

# IMPACT OF EXPECTED NETWORK EFFECTS ON THE CHOICE OF OPENNESS OF A FINANCIAL PLATFORM

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# IMPACT OF EXPECTED NETWORK EFFECTS ON THE CHOICE OF OPENNESS OF A FINANCIAL PLATFORM

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Faculty of Technology, Policy and Management

by

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## Executive summary

Financial institutions want to participate in the digitization services demanded by consumers. “*Banking-as-a-platform*” is an increasingly popular business model. By way of this business model, traditional banks and fintechs move from a fully controlled environment, with a full end-to-end product or service without external service suppliers, to an environment where consumers are directly connected to third parties. The role of a platform is to connect different user groups; users who offer products or services via the platform are called producers, and users in need of the services or products are described as consumers. The interaction between consumers and producers takes place on the platform. The rules, regulation and the infrastructure for the user interaction are provided by the platform. Regarding platform governance, different roles and responsibilities are identified. Often in initiating and managing a platform, a sponsor and a provider are distinguished; the sponsor being involved in financing and strategic choices, and the platform provider involved in operations and development.

“*Banking-as-a-platform*” model encourages the progress of innovative services and products, providing consumers with a larger diversity of products and services to select from. Due to the larger diversity of services and products offered on one marketplace they have become easy to compare. This allows consumers to select a traditional banking product like spending, saving and borrowing based on a wide variety of options.

An example of a financial platform is Raisin, a marketplace for savings and investment products. Raisin is the platform provider that facilitates interaction between consumers (users) and banks (producers) all over Europe. The platform offers consumers the opportunity to receive a higher interest on their savings account without having to change banks by connecting them to products offered by various European banks. Consumers compare different services and make a choice.

### **Network effects related to a platform**

Becoming a successful platform can be challenging. A key characteristic of a platform is its’ “network effects”, which can be explained as follows: in order to interest consumers in a platform you need sufficient products and services (producers) present. The value of a product or a service of a platform grows with the number of consumers that are active on the network. This in turn attracts more producers offering services and products on the platform, again increasing the value of the service for existing consumers. No side will join without the other. A platform business model can be designed such that network effects are stimulated.

### **Impact of openness**

Platform openness is addressed as a relevant design choice which could lead to increased network effects. Openness could have a positive impact by increasing adoption through consumer acceptance of the platform and thus exploiting network effects. A growing number of consumers will increase the value of the network (direct network effects), which will stimulate third parties to contribute new services and products to the platform, leading to more connected consumers (indirect-network effects). Openness can also have a negative impact on the platform; as it can lead to a decrease of switching costs for users. As a result, consumers might easily switch to other platforms. Therefore, the competition from other platform providers will increase, which could undermine

the profitability of the platform. The possible positive and negative impacts of openness should be identified before making a strategic decision on how open the platform should be.

### **Research gap and research question**

The research agenda of McIntre & Subramaniam (2017) addresses the need towards a more comprehensive view of design choices related to networks, platforms and strategy. Often network effects are mentioned as the most important reasons to introduce openness. It is unknown whether for platforms in banking, expected network effects have an impact on the choice for level of openness. It could be that network effects have an essential part herein, perhaps this is not the case, maybe there are also other factors that have impact. Therefore, this research will explore the impact of expected network effects on the choice of the platform to become more open, or not. The choice will be approached from the sponsor perspective and the provider perspective since these roles are both involved in strategic design choices on openness and related network effects. The main research question is formulated:

***What is the impact of expected network effects of a financial platform on the choices that platform sponsor and providers make regarding openness?***

**The purpose** of this research is to contribute to a structured overview of possible positive and negative impact of openness in the financial sector, and thereby contribute to the knowledge base. More specifically, the research provides insight into whether openness is included in their platform strategy and if expected network effects have impact on the choice of being open in this specific sector. The scope has been narrowed because the financial sector encompasses a large variety of services and institutions. This research focuses on the (sub) sector of traditional banks with the ambition to implement the “*banking-as-a-platform*”. The described area of the financial sector is labelled as the Purple Banks. One Purple Bank and one connected retail platform has been selected for this case study. The platform in this research is referred to as FinCo.

### **Research approach**

A case study method is used because this in dept research method allows for a deeper understanding of underlying mechanisms. To give direction to the possible impact of openness in the case study, a frame of reference indicating possible impact of platform openness is needed. In this research a theoretical framework is constructed. The theoretical framework provides an overview of possible positive and negative impacts. The theoretical framework is not suitable for immediate use, it is too generic. Therefore, it is made specific by adding 7 propositions on the financial domain resulting in a *theoretical framework specified on the domain*.

The *theoretical framework specified on the domain* is used as a frame of reference to identify possible positive and negative impacts of openness. Semi-structured interviews are used to gather data on the possible positive and negative impacts of openness identified by the sponsor and provider of a platform in the financial sector. The result is a framework with only relevant propositions for the specific case study, referred to as *overview of factors found in the case study*.

### **Results and answer to the main research question**

The results of the case study show that the Purple Bank and FinCo have a different vision. From Purple Banks' perspective, the impact of expected network effects on the choice of openness of a financial platform is substantial but limited and conditional to manage quite some issues. For example, one of the identified dilemmas is: making the platform too open may result in consumers losing trust in quality of services. From the perspective of FinCo, there is no impact of expected network effects on the choice of a financial platform because openness is not considered as a relevant design choice.

Besides, this different view on openness, there are also shared insights found. The Purple Banks and FinTech's exist around the regulatory frameworks limiting the options to be fully open. Besides, there is a lack of technical industry standards limiting seamless compatibility and cooperation between partners in the sector. At last, the possible negative impact of openness versus low switching costs for consumers and their platform loyalty.

The answer to the main research question: the sponsor role recognizes the importance of openness to achieve network effects (and other benefits). In practice, the expected negative effects of being open are dominant and choices in developing the platform are driven by delivering added value for the consumers. Sponsor and provider agree on this approach. Apart from the generic negative aspects for a platform of being open, the financial (sub)sector of Purple Banks faces regulatory limitations on national and international level. Also, the risk of cannibalization is regularly mentioned as a risk in the current market of Purple Banks. These specific downsides could be applicable to other (sub)sectors of the financial sector.

### **Contribution existing knowledge**

The research contributes to existing knowledge of the Purple Banks, fintech's and science in multiple ways. Firstly, the case study shows that openness is addressed in the strategy of the purple bank as an important strategic design choice. This research identified insight into the possible positive and negative impacts of openness and related dilemmas. This can be helpful for the Purple Bank but also for other banks in the sector. Secondly, from the case study is learned that introducing openness requires a mindset change of employees. This research could contribute to the mindset of employees by addressing the need to become open. The consequences of becoming open too late could result in a situation that the Purple Bank becomes a producer to other platforms and thereby lose direct customer contact. This is not a desired situation for a Purple Bank. Thirdly, the research provides insight into sector dynamics related to platform development in the financial sector. For the fintech the practical value of the research is learning how to cooperate with a sponsor acting from a different perspective. Furthermore, the insights on platform openness could be a source of inspiration when formulating strategy in the future.



The study adds to existing scientific knowledge by giving information on the knowledge gap, identified by the research agenda of McIntre & Subramaniam (2017). Furthermore, the constructed theoretical framework has proven to be useful when exploring possible impacts of openness of a platform in the case study. The framework can be a starting point for new researchers as a frame of reference, as demonstrated in this research, as a beginning for new theory forming.

### **Managerial implications**

There are several managerial implications for the Purple Bank. First, management of the Purple Bank should add information to their platform playbook. The impact of openness of a platform should be elaborated into more detail. It would be helpful to give an impression of positive and negative effects of openness and introduce the difference between short- and long-term impact that openness can have on the platform's development. This information would be helpful for platform developers when considering openness as a strategic design choice. This research can be used as an information source. Second, currently there is a barrier for platform providers to operationalise openness. Therefore, it is recommended to the management of the Purple Bank to invest time and money in the translation of theory to operationalizing openness on a financial platform. If it is possible, it would be valuable to combine this with the possible positive and negative outcomes. Third, it is recommended to the management to research in which phase platform openness is relevant. With phase is referred to for example the beginning of the development phase or in a more mature phase. This research provided insight into the possible impacts, this can be used as a starting point. Fourth, given the difference in perspective between the sponsor and provider role, it is recommended that managers of the Purple Bank communicate better on this topic. A suggestion is to include FinCo in the platform strategy. The Purple Bank would learn from the practical insights.

For FinCo specific, it is recommended to research the positive impact of openness. Currently only the negative impacts are experienced by the company. It would be valuable to consider the in the long-term implications of openness. When FinCo is well informed on both the positive and negative impact they can make a conscious decision to be open or not. To increase the practical value of the research results, it is recommended to validate the overview of positive and negative effects of openness on a financial sector,

### **Recommendations for further research**

Several recommendations for further research have been found. First, it would be interesting to include more fintech's in the research to be able validate the framework from that perspective. Secondly, a strong value proposition is addressed as a key to success. Future research can show what makes a value proposition strong and how it can be developed. Third, more research could go into the understanding the underlying mechanisms related to trust, monetization and commoditized to overcome those possible negative effects of openness and be able to become more open. Fourth, an interesting field of research would be to deeper understand the tipping point and relevance of openness in the strategy.

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## Preface

Dear reader,

The thesis you are reading is titled: " Impact of expected network effects on the choice of openness of a financial platform". The thesis is written as a graduation project for the master Complex System Engineering and Management (CoSEM) and as a part of the graduation internship at a company. I have been conducting the research and writing the thesis since the kickoff on April 11th 2019 and it is going to be defended on the 10th of January 2020.

In cooperation with Mark de Reuver and Ellen Hennekens I have formulated the main question and corresponding sub-questions. By using a qualitative research method, I was able to answer the formulated sub-question leading to the answer of the main question.

I would like to thank all my supervisors for their support throughout the thesis. Firstly, Mark de Reuver and Rolf Künneke for being my academic supervisors. You were always prepared to give feedback at any time. The meetings were useful, especially to see the research from a different perspective. This helped to structure the thesis and improve the research step by step. Second, I would like to thank Ellen Hennekens for providing feedback on the thesis and for guidance during the process. You helped me to keep the process up to speed and pushed me to focus on certain elements. I would also like to thank my colleagues at the department for the great cooperation and support.

Furthermore, I would like to thank all respondents who participated in the research. Their knowledge and expertise have been of great value. Without their cooperation, conducting the research would have been impossible.

Lastly, I would like to thank my friends and family for supporting me. It has not always been easy and their motivational words helped me to remain positive. They have been very patient with me and always gave me confidence and trust that it would work out.

Enjoy reading!

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## 1. Introduction

Traditional banking is changing. With the use of IT solutions, financial institutions are able to offer personalised services to consumers and increase the efficiency of business processes. Also, new IT-based companies (fintech) emerge for example Adyen, enabling consumers and businesses to conduct online payments worldwide. Innovative technologies, referred to as fintech's, shift customer behaviour and regulatory frameworks and thereby drive banks to focus on new fields (ABN AMRO-beyond banking 2019, n. D) (Brummer and Gorfine, 2014).

Until a couple of years ago, blockchain, platforms and lean start-ups were hot topics only within tech companies, whereas today these innovations are considered business as usual and form an integral part of any bank's corporate strategy (ABN AMRO-beyond banking 2019, n. D). The "Global Fintech Report 2017" (PWC) shows that 77 percent of financial institutions want to invest more in innovation (PWC, 2017). Although, nobody knows exactly where it will go, one thing is evident: the future of banking will not be a matter for banks alone anymore as other sectors also start to offer financial services. For example AliPay related to Alibaba a Chinese web shop (AliPay, 2019). All banks are discovering what will happen when different parties come together and set the next steps, which is typically referred to in the industry as *Beyond Banking* (ING, n.d.).

An increasingly popular strategic example of *Beyond Banking* is the "*banking-as-a-platform*" model. This movement means that traditional banks and fintechs move from a full controlled and dedicated technological environment with a full end-to-end product or service without external service suppliers, to an environment where consumers are connected to third parties and build additional products and services to the core consumer propositions of traditional banking (PWC, 2017) (ABN AMRO-beyond banking 2019, n. D). An illustration of a successful financial platform is Raisin. Raisin offers consumers the opportunity to receive a higher interest on their savings account without having to change banks by connecting its consumers to products offered by various European banks. In other words: Raisin is a marketplace for savings and investment products. It is attractive to consumers in a time when savings rates are low in certain countries and higher in other European countries.

A "*banking-as-a-platform*" model like Raisin has the advantage that consumers are offered with a larger assortment of services and products, resulting in increased options to choose from. More options are or will be launched permitting consumers to make better-informed and more efficient choices regarding traditional banking products like spending, saving and borrowing. Raisin has grown rapidly in amount of users, besides, direct competitors have developed such as Deposit Solutions and Savedo (Rooijers, 2019). From these observations can be learned that consumers have welcomed platform-based fintech such as Raisin. This can be explained as the platforms ensure lower costs and improved services, in addition to the ease of use by offering connectivity through mobile devices. This has also given rise to the consumers expectations that other products and services will be offered with the same user friendliness.

Besides technology, there are also regulatory changes within the European Union enabling new service providers to enter the financial sector. This movement is referred to as *open banking*. The PSD2 legislation is part of the open banking movement. Through the PSD2, banks are obligated to distribute customer-data with other parties, when a customer requests this and gives permission (or another financial institution). This customer data is exchanged by using APIs which are technical standards to exchange data. If a customer gives permission, this third party will



have access to the customer's account(s) at their bank(s). If consumers do not give permission, nothing will change (De Nederlandsche bank, 2019). With PSD2, providers of new payment and information services are entering the financial market. All these parties must have a license from DNB or another European Union regulator. PSD2 enables consumers to start using new online payment services and more.

### 1.1 Raisin, example of a financial platform

In the introduction, the financial platform Raisin is briefly mentioned as an example. In this paragraph Raisin is further elaborated to illustrate mechanisms of a banking-as-a-platform model.

**How does the financial platform Raisin work?** Consumers' can invest their savings in deposits through the Raisin platform to a bank with the highest interest rate. Raisin works with 82 partner-banks in over 30 EU countries who are part of the European Economic Area (EEA) (Raisin, 2019). This international agreement enables the expansion of the European Union on its own market to non-European markets. The agreement stimulates international trade of the members in all kinds of goods, including the financial goods and services (Rijksoverheid, 2019). Therefore, consumers' savings are protected by national deposit guarantee schemes of up to € 100.000 per client.

There are two user groups identified on the platform; the consumers and the producers. The producers in this case are the bank partners of the platform, as they offer services on the platform. The advantage for consumers is having the option for a higher interest rate at another bank without the hassle of opening a new account. For the bank partners, it is attractive to receive additional financing from other consumers than their original customer base.

Raisin illustrates the possibilities of the open banking movement. The platform is developed as a reaction on new European regulation, it uses the PSD2 legislation. Therefore, the platform has access to financial consumer data (Raisin, 2019).

**How has Raisin developed?** Since the launch of Raisin in 2013, more than 175,000 consumers from more than 30 European countries have deposited more than € 13 billion in savings at more than 80 partner banks through Raisin (Raisin, 2019). The fintech is consistently in the top 5 of the prestigious Fintech50 and is supported by well-known US and European investors including PayPal, Orange Digital Ventures, Index Ventures, Thrive Capital and Ribbit Capital with a total investment of 170 million euros.

### 1.2 Platform characteristics

#### Platform and involved parties

The definition of a platform used in this research is: *an infrastructure that enables people, businesses and organizations to communicate with each other and trade value* (McIntyre and Srinivasan, 2017) (Eisenmann, Parker and van Alstyne, 2006) (Gawer, 2011). In this infrastructure is narrowed down to an IT and internet based infrastructure. Unlike traditional business models, platforms do not necessarily own services or products. The role of the platform is to connect **different user groups**. Users needing these services are referred to as consumers and

users who offer products or services are called producers. The action between users and producers takes place on the platform (Gawer, 2011). The platform provides rules, regulation and the infrastructure for those actions to occur (McIntyre and Srinivasan, 2017) (Eisenmann, Parker and van Alstyne, 2006). Often in initiating and managing a platform, a **sponsor and a provider** are distinguished; the sponsor being involved in financing and strategic choices, and the platform provider involved in operations and development.

Platforms have the ability to explore markets and adopt innovation, by creating new services, causes a disruptive effect on sectors (Baldwin and Woodard, 2009: 19). Platforms bring about a whole new way of thinking that disrupts their respective industries. Platforms are scalable, open and borderless.

Take the example of Raisin. The earlier mentioned investors of Raisins, such as Index Ventures and Orange Digital Ventures are sponsors. The platform provider is Raisin, which connects European consumers to European banks that offer deposit products. The platform consists of two user sides, one side are the end consumers on the platform and on the other side are the European banks which are the producers on this platform. The platform removes practical barriers for consumers, by enabling the customer to switch saving products without having to change bank accounts. The consumers have wide range of options to select the best interest rate from all over Europe. European banks will join the platform as they can increase their customer base and receive additional financing. This brings a new dimension to the deposit market.

### **Platform and network externalities**

The earlier mentioned characteristics of a platform being scalable, open and borderless can be illustrated by an international successful example outside the financial sector, namely Uber. The platform connects also two sides, one side are consumers of a ride, on the other side are the drivers which are the producers on the platform. The platform makes taxi services easy accessible for consumers, transparent and in general lower priced. Everyone uses the platform in the same way. It does not matter whether it is used in Amsterdam, New York or Budapest. The platform model is so simple and standard that it can grow with limited additional investment.

According to the studies of Thies, Wessels & Benlian, 2018 and Kim, Prince and Qiu 2014 network effects can be a stimulator of growth. A platform can experience two sorts of network effects being direct and indirect. Direct network effect is the added value to the platform of one extra user joining the platform. This could be a consumer or a producer. Indirect network effects arise when a growing number of users on one side of the platform (for instance producers) increase the value to the other side (being the consumers in this example).

The example of Raisin is used to explain the direct and indirect further. Raisin experiences direct network effects when more consumers join the platform attracted by good references or good services. Indirect network effects arise when more consumers join Raisin, leading to banks all over Europe more willing to join the platform. It also works the other way around. Because Raisin offers a large variety of saving and investment products, consumers will be attracted to the platform.

Platforms aim to create favourable conditions to stimulate both direct and indirect network effects in order to grow as a business (Rochet and Tirole, 2003; Benlian, Hilbert & Hess., 2015;). To determine where this mechanism starts is hard. No side will join without the other (Parker and Van Alstyne, 2005; Ondrus, Gannamaneni & Lyytinen.,

2015). Overcoming this dilemma with a successful outcome is challenging (Hagiu and Wright, 2014) (De Roos, 2018). In practice, every year numerous costly failures are observed (Ondrus, Gannamaneni and Lyytinen, 2015) (Eisenmann, Parker and Van Alstyne, 2009).

Therefore, financial institutions should carefully consider strategic choices on platform design. Literature illustrates specific characteristics of platform design that would increase the impact of network effects and therefore lead to successful outcomes.

### 1.3 Platform openness

Design strategies to enhance competitive outcomes are addressed in the literature review of McIntre and Subramaniam published in 2017. It is concluded that the platform design could affect the attractiveness of complementary services and products and thereby achieve a competitive advantage (Venkatraman and lee, 2004). Hereby, **openness** is addressed as a relevant design choice which could lead to increased network effects (Faber and De Reuver, 2019). Determining the optimal level of openness is essential to create and maintain a platform from a business perspective (West, 2003) (Eisenmann et al., 2009)(Parker & Van Alstyne, 2005)(Boudreau, 2010)(Gawer & Cusumano, 2002;). The platform of Raisin is open towards consumers, there are no entry barriers. On the producer side, the platform is selective on their partners. Therefore, openness is limited on that side of the platform.

Deciding to what extend a platform should be open, can be a challenging dilemma because openness has possible positive and negative impacts. Two examples follow hereunder to illustrate the complexity (West, 2003).

Openness could have a positive impact by increasing adoption through consumer acceptance of the platform and thus exploiting network effects. A growing number of consumers will increase the value of the network (direct network effects), which will stimulate producers to contribute innovative services and products to the platform, leading to more connected consumers (indirect-network effects).

Openness can have also a negative impact on the platform; as it can result in a decrease of switching costs for users; As a result, consumers might easily switch to other platforms (Gebregiorgis and Altmann, 2015). Therefore, the competition from other platform providers will increase, which could undermine the profitability of the platform (Eisenmann et al., 2009).

The decision to become open involves careful consideration by both sponsor and provider role. When determining a policy to govern openness, the positive and negative impacts of openness should be studied into more detail. From platform literature is learned the concepts of openness and network effects are very important, but they have not yet been researched in open banking. It is specifically interesting as the financial sector is originally rather a closed sector due to the regulation. There is a lot of regulation in this sector because financial data is very privacy sensitive, therefore it needs to be protected. This made it hard for new participants to enter the market. Now that both technology and legislation enable the sector to change and the first initiatives of the open banking movement like Raisin are successful, makes platform openness and network effects an interesting topic.

## 1.4 Research gap and research question

The research agenda of McIntre & Subramaniam (2017) addresses the need towards a more comprehensive view of design choices related to networks, platforms and strategy. Openness is addressed by this research agenda to be an interesting strategic design choice potentially leading to enhancement of network effects of a platform (Faber and De Reuver, 2019). Some literature studies address decision models to design the optimal degree of openness of a platform. However, those models are either sector specific and/or address the need for further research (Wessels, Thies and Benlian, 2017)(Ondrus et al., 2015).

Openness is considered to be a design choice having both positive and negative impact on platform development. Often, the most important justifications to introduce openness is the impact of expected network effects. It is unknown if platforms in banking are designed to be more open or closed. It could be that network effects have an crucial position in the decision making, perhaps not, maybe there are also other factors that have impact. Therefore, this research will explore the impact of expected network effects on the choice of the platform to become more open. The choice will be approached from the sponsor perspective and the provider perspective since these roles are both involved in strategic design choices on openness and related network effects.

Taken all considerations in account, the following main research question is formulated:

***What is the impact of expected network effects of a financial platform on the choices that platform sponsor and providers make regarding openness?***

This research aims to contribute to a structured overview of possible positive and negative impact of openness on network effects in the financial sector, and thereby contribute to the knowledge base. More specifically, the research provides insight into whether openness is included in the platform strategy and if expected network effects have impact on the choice of being open in this specific sector. From earlier literature it is clear that context factors of a specific sector have significant influence on the design of a platform. It is to be expected that in the financial sector, for instance regulation has impact on the choice of openness. As the financial sector encompasses a large variety of services and institutions, this research focuses on the (sub) sector of traditional banks with the ambition to implement the banking as a platform model. For practical reasons this research refers to this (sub) sector as "Purple Banks".

## 1.5 Corresponding sub-questions

To answer the main research question, there are three sub-questions formulated. More information regarding the chosen rationale will be provided in Chapter 5.

1. ***What is the impact of openness on network effects of a platform identified in literature?***

This sub-question will provide insight into identified possible positive and negative effects of openness on network effects of a platform. A desk research will be conducted to identify available studies on these topics. These will be structured and presented in a generic *theoretical framework*, presented in chapter 3.

## 2. *How is the impact of openness on the network effects to be expected on the specific domain of finance?*

This sub-question will provide insight into the dynamics of the (sub) sector of the financial sector. A desk research is conducted to identify possible positive and negative effects of openness, network effects being one of them. These specific dynamics are included into the theoretical framework. Thereby, the theoretical framework becomes a *theoretical framework specified on the domain*, presented in chapter 4.

## 3. *Do expected network effect have impact on the decision of a platform provider of sponsor to become open on a financial platform?*

This sub-question will provide insight into platform openness from a sponsor perspective and provider perspective. From this can be learned to what extend openness is considered as a relevant choice. Is there a difference between those perspectives? This sub-question will be answered in chapter 5.

## 1.6 Research method, approach and relevancy

### Chosen method

The financial sector offers a great opportunity for this research topic by means of a **case study** method. It offers the option to gain specific insights into the (sub) sector of Purple Banks from different perspectives being the Fintech (platform provider) role and a Purple Bank (platform sponsor) role. Through legislation such as PSD2, financial institutions aim to incorporate innovation and introduce the banking-as-a-platform model. Therefore, it is expected that this research is relevant for the financial institutions themselves and there will be a willingness in general to contribute to a case study approach by means of semi-structured interviews. Outcomes will give insight into the possible positive and negative impact of openness on financial sector from the perspective of the sponsor and provider role.

More specifically: a **single-case** study method is selected. Firstly, this research offers the opportunity to investigate a research field with very little public data. This is probably because it was previously less opportune for scientific research: “banking as a platform” is a relatively recent development and the financial sector has very specific characteristics influencing choices in platform development. Secondly, this method allows an in-depth research allowing a deeper understanding of the underlying sector specific mechanisms leading to choices on platform openness and related network effects. Thirdly, a single-case study offers the possibility to deal with unique cases even within the financial sector. The openness decisions are currently expected to be very context dependent, which is why large samples of comparable situations are not available. This also makes quantitative research not realistic. Fourthly, the case study can help to revise or add to existing ideas from previous research conducted in

other sectors and to produce new hypotheses that will be carried out with further research (Yin, 2017). In short, the case includes many variables, and interactions between them which is a reason to conduct a case study.

This case study will include:

- Interviews with sponsor to provide insight into strategic considerations from sponsor perspective
- Interviews with provider to provide insight into strategic considerations from sponsor perspective
- Review of internal documents as a reference and to support interview findings.

### **Relevance of the research**

Insights learned from the case study are valuable for the banking sector because the banking as a platform model is becoming increasingly popular in the financial segment worldwide. Findings of this study can be of value with current developments, as confirmation of known mechanisms, or offer additional insights. This research can offer guidance on decisions on the level of openness of a platform, can help the market to oversee the opportunities and possible negative effects of openness and thereby enhance decision making. For a university, it is a valuable research topic because multiple research agendas address the need for more research on network effects and openness of platforms. Furthermore, research on success factors of platforms are widely researched in all type of sectors, although not yet for the financial sector (research gap, Chapter 1.3). This research tests if those mechanisms are valid in the financial sector. The outcome can help other researchers to find more specifics or go into more detail as the sector dynamics become clear from this research.

The applied research method also contains limitations. First, a restricted group of applicants can be interviewed in the conducted single-case study, as relevant knowledge on and experience with drivers of platform development is required. Second, due to restricted timelines, not all impacts could be researched: only a limited number of pros and cons are considered. Third, as it is an anonymous study, there is a limitation to the level of detail that can be provided. Interviews are anonymously processed, and the documents are abstracted. During the research it is addressed how those limitations are minimized.

## **1.7 Structure of the research**

In Chapter 2, a desk research is conducted to define relevant concepts related to this research. Chapter 3 starts with the construction of the framework to structure the literature study. In this chapter is a theoretical framework is presented, it provides an overview of possible positive and negative impacts of openness. Research sub-question 1 is answered in this chapter. In Chapter 4, a study into the sector characteristics is conducted. With this, sub-question 2 is answered. Chapter 5 explains how the case study method is executed in this research. The results are shown in Chapter 6, the discussion and limitations of the research are presented in Chapter 7. The conclusions are presented in Chapter 8, in which the main research question is answered.

## 2. Theory

The previous chapter introduces the research and presents the main- and sub-research questions. The first paragraph (2.1) will elaborate on the platform roles as the main research question includes the sponsor and provider role. The second paragraph (2.2), presents the definition of openness used in the purpose of this research. The last paragraph (2.3), discusses the definition and relevance of network externalities for a platform.

### 2.1 Platform roles identified by Eisenmann

The role of the platform, described in the previous chapter, is to connect users and producers, interaction between those takes place on the platform (Gawer, 2011) (Eisenmann, Parker and van Alstyne, 2006) (McIntyre and Srinivasan, 2017).

Eisenmann describes that openness of a platform can be introduced on selective elements of a platform. For example, a platform can be open only to consumers or only to producers or to both, which has different impact on the platform.

