise

Partnering with a FinTech company allows banks to access a new area of expertise, enhancing their ability to innovate and deliver new services to customers. Primarily, employees working in incumbent banks have finance and banking as their main specialization. Employees whose expertise relates to technology and IT are in minority. According to our interviewees, however, this is a changing trend. Nowadays, banks are to an increasing degree recruiting staff with a background from the technology and IT sector.

Nevertheless, banks still find themselves in great need of tech-competence, which require further recruitment of relevant employees and labor force. By collaborating with a FinTech company, banks can gain access to new ideas, specialized expertise, valuable knowledge and strong motivation. As well as an entrepreneurial drive from new employees with new attitudes and goals. The financial institution, in addition, will gain valuable insight into what kind of FinTech services clients are preferring. These assets and resources are somethings the bank would have difficulty in obtaining otherwise.

Access to knowledge through partnering with banks provide a valuable asset for FinTech companies as well. This can help them access resources that would otherwise be unavailable if the firm attempted to enter the market alone. Typically, FinTech companies do not have extensive knowledge or experience concerning running a financial company. Neither do they have the necessary systems for it. In contrast, because incumbent banks have been around for decades, such resources and abilities are already in place among banks. Additionally, banks do not face the same degree of regulatory challenges, because they already have lots of experience complying to regulations in the payment market. Such experience is key when operating in the payment market and can be obtained by partnering with an established bank.

7.2 Competitive characteristics

As discussed in the previous part of the chapter, partnering with FinTech companies can create value for incumbent banks. However, banks have to be strategic when identifying with whom to collaborate with within the ecosystem. To create additional value, they should choose partners that can either enhance existing propositions or add new ones. An ideal FinTech partner is one whose solution yields quick dividends, but with the scope to add longer-term

value to the bank as well. With respect to this, incumbent banks have to consider how these relationships should be structured for optimal results.

In the following, we analyze how the competitive relationships and characteristics of the Norwegian banking and payment market have changed in response to PSD2. In specific, we examine the competition, cooperation and the co-competition witnessed between Norwegian banks and FinTech companies. The majority of banks and FinTech companies are to some extent experiencing competition and cooperation. Therefore, it is inexpedient to discuss coexistence in further detail.

7.2.1 Competition

The Norwegian payment market is characterized by competition. Players pursue similar goals, such as providing financial services to Norwegian consumers, where one player can gain value at the expense of another. For example, banks compete with each other to become the preferred bank, which ensures that they provide great services for their customers. Otherwise, customers will switch to another, better bank. An obvious way for banks to both attract and retain customers is to provide their customers with unique and value-adding services.

Competition after PSD2

With the implementation of PSD2, competition in the Norwegian payment market has tightened. New players have entered the market, offering new and innovative financial services. Some of these have become PSD2 licensed TPPs, which means they are allowed to operate as a PISP or AISP. It is likely to believe that the competition will become even fiercer with the emergence of even more FinTech companies and licensed TPPs.

However, as of today, there are actually very few registered TPPs in Norway, compared to neighboring countries. There are 48 TPPs with a license to provide payment services in Norway. In comparison, the UK has 151 licensed TPPs (Jones, 2019). Nevertheless, FinTech companies have begun posing a threat for Norwegian banks, as they establish themselves in specific segments of the market. This puts pressure on incumbent banks, who needs to deliver innovative solutions to keep up with competitors. As we will see in this part of the chapter, competition has increased both between incumbent banks and FinTech companies, as well as between neobanks, incumbent banks and FinTech insurgents.

Customer relations and touchpoints

The Norwegian banking and payment market is beginning to see tendencies of increased competition for customer touchpoints. The market is experiencing a shift of focus, as incumbent banks have an increasingly higher focus on profiling themselves, according to some of our interviewees. The focus has gone from delivering basic services such as bank accounts to providing value-adding services on top. This includes lifestyle applications integrating consumer budget tools, consumer finance and investments. These solutions involve a broader functional scope than what banks typically offer.

The increased competition means not only thinking of transactions and liquidity management, but also looking broadly at customer journeys. With the opening-up of APIs, banks are at risk of losing their direct relationship with customers. The XS2A rule enables the scenario whereby consumers can fulfill their traditional banking needs from an online portal provided by a TPP. Banks may thus go from playing an obvious part in customer's lives, to play a more indirect part. The result may be two-folded. First, it can reduce banks' opportunity to cross-sell their products, as consumers may begin shopping around for new solutions from a variation of providers. Second, customers will no longer have a meaningful engagement with their original bank's brand.

Although the Norwegian banking and payment market is not yet witnessing this extreme shift, it is likely to believe that this is where the market is heading. Thus, banks should prepare for an increased competition from both competing banks, as well as from FinTech companies, by focusing on strengthening consumer relations. We can see that banks are already preparing for this, by increasing their development of value-adding services, with the goal of becoming the customer's preferred daily bank and online interface.

Wealth management and savings

Several FinTech companies were originally established as challengers, such as the Danish FinTech company Spiir, who originally began as a pure savings application. Today, Spiir deliver additional services that enable customers to connect their accounts and ensure that all transactions are automatically analyzed and categorized. Spiir is a licensed AISP and operates under the supervision of the Danish Financial Services Authority (Spiir, 2019). Moreover, Spiir may provide cross-border services from Denmark to Norway as well. With their

expansion to Norway this summer, Spiir poses a threat to similar services provided by established banks and other similar providers in Norway.

As mentioned in chapter six, few banks are taking advantage of the fact that consumers request services for personal budgeting and automatic categorization of spending. However, in addition to offering a savings application, Spiir is one of the FinTech companies who take advantage of this. The fact that some banks are marked by past failures can perhaps explain this. In the past, this is something banks have tried without big success. Thus, they have discontinued such services, which represent historical legacy FinTech companies do not have. This results in them trying to develop such services, differentiating them from banks.

