Aalto University
School of Business

PRICING METHODS IN DIGITAL MULTI-SIDED PLATFORMS WITH A DELIVERY SERVICE

Evidence from a case company

Master's Thesis
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Abstract of master's thesis

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Abstract

Digital platforms and their success stories during the last twenty plus years have yielded questions on how such corporate fairytales come into existence. One of the critical decisions when building a successful digital platform is pricing. Pricing in digital platforms has been studied by a number of different scholars. The pricing models presented in academic literature vary from qualitative to very quantitative. Pricing models can be a listing of decisions or a mathematical model to determine the optimal price points for a digital platform.

The research questions for this study are: How do digital platform companies with a delivery service determine correct price points for their service? Can a digital platform with a delivery service make accurate pricing decisions based on a qualitative model? In this study, I research pricing methods in digital platform companies, with an emphasis on companies with a delivery service. The case company in this study is a European three-sided digital platform with a delivery service. The evidence from the case company contributes to this study greatly, by providing an example from a real-life pricing model. I am able to present their pricing procedure in detail in this study.

The goal of the study is to present pricing models from existing academic literature. The pricing models presented in this study are qualitative and quantitative. I compare the academic pricing models to the one in case company. The contribution of this thesis is to examine and present pricing models of digital delivery platforms. This study presents a unique finding in the context of pricing models for digital platform with a delivery service. There is evidence for the correctness of the case company's pricing model with comparable results from another model, and evidence on how the model has performed historically.

The method of the study is qualitative, and interview based. The most important finding of this study is the case company's unique method of data collection for their pricing procedure. This finding sets it apart from existing models in the field. The restrictions of the study are related to the generalization of the case company's pricing model and the potential misrepresentation of corporate specific pricing models in academic literature.

Keywords Digital Platforms, Pricing models, Pricing structure

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Tiivistelmä

Digitaaliset alustat ovat viimeisten yli 20 vuoden aikana herättäneet kiinnostusta uskomattomilla kasvutarinoilla sekä herättäneet myös pelkoa niiden ottaessa isoja osia markkinoista, nykyisiltä perinteisen mallin yrityksiltä. Yksi oleellinen päätös ja mietinnän aihe digitaalisissa alustoissa ovat hinnoittelupäätökset. Alan tutkijat ovat maininneet juuri hinnoittelupäätökset yhdeksi tärkeimmistä päätöksistä rakennettaessa alustayritystä. Hinnoittelumalleja on niin kvalitatiivisia kuin kvantitatiivisiakin.

Tutkimuskysymykseni ovat: Miten monipuoleiset, digitaaliset kuljetusalustayritykset tekevät oikeita hinnoittelupäätöksiä palvelulleen? Voiko digitaalinen kuljetusalusta tehdä tarkkoja hinnoittelupäätöksiä kvalitatiivisella hinnoittelumallilla?

Tässä tutkimuksessa keskitytään digitaalisten kuljetusalustojen hinnoittelumalleihin. Tapausyritys on kolmipuoleinen eurooppalainen digitaalinen kuljetusalusta. Esittelen tässä tutkimuksessa tapausyrityksen hinnoittelumallin yksityiskohtaisesti. Se toimii esimerkkinä todellisen maailman hinnoittelumallista. Tutkimuksen tavoitteena on esittää olemassa olevia teoreettisia hinnoittelumalleja sekä liiketoimintaa harjoittavan yrityksen käytössä oleva malli. Työssäni vertailen myös näitä malleja keskenään.

Tutkimuksen tieteellinen kontribuutio on esitellä digitaalisten kuljetusyritysten hinnoittelumalleja, sekä tapausyrityksen hinnoittelumalli kokonaisuudessaan. Tutkimuksessa esittelen uudentyylisen hinnoittelumallin verrattuna nykyiseen tutkimukseen digitaalisissa kuljetusalustoissa. Tukea tapausyrityksen mallin toimivuudesta tuovat toisen mallin vertailutulokset sekä taulukko tapausyrityksen mallin ennusteista verrattuna toteutuneisiin hintoihin.

Työ on kvalitatiivinen ja tehty haastattelemalla tapausyrityksen edustajaa useampana eri ajankohtana. Tutkimuksen vaikuttavin löydös on tapausyrityksen kohtuullisen ainutlaatuinen tiedonkeräämismenetelmä hinnoittelua varten. Tutkielman rajoitukset liittyvät pitkälti tulosten yleistettävyyteen, koska erilaisia digitaalisia alustayrityksiä on melko paljon. Myös tämän tutkimuksen ainutlaatuisena pitämäni löydös saattaa johtua osittain yritysten haluttomuudesta kertoa hinnoitteluprosesseistaan julkisesti.

Avainsanat Hinnoittelumallit, Digitaaliset alustayritykset

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Mom and Dad, thank you for everything. I am just a little boy in a hard world. Without your support and example, I would have never made it this far. Thank you.
Brothers. We will always be. That is the most important thing. It is also exhilarating to join the group of university graduated brothers. We are now 3 out of 4 and in a couple of years, I am sure 4 out of 4. Let's have fun in life, that counts.
All the friends in and outside of Aalto University. Thank you for making the days count also in other matters of life than economics and pricing theories. Life is at its best when shared with great people. Thank you.

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"Education is not the learning of facts, but the training of the mind to think."

- *Albert Einstein*

Niklas Ahlbäck,
Helsingissä, 28.7.2020

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Terminology

A platform company – Company that facilitates at least two different participating groups

A digital platform – Internet based platform

Two-sided online platform - A digital platform with two groups of participants

Platform participating group – a group of participants to a platform with similar needs from the platform. E.g. accommodation seekers in Airbnb platform.

Network effect – the effect that an additional user of a product or service, has on the current users.

Network externalities – same as network effect

Positive network effect - if the entrance of a new user causes the marginal utility of existing users to increase, this is called a positive network effect. This means that, the a user's benefit is an, "increasing function of the number of other users" (Moffat, 2019)

Negative network effect - if the entrance of a new user, causes the marginal utility of existing users to decrease, this is called a negative network effect.

Chicken-egg problem – in this context it means that a platform needs to gather both sides of users simultaneously and it is hard to get started trying to attract one side without any participants on the other side.

Pipeline company – a traditional company, not a platform company

Pricing strategy – The pricing strategy of a company, including pricing models and singular price level decisions.

Pricing model – A company can have multiple pricing models in use for different types of situations and still be part of one pricing strategy.

Price level decision – A price point decision within a certain pricing model

Homing costs – costs related to being accustomed to a new platform

Switching costs – costs related to switching from one platform to a fairly similar one

Winner take all propensity – In platform economy this means that the first successful platform is likely to grasp a great share of the market, leaving little to others, even if faced with tough competition.

Multihoming – Participating to more than one similar platform at a time

Platform participant (user) groups – Platform user groups have a common interest towards the platform, e.g. ride seekers in Uber is a platform participant group.