To manage openness on the platform and to determine the right strategy regarding openness, it is vital to identify the diverse sorts of openness and their impact on the platform. Therefore, Eisenmann identified four roles on the platform, together they form the platform mediated network (Eisenmann et. al., 2009).

#### Description of the four roles

Eisenmann (2009) identified four roles that together form a platform mediated network. A visualisation is presented in figure 1, the numbers in the figure correspond to numbers in the text.

The demand-side users (1) are the end users of the platform, being individual consumers. The supply-side users (2) are users, individuals or third parties, who contribute to the platform by offering products to the end-users. This research referred to this role as producers. The central point of contact for both types of users (1) and (2) is the platform provider role (3). The platform provider determines rules and regulations within the network. The last role, platform sponsor (4), often controls the development of the platform and owns the property rights.

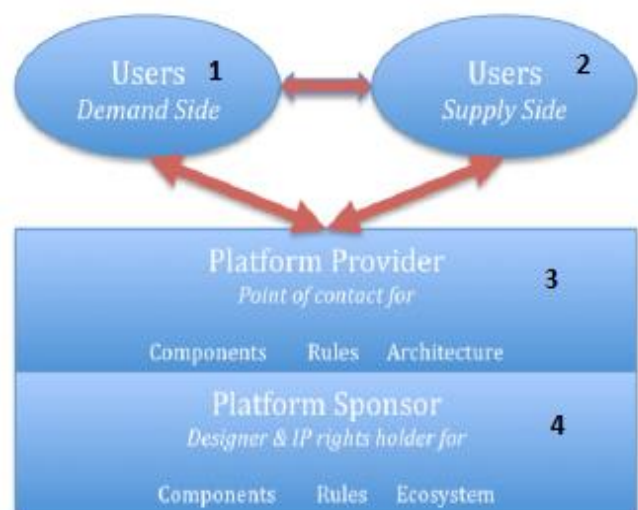


Figure 1 Visualization of roles identified by Eisenmann

The described roles identify groups of users and indicate their tasks and responsibilities. It is important to realize that the exact tasks and responsibilities of the roles can be different for each platform. When conducting a research

using the platform roles of Eisenmann, it is important to define the tasks and responsibilities for each role in the beginning of the research. From this, the relation between the roles becomes clear. It is valuable for the research to understand the relation between platform roles on that specific platform.

In the example of Raisin the following roles are identified: The *user demand side (1)* are the consumers of the platform. The *user supply side (2)* are the European banks who offer savings products. The *platform provider (3)* is Raisin itself, they facilitate interaction between the two identified user groups. Raisin has a licence and determines the rules on the platform e.g. bank partner must be part of the EEA. The last role is the *sponsor role (4)*, in the case of Raisin the sponsor role consists of divers investors of the platform, having low influence on the platform provider.

These different identified roles result in a wide range of possible strategies for managing openness. According to Eisenmann, the extent to which a platform is open, is in particular strong-minded by the amount of desired involvement on selective parts of the platform (Eisenman et al, 2000).

### **Eisenmanns roles in this research**

The Eisenmann framework is used as a structure throughout the research to be able to refer to specific parts of a platform. The *user supply side* and *user demand side* are re-named for practical purposes, in practise those sides of the platform are named differently. The user supply side is referred to as *producers* and the demand side is referred to as *consumer*. The labels of the roles used in this research are presented in the list below, numbers are corresponding to the numbers used in figure 1.

- |                      |             |
|----------------------|-------------|
| 1. Users demand side | = consumers |
| 2. Users supply side | = producers |
| 3. Platform provider | = provider  |
| 4. Platform sponsor  | = sponsor   |

## **2.2 Definition of platform openness**

Platform openness has been studied from an early moment on in all literature streams (Gawer & Cusumano 2002; West 2003; Eisenmann, Parker & Van Alstyne 2009). Defining openness is not easy, for instance, the technical approach of openness on digital platforms is defined by Tiwana, Konsynski and Bush (2010) indicating the extensible code base to which complementary modules can be added. On the other hand, openness is often approached as: to which extent producers have entree the properties of a platform without restrictions (West 2003). Besides, the approach of openness, it also appeared that because openness is not always specifically defined, the terms are used differently. For example, researchers use the term access openness and refer to technical openness others refer to the governance of the openness. Besides, the context in which openness is mentioned is of importance to get a better understanding. To be clear on the concept of platform openness used in the purpose of this research, this paragraph defines openness based on previous studies.



### 2.2.1 Openness definitions found in literature

Platform openness is researched from diverse perspectives (Gawer & Cusumano 2002; West 2003; Eisenmann, Parker & Van Alstyne 2009). At first, there were two dominant theoretical approaches: the economic theory and engineering design. Each approach developed separately and formulated platforms differently (De Reuver, Sørensen & Basole 2018). The economic perspective conceptualized platforms as markets with two distinct sides of users (Rochet and Tirole, 2003). The engineering view conceptualized a platform as technological architectures (Baldwin and Woodard, 2009). Recently, more literature perspectives have been distinguished, like strategic management (McIntyre & Srinivasan 2017; Constantinides, Henfridsson & Parker 2018), technology management (McIntyre & Srinivasan 2017), innovation management (De Reuver, Sørensen & Basole 2018) and information systems (Constantinides et al 2018; De Reuver et al 2018).

From this can be learned that defining openness is hard. For example the study of Tiwana, Konsynksi and Bush (2010). This has several causes. First of all, the concept is used while referring to different meanings. Access openness is an example of this. Some researchers mean by this the management of openness on a platform, such as which parties have access to the platform. Other researchers use openness access to refer to technical accessibility. Secondly, openness of a platform is highly context dependent.

Openness of a platform can determine limitations and restrictions for partners to contribute the platform. This is how Eisenman et al., (2009) and Boudreau (2010) approached platform openness. A distinction is made between granting access or relinquishing control. The approach of granting access permits others, such as producers, to contribute to the platform and create new services and products. Many studies use this approach to refer to the platforms 'accessibility (Gawer, 2014). For example study of Gawer (2014) approached openness into the extend that platform provider made the interface available to other platform providers or service producers. This could contribute to the compatibility of platforms. It could also lead to interaction between producers and create new services. In this line of thinking the studies of Ghazawneh and Henfridsson (2013) illustrates the stimulating the creation of new services could be done by making resources available to producers. Openness defined as accessibility and transparency of the platform are researched by Benlian et al. (2015).

The approach of relinquishing control is used to divide responsibilities and decisions related to the technological architecture. The platform architecture is not available to other producers or platform providers (Boudreau, 2010). The platform provider wants to remain control on the development and goals of the platform, thereby the platform can influence the other involved roles (Goldbach and Benlian, 2015). The platform could make use of technological standards to stimulate producers (Boudreau, 2012). Or devolve control over all roles of the platform. The platform provider remains suitable and reasonable restriction should be in formulated (Eisenmann et al 2009).

Next to the two dimensions granting access and relinquishing control other sources (Stefi, Berger & Hess, 2014) approach openness from a strategic perspective connected with market and commercial positioning, balancing the potential network effects with Possible negative impact of openness like cannibalisation by third parties, low switching barriers of third parties and consumers. Trade-offs like these lead to governance rules of the platform and its ecosystem and technical options.

### 2.2.2 Used definition of openness

This research will approach openness as a strategic choice, for instance on the producer or consumer side, which can lead to choices regarding technical openness and governance rules for the platform and its ecosystem. Three dimensions of openness are identified (figure 2). It can be expected that foremost the sponsor and/or provider role are involved in making these choices.

*Strategic openness:* This level refers to openness as a strategic choice, for instance based on a vision and/or policies taking into account the characteristics of the specific sector and the related “pro’s and con’s” of openness. This could lead for instance to strategic choices regarding what type of services of producers the platform and its ecosystem are open.

*Technical openness:* This level refers to choices on the technical dimension, and addresses issues like what level of technical openness is desired, what standards can/will be used. On one hand is it hard to integrate producers in terms of complexity and investments, on the other hand Seamless partnering is an important feature to make the platform attractive to partners.

*Governance openness:* This level refers to the rules of the game. How to manage the onboarding of new producers or platform providers and management of existing platform. For example implement a review system for users and producers to review each other. This enforces good behaviour on a platform. Governance could also be related to simple restrictions to join the platform as a producer or consumer. Think of minimum age for example.

It is assumed that the platform sponsor and/or provide role are involved in determining the level of openness on the indicated levels. These roles are important to consider for empirical studies. They make the trade off and consider the perceived impact on the other roles.

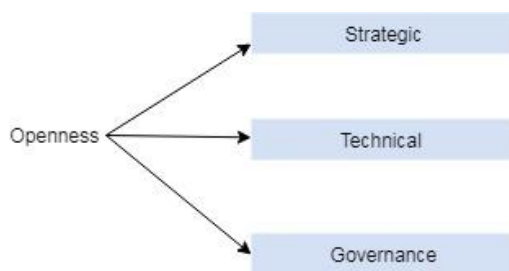


Figure 2 Visualization of defined levels of openness

## 2.3 Definition of network externalities

### 2.3.1 Definition of concepts

A **network** can be described as: a set of interconnected elements that together constitute a system (Borgatti, Mehra, Brass and Labianca, 2009). The interconnected elements of a platform, that together form a system can be illustrated, using the roles of Eisenman. In the example of Raisin the interconnected elements are investors (sponsor), the platform Raisin (platform provider), the EEA bank partners (producers) and the end users (consumer) of the platform. For each platform these roles can be identified, together they form a network of interconnected elements.

**Direct network effects can be defined as the** platforms' additional value to the when one extra user joining the platform. This could be a consumer or a producer. The added value is associated with increasing amount of users entering the platform, the value caused by one extra user joining the platform is called direct network effects. The immediate physical impact of amount of consumers (Katz and Shapiro, 1985). If a consumer connects with Raisin, the importance of the platform rises because the platform has additional consumers.

**Indirect network effects** rise as almost immediately as a reaction to increasing number of users, on single side of the platform (for instance producers) rise the value to the other side being the consumers in this example. The consumption rate of the platform is influenced by the indirect network effects. To illustrate the effect, the example of Raisin is used. When more banks join the platform and offer their deposit products (producers), the platform increased value for users on the other side of the platform, being the consumers, will increase. The consumer be attracted to the platform by the increasing amount of offers and thereby increases their chances of getting the best deal.

### 2.3.2 Impact of indirect network effects

The essence of indirect network effects is that utility for users derived from platform is subject to the amount of users on the other side of the platform, who are in the similar network. Indirect network effects grow exponential and increasingly stimulates the amount of users. Therefore, network effects are seen as an important driver to achieve a large amount of users as soon as possible (Hayashi, 1992). It is vital for a platform to survive the competition.

The evolution of indirect network effects is addressed by Srivivasan and Venkatraman, 2010. It can be time dependant when a platform needs quality or quantity of participants (users and developers). The research of Li & Penard (2013) suggest that the quantity of producers vital throughout the primary phase of a marketplace, the quality of services of a producer are important more than in a later more established stage. This would mean the impact of indirect network effects evolve over time.

There are also other impacts of network effects identified. Such as being the driver of optimal pricing. According to the study of Zingal & Becker, 2012 indirect network effects are the most vital cause of optimal prices. Because, a platform facilitates contact between two different user groups. The one side, consisting of consumers depends on

the other side, being the producers of services. This is the reason why prices rise at the same time. Both sides of the platform are dependent on each other, slowly the demand and willingness to pay will be balanced. This results in optimal pricing.

Indirect network effect can cause **tipping point**, this concept refers to an increased market share dominance (Dubé, Hitsch and Chintagunta, 2010). The tipping point is reached when the critical mass. Meaning that a platform has become successful business.

Network effects can cause a **lock-in** effect. The lock-in effect makes it difficult for other similar product or service to compete as a starter with an established product or service. Due to network effects, users derive relative less benefit from the new product or service. This forms a barrier for consumers to change within the specific network (Farrell and Klemperer, 2007). This creates a powerful position to the platform. An example of the lock-in effect in the financial sector starts with a customer opening a bank account with a number connect the specific bank. This number cannot be transferred to other banks, this is a barrier for consumers to change of a bank.

### 2.3.3 Focus of this research

This research concentrates on a platform design of the indirect network effects. It could be stated that indirect network effects are key stimulants of the success of a platform although details on the mechanisms are unknown (Thies, Wessels & Benlian, 2018) (Kim, Prince and Qiu 2014). Additional, the literature review conducted by Faber and De Reuver (2019) addresses the need to be more specific about network effects on platforms. Besides, no clear distinction between different type of network effects for example local and global network effects or (in) direct network effects. A clear conceptualization capturing network effects experienced by platforms should be defined to determine the effect (Faber and De Reuver, 2019).

### 3. Literature review

This chapter explores literature in the field of platform openness and network effects of a platform in relation to the main research question. To provide direction to the case study, this study aims to construct a frame of reference including possible impacts of openness identified in literature. The frame of reference will be used to detect possible positive and negative impacts of openness relevant in the specific case study. Network effects being one of them. This chapter will lead to an answer to the first formulated sub-question.

There are three reasons why it is challenging to construct a coherent theoretical framework. First of all, there are various definitions of openness available as illustrated in the previous chapter. There is no overview of type of openness or levels of openness as illustrated in the previous chapter. Secondly, when researchers refer to platform openness it is often unclear what type of openness is specifically discussed, for example access openness or technical openness. Thirdly, as platform development is context dependent the impact of platform openness is also context dependant.

The combination of these reasons leads to a range of outcomes related to platforms, openness and network effects, some overlapping and some not. There is a lack of systematic and well defined overview of impact of openness. An overview as such is valuable specific in this case study to identify the impact of openness in a sector only a few studies have conducted research on.

In conclusion, the existing knowledge base does not provide an adequate overview of possible impacts of openness which can be used in this case study as a frame of reference. However, elements of earlier conducted studies are valuable to construct a frame of reference.

#### 3.1 Constructed framework

To give direction to the possible impact of openness in the case study, a frame of reference indicating possible impact of platform openness is needed. The framework will be derived from the found elements in literature. The framework is constructed in two steps. The first step is to select an appropriate x and y axis to construct a framework. The second step is to provide content based on previous studies that identify positive and negative impacts of platform openness.

**Step one** is to select an appropriate x and y axis. For the vertical axis the definition of openness presented in the previous chapter is used. Because, there is a needed to be specific on what level of openness the study refers to. The roles of Eisenmann are used on the horizontal axis to be more specific on the impact on the platform. The advantage of the roles of Eisenmann is that they are generic applicable on all types of platforms. The combination of the three levels of openness and the four platform roles resulted in a structured approach of all literature studies.

**Step two** is to provide content for the framework. Based on literature, possible positive and negative impacts of openness on platforms will be identified and re-phrased into a short (condensed) proposition. The propositions reflect the impact straight forward, no nuance is included in the proposition. As a result, these propositions will be applicable in various sectors. Placing the propositions into the framework can be challenging. There are some

studies that clearly explain the level of openness and specify the direct impact role of the platform. In this case, placing the proposition is evident. There are also studies that are less precise in defining openness and/ or do not specify the role it has impact on. In such case, the researcher is forced to make assumptions and plot the proposition on the most applicable level of openness and the role it has impact on based on the content of the study. It is no option to place the statement on multiple places, although, the framework would become less comprehensible.

**Figure 3** provides a visualization of the framework. The three levels of openness are labelled in light blue on the vertical axis, y axis. The four roles of Eisenmann are horizontal axis, x axis. Green refers to possible positive impact of openness and red to possible negative impact of openness. On the X's the impact will be described.

STRATEGIC			
Sponsor	Platform provider	Producer	Consumer
x	X	X	x
Sponsor	Platform provider	Producer	Consumer
X	X	X	X

TECHNICAL			
Sponsor	Platform provider	Producer	Consumer
x	X	X	x
Sponsor	Platform provider	Producer	Consumer
x	X	X	x

GOVERNANCE			
Sponsor	Platform provider	Producer	Consumer
x	X	X	x
Sponsor	Platform provider	Producer	Consumer
x	X	X	x

*Figure 3 Visualization of framework including the levels of openness and roles of Eisenmann*

## 3.2 Research method

This chapter aims to present a structured overview of existing literature on openness and network effects related to platforms. To get a complete overview of the research field, network effects of a platform and platform openness are researched separately, this results in a broadening of found articles. In addition, it gives the option to perform a check at article level to see if the link between platform openness and network effects are covered in the article. This maximizes the chance that all relevant articles are included in the research.

It appears that when searching for platform and networker effects a lot of articles are connected to platform openness. When searching for openness, many articles indicate the power of network effects. This confirms that the assumption that openness, network effects of platforms are strongly interconnected.

To collect papers Scopus and Google Scholar are used. For both the subsequent research terms; “openness” AND “platform” AND “platform strategy” AND “platform openness” AND “network effects”. Snowball method is used for a couple of papers such as (Gannamaneni, A., & Lyytinen, 2015), (Boudreau, 2010) and (Eisenman, 2009). Also, suggestions of Mendeley were explored to extend the literature review. The research term *platforms* resulted in a

wide range of papers covering all kinds of mechanisms on the rise of platforms, a selection of papers have been made. First of all, articles including elements such as industrial internet (Menon, Kärkkäinen & Wuest, 2017), blockchain (Glaser, 2017), IoT (Kotsey, Schade, Craglia, Gerboles, Spinelle & Signorini, 2016), politics of openness in international digital principles (Goggin, 2011) or deep technical architectural openness (Schrock, 2014) are left outside scope because they are unrelated to the research goal. Second, a wide range of geographical locations conducted studies on this topic such as China, Japan (Maruyama, Flath, Minamikawa, Ohkita & Zenny, 2015), East Europa and United States. Which include a different financial system and culture. Some of those papers have been considered because platform development in the financial sector is cross border. Others that were completely out of range were read but not explored into depth as the context and conditions were too different and therefore not relevant for this research topic.

### 3.3 Impact of openness on indirect network effects of a platform

This paragraph will provide insight in the indirect network effects of a platform influenced by openness. These indirect network effects are categorised into their direct impact role of Eisenmann, being sponsor, provider, consumer and producer.

#### 3.3.1 Indirect network effects sponsor role

##### **Possible positive impact of openness**

The study of Choia, Nam and Kim (2018) is conducted within open mobile operating systems specifically the case of Android. The variety of services and products offered by producers on a platform determine the attractiveness of a platform (Gawer, 2014) (de Reuver, Sørensen, & Basole, 2018). When a platform offers a large amount of products, consumers have more choice. The chance a consumer finds the perfect match is higher. The platform becomes more attractive because of one side growing, indirect network effects are created (Mcintyre & Srinivasan, 2017). To enhance the mechanism, platform providers or other roles involved in creating the platform aims to create an attractive and profitable platform (Cennamo & Santalo, 2013). From this can be concluded that a platform aims to become open to enhance network effects and thereby expand variety of services available on a platform. Stimulating network effects on sponsor level leads to the three opportunities. Given the arguments above, openness could potentially lead to the following outcomes, formulated in propositions:

1. *Increases availability of services*
2. *Attracts more consumers*
3. *Creates a competitive platform*

##### **Possible negative impact of openness**

The study of Srinivasan and Venkatraman (2010) conducted within US home video game industry highlights the value of the platform in relation to other platforms and complementors. Referred to as relative network positions of platform. To illustrate the importance, the mechanism the example of Wii is used. By offering a large amount and

diversity of game titles contributes to a larger demographic area. Although, a negative impact on the market position arises when the platform has too many titles with overlap. Therefore, the producer should always position itself on a platform and its competitors. Due to lower porting costs, these are costs related to game development. The position of the platform will be influenced by a decrease of nonexclusive game titles. In short, openness on sponsor role indirectly drives the possible negative impact of openness to negative impact the network effects though more overlap of games, this could also be relevant with financial services as there are many producers of same competitive services. Being completely open at strategic level results in the possible negative impact of openness of a high degree of overlap across platforms and might decrease market share. In proposition 4 the possible outcome of openness is formulated:

4. *Decreases market share*

### 3.3.2 Indirect network effects platform provider role

#### **Possible negative impact of openness**

The study of Thies, Wessel & Benlian (2018) conducted on fintech- crowd funding and focusses on dependencies of network effects. A new insight of the study is the one-sided characteristics of indirect network effects. This is different compared to other platform characteristics, for example the consumer-to-consumer (e.g., Chu & Manchanda, 2016). The study indicates consumers and producers are negatively affected when the platform has a large amount on one side. A high amount of participants could lead to a crowding-out effect of other participants. Network effects on platform provider level offers the possible positive impact of openness to create strong stable long-term network effects or the possible negative impact of openness of creating unstable network effects, dependant on the input control of the platform. High input control leads to long term stable network effects. Low input control could lead to weaker and unstable long-term network effects, formulated in short formulated, without the context and condition, in proposition 5.

5. *Creates unstable network effects*

#### **Possible positive impact of openness**

In the study of Garcia-Swartz & Garcia-Vincente (2015) is conducted the smartphone industry. Smartphones are “systems,” including a hardware and software element that are connected with each other. The two components link multiple different user groups such as network operators, app developers and users resulting in network effects. Therefore, they are seen as multi-sided platform. The research is focussed on the reaction of users on application developers. The response of users on producers contributed to the growth of the iPhone, the impact on growth has been confirmed. Currently, the heterogeneity of products were dominant in determining the power of indirect network effects on devices such as the smartphone. This does not have to be the only reason of the effect, it should also include the heterogeneity of producers’ services. For example when an application becomes very popular among users, and thereby stimulates the demand for the product, on which the application is available. These applications are referred to as “killer apps”. It can be concluded that the growth of a platform is strong stimulated by indirect network effects. In the case of iPhone, “killer apps” have significant impact on the main



product offered. Stimulate indirect network effects on producer offers the possible positive impact of openness to increase diversity of applications as “killer apps could have large impact on core product”, this is in short formulated in proposition 6.

6. *Increases diversity of services*

### 3.3.3 Indirect network effects producer role

#### **Possible positive impact of openness**

The study of Maruyama et al. (2015) conducted within the Japanese home video game industry. Focussing on game developers, complementors, select the platform to affiliate their game/ service based on prospect of future growth of the platform. The study researches the choice of game/ developers to select a specific platforms to develop games for the Japanese home video gamers. The study illustrates that the decision of game developers is influenced by the expect indirect network effect of a platform. Stimulate network effects on producer role offers the possible positive impact of openness to stimulate complementors to contribute to the platform, in short formulated in proposition 7.

7.

7. *Attracts produces to platform*

#### **Possible negative impact of openness**

There have not been any possible negative impact of openness identified on this role.

### 3.3.4 Indirect network effects consumer role

#### **Possible positive impact of openness**

The research of Kim, Prince & Qiu (2014) is conducted within the video game industry. The study connects complementary goods of producers with retail consumers. The existence and scale of indirect network effects could influence the consumer to adopt or not. A positive feedback loop is identified, it starts with the first adopters of the platform. Those consumers will use the primary product of the platform. This encourages producers in the market to create complementary products. Then the original, primary product, will increase value as an reaction. It is proven that the indirect network effects are underestimated by 30%. Stimulate network effects on consumer level offers the possible positive impact of openness to increase consumer adoption, in short formulated in proposition 8.

8.

8. *Increases consumer adoption*

#### **Possible negative impact of openness**

There have not been any possible negative impact of openness identified.

### 3.3.5 Overview of impact of openness on indirect network effects

It can be concluded that a lot of indirect network effects appear to be directly or indirectly driven by openness. This underlines that openness is a relevant driver of indirect network effects of platforms. During the literature study it appears that indirect network effects are not very specifically defined and the context in which these are mentioned is of importance to get a better understanding.

Furthermore, several highlights indicate that the *timeline* (or phase in the lifecycle of a platform) is of importance: *low* or *high* input control related to third party content generate respectively *short* or *long*-time impact. Also, the *quantity* or *quality* of content by suppliers (third parties) are contributing on respectively the *short*- or *long* term. Final remarkability is that literature describes a relatively little number of possible negative impact of openness indirect network effects (red).

**Figure 4** shows the network effects of a platform found in literature. Each proposition is placed into the framework based on the roles of Eisenman, being sponsor, platform provider, consumer and producer level and marked as “Possible positive impact of openness” (green) or “Possible negative impact of openness” (red). As they were already structured in each paragraph.

IMPACT OF OPENNESS			
Sponsor	Platform provider	Producer	Consumer
1. Increases availability	6. Increases diversity of products	7. Attracts producers to the platform	8. Increases consumer adoption
2. Attracts more consumers			
3. Creates competitive platform			
Sponsor	Platform provider	Producer	Consumer
4. Decreases market share	5. Creates unstable network effects		

Figure 4 Overview possible positive and negative impact of indirect network effects, structured by roles of Eisenmann

### 3.4 Strategic level of openness

The first, out of three levels of openness, is strategic openness. This level discusses to the mentality of the platform provider of sponsor. The strategic level is dominant in most cases and determines the level of openness in on technical and governance level.

### 3.4.1 Sponsor role

#### **Possible positive impact of openness on sponsor role**

According to Kauffman (1996), the interdependency forms a blockade to have contact and therefore hinders further development. Due to high complexity it is not possible to maintain consistency when several producers try to develop at the same time. You will lose the overview. These findings are already reflected in the propositions before. The positive outcomes of openness at the strategic level resulted in the effects that already been mentioned in section 3.3. For information, it is about creating a competitive platform, attracting more consumers and increasing the availability of services.

#### **Possible negative impact of openness on sponsor role**

The research of Lee, Lee and Hwang, 2014 compares two different platform ecosystems, an open and a closed platform ecosystem. Openness of the platform refers to how easy third parties can enter the ecosystem and contribute to the platform. The example used throughout the research of Lee et al. (2014) is the case of apple. Apple applies a strict control strategy for assimilating value chains through all layer's results in an ecosystem which is restricted open. On the long term this leads to increased technical efficiency for two reasons: Apple can reduce conflict, which is essential in the evolution of the ecosystem. Secondly, the approach restrains the amount of technical standards such as technical languages, this ensures the quality of producers and creates efficiency. Apple's rather closed platform, specifically in the development, is considered to be a strategic choice (Lee et al, 2014). The example addresses that **restricted** openness on sponsor role leads to long term efficiency in the ecosystem. Meaning that unrestricted openness could decrease long term efficiency, in short formulated in proposition 9.

9. *Decreases long term technical efficiency*

#### **Possible negative impact of openness on sponsor role**

The study of Lee et al (2014) also addresses another possible negative impact of openness.. When opening a platform, the central control point is less dominant related to the high interconnectivity and interdependency between platform roles which leads to a vulnerable situation. If one layer fails for whatever reason it might influence the functioning of the whole ecosystem (Lee et al, 2014). The sponsor needs to assess this possible weakness of the platform caused by openness other producers. The possible negative impact is reflected in proposition 10.

10. *Increases vulnerability of ecosystem*

#### **Possible negative impact of openness on sponsor role**

The study of Farrell and Klemperer (2007) identifies the possible negative impact of openness linked to the absence of customer lock-in power of a platform. When being open towards both sides of the market; producer and consumer sides will not experience a binding force to the platform. The negative effect of reducing switching cost, makes it is easy for a user of the platform to switch to another platform easily (Parker and Van Alstyne, 2013) (West, 2003). On strategic level a strong relation with the consumer to the platform through indirect network

effects is desired by a platform sponsor. When switching becomes too easy for consumers, the possible negative impact of openness is not having a customer lock-in. Openness on sponsor role thus leads to the strategic possible negative impact of a customer not being locked-in on the platform, proposition 11.

