



Innovations in Finance as Regulators Push Open Banking

Understanding innovative processes and
market change in the Swedish banking
market as of payment services directive 2

*Master's thesis in the Master's programme
Management and Economics of Innovation*

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Abstract

Digital technologies are transforming each layer of every stack in society. Within the financial industry, authorities in the EU and in Sweden believe that the development of digital technologies is being held back. Competitive authorities urge for the industry to provide better products, increased customer choice and higher price competition. One regulation that aims toward enhancing innovation within banking in Europe is the directive payment services directive 2 (PSD2), introduced in 2018. PSD2 requires banks to enable external parties to use their account services, and transaction services, through technical APIs. Banks' compliance of PSD2 is sometimes referred to as open banking.

The purpose of this report is to, from an academic perspective, explore the market changes in Sweden as of PSD2 and open banking. Specific theory related to technologies, and more general theory applicable on market change, disruption, and innovation, is used. Further, disruptive tendencies toward incumbent banks are analyzed.

The study shows that there are reasons to believe that the industry has moved to an un-optimal state in terms of innovation, and that PSD2 can partly move it to a more efficient state. It shows strong incentives for collaborations between FinTechs and banks post PSD2 and open banking, based on utilizing each other's strengths to enhance value offerings toward end consumers. The research concluded that there are no direct disruptive effects of PSD2 and open banking. However, PSD2 and open banking lowers the efforts for a business to configure itself as a marketplace bank. While incumbent banks rely on providing their own provision services and loans on their "platforms", marketplace banking subjects these services to competition on a non-discriminating platform and thus potentially offers higher value to end customers. A conclusion is that the business model of marketplace banking has disruptive qualities.

Keywords: PSD2, Open Banking, FinTech, Banking, Digitization, Disruption, Transaction Cost, Platforms, Debundling, Rebundling, Financial Services, Regulations

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1. Introduction

The following chapter presents the background, aim & purpose, delimitations and research questions. Two research questions are defined, which will be answered by analyzing the results and conclusions.

1.1. Background

Digital technologies are transforming each layer of every stack in the modern society (Olleros & Zhegu 2016; World Economic Forum, 2016). In the financial sector, digitization has brought higher efficiency to existing practices, and through digitalization, completely new business models and ways to create services have been introduced (Scardovi, 2017).

Among authorities regulating the European and Swedish banking market, there is a consensus that the innovative potential and opportunities of digital technologies are not captured to a satisfying level, and that competition remains low (European Commission, 2017a; European Commission, 2018a; SCA, 2016). The EU wants to increase consumer surplus through better products, increased choice, more competitive pricing, and fostering the rise of innovative services (European Commission, 2017a; European Commission, 2018a). Following what the European Commission is communicating, the Swedish Competitive Authority expresses that new innovations in the market are likely to lead to increased competition in Sweden. (SCA, 2016)

One regulatory effort that drives change toward the desired state, is happening in the payment market through the directive payment services directive 2 (PSD2). The history behind the regulation begins as early as in the 2000's, when the European Commission identified an undesirably fragmented transaction infrastructure in Europe (European Commission, 2019a). As a result, the payment services directive (PSD) was formed in 2007 and implemented across the European countries, with the ambition of harmonizing European systems through setting standards on how transaction systems must interact with each other (European Union, 2007). However, with the development in the financial sector, new kinds of businesses emerged that was outside the scope of regulation. The companies that emerged are so called Payment Initiation Service providers, and Account Information Service providers. The former initiate payments between consumers and merchants, through a bank that remains passive in the transaction. The latter gather data from a consumer's bank(s) and aggregate the financial information for that user in one place. (European Commission, 2017b; European Commission, 2018b)

As a response, a revised version of PSD, PSD2, was proposed in 2015. The purpose of the revised directive is to regulate these new functions in the market, and it came to be introduced

in Sweden in 2018 and is to be fully complied with in late 2019 (Finansinspektionen, 2019a; Finansinspektionen, 2018).

PSD2 requires banks to, through technical standards (APIs), provide customer information to third parties and let them initiate transactions from their accounts, with the customer's consent. This opens up for external innovators to create digital services based on the data and infrastructure previously only accessible by banks themselves. To provide these services from a bank's perspective, is sometimes referred to as adopting open banking. Open banking is happening in most parts of the world. According to the Open Banking Project (2018), legislation for open banking is already present in Japan and South Korea. Further, Mexico and Australia has legislation in progress, whereas the US, Canada, Singapore and more countries have open banking legislation under consideration (Open Banking Project, 2018). While the purpose behind the regulation and the technical implications on banks are clear, it is unclear how and through which processes PSD2 will affect the financial ecosystem as a whole.

1.2. Problem description

The effects of PSD2 and open banking are widely discussed in the industry. While financial institutions and different interest groups within the sector agree that the ongoing innovative trends, and PSD2 as a regulation behind it, will have a large impact on the industry, it is unclear just how. Some call it a means for regulators to expose retail banks to one of the biggest disruptions in banking for decades (Globalbankingandfinance, 2016; Accenture, 2018; Bain, 2018). Others say it will create opportunities for banks to develop new offerings and reach new revenue streams.

One representative of a financial services provider stated in a report by Deloitte (2017) that "banks are going to die by a thousand cuts". The representative is referring to the scenario where financial technology start-ups (FinTechs, see chapter 4.1.1 for further definition) will continuously pursue verticals within the financial industry where profitability is high, until the traditional financial institutions are step by step "disrupted".

Other management consultancy firms seem to agree that banks are being challenged, but to what extent and which transformation banks need to undergo is unclear. McKinsey (2018) released an article in January 2018 highlighting PSD2 provides banks with new opportunities. The management consulting firm Boston Consulting Group (2018) goes further and makes the point that banks must embrace an open banking business model in order to sustain the changes in the industry. Arthur D. Little (2018) makes a similar point, and supports the scenario of co-existence between FinTech companies and banks that have shifted their business model toward open banking. The consultancy firm BearingPoint (2019) chooses to formulate an even brighter future for banks, and calls it a massive opportunity where PSD2 works as a "stepping stone" into a platform business model. BearingPoint then brings up large tech companies such as Uber, Google and Apple and argues that it is time for banks to take a similar shape.

Neither reports or articles from interest groups or management consultancy firms are unbiased in the context. They can be assumed to create a sense of urgency to sell services or attract investments, and may communicate highly speculative scenarios. With much speculation coming from these institutions, it is difficult to tell whether words like “disruption” are just used to gain attention, or if they are proper words to describe the phenomena the financial sector is currently going through.

At the same time, the communicated goals of PSD2 by the European Commission to foster innovation are clear, but exactly how it will do so is less spoken about. The current discourse around PSD2’s effects on the financial sector, more specifically retail banks, has created an unclear picture of the current transitions the industry is going through, and which direction the industry is taking toward the future. There seems to be no research available that describes the processes that will follow PSD2.

1.3. Aim and Research Questions

The purpose of this report is to use relevant theory to address the regulatory implications of PSD2, from the perspective of market change through innovation. Further, based upon the understanding of the innovative processes, the aim is to create clarity in if and how open banking has any disruptive tendencies toward incumbent banks.

- Which market change processes follow the implementation of PSD2 in Sweden?
- Are there tendencies toward disruption in the Swedish financial ecosystem?

1.4. Scope of Research

One delimitation of this report is to exclusively analyze the impact of PSD2 on the Swedish financial sector. As the market is exposed to external influence, examples and/or global trends are still partly used to understand the domestic development of Sweden. Within the aspect of how incumbent participants in the Swedish financial sector are affected by the market change, different segments might be affected differently. This report takes the perspective of the four largest banks operating in Sweden due to their significantly large size in comparison with their other competitors.

There are several other companies that might pose a competitive threat to incumbent banks, both small scale banks and large tech firms. Many of these companies and their initiatives as a phenomenon are difficult to relate to as consequences of PSD2, and are therefore left out in this report. Also, many of these companies’ predicted effects are judged to be too speculative.

2. Theoretical Framework

In this chapter, theory within market change, innovations, as well as relevant technologies is introduced.

2.1. Transaction cost & digitization

According to Coase (1937), a transaction cost is the cost of participating in the market and is any price or effort associated to a purchase not directly included in the price of the purchased product or service. Dahlman (1979) divides transaction costs into three broad categories: (1) Search- and information costs, which are costs related to finding a product and its information. It could for example be locating where to buy it, determine its quality or finding where it is offered at the lowest price. (2) Bargaining/negotiation costs are costs for reaching an acceptable agreement, leading to drawing up a contract of some kind. (3) Policing and enforcement costs, which are costs of ensuring enforcement of the contractual agreement and in terms of breach taking action through a legal system.

Within a firm, the equivalent of a transaction cost, that again, is the cost of using the market for acquiring services and goods, is the administrative cost. The administrative cost is the cost of producing a service or product internally instead of utilizing the market. Coase (1937) found that the business activity will be performed within the organization when the transaction cost (of collaborating with external companies) is higher than the administrative cost (of performing activities in-house). Consequently, all other things held constant, a reduction in transaction costs would lead to vertical disintegration within markets.

Digitization has reduced the search, negotiation and enforcement costs in society by making exchanges both easier and more efficient (Cordella, 2006). Due to information and communications technology (ICT), consumers and companies have both access to more goods and more information about these goods. Bailey & Bakos (1997) have through empirical studies shown how this can lead to ambiguous results in regard to search cost: 'on one hand lower search costs will reduce the importance of intermediaries by allowing buyers to search directly for appropriate suppliers, while on the other hand the overwhelming abundance of information offered by internet-based market infrastructure may increase the need for intermediaries that can help to match customers and suppliers by filtering information' (pp. 10-11).

2.2. Disruptive Innovations

Bower & Christensen (1995) identifies the pattern of failure for incumbent firms to catch the potential that comes with the emergence of new technologies. The authors make a point that managers make actions based on customers' current needs, and that this can lead to neglecting technologies that over time can develop to outperform current solutions. "Managers must beware of ignoring new technologies that can't initially meet the needs of their mainstream

customers” (p. 2). This phenomenon implies that rational decisions based on customer’s needs and not investing in inferior technologies may after time cause organizations to become outcompeted. The companies that find inferior technologies superior in niche markets where performance is evaluated in different measurements, reinvest in the technology until it performs as good, or better, than the previous solutions, but with the additional performance factor that made it succeed in the first place. The diffusion of the new technology into the wider market is sometimes characterized by the disruption of the previous products, and the large firms providing them. One additional important factor that drives disruption is that the incumbent company may cannibalize on their current business by deploying the new technology into the market. The new technology may not be as profitable as the previous one, which creates incentives against releasing and developing the new product. The phenomenon is formulated by Christensen et al. (2015) as “Entrants then move upmarket, delivering the performance that incumbents’ mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants’ offerings in volume, disruption has occurred” (p. 2).