Two-sided markets – a general term, referring to markets which are characterized by platform companies. Credit cards, TV-channels, shopping malls. (Armstrong 2016)

1 Introduction

Digital platforms have existed since the early 1990's[1]. Their baffling disruption power to existing industries through technological innovation and mass scale, has caught the eye of the businesspeople as well as academics alike (Furth, 2018; Hagiu, 2009; Still et al., 2017). Today, digital platforms are present in nearly every market (Cusumano, Yoffie, & Gawer, 2020). "Platforms are economically important and widely observed in modern economies" (Anderson, Parker, & Tan, 2014). Companies such as Amazon, Google, Facebook, Microsoft Windows[2], Alibaba and eBay are case examples of successful digital platforms. These companies have paved the way for digital platforms and their role in global economy as the new normal in many traditional industries. The power of platforms and digital platforms lies in their ability to bundle resources and reduce search costs (Hagiu, 2014; Series, 2018). Building a successful digital platform is however the exception rather than the norm (Hagiu, 2012). According to Evans & Schmalensee (2016), the reasons why digital platforms are now a timely phenomenon, are the technological advancements of modern business. The modern information technology enables the effective use of data which is a key contribution in platform value creation (Van Alstyne, Parker, & Choudary, 2016). The technological advancements do not however ensure the successfulness of the platform company model. For a platform company to thrive, careful planning and key strategic decisions are needed to be made, among them, pricing (Hagiu, 2014).

From the many features unique to platform companies, pricing has been mentioned to be the most critical one (Eisenmann, Parker, & Alstyne, 2006). Pricing in digital platforms has been studied by various scholars starting with the pioneers in the field Rochet & Jean (2003), to many other scholars studying quantitative and qualitative pricing models. The urge to understand more in-depth platform companies and their success, seems to have driven academic research, but serves also as a clear motivation for this study. Besides being mentioned as one of the most critical decisions that managers need to consider when building a successful platform company, pricing in platform companies, has been mentioned to be more complicated than in traditional companies (Eisenmann et al.,

[1] Amazon can be considered as one of the first digital platforms, founded in 1994.
[2] Microsoft in itself is not a platform as a company, but its operation system, Windows is a textbook example of a platform.

2006). These artefacts have contributed to the decision to choose digital platforms' pricing models, as the topic for this study.

Studying pricing in digital platforms with a delivery service gets encouraging support from academic literature. According to Sun, Teunter, Babai, and Hua (2019), platforms with a delivery service have pricing power, compared to other types of platforms. Delivery platforms deliver physical goods or people in the context of this study.

In this thesis, a case company is utilized. The case company is a European three-sided digital platform with a delivery service. Their pricing model and procedure is presented in detail in this study. To richen the study and to put the case company's pricing model into context, eight additional pricing models from existing literature are presented. Three of these models are mentioned to be especially in the context of digital platforms with a delivery service. These models are presented by Kung & Zhong (2017), Riquelme, Banerjee and Johari (2015) and Sun et al. (2019). The other five models are from platform context, but not explicitly from platform delivery context. This does not mean that these models cannot be considered in delivery context, they are just not explicitly from that context.

The case company provides essential evidence to this research. Their pricing model from real life is presented in detail. They use their pricing model to price the company's service in over 50 different locations across Europe, with seven pricing decisions to be made per each location. With the evidence from the case company, it is possible to show a pricing decision process from end to end. The model takes into account consumers' different tastes for product variety, income backgrounds and price elasticities of demand.

Pricing in platforms is a complex matter and the initial prices with which the service is opened, carry a significant importance. Platform pricing starts with figuring out at least two prices, one for the buyer side and one for the seller side. For correct pricing decisions, platform companies must estimate the overall growth potential of the platform, the expected demand on each side of the platform and the price elasticity of demand for all of its distinct user groups, among other things. In addition to these, platforms need to incentivize, subsidize and monetize correctly. The fact that pricing decisions in platform companies are interdependent of each other, (Bardey, Cremer, & Lozachmeur, 2014), adds yet another level of complexity to platform pricing. Lastly, there can be several pricing decisions to be made within one platform participant group. For example, as mentioned earlier, in the case company of this study there are a total of 7 pricing decisions to be made

for every new location. From these seven pricing decisions, 4 are done to one platform participant group only, the chauffeurs (Steven, 2018).

1.1 Research objectives and questions

To study digital platform pricing, a total of 9 pricing models are studied in this thesis. The emphasis being on platforms with a delivery service. One of the models is from the case company. The study's crucial input is to research the pricing decision-making process as well as the models in digital platforms. The research questions are:

How do digital platform companies with a delivery service determine correct price points for their service?
Can a digital platform with a delivery service make accurate pricing decisions based on a qualitative model?

The research questions reflect the core focus of this study. Presenting different types of pricing models of digital platforms and evaluating them, is the main contribution of this study. Beyond this, the second research question answers to a more specific problem setting. As the second question is much narrower, the data from the case company provides the most compelling evidence for it. The different pricing models in the study allow a comparison between the pricing models from academia and the one from the case company.

The contribution of the study is to present pricing models found from academic literature and describe in detail the case company's equivalent. Platform entrepreneurs can use this study for the purposes of comparing pricing models, or to evaluate a suitable pricing model for their platform.

1.2 Theoretical framework

The theoretical framework for this study is based on digital platforms and their unique corporate structures which to a great extent affect the pricing models. "Under multisidedness, platforms must choose a price structure and not only a price level for their service" (J.-C. Rochet & Jean, 2003). This quotation describes well the theoretical framework of this study. Platforms must consider a complete pricing structure and not only individual price levels. This framework illustrates the different levels of decision-making

in platform pricing structures. This framework helps to understand the three different layers in platform pricing.

- The first level in platform pricing is the pricing process. This means all the tools and methods that a platform uses to set their prices.
- The second level is the pricing model. This is a specific pricing model that a platform uses. An example of this is membership-based fee versus transaction-based fee.
- The third level in pricing are the results of the two previous steps, the final prices.

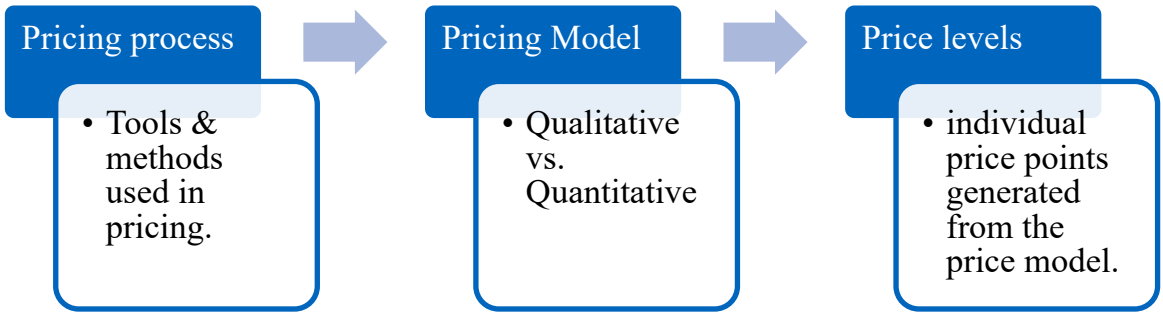

Figure 1 Different levels in platform pricing

The model progresses towards more granular and specific from left to right

1.3 Structure of the Thesis

This thesis is comprised of 6 different sections. The first section in this thesis is introduction. The second chapter is the literature review. In the third part I present the research design and methodology. The fourth chapter is about the case company and their business model, revenue logic and their pricing procedure and model. In the fifth part I analyze the case company's model and present four other pricing models from platform context. In the sixth part I present the study results and discuss the generalization of the study's results, as well as the restrictions of the study. In literature review the focus will be on introducing platforms, digital platforms and different digital platform pricing models. The presentation of the case company's pricing model captures deserved fully a lot of

attention in this thesis, as the access to the case company enables firsthand evidence from their pricing procedure. Three models in literature review are researched explicitly in delivery platform context; (Kung&Zhong, 2017; Sun et al., 2019; Riquelme et al., 2015) and the rest of the models in other platform contexts. In this study, a delivery platform means a platform that delivers something physical; food, goods or people.