11. *Weakens the feeling of being lock-in to the platform*

#### **Possible negative impact of openness on sponsor role**

Another possible negative impact of openness on sponsor level is addressed in the study of Ondrus, earlier identified by Boudreau (2010) and Eisenman (2009), is the possible reduction of profits due to a decrease of multi-homing, leading to a lower industry unit volumes. This type of openness has possible negative consequences on the profitability, being a strategic decision on sponsor or provider role. Impact is formulated in proposition 12:

12. *Reduces profitability of the platform*

### 3.4.2 Platform provider role

#### **Possible positive impact of openness on provider role**

The research of Choia, Nam and Kim research is conducted on mobile platforms. The research focusses on the impact of platform openness on the intention of a service or product producer. For example it could be that a producer contributes once or regularly to the platform. This has impact from a platform ecosystem perspective. In the study, openness is approached as the right for producers to join the platform deprived of regulation or restrictions (Boudreau, 2010). The research focusses platform openness in diversity of products, services and ecosystem. It can be concluded that being open towards producer can have a stimulating influence on the intention of a producer to contribute on a repetitive basis. This again, would increase the user base through network effects, and thereby stimulate competition among developers. This has thereafter a stimulating effect on innovation of services and products developed by producers (Choia et. al., 2017). Openness on provider role could lead to the strategic positive impact to foster innovation on the platform, in short formulated in proposition 13.

13. *Fosters innovation*

#### **Possible negative impact of openness on provider role**

There have not been any possible negative impact of openness identified.

### 3.4.3 Producer role

#### **Possible positive impact of openness on producer role**

The research of Ondrus, Gannamaneni and Lyytinen conducted a research in 2015 focussed on how openness can contribute to the market potential of a platform. The paper also used the Eisenman roles to structure and introduce openness. The research addressed positive and negative impacts on provider, and consumer role. One of the found positive impacts on strategic level having impact on producer role is that it increases cooperation of third parties and creates new, maybe unexpected, services and features. The example given is that a phone could become more

popular because a producer developed a “killer app”, creating an unforeseen feature for the phone and creating popularity because of an application which was not thought of at first. Openness on producer role could lead to the strategic possible positive impact for unexpected opportunities, in short formulated in proposition 14.

14. *Increases co-creation of products*

#### **Possible positive impact of openness on producer role**

In line with this positive effect on producers, openness offers the possible positive impact of openness to be a stimulance for third parties by multiple studies (Benlian, Hilkert and Hess, 2015) (Choia, et al, 2017) (Eisenmann et al., 2010) (Boudreau, 2010) (Eisenmann et al., 2009). Openness directly influences the direct motivation and purpose of producers to contribute to the platform. Furthermore, the consumer base of the platform leads to competition between producers, thus stimulating producers to contribute. When a platform has more participants, the producers will be stimulated through indirect network effects (Choia et. al., 2017). Openness on producer role leads to the strategic possible positive impact to encourage participation, innovation and continuous contribution of third parties and its developers. Possible positive impact is in short formulated in proposition 15:

15. *Encourages participation*

#### **Possible negative impact of openness on producer role**

There have not been any possible negative impact of openness identified.

### 3.4.4 Consumer role

#### **Possible positive impact of openness on consumer role**

The study of Gebregiorgis et al. (2015) is conducted on IT platforms with a technical approach of openness. The study addresses the strategic a possible positive impact of openness on the consumer role. Some cloud-services restrict the option for consumers to transfer their data to another platform. This can be made difficult by the platform provider on purpose, for example by not being interoperable with other systems. For a customer this forms a lock-in. Consumers who are conscious of this possible negative impact of openness might not adopt such narrowed cloud services, because switching costs to a different system can be expensive. Opening an IT platform reduces this possible negative impact of a lock-in and its associated switching costs. The concerns of consumers about being lock-in on a platform and the risk of having switching cost is decreased by providing an open platform to consumers. Therefore the platform becomes more attractive for users (Gebregiorgis et. al, 2015). This possible positive impact leads to proposition 16.

16. *Reduces consumers concern about lock-in*

#### **Possible positive impact of openness on consumer role**

The research of Gebregiorgis and Altmann, 2015 is conducted within cloud computing. The research is rather focussed on a technical definition of openness and addresses that (technical openness) it is key to gain **market power as a platform**, which influences trust of consumers in a positive way. For instance the fear of the platform

going bankrupt will decrease from a consumers perspective when a platform has market power. The platform will be considered as a stable and trustworthy party. Therefore, participants of the platform will not be frithgtend by the possibilities like loosing data or having to change to anohter platform or other inconveniences. Trust influences the attractiveness of service platforms in a positive way. In short, openness leads to market power wich enhances trust of users. Although it could be questionable wich is first, in short formulated in proposition 17 and 18:

17. *Increases market power*

18. *Enhances trust of users*

STRATEGIC			
Sponsor	Platform provider	Producer	Consumer
x	13. Fosters innovation	14. Increases co-creation of products 15. Encourages participation	16. Reduces customers concerns about lock-in 17. Increases market power 18. Enhances trust of consumers
Sponsor	Platform provider	Producer	Consumer
9. Decreases long term efficiency 11 Weakens the feeling of being locked-in to the platform 10. Increases vulnerability of ecosystem 12. Reduces profitability of the platform	x	x	x

Figure 5 Overview of possible positive and negative impact of strategic openness, structured by roles of Eisenmann

### Possible negative impact of openness on consumer role

There have been no possible negative impact of openness identified

### 3.4.5 Overview of strategic level of openness

**Figure 5** shows an overview of the found possible positive impact of openness (green) and possible negative effects of openness (red) on strategic level and placed on their roles of impact. Numbers correspond to the numbers of the propositions formulated in the chapter above.

### 3.5 Technical level of openness

Technical openness is described as the infrastructure and partnering of a platform. For example, partnering could be done through horizontal or vertical integration. Horizontal refers to licencing, shared standards and technical interoperability with various platforms, also with competitive platforms. Vertical strategies entail adoption of third parties and category exclusivity. These strategies increase or limit access to the platform roles identified earlier (Eisenmann et al., 2009). These types of openness have technical implications but is determined on the strategic level of the platform. From the example the interconnection between layers becomes already clear. This paragraph provides insight into identified possible positive and negative impact of technical openness.

#### 3.5.1 Sponsor role

##### **Possible positive impact of openness on sponsor role**

Besides the identified strategic openness in proposition number 9, the study of Ondrus et al (2015) also addresses technical issues. Such as the possible positive impact of openness on sponsor level to split the costs of the investments needed for the technical infrastructure (Boudreau, 2010). This could reduce the investment and refers for instance to the cost when the platform requires a new technological infrastructure, formulated in short in proposition 20.

20. *Reduces cost of new technological infrastructure*

##### **Possible positive impact of openness on sponsor role**

Openness on technical level could mean that the efforts are not equal to all involved parties. Openness on sponsor level leads to the technical possible positive impact of openness to leech of the advantages of competing platforms (Eisenmann et al., 2009), leading to proposition 21.

21. *Increases benefits from other platforms*

##### **Possible negative impact of openness on sponsor role**

The possible positive impact of openness mentioned above also entails a possible negative impact of openness identified by West (2003). An interconnected technical system increase technical efforts to be interoperable. Meaning that openness on sponsor role leads to the technical possible negative impact of openness of large technical efforts, proposition 22.

22. *Increases technical efforts*

##### **Possible negative impact of openness on sponsor role**

The research of Gebregiorgis and Altmann, 2015 is conducted within cloud computing. In the research openness is defined as IT standards like interoperability, portability and usability of components within IT facility systems. The research focusses on the impact of standardization of technology related to market power of cloud computing platforms. It turns out that standardisation has a negative influence on the platform provider with a large market share. On the long run, standardisation will lead to a reduction of market power. This is one of the most important

reasons for providers with a large market share not to use standardization or stimulate standardization. The opposite, those market leaders will try to block or influence the decision of standardization into their favour. In this research it is assumed that these kinds of decisions are made on sponsor levels. Openness on sponsor role leads to the possible negative impact of technical openness in statement 23.

23. *Reduces market power of key provider*

### 3.5.2 Platform provider role

#### **Possible positive impact of openness on platform provider role**

The study of Ondrus, Gannamaneni and Lyytinen 2015 **indicates** how multiple technologies can be integrated into one platform. Also encompassing how easy is it to connect with competitive platforms. It is challenging to become interoperable when diverse technologies are used. The research addresses that technical openness on provider role leads to the possible positive impact of openness to seamless connect compatible suppliers and strongly positively enhances indirect network effects of the platform. The possible impact is captured in proposition 24

24. *Enhances seamless connection*

#### **Possible positive impact of openness on platform provider role**

When the technique of a platform is open, it rises entry to capabilities, assets and resources of others. The possible positive impact of openness is identified by Ondrus and West (2015). This could contribute to the platform potential to develop, proposition 25.

25. *Increases access to resources*

#### **Possible negative impact of openness on platform provider role**

A possible negative impact of openness on technical level is identified by the study of Eisenmann et al. (2009). When being open technical you could have the benefit to leech of the benefits of others, but the negative side of this effect is that benefits are leached off from your platform or technical structure. It is a two-sided medal, presented in proposition 26.

26. *Gives away platform benefits*

#### **Possible negative impact of openness on platform provider role**

Mentioned in the part of Ondrus, identified earlier by Eisenmann et al., 2009; when a platform is technically open and available, it is hard to create standalone properties to differentiate from others. Openness on provider role leads to the possible negative technical impact of losing the differentiating power of a platform. In short formulated in proposition 27.

27. *Reduces ability to create differentiating properties*



### **Possible negative impact of openness on platform provider role**

The study of Sharpiro and Varian (1998) identified a disadvantage also mentioned in the study of Ondrus et al. 2015. If a platform is open on technical level, it is not interesting for a provider to invest, as everybody can enjoy the benefits. One might not put that much effort into the benefit of the whole. The possible consequence of a lack of incentive is that investments are not made anymore. Technical openness on provider level leads to the possible negative impact of having low investments leading to a loss of quality and innovative power, leading to proposition 28.

28. *Reduces incentive for investments*

### **Possible negative impact of openness on platform provider role**

From the article of Gebriorgis et al., 2015 can be concluded that for an IT platform the interoperability, portability and usability are very important to increase the value of IT services. It is important for current market leaders but also for new platform providers. For the current platform providers in the market it is required to be able to be a competitive platform on the long term. They will need to alter their strategy to the actual developments in the market. Seamless connection of IT platforms allows compatible suppliers. The possible negative impact of openness is not being able to compete in the market and thus weakening the market position, proposition 29.

29. *Weakens market position*

### **3.5.3 Producer role**

#### **Possible positive impact of openness on producer role**

Openness to producers of products and services increases the opportunities to make use of the technological architecture. Thereby, general support can be shared such as rules, tools and information that can be helpful to develop service or product on the platform. Openness on the producer role leads to the technical possible positive impact to lower the entrance barriers of the platform for producers of services. The possible positive impact is in short formulated in proposition 30.

30. *Lowers entry barriers to connect*

#### **Possible negative impact of openness on producer role**

There have been no possible negative impact of openness identified.

### 3.5.4 Overview of technical level of openness

**Figure 6** shows an overview of the found possible positive impact of openness (green) and possible negative effects of openness (red) on technical level and placed on their roles of impact. Numbers correspond to the numbers of the propositions formulated in the chapter above.

TECHNICAL			
Sponsor	Platform provider	Producer	Consumer
20. Reduces cost of new technological infrastructure	24. Enhances seamless connection	30. Lowers entry barriers to connect	x
21. Increases benefits from other platforms	25. Increases access to resources		
Sponsor	Platform provider	Producer	Consumer
22. Increases technical efforts	26. Gives away platform benefits	x	x
23. Reduces market power of key provider	27. Reduces ability to create differentiating properties		
	28. Reduces incentive for investments		
	29. Weakens market position		

Figure 6 Overview of possible positive and negative impact of technical openness, structured by roles of Eisenmann

## 3.6 Governance level of openness

Governance openness refers to the rules of the game, input control (onboarding) and to manage the maturity of the platform.

### 3.6.1 Sponsor role

#### Possible positive impact of openness on sponsor role

When the regulation is correct, there is an option to share cost of regulation, enforcement ect. (Eisenmann et al., 2006) (Ondrus et al. 2015). On provider role, openness leads to the governance possible positive impact of openness to share costs, leading to proposition 31.

31. Decrease costs of regulation

### **Possible negative impact of openness on sponsor role**

The studies of Evans (2002) and Ondrus et.al. (2015) both address possible negative impact of openness on governance level. The involvement of each platform role and control on producer and user side of the platform can be determined by the provider level. On this level, openness can be used strategically to deviate rights and obligations of each partner who joins the platform. The two possible negative impacts of openness are short formulated in proposition 32 and 33.

32. *Increases anti-trust issues*

33. *Decreases control of central point*

### **Possible negative impact of openness on sponsor role**

Openness on sponsor or provider level would lead to more coordination problems according to Greenstein, (1996), Gawer and Cusumano (2002) and Ondrus, et al (2015). Openness leads to coordination cost among producers and the platform provider. This could be caused by differences in characteristics of connected devices. These extra struggles increase the costs of coordination. From the study is learned that satisfaction of game developers is decreased by rising of coordination costs (Choia et al. 2017). Openness on sponsor role on governance leads to a possible negative impact on coordination issues (34) and influence third parties development (35).

34. *Increases coordination issues*

35. *Increases coordination costs*

### **3.6.2 Platform provider role**

#### **Possible positive impact of openness on platform provider role**

There have been no possible negative impact of openness identified on this level.

### **3.6.3 Overview of governance level**

**Figure 7** shows an overview of the found possible positive impact of openness (green) and possible negative effects of openness (red) on governance level and placed on their roles of impact. Numbers correspond to the numbers of the propositions formulated in the chapter above.

GOVERNANCE			
Sponsor	Platform provider	Producer	Consumer
31. Decreases costs of regulation	x	x	x
Sponsor	Platform provider	Producer	Consumer
32. Increases anti-trust issues	x	x	x
33. Decreases control of central point			
34. Increases coordination issues			
35. Increases coordination cost			

Figure 7 Overview of possible positive and negative impact of openness on governance level, structured by roles of Eisenmann

### 3.7 Literature synthesis

In this paragraph the literature found on indirect network effects and on openness are merged into one overview. A literature study has been executed in which articles have been selected that include the impact of openness on platforms. Different types of impact of openness on platforms are found in literature. The network effects are identified in paragraph 3.3 represented in propositions 1-8. Sub paragraph 3.3.5 presents a visualisation. The openness effects are identified in paragraph 3.4 till 3.6, represented in the propositions 9-35.

From the first part of the study it can be concluded that openness generates a relative large number of propositions regarding network effects. From this part of the literature research it appears that openness is an important driver of network effects.

**Figure 8**, the complete **theoretical framework** plotting propositions 1-35 is presented. The propositions have been allocated to the corresponding level of openness being strategic, technical and governance (fig. 5, vertical axis) and to the applicable Eisenmann roles identified (fig 5, horizontal axis)

Additionally the possible positive (green) and negative (red) impacts of openness are identified. The theoretical framework includes propositions without context factors and is generically applicable in various sectors.

STRATEGIC			
Sponsor	Platform provider	Producer	Consumer
1. Increases availability	6. Increases diversity of services	7. Attracts producers to the platform	8. Increases consumer adoption
2. Attracts more consumers	13. Fosters innovation	14. Increases co-creation of products	16. Reduces customers concerns about lock-in
3. Creates competitive platform		15. Encourages participation	17. Increases market power
			18. Enhances trust of consumers
Sponsor	Platform provider	Producer	Consumer
4. Decreases market share	5. Creates unstable network effects	x	X
9. Increases long term efficiency			
11 Weakens the feeling of being locked-in to the platform			
10. Increases vulnerability of ecosystem			
12. Reduces profitability of the platform			
TECHNICAL			
Sponsor	Platform provider	Producer	Consumer
20. Reduces cost of new technological infrastructure	24. Enhances seamless connection	30. Lowers entry barriers to connect	x
21 Increases benefits from other platforms	25. Increases access to resources		
Sponsor	Platform provider	Producer	Consumer
22. Increases technical efforts	26. Gives away platform benefits	x	x
23. Reduces market power of key provider	27. Reduces ability to create differentiating properties		
	28. Reduces incentive for investments		
	29. Weakens market position		
GOVERNANCE			
Sponsor	Platform provider	Producer	Consumer
31. Decreases costs of regulation	x	x	x
Sponsor	Platform provider	Producer	Consumer
32. Increases anti-trust issues	x	x	x
33. Decreases control of central point			
34. Increases coordination issues			
35. Increases coordination cost			

Figure 8 Theoretical framework

### 3.8 Conclusion and answer to the first sub-question

In this chapter a theoretical framework is constructed and a literature study is conducted to identify positive and negative impacts of openness. This chapter first presents findings related to the constructed framework. After that, the first sub-question will be answered.

The theoretical framework will be used as a frame of reference in the case study, it will provide direction to find positive and negative impacts of openness. The constructed theoretical framework offers the following valuable characteristics. First of all, it is possible to give an overview for a relative large number of propositions. This study encompass around 30-50 propositions, covering a large amount of research is linked to openness. Second, content of the framework is easy to adapt. Propositions can be easily added to the framework. The value of the framework is that propositions representing the impact of openness based on domain knowledge can be included in the framework. The sector specific framework will increase the insights when conducting a case study in a certain sector. Third, by categorizing each proposition on the specific level of openness (vertical axis) and the role of Eisenmann (horizontal axis) where it has direct impact indicates the related dynamics. This provides also further insight into the balance of possible positive and negative outcomes, dominance of certain categories and possible dilemma's e.g. propositions with a contradicting effects. At last, because the propositions lack context factors the framework applicable to multiple cases in various sectors. A limitation of the framework is that placing the propositions can be challenging. Because, openness is not always specifically defined and the context in which it is mentioned is of importance to get a better understanding. It is expected that there is a strong interconnection between those layers and that the propositions might not be placed on the correct level and role. Although, this will not impact the results of this case study, as the theoretical framework will be used as a frame of reference to explore the case study.

The conducted literature study answers the first research sub-question presented in the introduction: *What is the impact of openness on network effects of a platform identified in literature?* In literature there are 35 possible impacts of openness on network effects identified. The theoretical framework provides insight into the balance and coherence between all identified impacts consisting of positive and negative impacts. From this can be learned that introducing certain openness (strategic, technical, governance) can lead to dilemma for a platform, as it could result in contradictory impacts. This shows that the introduction of openness must be cautiously judged by the platform provider and sponsor to ensure that it will have the desired impact. The dilemmas identified from the theoretical overview are:

- Strategic openness could reduce consumers concerns to be locked-in and thereby increase consumer adoption versus too much openness on this level could lower the switching barriers for consumers. Therefore, it is hard from a platform perspective to keep the customer locked-in on the platform.
- Strategic openness could be needed to create more efficiency on the platform. Through interaction it will develop further. Other theory states that trough limited openness and strict control on the platform efficiency would be increased.

- Technical openness allows a platform to have access to resource of others, but on the other hand others can leech of the benefits of your platform.
- Governance openness could lead to coordination issues between all parties involved versus a reduction of costs as those can be divided among all involved.

It is learned that impact of openness is dependent on the type of platform, sector characteristics or other context factors. Furthermore, it seems that openness has a time dimension. Alike the previous analyses regarding “network effects” and “platform” (2.2.3) we find a time related highlight: “on the short term a closed platform ecosystem achieves higher efficiency. An open ecosystem has higher efficiency on the long term” (Doyle,2013).

The possible positive and negative impacts of openness are identified based on all kinds of sectors, leading to a framework applicable to all sectors. The propositions lack context factors, these are removed on purpose to construct a generic applicable framework. Although, openness is context dependant. This means that an one on one translation of the propositions to a specific sector is not possible. To use the theoretical framework in the case study to explore the impact of openness in the financial sector, the following question should be answered: *How is the impact of openness on the network effects to be expected on the specific domain of finance?* In chapter 4 this research question will be answered.

## 4. Domain

The previous chapter presented the theoretical framework, which provided an overview of possible positive and negative impact of openness on network effects of a platform. The theoretical framework is applicable to all kinds of sectors.

In the case study the theoretical framework will be used as a frame of reference to identify possible positive and negative impacts of openness in the financial sector. The theoretical framework is not suitable for immediate use, it is too generic. To make the framework a valuable frame of reference, propositions representing the impact of openness based on domain knowledge should be included in the theoretical framework. Therefore, knowledge on the financial sector is required to understand and include the possible positive and negative impact of context factors on a financial platform.

In this chapter, literature and grey literature searched and used to include the sector characteristics in the theoretical framework. In this chapters propositions will be formulated, those will be placed into the structure of the theoretical framework. The final result of chapter 4 is a *theoretical framework specified on the domain*. This framework will be used in the case study to detect the possible positive and negative effects of openness.

As shortly addressed in the first chapter, the scope of banks has been narrowed to a specific subsector. The research focusses on traditional banks willing to change to the banking-as-a-platform model. In this research this (sub) sector is referred to as the Purple Banks. This chapter will take the (sub) sector of Purple Banks into account. This chapter goes into characteristics (4.1), regulation (4.2) and possible negative effects of openness (4.3) of the financial sector to gain understanding and knowledge on the characteristics. Based on the following paragraphs relevant characteristics are formulated into a proposition and included in the theoretical model transforming to a *theoretical framework specified on the domain*, presented in 4.4. In the last paragraph, the conclusion and the answer to sub-question 2 is provided.

### 4.1 Sector characteristics

To start this chapter, first some general information is provided to understand the sector characteristics better. The financial sector comprises institutions to safeguard consumers be able to save, pay and borrow. Such as banks and insurers (Rijksoverheid, 2019). This research focusses on banks. The core responsibility of a bank is to guarantee the both demand and supply streams of money comes together and is balanced (Geld.nl, 2019).

There are changing aspects in the financial sector, the study of Brummer and Georgine (2014) identified three main drivers pushing the financial market to change their structure. Firstly, *technological improvements*, the digitalization and related process innovation causing a reshape of the financial markets and services. As an example, online payment services made it possible to transfer money instantly, which significantly increased accessibility and usability for consumers significant (Jayewardene and Foley, 2000). Secondly, *the changing legislation* redefine the framework in which financial services can be developed and rendered. Making the financial sector increasingly sensitive for platform development and opportunities in the field of financial services, this will



be further explained in the next paragraph. Third and last are the *social changes*, which refer to the changing needs of the consumers. The slogan “customer is king” suits the situation, as more information, services, products and providers are available online, the customer becomes more demanding (Jayawardhena and Foley, 2000). From customer perspective, Fintech offer new services such as the possibility to invest through crowd funding (Menat, 2016).

## 4.2 Regulations

The financial sector is highly regulated to ensure stability of the financial system which is important for the economy, businesses and consumers (Buckley, 2008). Financial regulation refers to the rules and laws banks need to comply with. Within the EU there are different laws and regulations on the financial area. The UK, Germany, France and Spain have comparative systems, but they are not identical. For this research the European setting of rules and regulation will be considered.

The financial sector played an important role in the 2008 crisis. There was a lot of distrust from society and the government had no control. To prevent a crisis in the future, governments around the world have tried to initiate regulations that lead to financial sector reforms. Such as increasing transparency aiming for more stable markets and increased consumer protection.

Fintech need to comply with regulation. Like Raisin. To ensure customer savings they only partner banks that are part of the European Euro Area to ensure savings up to a certain amount. An important institution within the financial system is the European Banking Authority (EBA), this institution ensures that (online) payments across the EU are secure, easy and efficient (European Banking Authority, n.D.).

Another example is the GDPR legislation. The financial institutions handle a significant amount of privacy sensitive data. Therefore, the EU General Data Protection Regulation (GDPR) is important. Since 25 May 2018 the GDPR regulation is enforced for all citizens belonging to a country within the EU, no matter where the business is currently located. The GDPR is in place to ensure the privacy of all EU residents when for example a data breach occurs. This is a risk that is constantly increasing in the digital and connected world. The regulation is constructed to: bring into line laws related to data privacy across Europe, safeguard and permit all EU citizens data privacy and to redesign the method administration’s approach privacy of personal data. The main points of the GDPR are: data protection officer, increased territorial scope, introduction of high penalties (up to 4% of global turnover), right to be forgotten, breach notice and right to access, privacy by design (GDPR: Key changes, 2019).

**Possible negative impact of regulation.** The financial sector often sees regulations as a barrier to technological innovation and as a source of uncertainty. For example, Raisin is limited to banking partners within the EEA as those only ensure 100.000. Or in the example of the GDPR regulation, this has impact on the data storage, privacy and digital identity verification as barriers to innovation. The use of technology must comply with laws and guidelines so that banks and insurers can respond quickly to legal requirements. This can also limit the openness that can be created. Proposition 36 on technical openness can be limited due to regulatory boundaries or obstacles.

The possible negative impact of openness:

*36. Decreases through regulatory obstacles*

**Possible positive impact of regulation.** There are new regulation that reduce barriers and stimulate innovation. Such as the open banking, this concept represents a mechanism (Rommers, 2019). This increasing use of APIs (Application Programming Interfaces), is also called Open Banking. APIs are tools with which different IT systems can communicate with each other based on a fixed set of rules and specifications. It enables IT systems to 'open up' and creates new ways in which these systems communicate with each other.

In the financial sector, open banking may be the next step in the development of the way in which banks share their data, products / services and functionalities, and in which they enable consumers to access and use their own financial data, account information and functionality regarding authorized third parties. It makes it possible to create the value and flexibility that many consumers and businesses need by making financial data and account information more available and more widely shared than ever. Raisin also uses the PSD2 to share financial data of consumers. The possible positive impact of openness is represented in proposition 37.

*37. Generates a new level of services and network effects (PSD2)*

#### 4.3 Possible positive and negative impacts of openness

Open Banking, has several important benefits for banks and their consumers. This appears from recent research by Capgemini (2017). At the same time, there are also some important pitfalls that banks will have to avoid in the journey to a more open banking sector ("De belangrijkste voor- en nadelen van Open Banking", 2017, pp1-3). From the fintech and financial institution perspective Open Banking, the use of APIs brings positive also negative effects. Openness could lead to becoming the platform facilitator and thereby maintain customer contact. Thereby long term stable network effects are created, leading to proposition 38.

*38. Creates long term stable network effects*

**Some possible negative effects** are identified from the perspective of the banking sector and fintech sector. The downside of openness is having less control in the services. A possible negative effect is that the data security and control of customer data decreases. According to the report of PwC in 2015, banks and fintechs are concerned about this reduction of central control. It could lead to fraud through phishing, smashing and cybersquatting. The possible negative impact of openness is formulated into proposition 39.

*39. Decreases control of customer data*

Approximately one third of fintech administrators and bank administrators are concerned about the possibility of product cannibalization that occurs when working with open APIs (PwC,2015). This would lead to instability on the short term. The possible negative impacts are represented by statement 40 and 41.

*40. Increases product cannibalization*

*41. Creates short term and unstable network effects*

#### 4.4 Theoretical framework specified on the domain

The propositions are plotted into the theoretical framework, the result is figure 10. The *theoretical framework specified on the domain* will be used in the case study to identify the possible positive and negative effects of openness.

**Figure 10** presents the theoretical framework specified on the domain. Possible positive impact of openness is plotted into the green and possible negative impact of openness in to the red. The propositions are plotted on their level and role of impact (Eisenmann's roles). New propositions are numbered from 36-41.

STRATEGIC			
Sponsor	Platform provider	Producer	Consumer
1. Increases availability	6. Increases diversity of products	7. Attracts producers to the platform	8. Increases consumer adoption
2. Attracts more consumers	13. Fosters innovation	14. Increases co-creation of products	16. Reduces customers concerns about lock-in
3. Creates competitive platform		15. Encourages participation	17. Increases market power 18. Enhances trust of consumers
Sponsor	Platform provider	Producer	Consumer
4. Decreases market share	5. Creates unstable network effects	x	X
9. Increases long term efficiency			
11 Weakens the feeling of being locked-in to the platform			
10. Increases vulnerability of ecosystem			
12. Reduces profitability of the platform			
40. Increases product cannibalization			
37. Data security			
TECHNICAL			
Sponsor	Platform provider	Producer	Consumer
20. Reduces cost of new technological infrastructure	24.Enhances seamless connection	30. Lowers entry barriers to connect	x
21 Increases benefits from other platforms	25. Increases access to resources		
Sponsor	Platform provider	Producer	Consumer
22. Increases technical efforts	26. Gives away platform benefits	x	x
23. Reduces market power of key provider	27. Reduces ability to create differentiating properties 28. Reduces incentive for investments 29. Weakens market position 36. Decreases through regulatory obstacle 39. Decreases control of consumer data		
GOVERNANCE			
Sponsor	Platform provider	Producer	Consumer
31. Decreases costs of regulation	38. Creates long term stable network effects	37. Generates a new level of services and network effects (PSD2)	x
Sponsor	Platform provider	Producer	Consumer
32. Increases anti-trust issues	41.Creates short term and unstable network effects		
33. Decreases control of central point			
34. Increases coordination issues			
35. Increases coordination cost			

Figure 9 Theoretical framework specified on the domain

#### 4.5 Conclusion and answer to the second sub-question

In this chapter sector characteristics are researched and used to adjust the theoretical framework. The theoretical framework is made specific by adding 7 propositions on the financial domain. Therefore, it can be used as a valuable frame of reference in the case study.