Spare

DNB has developed their own savings application, named Spare, which has many similarities with Spiir. However, an important difference is that Spare is still a pure savings application. It requires users to be customers in DNB, which means that customers in other banks cannot use the savings application. In addition, Spare enables users to open new savings accounts within the application. This is not possible in Spiir, as the application requires users to have existing accounts in established banks. Thus, the competition between Spiir and DNB is not related to becoming the preferred bank for customers, in the traditional sense of providing accounts and loans, as well as monitor borrowers and distribute risk. It simply concerns delivering the best and most value-adding services to users, such as personal advice and financial guidance based on account information and transaction history. This involves becoming the preferred online interface in which customers organize their finances.

Spiff

Another example is the Norwegian FinTech company Spiff, which is partnering with BN Bank, a Norwegian bank wholly owned by the SpareBank 1 Alliance. Spiff has many similarities to both Spiir and Spare and is the first TPP running a PSD2 integration with live users in Norway (Spiff, 2019). Just like Spiir, Spiff can be used independent of what bank customers already have. However, an important distinction is that in order to use Spiff, the application opens a savings account for their users in BN Bank. This means that the use of Spiff indirectly leads to a customer relationship with BN Bank as well. Thus, the competition between Spiff and Spiir reminds of the competition between DNB and Spiir, as the companies compete on delivering unique and personalized services.

Digital banking

Competition has tightened in other segments of the banking and payment market as well. Digitalization is a major focus among both incumbent banks and insurgent FinTech companies. This is enhanced by the implementation of PSD2, which makes it easier for FinTech companies to establish themselves in the payment market as TPPs. Before PSD2, the only way for FinTech companies to truly deliver value was through partnerships with banks or by using methods such as screen scraping. However, PSD2 offers a leveling field and easier access to customer's payment accounts data. This means that digital banks not only face increased competition from digitizing traditional banks but emerging FinTech companies as well.

Sbanken is likely to experience increased competition from Bulder Bank after their launch this fall, which is based on most of the PSD2 APIs developed by Sparebanken Vest. Although neobanks like Sbanken and Bulder Bank operate in a specific segment of the payment market, with their 100 % digital platforms, they experience competition from multiple angles. Close to all Norwegian banks have developed online and mobile platforms for customers. Therefore, the boundaries separating digital banks from traditional banks are on the verge of being blurred out. Neobanks like Sbanken might have had an edge over traditional banks for a long time within this area. Nevertheless, they are now facing increased competition in providing the best user experience and value proposition.

In a report published by Cicero (2019, p. 14), Sbanken is sharing the lead with Danske Bank in the competition of delivering the best and most value-adding services within mobile banking. This is interesting, as Danske Bank is a traditional and established bank. Furthermore, right behind them are other payment market players, including established banks such as DNB, as well as the FinTech company Spiir. This highlights the fact that both digital and traditional banks are competing side by side. The competition for customer dialogue has never been tougher. So, to stay competitive, incumbent banks have to deliver on the service spectrum in order to remain relevant for consumers.

7.2.2 Cooperation

In addition to competition, the Norwegian payment market is also witnessing cooperation. FinTech companies are venturing into the traditional banking area with new ideas and have

come to stay. Thus, cooperation exists both between incumbent banks, as well as between incumbent banks and new FinTech companies.

For example, banks cooperate with companies that have common beliefs and mutual interests as themselves. This can include cooperating with a FinTech company to ensure delivering the absolute best financial services to Norwegian consumers, achieved by combining skills and expertise from both firms. As discussed in the previous part of the chapter, there are several reasons to why banks and FinTech companies cooperate, including speed, economics of scale and access to knowledge. In this part of the chapter, the discussion concerns what specific FinTech companies are cooperating with which Norwegian banks.

Cooperation after PSD2

To utilize opportunities emerging from PSD2, several Norwegian banks have engaged in cooperative relationships with FinTech companies. As we will see in the following part of the chapter, cooperation has enabled banks to deliver value-adding services related to subscription management, invoice scanning, account aggregation and payments.

When cooperating with a FinTech company, the flexibility and innovativeness from them meets the regulatory and safe framework from banks. In these situations, we can see great value creation, and we share a lot of ideas with them. (...) Sometimes, they propose good ideas, which they try to sell us. Some of these ideas may lead to something, for example a cooperation. (Svein Ove Langeland, Sparebanken Vest)

Account aggregation

With the implementation of PSD2, the Norwegian payment market is witnessing a new type of cooperation between aggregation service providers and incumbent banks. With respect to this, Sbanken, SpareBank 1 and Sparebanken Vest are cooperating with Nets. Both DNB and Danske Bank, on the other hand, have cooperative relationships with Nordic API Gateway for the delivery of access to account APIs. These cooperative relationships can lead to economies of scale, as described in the previous part of the chapter.

Account aggregation is the technological foundation that enables account overview services, which is a service provided by most Norwegian banks (see table 3, chapter six). Aggregation services provide access to financial data from other banks, meaning that banks are connecting to each other's APIs. However, connecting to every single bank's APIs is a comprehensive

and time-consuming task. Therefore, most Norwegian banks are cooperating with FinTech companies delivering this service. If banks rather developed aggregation services themselves, they would likely need to acquire additional working force with the necessary competency, as well as it would require large investments. Because some FinTech companies are specialized in this area, and therefore have significant expertise, it can be more profitable for banks to engage in a cooperative relationship with them.

Such providers, like Nets and Nordic API Gateway, provides banks with a standardized platform that enables them to connect to other banks' APIs (Nets, 2019). By providing these services to banks, the FinTech companies in question are taking the role as aggregator service providers. Ursfjord argues that this role was not initially expected to arise as a consequence of PSD2. However, when looking back, she claims that the role was granted to occur. Cooperating with FinTech companies on the delivery of this service can provide banks with valuable learning, uncertainty reduction and gaining access to valuable assets, as they now do not have to spend time and effort developing the service on their own. Instead, they can use their resources developing other important products and services for customers.

Tink is another FinTech company worth discussing. What began as a mobile application for account aggregation, directly aimed at challenging similar services provided by incumbent banks, later became a supplier and cooperative partner for banks. They realized that competing with established banks would be a difficult task, as they lacked one important thing: customers. However, the company had accumulated comprehensive knowledge and expertise on account aggregation, which is something they realized would benefit banks. So instead of challenging banks, Tink pivoted their business model and is now delivering account aggregation services to banks. In other words, they went from competition to cooperation. Among the Norwegian banks, Nordea is cooperating with Tink. Head of Personal Banking in Nordea argues that PSD2 will likely change the industry, and a partnership with Tink will make them more prepared to face these changes (Nordea, 2017).