2 Literature Review

Platforms are platforms, whether they are digital or not. According to Hagiu (2014), “MULTISIDED PLATFORMS (MSPS) are technologies, products or services that create value primarily by enabling direct interactions between two or more customer or participant groups.” (Hagiu, 2014). This describes the multisided nature of platforms. Another description for two-sided markets and platforms is provided by Eisenmann et al. (2006), “products and services that bring together groups of users in two-sided networks are platforms” (Eisenmann et al., 2006). These examples show that, platforms can be two-sided or multisided. The definition by Hagiu (2014), does not specify the number of sides in multisided platforms. It refers to two-sided and multisided. However, for a platform to be a platform it must have at least two sides, otherwise it is not a platform (Hagiu, 2014).

A digital platform is a platform company that utilizes modern IT technologies in its operations (Evans & Schmalensee, 2016; Van Alstyne et al., 2016). The focus of this study is on digital platforms with a delivery service. A digital platform with a delivery service in this study means a platform that delivers something tangible, i.e. people, food or goods. In the case of people transporting, the platforms are usually referred to as ride-hailing platforms, such as Uber and Lyft. When delivering goods, this means companies such as Instacart and Amazon. Some features of pricing and platform structure are unique to delivery platforms. However, there are still quite many characteristics that exist both in digital and non-digital and in all types of platform companies. Next is an example of a problem, common to all types of platforms. This problem is important to understand as it is closely related to pricing in platforms.

A characteristic problem of all platforms alike is called a chicken-and-egg problem. The example from credit card industry describes this problem and how it was solved. The first successful credit card was introduced by Bank of America in 1958 (Wikipedia, 2019). For credit cards, the chicken and egg problem was the following, how to get one participating group (merchants) to start accepting a credit card as a payment method, while there were no card users using the card yet. Bank of America solved this problem by sending credit cards to 60,000 of its then current customers and then convincing merchants to accept the card as a payment method. This way Bank of America was able to get enough users on one side of the platform and then convince the other participant group to start accepting the card as a payment method. This demonstration, although from a non-digital platform, describes purposefully the very distinctive problem that all platforms, digital and

non-digital face and must solve. The example also shows how closely this problem is related to platform pricing. Bank of America knew that they have to incentivize the use of the card through pricing in order to get one side of the platform aboard first. Bank of America decided to give the credit cards for free to its current users, this way heavily incentivizing the card's use as a payment method. After this, convincing the merchants was easier as there were already users willing to make payments with the card. The chicken-and-egg problem happens in the early phases of any platform and pricing plays an important role in solving it. A decision not to charge a certain amount i.e. subsidizing, is also a pricing decision as the above example demonstrates. When tackling this problem, platform companies usually ask questions such as: which users to subsidize, which users to charge and for how long. In addition to attracting enough users on each side of the platform, it is usually required to grow the platform user groups at an equal pace, otherwise there will be dissatisfaction among some of the platform users, as there is no demand for their supply. To succeed in this, pricing must be done as accurately as possible.

Many of the dynamics concerning platforms are true to both digital and non-digital alike, as is supported by Evans and Schmalensee (2016), "All matchmakers play by similar rules. But the rules are different than those for traditional firms" (Evans & Schmalensee, 2016). Evans and Schmalensee (2016) refer to platforms as matchmakers, another term used in academia for platforms. In the context of pricing Weyl (2010) develops this categorization further. He states that pricing for credit cards and newspapers have clear differences, "despite credit cards and newspapers both being canonical two-sided markets, the economics of these industries seem intuitively quite different" (Weyl, 2010). This intuition he further fortifies in his study.

In academic literature, it is usually stated whether the study is focusing on two-sided or multiple sided platforms or markets. From my perspective, scholars use two-sided markets intertwined with two-sided platforms. Some of the pricing models studied in this thesis are explicitly mentioned to be for two-sided markets. The applicability of pricing models mentioned to be for two-sided platforms to three-sided platforms, can still be valid, as some of the three-sided platforms have the same functionalities than the two-sided ones, e.g. Uber (two-sided delivery platform) and Amazon (three-sided delivery platform[3]).

[3] Amazon is a three-sided delivery platform when its customers buy products not made by Amazon, but by third parties.

Pricing in digital platforms have been studied by various scholars, from various points of views. Rochet & Jean (2003) made their pioneering work, “Platform competition in two-sided markets” focusing mostly on non-digital platforms, such as credit cards and video game consoles. They state that, markets with network externalities are often based on platform companies. In addition, they point out a very insightful fact about platforms and the nature of their pricing procedure, “Under multisidedness, platforms must choose a price structure and not only a price level for their service” (Rochet & Jean, 2003). This characterization of platform pricing by Rochet & Jean (2003) is a very accurate one and describes vividly the purpose of my study. Before platform companies can figure out individual price points for their service, they must or should, choose a pricing structure.

In his article, "Price theory of multi-sided platforms" Weyl (2010) examines the pricing theories of multi-sided platforms extensively and thoroughly. In the paper, he approaches the topic from the viewpoint of one single platform participant. He studies pricing by, “choosing participation rates for the two sides of a platform rather than prices to support the allocation of demand” (Weyl, 2010). He presents a formula of how user utility can be presented in dollar value and thus be used as the basis of pricing. A key contributing metric in the model is network effects of platforms. A user’s utility from a platform can vary quite a lot, but network effects can be used to calculate utilities more effectively.

Riquelme et al. (2015) study in their paper, “Pricing in Ride-share Platforms: A Queueing-Theoretic Approach” the role and performance of dynamic pricing over static pricing. They introduce in their paper a, “queueing-theoretic economic model to study optimal platform pricing” (Riquelme, Banerjee, & Johari, 2015). Their key findings are that a platform’s performance will not be better under any given dynamic pricing strategy over static pricing. On the other hand, they mention that dynamic pricing is, “more robust to fluctuations in system parameters” (Riquelme et al., 2015). This means that dynamic pricing does not necessarily bring better results but may work better with changing and imperfect data. This pricing strategy enables platforms to use dynamic pricing to maximize the platform profits as effectively as an optimal static model would (Riquelme et al., 2015).