In this chapter the second research sub-question is answered: *How is the impact of openness on the network effects to be expected on the specific domain of finance?* It is expected that the impact can be similar as identified in the theoretical framework because there is an overlap with earlier identified possible positive and negative impact of openness. Such as, it is easy to switch for a consumer and being able to create more personalised services. This confirms that there is a relevant link between the theoretical framework and the dynamics of the financial sector.

Next to possible positive and negative impacts of openness also restrictions of openness are introduced, given the strong regulatory framework related to the financial sector. All platforms related to the financial sector required to comply. This can also be derived from the fact that there is additional regulation of the financial sector on these issues like data security, customer privacy, loss of control of customer data et al. Although, the complexity of regulation in the financial sector: the PSD2 directive opens options to provide financial services cross sector, meaning that parts of multi sided platforms are within the financial sector. Cross border financial companies operating must deal with multiple regulatory regimes, for instance on country-, European- and any other country where activities are deployed.

Until so far, theoretical approach is used to identify possible positive and negative impact of openness and regulatory boundaries. Although, it is unknown into what extend openness is considered as a relevant choice in the case study and if expected network effects have impact on the choice to become open. Therefore, insight is needed into platform openness from a sponsor and provider perspective. Insight from these two roles is needed because they make the decision to become open. This leads to the third research sub-question 3: *Do expected network effects have impact on the decision of a platform provider or sponsor to become open on a financial platform?* Empirical data is needed to answer this question. To collect the right data, a case study is conducted. This is explained in the next chapter.

## 5. Case study research method

This chapter describes how the case study research method is conducted in this research following the following six phases: *plan, design, prepare, collect, analyse* and *share* (Yin, 2017). The first phase, ***plan***, is conducted in chapter 1 in which the research questions are addressed, and the case study method is selected as an appropriate research method. The second phase, ***design***, going into the set-up of the research is presented in paragraph 4.1. Third is the ***prepare*** phase, in this phase the specific data gathering, and interview protocols are constructed is presented in paragraph 4.2. Information about the ***data collection***, the fourth phase, including sources and storage is found in 4.3. To discover patterns, gain insights and identify concepts the data will be ***analysed and shared***, those last two phases can be found in chapter 5.

### 5.1 Research design

This sub-paragraph provides a plan from getting the literature study to the empirical case studied, as logical model of proof (Nachmias & Nachmias, 2014). Literature has been consulted to find suitable research methodologies for the main research question and the three formulated sub-questions. A theoretical framework specified on the domain reflecting platform openness and impact of network effects has been presented in figure 10, chapter 3. This theoretical framework specified on the domain needs confirmation; interviews are used to collect qualitative data to explore what propositions in the theoretical framework specified on the domain are relevant for platforms in the financial sector. The data is analyzed based on coding using Altas TI Cloud as a tool. The case study will also show the relevance of openness on financial platforms.

#### 5.1.1 Choice of specific methodologies

There is no predefined format of a case study design, therefore a unique design will be constructed which requires careful consideration. The book of Yin (2017) is used to design a rigorous and methodological correct case study. For the purpose of this research a **single-case study** is chosen because in this research a unique case because the relation between the Purple Bank and FinCo is unique and results therefore are context dependant (Ruddin, 2006). Existing theories related to platform openness and network effects will be confirmed possible negative effects of openness or extended. The dynamics in the research scope: platforms arise rapidly in the financial sector and legislation is changing it is a relevant and special topic. Value of the case can be connected to many platform start-ups within the financial sector, as those platforms will confront similar struggles. Relevant common factors addressed in the case are circumstances of the financial sector, conditions, social processes within a financial institution and different perspectives begin sponsor and provider role and more. For this research the **holistic approach** is selected, because a single case is researched including the perspective of the Purple Bank and FinCo, there are no other fintech's studied. Two limitations are identified when executing a holistic approach. First limitation is to conduct a research without sufficient and understandable measures (Yin, 2017). This is tackled by enforcing strict selection criteria of participants to ensure knowledge on the topic. Also, information is provided on the terms used to make sure the concepts used in the interview are well understood. Second limitation is to

remain the original nature of the case as there is a Possible negative impact of openness of shifting while conducting the research. Previous research on platforms have already used multiple qualitative methods and several quantitative methods. The research scope of this topic is to explore the factors relevant on each level of openness being strategic, technical and governance. This will be helpful to impact of network effect on the choice of being open. The research is qualitative therefore more describing form of research and focussed on interpretations, experiences and meaning. Besides, it offers the Possible positive impact of openness to ask though and discover underlying mechanisms. Therefore, open questions are appropriate (Ayres, 2008). A **semi-structured** interview method is selected as a suitable method because it allows a basic interview schedule with generally formulated questions but it also room to deviate from the basic scheme for each interview, for example by continuing to ask if a respondent says something remarkable or to further substantiate or clarify his answer. As a result, much detailed information will be obtained, which is of value in this qualitative study. A disadvantage is that the semi-structured interview has a lesser validity compared to a structured interview because of the lack of comparable elements. To keep the validity of the research as high as possible/ strong a research protocol is constructed to enhance order.

### 5.1.2 Data sources

Multiple data sources are used in this case study, also called triangulation. This way, the outcome of the interviews can be confirmed or possible negative effects of openness by the other data sources (Rothbauer, 2008). The construct validity is strengthened by using several information sources (Yin, p43). This research used literature, received documents from participants and interview data as data sources. In this research literature is used to find key issues. Chapter 2 provided theoretical insights on platform openness and (in) direct network effects. The theoretical propositions will have a essential role in helping you to generalize the lessons learned from the research (Yin, 2017). Thereby the research provides the Possible positive impact of openness to shed empirical light on theoretical concepts and principles related to impact of openness and network effects.

There have been 7 documents received. To give an indication of the documents, table 3 presents an overview of the title, author, type of document, quantity of pages, publication data and date received. In appendix A, a summary of each document can be found. These documents are stored, coded and analysed the same as the interviews.

Document	Given title	Author	Type of document	Pages	Publication date	Date received
1	Overview of business model fintech and goals for 2019	fintech	PowerPoint presentation	51	13-11-2018	22-03-2019
2	Platform view	Financial institution	PowerPoint presentation	1	2018	07-06-2019
3	Platform handbook	Platform orchestration team	PowerPoint presentation	10	01-2019	04-07-2019
4	Platform business model elements	Platform orchestration team	PowerPoint presentation	10	01-2019	04-07-2019
5	Business insider case study: How they launched open banking enabled services	-	PDF	3	28-03-2019	04-04-2019
6	Open is the way to go	Speaker at Money 2020	Webpage	2	07-06-2018	10-4-2019

Table 1 Overview of document sources

The interviews are used to gather empirical knowledge, these will be conducted in person. The advantages are: the interview can be conducted extensively, a respondent available time, therefore will be open for a longer conversation. Besides the conversation, face expressions can be observed as well. Remarkable emotions would be confusion or uncomfortable expressions. There is room to go deeper into a certain topic. This could be valuable when the answer of a respondent is not clear or specific enough. Besides, the personal ambiance might enhance the interview positive and tell more about the topic than initial thought of. Disadvantages of a personal interview versus for example a questionnaire through email is that it takes more effort from an interviewee and respondents to schedule a meeting. This issue is tackled to conduct the interview at the office of a participant and thereby minimize the participation effort. Second limitation is that physical presence of the researcher might bias the answer of the respondent. The interview topic could contain sensitive information, anonymity can have impact and result in people to answer in a untruthful. This is tried to be tackled to address the issue is for university research and the research is conducted anonymously. Besides, conducting the interview in person offers the possible positive impact of openness to ask again and to ask deeper, unlike with an email. The possible negative impact of openness of an email is that you receive standard and social desired answered. Another is the issue of language, as not the interview participants aren't English as native speaker, this might limit people's ability to express themselves. Although this issue is of minimal influence as only half of the interviews are conducted in English and more importantly those participants speak English on daily basis in their work environment.

### 5.1.3 Description of specific case study

In the financial sector there are many institutions dealing with financial services and various banks. This research focusses on traditional banks who want to incorporate innovation and see the banking-as-a-platform model as a promising business model for the future. These are referred to as Purple banks. Purple has been chosen as a symbolic colour, it cannot be associated with a traditional brand. In addition, it is a mixture of green (sustainable/future) and red (traditional). In the case study one Purple Bank is researched. The alias of the fintech included in the study is FinCo.

FinCo offers smart money services to end-consumers. The company's mission is to give everyone the power to be smart with their money (Appendix A, document 5). The application provides insights into a customer's current accounts, savings, credit cards, pensions and investments in one place thereby FinCo embraces the principles of open banking. The platform provides aggregation of the financial accounts of consumers and wants to offer the option to enable consumers to use Personal Financial Management (PFM). The use of Open Banking API's to aggregate accounts of multiple banks was not done before. For consumers this is a unique feature, it provides overview of the financial status. It removes the struggle to check every account at various banks. The Purple Bank enabled the customer to gain insight in to their financial status very easily by providing the overview.

FinCo is launched as a standalone project for two reasons. First of all to remove the bias of the Purple Bank towards the product. Second, it is valuable to discover the opportunities without any limitations. As a standalone project, FinCo can develop in unrestricted environment. Currently, FinCo has 900.000 consumers, connected 25 banks and other financial institutions have joined the platform. For example an American bank, British bank and an online bank



from United Kingdom. Besides, financial services are offered to consumers, there are already 5 producers offering services and the number is growing.

FinCo is a distinct entity and therefore independent from a legacy of requirements of the Purple Bank. The fintech is free to work with their own methods and select an appropriate way of working. This enables continuous and real time improvements.

The case is suitable to answer the main research question because: multiple perspectives are included which will give a complete insight. As indicated above there are currently considerations related to openness of the platform to enhance the open banking strategy case offers the Possible positive impact of openness to investigate a research in a field with little public data. The insight into the Purple Bank and FinCo is a unique. Furthermore, FinCo is already an established platform questions can be asked in depth and changes over a period can be observed.

From the Purple Bank perspective insights are valuable, next to FinCo there will come more initiatives to develop platforms that could incorporate open banking

#### 5.1.4 Quality requirements

This research aims to design a high-quality case study and to collect, present and analyse data correctly and fairly. To enhance quality identified tests to check the quality and the five traditional concerns identified when executing a case study are addressed.

##### **Five traditional concerns**

There five are identified when executing a case study, how these are minimized is discussed in this section (Yin, 2017). The first concern relates to the execution of the method, the study should be *rigorous*. By strictly following structured and systematic procedures this Possible negative impact of openness is reduced. A second concern is connected to the goals and intentions of the research. There should be no confusion with non-research case studies such as for education purposes. Confusion is limited by mailing the purpose and repeat it in the interview itself. The third concern is the ability of the case study to generalize from a single case study; it must be suitable to generalize conclusions from and contribute to the existing field of knowledge. In the end the goal of the case should be expanding and generalize theories instead of analysing the specific case in detail. Therefore, in this study theoretical proposition and related issues to guide the anticipated case study and generalize its findings (Yin, 2017). The fourth concern is related to the unmanageable level of effort a case study could lead up to. To avoid this, documents are very well structured and saved from the beginning. The fifth and last concern is related to the unclear comparative advantage compared to other research methods. This concern was dominant in a period in which there was a focus on quantitative approaches. The power of a case study lies in answering on the “how” and “why” questions (havelson&Towne,2002, pp.99-106). Semi-structured interviews are used to use this power, it enables the interviewer to ask deeper and identify underlying reasoning.

## 5.2 Preparation of case study

In preparation of the data collection, interview participants are selected and contacted, ethical considerations are made, and interview protocol is formulated. All elements of the interview procedure are discussed in this paragraph.

### 5.2.1 Selection of and contact with participants

There have been several meetings (4/5) with a key informant to gain understanding on the case and its specifics. The informant provided all names and contacts within FinCo, I conducted 4 official interviews. To give more context, FinCo has about 80 employees and this number is rapidly growing. The key informant also introduced me to a couple of participants within the Purple Bank. During these interviews new names and contacts were gathered. At one-point repetition of names occurred. From this it can be concluded that all relevant informants have been included in the interviews. The Purple Bank is a big concern with over 13.890 employees, the innovation team is about 40 employees.

Participants are selected based on the following criteria:

- Minimal 1-year experience
- Indication of level of functioning
- Sample criteria
  - o Strategic/operational expertise
  - o Platform sponsor/ platform provider role

Table 4 provides an overview of interview participants including the selection criteria are presented. Facts and background knowledge on the participant are provided in Appendix C.

Participant	Experience in current position	Level	Business area	Role of involvement (Eisenmann)
Participant 1	2 years	Sr consultant	Strategical and operational	Sponsor
Participant 2	3 years	Sr consultant	Strategical	Sponsor
Participant 3	1 year	Sr management	Operational	Platform provider
Participant 4	> 3.5 years	Executive	Strategic and operational	Platform provider
Participant 5	-	Sr management	Strategic	Sponsor
Participant 6	> 3.5 years	Executive	Strategic and operational	Platform provider
Participant 7	> 3.5 years	Executive	Strategic and operational	Platform provider
Participant 8	3 years	Sr management	Strategic	Sponsor

Table 2 Overview of interview participants

In advance of the interview the goal of the research and interview have been made clear, based on this a participant can decide to contribute to the research. For this first contact, a short e-mail has been drawn up which can be found in appendix D. After the candidate has given permission, a date has been set.

### 5.2.2 Approval for human subject's protection

When conducting a research involving a human 'subject', ethical considerations are required (Yin, 2011) (Human Research Committee TU Delft, n. D). The participants are not exposed to any form of Possible negative impact of openness or conflict of interest. The participant gave voluntary consent to participate and were given the freedom to withdraw at any time. Before starting the interview, the purpose of the study and scientific value is expressed. Besides, approval has been requested to voice record the interview for study purposes. The approval of conducting the interview and use the data for the research is given by signing the participation form (Form of consent, appendix F).

Due to privacy concerns the transcripts and received documents are not published in this research. All transcripts are numbered, based on order and saved with only the number in the title. The same goes for the signed and scanned 'Consent form interview'. The received supporting documents are saved by the given title. The result is a large amount of data. The data is uploaded into Atlas TI Cloud version to do the coding. This will be helpful to provide insights into the large amount of collected data.

### 5.2.3 Interview protocol

To make sure every interview has the same order a so called interview protocol is formulated. This also ensures all participants have the same information and experience the same setting. This enhances the **internal validity** of the research method (Yin, 2017).

First an introduction on the research topic is provided, then the interview process is elaborated, and permission is asked for recording. The full interview protocol is presented in appendix E. In preparation for the interview, it is important to properly inform the interviewee about the design and approach of the research. Platforms is a concept in which many give their own interpretation, as well as openness can be interpreted in different ways. To avoid confusion, desired knowledge needed for the research is clear an information page is made including definitions of core concepts used in this research such as platform and (in) direct network effects. Also, the platform roles identified by Eisenmann (just in case of need) and at last the levels of openness on a platform are elaborated. The one pager has been constructed based on the pilot case (4.2.4). A discussion on the definitions used has never occurred. Although from FinCo perspective the concept openness was in several interviews an unknown, then it was required from the interviewee to provide more examples. The one pager is presented in Appendix D. To strengthen **ecological validity**, all interviews have always been conducted in a separate room with the participants in the office so that they feel at ease and are free to talk. In addition, the interviews were conducted individually because some questions are somewhat sensitive, and people are not intimidated by their opinions on answers. The interview consists of three parts: introduction, middle part and the final part; the completion.

The first part, the introduction consists of two questions. First question goes into the role and responsibilities of the participant. The second question addresses the relation from their position towards FinCo or the Purple Bank or the other way around. This is useful in some cases to understand the relationship. Then openness is addressed, and the layers are explained by the interviewee. If the participant preferred reading the information page this was of course also an option.

In the middle part of the interview started. In the middle part, three questions are asked on a high-level approach on strategic, technical and governance level. For example: What are strategic opportunities and Possible negative impact of openness of platform openness from your perspective? The propositions in the theoretical framework specified on the domain are used as help-questions.

In the final part, open questions were asked to test into what extend the vision on openness is brought into practise. *Could you give an example how openness is within your strategy of platform?* This open question is adjusted dependent on the interview. When a participant knows a lot on technical openness, this question was scoped to that specific element. Following question asked was: *What is the role of network effects in the vision/ strategy of FinCo/ Purple Bank? And how are they enforced?*

#### 5.2.4 Pilot interview

In preparation of the official interviews a test interview is conducted with a respondent to make sure the questions were clear for participants and to make sure the required information I want to know is gathered with the formulated questions. From the pilot is learned that some general definitions were needed as not everyone uses the same concepts such as network effects and openness split into three layers. In advance it was the idea to go into specific propositions. It turned out that these propositions were too specific and too much, therefore it is decided to ask overarching questions going into strategic, technical and governance openness and use the framework as help (assistant) questions. Input based on this the pilot interview was valuable to complete research design.

### 5.3 Data collection

Data is collected through recording, on which transcripts have been made. Unfortunately, two interviews have not been recorded. One because it was conducted through WhatsApp call and the other due to technical issues. For both extensive notes are used to make a transcript useful for the coding.

The interviews are transcribed. To code the interviews, a qualitative data analysis software tool ATLAS TI Cloud is used, the four steps listed below are followed during the coding process (Weston, Gandell, Beauchamp, McAlpine, Wiseman & Beauchamp, 2001).

1. Open coding: in this phase all interesting propositions are labeled.
2. Axial coding: related labels relate to each other. Some labels might be placed into multiple overarching themes.

3. Selective coding: identify the main categories, found in the previous steps are used to construct a theory. This is done by searching for relations between the concepts within each category.
4. Iterations: step one to four is repeated for new interviews.

The identified data patterns, analysis and results are presented in chapter 6.

## 6. Results and analysis

This chapter presents the results and analysis of the case study. The first paragraph elaborates on the case study and how it contributes to the purpose of this research. In the second paragraph, data patterns are displayed. In the third, fourth and fifth paragraph, findings related to the theoretical framework specified on the domain respectively on strategic, technical and governance level of openness are presented and analysed. In paragraph six, an overview of the factors found in this specific case study is presented. The findings connected to the sponsor and provider perspectives and answer to sub-question number 3 can be found in the last paragraph, number seven.

### 6.1 Introduction of the case study

This paragraph presents: First of all, the definitions of platform, network and openness used in the case study. In Chapter 2, this study provided definition of important concepts used in the purpose of this research such as network externalities, platform and openness. It is important to be clear about the meaning of these concepts to avoid confusion. It is important to know how these concepts are defined in the case. This will provide insight to what extent the meaning of the concepts is overlapping, which is helpful for interpreting the results of the case study, this will be presented in 6.1.1.

Second, the tasks and responsibilities of the sponsor and provider will be presented. In chapter 2, the roles of Eisenmann are used to structure the research. The tasks and responsibilities of each role is different for each platform. When conducting research on a platform, the roles of Eisenmann are helpful to understand the dynamics and dependency between platform roles. This research is focussed on the sponsor and provider role, therefore those will be explained in 6.1.2.

Finally, the regulation the Purple Bank and FinCo deals with will be described. Regulation is addressed as a dominant element in the sector. The type of regulation is dependent on the services provided by the platform. For example, Raisin only does business with EEA bank partners. The last paragraph, 6.1.3, describes into what extent rules and regulation are relevant in this specific case study for the sponsor and provider.

#### 6.1.1 Definitions of core concepts used in the case study

A source that is used within the Purple Bank to illustrate what a platform is and how it works is the document called the *platform playbook* (Appendix A, document 3). This could be seen as an introduction and handbook to start a platform. In this document the Purple Bank defined all elements of a platform business model and all mechanisms involved. One of the appendixes of this handbook is the: *platform business model elements*, (Appendix A, document 4) this document provides a description of the elements behind the platform business model. These documents describe the characteristics of a platform e.g. having different user groups. The documents are made to address the complexity of an ecosystem and say methodology can't fully comprise all the cases, but a common methodology is a great way to approach complicated matters. The process is essential based on a set of roles that

are considered for the entities around a platform. Including key elements that will help to understand platform and how you can model it.

In the Purple Banks handbook (Document 3) a **platform is defined as:** *“A platform is a multisided business model, which has open architecture and governance structure to enable value-creating interactions between people, organizations and business”*. The definition is overlapping with the one provided in chapter 2 is creating value creating interactions between different user groups. It is remarkable that an open architecture is included in the definition.

**Network effects are defined as:** *“A platform creates network effects, improving and creating more value for its users each time a new producer and consumer joins”*. The case study does not distinct direct and indirect network effects

The **definition of openness** consists of essential elements also identified in previous literature studies, presented in chapter 2 being: multisided, open architecture, governance and value creating interactions are included. Some additional propositions describing the main characteristics of a platform: *“Platforms are scalable, open and borderless”*. These indicates the importance of openness because the main characteristics are captured in only three terms, **open** is one out of three. In the document is a list to help to assess the quality of ideas on the business model requirement a *“Platform business model assessment checklist”* is presented on the last page (p.10) of document 3, is addressed not all of the criteria are relevant at the inception stage of an idea, so it is useful to go back to this checklist throughout the process of developing a platform business and decide whether your idea has a platform business model potential. It is used to further validate shape and build a platform business. The list includes criteria such as monetarization, governance and network effects. A remarkable checkbox on the list is a *“strong control point”* defined as *“a platform has a clearly identified control point, enabling it to orchestrate the ecosystem and provide a differentiating experience for producers and consumers alike”*. More context: *“Successful platform businesses have a strong control point which is hard to replicate for any new competitor. If you have an idea of a platform business, ask yourself the following question: If someone was to create the same platform tomorrow, what will make your model defensible and prevent your user from switching? The answer to this question will be your control point”*.

According to the Purple Bank the key to a successful platform strategy is to identify the control point and embed it in your platform design from the very beginning. Based on the definition and context provided can be learned that the platforms are business oriented and focused to find a solution for both sides of the market and formulate a unique value proposition. The concept of control point is of importance in balancing the opportunities of openness (i.e. network effects – 5.1.1) versus the possible negative effects of openness (reducing switching cost and customer binding – 5.1.2).

### 6.1.2 Responsibilities and tasks of the sponsor and provider in the case study

The **sponsor role** consists of one investor, the Purple Bank, and has a venture relation with the platform provider FinCo. The **platform provider** is responsible for the strategy, development and operations of the platform. FinCo only has to get approval of the Purple Bank on their strategy.

Unlike some other platforms, the sponsor has limited responsibility on the functioning of the platform. This does not mean the case study is less valuable. The case study can address the difference between the concepts formulated from the Purple Bank and the operational relevance for a fintech like FinCo.

In some interviews is addressed specifically that the Purple Bank could be in the sponsor role or the provider role. As the Purple Bank want change and stimulate innovation in the financial sector, they have an innovation team in which they help new initiatives by offering facilities like a test environment and coaches and so on. The advantage is already mentioned when you are a fintech that you can test the value proposition and grow incremental, you will be financially support. Competitors have a harder time because in the first phase they lack initial investors, knowledge on regulation and most important the consumer trust. The disadvantages occur in a later phase, when the platform wants to grow. Partnering for example, the due diligence is quite extensive compared to other fintech's. Of course, when you are in the financial sector this is needed but when partnering with a partner from a different sector, like mobility this is not relevant, although due diligence is required. Furthermore, a platform is built from scratch to be scalable and adaptable. A traditional bank is far from that, there is a big legacy of systems and due to the size, it processes slow. Last important remark made by participant 3 on this topic is the dependency of any fintech on the API's of the bank. *"We can be as strong as the weakest API of the bank"*. The cooperation with a bank can be beneficial for a fintech, although it is dependent on de sector the platform is focusing on. It could be that the services are too close to the bank, then it could be a disadvantage especially when searching for partners. They fear being eaten (participant 7).

### 6.1.3 Impact of sector regulation on the sponsor and provider in the case study

In this case study, sector regulation is a re-occurring topic in each interview. Interesting remark of participant 1 is: *"Other successful platforms went on the edge of regulation or no regulation, this enhanced their freedom and disruptive effect"*. According to participant 2, 4 and 5 in case of the financial services adopting regulation can be considered as an advantage as this it gives trust to users. In this sector the trust of users is very important. That is also the reason why established financial institutions have an advantage on incumbents, the legacy of being a trustworthy business partner stimulates customer adoption. In some situation, regulation functions as a locker because there is no open competition, this is where fintech's are very successful and grow fast. According to participant 4 the financial sector can be split into two parts. First the easy access part, in this fintech's are real competition to financial institutions. FinTech's have an advantage because they do not have to comply with all regulation. Second part is the heavily regulated market, in this part the established traditional banks have an advantage because they know the regulation and they are already compliant. This is the part with the large potential and disruptive effect. For example, wholesale, highly regulated and only view players in the field.



Participant 8, who is active in this highly regulated part of the Purple Bank indicates the struggles “*Unlike retail we do not have an example*”. They are struggling with the value proposition of a platform in this specific area. They are brainstorming on a value proposition that is so valuable for the market that their consumers (big corporate companies) go through the “trouble” to use the platform. As they only conduct those transactions rarely, it is a very challenging and complex field. The retail banking, as FinCo is a retail platform are the focus of this research.

## 6.2 Structure of results

After open and axial coding, described in chapter 5, three categories of the theoretical framework specified on the domain being strategic, technical and governance are found through selective coding. This is not a surprising outcome since the main interview questions are based on strategic, technical and governance level of openness. The following three paragraphs on respectively strategic, technical and governance openness include the subparagraphs: possible positive impact of openness, possible negative impact of openness and ends with an analysis of the findings. An overview of results is presented in paragraph 6.6.

Within each subparagraph, the propositions on each level will be discussed. Based on the interviews and additional data sources, some propositions are identified, and some are not. The propositions that are identified as possible positive or negative outcomes of openness are categorized as **relevant propositions for this case**. The propositions that are not identified or are not relevant in the context of the case study are categorized as **not relevant propositions for this case**. Additional formulated propositions reflecting new relevant data based on the interviews which could be allocated to one of the 3 levels of openness and categorized as **additional identified propositions**. The newly found propositions are allocated to one of the four Eisenmann roles and given a reference number in the range 100-200.

## 6.3 Results and analysis of strategic openness

### 6.3.1 Possible positive impact of strategic openness

#### **Relevant propositions in this case study**

The following propositions from the theoretical framework specified on the domain are confirmed by the data found in this case study.

1. *Increases availability*
3. *Creates competitive platform*
6. *Increases diversity of products*
13. *Fosters innovation*
15. *Encourages participation*
17. *Increases market power*

In the interviews participants of the Purple Bank (sponsor) often refer to the platform handbook and one of its appendix, represented in document 3 and 4. In the handbook, document 3, openness is already addressed on the third page as: *“One of the biggest strategic decisions a platform business faces are how open should the platform be to third party participation and what should remain under the control of the platform owner. Open architecture has its benefits, but to what extent should the platform owner open up?”* The citation indicates the strategic dilemma of openness, as found in literature. From both the vision of the Purple Bank as FinCo perspective, openness is seen as a possible positive impact to increase availability, encourage participation, create a competitive platform, increase market power and foster innovation.