Tink realized that it is actually pretty difficult getting customers to stop using their banks, and instead use Tink. Because users would only get parts of the truth. They would not get offered loans, the possibility to pay invoices, and not that many customers have many accounts in different banks. So, they pivoted their business model to rather say that – okey, if we cannot beat them, lets join them. (Svein Ove Langeland, Sparebanken Vest)

Subscription management

Several Norwegian banks have engaged in interorganizational relationships with FinTech companies offering a subscription management solution for banks. Among these, Danske Bank and SpareBank 1 are cooperating with Minna Technologies, while Nordea cooperates with Subaio. In this way, the banks' customers are able to use the subscription management service provided by the respective FinTech company within the bank's existing customer interface. This gives customers a valuable overview of their subscriptions, such as what streaming services they are paying for each month.

Such collaborations are not only about pure investments, but also about securing return on investments given the increased value provided to customers. The alternative would be for banks to develop a similar service themselves. However, the respective banks have found a cooperation with Minna Technologies or Subaio to be both efficiency improving and cost reducing in comparison.

Other services

In addition to developing services for subscription management and account aggregations, Norwegian banks are taking advantage of the technological opportunities under PSD2 in other ways as well. Utilizing these opportunities may lead banks from being a passive player to become an active participant for their customers. One way to achieve this, is through connecting digital receipts to transactions. Both Sbanken and Sparebanken Vest are cooperating with the FinTech company Zeipt in doing this, who clearly has more specialized expertise in developing this service compared to banks.

Furthermore, Sbanken cooperates with the FinTech company Quantfolio, of which they own 39.9 % of the shares (Weldeghebriel, 2017). The cooperation with the FinTech company enables Sbanken to provide their customers with simple and automatic savings advice, individually customized each customer. This is achieved using algorithms through Quantfolio's user-friendly robotic advisory service.

The common denominator for the cooperation relationships discussed, is the fact that the involved FinTech companies do not compete with banks on delivering their service. They act as suppliers, delivering an input demanded by banks. Cooperating with each other enables mutual value creation for both the FinTech company and bank. An alternative would be for

banks to develop the respective services internally, while FinTech companies would have to enter the market alone. However, as argued in the section of “The value of partnerships”, in the previous part of the chapter, there is significant value to be gained from cooperating, both for banks and FinTech companies.

7.2.3 Coopetition

As discussed in the previous, it is clear that FinTech companies have realized the benefits from cooperating with banks. This provides them access to a critical number of customers, as well as the bank’s infrastructure. Banks, who initially viewed fast-growing FinTech companies as threats, have acknowledged the value of collaborating as well. The focus has shifted toward embracing the FinTech companies’ advantages in increasing flexibility, speed and innovativeness. However, even though cooperation is sometimes a preferred strategic move, both parties are in some cases still struggling for their piece of the cake, regarding customers and market share.

Some banks are already discovering that sharing and combining strengths can lead to a win-win-situation, which can enlarge the pie and increase customer satisfaction. In fact, some competing Norwegian banks and FinTech companies are willing to share parts of their strengths and actually work together. A partial congruence of interests can allow parties to share knowledge and offer new and improved services together. In the Norwegian banking and payment market this is an increasing trend, where both players still remain competitors.

Coopetition after PSD2

Although coopetition has existed in the Norwegian banking market for a long time, an increasing number of competitors are now cooperating as a result of PSD2. For example, TPPs and banks are operating under common regulatory requirements, and thus serving the same customers (Eber, Havard , & Roccia, 2016). To ensure that this cohabitation is as mutually beneficial as possible, coopetition is key. Both FinTech companies and banks are needed for a healthy functioning of the payment ecosystem. Therefore, it will be important to have a strategy that secure market share through interaction rather than struggle. In specific, coopetition has been occurring between incumbent Norwegian banks, as well as between banks and FinTech companies concerning account aggregation, payments and crowdfunding.

Account aggregation

“We cooperate when we can and compete when we must” seems to be the core mentality among companies engaging in cooptition. This was the reason behind the cooperation between Sbanken, Sparebanken Vest and Sparebanken Sogn og Fjordane when they in 2018 cooperated to enable an account overview service for their customers. In this way, the three banks got an early head-start with the PSD2-implementation. SpareBank 1 is another Norwegian bank that was an early developer of open APIs, who later joined the cooperation with Sbanken, Sparebanken Vest and Sparebanken Sogn og Fjordane.

In other words, the banks in question implemented the technology for account aggregation before it was actually required by PSD2. Cooperating with their competitors gave the involved parties valuable insight and experience, which came in handy when PSD2 was fully implemented a year later. This allowed them to learn from possible mistakes and ensure a successful opening of APIs when even more banks joined the cooperation.

Even though Norwegian banks have always collaborated about creating a well-functioning infrastructure of the banking market, the traditional Norwegian banking market have been characterized by closed dividers between competing banks. Thus, opening up APIs leads to increased cooptition, which is considered a paradigm shift in the banking sector. Banks are now cooperating to provide value-adding services, such as account aggregation, to customers. Today, as a result of PSD2, even more Norwegian banks are cooperating to deliver such services.

Payments

With respect to payments, the Norwegian banking and payment market is witnessing cooptition in several ways. This will be explored in the following

Vipps

In addition to account aggregation, competing banks are also cooperating with respect to payment services. With the merger of Vipps, BankID and BankAxept in 2018, all stakeholders in BankID and BankAxept were transferred as stakeholders in Vipps as well. This involves a total of 106 competing banks that are now cooperating about the payment services provider Vipps. The intention of the merger is to develop and improve the service further. However, as Vipps is a licensed TPP, and can operate as both a PISP and AISP, the company in itself is

competing with their investing banks. This may have some unfortunate consequences for the further development of Vipps, as the shareholding banks may be resistant in developing the company (Gundersen, et al., 2019, p. 22). For example, developing Vipps too successfully can likely pose a threat for established banks. This can lead customers to preferring Vipps as their choice of customer facing interface, increasing competition for banks.