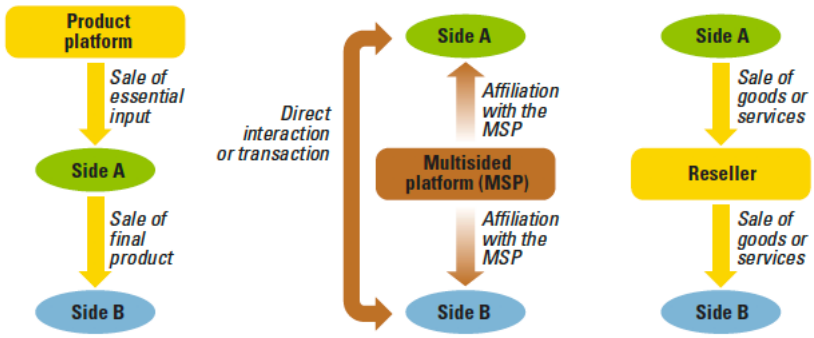

Figure 2 How multisided platforms differ from product platforms and resellers (Hagiu 2014)

From the above figure we can understand that a multisided platform (MSP), is a facilitator of communication, the pooler of resources and a reducer of search costs (Hagiu, 2014). One key difference between traditional companies and platforms is the amount of communication that a platform facilitates. A platform is in contact to all its platform participants groups and in addition, facilitates and regulates the communication among the platform participating groups. For all platform participants, the pricing must be thought through. The hardest part in platform pricing is to predict the demand on each side of the platform and the groups' price sensitivity. On top of this, platform operators should know which platform participant groups bring the most value with their presence to the platform. These aspects must be considered before opening the platform for business. As platforms communicate with all the sides and the sides communicate with each other, the platforms are also the rule setters, and one of the most important rules in it, is pricing this communication. (Hagiu, 2014)

In the early phases of platforms, the companies usually seek for volume in transactions. According to the case company representative, it is the only way towards profitability (Steven, 2018). According to Zhu & Furr (2016) every platform needs a critical mass of users to start operating profitably. Before this critical mass of users on each side of the platform is achieved, significant incentives may need to be used, in order to ensure enough traction on each side of the platform. Incentives are important pricing decisions in the early phases of platforms (Evans & Schmalensee, 2010). Usually the next phase in platform pricing after incentives, is subsidization. Incentivizing and subsidization can be seen being the same thing, as they both incentivize the use of a platform. Incentivizing is anything that encourages the use of a platform and subsidizing is not charging the full price for a certain transaction in the platform. The difference is that, there

can be other incentives to use a platform than price reductions. To subsidize correctly, the platform operators should know the platform side that generates the most value by its presence and focus on subsidizing them. This is thinking is supported by Eisenmann et al. (2016), "the platform provider sets prices for that side below the level it would charge if it viewed the subsidy side as an independent market" (Eisenmann et al., 2006). Generally, the case is, that one side of the platform is more valuable to the platform than other sides. (Eisenmann et al., 2006).

The last part of pricing in platforms is monetization. This part of the pricing is done, or should be done the earliest, once the critical mass of users has been reached. Once the platform provides enough value to its users and additionally, changing to another similar platform becomes more and more inconvenient, only then are platforms in a reasonable position to start effectively monetizing the transactions on the platform. This is a challenging point in the journey of platform pricing. In the beginning of pricing, there needs to be enough incentives for platform users, which usually means poor profitability for the platform operators and once the monetization phase starts, it typically means raising prices for current users and raising prices is always received with a slight negative reaction which can cause some users to leave the platform. To ease out the pain of increased prices, one pricing strategy is to provide a free option and a chargeable (premium) subscription to the same platform. This pricing model is called a freemium model. In this pricing model, the basic functions of the service continue to be free for the users, while e.g. advertisement-free usage of the service becomes chargeable or supplemental features are provided to the same service. This leaves the users with a freedom to choose of whether to continue with the free account or to upgrade to a chargeable account. From the platform's point of view, the premium accounts are usually the more profitable option, but utilizing an incremental change in pricing, does not jeopardize the important current user base. Spotify uses this pricing strategy. With this pricing model, Spotify is able to monetize on some of its users directly and through advertisers on the free account users. If a platform does not reach the critical mass and starts implementing full fees on its users, it assumes a serious risk of losing the existing users and risks them changing to a more value-adding platform or to start using a substituting service once and for all, not necessarily even a platform, e.g. using a traditional taxi company instead of using ride-sharing platforms.

The market conditions that platform companies operate in, are also hugely important when determining the optimal pricing structures. The most common competitive landscapes are a monopolistic, duopolistic and competitive landscape. The effect of these

situational conditions to price levels and sometimes even to pricing models has been studied by Armstrong (2006). On a quick thought, one could assume that a monopolistic market position might mean for a platform to be able to charge higher prices. Unfortunately this can be a false conclusion, as modern platforms tend to be disrupting traditional industries and the decision to charge premium prices, can result in users abandoning the platform service model as too expensive, as they are not yet familiar enough with the service and their user utility is not on the same level as the price would suggest.

In platform pricing the price elasticity of demand is an important concept to be taken into account (Bolt & Tieman, 2011; Rochet & Jean, 2003). Users on each side of the platform, represent different levels of price elasticity (sometimes referred to as price sensitivity) to the same service. Krueger (2009) studies the topic through the much debated finding of Rochet & Tirole (2003 & 2006), "the more elastic group of customers will be charged more" (Krueger, 2009). Krueger (2009) later presents in his study that platforms will raise prices for markets traditionally considered inelastic and lower prices for markets considered to be elastic. The findings of Krueger (2009 is in contradiction to the finding of Rochet & Tirole (2003 & 2006). Despite the debate in academic literature about this finding by Rochet & Tirole (2003 & 2006), there is a true challenge for platforms to decide a certain market's price elasticity for demand for each user group of the platform as it is an undeniable driver of prices in platforms, as can be seen from the comparison of results from Krueger (2009) and Rochet & Tirole (2003&2006) to the topic. In regard to price elasticity of demand in platform pricing, the pricing model of the case company is one of the most impressive ones in its ability to measure price elasticities of demand of its users. The case company operates in tens[4] of different locations, which requires detecting more than 150 different price elasticities of demand for its three user groups. This requires the ability to price the service accurately and effectively time and time again.

2.1 Digital Platforms

A digital platform is said to be a platform company that utilizes modern IT technologies in its operations (Evans & Schmalensee, 2016; Van Alstyne et al., 2016). According to Still et al. (2017) digital platforms create value by providing, "greater accessibility, speed,

[4] The case company operates in more than 50 different locations across Europe and has three distinct user groups (sides) in its platform. (Steven, 2019b)

efficiency and sometimes an improved user experience, service and greater convenience compared to existing solutions" (Still et al., 2017). The same authors also credit the birth of digital platforms to the advancements in digitalization. In this context, digitalization can be seen as the use of internet. For example, a digital platform, Uber facilitates communication between ride-offerors and ride-seekers on its application. For the application to work, it must me be connected to internet in order to receive the locations of the ride-seeker and ride-provider. In this sense digital platforms leverage the use of modern technologies for higher efficiency and user friendliness. Facilitating communication, bundling resources and legalizing transactions can be seen as the main functions of digital platforms. Still et al. (2017) describe this the following way, "Platforms are about making it easy and efficient for participants to connect and exchange" (Still et al., 2017).