Although FinCo argues the added value of platform growth on producer side. According to participant 7, connecting producers should be done wisely. Just adding producers is pointless, you need to add producers that relate to the purpose of the application, otherwise the consumer does not benefit from an extra producer.

According to FinCo, the key factor to attract people is quality of the service, especially when it is about financial related services. Therefore, you gain consumer trust, which is the most important to become successful in the financial sector. Additionally, the slickness of the journey and the wow effect, as previously mentioned. Like Uber, the service did not change that much but for you as a customer, the whole experience changed! The slickness of the customer journey will determine the number of users. A strong value proposition and market budget is used in the case of FinCo (participant 6). Furthermore, a strategy is to become the so called “talk of the town”. A future goal is to empower users, if you have some control as a user you feel involved. Participant 5: *“Like Airbnb, I cannot say I am a consumer of Airbnb, but I do yes it”*. Participant 2 addresses the value of incorporating learning effects and thereby keeping the interest of the platform user by for example keep the tempo of developing new services as high as possible, participant 4, 5. Thereby you keep triggering the users’ attention. This is closely related to gaming methods like discount for subscribing.

#### 7. *Attracts producers to the platform*

From the perspective of FinCo becomes clear that new platforms in the financial sector have a hard time to facilitate interaction between different type of services. To illustrate the difficulty a quote of participant 3: *“It is difficult to find partners who are willing to connect, because this technically requires a high investment”*. More about these technical elements later. For now, the focus is on the willingness to connect. In the interviews is addressed that platform providers experience a tipping point. There is a moment in time that producers become “more willing” to connect, although the technical costs remain the same. According to participant 3 and 4 this has to do with growth of the platform in number of consumers, which at a certain level proves that the concept of the platform has works and is expected to grow even more. This implies that complementors choose platforms that have future growth prospects. According to participant 7 the market is currently divided into roughly 3 types of groups: big corporates, MKB’s and small startups. The first group, big corporates are arrogant and do not take a fintech serious. The second group knows they need to move and want to move but do not exactly know how and into what direction. They are certainly searching for opportunities. The last group is the one that is very eager to benefit from your success and

willing to connect. The downside is that they are also figuring out how the market works and create a platform. In short, it is a rough market. One day you are the most promising startup and the other day you could be nowhere.

## 2. *Attracts more consumers*

The participants of the Purple Bank see proposition 2 as key impact of openness, openness as one of the most important ones because the attracting more users is critical to start and become a successful platform. Participant 3 (FinCo) on the other hand strongly addresses that in practice more providers do not lead to more users. *"I can say from experience that more producers do not equal more users, it is the magic that happens when you open the application"*. The participant has several years of work experience at another worldwide successful platform. This background information is mentioned to strengthen the argument Attracting more users is caused by completely of different things according to participant 3 and 5, such as the slickness of the customer journey and the "wow" factor of the services offered. Participant 8 does say openness could lead to such things but not in the business to business market.

## 8. *Increases consumer adoption*

Participant 6 was involved in the product progress and selling first product to the first users of FinCo. The value proposition of FinCo was the key selling point. *"That is the reason why users download the app."* As participant 6 strongly addresses. The platform mechanism makes the users active and explore other possible services the application can offer. The primary reason is the original service we offer, and they were the first to do so. This is the customer adoption, when they like the primary product, they think of new possibilities to explore. A strong proposition adding to this made by participant 7 is that one of the selection criteria before partnering is that a customer must have a way back to the app of FinCo.

## 18. *Enhances trust of users*

Trust is very important for a consumer to use financial products and services. A traditional institution already gained that customer trust, therefore a big bank behind a fintech can be an advantage. Being open could decrease the trust of users. This is experienced as one of the biggest possible negative effects of openness. Participant 3: *"Because it is about customer financial information, we cannot become intrusive, which is quite quick the case"*.

## **Not relevant propositions in this case**

Propositions that are not mentioned and are also not in line of the conducted interviews and other data sources are:

## 14. *Increases co-creation of products*

## 17. *Increases market power*

It could be that proposition 14 is a bit too far-fetched, the future might bring such strategic opportunities but since trust and security is a big issue it is not likely that this could be executed in the nearby future. As most applications are free for consumers, to stimulate participation, increasing consumer adoption was not relevant in the conversation.

16. *Reduces consumers concerns about lock-in*

Participants (1,2,5,7,8) address reduction of customer lock-in in the financial sector not a Possible positive impact of openness to attract consumers, the opposite effect is what is worrying. Because of the low switching costs, creating customer lock-in is a possible positive impact of openness to bind the customer to the platform. This enforces proposition 11.

### **Additional identified strategic opportunities**

100. *Offers complementary products (Sponsor)*

During the interviews the quote *“Open is the way to go”* from document 6 (appendix A) is often referred to, as openness is an obvious goal for the whole banking system. It is important for a traditional bank to broaden current services and become open for new services. To illustrate the issue a quote of participant 2: *“The fact that you used to have good and successful services does not mean your current services are good. You need to explore new options”*. Openness could help with exploring new services. The biggest opportunities distinguish yourself from other financial institutions is to offer complementary services. According to participant 8, good that you announce the ambition of *“Open is the way to go”*, but how can we possible reach this in practice. The lack a standardized system, an example of a platform and are limited through strong regulation. *“How can we possible realize this?”*- participant 8.

101. *Creates first mover advantage (Platform Provider)*

To be the first and enjoy the first mover advantage is often mentioned by interview participants as ambition. Participant 2: *“Being the first makes you more attractive for participants because you are the only one and it will make your platform needed”*. Traditional banks have the resources to become the first mover (participant 3 and 5). Quote of participant 5: *“You want to have the first mover advantage. If you already have a piece of the pie, there is less pie to be divided”*. On the other hand, participant 8 addresses the complexity of creating such a good platform in the financial sector. *“Some people say we are sitting on a goldmine of data, please come and look because we are not getting it”*. This is caused by the fragmented systems used in such a large company. It makes it hard to get this data out, also when we have the data, a lot of it is confidential, or at least we cannot use it directly. *“Our consumers, especially the corporates would not appreciate it if we are transparent about issues.”*. So, there are multiple barriers to overcome. For sure, we want to become the spider in the web.

102. *To incremental growth of platform and services (sponsor)*

Literature indicates that platforms prefer to be open from the start to accelerate growth on both sides of the platform. Financial institutions prefer to introduce openness incremental on one of the sides. The following steps are described by participant 4: first discover the pain point in a market and check both sides of the market. Is the pain point on the consumer side and can it be solved by the provider side of the market? If this is true, formulate a value proposition. Test the value proposition and start testing with a specific group. Check how the network effects occur and how. Learn from the experimental phase and expand. Additional quote from participant 4: *"The level of openness is dependent how much you can handle the first time"*. Preferably openness is introduced incremental and offers the Possible positive impact of openness to speed up the growth in a later stage, document 3 and 4. Participant 7 also addresses the issue. *"First, we were more focused on growth and numbers of partners, now we are more selective because we know it is useful to connect only partners that contribute the core of the platform"*.

### 6.3.2 Possible negative impact of strategic openness

#### **Relevant propositions in this case**

11. *Weakens customer lock-in*

Propositions 11 is confirmed as important possible negative effects of openness needed to be tackled. The financial market already is becoming more transparent which makes it for consumers easy to compare services on price. This makes it very easy for a customer to switch to the service provider with the lowest costs. Resulting in the Possible negative impact of openness of weak customer binding. Interview participants address the importance of the *value proposition* (mentioned earlier) to minimize this Possible negative impact of openness. Especially participant 6, who is responsible for the product of FinCo is thinking of ways to keep triggering the customer to use the application.

12. *Reduces profitability of the platform*

40. *Cannibalization of products*

Proposition 12 and 40 are both confirmed. Most traditional banks all offer comparable services like loans, mortgages and savings. There is not one marketplace on which banks offer all products to all consumers. Openness on strategic level leads to the Possible negative impact of openness of offering services of competitors. This means that one must be sure to offer the best ones, otherwise the selling channels of competitors would be facilitated. The Possible negative impact of openness of not being the facilitator of such a platform is that the Purple Bank becomes a producer of services to other (banking or fintech) platforms. Launching a cross banking platform. Offering e.g. saving services might lead to a reduction of profit margins on the short term, as one cannot always be the best and stimulate consumers to select the best. On the long term this could lead to efficiency and long-term value of the platform. It becomes needed and additionally there might be the advantage of being the first mover (Possible positive impact of openness – 5.1.1).

### **Not relevant propositions in this case**

4. *Decreases market share*

10. *Increases vulnerability of ecosystem*

Proposition 4 and 10 are irrelevant for this research. Proposition 4 considering the vulnerability of the ecosystem is partly mentioned in the technical aspect, therefore this will be explained later in 5.2. Proposition 10 related to the market share is not mentioned because the sector is not in this phase yet.

### **Additional identified strategic possible negative effects of openness**

From the data more, strategic possible negative effects of openness are identified.

103. *Decreases ability to differentiate products (Sponsor)*

Within the financial sector it is hard to address the price quality balance of products unlike other products. The example of participant 5 is used to illustrate the issue. The quality differences can be very clear on a platform like Airbnb, if the house has a swimming pool the consumer will notice the quality difference and thereby accept the price difference. Same goes for Uber, the brand of the car can be a factor why consumers are willing to pay more. In the financial sector quality differences are not clear and addressing those is therefore challenging. It is not clear what loan or other financial product is qualitative better or is offered for a fair price. Therefore, it is a possible negative effect of openness to present those differences to the customer on a platform. Why would someone not just go for the cheapest, that is the most comparable value now.

104. *Leads to commoditization of the institution (Sponsor)*

This proposition reflects further consequences of the Possible negative impact of openness o that a financial institution becomes producer on a platform instead of platform provider (the earlier mentioned *cannibalization of products* - # 40) Apart from. An additional disadvantage of only being a producer is that one is not in control (the platform providers is), leading to the possible negative impact of openness of being commoditized. Also, valuable direct customer contact will be through the platform.

### **6.3.3 Analysis strategic openness**

From the 18 propositions presented in the *theoretical framework specified on the domain*, 13 propositions are identified in this case as possible outcomes of openness, being both possible negative effects of openness. The other 5 propositions are not identified as possible outcomes of openness in this case. These propositions are not relevant in this case study and will be removed from the framework.

Considerable effort has been put into formulating the strategy of the Purple Bank, including theories that are relevant from their perspective. The participants from FinCo seemed to have a different perspective on openness on strategic level, as they were less familiar with the topic. They did not include this in their strategy or as a business

goal. To engage participants their focus is a strong value proposition. This can be seen as a product on your own platform. This is, according to FinCo, the most important factor to influence growth.

In total there are five additional found propositions on sponsor level and one on provider level. The high number plotted propositions on the sponsor role can be explained because in this case the sponsor has given more thought on this topic and is more informed on strategy of platforms because of the handbook.

## 6.4 Result and analysis of technical openness

### 6.4.1 Possible positive impact of technical openness

#### **Relevant propositions in this case**

The following propositions are confirmed in the case study:

24. *Enhances seamless connection*

30. *Lowers entry barriers to connect*

The added value of technical openness is addressed from several interviewed participants of the Purple Bank and from FinCo. As participant 2 illustrates: *"The perfect situation would be, to be able to connect the customer through a journey of only 2,3 or 4 steps to all types of partners without switching interfaces."* Which is one of the quotes that supports proposition 24. Platform providers have a possible negative effect of openness to prove themselves and be attractive in their first phase with respect to partnering. The entry barrier for service producers is currently quite high because of the required technical investments. Established financial institutions have a large legacy of backbone and other IT structures, which result in complex and slow IT system to connect with in general the complex IT infrastructure is specific for every financial institution, the market is very fragmented and there are no or very little IT industry standards. This makes it challenging for a platform to connect seamless with compatible producers and enhance in network effects. The problem of the fragmented market is confirmed by all participants in user group 2 (platform provider). They experience in practice that mainly fintech's are ready to connect as they have been designed in compartments to be able to connect quick and seamless. This limits the ability of a platform to connect with other market. These technical possible negative effects of openness will be further discussed in the next section. Clear is that technical accessibility is very much needed, and entry barriers need to be lowered for producers (Proposition 30). The highly fragmented market makes it difficult.

#### **Not relevant propositions in this case`**

21. *Increases benefits from other platforms*

Proposition 21 is barely mentioned. From the respondents it became clear that a financial platform could contribute to another platform, like offering a service on YouTube or Facebook but currently there are no interoperable systems to piggy bag the benefits from.

20 *Reduces costs of new technological infrastructure*

This proposition is not confirmed for the foreseeable future. The financial system is mostly company specific and built incremental over the years with i.e. regulation as a driver. Therefore, the systems of the traditional financial institutions are not designed in a “state of the art” efficient or effective way. It is not a likely scenario that there will be a new technological (backbone) infrastructure providing those financial services. Regulation is to impactful and its deployment to complicated. However, such initiatives like open banking is likely to happen more in the future. As participant 3 addresses “Open API’s is just the beginning, much more will follow”. This will allow others to provide services which originally can only be executed through the (traditional) banking infrastructure.

25. *Increases access to resources*

The platform sponsor and provider want to be in control therefore proposition 25 was not mentioned at all.

**Additional formulated technical opportunities**

There are no additional identified possible positive impacts of technical openness. On the contrary participant 4 and 5 say that now open API’s is the only way to be technical open (proposition 41).

6.4.2 Possible negative impact of technical openness

**Relevant propositions in this case`**

27. *Reduces ability to create differentiate properties*

Technical possible negative effects of openness are addressed from both sponsor and provider level. The propositions 27 is only shortly mentioned in combination with losing the ability to monetize. In document 1 the famous example of Linux is provided to illustrate this possible negative effect of openness. In the financial sector it will be challenging to offer differentiated standalone properties as in the financial sector most institutions offer comparable produces.

36. *Increases regulatory obstacles*

The reaction of participants on proposition 36 was quite interesting. Unanimous all participants agree on the potential of open API’s related to financial transaction data. Although participants 2 and 4 also have critical remarks. According to them the PSD2 does not create a fair level playing field. Why are API’s of other industry sectors not opened? Specially the big Tech companies like Facebook, Amazon and Google already have extensive data available of consumers through their digital footprint. Financial institutions used to be the only ones that had access to financial transaction data, which is valuable information on consumer behavior. Due to the PSD2 developments the big TECH companies, originally active in other non-financial sectors like Facebook will be able to add financial transactions to their already extensive knowledge base of consumer data. Data on for instance hobbies, interests, travel, medical info, place of living, etc. will be completed with data on financial transactions.



This creates a rather “creepy” setting for consumers, next to the fact that the non-financial data of the big Tech companies are not subject to the PSD2 directive, creating a non-level playing field. It could be an option to clarify the consequences for the consumer when allowing amazon to handle your payment and provide the consumer with alternatives. According to participant 3 it is really their own fault. *“They have the advantage now. Banks are the ones that have been sleeping, not the Amazons and so on. We should have known it was coming for a couple of years and should have been better prepared.”*

39. *Increases loss of control of customer data*

Proposition 39 are confirmed to be a technical possible negative effect of openness when openness is introduced. Protecting data security and privacy of financial data is of course a big possible negative impact of openness. As mentioned in the previous section the participants made it very clear that the infrastructure will always be in control of the platform owner or sponsor to ensure trust, safety and privacy to minimize this possible negative impact of openness.

**Not relevant propositions in this case**

22. *Increases technical efforts*

23 *Reduces market power of key provider*

26. *Gives away platform benefits*

28 *Reduces incentive for investments*

29. *Weakens market position*

The propositions above are not mentioned because when addressing the technical openness, the participants were so much focused on other issues and the propositions above were out of scope/ priority.

**Additional identified technical possible negative effects of openness**

105. *Increases management issues on standardization (Platform Provider)*

Technology is preferably not shared. Although seamless compatibility is desired. The problem, as mentioned in the previous proposition, is that predominantly fintech's are ready to connect. Other parties, mainly traditional financial institutions, - are not ready yet. This results in the situation that a first mover must do all the heavy lifting itself and invest. In general, the technical possible negative effects of openness are standardization. The question is how to construct standardization in such fragmented market? In a later stage it would lead to governance issues like how to manage and maintain such standardization.

### 6.4.3 Analysis of technical openness

From the 14 propositions presented in the *theoretical framework specified on the domain*, 6 propositions are identified in this case as possible outcomes of openness, being opportunities and possible negative effects of openness. The other 8 propositions are not identified as possible outcomes of openness in this case. These propositions are not relevant in this case and will be removed from the framework.

On this level, the majority of propositions is not identified as relevant impact of openness. A reason could be that the priority of financial sector is being trustworthy and maintain a safe environment. To ensure a trustworthy environment the Purple Bank and FinCo want to be in control of the technical aspect. Being technical open is not an option, therefore limited technical openness might not have their priority.

There is only one additional found proposition, a possible negative effect of openness is addressed from the provider perspective. As mentioned in the previous paragraph the market is technical very fragmented. This makes it hard to be able to seamlessly connect. In a couple of interviews there was a talk about a standardization, as a solution to be able to connect easily. The biggest possible negative effects of openness would be to create such a standardization, it would be extremely difficult.

## 6.5 Result and analysis of governance openness

### 6.5.1 Possible positive impact of governance openness

#### **Relevant propositions in this case**

37. *Generates a new level of services and network effects (e.g. PSD2)*

According to participant 1,2,4,5,7,9 openness on governance could lead to possible positive impacts. The example of PSD2 is used to illustrate the potential. Besides, it is one of the first regulations so therefore also one of few examples that are available. According to the participants it is expected that in the future laws and regulation will stimulate innovation, just like PSD2 does.

#### **Not relevant propositions in this case**

31. *Decreases costs of regulation*

38. *Creates long term stable network effects*

The opportunities of openness on the governance level, proposition 31 and 38 are not mentioned in any of the data sources. Governance appears to be a means by which control can be used to create a safe a trustworthy environment for consumers, this will be further explained in the section hereunder.

### **Additional identified governance opportunities**

#### *106. Enhances safe and restricted environment*

As stated briefly above, governance is seen as a Possible positive impact of openness to regulate and limit openness. Being in control and enforce regulation is important for a financial platform provider. A certain level governance can create entry barriers and thereby limit the possible negative impact of openness of low quality of services and malicious providers or consumers. Participant 2,3 and 4 emphasize that platform governance does not have to be expensive. Simple regulations such as: only allow users from a minimum age or kick out a provider after three bad reviews could be effective already.

### **6.5.2 Possible negative impact of governance openness**

#### **Relevant propositions in this case`**

##### *32. Increases anti-trust issues*

Proposition 32 is very relevant, trust is essential in the financial sector. This is also the reason that a platform sponsor and provider want to have a dominant influence on the platform and maintain control over who is allowed on the platform and be able to kick producers and consumers off easy if necessary. The possible negative impact of openness of losing control and thereby potentially lose trust of consumers and regulating bodies (like AFM, ECB) is not acceptable. This type of governance openness is a “no go area”.

##### *33. Decreases control of central point*

As addressed in the previous paragraphs, financial platforms need to allow only trustworthy users and produces. Therefore, a high input control is required. An effective input control does not need to be complex or costly, simple principles can protect the integrity of a platform. For example, only consumers of 18 year older or peer reviewing, kick a producer out after 3 mistakes creates pressure on third parties to deliver integer and compliant services. High input control is required to avoid losing control on the platform.

#### **Not relevant propositions in this case**

##### *34. Increases coordination issues*

##### *35. Increases coordination costs*

##### *41. Creates long term stable network effects*

Possible negative effects of openness related to coordination issues and costs (34, 35) and unstable long-term network effects (41) are not mentioned on provider level, because this is not relevant given the fact that such openness would not be an option from both sponsor or provider role.

## **Additional identified governance possible negative effects of openness**

107. *Increases complexity of responsibilities*

Clearly the financial system is highly regulated. Current legislation and regulations do not always apply to innovative developments, like platforms. This means that in many cases the regulation needs to be updated. In addition, there are also cases for which regulation does not yet exist, simply because these situations did not occur until this moment. In some cases, regulation interferes with the governance of a platform. Regulators are not fully anticipating and often do not yet know how to handle this dilemma. This makes it a complex playing field. According to participants there are multiple possible negative effects of openness in the sector related to determining governance to comply with regulating bodies. For example, there is sometimes no clear distinction of products, like a transaction of money: should it be considered as pension or should it be handled as a normal payment? (participant 3). Another example is that role of a regulator in the traditional bank is known, but with all kinds of new areas emerging, it is sometimes difficult to determine whether the regulator is dealing with these new areas or not (participant 5). This slows down the process and increases costs of the process due to complexity.

### 6.5.3 Analysis of governance openness

From the 8 propositions presented in the *theoretical framework specified on the domain*, 3 propositions are identified in this case as possible outcomes of openness, being opportunities and possible negative effects of openness. The other 5 propositions are not identified as possible outcomes of openness in this case. These propositions are considered not to be relevant in this case and will be removed from the framework.

## 6.6 Overview of factors found in the case study

In chapter 4 the *theoretical framework specified on the domain* is presented. The framework is used as a frame of reference to guide the case study and find possible impacts of openness on a financial platform from the perspective of the Purple Bank and FinCo. The propositions are used to explore impact factors. In the previous chapters relevant propositions in this case are identified and propositions not relevant in this case are identified. The propositions not relevant for this case are removed from the *theoretical framework specified on the domain*. The additional found propositions are included in the framework, allocated into the position they are identified in previous chapter. They can be recognized by the numbers 100-109.

**Figure 10** *Overview of factors found in the case study*, presents propositions only relevant for this specific case study conducted in this research. In other words, in the overview possible positive and negative impacts of openness for this specific case study are identified. Propositions numbered from 100 are the additional formulated propositions, printed in bold.

STRATEGIC			
Sponsor	Platform provider	Producer	Consumer
1. Increases availability	6. Increases diversity of products	7. Attracts producers to the platform	8. Increases consumer adoption
2. Attracts more consumers	13. Fosters innovation	15. Encourages participation	16. Reduces customers concerns about lock-in
3. Creates competitive platform	<b>101. Creates first mover advantage</b>		18. Enhances trust of consumers
<b>100. To offer complementary products</b>			
<b>102. To incremental growth of platform and services</b>			
Sponsor	Platform provider	Producer	Consumer
9. Increases long term efficiency	5. Creates unstable network effects	x	X
11 Weakens the feeling of being locked-in to the platform			
12. Reduces profitability of the platform			
41. Increases product cannibalization			
<b>103. Decreases ability to differentiate products</b>			
<b>104. Leads to commoditization of the institution</b>			
TECHNICAL			
Sponsor	Platform provider	Producer	Consumer
X	24.Enhances seamless connection	30. Lowers entry barriers to connect	x
Sponsor	Platform provider	Producer	Consumer
37. Decreases data security	27. Reduces ability to create differentiating properties	x	x
	36. Decreases through regulatory obstacles		
	39. Decreases control of consumer data		
	<b>105. Increases management issues on standardization</b>		
GOVERNANCE			
Sponsor	Platform provider	Producer	Consumer
<b>106. Enhances a safe and restricted environment</b>	x	37. Generates a new level of services and network effects	x
Sponsor	Platform provider	Producer	Consumer
32. Increases anti-trust issues	107. Increases complexity of responsibilities	x	x
33. Decreases control of central point			

Figure 10 Overview of factors found in the case study

## 6.7 Findings related to sponsor and provider perspective

The previous paragraphs the propositions were discussed into detail, some are confirmed and therefore considered to be relevant for the case and others are not confirmed and therefore those propositions are considered not to be relevant for this case study. The result of the case study is an overview of *factors found in the case study*.

From this overview, insight can be provided on the difference between the sponsor and provider roles, the vertical axis. These insights are categorized into the following paragraphs: difference between sponsor and provider perspective (6.7.1), shared perspective of sponsor and provider (6.7.2) and dilemmas identified by the sponsor (6.7.3).

These insights are required to provide an answer on sub-question 3, the answer can be found in the last paragraph (6.7.4).

### 6.7.1 Difference between sponsor and provider perspective

A difference in perspective has been observed between the sponsor role (Purple Bank) and provider role (FinCo).

**According to the Purple Bank**, network effects must be understood and engineered by the platform owner. In the case openness is addressed as: *“The biggest strategic decisions of a platform business face how open should the platform be to third party participation, and what should remain under the control of the platform owner.”* That there are several positive and negative effects of openness considered, network effects being a positive effect. Aspects like cannibalization and commoditization of products as well as losing trust are possible negative effects of openness to be countered. These aspects are further addressed in “dilemmas related to openness” later.

**From the perspective of FinCo** openness is not a key element in their strategy or vision. According to FinCo the key to success is a strong value proposition to attract users by offering services. With a good value proposition a user base is created, enhanced by marketing. Attracting partners to the platform is not a priority. As indicated in the results a partner is carefully selected. FinCo addresses that they have experienced a “tipping point” beyond which they are becoming more and more an established platform and partners become increasingly interested. *It cannot be stated that these observations are valid for all fintech platforms, since FinCo is one of the platforms sponsored by Purple Bank and the specific background of FinCo, which started outside the sponsorship of Purple Bank and its strategy on platform development. Nevertheless, the issues FinCo experiences during its development underline the practical dilemma’s and possible solutions on openness in the (sub)sector of Purple Banks.*

### 6.7.2 Shared insights from sponsor and provider perspective

Besides the difference in perspective between the Purple Bank and FinCo the case study also found shared and confirmed insights related to platform openness. First, the sector is highly regulated. Although openness is considered as valuable mechanism to increase network effects, openness will only be allowed on selective parts limited by regulatory boundaries. Secondly, Purple banks have an advantage in creating openness on a (partner)platform subjected to financial regulation given their experience with applicable regulatory frameworks.

On the other hand, they also are 'slow movers' because of this regulatory burden. Thirdly, technical openness to enhance seamless compatibility between partners is a complex and costly matter due to the lack of industry standards within the sector. Fourthly, both acknowledge the dilemma of having an open and easy access on the consumer side of platforms since this also implies low switching costs for consumers. Resulting in the possible negative effects of openness to keep consumers loyal to the platform. Finally, the approach is to introduce openness step by step. both the Purple Bank and FinCo mention a step by step approach to gain experience and shift the boundaries of the mentioned issues.

### 6.7.3 Dilemma's identified by the sponsor

Also, the following dilemmas, foremost mentioned by the Purple Bank:

*Openness versus commoditization:* Openness of products on a platform related to Purple Banks would lead to cannibalization: the introduction of a new product of a Fintech on a (partner)platform (e.g. a savings optimizer, giving consumers options of several competing providers) comes at the expense of the already existing savings product range of a Purple Bank, which may lead to an overall short-term profit reduction. On the long term it could lead to a profitable proposition depending on the market position of the relevant (partner)platform. The Purple Bank would then also maintain customer contact and thereby be a needed party, maintaining customer loyalty, expanding its customer base and thus network value. The – downside of not taking this path of opening these new products on (partner)platforms is to become commoditized; others might choose this path and add this product to their platform. The Purple Bank would become a producer hereof, losing business and direct consumers contact. This would lead to long term profit reduction on these products.

*Openness versus trust of the platform:* openness in general stimulates network effects. A Purple Bank has proven itself and became a trustworthy brand over the years. Make it too open will make it hard to control third parties and/ or consumers on the platform raising concerns on quality, privacy and other related values for consumers. This could endanger trust of consumers in the platform and possibly the Purple Bank itself. And trust is the ultimate value of a Bank. Losing trust is a no-go area.

*Openness versus monetization of the platform:* knowing who to charge and for what value of products or services must be based on whether these choices strengthen or weaken network effects. Make it too open and it will be hard to monetize because of the multi-sided nature of the platform business. Platforms struggle to determine the price of the service or product offered. This dilemma is applicable for all platforms and not unique for the financial sector.