Payr

Coopetition is present in the competitive relationships between the FinTech company Payr and some Norwegian banks. As PSD2 make customer data available to TPPs, Payr is provided with the opportunity to develop their services, as an authorized PISP and AISP (Payr, 2019). However, Payr is a payment application that also provides a service for invoice scanning. In addition to operating as their own stand-alone application for consumers, they develop this service to banks as well. Both Sparebanken Vest and Bulder Bank cooperate with Payr and have incorporated Payr's invoice scanner to their mobile applications.

We see the possibility of being “frenemies”, collaborate where it makes sense and compete when necessary. We believe this; cooperate where the it provides value for the customer.
(Svein Ove Langeland, Sparebanken Vest)

Cooperating with Payr creates value for Sparebanken Vest and Bulder Bank as it enables them to deliver value-adding services for customers. However, because Payr is offered as a stand-alone application as well, the FinTech company is also a competitor. In other words, Payr can pose a threat to Sparebanken Vest and Bulder Bank, and potentially steal some of their customers. Payr, on the other hand, find it profitable to sell their service to banks, as this gives them additional revenue streams.

An important thing to stress, is the fact that as of November 2019, the payment-part of their application is discontinued. Exactly what implications this will have for Payr is still unclear. Nevertheless, it is likely to believe that the company will continue as a supplier of invoice scanners, with banks as their main clients. If this is the case, banks collaborating with Payr will classify as cooperation rather than coopetition, as Payr no longer will have a competing payments application.

Crowdfunding

Lastly, Monner is a Norwegian FinTech and crowdfunding company based on a business model that is developed with PSD2 and Open Banking in mind (Holm, 2019). They operate a digital platform connecting entrepreneurs looking for funding with potential investors. Providing this service makes them a competitor to banks, as it challenges the traditional way of applying for a loan through banks. However, Monner cooperates with SpareBank 1 SR-bank, one of the banks in the Norwegian SpareBank 1 Alliance, making this a case of coopetition. This is an example of two competing players engaging in cooperation, leveraging each other's assets. The Chief Executive Officer of Monner, Jarle Holm (Askeland, 2019), argues that "What we are doing now, is taking the strength of Monner as a fast FinTech company and combining this with SpareBank 1 SR-Bank's strength as a large bank".

7.2.4 Summary overview

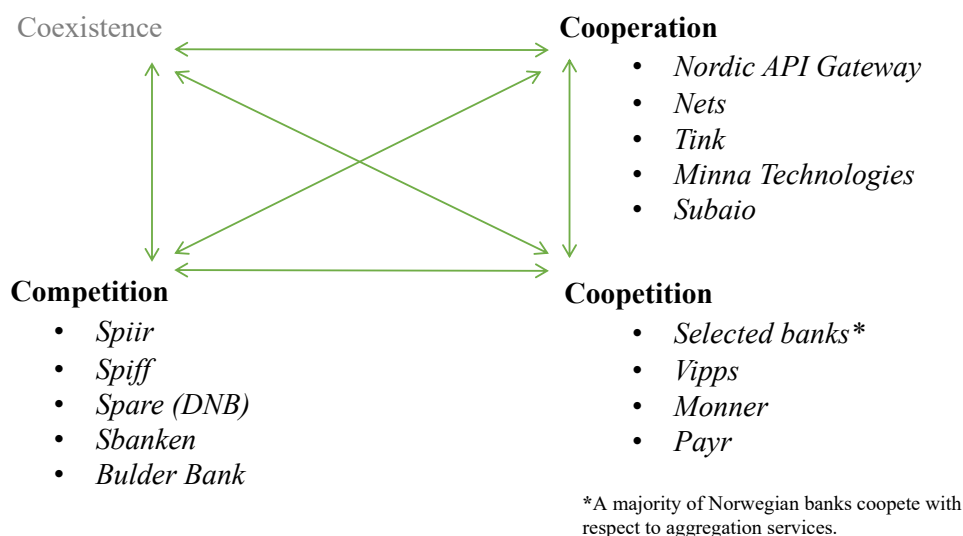


Figure 7-2: Coopetition in the Norwegian banking sector, after PSD2

Based on the discussion of competitive relationships, a summarization is provided in figure 7-2. This illustrates that the Norwegian banking and payment market is a complex ecosystem, consisting of a variation of competitive relationships between FinTech companies and incumbent banks. As we have seen, PSD2 leads to the emergence of new FinTech companies, which leads to new ways for participants in the payment market to compete and cooperate.

In summary, the discussion and analysis in this chapter has provided insight to how competitive relationships in the Norwegian payment market has changed in response to PSD2. As perhaps one of the most important findings, is the fact that increasingly more participants cooperate with each other, such as through strategic alliances like cooptation. This differs from the original market consensus, that FinTech companies would likely challenge incumbent banks and in some cases replace them. In the next chapter, we discuss what roles banks have taken so far, and we provide some suggestions to what roles they are likely to take in the future.

8. Embracing change with new roles

New competitive relationships and conditions also mean new roles for the involved participants. With the emergence of new competitors and new technology, the traditional role for banks is challenged. As a result, banks should make strategic decisions about where in the new landscape they would like to be positioned. Thus, the question is how to maintain primary contact with their customers concerning financial duties. What roles do banks need to take, in order to enable this?

How banks have decided to respond to new competitive conditions resulting from PSD2 is discussed in the following. This chapter provides insight into what business strategies banks potentially can take and the specific roles they may choose going forward. These decisions are important for banks to address in order to stay competitive by embracing the changing landscape. At last, we provide a short note on the future of banking, including Open Banking and the potential entrance of BigTech companies.

8.1 New roles after PSD2

Adjusting to new changes are important if banks want to achieve long-term profitability. This typically require banks to not only innovate their products and services, but an innovation of their business model is crucial as well. This involves taking new roles. In specific, banks may offer everything from new services and input to other financial institutions, to provide customers with more secure utility services. This spectrum of strategic choices indicate that banks have a stimulating and fruitful path ahead (Bricio, 2019).