Christensen et al. (2015) criticizes the current wide use of the word “disruption”, and points out that “Many researchers, writers, and consultants use ‘disruptive innovation’ to describe any situation in which an industry is shaken up and previously successful incumbents stumble. But that’s much too broad a usage” (p. 1).

2.3. Incumbent survival in radical market changes

Tripsas (1997) identifies that some companies drastically fail when exposed to radical technological change, and that others seem to thrive and prosper. Tripsas (1997) uses empirical studies of radical innovations and their effects on companies and industries, as well as own cases and Schumpeterian economics, to create a model to identify dominating factors that determine the fate of companies in such environments. According to Tripsas, the “ultimate commercial performance of incumbents vs. new entrants is driven by the balance and interaction of three factors”. Those factors are (1) “investment in developing the new technology”, (2) “technical capabilities” and (3) “the ability to appropriate the benefits of technological innovation through specialized complementary assets”. Factor (1) of investments refers to early efforts into research and development within the new technological area, and factor (2) refers to competencies within the company and in which way they are relevant and/or applicable to the scenario that comes after the radical innovation. Factor (3) assumes that some parts of a company’s activities, intellectual property and/or products can still be relevant after a radical innovation shifts a market’s conditions. Sales/service relationships have historically proved to be important complementary assets that make it difficult for new entrants to compete with incumbent firms. (Tripsas, 1997)

2.4. Platforms and Network Effects

2.4.1. Network Effects

Traditionally, economics has been assuming diminishing returns, meaning that if scaling up production, a company will eventually face a scenario where marginal cost of producing another unit increases. This creates an equilibrium in the market, where a market only produces a certain number of units. The theory is roughly valid for processing industries, however, knowledge-based industries are instead often subject to increasing returns. Increasing returns does not generate an equilibrium, but instead the market follows a tendency that what is ahead tends to get further ahead, and what falls behind tends to fall even further behind. If a product, company or technology gets ahead, a technology can “go on to lock in the market”. There are three main causes for increasing returns: High up-front costs, network effects and customer groove-in. (Arthur, 1996)

One source of increasing returns can be found if a product is “heavy on know-how” and “light on resources”. That is, when the effect of splitting the up-front costs on one more user outweighs the cost of acquiring the user. Then, the unit cost of supplying a product diminishes per acquired user while revenue increases. (Arthur, 1996)

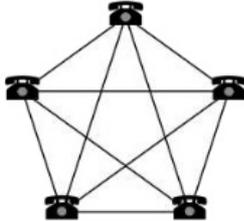
One other source is network effects (Arthur, 1996). Network effects applies when the value of a product increases with every new user. This effect is sometimes referred to as “increasing returns to adoption”. Network effects are commonly illustrated with Metcalfe’s law (see figure 2.1), stating that the value of a telecommunications network is proportional to the square of the number of connected users.

Metcalfe's Law:

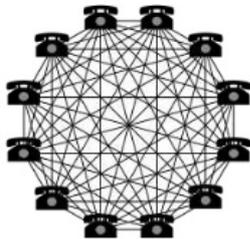
$$\text{Connections in a network} = n(n-1)/2$$



2 telephones = 1 connection



5 telephones = 10 connections



12 telephones = 66 connections

Figure 2.1: Metcalfe's Law.

One business model that, among other things, cater positive network effects is the platform business model.

2.4.2. Platforms

A platform function as a surface that facilitates value-creation through bridging interactions between consumers (demand-side) and external producers (supply-side) to create a multi-sided market (Rochet & Tirole, 2006; Hagiu & Wright, 2015). The platform then creates a positive feedback loop of increased transactions, where more customers attract more external producers to enhance the value of the platform, to in turn attract more customers.

Features of platforms are also that the platform can either or both: (1) reduces the transaction cost between the engaged parties, and (2) generate completely new transactions that otherwise would not occur (Evans & Schmalensee, 2007).

Sánchez-Cartas & León (2019) conclude in an extensive literature review that no single standard definition exist. Hagiu & Wright (2015) offers an inclusive description highlighting the two main characteristics of a platform: (1) “Multi-sided businesses enable direct interactions between two or more sides” and (2) “Each side is affiliated with the platform” (p. 5).

Gawer (2009) argue that a platform is more innovation centric in comparison to a business model with vertically integrated products and/or services. The business model incentivizes platform providers to compete on maximizing the value for suppliers and users when interacting on the platform (Zachariadis & Ozcan, 2017).

A common feature that we observe in multi-sided markets is that some agents tend to use several platforms at the same time, so called multihoming (Sánchez-Cartas & León, 2019). For example, banks' customers may carry both a Visa and a MasterCard. The greater the cost of multihoming, the greater the tendency for market concentration, since a higher cost decreases user willingness to affiliate with competing networks providing similar services (Sánchez-Cartas & León, 2019).

2.5. APIs

Jacobson et al. (2012) defines APIs as “a way for two computer applications to talk to each other over a network using a common language that they both understand”.

Chris Hoffman (2018) provides an intuitive example to understand how APIs work, what purpose they have and what value they create. He encourages the reader to think of a menu in a restaurant. “The menu provides a list of dishes you can order, along with a description of each dish”. Similarly, APIs list functions available to developers, together with documented descriptions. “When you specify what menu items you want, the restaurant’s kitchen does the work and provides you with some finished dishes. You don’t know exactly how the restaurant prepares that food, and you don’t really need to.” In the same way, developers can acquire data and get access to functions without bothering about how they were produced. (Hoffman, 2018)

The value becomes clear by analyzing the contexts where they can be utilized. Firms can integrate systems by having them exchanging information and sending tasks to each other, and externally, separate companies can connect their services and/or internal systems and open them up for communication by creating APIs. This creates a way to bundle services together to increase the customer experience by combining functionalities (Nijim & Pagano, 2014). Bodle (2011) argue that in general within systems integrations, modular design and interoperability is at the very core. Modularity also brings flexibility and more combinations of services and processes, which leads to an increased supply of options for a system’s end-users (Baldwin & Clark, 2000).

Baldwin & Clark (2000) argue that this sort of interoperability accelerates innovation, as each separate system can be developed independently from the systems it communicates with, based on demand, resources and technological development. Given these characteristics of APIs and the modularity of systems, organizations can open up their core value creating processes through APIs to external parties, to create business platforms. These platforms can be spaces where developers innovate new products and services and pay a fee for using the underlying

services' APIs. The process where this business model creates markets with new characteristics is sometimes referred to as the emergence of the API economy. The characteristics are usually disintegration of services, where separate companies focus on core competencies and combine those through fast and efficient APIs, which are combined to provide end-users with final products. (Baldwin & Clark, 2000)

The EBA (2016) classifies different levels of access that companies can choose to give external developers into four categories listed below. In all four categories, the APIs are available to a company's internal developers.

- **Partner:** Open API that is accessible to preferred partners.
- **Member:** Open API that is accessible to members belonging to a community.
- **Acquaintance:** Open API that is accessible to anyone complying with a predefined set of requirements, usually through a contract.
- **Public:** Open API that is accessible to anyone. Typically involves some form of basic registration.

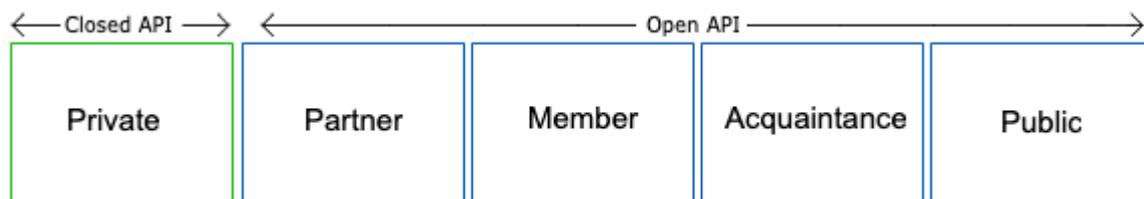


Figure 2.2: Different levels of API openness.

2.6. Path dependency

David (2000) discusses the meaning of path dependency in the context of economics. He provides two definitions, one positive and one negative:

- “A path dependent stochastic process is one whose asymptotic distribution evolves as a consequence (function of) the process's own history.” (p. 5).
- “Processes that are non-ergodic, and thus unable to shake free of their history, are said to yield path dependent outcomes.” (p. 5).

Essentially, if a decision is made, or a change in a system is developed, with regards to what previous decisions have led up to, there exists a path dependency. Path dependency can be a problem for economic systems, because it introduces the notion that systems can diverge toward inefficient and nonoptimal states. If the full costs of optimizing the system and implementing a move to a more efficient state is higher than the positive outcomes from doing

so, rational companies might not perform those changes - even if the change would render a more efficient state of the system. The very same effect is the cause of iterative path dependency, where again, decisions are made with regard to what has been generated by previous decisions.

Liebowitz & Margolis (1995) argue that if inefficient state of affairs come to exist as an effect of path dependency, entrepreneurs seeking Schumpeterian rents will enter the market and provide more efficient alternatives and thus make sure that inefficiencies are short-lived. In turn, this creates incentives for the incumbents to break free from inefficient states despite its high transition costs, due to the threat of new entrants.

The following quote from David (2000) explains how innovative processes and regulatory changes can break path dependency in a system, in a process where incumbent actors may be ruled out:

“If and when the structure of economic incentives and constraints bearing upon the process under study is altered by events that, for the purposes of the analysis may reasonably be regarded as ‘exogenous innovations’ (in the state of relevant knowledge, or in the regulatory institutional regime), the previous attractor(s) may be destroyed, freeing the system to endogenously begin to evolve some new configurations” (p. 11).

David (2000) responds to the notion of Schumpeterian rents as a solution to lock-in inefficiencies as brought up by Liebowitz & Margolis (1995), by claiming that Schumpeterian rents do not solve the entirety of path dependent inefficiencies.

“To claim that the evidence of change itself is sufficient to dispose of the notion of a persisting inefficient lock-in is tantamount to supposing that Schumpeter’s gale of ‘creative destruction’ is blowing continuously at full force, through every niche, nook and cranny of the economy” David (2000, pp. 9).