As digital platforms utilize modern IT technologies as their key component (Evans & Schmalensee, 2016), it can be concluded that digital platforms are a timelier phenomenon than non-digital ones. There are several different types of digital platforms; social digital platforms such as Instagram, Facebook, Snapchat and YouTube, marketplace digital platforms; Amazon, eBay, Etsy and Tori.fi, operating systems; OS and Android and then digital platforms with a delivery service such as Instacart and Uber. It is needed to clarify the nature of platforms that I study in this thesis. If one runs an academic search for "digital delivery platforms" the results are mainly concerning platforms that deliver digital content. An example of this type of platform would be Adobe PDF or any other type of platform providing something digital content as its service. This is however not the focus in this thesis. The focus of this thesis is on digital platforms with a delivery service, meaning platforms that transport something tangible as their service. These digital platform companies have a delivery service as a key functionality of their business. Such companies are food delivery companies such as: Uber Eats, Foodora and Instacart, ride sharing companies such as Uber and Lyft and also product platforms such as Amazon and eBay.

In general, a company can be a pipeline company exclusively i.e. a traditional company, a platform company or a mixture of pipeline and platform business models. A company does not need to be necessarily either or (Van Alstyne et al., 2016). An example of a company that utilizes platform and pipeline company models simultaneously is Amazon, a digital platform company as well. This is possible because it sells and delivers some of its own products on its website, but a big share of the company's revenue comes from third party sellers, that list their products on the Amazon web store for sale (Hagiu &

Wright, 2015). Digital platforms can be thought of as digital versions of their big brother, platform companies, which have existed for decades already[5].

The power of platforms is, that they pool resources that otherwise are too scattered to be used in a meaningful manner (Hagiu, 2014). As internet became more of the everyday life in the beginning of 1990s, soon after was born one of the first digital platforms, Amazon, in 1994. Amazon started out by selling books online, cutting the costs of a traditional bookstore, with no employed work force or a chain of physical sales locations. A bit more recent digital platform, Uber, is a transportation company with no expensive equipment to worry about. It pools together unused resources in a way that a person needing a ride, can safely use their service as he would use a regular taxi. Uber's whole business model is based on the use of internet.

2.1.1 Platform definition

Some terminology used in academic research is useful to be presented here. First, a platform company is generally considered the same as a multisided platform (MSP). The term multisided refers to the number of different platform participant groups or "sides" that a platform company can have (Cusumano et al., 2020). For example, Uber has two "sides" i.e. ride providers and ride seekers. If Uber would have advertisers on its platform, the advertisers would be an additional platform participant group and Uber would become a three-sided platform. The common number of platform participant groups is either two or three. One platform that has been said to have more than three sides, is Facebook. The participant groups in Facebook are individual people, advertisers, developers and companies. For a company to be a platform by definition, there needs to be at least two different platform sides, otherwise it is not a platform company (Hagiu, 2014). If a company produces only goods manufactured by itself it is not a platform company, but a "one-sided platform" (Cusumano et al., 2020). A platform participant group is a group of people with a shared and similar interest towards a platform, e.g. ride-seekers in Uber.

Hagiu (2014) refers in his study to the aforementioned platform participant groups. The interaction between these groups is the value that platform companies bring. A very important point about platform value creation is the pooling of resources and legalization of pooling that Hagiu (2014) mentions. Good examples of this are Uber and Airbnb. These

[5] e.g. shopping malls, credit cards and newspapers

platforms not only pool resources, but also legalize the pooling and facilitate the peer-to-peer interaction.

2.1.2 Digital vs. non-digital platforms

According to Eisenmann et al. (2006) “Products and services that bring together groups of users in two-sided networks are platforms.”(Eisenmann et al., 2006). According to Evans & Schmalensee (2010), platform businesses are significant in many web-based businesses. Non-digital platforms often do not utilize internet as a part of their service creation. Good examples of non-digital platform companies are credit cards and shopping malls. Good examples of digital platforms are Amazon, Google, Facebook and Uber. Some of the platforms such as operating systems, Microsoft Windows and OSX are usually considered digital platforms, even though they do function without internet. The participant groups of operating systems are software users and developers. Internet is used to update the software. In this sense, they can be considered digital platforms as well.

2.2 Fundamentals of platform pricing

Eisenmann et al. (2006) present that pricing in platforms is more complicated than in traditional companies. Rochet & Jean (2003) illustrate the challenging nature of platform pricing, “Under multisidedness, platforms must choose a price structure and not only a price level for their service” (Rochet & Jean, 2003). In a bigger picture, a platform company has basically two options for its pricing strategy; aiming not to change the prices or aiming to raise prices at some point after the critical mass is reached. The more common strategy is to aim at raising prices after critical mass is reached. Platform companies, such as operating systems and gaming consoles follow the former strategy in their pricing. They do not charge customers later on for more to use the platform. In the case of operating systems, the initial price can be the only cost that the user will pay. For gaming consoles, the cost for the console is done only once, but there are games that users might buy later on. A platform can choose to sacrifice profitability maximization over growth in its early phases. This approach is used by the majority of platforms. The decision between the two pricing strategies, can be dictated by qualitative factors also, namely by how revolutionary the business concept is and what is the competitive landscape. A monopolistic market condition with a breakthrough idea can still be inadequate to use a pricing strategy that charges full price straight in the beginning of the use.

The more likely scenario for a platform is that, it attracts users with discounted prices and wait to monetize later on. This means that the price levels need to be changed and that the initial price that is charged for the use of a platform is not the only cost there will be. Raising prices is a tough situation to communicate to the users. That is why, platforms usually wait until they have enough users before starting to monetize. The study by Kung and Zhong (2017) reflects the challenging but potentially rewarding nature of price setting strategies in platforms and the dependent nature of price setting, "The two pricing problems must be considered together to optimally provide incentives for shoppers and consumers to stay connected to the platform. This brings new challenges and great potential values to the investigation of platform pricing." (Kung & Zhong, 2017). The two pricing problems that Kung & Zhong (2017) mention, mean the prices set for each user group in a platform and their correlative nature. In this example there are two, but there can be more of those prices.

Bakos & Katsamakas (2008) present in their paper the role of asymmetry in platform pricing. They state that, "Real-world two-sided networks often demonstrate several types of asymmetry" (Bakos & Katsamakas, 2008). As examples of this, they present different levels of network effect and participation prices among platform participant groups. This asymmetric nature of platform characteristics, according to the them, affects the pricing structures or at least price levels at platforms. This may result in receiving different revenues from the platform sides and due to this, "one side of the network may receive a larger fraction of the surplus created by the network." (Bakos & Katsamakas, 2008).

In their paper, Eisenmann et al. (2006) examine, "the factors that senior managers must consider in designing their platform's business models. The key decision here is pricing" (Eisenmann et al., 2006). Furthermore, the authors state that platform pricing is challenging and provide an example from platform subsidization, "It is not always obvious which side–if either–the platform should subsidize and which it should charge" (Eisenmann et al., 2006). The argument of Eisenmann et al. (2006) receives support from Hagiu (2014) by saying that pricing is one of the success factors of digital platforms. Pricing as such is crucial in all types of businesses, but according to Eisenmann et al. (2006) its importance is even heightened in platforms.