Based on discussions in chapter six and seven, we now provide a strategic framework to summarize what new roles banks seem to be taking as a response to PSD2. Following from the XS2A rule, PSD2 requires banks to open up APIs and thus share customer information, at the customer's approval. This provides the basis of the framework, illustrated in figure 8-1, where the horizontal axis considers the amount of available data. Banks can either offer the bare minimum APIs, which might reduce risk, or offer premium and more advanced APIs that goes beyond requirements from PSD2.

As our previous discussions suggests, PSD2 enables new types of services, utilizing the account information banks are obligated to share. Therefore, the vertical axis illustrates the degree of development of front-end systems. This involves two alternatives. First, banks can be positioned in the back-end, where they provide information and compete with other banks to stay relevant for customers. The second alternative is to be positioned in the front-end, competing with both other banks, as well as new entrants, such as FinTech companies. In this latter case, the bank is a collector of information rather than a provider.

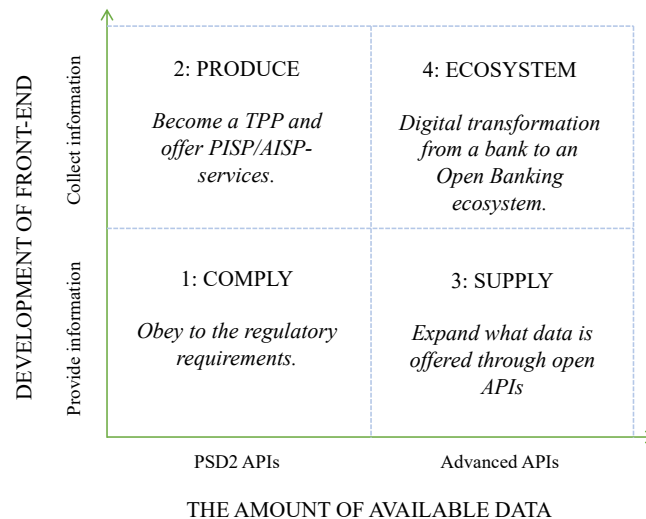


Figure 8-1: New potential roles for banks after PSD2

8.1.1 Comply

As our previous discussions and analyzes suggest, none of the banks investigated in this thesis seem to be taking the bare minimum approach of pure compliance. This strategy involves making as few changes to the current infrastructure as possible. Banks taking this role only implements the strictly necessary measures required by PSD2. As illustrated in figure 8-1, this involves providing only PSD2 APIs to TPPs, and limited development of front-end systems.

With that said, the role of compliance is perhaps the easiest option for banks to embrace. It requires minimal effort and is less expensive in comparison to the other roles. In specific, it involves less need for major investments in solutions for data structuring and development of innovative solutions. Taking this role illustrates a “wait and see” approach. This can be a valuable strategy to take if the bank is not yet sure whether their customers will want new services developed in the light of PSD2 or not. An additional advantage is that the bank may be shielded from bad investments, if they were to develop more advanced APIs that proves to be unnecessary.

Although the banks investigated in this thesis have not taken this role, some other Norwegian banks may have. For instance, smaller and more local banks are more likely to have found the role of compliance appealing. Such banks may want to differentiate themselves by offering simple services combined with physical communication through local presence and branches. In the report published by Cicero (2019, p. 13), the Eika Alliance is put forth as an example of an alliance that in general provides limited value-adding services in response to PSD2. This alliance mainly consists of smaller and more local banks. Thus, some of the banks in this alliance are likely taking the role of compliance. However, even though a bare minimum approach may be a good idea at first, it may be more difficult to compete if the bank does not exploit additional value from PSD2. This brings us to the next role.

8.1.2 Produce

Instead of taking the role of compliance, banks may rather take the role as a producer. This is an approach that exploits opportunities from PSD2 by collecting information from other banks and in this way develop new services. By developing such services, banks can become TPPs themselves, thus leverage the reach to other banks. The banks investigated in this thesis seem to be taking this role, indicating that several of the large Norwegian banks have a strategy that goes beyond pure compliance to PSD2.

This second role is more demanding than the role of compliance. It requires extensive investments in infrastructure. Front-end systems need to be upgraded, developed and implemented in order for banks to provide value-adding services and good customer experiences. As discussed in chapter seven, this is something several of our investigated banks have done in collaboration with selected FinTech companies. This includes PSD2 API providers such as Nordic API Gateway and Tink, as well as banking software providers like Nets and Evry. These API-hubs collect and manage information from a large number of banks, making the role of producing a bit easier for banks to comprehend.

As discussed in the preceding chapters, five out of six investigated banks have already launched the service of account aggregation and overview. This is a service that is based on collecting account information from other banks. Moreover, several banks have also developed a service for subscription management. Eventually, this service has the potential of exploiting information from other banks as well. These services are examples of measures

banks take to explore the role as a TPP. As we saw in chapter seven, collaborating on the development of such services enables banks to be more innovative and agile.

8.1.3 Supply

Some Norwegian banks have also seen the potential of opening up more advanced APIs. This brings us to the third role, which involves becoming a supplier of customer data. Taking this role implies a strategy of taking advantage of the benefits arising from PSD2, but in a different way than the role of producer. In specific, banks can take it one step further and offer TPPs additional APIs than the ones required by PSD2.

This is something several Norwegian banks have done, or plan to do. As discussed in chapter six, Nordea is commercializing their APIs, while Danske Bank offer some premium APIs to selected developers. SpareBank 1 also acknowledge that APIs and opportunities extend out of PSD2 scope, and therefore offer some APIs that go beyond compliance. Furthermore, DNB has announced to follow soon. Thus, it is evident that several Norwegian banks are exploring the role as a supplier. This benefits TPPs, as access to additional customer data enables them to create valuable services for consumers.

However, the role of supply has proven to be more challenging than perhaps expected. Banks are subject to comprehensive regulations, especially related to customer data. This represent a significant obstacle for banks, preventing them from selling data as easily as desired through APIs. Therefore, taking the complete role as a supplier has proved difficult. When taking a new role, banks rely on new revenue streams. They have to be certain that their new role is sufficient for future operations. This is why the four mentioned banks only explore this role, instead of fully taking it. It is likely to believe that several banks will follow in the future, after they have gained some experience in offering the mandatory PSD2 APIs.