3. Methodology

In this chapter, the research process is brought up together with efforts to ensure quality.

3.1. Research strategy and design

According to Edmondson & McManus (2007), an inductive research design is preferred in developing theory and insight about how a process unfolds, explaining the occurrence of an event and in researching novel phenomena. In contrary, a deductive method is preferred when existing proven theory can applied on a subject to draw general conclusions (Edmondson & McManus, 2007).

Therefore, first, the prior state of knowledge within the field was researched by searching through online libraries. This also worked as a way to determine the key concepts, search words and trends to examine in the later stages. As the prior state of knowledge within the field of market changes, innovations and technologies were judged as high, a deductive research approach was adopted.

Edmondson & McManus (2007) also suggest that the state of prior research determines whether a quantitative or qualitative method is suitable for a research project. According to the authors, a qualitative method is preferable the more nascent the state of exploration and theory availability is. The specific domains of innovation and disruption as of PSD2 were judged as academically nascent, and thus a qualitative approach was adopted.

The current development of the financial ecosystem has many interest groups, and attracts a high degree of media attention. Consultancy firms and other interest groups produce several extensive reports on a year-to-year basis. A challenge with using these reports as basis for answering the RQs of this report, is that it is expected that these institutions are not unbiased in what data they present and how they do so. Forecasts and statements are chosen and formulated in line with respective consultancy firm and interest group's agenda.

Consistent with both Yauch & Steudel (2003) and Edmondson & McManus (2007), triangulation can thus be used to increase the validity of the underlying results, by using different kinds of data sources to build up knowledge. Edmondson & McManus (2007) define triangulation as “a process by which the same phenomenon is assessed with different methods to determine whether convergence across methods exists” (p. 3). Jick (1979) explains triangulation more thoroughly, and the effect that is sought after in this report is that it can be used to cross-validate the data that different information sources yield.

3.2. Research Process

Figure 3.1 illustrates the pursued research process. A first literature review was conducted to initiate the research process. The review functioned as a preparation for the following more specialized research, by providing a comprehensive understanding of the domain of the RQs and industry subject to the research. Based on the knowledge from the initial literature review, interviews were conducted with actors within the financial ecosystem. The interviewees represented management at FinTech start-ups, relevant financial regulators, the central bank of Sweden, and departments within innovation and/or payment infrastructure at the four large Swedish banks. These interviews included both focused questions with the purpose of understanding the interviewees' perspective of the regulatory change, and questions related to the macro perspective. After conducting the interviews, a further and more specialized literature review was conducted. The literature reviews and the interviews were followed by data collection to understand the different states and changes in the industry. Parallel to the data collection, theory and models that could be used to understand and analyze the industry

change based on the current data were searched for, both to understand which theories could be applied to the RQs, but also to understand which further data needed to be collected. The RQs were used as the starting point in the search for relevant theory. After the data collection and theoretical framework were complete, an analysis followed to answer the RQs.

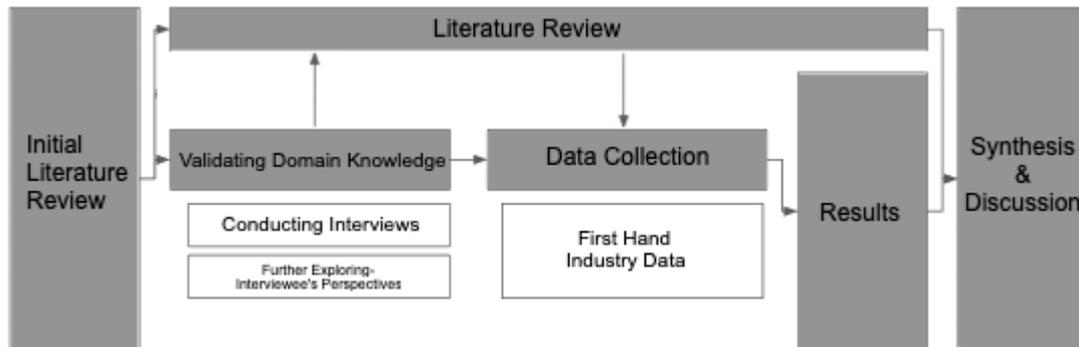


Figure 3.1: Illustration of the pursued research process.

3.3. Literature Review

During the first literature review, management consultancy- and industry reports were being searched for and used to a large extent in understanding PSD2 and its effects on the industry. To some extent, the first literature review also included academic reports explaining the financial ecosystem, and reports published by its actors. In the second stage of the literature review, academic databases were searched through for understanding the financial ecosystem and its inherent actors more thoroughly, as well as their digital development and their involvement in PSD2 and its effects in the industry. More specific terms were used to access literature more related to the RQs. For example, “Open Banking, Debundling of financial services, API economy” was searched for in academic databases, rather than at management consultancy firms’ webpages. In the literature review, relevant sources used in literature found on the topic were researched further in accordance to what Easterby-Smith et al. (2015) define as snowball sampling. This increased the understanding of how the academia described different phenomena included in the domain of the RQs of this report.

3.4. Data Collection

After having conducted the literature reviews and interviews, data from for example news articles, reports from financial institutions and banks’ annual reports were used to understand the industry change in a data oriented manner independently from, for example, management consultancy firms’ foretellings. For example, publications directly from the European Union and the Swedish financial supervisory authority were used to understand the details of regulations as well as their desired outcomes. Statistical data of FinTech development was collected from FinTech organizations. Banks’ initiatives related to the RQs were researched on the banks’ webpages and annual reports. Literature and theory was used to guide the data

collection process, and the data collection was used to guide the further search for literature and relevant theory.

3.5. Quality of the study

According to Easterby-Smith et al. (2015), quality and validity in a research project must be taken into consideration in order to ensure relevance. A criteria model for evaluating the quality of qualitative research is presented by Bryman & Bell (2015) and bestows of “credibility”, “transferability”, “dependability” and “confirmability”. Below, each criterion will be evaluated separately.

Credibility

In qualitative research, credibility corresponds to the internal validity of quantitative research, and is ensured by questioning whether or not understandings of observations are correct. (Bryman & Bell, 2015). Glaser & Strauss (1967) state that credibility can be enhanced by describing data thoroughly and by using direct quotes from different sources. This mitigates risks that interpretation changes the meaning of the primary or secondary source. Tables and figures can have a similar effect. (Glaser & Strauss, 1967)

Transferability

By thorough elaborations on new concepts, a well-developed research background and a transparent method, along with explanations of interconnections of phenomena, it is ensured that the reader can judge the transferability of the research to other fields (Sikolia, Biros, Mason & Weiser, 2013). Limitations such as the geographical focus on Sweden however, sets restrictions on the transferability.

Dependability

According to Sikolia et al. (2013), dependability refers to the way data is representing the subject of the study. An effective way to ensure high dependability is through audit (Morrow, 2005). A faculty member of the University has been supervising the research project, and at a few times, other research groups have reviewed the process in order to further strengthen the dependability.

Confirmability

The dimension of confirmability refers to the objectiveness of the researchers (Bryman & Bell, 2015). A high level of confirmability is theoretically achieved if an independent researcher would draw the same conclusions and make the same connections if he or she was working with the same data (Morrow, 2005). The research project has been carried through with no interests from third parties.

4. Results

In this chapter, data is presented that represent current states and development of the financial sector, and thus the domain of the research questions.

4.1. The financial ecosystem

In this chapter, the core capabilities, functions and assets of different parties within the financial ecosystem are explained. The ecosystem structure is based upon the one that exists in Sweden, but is applicable on several markets, especially within the European union. Their functions and assets are important in understanding their collaborative and competitive interplay in the development of the industry.

The financial ecosystem consists of several different actors. Lee & Shin (2018) provide a model that illustrates the FinTech financial ecosystem, as depicted in figure 4.1. The illustration will be used as a proxy for the financial ecosystem.



Figure 4.1: A modified version of FinTech ecosystem (Lee & Shin, 2018), centering the bank instead of the FinTech.

The actors in figure 4.1 are briefly described below:

- **FinTech startups:** Companies providing financial technologies
- **Government:** Financial regulators and legislature
- **Traditional financial institutions:** Incumbent firms such as: traditional banks, insurance companies, venture capitalists and investment banks
- **Financial customers:** Individuals and organizations
- **Technology developers:** Providers of technology to be applied in the financial industry

The actors in the financial ecosystem enhances innovation and facilitate collaboration and competition in the financial industry in what Lee & Shin (2018) calls a “symbiotic” relationship. The domain of this report is of the interplay between banks and FinTech companies as a result of governmental legislative activities, hence those three parties will be elaborated further.

4.1.1. FinTech Companies

The financial sector has gone through an unbundling of financial services, where FinTech firms are companies providing independent financial services. Rather than relying on a single financial institution, such as a customer’s main bank, consumers are increasingly using debundled services offered by FinTechs. (Lee & Shin, 2018)

There is no single definition of what a FinTech is, but it commonly refers to a financial company that adds value to the customer by utilizing technology to provide one or several things of reducing cost, increasing revenue, or removing friction. Despite referring to a company, the word FinTech stems from “financial technology”. (Ståhl, 2017)

By reviewing approximately 200 scholarly articles about FinTechs, Schuffel (2016) highlights the ambiguity in the term and offers the following definition: “FinTech is a new financial industry that applies technology to improve financial activities”. Hence, a FinTech can refer to a variety of different businesses. A characteristic common for FinTechs is that many of them are ran in an entrepreneurial fashion backed by venture capital and private equity (Lee & Shin, 2018). Teigland et al. (2018) adds that FinTechs lack legitimacy, network and capital. Further, Fellander et al. (2018) highlights that FinTechs are both able and demonstrably more prone to take risks in challenging existing regulatory boundaries. Lee & Shin (2018) categorizes FinTech firms into six groups based on their market, together with examples, listed below.

- **Wealth management:** Automated investment advisory
- **Lending:** Peer to peer lending or brokerage of loans
- **Capital market:** Securities brokerage
- **Insurance:** Customized insurance packages
- **Crowdfunding:** Financing and product validation through a network of investors
- **Payment:** Payment solutions for individuals and businesses

For these categories, there are both FinTech companies that compete with bank’s existing offering, and companies that provide completely new services.

4.1.2. Traditional institutions

Banks have been identified as the traditional institutions related to the RQs. In this chapter, the role of banks in the financial ecosystem are elaborated on.