### 6.7.4 Answer to the third sub-question

This subparagraph answers sub-question 3: *Do expected network effect have impact on the decision of a platform provider of sponsor to become open on a financial platform?*

The answer from **perspective of the Purple Bank** is: openness does have a positive impact on network effects, and it would stimulate growth, participation and innovation. The Purple Bank also addresses three dilemma of

openness. The handbook and participants indicate that openness generates, next to positive network effects, also several possible negative effects of openness and dilemma's, but that is beyond the scope of the third research question. In the answer to the main research question, these aspects will be included (Chapter 8).

The answer from the **perspective of FinCo** is: no impact, because impact of openness is not a familiar openness to stimulate network effects is not in their strategy or "top of mind". FinCo experiences during its development underline the possible negative effects of openness and dilemma's regarding openness in the (sub) sector of Purple Banks. Such as lose control on the platform and decrease data security.

**FinCo and the Purple Bank address the** positive impact of a strong value proposition on the network effects. A value proposition refers to a customer service provided by the platform provider on their own platform. It is the first complementary service offered on their own platform, and presented as basic function. FinCo adds to the statement that the quality of this primary complementary service is important to attract consumers.



## 7. Discussion

In this chapter, findings of the research are discussed. Thereby, expectations, possible causes and alternative explanations will be given. This will lead to limitations of the research, presented in the last paragraph of this chapter.

### 7.1 Structure of theoretical framework

In the theoretical framework there are three levels of openness identified being strategic, technical and governance. From the case study is learned that the propositions on strategical and technical level were valuable to explore the possible impact of openness on a platform. Often, studies indicate a strategical vision and governance measures. For example, the study of Thies, Wessel and Benlian 2018. The strategical issue addressed is that openness could lead to unstable network effects. The study also presents an operational measure to reduce the negative impact: input control. According to the research, input control can be operationalized in certain sizes, depending on the goal and type of platform. The example illustrates that strategic propositions formulate a vision and do not tend to contain details on the specific impact or sector and therefore more generically applicable in multiple sectors.

The difference in explorative power between the levels of openness could be explained by difference in scope between the three levels of openness. The strategical level of openness is mainly related to vision and long-term goals. The shared strategic vision can be used for platform development in a more tactical level (encompassing technical and governance openness) depending on their relation as sponsor with the platform provider role, which is different for each platform. The explorative power of the governance level is little. It could be considered in future research to remove the governance level. In this case study there were only a very few propositions considered to be relevant. Therefore, the results found related to the difference in perspective and importance of openness, will not be influenced by removing the governance level. It would create a new opportunity for a more suitable layer to be included in the framework. A more suitable layer could lead to more valuable insights. Future research could research what the last layer of the theoretical framework would contribute value.

### 7.2 Insights learned from results

This study has been one of the first providing an overview of the impact of openness on a platform. Thereby, it contributes to studies related to platform openness and answers the need for further research as addressed by the research agenda of McIntre & Subramaniam (2017). The theoretical framework aimed to be applicable in multiple sectors. Therefore, it only included general formulated propositions leading to rather broad insight. Such as, the dynamics between the roles and the proportion of positive and negative impacts. These insights can be valuable when exploring the impact of openness of a platform in a certain sector. The value of the theoretical framework limited when deciding on the level of openness, the theoretical framework lacks detailed information to understand the complexity of openness. Due to the short-formulated propositions, there is no context or nuance included. In some situations, nuance is desired, for example on technical level, a deep technical integration to accomplish

openness and thereby stimulate positive network effects are suggested by for example Bourdau (2010), proposition 24. Although, deep technical integration can be very hard, and it is not always desired for multiple reasons. In the conducted case study, results show that deep technical integration is not possible because of the high fragmented market. Although, the platform provider wants to become 'easy to connect with' on a technical level but maintain control due to security reasons. Therefore, there is technical openness desired on selective elements. This kind of reasoning cannot be included in the framework.

Therefore, theoretical framework constructed in this study is only valuable when the potential of the platform business model is explored in a certain sector. The theoretical framework will provide a quick insight into the potential of such design choice. As the platform model is becoming increasingly popular, it is expected that in a matter of time, the need for more detailed frameworks on platform openness will rise because the platforms in sectors will mature. Future research should focus on that.

### 7.3 The observed difference in perspective on platform openness

In the case study a difference in perspective between sponsor and provider is identified. An explanation for the observed difference in perspective is that the sponsor in this case study desires to develop platforms in the sector. Therefore, the Purple Bank conducted extensive research to gain knowledge on platform development. This explains the strong connection between the literature-based propositions on strategic level. It means that the sponsor in the case study has a vision in line with the vision of literature. Therefore, it is expected that other Purple Banks interested in developing platforms will conduct a research on platform development. This will lead to similar vision and platform strategy identified in this case study.

From the platform provider in the case study is learned that financial platforms in the first phase might not have their focus on strategic design choices. Therefore, openness can be forgotten in the first phase of starting a platform business. The fintechs will be focussed to attract consumers to the platform by offering them a unique service. A platform's primary occupation is to connect users and second is to solve arising issues for users during the first phase as soon as possible. The platform provider, in the case study FinCo, does not confirm strategic propositions.

The observed differences in terms of strategic priorities were not to be expected based on the Eisenmann framework. The allocation of responsibilities and tasks in the specific case study could have contributed to the observed difference in perspective. The literature study of Eisenmann et al., (2009) describes the sponsor and provider to be complementary in terms of responsibilities and tasks. The sponsor role is described to be quite dominant, involved in strategy and development of the platform. The provider role is described to be mainly focused on operational tasks. The allocation of roles is different in many studies describing the impact of openness. For example, in the research of Onrus et al., (2015). In this study the sponsor role is left outside scope because users do not have direct contact with this role. The study does include cases in which the sponsor role is seen as one with the platform provider role, this is often the case. Key argument is that those have power to influence the market potential of the platform. From this can be learned that describing roles and responsibilities is important. In this specific case study, the sponsor can influence the market power, as it has a large consumer base and is included in the scope. In the specific case study, the sponsor role is merely a shareholder's role and all other strategic

development and operational tasks are conducted by the platform provider being FinCo. This arm's length relation between Purple Bank and FinCo has been there from the start. Whereby FinCo developed on its own, focusing on the value propositions for consumers.

The case study is conducted on a platform, spin off from of a bigger concern, in a sector which is from origin a closed sector with only few players. It is expected that other platforms developed on arm's length of a Purple bank will develop likewise. It is hard to tell for the FinTechs, developed separate from the bank. These could have the same deviation as illustrated by Eisenmann and the other studies. For future research it is important to define the platform roles and related tasks and responsibilities. It is important to understand the results, as it could influence the perspective on certain topics.

#### 7.4 Identified challenges regarding different sectors

In the case study, there are three challenges identified from sponsor role. These remind to earlier identified challenges.

First of all, ***openness versus commoditization***. The dilemma indicates long term versus short term impact of openness. This reminds to the literature review of Gebriorgis et al 2015 that address the long versus short term impact of openness. The study of Gebriorgis discusses technical openness having impact on the platform provider role. According to the research, new IT service platforms need to have a high level of openness to become a competitive platform in the market. Current dominant platforms in the market also need a high level of openness otherwise new (open) platforms will take over the market. The issue of commoditization is now relevant in the financial sector, but it can be stated that in other sectors, companies and platforms have faced the threat of becoming commoditized. It could be valuable to explore the dilemma further and learn from other sectors to overcome this dilemma.

Second, ***openness versus monetization of the platform***. The dilemma is not sector specific but characteristic dilemma when starting a platform (Eisenmann et al., 2009). Therefore, the dilemma was to be expected. In the original study the dilemma is related to the technical level of openness, as this reduces the ability to create differentiated properties (Ondrus et al 2009). The reasoning is: When being an open platform, it is hard to create standalone properties earn money with it. In the case study conducted in this research, the dilemma is considered on a strategical level. It is harder to ask money for the products. This could be dependent on the platforms business model. It is likely that other platforms could consider the dilemma also more from a strategical point of view. Although, this does not influence the results of the case study.

Third, ***Openness versus trust of the platform***. This dilemma is identified in the theoretical framework specified on the domain (4.4) in proposition 12. After chapter 4 it became clear that trust is very important in the financial sector. When a platform becomes too open trust might be at stake as the platform might lose control on values like quality, security and privacy. Therefore, this dilemma is to be expected. Future studies on financial platforms should include this from the start.

## 7.5 Alternative factor having impact on the network effects

The results of the case study indicate that openness in this sector may not be an important factor when deciding of impact on the network effects of the platform. The answer found in the case study from perspective of FinCo is clear. In the case study openness is not considered as an impact factor on network effects. It is learned, in Chapter 6, that the most important factor to stimulate network effects is the value proposition of a platforms. The value proposition refers to the complementary service offered by the platform provider on their own platform (6.7.4). The value of the service stimulates the number of consumers and thereby indirect network effects; therefore, the quality of this service is of high importance. This line of thinking is in line with the study of Srinivasan and Venkatraman 2010 on the US home video game industry. The study highlights the importance of the quality of complementors (reflected in proposition number 4). From this study is learned that the primary users are the most important ones as they are loyal to the platform on the long term. It could be related to the type of service, expectations of the customer. Future research could explore the importance of a primary service of a platform on the growth of a platform in the financial sector by conducting case studies.

## 7.6 Limitations

This paragraph presents the limitations of this research.

### **Scope of research**

There are many factors influencing the network effects of a platform. Openness is selected as research focus because it is addressed by multiple studies to have a strong impact. Furthermore, introducing openness would cause dilemmas for the platform provider which makes it an interesting topic. Other factors that influence network effects have not been included in the research. If the research would have included a wider scope, it could have resulted to a broader spectrum of factors influencing the growth of a platform. Then the impact factors could be compared. Although, this would also lead to a different research focus. The result would be an overview of factors that influence the network effects of a platform. With these results a different research question would be answered.

### **Theoretical framework**

The structure of the framework makes it is easy to add sector specific propositions to the theoretical framework. The added sector specific propositions have been of great value in this case study. From this can be learned, that the selected x and y axes of the framework are valuable to structure literature on the impact of openness and the framework is easy to use for researcher. Although, placing the propositions into the theoretical framework required assumptions to be made. In some literature studies it was unclear what type of openness was meant and, in some studies, the direct impact role was unclear. In this situation, the researcher is forced to make assumptions created based on the content of the study. A different researcher might place the propositions different or formulated the proposition different. The theoretical framework can only be used as a frame of reference but

cannot be used as a factual theoretical framework. This causes a limitation for the usability of the theoretical framework.

### **Research method**

The sponsor and provider role are included as participants of the semi- structured interviews. These two roles are selected because they determine the platforms strategy and make decisions regarding openness. The consumer and producer role are dependent on the decision made by the sponsor and the provider. However, from the research is learned that attracting consumers in the first phase of a platform is essential to start network effects. Therefore, it would be interesting to include the consumer and producer roles in future research. The two roles could have contributed to a holistic view on the topic. However, also challenges are identified. The interview participants are selected based on certain requirements to ensure knowledge on the topic such as years of work experience. In this case study there were a selective group suitable to be participants. These requirements could be suitable to select right producers but not to find the right consumer. New requirements should be formulated to find consumers with knowledge. Finding consumers with knowledge and experience will become challenging. Consumers are not likely to have knowledge on the topic.

### **Results**

The theoretical framework has been useful to understand dynamics between roles and understand the complexity of openness. The framework does not allow factors that have indirect impact or specific characteristics of such platform as it is a generic framework. This is a limitation, specifically because the impact of openness is context dependent and sometimes requires platform specific information to be able to comprehend the possible impact of openness. On the other side, the generic formulated framework is valuable as it provides an overview. The framework is specifically useful when the impact of platform openness is not yet researched in a specific sector. The framework offers the opportunity to explore a new sector by using the frame of reference including possible impacts of openness identified in other sectors.

## 8. Conclusion

This chapter presents the conclusion of this research. The first paragraph presents the answer to the main research question 8.1. Followed by a reflection on the research process, in paragraph 8.2. In paragraph 8.3 recommendations for future research are presented. The last paragraph, 8.4 elaborates on the CoSEM program and how this research is related to the program.

### 8.1 Providing an answer to the main research question

The main research question will be answered in paragraph 8.1.1. Next is discussed into what extend findings of the main research question can be generalized to the (sub) sector of Purple Banks and fintechs in paragraph 8.1.2. The third part presents the scientific contribution of this research in 8.1.3. The fourth part will discuss management implications of the research (8.1.4) followed by the societal relevance presented in the last section of this paragraph being 8.1.5.

#### 8.1.1 Answering the main research question

The main goal of this research is to discover the role of expected indirect network effects in the choice of a financial platform to be open. The answers all three sub-questions leads to the answer of the main research question. The sub-questions are answered in previous chapters, a short recap of the answer will be provided in the following paragraphs to understand the answer to the main research question.

The concept platform openness is often used by researchers with different meanings. Openness for the purpose of this research, is defined using three levels being; strategic, technical and governance openness. *Strategic openness*: This level refers to openness as a strategic choice, for instance based on a vision and/or policies taking into account the characteristics of the specific sector and the related “pro’s and con’s” of openness. This could lead for instance to strategic choices regarding what type of services of producers the platform and its ecosystem are open. *Technical openness*: This level refers to choices on the technical dimension, and addresses issues like what level of technical openness is desired, what standards can/will be used. On one hand is it hard to integrate producers in terms of complexity and investments, on the other hand Seamless partnering is an important feature to make the platform attractive to partners. *Governance openness*: This level refers to the rules of the game. How to manage the onboarding of new producers or platform providers and management of existing platform. For example implement a review system for users and producers to review each other. This enforces good behaviour on a platform. Governance could also be related to simple restrictions to join the platform as a producer or consumer. Think of minimum age for example.

The first formulated research sub-question is: ***What is the impact of openness on network effects of a platform identified in literature?***

There are 35 different impacts of openness identified consisting of positive and negative impacts. It is learned that openness can have contradictory impacts therefore, determining the strategy of a platform causes dilemmas. The identified dilemmas are:

- Strategic openness could reduce consumers concerns to be locked-in and thereby increase consumer adoption versus too much openness on this level could lower the switching barriers for consumers. Therefore, it is hard from a platform perspective to keep the customer locked-in on the platform.
- Strategic openness could be needed to create more efficiency on the platform. Through interaction it will develop further. Other studies have a different theory, according to them limited openness and strict control on the platform would increase efficiency.
- Technical openness allows a platform to have access to resource of others, but on the other hand others can leech of the benefits of your platform.
- Governance openness could lead to coordination issues between all parties involved versus a reduction of costs as those can be divided among all involved.

Furthermore, it can be concluded from the literature study that the when determining the exact impact of openness the context- sector dynamics are of great importance. Remarkable from the literature study is that the trade-offs regarding openness and network effects have a time dimension. A time related found statement is: “on the short term a closed platform ecosystem achieves higher efficiency. An open ecosystem has higher efficiency on the long term” (Doyle, 2013). The insights shows that the introduction of openness must be carefully considered by the platform provider and sponsor to ensure that it will have the desired impact.

The second formulated research sub-question is: ***How is the impact of openness on the network effects to be expected on the specific domain of finance?***

The impact of openness on the network effects in the financial sector are similar to identified impacts in other sectors. Next to possible positive and negative impacts of openness, also restrictions of openness are introduced by the strong regulatory framework related to the financial sector. In the financial sector there is additional regulation on issues like data security, customer privacy, loss of control of customer data etc. All platforms related to the financial sector are required to comply.

An observation is the complexity of regulation in the financial sector, e.g.:

- the European PSD2 directive opens also options to provide financial services cross sector, meaning that parts of multi sided platforms are within the financial sector.
- Cross border financial companies must deal with multiple regulatory regimes, for instance on country-, European- and countries outside the European union where activities are deployed.

The third, and last formulated research sub-question is: ***Do expected network effect have impact on the decision of a platform provider of sponsor to become open on a financial platform?***

From the sponsors perspective, the impact of expected network effects on the choice of openness of financial platform is limited. The sponsor identifies many other factors having impact on the decision to become open. These will be explained by the main research question. From the perspective of FinCo openness is not considered as an important design choice. Therefore, expected network effects do not play a role in the choice of being open.

### **Answering the main research question**

The results of the case study are used to answer the main research question:

***What is the impact of expected network effects of a financial platform on the choices that platform sponsor and providers make regarding openness?***

The main research question will be first approached from the perspective of the sponsor, the Purple Bank. Followed by the approach from the provider perspective, FinCo. Then a shared insight will be discussed. To conclude, an overall answer to the question will be presented in the last section.

### **Sponsors perspective**

From the sponsors perspective, the impact of expected network effects on the decision of being open is limited. According to the Purple Bank, the choice to become open should be carefully considered. There are possible positive and negative impacts of openness identified. The **possible positive impact of openness** identified by the sponsor are: expected network effects, attracting third parties and increased availability of products and services. Besides, on technical level openness could lead to a seamless connection of producers and thereby lowering entry barriers for producers. On governance level openness could generate new levels of services on the platform by providing rules and regulation together with other partners.

Identified **possible negative impact of openness** on strategic level are an increased risk of product cannibalization, a decreased ability to differentiate products, a weakened customer lock-in and reduction of profitability of the platform. On technical level openness could decrease the level of security, increase regulatory obstacles, increase loss of control of customer data and increase management issues on standardization. On governance level openness could increase complexity of responsibility, increase anti-trust issues and decrease control on the platform from a central point.

Dilemma's related to the choice to be open identified by the sponsor are: 1) *Openness versus commoditization*, 2) *Openness versus trust of the platform* and 3) *Openness versus monetization of the platform*.



### **Platform providers perspective**

From the perspective of FinCo, expected network effects do not play a role in the choice of being open, because openness is not considered as an important design choice. Remarkable is that the downsides of openness, indicated by the Purple Bank, are confirmed by the priorities and choices made in the platform development of FinCo.

For example, the negative impact of having too much offered services on the platform: FinCo carefully selects their partners with a focus on direct added value to consumers and to avoid that consumers are overwhelmed with new services. Also, the technical difficulties are addressed by FinCo, resulting in specific targeted investments on selected interfaces with producers, mainly on the basis of API's.

It is recognized that on the longer term, a tipping point might be reached at which a platform will have an established user base, market share and business position from which point more openness will generate network effects with less downside risks.

### **Shared insight**

Openness is in this research addressed as a stimulator of network effects, in the case study is found that openness is not so important. FinCo and the Purple Bank address an alternative factor that has a positive impact on the network effects of the platform. The so-called value proposition of a platform. According to FinCo this is even the most important impact factor. The value proposition of a platform refers to the primary service provided on the platform by the platform provider itself. It could consider as a platform's basic functionality and the reason why consumers use the application.

**Summarized answer to the main research question.** On the level of vision, openness to achieve network effects (and other benefits) is recognized by the sponsor. In practice, the negative effects of being open are dominant and choices in developing the platform are driven by delivering added value for the consumers. Sponsor and provider agree on this approach. Apart from the generic negative aspects for a platform of being open, the financial (sub)sector of Purple Banks faces regulatory limitations on national and international level. Also, the risk of cannibalization is regularly mentioned as a risk in the current market of Purple Banks. These specific downsides could be applicable to other (sub)sectors of the financial sector.

#### **8.1.2 Generalize findings to sector**

The Purple Bank in this research is one of the biggest in the Netherlands and active in the European market. Given the size and international character the Purple Bank, lessons learned in the case study are relevant for other European banks in the (sub) sector of Purple Banks. Besides, the European culture is strongly connected to the Dutch culture. From this case study can be learned that it is likely that other Purple Banks should include openness into their platform strategy. Furthermore, it is likely that banks of the (sub)sector will experience the three identified dilemmas of openness. At last, the rise of a platform from a traditional bank can be challenging and lead to a difference in perspective. This could be challenging position for both involved parties.

The situation of FinCo is unique, therefore it is hard to generalise specific findings **of FinCo** to other fintechs. The people who developed the concept of FinCo are originally employees of the Purple Bank. And even though the fintech was developed as a separate initiative, the resources they had access to were from the Purple Bank. These factors make the case of FinCo unique and therefore comparison with other fintechs is nearly impossible. What can be learned from the case study is that financial start-ups in the first phase might not have their focus on strategic design choices. They are rather focussed on operational tasks.

Some findings from the shared insights can be generalized to the (sub)sector Purple Banks in Europe and fintechs like FinCo. First of all, there is the impact of the technical fragmentation on platform development as experienced by the Purple Bank and FinCo. The technical fragmentation in European market forms a barrier for every participant, new but also experienced. Currently, the sponsor and platform provider need a lot of resources and 'learning-by-doing' because the market is not yet ready for such technical innovations. Second, the importance of maintaining and-or gaining trust of consumer can be generalised to all Purple Banks and to fintechs in Europe. The subsector of Purple Banks has earned and wants to maintain trust of consumers, hence do not want to take any risks. The fintechs need to earn trust from the consumer first, therefore they are careful as well. Third, there is the dominant role of regulation. The subsector of Purple Banks complies with the heavy regulation. In the case study the Purple Bank was searching for ways to use this as an advantage. It is expected that other Purple Banks will be doing the same. Similar, it is expected that all fintechs – like FinCo - are searching for ways to handle regulation. Because the type of regulation is dependent on the type of financial service they offer and in which European market they are active, some fintech will be struggling more than others.

### 8.1.3 Contribution to scientific literature

The scientific contribution of this research will first focus on the theoretical framework presented in chapter 3. The framework has been valuable in the purpose of this research for several reasons as mentioned in chapter 3.1 and can be valuable in other studies related to platforms and openness. The second paragraph will discuss the contribution of the case study findings to scientific literature.

First of all, the *theoretical framework* without propositions, the structure itself, with the three levels of openness on the vertical axis and the four roles of Eisenmann on the horizontal axis, can be helpful for other researchers to approach literature on openness and platforms. From this research is clear that the research field is diverse and consists of many complexities. The simple construction of framework forces the researcher to capture the essence of a study and become specific on the type of openness leading to certain impact on a platform role. There is no nuance in the framework, it represents the cause-effect leading to a straight-forward approach of a complex topic. Second, the *theoretical framework* including the propositions, can be the basis for further theory-development. The researcher can add propositions, reallocate current propositions or remove propositions. The theoretical framework is not positioned to be a fact, but it can be used as a guiding principle in future studies. Third, the *theoretical framework* can be used to explore the possible impact of openness of a platform in new domains, like it is used in this research. Sector specific propositions can be added to the theoretical framework. In a case study the theoretical framework specified on the domain can be used to explore the impact of platform openness.

Besides the contribution of the constructed framework the case study findings also lead to valuable insights. The findings are represented in the final framework: *factors found in the case*. This framework specified on the financial sector can be used to explore the financial sector further or to validate the factors found in the case study by adding more case studies. This would contribute to the literature of platform openness in the financial sector. This knowledge would be valuable when starting a platform in the sector. Furthermore, the observed difference in perspective between the sponsor and provider role is not identified in previous research in any other sector. Also, the importance of a unique primary service on the platform is also remarkable in the platform field of research. It has not been addressed to be that important.

#### 8.1.4 Managerial implications for the Purple bank and FinCo

Based on the results of the case study there are managerial implications found for the Purple Bank and also for the sub sector of the purple banks. The management of those banks can also learn from the single case study conducted in this research because the Purple Bank is such a prominent bank in the Netherlands and active all over Europe. Furthermore, there are managerial implications for FinCo specific formulated. At last, a few managerial implications are found for other fintechs.

The **managerial implications for the Purple Bank** are: First of all, management of the purple bank should elaborate and describe the impact of openness of a platform into more detail. In the platform handbook, openness is presented as one of the most important strategic design choices. It stated that the choice is challenging as it can lead to dilemmas. This is illustrated by only one positive and one negative effect. Other positive and negative impacts are not included in the platform handbook. It would be helpful to provide an overview of positive and negative effects of openness and introduce the difference between short- and long-term impact that openness can have on the platform. This information would be helpful for platform developers when considering openness. Second, management should invest time and money to provide suggestions for operationalizing openness on a financial platform. If it is possible, it would be valuable to combine this with the possible positive and negative outcomes. The platform provider could think of expected impacts. Third, it is recommended to research in which phase it is important to introduce openness on the platform for example in a more mature phase. Fourth, given the difference in perspective between the sponsor and provider role, it is recommended that managers of the Purple Bank facilitate communication. A suggestion is to include FinCo in the platform strategy. The Purple Bank would learn from the practical insights.

The **managerial implications to the subsector of Purple Banks** are the following: Firstly, in this case study the Purple Bank addressed openness as the most important strategic design choice for a platform business model. This means other Purple Banks should also consider openness as a strategic design choice. This research identified various factors influenced by openness that could have positive or negative outcomes. Therefore, this research contains valuable information when illustrating the impact of being open as a platform. Secondly, the research addresses that introducing openness and transform to a banking-as-a-platform model requires a mindset change of employees. This research could contribute to the understanding and address the need to change. Thirdly, the observation of a step by step approach and a tipping point could result in a difference of a long term versus short

term vision or phased implementation. Fourth, this case study addresses the importance of a strong value proposition. This should be researched per individual platform.

The **managerial implications for FinCo specific** is to research the positive impact of openness. Currently, only the negative impacts are experienced by the company. It would be valuable to consider the long-term implications of openness. When FinCo is well informed on both the positive and negative impact they can make a conscious decision to be open or not. FinCo might include openness in their strategy. This research could be inspirational while constructing strategy and a vision in the future.

The **managerial implications to platforms alike the described FinCo** are: first of all, to research if there is a difference between the sponsor and provider perspective. These insights can be valuable in cooperation with the platform sponsor. Second, think of platform openness from an early moment when designing the platform. It could stimulate positive network effects. Third, to increase the practical value of the research results, it is recommended to validate the overview of positive and negative effects of openness on fintech perspective.

#### 8.1.5 Societal relevance

In addition to scientific relevance, there is also social relevance in research. First of all, healthy, stable and good functioning financial system is important to society, as is learned from the crisis in 2008. This research contributes to keep the system stable. Second, this research can contribute to the current changes of the financial sector by providing information on the banking-as-a-platform model. The research indicates the possible positive and negative outcomes of openness on financial platform. These insights on banking-as-a-platform model can be used to maximize the positive and minimize the negative outcomes. Third, the change of traditional banking to the banking-as-a-platform model will result in advantages for the consumer. Such as the transaction functionality ensures lower prices. Furthermore, the services will be improved, ease to use and personalised. At last, it will offer the consumer more transparency. Providing transparency is one of the important benefits, after the crisis in 2008 this became more and more important as indicated in chapter 4.

## 8.2 Reflection on research process

Verschuren & Hartog (2005) identified four criteria to reflect on the quality. Those are used to evaluate the process are used to reflect on this research process. The quality criteria are validity, reliability, researcher independence and verifiability (Piet Verschuren & Hartog, 2005a). In this paragraph all criteria will be elaborated and discussed in relation with the research.

### Validity

The term validity is about whether findings are consistent with reality. To reinforce validity in this research, the study included recent, relevant and diverse types of sources. The literature study has been conducted based on

different online data bases (Google Scholar and Scopus). Furthermost of the literature selected comes from articles published in scientific papers, the amount of grey literature used is minimized.

The (semi)- structured interviews are conducted with participants selected based on years of work experience in the field, background knowledge and current position to be certain they are well informed on the topic. Besides, they are involved from different perspectives being sponsor and provider role. During the interviews is noted that the interview group is saturated as participants referred to the same participants. This increases the validity of the research for this specific case study as no perspective is forgotten to be included. Furthermore, the received documents have been useful to support the statements made by the interview participants. This confirms that the findings are alike the actual vision on openness in reality. These could be considered as reliable sources, they are all recently published and used by the Purple Bank daily. Various documents types of documents are received such as PowerPoints, internal publications and handbooks. Details on these documents are described in the appendix A.

### **Reliability**

Reliability indicates the level to which a different researcher would reach the same or alike outcomes as those who would conduct the study using the same method. A case study can be conducted in various ways, during the research, Yin 's book is used as a guideline indicating the steps to follow. This is presented in chapter five. Because a protocol is used to conduct the case study, the reliability of the research is improved. A semi-structured interview has been used because of their flexibility to ask deeper on a specific topic. Although, this reduces the reliability as this type of interviewing allows inconsistency. By using the interview protocol and information page it is aimed to minimize this issue.