8.1.4 Ecosystem

The last role banks can take involves becoming an Open Banking ecosystem. This is a combined strategy of the roles “produce” and “supply”. It requires a comprehensive transformation, whereby banks must conduct large investments in the development of new and innovative technology. Both large amounts of customer data, premium APIs and advanced front-end systems are necessary when succeeding as an ecosystem.

As the analysis in chapter six reveals, all the investigated banks are to some extent exploring this role, by providing developer portals. These differ in some ways, as some banks offer a higher degree of openness to TPPs than others. By providing developer portals, banks are taking the first necessary step toward an Open Banking platform. At this point, the developer portals are, however, just beginning to attract developers. In order to become an actual platform and ecosystem, banks rely on attracting a substantial number of developers. This is achieved by ensuring that it is easy for developers to develop new financial services in the platform. Nevertheless, this is a demanding task to perform, as it requires expert help, documentation and major changes to their business model.

With such a comprehensive transformation, it will likely take some time before we witness any Norwegian banks taking this role. It is not until after the developers are pleased, and they have developed new potential services, that the bank will consider collaborating with them. This can enable co-creation and further development of the services proposed by the developer. Then, the next step would be to connect developers and customers. In a similar manner to how iPhone users are connected to application developers in App Store, the bank will thus become a two-sided platform. The final step would be to expand the platform and include non-financial services as well, delivering additional value to users.

As mentioned, none of the banks in Norway seem to take the role of an Open Banking ecosystem. At least not yet. However, if none of the banks are taking this role, who will? A report published by Cicero (2019, p. 13) suggests that Vipps has the best starting point to achieve success with this role. In fact, the report argues that Vipps has the potential of becoming Norway's version of the Chinese company WeChat. The Chinese giant has received massive success as a platform, offering everything from payments to booking of hotels (Kharpal, 2019). With several million users, a strong brand and high trust among consumers, it is likely to believe that Vipps has what it takes to manage an increased position in the financial market. However, as discussed in chapter seven, Vipps is being held back by their structure of ownership, perhaps preventing them from exploring their full potential.

8.1.5 Summary of roles

As illustrated by the strategic framework, PSD2 is not just something banks must comply to. It opens endless of opportunities that banks can utilize. Open Banking will be an important part of the future of banking, whereby PSD2 is just one important step. Thus, to thrive in an

Open Banking environment, going beyond compliance will be necessary, and incumbent banks must use data as an important fuel. In other words, leveraging the directive is key to ensure competitiveness going forward. This can ensure their relevance for, and maintain their primary contact with, customers.



Figure 8-2: Summary table of roles

Based on the discussion in this chapter, we provide an overview of what roles Norwegian banks are taking in response to PSD2. This is illustrated in figure 8-2. Most Norwegian banks are taking the role of producing, while some explore the supplier role as well. Although Eika is not one of our investigated banks, the alliance is used as an illustrative example of the fact that some banks are taking different roles, such as the role of compliance. Furthermore, no Norwegian bank is yet taking the role of an Open Banking ecosystem. However, it will be interesting to see who will embrace Open Banking and take this role in the future.

8.1.6 A short note on Open Banking and BigTech companies

In this chapter, we have obtained insight into what different roles banks are taking in response to PSD2. It is evident that Open Banking will play a significant part in this, motivating banks to open up further than what is required by PSD2. A more detailed discussion on Open Banking and the future of banking go beyond the scope of this thesis. Thus, we will not provide a full analysis of this topic. Nevertheless, as it is difficult to mention PSD2 without mentioning Open Banking, we include a short note on this.

Deciding what roles to take can affect banks' competitiveness, which is likely to be further affected by the emergence of new participants in the payment sector. With PSD2 as an accelerator for Open Banking, the Norwegian payment market may face competition from BigTech companies. In fact, some of our interviewees believe that BigTech companies will pose a more prominent threat to banks than FinTech companies. Therefore, Skogland emphasizes the importance of collaborating with FinTech companies in order to help them become agile, innovative and thus develop competitive services in competition with BigTech firms.

BigTech companies typically involve large IT-companies, such as Amazon, Apple and Google, as well as Social Media providers like Facebook. Actually, in 2018, both Apple and Google launched their payment services, Apple Pay and Google Pay respectively, in Norway (Hopland, 2018). Not long after, Facebook announced their plans about providing their own cryptocurrency, Libra, and their own payment service, Facebook Pay (Liu, 2019).

Several Norwegian banks have adopted a business strategy where they embrace collaboration with Google and Apple. Among these, Danske Bank, Nordea and Sbanken have implemented Google Pay in their services. DNB has stated that Google Pay will become a reality in their services as well. Moreover, both Nordea and Sbanken have implemented Apple Pay (Enger, et al., 2019, pp. 13-16). By doing this, the banks establish themselves as flexible and attractive banks, that focus on optimizing the customer experience.

BigTech companies are seemingly in a hurry to rush into financial services, and to establish themselves within the payment market. However, our interviewees believe that BigTech companies may experience some obstacles if entering the Norwegian payment market TPPs. This relates to lack of trust and limited willingness to share data. Also, operating alongside banks in the payment sector requires compliance to an extensive number of regulations and laws. This will impact the rest of their operations and may weaken their agile structure.

It will be interesting to observe to what extent BigTech companies decide to establish themselves as financial institutions in Norway. A lot will likely happen in the nearest future, but exactly how long it takes or how the development will happen is difficult to say.

Maybe in five years you can pay via Facebook, and via Gmail, and Instagram – most likely. You can pay directly on Instagram; you do not have to go through pay pal or whatever. (Raja Skogland, The Factory)

9. Conclusion

This thesis has the purpose of studying how Norwegian banks are responding to PSD2, as well as studying how their competitive relationships and roles are affected in result. Through substantial research, discussion and analysis, we have provided some potential explanations to this research question.