The primary business of a bank is to manage the spread between interest rates on deposits and lent out funds, from which the net interest income is derived (Investopedia, 2019). In other words, minimizing the interest rate on money deposited into the bank and maximizing the interest rate on loans yields a higher spread and thus higher income for banks. With this, of course, comes risk management to ensure loans are paid back and given at an interest rate corresponding to its inherent risk. (Investopedia, 2019)

Further, a bank that offer a wide selection of financial services within banking, insurance and savings to households and companies are what Finansinspektionen refer to as a universal bank (Finansinspektionen, 2019b). Retail banks, consumer credit banks, and securities banks, in that order, tend to offer lower ranges of services (Finansinspektionen, 2017). Universal banks divide their revenue into the two categories “net commission income” and “net interest income”. The net commission income mainly consists of savings products, credit card fees, payment services, customer concepts and life insurance (Investopedia, 2019; Handelsbanken, 2019; Nordea, 2019; SEB, 2019; Swedbank, 2019). Each of these are small in comparison with net interest income, the largest source of revenue, consisting of interest rates on different loans.

In banking as it has functioned until now, the bank itself has been the provider of all bank services with that bank. The consultancy firm Innopay (2018), specialized on “digital transaction ecosystems” calls the business model of universal banks “integrated banking”. Historically, a bank account has been the centerpiece in banking (Arvidsson, 2019). The commercial banks have been the provider of these accounts, which has given the banks firsthand access to customers. The access has consequently enabled banks to build up data that is used for complying with regulatory burden and creation of more precise risk models. From that follows a natural opportunity for banks to, upon that fundamental centerpiece, create and provide a variety of services connected to the account in a closed system (Arvidsson, 2019). Payment services such as cash, cards and mobile payments, and financial services, such as lending, insurance and savings offerings, are inherently built on the connection to the bank account (Arvidsson, 2019; Fellander et al., 2018). Lee & Shin (2018) calls the offer a “comprehensive one-stop shop” for bundled financial services, in contrast to specialized unbundled services provided by FinTechs. This gives incumbent banks a competitive advantage in economies of scale (Lee & Shin, 2018). At the same time, banks have difficulties to perform high paced innovative activities and take substantial risk as their size and role in society requires them to remain stable (Teigland et al., 2018).

Below are Allen & Carletti (2012)’s and Swedish Bankers (2014) summaries of these roles of banks in the economy.

- (1) They ameliorate the information problems between investors and borrowers by monitoring the latter and ensuring a proper use of depositors' funds.
- (2) They provide intertemporal smoothing of risk that cannot be diversified at a given point in time as well as insurance to depositors against unexpected consumption shocks. Because of the maturity mismatch between their assets and liabilities, however, banks are subject to the possibility of runs and systemic risk.
- (3) Banks contribute to the growth of the economy.
- (4) They perform an important role in corporate governance. The relative importance of the different roles of banks varies substantially across countries and times but, banks are always critical to the financial system.

Swedish Bankers (2014) choose to focus on two core functions as categorized below.

- (1) Allocation of capital - A bank's elementary function is to convert savings into investments. Private customers and companies can deposit money into bank accounts and withdraw the money at a later time in exchange for a rent. At the same time, banks can lend the deposited money to private customers that need money to perform different purchases, and to companies for investments. A bank thus distributes money within a market to where utility is high and where productivity can be improved, based on historical data and risk modelling. Banks also play a role in managing transactions of financial instruments for customers who want to participate in stock markets.
- (2) Transaction- and account services - Transaction services and related products provided by banks are a prerequisite for companies to efficiently access capital for investments and expansions, to be able to perform transactions and to manage risk through insurances. For consumers, the same services are necessities for being able to perform payments through credit- and debit cards, pay bills, manage savings on bank accounts as well as funds and stocks, saving to pension and borrowing money for e.g. purchasing a house or for consumption.

Esterik-Plasmeijer et al. (2017) argue that to be able to provide these services, an established trust in banks and their surrounding institutions is essential. Trust is strengthened by regulations, and efforts to ensure trust has traditionally been revolving around safe transactions and assuring that customers can access their funds at any time. Fellander et al. (2018) argue that banks have an inherent credibility and trust advantage due to their historical position in society. However, even though the trust is a competitive advantage for banks, Teigland et al. (2018) argue that, in the wake of the latest financial crisis, the trustworthiness of banks has been decreased.

Below is a summary of an aggregation of several sources' factors that determine trust in banks, provided by Esterik-Plasmeijer et al. (2017).

- **Competence:** ability, expertise
- **Stability:** predictability
- **Integrity:** fairness, morality, credibility, honesty, (consistency) and ‘good character’
- **Customer orientation:** Benevolence, concern about customers
- **Transparency:** Clear communications, disclosure of rules, regulations and processes
- **Value congruence:** Shared values and norms between customers and the bank
- **Stability:** Long term predictability of institution/company to carry through services

4.1.3. Financial infrastructure

The central bank of Sweden, Riksbanken (2013), defines financial infrastructure as systems that manage financial positions and/or facilitate flow of financial resources between actors. The financial infrastructure also includes legal framework and routines, and the participants use of these systems. A large part of these systems are processes of clearing and settlement of financial transactions. The financial infrastructure enables individual households, companies and authorities to pay and accept payments in a secure and effective way. (Riksbanken, 2013)

Infrastructure further enables secure and efficient ways for paying and delivering financial instruments traded on financial markets. The term “financial infrastructure” is further often used arbitrarily when referring to functions that enable activities within the financial system such as bank accounts, bank branches, and ATMs. (Riksbanken, 2016)

Typically, the payment infrastructure tends to be dominated by a few large players due to economies of scale and network effects (Segendorff & Wretman, 2015). There are heavy investments associated with aligning internal IT systems and the joint infrastructure to a specific standard. The costly nature to construct an industry-wide infrastructure leads to a reluctance toward replacing old systems, even though technologies with better performance are constantly being developed (Segendorff & Wretman, 2015). The reluctance to change may create lock-in effects in the infrastructure, why the present situation with old systems to a large degree is a function of investments made back in time (Segendorff & Wretman, 2015). Innovative payment services such as Apple Pay, are commonly only a new way of initiating payments through the already existing payment infrastructure (BIS, 2012).

4.2. PSD2

Having explained banks and FinTech companies together with the financial infrastructure, this chapter of PSD2 explains how a regulatory change affects their interactions.

Payment Services Directive 2 (PSD2) is a regulation issued by the European Commission, requiring member countries within the European Economic Area (EEA) to implement a set of laws regulating banks. The requirements obligate banks to share data, and give access to

transaction services, to authorized third parties (European Commission, 2017b). The requirements should be fulfilled latest by September 2019 (Finansinspektionen, 2018). Below, the background to the regulation and a more in-depth description is provided.

As a rule, rapid changes in technologies and new business models within the financial services industry, requires rethinking of financial regulations (Swineheart, 2018). Mostly, when it comes to innovations, it is FinTech companies that pose challenges to current regulatory approaches (Brummer & Gorfine, 2014).

Tsai & Peng (2016) formulate it as “FinTech regulation should be humble and light-touch to promote innovation for improving digital financial inclusion”, and mention that it should at the same time take into account the importance of protecting customer interests.

The European Union have made regulatory efforts to foster a positive innovative development since 2007, through the PSD1 directive, with an additional goal to promote a European single market within payment services. The objective of PSD1 was to create standards for cross-border payments to make them easier, more efficient, and more secure. The directive has since its implementation enabled innovation and increased competition through new payment institutions and market entrants (FinTechs). (European Commission, 2019b)

Some of these entrants have been companies within “payment initiation services”. They are companies that rely on being able to initiate transactions for its users, through their banks. These entrants have provided more, and often cheaper alternatives for payments and have brought more innovation to the market (European Commission, 2018b). With the rise of companies issuing transactions on behalf of their customers through their banks, in other words without themselves being a payment institute or alike, a regulatory vacuum came to exist. To set a legal foundation for these services, the EU released a revised version of PSD1; PSD2. The purpose of PSD2 is for third party providers (TPPs) to be able to leverage more bank data to build more intelligent, customer-centric and cheaper services for end consumers. It also regulates which companies may initiate bank payments and how they may do so, as well as sets requirements on banks to comply with these new requests of payment initiators. (European Commission 2018b)

According to Kubus (2019), PSD2 “liberalize the access to banking data” and their transaction infrastructure, that previously only have been accessible to the banks themselves. In other words, it requires banks to open up their transaction infrastructure and a predefined set of data for non-banks to use, with a customer’s consent. APIs is the most used and reliable technology to facilitate these functionalities (Zachardis & Ozcan, 2017). The PSD2 provide required technical standards for strong customer authentication and secure communication but it is up to the banks to define the interfaces (EBA, 2017).

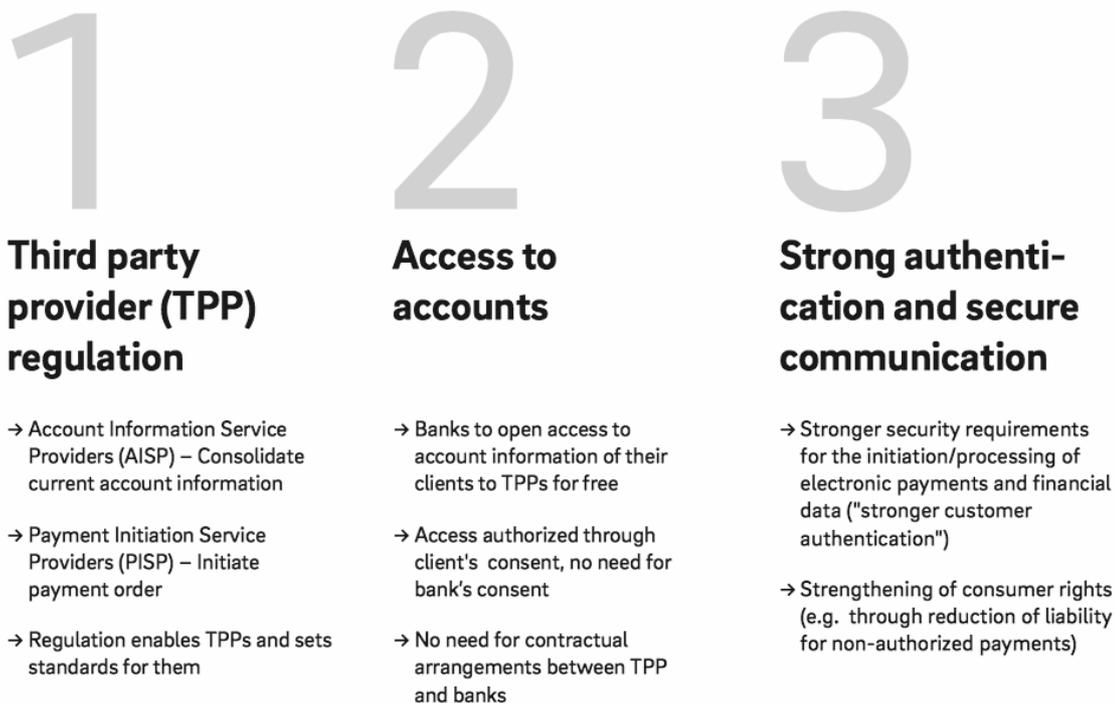


Figure 4.2: The three pillars of PSD2 (Roland Berger, 2018).