### **Researcher-independence**

A single individual conducted the research. The researcher did work for a Purple Bank, but not on the platform innovation department. The semi-structured interviews provided a large amount of data and led to additional supporting documents to confirm propositions based on different data sources.

### **Verifiability**

The verifiability of the research means the capability to criticize the correctness of the data used in this research. The data used in this research has been documented following the privacy protection rules and documentation is described to enhance the verifiability. Firstly, the process and description of the conducted literature study can be found in chapter 3. Each proposition used in the framework is numbered, corresponding to the numbers used in the chapter. Therefore, it is transparent from which studies the propositions are abstracted from. Secondly, the case study method has been elaborated in chapter 5. In this chapter the design approach is elaborated step-by-step. Thirdly, the qualitative data gathered from the interview participant and additional supporting documents have been transcribed and documented anonymously they cannot be published because of privacy reasons. To give some indication on the supporting documents as much information as possible is provided in the appendix. Such as: experience of participant, title/type and size of document and an abstracted summary of the content.

### 8.3 Recommendations for further research

First, findings underline the practical dilemmas of openness. It would be interesting to research more fintech's involved in platform development in the (sub) sector of Purple Banks. Their perspective could be different from the results found in this case study. It could be that other platforms consider openness as a strategic design choice from an early moment on. This would influence the findings of this case study found on the platform provider perspective. But it could also be that other platforms confirm the importance of a primary service offered by the platform. When conducting this research, it is important to describe the roles and responsibilities of the sponsor and provider. This information is needed to understand the relation between the roles.

Second, in stimulating the platform to be open several possible negative effects of openness and dilemmas are identified in paragraph 5.7, being trust, monetization and commoditization. For the (sub) sector of Purple Banks it is important to learn more about these dilemmas to ensure openness has the desired impact. Further research could focus on underlying mechanisms to better understand these dilemmas and understand what determines a positive or negative outcome. Chapter 7 describes that these dilemmas have been identified in previous studies conducted in other sectors. Therefore it is recommended to search for these dilemmas in divers sectors.

Third, it has been indicated that a tipping point from a fintech perspective could be the point that network effects are experienced, and partners are attached. As this could also be the switching point for openness to become relevant for a platform strategy. Future research could include a time dimension into the scope, this would identify the long-term impact. It could be possible to identify factors that indicate a tipping point or that can predict a tipping point.

### 8.4 Link between the CoSEM program and this research

The thesis is conducted in the Complex System Engineering program (CoSEM). The aim is conducting a research that recognizes insight on an analysis conducted on multiple levels such as legal, technical and economic. The study includes interaction between multiple stakeholders. All of the mentioned elements are included in this research. The research encompasses an overview of network effects plotted against openness on strategic, technical and governance level on one axis, and specifying the impact to different stakeholders within the platform ecosystem, being sponsor, provider, producer/third party and consumer roles on another axis. As this is a relatively unexplored strategic field of research in the financial sector (research gap, Chapter 1.3) findings of this study are valuable for the current body of knowledge. In short, the complexities of interaction between multiple stakeholders within a technical environment.

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## Appendix A List of document data sources

Document 1	
<b>Title</b>	Overview of business model fintech and goals for 2019
<b>Type of document</b>	PowerPoint presentation
<b>Author</b>	Fintech
<b>Number of pages</b>	51 slides
<b>Publication date</b>	13-11-2018
<b>Date received</b>	22-03-2019
<b>Description</b>	The PowerPoint contains a lot of information on the previous year. How processes are organized on partner selection, internal support, post deal management, KPI's and further. Also, content on: How to connect partners and consumers. Platform earnings, building a smart ecosystem, beyond 2019 ambition from ecosystem to open platform. Summary on "how we got here". Further information for example models on pricing, Partnership assessment, look forward on 2019, B2C relationship,

Table 3 Information document 1

Document 2	
<b>Title</b>	Platform view
<b>Type of document</b>	PowerPoint presentation
<b>Author</b>	Financial institution
<b>Number of pages</b>	1
<b>Publication date</b>	2018
<b>Date received</b>	07-06-2019
<b>Description</b>	Visualization including short description of platform view consisting of internal, external and independent initiatives.

Table 4 Information document 2

Document 3	
<b>Title</b>	Platform playbook
<b>Type of document</b>	PowerPoint presentation
<b>Author</b>	Platform orchestration team
<b>Number of pages</b>	10
<b>Publication date</b>	01-2019
<b>Date received</b>	04-07-2019
<b>Description</b>	This document answers the question what is a Platform Business Model? Content goes into definition, making the most of the ecosystem, create network effects, monetizing a platform, chicken and the egg problem and assessment checklist.

Table 5 Information document 3

Document 4	
<b>Title</b>	Platform business model elements
<b>Type of document</b>	PowerPoint presentation
<b>Author</b>	Platform orchestration team
<b>Number of pages</b>	10
<b>Publication date</b>	01-2019
<b>Date received</b>	04-07-2019
<b>Description</b>	Provides a description of the elements behind the Platform Business Model. The inner workings of a platform and ecosystem are complex, and methodology can't fully comprise all the cases, but a common methodology is a great way to approach complicated matters. So, this document is offered as a base. The process is essential based on a set of roles that are considered for the entities around a platform. Including key elements that will help to understand platform and how you can model it.

Table 6 Information document 4

Document 5	
<b>Title</b>	Business insider case study: How they launched open banking- enabled services
<b>Type of document</b>	PDF
<b>Author</b>	L. Nonminer
<b>Number of pages</b>	3 pages
<b>Publication date</b>	28-03-2019
<b>Date received</b>	04-04-2019
<b>Description</b>	Article includes the following headings: <i>possible negative effects of openness, strategy</i> (including "current getting" and "looking into", result and <i>our take</i> .

Table 7 Information document 5

Document 6	
<b>Title</b>	Open is the way to go
<b>Type of document</b>	webpage
<b>Author</b>	Speaker at Money2020
<b>Number of pages</b>	1 page
<b>Publication date</b>	07-06-2018
<b>Date received</b>	10-4-2019
<b>Description</b>	The need is addressed for digital platforms to be open. European PSD2 regulation is forcing banks to think this way.

Table 8 Information document 6

## Appendix B Overview criteria table participants

Participant	Experience in current position	Level	Business area	Role of involvement (Eisenmann)
<b>Participant 1</b>	2 years	Sr consultant	Strategical and operational	Sponsor
<b>Participant 2</b>	3 years	Sr consultant	Strategical	Sponsor
<b>Participant 3</b>	1 year	Sr management	Operational	Platform provider
<b>Participant 4</b>	> 3.5 years	Executive	Strategic and operational	Platform provider
<b>Participant 5</b>	-	Sr management	Strategic	Sponsor
<b>Participant 6</b>	> 3.5 years	Executive	Strategic and operational	Platform provider
<b>Participant 7</b>	> 3.5 years	Executive	Strategic and operational	Platform provider
<b>Participant 8</b>	3 years	Sr management	Strategic	Sponsor

*Table 9 Overview participants*

## Appendix C Background information participants

Participant 1	
<b>Years of experience</b>	2 years
<b>Level</b>	Sr consultant
<b>Business area</b>	Strategical and operational
<b>Role of involvement (Eisenman)</b>	We are active in both sponsor as provider role, depends
<b>Description</b>	Part of the platform innovation team. Develop the PACE development for platforms, think of different phases require different strategies and face different possible negative effects of openness. Part of the function is to think about how to validate elements such as control points. Involved in strategy worldwide and independent initiatives.

Table 10 Information participant 1

Participant 2	
<b>Years of experience</b>	3 years
<b>Level</b>	Sr consultant
<b>Business area</b>	Strategical
<b>Role of involvement (Eisenman)</b>	Role is on both provider and sponsor level. To create sustainable platform, you need theory and practice
<b>Description</b>	Leader of the platform team. Team is responsible for building bank wide platform asses' capabilities, skills and knowledge. Responsible for the overall strategy we want to develop. Close collaboration with retail, wholesale banking to bring everything together. Big part of our job is to enabling components that you need to make it work. IT, infrastructure, business perspective

Table 11 Information participant 2

Participant 3	
<b>Years of experience</b>	1 year
<b>Level</b>	Sr management
<b>Business area</b>	Operational
<b>Role of involvement (Eisenman)</b>	Platform provider
<b>Description</b>	Head of partnerships, taking care of the B2C partnerships. Look at transaction data and learn what the customer wants. Form that I approach new partners

Table 12 Information participant 3

Participant 4	
<b>Years of experience</b>	Over 3.5 years
<b>Level</b>	Executive
<b>Business area</b>	Strategic and operational
<b>Role of involvement (Eisenman)</b>	Platform provider
<b>Description</b>	Responsible for overall functioning, strategy and progress

Table 13 Information participant 4

Participant 5	
<b>Years of experience</b>	-
<b>Level</b>	Sr management
<b>Business area</b>	Strategic
<b>Role of involvement (Eisenman)</b>	Sponsor
<b>Description</b>	Head of platform thinking. Responsible for the internal platform's strategy as also for independent initiatives.

Table 14 Information participant 5

Participant 6	
<b>Years of experience</b>	Over 3.5 years
<b>Level</b>	Executive
<b>Business area</b>	Strategic and operational
<b>Role of involvement (Eisenman)</b>	Platform provider
<b>Description</b>	Chief customer office, chief product officer. Responsible for various tasks such as the customer journey. Building requirements for add ones.

Table 15 Information participant 6

Participant 7	
<b>Years of experience</b>	Over 3.5 years
<b>Level</b>	Executive
<b>Business area</b>	Strategic and operational
<b>Role of involvement (Eisenman)</b>	Platform provider
<b>Description</b>	Responsible for operational management such as legal.



Table 16 Information participant 7

Participant 8	
<b>Years of experience</b>	3 years
<b>Level</b>	Sr. management
<b>Business area</b>	Strategic
<b>Role of involvement (Eisenman)</b>	Sponsor
<b>Description</b>	Responsible for wholesale innovation. Thinking of good value proposition of the both sides of the market.

Table 17 Information participant 8

## Appendix D Interview request

Beste ...,

Mijn naam is Martine Romer, een 25 jarige student Complex System Engineering aan de TU Delft. Ik loop stage bij ING Blackbelts, waar ik mijn afstudeerscriptie schrijf over de ontwikkeling van platformen in de financiële sector, specifiek over de relevantie van “platform openness”. Via x heb ik je contact gegevens ontvangen.

Gezien je kennis en ervaring zou ik je heel graag willen interviewen. Het interview zal ongeveer een uur duren en anoniem worden verwerkt. Ik hoop dat je hiervoor openstaat.

Als dit het geval is, zou ik graag op korte termijn een afspraak willen inplannen. Eind deze week of begin volgende week bijvoorbeeld.

Ik hoor het graag!

Met vriendelijke groet,

Martine Romer

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Dear ...,

My name is Martine Romer, a graduate intern at ING blackbelt. I am conducting a research on the development of platforms in the financial sector for my master thesis at TU Delft. Specifically, on the impact of openness and perceived network effects. I have your contacts from x.

I would like to ask if you are open to participate in an interview related to the research. The interview would take max one hour and will be processed anonymously.

Your contribution would be very valuable for the research.

I hope you want to participate.

Kind regards,

Martine Romer

## Appendix E Interview protocol

### Introduction

You have been asked to participate in a research on the development of platforms in the financial sector because of your expert in this field. Your participation in the interview is greatly appreciated.

My name is Martine Romer, a 25-year-old student from TU Delft. I am conducting a research on the impact of openness on financial platforms. Maybe you are familiar with the platform playbook, in which openness is addressed as the biggest strategic decisions for a platform. Some pros and cons are mentioned, I would like to learn more about the choice of being open and why it is complex. For this research I will conduct 5 to 10 interviews to collect information and to get a good impression from different perspectives. The interview will last an hour in total. Your data will remain anonymous.

- I would like to record the interview, is this ok?
- Sign the consent form

### Set-up of interview

The interview consists of three parts. First, you will be asked about your role and responsibilities. Second, you will be asked about your vision regarding platform openness on strategic, technical and governance level. Check the information page for the definitions. The last part open questions will be asked, leaving room for you to address undiscussed issues.

### Platform involvement

1. What is your role and what are your responsibilities?
2. Could you describe your position towards the Purple Bank/ or FinCo

### Platform Openness

As mentioned in the platform playbook; one of the biggest strategic decisions a platform business faces are how open should the platform be to third party participation and what should remain under the control of the platform owner

3. What are strategic opportunities of platform openness from your perspective?
4. What are the strategic and Possible negative impact of openness of platform openness from your perspective?
  - Use propositions as help questions
  - Sponsor/ provider. /...
5. What are the technical opportunities of platform openness from your perspective?
6. What are the technical Possible negative impact of openness of platform openness from your perspective?
  - Use propositions as help questions
  - Sponsor/ provider. /...
7. What are the governance opportunities of platform openness from your perspective?
8. What are the governance and Possible negative impact of openness of platform openness from your perspective?
  - Use propositions as help questions
  - Sponsor/ provider. /...

### Open questions

9. Could you give an example how openness is included in the platform design?
  - Could you tell how open your platform is and why
10. How important is stimulating network effects in the strategy?
11. Are there alternative drivers of network effects included in the design?

## Appendix F Consent form interview participant

### Consent form interview

*Please tick the appropriate boxes*

Yes No

#### Taking part in the study

I have read and understood the information about the study given to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction. ☐ Yes ☐ No

I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. ☐ Yes ☐ No

I understand that taking part in the study involves an audio-recorded interview ☐ Yes ☐ No

#### Use of the information in the study

I understand that information I provide will be used anonymous for master thesis research ☐ Yes ☐ No

I understand that personal information collected about me that can identify me, such as [e.g. my name and function], will not be shared. ☐ Yes ☐ No

#### Signatures

\_\_\_\_\_  
Name of participant Signature Date

I have accurately read out the information sheet to the participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

\_\_\_\_\_  
Martine Romer Signature Date

Study contact details for further information: Martine Romer, 06 [redacted],  
[martineromer1@gmail.com](mailto:martineromer1@gmail.com)

Source of form: <https://www.tudelft.nl/over-tu-delft/strategie/strategiedocumenten-tu-delft/integriteitsbeleid/human-research-ethics/template-informed-consent-form/> April, 2019

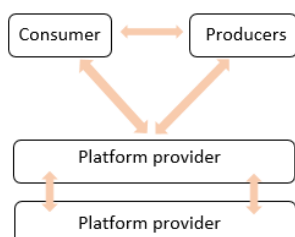
# Information page

## Definition of core concepts



Platform	An infrastructure that enables people, businesses and organisations to interact with each other and exchange information and/or transactions.
Network effect	The value of a network product or a service grows with the number of people using it (# users and/or # contacts per user).
Direct network effects	Direct value increase of the platform caused by one extra consumers entering the platform. Or direct decrease by one person leaving.
Indirect network effects	Indirect effects are caused by an increased value of the consumer side towards other sides of the platform.

### Platform



Sponsor role	Owns property rights and controls the development of platform.
Provider role	Central point of contact for users of both sides.
Consumer role	End-user of the platform often referred to as the individual customer.
Producer role	Third parties, individuals or users who contribute to the platform by offering products and services (also named “user – supply side” or “complementors”).

## Levels of openness on a platform



Strategic	Refers to the platforms long term (strategic) mind-set. E.g. what is the market positioning and related desired type of services on the platform? Basically, strategic choices determine the framework in which choices regarding technical and governance levels are made.
Technical	The level of open access towards third parties. Full open access means low entry barriers for third parties, and fit. technical interoperability allows seamless compatible suppliers. There are other options like no or limited access openness.
Governance	What are the rules of the game. E.g. How is input control managed? (coordination of new developments, software/ hardware standards & releases, pricing & cost allocation,)

# A structured framework for research on openness and network effects of specific platforms

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**Abstract:** The platform business model is becoming increasingly popular in various sectors. This research focusses on platform openness as a strategic design choice. Openness is considered to be a design choice having both positive and negative impact on a platform. Therefore, deciding to what extent a platform should be open requires insight into the possible positive and negative impacts. Studies on the impact of openness are conducted in multiple sectors. As the impact of openness on platforms is very context dependant, there is no study providing a generic overview. Such overview can be valuable to explore the impact of openness on new platforms or platforms in new domains in which platform openness is not been researched yet. Therefore, the objective of this study is to contribute to the scientific knowledge base by giving a generic applicable and structured overview of possible positive and negative impacts of openness on platform. The overview is constructed in two steps. In the first step, a framework is constructed by selecting a x and y axis. In the second step a literature review is conducted to identify possible positive and negative impacts of openness. These studies are included into the framework. In this second step, the framework is transformed into a theoretical framework, presenting an overview of possible positive and negative impacts of openness. The usability of the theoretical framework is demonstrated in this research by conducting a case study in which the theoretical model is used as a frame of reference. The case study illustrates that the framework is valuable to identify possible positive and negative effects of platform openness in a relative new domain. Furthermore, the theoretical framework provides the opportunity to gain insight into the relation between the involved roles such as the platform sponsor, provider, user and producer. A limitation of the framework is that it only provides broad insights as the framework lacks detailed impacts. Future research could explore the option how to gain more specific insights using the theoretical framework.

**Keywords:** platform, openness, positive impact, negative impact

## 1.Introduction

The platform business model is becoming increasingly popular in various sectors. Platform has two types of users being consumers and producers. No user-side will join without the other. (Ondrus et al., 2015; Parker and Van Alstyne, 2005). Overcoming this dilemma with a successful outcome is challenging (Hagiu, 2015) (De Roos, 2018). In practice, every year numerous costly failures are observed (Ondrus, Gannamaneni and Lyytinen, 2015) (Eisenmann, Parker and Van Alstyne, 2009).

Design strategies to enhance competitive outcomes are addressed in the literature review of McIntre and Subramaniam published in 2017. From the study is concluded that the platform design could affect the attractiveness of complementary services and products and thereby achieve a competitive advantage (Venkatraman and lee, 2004). Hereby, **openness** is addressed as a relevant design choice which could lead to increased network effects (Faber and De Reuver, 2019) (McIntre and Subramaniam, 2009). Openness could have a **positive impact** by increasing adoption through consumer acceptance of the platform and thus exploiting network effects. A growing number of consumers will increase the value of the network (direct network effects), which will stimulate producers to contribute unique services and products to the platform, leading to more connected consumers (indirect-network effects). Openness can have also a **negative impact** on the platform; as it can result in a reduction of switching costs for users; As a result, consumers might easily switch to other platforms (Gebregiorgis and Altmann, 2015). Therefore, the competition from other platform providers will increase, which could undermine the profitability of the platform (Parker and Van Alstyne, 2008) (Eisenmann et al., 2009).

Deciding to what extend a platform should be open is important and can be a **challenging dilemma** because of the possible positive and negative impact of openness as illustrated in the previous paragraph (West, 2003; Gawer & Cusumano, 2008; Eisenmann, et al., 2009; Boudreau, 2010; Parker & Van Alstyne, 2005). The research agenda of McIntre & Srinivasan (2017) addresses the need towards a more comprehensive view of design choices related to

networks, platforms and strategy. Openness is addressed by this research agenda to be an interesting strategic design choice, potentially leading to enhancement of network effects of a platform (Faber and De Reuver, 2019). Some literature studies address decision models to design the optimal degree of openness of a platform. However, those models are either sector specific and/or address the need for further research (Wessels, Thies and Benlian, 2017)(Ondrus, Gannamaneni & Lyytinen, 2015).

In researching the topic of openness and network effects on specific platforms a detailed research a wide range of definitions on openness and its positive and negative effects on a platform will be found. All dependant on the context, perspective and sector. Also a more detailed understanding of a platform is relevant; what aspects or roles can be further defined within a platform and its ecosystem, giving further insight in possible actors and areas of impact related to openness. In order to facilitate research on openness on specific platforms in a certain sector, a comprehensive generic framework applicable in all sectors would be helpful as a reference.

**The objective** of this study is to construct such a generic framework on openness and network effects applicable for platforms in general, not limited to a specific sector, perspective or context. This generic framework should contain general applicable definitions of openness, the related positive and negative impact including network effects and a further definition of a platform and its components.

This framework should facilitate the research of a specific platform in a certain sector and context by eliminating the need for extensive literature research on the related topics of openness and network effects on platforms.

**In the research method** an framework is constructed in two steps. The first step is to construct a framework by selecting an appropriate x and y axis. The second step is to provide content based on previous studies that identify positive and negative impacts of platform openness. These studies are placed into the framework. The constructed framework including the content of multiple studies

is referred to as the *theoretical framework*. The practical value of the framework is demonstrated in this research by doing a case study.

The outline of this paper is as follows: first theory, explaining concepts used in this paper will be elaborated. Followed chapter 3, the research method in which the two steps of the construction of the theoretical framework will be elaborated. In chapter 4, literature review is conducted, in which positive and negative impacts of openness are identified. In chapter 5 the practical value of the framework is demonstrated by conducting a case study. The discussion is provided in chapter 7. The conclusion and suggestions for future research in chapter 8 and 9.

## 2. Theory

The role of the platform, described in the previous chapter, is to connect users and producers, interaction between those takes place on the platform (Gawer, 2011) (Eisenmann, Parker and van Alstyne, 2006) (McIntyre and Srinivasan, 2017).

Eisenmann describes that openness of a platform can be introduced on selective elements of a platform. For example, a platform can be open only to consumers or only to producers or to both, which has different impact on the platform.

To manage openness on the platform and to determine the right strategy regarding openness, it is vital to identify the different kinds of openness, their impact on the platform and parties or roles involved. Therefore, Eisenmann identified four roles on the platform, together they form the platform mediated network (Eisenmann et. al., 2009).

### 2.1 Description of the four roles

Eisenmann et al., (2009) identified four roles. A visualisation is presented in figure 1, the numbers in the figure correspond to numbers in the text.

The demand-side users (1) are the end users of the platform, referred to as consumers in this research. The supply-side users (2) are individuals or third parties who contribute to the platform by offering

products to the end-users, referred to as producers in this research. The central point of contact for both types of users (1) and (2) is the platform provider role (3). The platform provider determines rules and regulations within the network. The last role, platform sponsor (4), often controls the development of the platform and owns the property rights.

The described roles identifies groups of stakeholders directly involved and indicates their tasks and responsibilities in a generic way. It is important to realize that the exact tasks and responsibilities of the roles can be different in practice for each platform. When conducting a research using the platform roles of Eisenmann as a reference, it is important to define the actual tasks and responsibilities for each role in the beginning of the research. From this, the relation between the roles becomes clear. It is valuable for the research to understand the actual relation between platform roles on that specific platform.

These different identified roles result in a wide range of possible strategies for managing openness (Eisenman et al., 2009).

### Eisenmanns roles in this research

The Eisenmann framework is used as a structure throughout this research to be able to refer to specific parts of the platform. For practical purposes, the user supply side is referred to as *producers* and the user demand side is referred to as *consumer* in this study. The tasks and responsibilities of the four roles are assumed to be according the generic specifications of Eisenmann. The labels of the roles used in this research are presented in the list below, numbers are corresponding to the numbers used in figure 1.

- |                      |             |
|----------------------|-------------|
| 1. Users demand side | = consumers |
| 2. Users supply side | = producers |
| 3. Platform provider | = provider  |
| 4. Platform sponsor  | = sponsor   |



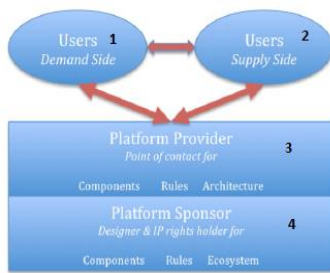


Figure 1 Roles of Eisenmann

## 2.2 Definition of platform openness found in literature

Platform openness has been researched for a long time and from different perspectives (Gawer & Cusumano 2002; West 2003; Eisenmann, Parker & Van Alstyne 2009). At first, there were two dominant theoretical approaches: the economic theory and engineering design. Each approach developed separately and formulated platforms differently (De Reuver, Sørensen & Basole 2018). The economic perspective conceptualized platforms as two-sided markets (Rochet and Tirole, 2003) and the engineering perspective conceptualized platforms as technological architectures (Baldwin and Woodard, 2009). Recently more literature perspectives have been distinguished, like strategic management and technology management (McIntyre & Srinivasan 2017), innovation management (De Reuver, Sørensen & Basole 2018) and information systems (De Reuver et al 2018).

From this it can be learned that there is no clear general definition of openness used in literature; it depends on the specific perspective and /or context of the research. For example access openness, some researchers mean by this the management of openness on a platform, such as which parties have access to the platform. Other researchers use access openness to refer to technical accessibility to platform modules.

Openness of a platform can determine limitations and restrictions for partners to contribute the platform. This is how Eisenman et al., (2009) and Boudreau (2010) approached platform openness. A distinction is made between *granting access* or *relinquishing control*.

The approach of *granting access* permits others, such as producers, to contribute to the platform and create new services and products. Many studies use this approach to refer to the platforms 'accessibility' (Gawer, 2014). For example study of Gawer (2014) approached openness into the extend that platform provider made the interface available to other platform providers or service producers. This could contribute to the compatibility of platforms. It could also lead to interaction between producers and create new services. In this line of thinking the studies of Ghazawneh and Henfridsson (2015) illustrates the stimulating the creation of new services could be done by making resources available to producers. Openness as accessibility and transparency of the platform are researched by Benlian et al. (2015).

The approach of *relinquishing control* is used to divide responsibilities and decisions related to the technological architecture. The platform architecture is not available to other producers or platform providers (Boudreau, 2010). The platform provider wants to remain control on the development and goals of the platform, thereby the platform can influence the other involved roles (Benlian et al, 2015). The platform could make use of technological standards to stimulate producers (Boudreau, 2012). Or devolve control over all roles of the platform.

Next to the two dimensions *granting access* and *relinquishing control*, other sources (Stefi, Berger & Hess, 2014) approach openness from a strategic perspective connected with market and commercial positioning, balancing the potential network effects with possible negative impact of openness like cannibalisation by third parties, low switching barriers of third parties and consumers. Trade-offs like these lead to governance rules of the platform , its ecosystem and technical options.

## 2.3 Definition of openness used in this research

This research will approach openness as a strategic choice, for instance on the producer or consumer side, which can lead to choices regarding technical openness and governance rules for the platform and its ecosystem. Three dimensions of openness are

identified (figure 2). It can be expected that foremost the sponsor and/or provider role are involved in making these choices.

*Strategic openness:* This level refers to openness as a strategic choice, for instance based on a vision and/or policies taking into account the characteristics of the specific sector and the related “pro’s and con’s” of openness. This could lead for instance to strategic choices regarding what type of services of producers the platform and its ecosystem are open.

*Technical openness:* This level refers to choices on the technical dimension, and addresses issues like what level of technical openness is desired, what standards can/will be used. On one hand is it hard to integrate producers in terms of complexity and investments, on the other hand Seamless partnering is an important feature to make the platform attractive to partners.

*Governance openness:* This level refers to the rules of the game. How to manage the onboarding of new producers or platform providers and management of existing platform. For example implement a review system for users and producers to review each other. This enforces good behaviour on a platform. Governance could also be related to simple restrictions to join the platform as a producer or consumer. Think of minimum age for example.

It is assumed that the platform sponsor and/or provide role are involved in determining the level of openness on the indicated levels. These roles are important to consider for empirical studies. They make the trade off and consider the perceived impact on the other roles.

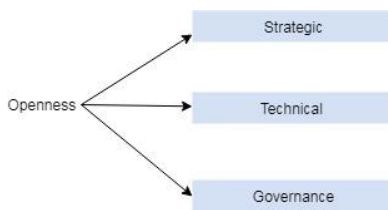


Figure 2 Visualisation of the used definition of openness

### 3. Research method

The framework will be derived from the found elements in literature. The framework is constructed in two steps. The first step is to select an appropriate x and y axis to construct a framework. This step is conducted in paragraph 3.1. The second step is to provide content based on previous studies that identify positive and negative impacts of platform openness. This is described in paragraph 3.2.