First of all, an important finding relates to what specific measures Norwegian banks have taken to ensure compliance. Most banks have interpreted compliance to PSD2 as the opening up of their APIs. Moreover, it is clear that a priority among banks have been to develop an account aggregation and overview service. This is because they consider the development of this service as an indirect requirement of PSD2. Another interesting finding is that several banks seem to view the technology from account aggregation as an interesting opportunity. The technology could be utilized and developed by providing a subscription manager on top.

Among account aggregation and subscription management, the latter is the only sought-after service by consumers. In addition, few banks have developed other requested services. Thus, it can seem as if banks are neglecting customer demand when deciding what to develop next. This raises an important worry, as the main idea behind PSD2 is to foster innovation and competition to benefit the consumer. Therefore, it is noteworthy that banks are seemingly not successfully solving their customers problems, by not delivering the most requested services.

It is clear that banks are innovating at a slower pace than initially anticipated. This brings us to another important finding. Implementing technological change, such as developing new services and ensuring compliance to PSD2, proves to be both time-consuming and difficult. This helps us understand why banks allegedly provide limited utility and innovate slowly. Banks have begun to recognize this. As a result, instead of considering FinTech companies as threats, banks value some of their characteristics and abilities. Cooperating with a FinTech company can provide banks with increased speed, niche expertise and an entrepreneurial mindset. We have found that such cooperative relationships are not only valuable for both involved parties. Actually, it is absolutely crucial in order for banks to develop new services and utilize the opportunities from PSD2. Thus, the frenemies, banks and FinTech companies, have realized that they are better together. At least in some cases.

Overall, this constitutes an additional important finding. One of the main objectives in PSD2 is to increase competition and innovation in the banking sector. Based on our discussion and analysis, it can seem as if PSD2 has failed to deliver their main goals. However, we believe an important explanatory factor is the fact that change takes time. We shall not overestimate change in the short run. We believe that change will come, leading to increased competition both between banks and with new FinTech companies. In fact, we are already starting to see some hints of this. Some FinTech companies, such as Spiir, are challenging parts of traditional banks. Thus, we believe that banks should focus on developments that make them their customers' preferred interface. This is what competition in the future of banking will likely evolve around; who delivers the most value to customers through a user-friendly interface, such as an online application.

This brings us to a final finding. Our analysis of the banking sector proves that banks are considering new strategic opportunities in response to PSD2. The majority of Norway's biggest banks are actually already beginning to take the role as a TPP. In other words, they view PSD2 as something more than just regulatory compliance. They believe PSD2 is only the beginning of something greater. In order to stay ahead in the future competition, major banks are therefore exploring new roles, including the role of supplier. We believe that other banks will follow this path soon and start utilizing opportunities that arise from PSD2. Further, we believe that someone will take the role as a platform, and that most payment participants eventually will embrace Open Banking. However, as taking the role as an ecosystem will require extensive development, only time will tell how and when these ecosystems will evolve.

9.1 Implications for future research

As our study is of an explanatory and interpretive nature, it raises a number of opportunities for future research. In fact, additional and further research will be necessary to both refine and elaborate our findings.

First, while we have interviewed eleven key personnel, it can be of great value to increase this number by interviewing more representatives from the market. A suggestion is to include several representatives from each firm, as this can provide a more composed picture of the truth. Also, we believe interviewing representatives from a bigger selection of companies can be a good idea. This can hopefully enhance the novel findings in this thesis, as well as disclose additional findings. Additionally, as we have taken a qualitative approach toward the research

question, taking a more quantitative approach can also provide some interesting findings, and perhaps lead to some refinements.

Second, because our study was conducted during the fall of 2019, our research was conducted at the same time as the final part of PSD2 was implemented. This led to some interesting findings, and we managed to stay on top of the changes in the Norwegian banking market as they were happening in real time. However, researching the same question may lead to additional findings if conducted at a later point in time. The market is still a bit premature, and significant changes are still yet to happen. Therefore, we believe additional research after PSD2 has been fully implemented in both legislation and by banks may be valuable.

The study can also be extended to include how PSD2 affects other and different aspects of the Norwegian banking market. For example, by analyzing the effect PSD2 has on the corporate market or analyzing how PSD2 affects the organizational structure of banks. Moreover, international transactions is a part of the directive that has received limited attention. Perhaps due to its complexity and uncertainty. However, we believe this is an interesting and important part of PSD2 that deserves more discussion, and that can provide additional value to the research.

Lastly, we suggest that future research should include shedding light to how banks and other payment market participants can take the directive a step further. While this is something we have addressed in our thesis, by discussing how some Norwegian banks are utilizing PSD2, we would like to suggest this topic being analyzed more in depth. This can be achieved by looking at PSD2 as just one important step toward Open Banking. Hopefully, by analyzing PSD2 and the Norwegian banking sector in a broader context can provide some additional value. Then, the perspective from FinTech companies should be taken into consideration to a larger extent as well.

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Appendix 1: List of FinTech companies

Payments	Wealth management and savings	Crowdfunding & crowdlending
Accountflow	Dreams	Crowdworks
Auka	DuVIPensjon	Dealflow
Bember	Exabel	Finanstipset
Bill Kill	GoScoreme	Funding partner
DiggEcard	Harvest	Investio
Eternic	Horde	Kameo
Fiken.no	Huddlestock	Kredd
Folio	Kron	Lendonomy
Kviq	LifePlanner	Monner
Luca labs	Miraix	Spleis
Lucidtech	Norquant	
Meawallet	Nøffe	
Payr	Quantfolio	
Payrest	Spiff	
Tjommi	Spir	
Travis		
Vipicash		
Vipps		
Zeipt		
Ztl payments		
Digital banking	Infrastructure and identification	Enterprise financial software
Aprilabank	BankAsept	Bizbot
Blockbonds	BankID	Brevio
Bulder Bank	Forgerock	Capassa
Empower	Idfy	Evva technologies
Jaja Finance	My Voice	Fixrate
Monobank	Zwipe	Just technologies
Sbanken		Ownersroom
Banking software	Personal finance software	PSD2 API providers
Evry	Minna technologies	Tink
Nets	Subaio	Nordic API Gateway
Data and analytics	Insurtech	Blockchain technology
Arundo	Cloudinsurance	Bitspace
Aseptia credit intelligence	Tillit forsikring	Diwala
Deep insight	Tribe forsikring	
Enin	SafetyWing	
Mito.AI		
Neonomics		

Table 4: Top FinTech companies in Norway

Table 4 provides an overview of the top FinTech companies in Norway. The different companies are categorized according to business models. This does not form a complete list of all FinTech companies operating in Norway.