A platform by definition, is a place that simultaneously serves at least two participant groups with different needs. Pricing comes into play when a platform is trying to get its first participants to either side of the platform. If the price to enter the platform is too high for one side, there will be no participants on that side, which means that the other side is

not interested either, even if their price was not a problem. In platforms, the success builds on a fact, that there are enough participants on each side of the platform.

A description of platform pricing is provided by Hagiu (2014), “Because MSPs serve multiple types of customers, they potentially have multiple revenues and profit sources ” (Hagiu, 2014). I think this is a good clarification and abstraction about platform pricing in general. The key issue for a platform to be successful in its pricing, is to take this statement into account and preferably identify all its revenue sources. In platform companies there are always at least two sides, which means a minimum of two different types of customer groups.

The nature of platforms is that cost and revenue streams can come from left and right (Hagiu, 2014). Eisenmann et al. (2006) also bring up the subsidization question. They mention that in most cases of platform companies, it makes sense to subsidize one side of the platform, but how to determine which side and for how long, is the open-ended question in their research. There are quite a few mathematical models presented in academic literature for platform pricing. In contrast to that, the pricing model from the case company builds its core information acquisition on unstructured and ex-tempore interviews of potential user group participants.

Another role of pricing in platforms is that it becomes a strategic tool for competition, because implementing high switching costs between two similar platforms, increases the likelihood that customers will not change from the current service provider to a competing one (Hagiu, 2014). He clarifies, that these pricing strategies can be implemented on one side or all sides of a platform.

2.2.1 User utility as a measurement for pricing decisions in platforms

When products and services are priced in platform companies, many pricing models in academic literature approach it with user’s utility as the metric to be priced e.g. (Kung & Zhong, 2017; Weyl, 2010). In order to understand the concept of user utility, I will present a graph describing the user utility in traditional companies and in platform companies.

When new products are introduced to markets in traditional companies, the prices are typically set at their highest level to reflect the value of the good. Once the product has been in the markets and new products are introduced, it is accustomed to give price reductions, in order to sell the inventory off before new arrivals and to reflect the decreased user utility. Quite the opposite logic can be seen happening in platform

companies, especially in new platforms. Platform companies usually start with a lower price to attract users and later on, as the user utility grows, monetize. The utility of users in platform companies is at its lowest at the time of joining the platform for the first time. However, once a platform company matures, new users are still incentivized to join the platform with e.g. free trial periods.

User utility is often the dependent variable to which the price is reflected. In other words, utility is the benefit that a platform user receives by using the platform. To correctly price this, it is vital to understand and estimate the user utility for different user groups of the platform. In traditional companies the expected user utility is on its highest level at the moment of purchase. Similarly, the price is at its highest level. The reduction in price happens, when the product becomes "old" and needs to be removed from the selection. This is related to perceived utility as the once new product does not seem that interesting and thus valuable anymore.

In the early phases of platform companies, the expected utility and thus the prices are usually at their lowest. An example of this is YouTube. When it started, YouTube was free to use, and later on the first non-advertisement based payments were introduced in 2013 to the platform (BBC, 2013). As the utility that the platform offered, grew, it started implementing chargeable premium accounts to its platform. In his study, Taylor (2018) reflects user utility in delivery platforms, "Delay sensitivity reduces expected utility for customers" (Taylor, 2018). Delay sensitivity means the platform users' sensitivity to waiting times. In the study, he researches expected utility, which is also a key attribute in the below illustration (Figure 3). In addition, he provides an example from a delivery platform where delay sensitivity affects the user's expected utility.

The utility for a new product can be divided into expected (often subjective or perceived) and realized utility. Furthermore, in this illustration platforms are always a service, because for example buying a product from Amazon can include looking at the reviews and transportation as part of the purchase event.

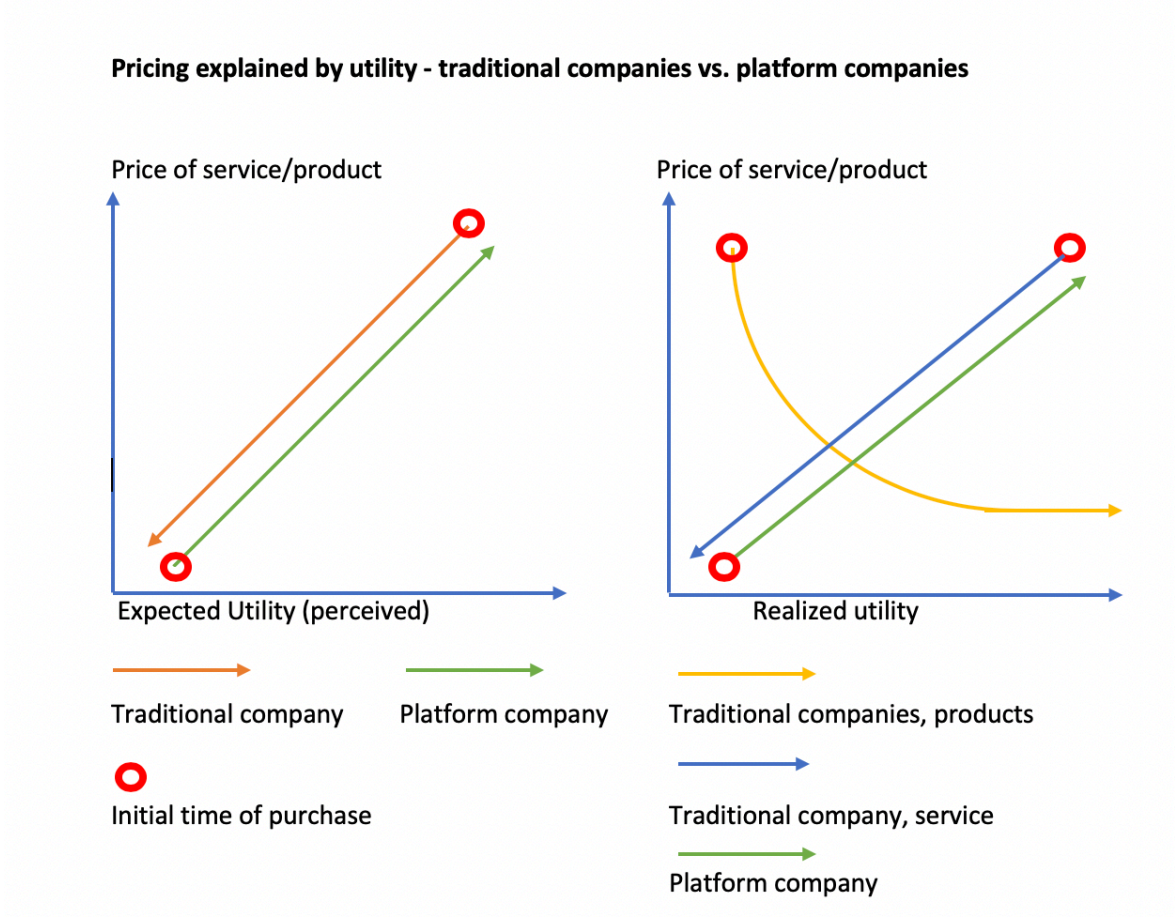

Figure 3 Pricing explained by user's utility

The initial time of purchase means the time when the first transaction occurs. In traditional companies, this means the time when a service or product is bought. In platform companies this can mean signing up for free to a certain platform and start using the service. In platforms, there can be additional points of purchases later on, as the value of the service grows to the users and they might upgrade to a premium subscription. This is a typical strategy for platform monetization. The value creation and monetization happen at an opposite logic in platforms and traditional companies. In traditional companies the value is created beforehand, (expected utility) and thus the price is at its highest level at the time of initial purchase. In platforms, the expected utility and price are at their lowest at the time of initial purchase.