The management consultancy firm Roland Berger (2018) summarizes the significance of PSD2 in what it chooses to call three pillars (see figure 4.2). The three pillars show how banks are forced to give access to data and open up different functionalities to third parties. Third parties can access customer information and initiate payments directly from the banks' systems, with the customers consent, without the regulatory burden associated with being a bank. One popular term for this new configuration is called open banking, and its implications on banks' way of operating will be elaborated upon in chapter 4.3 below.

4.3. Open Banking and Platforms

In chapter 4.2. prerequisites of becoming an "open" bank were described. In this section, business approaches of open banking will be described together with their differences from traditional banking. The term "open banking" is used by the EU when addressing banks that comply with PSD2 (European Commission, 2018a).

The technical standards that are currently being used for open banking, are application programming interfaces (APIs) (BBVA, 2016; Mead, 2016). Within banks, both internal and external APIs are used, where internal caters to integration and efficiency within the organization and external APIs are designed for partners to interact with the bank (Zachariadis & Ozcan, 2017). These APIs enable the unbundling of banking services, as illustrated in figure 4.3 below.



Figure 4.2: Visual representation of unbundled open banking (Pwc, 2019).

Unbundling processes are common within industries subject to digital transformations and opens up for a new sort of market structure. The rationale behind is that companies within a market can focus on optimizing one core offering (unbundling) and utilize a market with low ‘interaction costs’ to collaborate in delivering a complete offering (re-bundling). The process is sometimes referred to as unbundling and re-bundling. (Jazani, 2009).

One approach to re-bundle within banking, is referred to as “marketplace banking”. The approach essentially means that a bank provides underlying infrastructure essential for building financial services upon, and then orchestrates a marketplace where third parties can publish services and users can consume them. (Mulesoft, 2018)

Starling Bank (2019) is one example of a British bank that is pursuing this strategy. Starling bank is solely the provider of the bank account and associated credit card, and leaves the provision of other financial services traditionally provided by banks, to FinTech firms. Examples can be mortgages, stock broking, and advisory services (Starling Bank, 2019).

Intermediary business approaches also exist, where banks to varying degrees incorporate external innovators in their offerings, while supplying some selected services by themselves.

Courbe (2018) argue that there are 3 main reasons for why banks have not organized themselves as platforms. Firstly, in the current business models of banks and insurance companies, there has been no opportunities for additional network effects by adopting a

platform business approach. Banks have been the best suited intermediary for financial services since they, due to their favorable historical and societal position, have had the best position to make credit- and underwriting decisions. There has been no reason to partner up with other firms on a platform when banks themselves have been the best at creating risk models for lending. The third reason offered by Courbe (2018) is that the banks have owned all the customers, and that there is no rationale in sharing them with external companies.

4.4. Sweden

In this chapter, open banking in Sweden will be explored. The Swedish banks and their infrastructure, the FinTech environment and trends, and lastly a few cases of deregulation of markets will be explored.

4.4.1. Regulatory context

The Swedish Competitive Authority (SCA), state in a report analyzing the banking climate in Sweden that the market is subject to high barriers of entry, as it is “heavily dominated” by four large banks. At the same time, they bring up that innovations and alternative financial services from independent providers open up the industry for change. They also state that the strong position of the four large banks is to a moderate extent challenged by lower switching costs for consumers, in turn leading to increased competition. (SCA, 2016).

SCA is expecting positive effects from PSD2, but point out that the effects are to a large extent determined by how the directive is implemented and how the market reacts. They encourage the government to make it easier for consumers to purchase services from several different actors, which an efficient application of PSD2 can contribute with. SCA also point out that it is important that new actors have the possibility to get access to the financial infrastructure, especially where there are economies of scale and network effects. SCA also claim that current regulatory efforts are to achieve this access, and that the development is at large positive. (SCA, 2018a).

The Swedish authority regulating the financial market in Sweden, Finansinspektionen, have implemented PSD2 in the country, and the full obligations should be met in the third quarter of 2019 (Finansinspektionen, 2018).

4.4.2. Banks

This chapter will further specify the banking landscape in Sweden. A more general description of banks can be found in chapter 4.1.2.

In total, there are currently approximately 120 banks operating in the Swedish market (Finansinspektionen, 2018). The four biggest banks operating in Sweden, of which all are

universal banks, have a market share of around 70 % in terms of outstanding loans (Finansinspektionen, 2019b). The four large banks are Nordea, SEB, SHB and Swedbank. Technically, the term is obsolete as of Nordea's move to Helsinki, Finland, on the 1st of October 2018 (Nordea, 2018). However, for the purpose of this thesis, the “four large banks” term will be used and include Nordea.

In the financial statements of the universal banks, revenue is divided into net interest income, and net commission income (Handelsbanken, 2019a; Nordea, 2019a; SEB, 2019a; Swedbank, 2019a). More information about their components can be found in chapter 4.1.2. The biggest source of revenue for the Swedish banks is the net interest income, which has been at a stable level of approximately 58 % of total revenue (Finansinspektionen, 2019b).

The Swedish banks jointly have outstanding loans of 7,100 billion SEK, out of which 6,000 billion SEK is lending within the country. Out of the 6,000, approximately 50 % is mortgage loans, 10 % other kinds of lending to households (mainly consumer credits) and 40 % loans to companies (Finansinspektionen, 2019b). Figure 4.3 depicts the gross mortgage loan margin aggregated for all of the Swedish banks. The margin is calculated as the difference between the average interest to customers, and the average cost of financing (Finansinspektionen, 2016).

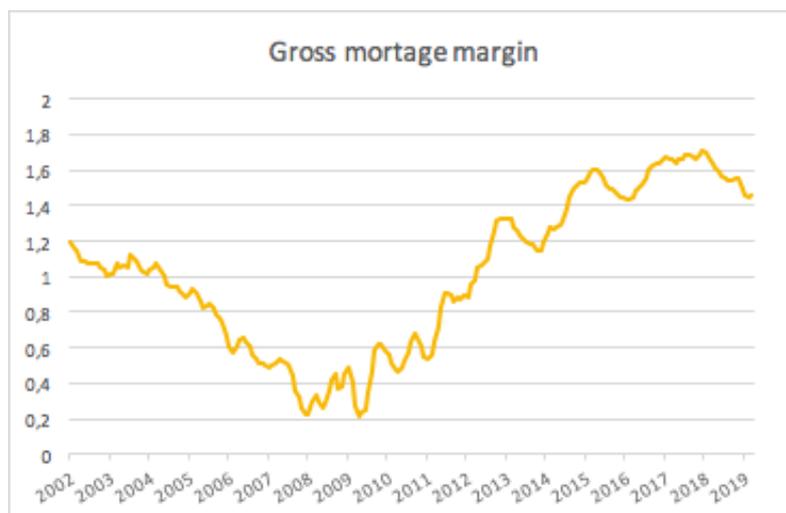


Figure 4.3: Mortgage loan margin for Swedish banks between 2002-2019 (Finansinspektionen, 2019c).

Excluding equity, the banks' lending is financed through deposits from the public, and by market financing through bonds. Deposits from the public make up 46 %, and market financing 54 % of the banks combined financing (Finansinspektionen, 2019b).

According to “bankbarometern” (Finansinspektionen, 2019b), the average return on equity has been stable between 12-16 % over the last 4 years. As shown in figure 4.4, the return on equity is significantly higher for the Swedish bank compared to the European average of between 3-8 %.

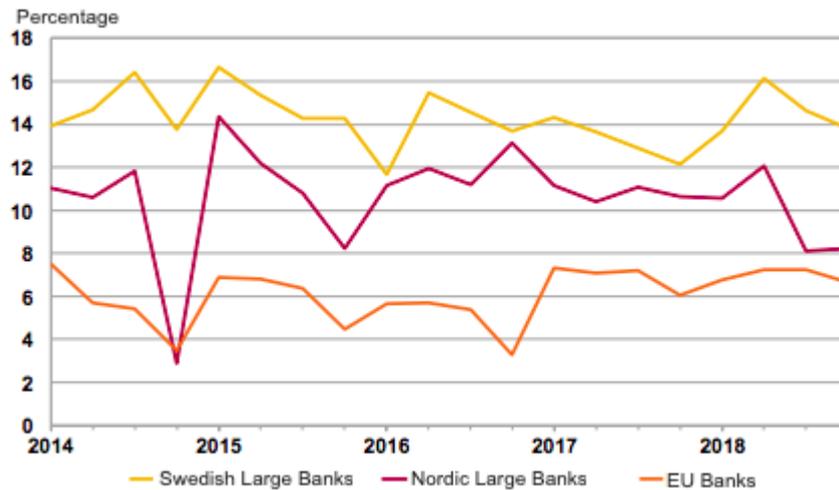


Figure 4.4: The average return on equity for the Swedish banks compared to the European average (Finansinspektionen, 2019b).

According to Finansinspektionen (2019b), two major sources of the higher profitability for the Swedish banks are the low costs within personnel-, IT-, and administration, together with the low level of credit losses. Costs in relation to revenue have been decreasing the last few years and amounted in H2 2018 to 42 % compared to the European average of between 60-65 %. Finansinspektionen (2019b) derive a major part of the difference in cost to a higher degree of digitization, which has enabled fewer physical branches and less density of personnel in several otherwise costly business functions. Looking at the level of credit losses, the Swedish banks have a 0,5 % of outstanding loans classified as “problem loans”, whereas the European average amounts to 3 % (Finansinspektionen, 2019b).