Appendix 2: Interview guide

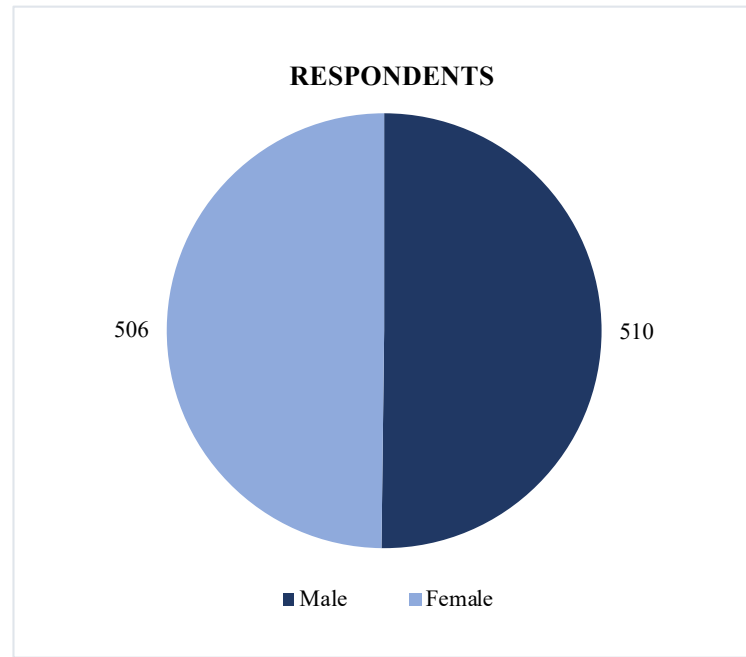
Topic	Question
Introduction	<ul style="list-style-type: none"> • Can you tell us about yourself and your position in the company, please? • How do you work in connection to PSD2?
About PSD2 in general	<ul style="list-style-type: none"> • What is the main objective with the directive? • What is meant by APIs? • How did you expect PSD2 to affect the banking sector? • Does this differ from how the directive actually affected the banking sector?
With respect to Norway	<ul style="list-style-type: none"> • What are your thoughts concerning the pace of innovation after PSD2, among banks? • What has been the greatest challenges when implementing PSD2?
With respect to your company	<ul style="list-style-type: none"> • What specific measures have your business conducted to ensure compliance? • What do you think customers will expect from new services post-PSD2? • Have your company engaged in any new strategic alliances or cooperative relationships after PSD2?
With respect to FinTech companies	<ul style="list-style-type: none"> • Did you expect more FinTech companies to challenge incumbent players? • What are the most important entry barriers for FinTech companies? • Why do you think banks have entered into cooperation with FinTech companies?
PSD2 and future prospects	<ul style="list-style-type: none"> • How can banks utilize opportunities from PSD2? • Did you expect BigTech companies to establish themselves as a response to PSD2? • How do you think the bank and payment market will look like in Norway in the next 5 years?

Table 5: Interview guide

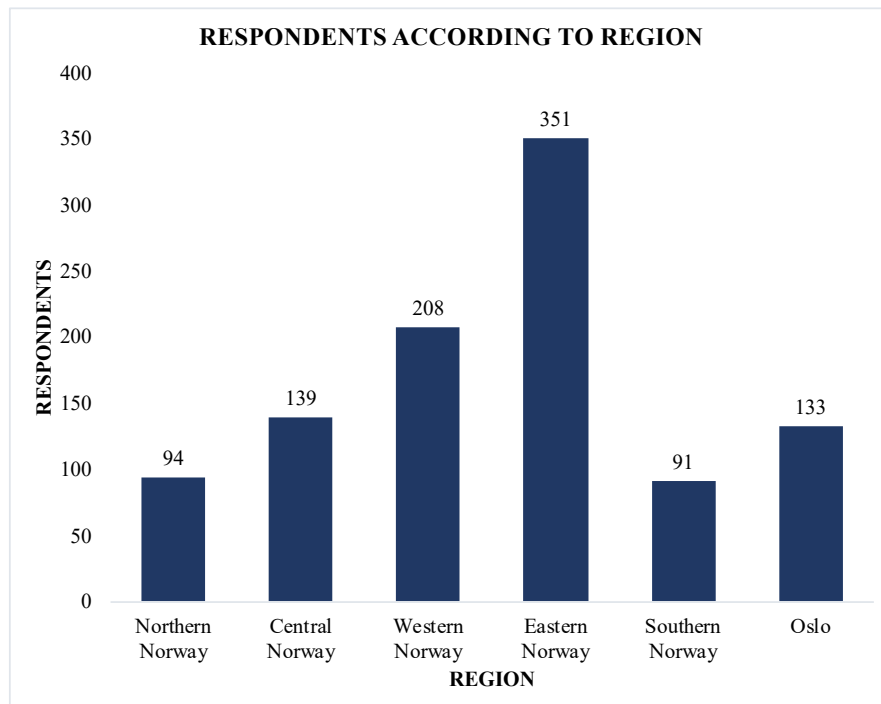
The interview guide in table 5 has been used as a general starting point for all interviews conducted in this research study. In preparation for each interview, we made smaller adjustments when necessary. For example, in the interview with Bits, we had some specific questions regarding the XS2A rule, Berlin Group, and the purpose of different implementation standards. This was therefore incorporated into the interview guide for that specific interview.

Appendix 3: Distribution of respondents

The distribution of respondents in the survey provided by Norstat and Cicero Consulting according to gender is illustrated in Appendix 3-1, while the distribution according to region is illustrated in Appendix 3-2.



Appendix 3- 1: Respondents according to gender



Appendix 3- 2: Respondents according to region