When a person acquires an access to a platform, e.g. YouTube, his expectations for the service are typically relatively low, and thus willingness to pay for the service is low. Once the service is able to provide more and more value, the willingness to pay for it also increases. That is why platform companies use a lot of incentives before they can monetize more effectively on their users (Evans & Schmalensee, 2010).

2.2.2 Different pricing models in platforms

In platform companies, growth is the way to profitability and thus investing in growth in the early phases of the platform is a common strategy. This affects to the choice of a pricing model. According to Evans & Schmalensee (2010) if, "the critical mass constraint can be satisfied, growth generally follows, and the business can turn its attention to maximizing long-run profits" (Evans & Schmalensee, 2010). A platform seeking growth and profitability in the long run, usually gives up on maximizing profitability before a critical mass of users is reached. This argument was supported e.g. by the case company interviewee. YouTube monetized first with advertisements and later on with premium subscription model (BBC, 2013). There are also other types of pricing models for platforms. Examples of these are a completely free services to users such as Facebook and Google, which monetize only through advertisers. As mentioned earlier there are also platforms that charge users a lump sum payment as soon as a user joins the platform. (operating systems and gaming consoles).

One distinctive pricing model is charge-per-usage pricing structure. Charge per usage model means that there is no subscription fee or any other payment. Good examples of this strategy are Uber and Airbnb. A user only pays if he uses the service, not for the access to the platform. A mixture of pricing models within the same platform is also possible. Application shops for IOS and Android are examples of a combination of a completely free and chargeable model. It is free to join the application shop and some applications are free to download and some applications are also sold for money through the same platform.

One of the greatest contributing factors to freemium pricing model is the so called "chicken and egg" problem in platforms. This problem is set to describe the logic that, in order to be able to charge platform participants for their access to the platform, the platform operators need to attract users to both sides of the platform. However, usually in the beginning, people are reluctant to join a platform, if there are no users on the other side of the platform. The freemium pricing model helps a platform to retain its current customers, while starting to monetize on customers that experience already a high utility from the platform. "Overcoming the chicken-and-egg problem is one of the most difficult challenges for many MSPs." (Hagiu, 2014).

Hagiu's (2014) pricing model serves as a great example of a qualitative pricing model. In contrast to mathematical models, he presents a sort of a "checklist" for managers

that need to be considered to make correct pricing decisions. Even though this is a list of three guidelines, this can be considered as a qualitative pricing model.
These guidelines are:

- Charge a higher price from the platform participant group, that has less price sensitivity.
- Charge more from the platform group, that benefits more from the presence of the other side or sides, if there is no priced transaction already existing between the two sides.
- "If there is a priced transaction between two platform sides, then charge more from the side that can extract more value from the other side" (Hagiu, 2014).

The last two points seem quite similar and frankly I could not distinct the two, but this is how Hagiu (2014) presents the issue. However, this is an example of a pricing model that is considered qualitative in this study.

Kung & Zhong (2017) on the other hand build a mathematical model for digital platforms with a delivery service and is hence one of the key articles in this study. The importance of pricing in digital platform companies is emphasized by many scholars. As (Kung & Zhong, 2017), in their paper "The optimal pricing strategy for two-sided platform delivery in the sharing economy" state, pricing is a profound decision that all profit seeking entities face inevitably (Kung & Zhong, 2017).

(Bardey et al., 2014) studied in their paper, "Competition in Two-Sided Markets with Common Network Externalities" the effect of different types of network externalities to platform pricing. They clarify the value drivers for prices and how price changes on one side of the platform affect the other side even to a great extent. Their main input is to explain the true effects that platform externalities can have on platform profits and platform pricing.

2.2.3 Model by Hagiu (2009)

Hagiu's (2009) paper "Two-Sided Platforms: Product Variety and Pricing Structures" examines platforms' pricing structures. According to the author the main contribution compared to other papers is that it takes into account platform user's desire for product variety and consumer's power of choice among competing products. "The paper provides a new modelling framework to analyze two-sided platforms connecting producers and

consumers. In contrast to the existing literature, indirect network effects are determined endogenously, through consumers' taste for variety" (Hagiu, 2009).

Hagiu (2009) develops a mathematical model that evaluates optimal pricing, through the elasticity of consumers demand for variety. The first part of his analysis concerns platforms in a monopoly position. The second part extends the basic model to competitive platforms and monopoly platforms. This is an additional pricing strategy component. As he describes in his study, the competitive platform model is an extension to his basic model. The model for competing platforms is based on the intensity of demand for product variety from consumer side. Hagiu wants to show in his paper that, "consumer demand for product variety is a key factor determining the optimal pricing structures" (Hagiu, 2009).

The study states that the more there is demand for product variety from consumers and/or, producers have power over consumers, the less effective a platform's price reducing tactics for the consumer side are, in a competitive landscape. This leads into a smaller consumer price decrease. The author concludes that the effect of this, is that a platform's optimal pricing strategy for a situation when producers compete with each other, is to focus on charging more from consumer side rather than the producer side (Hagiu, 2009).

He summarizes the state of the research on this area, prior to his publication as "focused on the effects of the relative magnitudes of indirect network externalities, demand elasticities and coordination (chicken-and-egg) issues on platform pricing structures" (Hagiu, 2009). Furthermore he adds that, "platform competition creates counterintuitive pricing effects, which have not been identified up to now." (Hagiu, 2009). He argues that earlier the reason behind lowering prices has been due to indirect benefits, when there are more consumers on one side, and they attract more people to the platform from other sides as well. In addition to this he states that, prior to his study, literature has not considered another reason for cutting prices in order to undercut a rival platform.

From the two models that Hagiu (2009) presents, the more interesting one for this study is the duopoly model. Even though the case company operates in a market where there are more than few companies competing, the duopoly model is the closest one to the actual situation. There are situations where the case company's service has a monopoly in some cities, but the majority of the time there is either direct or indirect competition.

2.2.4 Platform pricing according to Eisenmann et al.

In their paper, Eisenmann et al. (2006) explore the strategies for two-sided markets. They pinpoint three challenges that successful platform company managers should consider; 1. Pricing the platform, 2. Winner-take-all dynamics and 3. The threat of envelopment. The authors credit pricing being the most important one. Closely related to pricing is their comment on how platforms create value. They argue that traditional companies only have cost on the left side of the value chain and revenue on the right side, but platform companies can have cost and revenue both to the left and right side of the value chain. Based on this, they go further to describe the dynamics of pricing decisions in platforms. As platform companies can draw value from both sides, usually one side of the platform is subsidized more than the other, but the problematic question is for how much and for how long (Eisenmann et al., 2006).