#### 3.1 Construction of framework

Step one is to select an appropriate x and y axis. For the vertical axis the definition of openness presented in the previous chapter is used. Because, there is a needed to be specific on what level of openness the study refers to. The roles of Eisenmann are used on the horizontal axis to be more specific on the impact on the platform. The advantage of the roles of Eisenmann is that they are generic applicable on all types of platforms. The combination of the three levels of openness and the four platform roles resulted in a structured approach of all literature studies.

**Figure 3** provides a visualisation of the framework. The three levels of openness are labelled in light blue on the vertical axis, y axis. The four roles of Eisenmann are horizontal axis, x axis. Green refers to possible positive impact of openness and red to possible negative impact of openness. On the X's the impact will be described.

STRATEGIC				
Sponsor	Platform provider	Producer	Consumer	
x	X	X	x	
Sponsor	Platform provider	Producer	Consumer	
X	X	X	X	

TECHNICAL				
Sponsor	Platform provider	Producer	Consumer	
x	X	X	x	
Sponsor	Platform provider	Producer	Consumer	
x	X	X	x	

GOVERNANCE				
Sponsor	Platform provider	Producer	Consumer	
x	X	X	x	
Sponsor	Platform provider	Producer	Consumer	
x	X	X	x	

Figure 3 Visualization of framework including the levels of openness and roles of Eisenmann

### 3.2 Placing propositions into the framework

The second step is to provide content for the framework. Based on literature, possible positive and negative impacts of openness on platforms will be identified and re-phrased into a short (condensed) proposition. The propositions reflect the impact straight forward, no nuance is included in the proposition. As a result, these propositions will be applicable in various sectors.

Placing the propositions into the framework can be challenging. There are some studies that clearly explain the level of openness and specify the direct impact role of the platform. In this case, placing the proposition is evident. There are also studies that are less precise in defining openness and/ or do not specify the role it has impact on. In such case, the researcher is forced to make assumptions and plot the proposition on the most applicable level of openness and the role it has impact on based on the content of the study. It is no option to place the statement on multiple places, although, the framework would become less comprehensible.

In the next chapter a literature study is conducted to identify possible positive and negative impacts of earlier studies, resulting in a list of propositions.

## 4. Literature review

In this chapter literature study is conducted to identify positive and negative impacts of openness. The impact is re-phased into a short propositions, which are placed into the framework. The result is a framework with many propositions, this is presented in the last paragraph of this chapter. Because the framework reflects the theoretical impact of openness identified by previous research, the framework is referred to as the *theoretical framework*.

To structure this chapter, the horizontal and vertical axis of the framework are. The chapter divided into the strategic, technical and governance (vertical axis) paragraphs. Each paragraph consists of subparagraphs sponsor, provider, producer and user (horizontal axis).

### 4.1 Strategic level of openness

The first, out of three levels of openness, is strategic openness. This level discusses to the mentality of the platform provider or sponsor. The strategic level is dominant in most cases and determines the level of openness in on technical and governance level.

#### 4.1.1 Sponsor

##### Possible positive impact of openness

The study of Choia, Nam and Kim (2017) is conducted within open mobile operating systems specifically the case of Android. The variety of services and products offered by producers on a platform determine the attractiveness of a platform (Gawer, 2014) (de Reuver, Sørensen, & Basole, 2018). When a platform offers a large amount of products, consumers have more choice. The chance a consumer finds the perfect match is higher. The platform becomes more attractive because of one side growing, indirect network effects are created (McIntyre & Srinivasan, 2017). To enhance the mechanism, platform providers or other roles involved in creating the platform aims to create an attractive platform (Cennamo & Santalo, 2013). From this can be concluded that a platform aims to become open in to enhance network effects and thereby expand the accessibility and variety of services on a platform. Stimulating network effects on sponsor level leads to the three opportunities. Given the arguments above, openness could potentially lead to the following outcomes, formulated in propositions:

1. *Increases availability of services*
2. *Attracts more consumers*
3. *Creates a competitive platform*

##### Possible negative impact of openness on sponsor role

The research of Lee, Lee and Hwang, 2014 compares two different platform ecosystems, an open and a closed platform ecosystem. Openness of the platform refers to how easy third parties can enter the ecosystem and contribute to the platform. The example used throughout the research of Lee et al. (2014) is the case of apple. Apple applies a strict

control strategy for assimilating value chains through all layer's results in an ecosystem which is restricted open. On the long term this leads to increased technical efficiency for two reasons: Apple can reduce conflict, which is essential in the evolution of the ecosystem. Secondly, the approach restrains the amount of technical standards such as technical languages, this ensures the quality of producers and creates efficiency. Apple's rather closed platform, specifically in the development, is considered to be a strategic choice (Lee et al, 2014). The example addresses that **restricted** openness on sponsor role leads to long term efficiency in the ecosystem. Meaning that unrestricted openness could decrease long term efficiency, in short formulated in proposition 4.

4. *Decreases long term technical efficiency*

#### **Possible negative impact of openness on sponsor role**

The study of Lee et al (2014) also addresses another possible negative impact of openness.. When opening a platform, the central control point is less dominant related to the high interconnectivity and interdependency between platform roles which leads to a vulnerable situation. If one layer fails for whatever reason it might influence the functioning of the whole ecosystem (Lee et al, 2014). The sponsor needs to assess this possible weakness of the platform caused by openness other producers. The possible negative impact is reflected in proposition 5.

5. *Increases vulnerability of ecosystem*

#### **Possible negative impact of openness on sponsor role**

The study of Farrell and Klemperer (2007) identifies the possible negative impact of openness linked to the absence of customer lock-in power of a platform. When being open towards both sides of the market; producer and consumer sides will not experience a binding force to the platform. The negative effect of reducing switching cost, makes it is easy for a user of the platform to switch to another platform easily (Parker and Van Alstyne, 2005) (West, 2003). On strategic level a strong relation with the consumer to

the platform through indirect network effects is desired by a platform sponsor. When switching becomes too easy for consumers, the possible negative impact of openness is not having a customer lock-in. Openness on sponsor role thus leads to the strategic possible negative impact a of customer not being locked-in on the platform, proposition 6.

6. *Weakens the feeling of being lock-in to the platform*

#### **Possible negative impact of openness on sponsor role**

Another possible negative impact of openness on sponsor level is adressed in the study of Ondrus, earlier identified by Boudreau (2010) and Eisenman (2009), is the possible reduction of profits due to a decrease of multi-homing, leading to a lower industry unit volumes. This is type of openness has possible negative consequences on the provitability, being a strategic decision on sponsor or provider role. Possible impact is in short formulated in proposition 7:

7. *Reduces profitability of the platform*

#### **4.1.2 Platform provider role**

##### **Possible positive impact of openness on provider role**

The research of Choia, Nam and Kim (2017) research is conducted on mobile platforms. The research focusses on the impact of platform openness on the intention of a service or product producer. For example it could be that a producer contributes once or regularly to the platform. This has impact from a platform ecosystem perspective. In the study, openness is approached as the right for producers to join the platform deprived of regulation or restrictions (Boudreau, 2010). The research focusses platform openness in diversity of products, services and ecosystem. It can be concluded that being open towards producer can have a stimulating influence on the intention of a producer to contribute on a repetitive basis. This again, would increase the user base through network effects, and thereby stimulate competition among developers. This has thereafter a stimulating effect on innovation of services and

products developed by producers (Choia et. al, 2017). Openness on provider role could lead to the strategic positive impact to foster innovation on the platform, in short formulated in proposition 8.

8. *Fosters innovation*

#### **Possible negative impact of openness on provider role**

No possible negative impact of openness has been identified on the provider role.

#### **4.1.3 Producer role**

##### **Possible positive impact of openness on producer role**

The research of Ondrus, Gannamaneni and Lyytinen conducted a research in 2015 focussed on how openness can contribute to the market potential of a platform. The paper also used the Eisenman roles to structure and introduce openness. The research addressed positive and negative impacts on provider, and consumer role. One of the found positive impacts on strategic level having impact on producer role is that it increases cooperation of third parties and creates new, maybe unexpected, services and features. The example given is that a phone could become more popular because a producer developed a “killer app”, creating an unforeseen feature for the phone and creating popularity because of an application which was not thought of at first. Openness on producer role could lead to the strategic possible positive impact for unexpected opportunities, in short formulated in proposition 9.

9. *Increases co-creation of products*

#### **Possible positive impact of openness on producer role**

In line with this positive effect on producers, openness offers the possible positive impact of openness to be a stimulance for third parties by multiple studies (Benlian, Hilkert and Hess, 2015) (Choia, et al, 2017) (Eisenmann et al., 2010) (Boudreau, 2010) (Eisenmann et al., 2009). Openness directly influences the direct motivation and purpose of producers to contribute to the platform. Furthermore, the consumer base of the

platform leads to competition between producers, thus stimulating producers to contribute. When a platform has more participants, the producers will be stimulated through indirect network effects (Choia et. al, 2017). Openness on producer role leads to the strategic possible positive impact to encourage participation, innovation and continuous contribution of third parties and its developers. Possible positive impact is in short formulated in proposition 10:

10. *Encourages participation*

#### **Possible negative impact of openness on producer role**

No possible negative impact of openness has been identified on the producer role.

#### **4.1.4 Consumer role**

##### **Possible positive impact of openness on consumer role**

The study of Gebregiorgis et al. (2015) is conducted on IT platforms with a technical approach of openness. The study addresses the strategic a possible positive impact of openness on the consumer role. Some cloud-services restrict the option for consumers to transfer their data to another platform. This can be made difficult by the platform provider on purpose, for example by not being interoperable with other systems. For a customer this forms a lock-in. Consumers who are conscious of this possible negative impact of openness might not adopt such narrowed cloud services, because switching costs to a different system can be expensive. Opening an IT platform reduces this possible negative impact of a lock-in and its associated switching costs. The concerns of consumers about being lock-in on a platform and the risk of having switching cost is decreased by providing an open platform to consumers. Therefore the platform becomes more attractive for users (Gebregiorgis et. al, 2015). This possible positive impact leads to proposition 11.

11 *Reduces consumers concern about lock-in*

### **Possible positive impact of openness on consumer role**

The research of Gebregiorgis et al., 2015 is conducted within cloud computing. The research is rather focussed on a technical definition of openness and addresses that (technical openness) it is key to gain **market power as a platform**, which influences trust of consumers in a positive way. For instance the fear of the platform going bankrupt will decrease from a consumers perspective when a platform has market power. The platform will be considered as a stable and trustworthy party. Therefore, participants of the platform will not be frithgtend by the possibilities like loosing data or having to change to anohter platform or other inconveniences. Trust influences the attractiveness of service platforms in a positive way. In short, openness leads to market power wich enhances trust of users. Although it could be questionable wich is first, in short formulated in proposition 12 and 13:

12. *Increases market power*

13. *Enhances trust of users*

### **Possible negative impact of openness on consumer role**

No possible negative impact of openness has been defined identified on the consumer role.

## **4.2 Technical level of openness**

Technical openness is defined as the infrastructure and partnering of a platform. For example, partnering could be done through horizontal or vertical integration. Horizontal refers to licencing, shared standards and technical interoperability with various platforms, also with competitive platforms. Vertical strategies entail adoption of third parties and category exclusivity. These strategies increase or limit access to the platform roles identified earlier (Eisenmann et al., 2009). These types of openness have technical implications but is determined on the strategical level of the platform. From the example the interconnection between layers becomes already clear. This paragraph provides insight into identified possible positive and negative impact of technical openness.

### **4.2.1 Sponsor role**

#### **Possible positive impact of openness on sponsor role**

Besides the identified strategic openness in proposition number 9, the study of Ondrus et al (2015) also addresses technical issues. Such as the possible positive impact of openness on sponsor level to split the costs of the investments needed for the technical infrastructure (Boudreau, 2010). This could reduce the investment and refers for instance to the cost when the platform requires a new technological infrastructure, formulated in short in proposition 14

14. *Reduces cost of new technological infrastucture*

#### **Possible positive impact of openness on sponsor role**

Openness on technical level could mean that the efforts are not equal to all involved parties. Openness on sponsor level leads to the technical possible positive impact of openness to leech of the advantages of competing platforms (Eisenmann et al., 2009), leading to proposition 15.

15. *Increses benefits from other platforms*

#### **Possible negative impact of openness on sponsor role**

The possible positive impact of openness mentioned above also entails a possible negative impact of openness identified by West (2003). An interconnected technical system increase technical efforts to be interoperable. Meaning that openness on sponsor role leads to the technical possible negative impact of openness of large technical efforts, proposition 16.

16. *Increases technical efforts*

#### **Possible negative impact of openness on sponsor role**

The research of Gebregiorgis and Altmann, 2015 is conducted within cloud computing. In the research openness is defined as IT standards like interoperability, portability and usability of components within IT facility systems. The research focusses on the impact of standardization of

technology related to market power of cloud computing platforms. It turns out that standardisation has a negative influence on the platform provider with a large market share. On the long run, standardisation will lead to a reduction of market power. This is one of the most important reasons for providers with a large market share not to use standardization or stimulate standardization. The opposite, those market leaders will try to block or influence the decision of standardization into their favour. In this research it is assumed that these kinds of decisions are made on sponsor levels. Openness on sponsor role leads to the possible negative impact of technical openness in statement 17.

17. *Reduces market power of key provider*

#### 4.2.2 Platform provider role

##### **Possible positive impact of openness on platform provider role**

The study of Ondrus, Gannamaneni and Lyytinen 2015 **indicates** how multiple technologies can be integrated into one platform. Also encompassing how easy is it to connect with competitive platforms. It is challenging to become interoperable when diverse technologies are used. The research addresses that technical openness on provider role leads to the possible positive impact of openness to seamless connect compatible suppliers and strongly positively enhances indirect network effects of the platform. The possible impact is captured in proposition 18.

18. *Enhances seamless connection*

##### **Possible positive impact of openness on platform provider role**

When the technique of a platform is open, it rises entry to capabilities, assets and resources of others. The possible positive impact of openness is identified by Ondrus and West (2015). This could contribute to the platform potential to develop, proposition 19.

19. *Increases access to resources*

##### **Possible negative impact of openness on platform provider role**

A possible negative impact of openness on technical level is identified by the study of Eisenmann et al. (2009). When being open technical you could have the benefit to leech of the benefits of others, but the negative side of this effect is that benefits are leeched off from your platform or technical structure. It is a two-sided medal, presented in proposition 20.

20. *Gives away platform benefits*

##### **Possible negative impact of openness on platform provider role**

Mentioned in the part of Ondrus, identified earlier by Eisenmann et al., 2009; when a platform is technically open and available, it is hard to create standalone properties to differentiate from others. Openness on provider role leads to the possible negative technical impact of losing the differentiating power of a platform. In short formulated in proposition 21.

21. *Reduces ability to create differentiating properties*

##### **Possible negative impact of openness on platform provider role**

The study of Sharpiro and Varian (1998) identified a disadvantage also mentioned in the study of Ondrus et al. 2015. When a platform is open on technical level, it is not interesting for a provider to invest, as everybody can enjoy the benefits. One might not put that much effort into the benefit of the whole. The possible consequence of a lack of incentive is that investments are not made anymore. Technical openness on provider level leads to the possible negative impact of having low investments leading to a loss of quality and innovative power, leading to proposition 22.

22. *Reduces incentive for investments*

##### **Possible negative impact of openness on platform provider role**

From the article of Gebriorgis et al., 2015 can be concluded that for an IT platform the interoperability, portability and usability are very

important to increase the value of IT services. It is important for current market leaders but also for new platform providers. For the current platform providers in the market it is required to be able to be a competitive platform on the long term. They will need to alter their strategy to the actual developments in the market. Seamless connection of IT platforms allows compatible suppliers. The possible negative impact of openness is not being able to compete in the market and thus weakening the market position, proposition 23.

23. *Weakens market position*

#### 4.2.3 Producer role

##### **Possible positive impact of openness on producer role**

Openness to producers of products and services increases the opportunities to make use of the technological architecture. Thereby, general support can be shared such as rules, tools and information that can be helpful to develop service or product on the platform. Openness on the producer role leads to the technical possible positive impact to lower the entrance barriers of the platform for producers of services. The possible positive impact is in short formulated in proposition 24.

24. *Lowers entry barriers to connect*

##### **Possible negative impact of openness on producer role**

No possible negative impact of openness has been identified on the producer role.

#### 4.3 Governance level of openness

Governance openness refers to the rules of the game, input control (onboarding) and to manage the maturity of the platform.

##### 4.3.1 Sponsor role

##### **Possible positive impact of openness on sponsor role**

When the regulation is correct, there is an option to share cost of regulation, enforcement ect.

(Eisenmann et al., 2006) (Ondrus et al. 2015). On provider role, openness leads to the governance possible positive impact of openness to share costs, leading to proposition 25.

25. *Decrease costs of regulation*

##### **Possible negative impact of openness on sponsor role**

The studies of Evans et al., (2010) and Ondrus et.al. (2015) both adress possible negative impact of openness on governance level. The involvement of each platform role and control on producer and user side of the platform can be determined by the provider level. On this level, openness can be used strategically to deviate rights and obligations of each partner who joins the platform. The two possible negative impacts of openness are short formulated in proposition 26 and 27.

26. *Increases anti-trust issues*

27. *Decreases control of central point*

##### **Possible negative impact of openness on sponsor role**

Openness on sponsor or provider level would lead to more coordination problems according to Gawer and cusumano (2002) and Ondrus, et al (2015). Openness leads to coordination cost among producers and the platform provider. This could be caused by differences in characteristics of connected devices. These extra struggles increase the costs of coordination. From the study is learned that satisfaction of game developers is decreased by rising of coordination costs (Choia et al. 2017). Openness on sponsor role on governance leads to a possible negative impact on coordination issues (28) and influence third parties development (29).

28. *Increases coordination issues*

29. *Increases coordination costs*



#### **4.3.3 Platform provider role**

##### **Possible positive impact of openness on platform provider role**

No possible negative impact of openness has been identified on this level.

#### **4.4 Literature synthesis**

A literature review has been executed in which articles have been selected that include the impact of openness on platforms. Literature studies on openness are merged into one overview, by means of plotting propositions.

**Figure 5**, the complete theoretical framework plotting propositions 1-29 is presented. The propositions have been allocated to the corresponding level of openness being strategic, technical and governance (fig. 5, vertical axis) and to the applicable Eisenmann roles identified (fig 5, horizontal axis)

Additionally the possible positive (green) and negative (red) impacts of openness are identified. The theoretical framework includes propositions without context factors and is generically applicable in various sectors.

STRATEGIC			
Sponsor	Platform provider	Producer	Consumer
1. Increases availability	8. Fosters innovation	9. Increases co-creation of products	11. Reduces customers concerns about lock-in
2. Attracts more consumers		10. Encourages participation	12. Increases market power
3. Creates competitive platform			13. Enhances trust of consumers
Sponsor	Platform provider	Producer	Consumer
4. Decreases long term efficiency	x	X	x
6 Weakens the feeling of being locked-in to the platform			
5. Increases vulnerability of ecosystem			
7. Reduces profitability of the platform			
TECHNICAL			
Sponsor	Platform provider	Producer	Consumer
14. Reduces cost of new technological infrastructure	18.Enhances seamless connection	24. Lowers entry barriers to connect	x
15 Increases benefits from other platforms	19. Increases access to resources		
Sponsor	Platform provider	Producer	Consumer
16. Increases technical efforts	20. Gives away platform benefits	x	x
17. Reduces market power of key provider	21. Reduces ability to create differentiating properties		
	22. Reduces incentive for investments		
	23. Weakens market position		
GOVERNANCE			
Sponsor	Platform provider	Producer	Consumer
25. Decreases costs of regulation			x
Sponsor	Platform provider	Producer	Consumer
26. Increases anti-trust issues			
27. Decreases control of central point			
28.Increases coordination issues			
29. Increases coordination cost			

Figure 5 Theoretical framework

#### 4.5 Conclusion of literature review

The theoretical framework provides insight into the interrelation and interconnectivity within this research field. Positive and negative impacts of openness are represented in a structured way. Remarkable is that some positive and negative propositions represent two sides of the medal. These findings are interesting to gain insights on the impact of openness when determining the strategy of a platform. Or more specifically, when considering openness as a strategic design choice. These are:

- Strategic openness could reduce consumers concerns to be locked-in and thereby increase consumer adoption versus too much openness on this level could lower the switching barriers for consumers. Therefore, it is hard from a platform perspective to keep the customer locked-in on the platform.
- Strategic openness could be needed to create more efficiency on the platform. Through interaction it will develop further versus the theory that through limited openness and strict control on the platform efficiency would be increased.
- Technical openness allows a platform to have access to resource of others, but on the other hand others can leech of the benefits of your platform.
- Governance openness could lead to coordination issues between all parties involved versus a reduction of costs as those can be divided among all involved.

Furthermore, it can be concluded from the literature study that when determining the exact impact of openness the context- sector dynamics are of great importance.

The practical value of the theoretical framework is illustrated in the next chapter by a demonstration of a case study.

#### 5. Demonstration of the theoretical framework in practice

The *theoretical framework* including the propositions can be specifically useful to explore the impact of openness of a platform in a domain which is not yet been researched. To illustrate the practical value of the theoretical framework, a case study is conducted in the banking sector. The banking sector is selected because platforms are becoming an increasingly popular business model in this sector.

The case study will illustrate into what extent the framework is useful as a method when exploring the impact of openness of a platform in a specific sector. Furthermore, the case study will illustrate the value of the insights learned from the case study.

##### 5.1 Case study

The case selected consists of a big traditional bank, fulfilling the sponsor role and a fintech of a couple of years old, being the platform provider role. The roles and responsibilities are important to understand the relation between all involved parties. Because, the responsibilities of roles are different, depended on the organization of the platform. Therefore, first the platform sponsor, platform provider, user and producers are identified and more information on each role is gathered.

The impact of openness on a platform is dependent on the context. These propositions lack context factors, these are removed on purpose to construct a generic applicable framework. Although, openness is context dependent. This means that a one on one translation of the propositions to a specific sector is not possible. Therefore, sector specific propositions are formulated and added into the framework. The result is a theoretical framework specified on the domain. These sector specific propositions are based on (grey) literature and represent characteristics of the banking sector.

To research the impact of openness on financial platforms semi- structured interviews are conducted with participants from both sponsor and platform provider role. These two roles are selected because those determine the level of openness. The

consumers and producer's role are influenced by the decision but are not included in the decision-making process.

Interview participants are carefully selected based on years of working experience and level of functioning. During the interviews the framework is used as a frame of reference. This turned out to be very effective method. For example, when the participant was asked about strategic level of openness, the propositions were useful to illustrate possible impacts. Because propositions are shortly formulated, it was easy to discuss a lot during each interview. The interviews are transcribed, coded and analyzed. The results will be discussed in the next paragraph.

## 5.2 Results of case study

The case study resulted in an overview of *factors found in the case study*. In the overview, only confirmation propositions are considered to be relevant for the case study and some are not confirmed and therefore those propositions are considered not to be relevant for this case study. From this overview, insights are provided on the sponsor and provider roles specific for the case study. This provides an overview with only propositions applicable to this specific case study.

From the overview, multiple insights can be learned. To start with an observed difference in perspective between the sponsor and provider role. The sponsor in this case addresses openness as one of the most important strategic design choices that should be judged from an early phase in the platform development. The platform provider does not recognize the importance of openness as a strategic design choice and addresses other key elements in their vision that will lead to success. Remarkable is that there are also three dilemmas only identified by the sponsor in this case study. 1) Openness versus commoditization, 2) Openness versus trust of the platform and last 3) Openness versus monetization of the platform.

Insights learned from both perspectives are also found. For example, the strategic dilemma of having open and easy access on the consumer side of the

platform leading to low switching barriers. Furthermore, both roles address the barrier of openness due to heavy sector regulation. This limits the option to become open. On technical level is the sector very fragmented, therefore it is hard design a system that easily connects all of the technical systems. Besides, full technical openness is not desire in this sector. Every party wants to keep full control on their technical systems as the processed information is sensitive for security and privacy risks.

## 5.3 Conclusion of the case study

The aim of this case study was to demonstrate the framework as a method and to illustrate the value of the insights learned from the case study.

The framework has been valuable as a method in this case study. The propositions were helpful during the interviews. Participants quickly understood the three levels of openness and the different roles of a platform. Openness can be quite complex, and people often use terms without being specific. The framework was very helpful to force people to be very be specific on the type of openness and the impact. Only on governance level it was difficult to confirm statements. The examples mentioned by the respondents were very dependent on multiple aspects such as the type of product offered on the platform, the number of users and many more influential factors. On strategical and technical level, the propositions were approachable for participants. Therefore, propositions on these levels were helpful in the conversation to illustrate an example. Overall, the tool is considered to be very helpful as a frame of reference.

The insights learned from the case study are interesting when considering openness on a platform in the financial sector. Such as the observed difference in the vision of openness from sponsor and provider role and the shared vision on the sector characteristics

## 6. Discussion

Placing the propositions to the framework sometimes requires assumptions to be made. In some literature studies it was unclear what type of openness was meant and, in some studies, the direct impact role was unclear. In this situation, the researcher is forced to make assumptions based on the content of the research. Other researchers might come to a slightly different categorization. This is not critical for the usability of the theoretical framework, as long as the framework is used as a frame of reference and not in a deterministic way. E.g. in a research where category boundaries are of leading importance. Then it would cause a limitation for the usability of the theoretical framework.

In this study on the strategic level of openness, a relative high number of propositions in the theoretical framework is confirmed in the case study. This means that the case study identified roughly the same impact of openness as found in literature. The difference in relative number of confirmed propositions between the three levels of openness could be explained by the difference in scope between the three levels of openness. The strategical level of openness is mainly related to vision and long-term goals. This is made explicit in the case study. The strategic vision can be used for platform development in a more tactical level. The added value of the governance level is limited. Already in the literature study it was hard to formulate generic proposition, as it was so dependent on context factors. The case study it was also difficult topic to discuss with participants. The added value this level is limited and maybe it should be removed from the framework.

The theoretical framework has been useful to understand dynamics between roles and understand the impact of openness. This makes the generic formulated framework valuable in a case when the impact of platform openness is not yet researched. Although, it only provides broad insights. The framework does not allow factors that have indirect impact or specific characteristics of such platform as it is a generic framework. This is a limitation, specifically because the impact of openness is context dependent and sometimes requires platform specific

information to be able to comprehend the possible impact of openness.

## 7. Conclusion

The constructed theoretical framework is specifically useful when the impact of platform openness is not yet researched in a specific sector. The framework offers the opportunity to explore the sector by using the frame of reference including possible impacts of openness identified in other sectors. The generic formulated propositions are valuable to understand dynamics between the identified roles. Furthermore, the content of the framework is easy to adapt. This framework therefore can be adjusted to be a valuable frame of reference in a various sectors.

From the case study can be learned theoretical framework has been very valuable method throughout the case study research. Respondents were comfortable with the concepts used. Furthermore, it is confirmed that the theoretical framework is useful when exploring the possible impact of openness of platforms. The strategic and technical level of openness were specifically useful. Important note when using the framework as a method it to define tasks and responsibilities of each role at the beginning of the research. This is needed to understand the results of the case study.

## 8. Recommendations for further research

From the literature study is learned that impact of openness is very sector specific. The theoretical framework is generic applicable. It is already an advantage that it is easy to add propositions into the theoretical framework to make the framework more suitable to explore a certain sector. Although, further research could go into options to include more detail into the framework. This would lead to more specific insights on the impact of openness. A more nuanced vision.

In this case study only participates of sponsor and provider role are included because they determine the type and level of openness. As there are many positive and negative impacts on the consumer and producer role, it is recommended that a future case

study also includes those perspective into their research. This would contribute to the holistic vision on openness.

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