Nordea writes in their annual report that they have approximately 2500 external developers and that they use open banking to co-create value to its customers. SEB, Swedbank and Handelsbanken either mention facts about open banking and PSD2, or refers to their open-banking webpage for more information. (Appendix A.1) The four large banks have all released open banking subpages at their websites. Handelsbanken there provides the quote “we aim to find partners that share our values of commitment, customer care, simplicity and trust, so that together, we can deliver long-term value to our customers”. Swedbank provides with information that “We [Swedbank] believe in co-creation and innovation that enables people, businesses and society to grow“ and SEB that developers can “use SEB's APIs to enhance your business and join us in discovering new ways of delivering customer value”. (Handelsbanken, 2019b; Nordea, 2019b; SEB, 2019b; Swedbank, 2019b).

In the context of digitization, Swedbank acknowledges in their annual report that they “realize that we cannot do everything by ourselves and therefore cooperate with different financial technology companies”. Nordea and SEB also mention collaborations with FinTech companies as a strategy to create value for its customers. (Appendix A.1, Appendix A.2, Appendix A.3)

From transactions disclosed by Crunchbase (2019a; 2019b; 2019c; 2019d), a platform for finding business information, investments and funding, Nordea, SEB and Swedbank have

invested in several FinTech companies. As they have made investments in companies providing financial services to end-users, companies digitizing internal processes, and companies that are entirely unrelated to financial services, it is difficult to give an exact number of investments in companies classified as FinTech companies. However, with a definition that the company invested in is related to financial services, it can be concluded that Nordea has invested in 7 different FinTech companies since May 2017, SEB has invested in 6 FinTech companies since May 2016, Swedbank has invested in 2 FinTech companies since september 2014 and SHB has made no investments in FinTech companies.

4.4.3. The competitive landscape

The SCA has identified economies of scale, lock-in effects, infrastructure collaborations and regulations to be barriers to entry in the Swedish market (SCA, 2018b). See Appendix B for some important infrastructure collaborations in Sweden. In a 2018 report, the SCA alleges that the universal banks have a strong position in the market due to provision of complementary services with associated discounts, and (more previously so) big networks of physical branches. Lock-in effects contributes to low movement between banks. The SCA (2018b) attributes the low movement to likely be a consequence of lack of interest and knowledge about financial services, indirect switching costs, transaction costs and learning costs. This is in line with the proposal of Arvidsson (2019), stating that consumers in Sweden have historically tended to be loyal to their main bank.

With open banking however, bank A can gather a specific user's information from bank B to learn what type of accounts that person holds, and which services and products that user utilizes with that bank. Through this information, bank A can create an identical setup for its customer in the new bank. Historically, the customer would have needed to provide bank A with this information, and a physical request would have been needed to initiate the migration to the new bank. In other words, open banking and its digitization lowers switching costs and customers can move more freely across offerings than previously. This opens up for a potential threat where banks that fail to deliver high value to their customers will see their customers approaching other service providers

According to the communication of the universal banks, they claim that it is getting easier for customers to switch bank and that they are increasingly doing so. The services are described as becoming more and more standardized. Further, the universal banks mention the following tendencies of a changed competitive landscape in their annual reports: There is new demand on the market, the customer expectations on functionality, speed and accessibility is higher, there are new types of competitors and changed customer expectations drive digitization. They also mention that their customers have increased needs of more sophisticated services, more proactive advisory services and advanced digital solutions, and that digitization increases the competition. A more customer-centric approach is emphasized in their communication as a means to stay competitive. (Appendix A1; Appendix A2; Appendix A3)

Smaller companies in the savings market are disadvantaged by the lack of economies of scale and distribution possibilities, as they cannot use the distribution networks of the universal banks (SCA, 2018b). When it comes to consumers' activities in managing their savings, according to research by SCA (2018b), the majority of the customers that have a savings plan with the universal banks are less active in managing their portfolio and are less price sensitive.

4.4.4. FinTech development

There are several indicators of growth within the market of FinTech companies. The total number of FinTech companies in the greater Stockholm area of Sweden can be found in figure 4.5 below. The number of FinTech companies has increased from 52 in 2010 to 188 in 2017.



Figure 4.5: Accumulated number of established FinTech companies in greater Stockholm between 1983 and 2017 (Stockholm School of Economics, 2018)

Investments in FinTech companies in the greater Stockholm area have varied much between 2010 and 2017 (see figure 4.6). In 2010, 9 million euros were invested in FinTech companies, while one year later the same number was up at 131 million. In both 2012 and 2013, investments fell to 32 and 20 million euros respectively. In 2014, 193 million euros were invested, to back down at 135, 92 and 99 million euros for 2015, 2016 and 2017 respectively.

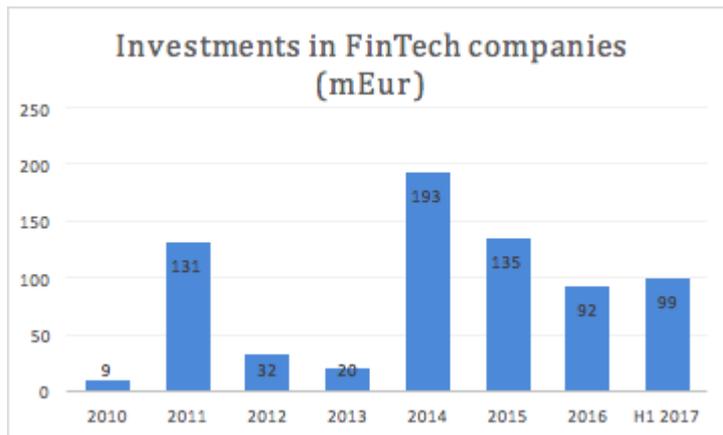


Figure 4.6: Sum of investments (mEur) made in FinTech companies per calendar year between 2010 and the first half of 2017 (Stockholm School of Economics, 2018)

The total operating revenue of FinTech companies in the greater Stockholm area has increased each year since 2008, with corresponds to a compound annual growth rate of 22,4 %.

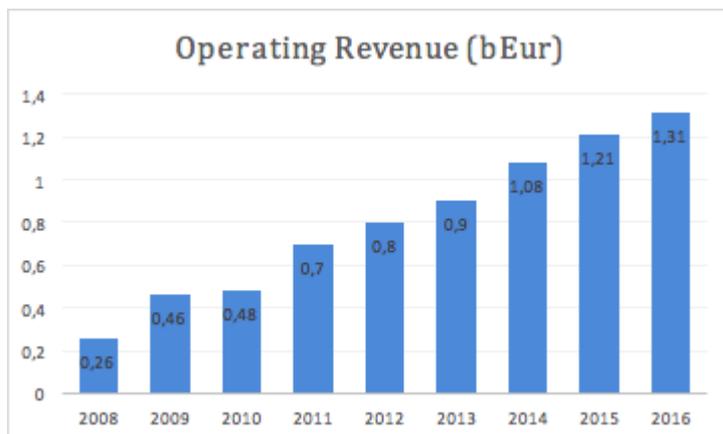


Figure 4.7: Total operating revenue (bEur) for FinTech companies in Stockholm per calendar year between 2008-2016 (Stockholm School of Economics, 2018).

As to explain the FinTech development further, three Swedish FinTech companies will be elaborated on. The companies also demonstrate how PSD2 enables new services to arise, while at the same time it shows how innovation can be inhibited by the few functions regulated by PSD2. The three companies respectively are offering services within lending, investment plans, and a completely new service that to a large extent is made possible as of PSD2 and open banking.

Sigmastocks is a Swedish FinTech company specialized in generating investment portfolios based on a user's demands. It takes a user's input on several parameters and paints up an investment plan. The company is collaborating with Nordea and Skandiabanken through selling their white-labeled service, meaning that in the bank's digital channels it is presented as if it is provided directly by the bank. There is no activity performed by the company directly linked to PSD2, instead it becomes evident that PSD2 has limitations on catering to all needs of FinTech firms. Sigmastocks cannot issue orders to purchase and/or sell stocks directly for

its customers, nor can they access the investment portfolios of their customers to optimize and monitor their current assets. They can only provide their recommendations as a list and assume that their users are following their advice. (Sigmastocks, 2019)

Lendify is another Swedish FinTech company that gained early growth in the market through creating a peer to peer lending service. Through risk modelling and operational efficiency, Lendify challenges the banks' lending operations by distributing funds from consumers looking to invest in loans, to consumers looking to loan money. In an interview with Lendify, the company mentions that they are creating bonds to access institutional funds in order to scale up their lending, and that these bonds still have a higher interest rate than the equivalent of the banks. However, over time they are observing that the approval of financial institutions increases, and interest rates are approaching those of banks' equivalent bonds. (Lendify, 2019)

The Swedish FinTech Minna Technologies serves as a good example of the kind that does not compete with banks' services. Minna technologies creates value to its users by giving them an aggregated platform to manage their subscriptions. On this platform, a full view over recurring costs as well as buttons to cancel their contracts and/or change to a cheaper or better service provider is possible. What makes the product possible, is the information that Minna technologies can access through a user's bank account. The companies let algorithms go through transaction history to identify what subscription services a user subscribes to. (Minna Technologies, 2019).

5. Analysis & Discussion

This chapter provides answers to the two research questions.

5.1. Implications of Path Dependency

The bank account and transaction services as centerpieces for retail banks have historically functioned as a base to provide additional services upon. With first-hand access to customers and their information, banks have been in an advantageous position to create risk models and provide financial services. Path dependency theory suggests that there may exist more optimized setups for different systems if undergoing development of the system is dependent on its previous state, and/or if the full costs of implementing a more optimized system is higher than the value for companies of doing so. Given the advantageous position of banks, they have had little incentive to expose financial services to innovation by sharing their account- and transaction services and access to customers to market participants. The strong position of banks has restricted innovation within the ecosystem, by limiting competition and innovative resources to those internal within banks. The historical path has thus led to a norm in the Swedish market of integrated banking with highly profitable incumbent actors. A radical change in a market, as exemplified by David (2000) through innovation or regulation, can lift

a system out of an inefficient path and generate a new and more optimized equilibrium. PSD2 is identified as a regulatory change that affects the path of banks bundling financial services together.

5.2. Open Banking from a Transaction Cost Perspective

Being a non-bank supplier of a financial service that relies on access to an account or transactions, came with high transaction costs prior to PSD2. Hypothetically, being able to utilize the services of a bank required the bank to create new ad hoc systems for external communication, and to form unique contracts with external companies to administer their collaboration. Apart from direct costs, a collaboration also brings risk to a highly risk mitigating industry, through the process of sharing customer data and services with external companies. Administration costs to internally innovate services utilizing bank's data and account- and transaction services, have evidently been lower than transaction costs of external development.

After banks comply with the requirements of PSD2, banks are forced to supply the market with these systems through open APIs. As an effect, very little contract writing is required for external parties to build products on top of their services. The effects of such change can best be understood through transaction cost economics. The development leads to a reduction in negotiation cost for FinTech companies to develop services reliant on access to bank infrastructure. The market of prospective external innovators is assured that banks will share critical functionality, and thus barriers to entry and barriers to "try" are lowered. In other words, the access for FinTech companies to use a bank's services, facilitate external innovation and unbundling of financial services.

By deploying APIs, several other effects can come to exist. One important effect is that by debundling services and having them communicating through APIs, services can be developed independently of each other. This sort of interoperability accelerates innovation, as each separate system can be developed independently from the systems it communicates with, based on demand, resources and technological development. Important to point out is through, that the role of PSD2 does not necessarily force a bank's every core function to go through a change toward modularity.

5.2.1. Tendencies toward banking as a platform

Given the characteristics of APIs and the modularity of systems, organizations can create business platforms where companies synthesize their core offerings to customers.

As brought up in chapter 4.4.2, some of the large Swedish banks are already communicating that they are pursuing a platform business approach. To understand the motives behind structuring as a platform, both the nature of PSD2 and the capabilities and limitations of FinTech companies and banks can be used.

As mentioned earlier, the cost for banks to integrate with FinTech companies were high prior to implementation of PSD2. Since PSD2 obligates banks to provide these integrations regardless, they are to be considered a sunk cost. Since integration is already in place, purchasing, or entering into collaborations with FinTech companies is thus subject to lower transaction costs than before.

Characteristics of FinTech companies are that they are entrepreneurial. Banks on the other hand have difficulties to perform high paced innovative activities and take substantial risk as their size and role in society requires them to remain stable. FinTechs are not under the same pressure, and are both able and demonstrably more prone to taking risks through challenging existing regulatory boundaries. FinTech firms also lack client databases and strong distribution channels, especially in comparison with the large banks. The business model of banking as a platform utilizes the strength and takes out the weaknesses of both parts of the market.

Broken down to its most elementary parts, banks' ways to compete are through lower interest rates on loans, lower provision fees, and better service and customer experience. The service offering can be enhanced by letting outside firms access your customer base. In return, banks can by incorporating external complementary services get either new revenue streams and/or additional functionality to the consumer, or services that partially compete with the core offering but where the value of increased customer value is perceived to be higher than the cannibalization.

Additionally, when banks organize themselves as platforms, they lower more types of transaction costs. These transaction costs are the ones between consumers and the platform. Search-costs are reduced for end users to find and to use FinTech services. Through selection and promotion of services, a platform bank functions as provider of trust that would not exist in an unbundled market. By doing so, the bank reduces the enforcement and negotiation costs between users and FinTech companies.

5.2.2. Dominant platform

One phenomenon that can occur when a market largely becomes dominated by platform business models, is that the market can generate a so called dominant platform. If a platform is subject to strong network effects, the value for users and developers on that platform will be increased by every new user and developer performing transactions on the platform. This creates a cumulative causation where the value of performing activities on the platform will be higher and higher, and thus acquiring more and more customers. It should however be mentioned that the norm is for multiple platforms to exist and compete within a market.

The network effects that can be directly identified within the banking industry in Sweden are multi-sided network effects. Regardless of how strong these are, since both multihoming costs and switching costs are low, the emergence of a dominant platform is not an obvious

development path. On the other hand, if an early mover manages to create a better offering through adopting a platform business model, low switching- and homing costs could mean that customers flow toward that platform. The value of the platform would not necessarily be strong thanks to its network effects, but rather because of the inherent advantages of platforms.

5.3. Does PSD2 threaten the survival of banks?

There is a discussion revolving whether or not retail banks are subject to disruption as of the transition toward open banking. In this chapter, trends that come with PSD2 that fulfil different requirements of disruption will be brought up. Further, regardless of whether or not the processes follow the definition of disruption, an analysis based on Tripsas' (1997) factors for incumbent survival are also used to determine the general survivability of the four large banks in the market change.

One criterion for a technology to be disruptive, is that its performance should be regarded as inferior by a majority of the customers. At the same time, the technology should perform better on one or several other measurements to cater a niche market. A large incumbent firm would rationally choose to ignore the new technology as the market potential is small in comparison to its current business. The new technology, often less profitable, would also compete versus a current offering. These criteria together make up a scenario where a company is likely to ignore a new technology that when developed further will outperform and outcompete the incumbent firm and its technologies. By studying the technologies behind the individual offerings that make up a bank's revenue, the direct content of PSD2, together with the criteria of disruption and how banks are acting, no cause of disruption can be identified for the full-scale service offering of universal banks as a direct consequence of PSD2. In Sweden, banks are investing in the transition, with strong incentives, and new structures as of PSD2 do not compete within banks' offerings, even in niche markets. PSD2 simply allows external companies to use some core functions of banks, giving them some of the same competitive means that banks have historically had exclusive access to.

Even though there is no direct disruptive effect as of PSD2, the current trend could challenge the incumbent banks' survival in the market regardless of whether or not it follows the criteria of disruption as brought up by Christensen (2015). An analysis based on the factors provided by Tripsas (1997) can be used to understand the ability for the incumbent banks to survive the change in the market. Tripsas (1997) brings up the three evaluation criteria complementary assets, investments in the new technology, and internal capabilities in the new market conditions, that will be elaborated on below.

The investment aspect of Tripsas' (1997) factors is proven by some of the incumbent banks in Sweden, who have demonstrated investments in the transition toward open banking. As the change in the industry comes as a result of a regulation, banks have been forced to invest in open banking. It is however evident that some banks have a more engaged stance to using open

banking as an opportunity to create better user experiences, for example through investing in FinTech companies to incorporate in the service offering.

Internal capabilities can be assessed by examining the core business of an incumbent bank, and comparing that to the scenario after PSD2. Lending and provision fees from services are what makes up a bank's income, both before and after. Capabilities surrounding those services are arguably therefore still the most important ones. However, PSD2 might increase the competition in the market in terms of customer experience, a trend already identified by the banks, and banks may not have the capabilities of single handedly developing their overall interfaces with customers. It shows that there are tendencies of new capabilities that banks might not fully possess, but the importance of these is not very subtle. At the same time, banks are investing in FinTech companies to cater to these needs, and there is no reason to assume that digital solutions and competencies cannot be acquired externally.

The strongest identified complementary assets of banks are its customer relationships, its trust, and its full-scale service offering. Trust is essential in the financial ecosystem, and is something that FinTech companies need time and resources to build. The customer relationships and distribution are complementary assets that give the banks an advantage against other companies in a market change. It can be assumed that it can permit banks to be slower in transitions, and even let banks pursue inefficient states in accordance with path dependency theory, and still maintain their customers as an effect of switching costs. The full-scale service offering gives banks another advantage, where the banks offer value to their customers by bundling services and distributing them through one surface. One more example of how the full-scale offering might benefit a bank can be seen in the case of the Swedish FinTech company Sigmastocks. Sigmastocks can currently only give recommendations of an investment plan for its customers, but not perform the transactions. Also, the company cannot access information about current stock holdings. An equivalent solution more extensively integrated with the bank's systems than required by PSD2 could both access information about current holdings, and initiate the transactions based on the recommendations provided by the investment plan algorithms. PSD2 does on the other hand make it easier for customers to use services from several providers at the same time, and thus access the best services independently. For example, in a website or mobile application, a bank A can display and access a user's account balance from a bank B, and directly use the money from bank B to purchase stocks for the user, ending up in an account with bank B. A user could then use bank A's investment platform, and bank B's account and credit card services. This is an example of how PSD2 unbundles financial services, which reduces their value as complementary assets.

The case is, through an analysis based on Tripsas' (1997) dimensions, that the banks are through all three of them likely to maintain strong positions. Probably the strongest one are the complementary asset dimensions of trust and customer relationships. The potential shortcomings of delivering user experience and competencies points further in the direction toward collaborations with FinTech companies. If now analyzing smaller banks and their complementary assets, it can be assumed that it will be more attractive for a FinTech company to collaborate with a bank that allows the FinTech company to reach out to many users. Given

that there exist costs for FinTech companies to establish collaborations; in a market of approximately 120 banks, this may lead to a prioritization and concentration in collaborations for the large banks. This development could potentially threaten the competitive abilities of the banks of a smaller scale.

5.3.1. One Potentially Disruptive Business Model

The four large banks in Sweden have direct access to a large number of customers, and an approximate 70% market share of total lending. The strong complementary assets of customer relationships and trust indicate that banks do not need to let competing services participate on their platforms. Allowing FinTech companies that provide services competing with banks' current offerings and core revenue streams, would be to give away market shares to external companies and expose banks to higher competition even within their own platform and user base. Doing so, however, would lead to increased competition and in turn likely lower margins on fees and interest rates, though thus better offerings to end-customers.

There is however one banking business model that would be able to expose each offering to competition. That is the business model of marketplace banking, that rebundles a complete set-up of disintegrated service offerings. The marketplace bank profits from each interaction on its platform instead of actual financial services. The platform would develop into promoting the best options for consumers, generating a high degree of competition. This would force providers to lower their margins and become operationally efficient. The business model has started to gain attention in other European countries. Two examples are Starling Bank in the UK and Fidor bank in Germany.

To clarify why this could be disruptive; if incumbent banks opened up all their verticals to competition through marketplace banking, they would have to encourage cannibalization on their own mortgages and provisions, to customers they already have access to. On top of that, a stand-alone marketplace banking platform would arguably be inferior in its early stages, where both trust and the value of the ecosystem would be undeveloped. If, on the other hand, a marketplace bank that subjects all services to competition progresses in a niche segment and expands to the mainstream market, it can be assumed that it would be able to deliver a higher value to the end customer than the incumbent banks. It is then unclear if incumbent banks would be able to afford losing their customers to a marketplace bank, where they would be forced to directly compete with separate services instead of its full-scale offering and customer lock-in effects. While PSD2 and its FinTech companies are not to be addressed as disruptive toward retail banks, the business model of marketplace banking does have the potential to become disruptive to retail banks in Sweden.

6. Conclusions

PSD2 forces banks to adopt open banking, through constructing APIs for communication with

external parties. This lowers transaction costs for conducting business between banks and FinTech companies, and thus facilitates external innovation on top of banks' services. APIs also give banks an opportunity to further reap benefits from lower transaction costs through adopting a platform business approach. Adopting a platform business model creates a win-win situation where banks can use FinTechs to provide more innovative and better offerings to their customers, and FinTechs gain from achieving instant scale-up and validity. However, while PSD2 lifts the path dependent system to a more optimized state, leading to more innovation in accordance with the communicated goals of PSD2 from the European Commission, this new state is still to a large extent controlled by banks. In other words, banks possess strong positions in the market to affect the outcome. Banks may leverage their strong positions to discriminate through only offering their own mortgages and investment products on their own platforms, in order to maintain what today makes up almost the entirety of their incomes.

Direct effects of PSD2 and open banking are not deemed to be disruptive in accordance with Christensen's framework. Also, an analysis based on Tripsas' (1997) factors show that incumbent banks have strong capabilities to sustain the market change. However, a marketplace banking platform that is exclusive from discrimination and makes investment products and mortgages subject to a high degree of competition within the platform, could provide a better value offering to its customers. Traditional banks might not be able to sustain if they themselves were to perform the transition toward a marketplace business model. That is, because it would cannibalize on its current business. The emergence and growth of such a platform could therefore potentially be disruptive.

6.1. Recommendations for Future Studies

A recommendation for future studies is to widen the analysis to include large tech companies such as Amazon, Google, Apple and Facebook and determine which role they could play in the future development of the financial ecosystem. More in-depth studies of FinTech companies and new and digital banks could also yield greater understanding of the market's development as of open banking. Further, case studies could be performed and compared with where other industries went through similar transitions, to better understand how, when and if markets eventually approach non-discriminating platforms. A follow-up research study could be conducted within a few years to analyze the outcome of the development processes followed in this research project.

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Appendixes

A - Annual reports of four large banks

Communication from the four large banks' about changes in the market and their initiatives in digitization and open banking. Translated from Swedish. Data retrieved from their annual reports if nothing else is stated. Specific terms searched for are "Open Banking", "Digital", "Platform", "Innovation", "FinTech", "Co-Creation"

A.1. Nordea

Source: Nordea (2019a)

Open Banking

Nordea writes the following about their open banking platform: "The development of Nordea's Open Banking platform goes on and is now active in Denmark, Sweden and Finland. Approximately 2 500 external developers take part of our digital ecosystem, where they carry forward ideas and solutions for our customers."

Nordea writes about initiatives regarding sustainable competitive abilities that they are engaging in "partner collaborations and co-creation under new market condition through our new Open Banking portal".

Digital development

"Customer behavior and demand pattern is quickly transformed, a development that we are meeting with digital innovations and our vision to supply products and services exceeding those historically provided by traditional banks."

"We meet new demands through using new technologies and showing the way through launching new innovative services by involving our corporate clients in the development work. We stay close to our customers and let them test new solutions and use their feedback in the development".

"The third important part [of our transition] is our digitization strategy, that has resulted in a large amount of new digital offerings to our customers. During 2016-2018, Nordea invested more than 200 million euro in digital solutions".

“Today’s revolution of the financial industry is the largest on many decades. We have brought to us ideas, worries and complaints from customers through special projects and from these developed Nordea to a better and more accessible bank with simpler services”.

A.2. Swedbank

Source: Swedbank (2019a)

Open Banking

“Read more about how we collaborate with different technical companies at <https://www.swedbank.com/openbanking/>”.

Digital Development

“Continuously innovative Swedbank has a strong innovation culture. We have throughout the years often been first with launching new digital solutions to our customers, who are more and more digital active. It is partly a result of the high it-maturity on the markets we are active on, but also a result of our large private customer base, our focus on everyday banking services and it-competence in the company’s leading positions as well as in the board. In Swedbank the IT-development is integrated with the business development. Together with our flexible it-platform we are fast in launching new solutions to our customers. Though, we realize that we cannot do everything by ourselves and therefore cooperate with different financial technology companies, like Meniga and Mina Tjänster, in several areas to continuously improve both our offering and our availability”.

“A strategy with the customer in focus: strengthening the digital experience through increasing the functionality in our digital channels, among other ways through aggregating account information from other financial providers and an increase in virtual assistance, we are securing a good customer experience”.

“The transformation continues; even if we have accomplished much under 2018 it is important that we keep our pace up because customers’ expectations on functionality, speed and accessibility especially in our digital channels becomes higher”.

“Continue our work with digitizing the mortgage process and launch a digital platform where our customers can get a complete overview over their financial situation, and proactively create more tailored solutions to our customers”.

“Digitization increases the competition and transparency within the banking market at the same time as banking offers and -products to a larger extent are standardized. The price of our services is therefore even more important. For a long term competitive power continuous work with cost efficiency and internal processes are needed - leading to investment opportunities in increased customer value. Having a high cost efficiency allows us to also continuously invest in our product- and channel development to make it easier to have competitive prices toward

our customers, in a time where transparency and choice for our customers is increased following the digitization.”

“Since our customers to a larger extent choose to meet us digitally, we keep adjusting the way we distribute our products and services”

A.3. SEB

Source: SEB (2019a)

Open Banking

“The new bank rules of open banking make it possible for a third party developer to build their customer applications around banks’ systems and data through using application programming interfaces (API). This development, summarized in the term open banking, brings both possibilities and challenges. The banks have large customer bases and large trust capital among its clients, which makes a collaboration with the new actors a large business opportunity. Banks with a good customer offering has also has the opportunity to use open banking to reach new customers. The rules of open banking differ between markets, which complicates solutions across borders. Within EU, PSD2 has been implemented and created a common ground.”

“Strategic initiative: Open Banking - developing the business together with external providers”

“New types of competitors and the development toward open banking and information sharing changes the playfield for banks. Apart from the strategic opportunities and challenges this brings, cyber- and information risks are increased as perpetrators get more technically sophisticated and exposure surfaces are widened”.

Digital Development

“Customers used digital meetings and apps more, and new functionalities were runningly implemented. In a time of fast change, we adapt to the customers increased need of more sophisticated services, more proactive advisory services and advanced digital solutions.”

“Our view on the banking business in the future is still built on an uncompromised customer centering and world class service, but will be based on real-time data and demand openness to the digital platforms our customers prefer, regardless of if they are in our own channels or in new financial ecosystems.”

“The purpose is to increase the productivity and increase productivity and improve cost efficiency, which becomes more and more important in a changing financial industry”.

“In pace with financial services becoming more integrated in our customers daily lives, we intend to profit of the more connected banking landscape through expanding SEB:s

distribution. Through partnerships and new technology, we can offer our products and services to customers outside of SEB, while at the same time identifying new sophisticated solutions from third party providers to integrated in SEB:s full-scale offering”.

“Our customer offering can be improved through digitization, automation and partnerships with external providers.”

“Strategy: widening the offering through offering external products to customers and increase SEB:s presence by providing products and services in the customers’ digital ecosystem.”

“The private customers want digital solutions simplifying everyday life. They want to feel seen and understood and expect tailored, personal advisory services both in digital channels and personal meetings.”

“Technological progresses, new rules and changed customer expectations drive the digitization within banking.”

“Agenda of management 2018: Discussion about strategic investments and collaborations with actors within fintech and digitization.”

“Payment services: 2018 was started by the implementation of PSD2, with the purpose to make banks information about customer accounts and banking services accessible externally. That means both possibilities and challenges regarding the current business models of banks, since banks and other companies - through standardized interfaces - will have access to each other’s customer information.”

A.4. Handelsbanken

Source: Handelsbanken (2019a)

Open Banking

“Innovative services:

Open Banking gives us the opportunity to develop new banking services. We believe that new technology generates increased openness and a better customer experience.” (Handelsbanken, 2019c)

Digital Development

“Accessibility and security in the IT-services of banks is a prerequisite for the business of the bank. The technological development and digitization of banking services mean that the importance of the area is increasing.”

“The survey also shows that Handelsbanken’s customers are considerably more loyal than other banks’ customers, and at the same time they give the bank’s digital services the highest

rating. That the digital customer experiences are perceived as good is important for long term strong customer relationships and contribute to the bank's continued strong position in customer satisfaction.”

Apart from the quotes above, Handelsbanken repeats mentioning their digital meetings with customers, several times.

B - Infrastructure owned by large Swedish banks

The information provided in appendix B is provided by Riksbanken (2013). Some of the major infrastructure in Sweden are: Swish, Postgirot, Bankgirot, BankID, Bankomat, SWIFT (– Society for Worldwide Interbank Financial Telecommunication).

- Bankgirot - payment system for retail payments
 - In Sweden, Bankgirot is the central actor for mediating retail transactions between banks. The Bankgirot is jointly owned by seven banks in Sweden and they run and develop the payment system of Bankgirot. The owners are: SEB, Swedbank, Handelsbanken, Nordea, Danske Bank, Länsförsäkringar Bank, and Skandiabanken. The Bankgirot facilitates specialization and standardization which gives economies of scale, economies of scope and network effects.
- Bankomat AB - cash withdrawals in an ATM
 - Responsible for cash withdrawals and deposits through ATMs. Bankomat AB is owned jointly by Danske Bank, Handelsbanken, Nordea, SEB and Swedbank.
- Swish - mobile payments
 - Swish is an application for mobile payments with real time clearing and settlement. Consumers can send money to other consumers in realtime and in some cases, use it to purchase goods from vendors. Swish is jointly owned by the six largest banks in Sweden, Danske Bank, Handelsbanken, Lansforsakringar Bank, Nordea, SEB and Swedbank (GetSwish AB, 2019).
- BankID - verification online
 - BankID is owned by “Finansiell ID-Teknik BID AB”, which in turn is owned by the major Swedish bank except Nordea. BankID is a e-ID equivalent to a passport, driver’s license or other physical papers for identification (Finansiell ID Teknik, 2019). Among 7 million Swedes utilize BankID and is hence ubiquitous in society.

Banks also clear payments through the system “RIX”.

- RIX - payment system for large payments
 - RIX is the payment system of Riksbanken for large payments between banks, clearing organizations, Riksgälden and Riksbanken. Participating institutes have accounts at Riksbanken. The role of RIX is to settle the payments of the customers of the banks.