For pricing a platform the study concludes that, when making a pricing decision, a platform company must take into account, "the impact on the other side's growth and willingness to pay" (Eisenmann et al., 2006). The other side here means another participant group in a platform. This means that the pricing decisions are always dependent of each other in platform companies. This leads to that the price elasticity of demand, subsidizing decisions and margins become important.

Platform companies, according to the study, experience, "increasing returns to scale" (Eisenmann et al., 2006) as platform users tend to pay more for access, the bigger the user base is. This they say, is usually not the case in traditional manufacturing and services businesses. They state that in traditional businesses growth eventually will lead into diminishing returns, as customer acquisition becomes harder. This fact of increasing returns through growth, leads into fierce competition in platform economy, states the article, and this creates the nature of platform markets, where winner take-all propensity sets its foot in (Eisenmann et al., 2006).

2.2.5 The role of price

Pricing decisions are decisions with underlying assumptions, expectations and informative value included in them. Price is set to define a value. However, this value is the opinion of the seller of a product's or service's value. Sometimes or even more often, the seller and the buyer does not share the same view on the price point for a good or a service. What happens then? The buyer can ask for a lower price and if this is not possible, the buyer does not have any other option than not to buy the good. He will look for similar products

with a lower price. Here comes into play one of the very basic characteristic of pricing decisions, price justification. If a company or a price setter can justify its pricing, the buyer is more likely to understand it and agree on the price point. This logic is especially true and in the core of the case company's pricing model. They base their pricing to information and opinion collection from all of their platform participant groups to have strong support for their price and thus justify their price points.

2.2.6 Platforms' role as disruptors

Van Alstyne et al. (2016) present and interesting statement in their paper, "Pipelines, Platforms and the New Rules of Strategy". They present that, "When a platform enters the market of a pure pipeline business, the platform virtually always wins." (Van Alstyne et al., 2016). This statement might need some further investigation, as I cannot completely agree with it. Because of the fact that platforms are hard to build, the statement does not, on my opinion, take this enough into account. It is true that with the examples we can see around us from successful platform companies such as. Amazon and Google, it is tempting to think that platforms would always do well and grab big market shares from traditional operators. The truth of matter is however that for every Amazon and Google, there are many failed attempts along the way. That is pretty safe to say. The quote could be rephrased to, "When a platform enters the market of a pure pipeline business, it has great potential to disrupt the existing market conditions, if it manages to be successful."

From the research presented in this study, the consensus seems to be that building a platform company is more complicated and harder to build than a traditional company (Eisenmann et al., 2006). This statement kind of contradicts with the above statement, saying that platforms will virtually always win in traditional markets. This is subject to platform's success, which is quite hard to attain.

Pricing mechanisms are a crucial part of building a platform. According to Armstrong (2006) there are mainly three types of pricing structures that are effectively used in modern digital era platforms. These are; subscription based pricing, also called membership or fixed-fee pricing (a lump sum is charged for the access and usage of a service), usage-based pricing, also called pay-as-you-go or per-transaction fee, and cross subsidization (when one side's fee is used to completely cover another side's cost) (Armstrong, 2006). Studying pricing structures in platforms is beneficial, because a platform company needs to assess their business model and think whether charging for the

access to the platform (Spotify's freemium model) or the usage (Airbnb an Uber) will be more suitable for it.

2.2.7 Utility in pricing

Weyl (2010) presents in his paper, "A Price Theory of Multi-Sided Platforms" a pricing theory for a platform's participation rates. He approaches pricing through user utility and his formula is useful to be presented here. In his model he measures the amount a single platform participant derives as utility from a platform. $U_i^{\mathcal{L}}$ is the utility that platform participant i derives from platform side $\mathcal{L}$. According to Weyl (2010) the utility is given by

$$U_i^{\mathcal{L}} = B_i^{\mathcal{L}} + b_i^{\mathcal{L}} N^{\mathcal{J}} - P^{\mathcal{L}}(N^{\mathcal{J}}) \qquad (1)$$

where N^J is the number of users participating on side $\mathcal{J}$. $P^{\mathcal{L}}(N^J)$ is the cost (or payment) for the access to the platform, conditional on a given the size of the platform on side $\mathcal{J}$. Here, $B_i^{\mathcal{L}}$ is the inherent membership benefit or cost that a user derives from the platform, if there are no users on other side of the platform. The term b_i^L is either, an interaction benefit or cost of participation that each user derives, for every user that participates on the other side, with the conditionality of a given size of side $\mathcal{J}$. To understand how this model functions, we can look at the example that the author provides: This function is used to measure the participation rule at a certain price point. Weyl (2010) clarifies that once the tariff is set, the decision for a platform user i from side A to participate, is conditional. The conditionally is given by

$$B_i^{\mathcal{A}} + b_i^{\mathcal{A}} N^{\mathcal{B}} > P^{\mathcal{A}}(N^{\mathcal{B}}) \qquad (2)$$

where $B_i^{\mathcal{A}}$ is the membership benefit for user i from side A. $b_i^{\mathcal{A}} N^{\mathcal{B}}$ is the interaction benefit or cost of participation to user i on side A, conditional to a given size of side B. The term $P^{\mathcal{A}}(N^{\mathcal{B}})$is the price set by the platform (the independent nature of i restricts price discrimination), and tells how much users must pay (or how much they will be paid) conditional on a given size of the platform on side B. In this model, when assessing the participation price level for side A, it is assumed that there will be participants on side B. In real life these two decisions are dependent on each other. As the authors mention, there

might a multiple of equilibrium price points and distribution of user preferences. The optimal pricing for a single price point in platform side $\mathcal{L}$ is given by

$$P^{\mathcal{L}} = \underbrace{C^{\mathcal{L}} + cN^{\mathcal{J}}}_{\text{Marginal private cost}} - \underbrace{b^{\mathcal{J}}N^{\mathcal{J}}}_{\text{marginal external benefit}} \quad (3)$$

where $P^{\mathcal{L}}$ is optimal price for platform side $\mathcal{L}$. $C^{\mathcal{L}}$ is membership cost on side $\mathcal{L}$. $cN^{\mathcal{J}}$ is the interaction cost on side $\mathcal{J}$. Together they are marginal private cost. The term $b^{\mathcal{J}}N^{\mathcal{J}}$ is an interaction benefit or cost of participation to each user, conditional to a given size of side $\mathcal{J}$. According to this equation the optimal price will be the costs from two sides of the platform added and subtracted by the amount of marginal external benefit. The takeaway from this equation is probably more valuable for my study than the equation itself. Weyl (2010) states his reasoning for the correct price point for a certain user at a certain platform side, "the price of an activity should equal its private cost less any external benefits." (Weyl, 2010). He clarifies that external benefits and thus the last term in the above equation (3) is the key difference in platform company and traditional company pricing. (Weyl, 2010). The author reflects the role of marginal external benefit, "because network effects are external to individual decisions, price should diverge from cost. Thus positive network effects should be subsidized and negative ones taxed." (Weyl, 2010).

The example that the author provides, helps to understand the model better. According to the model, the newspaper readers should be subsidized below the cost of producing the news by the value the newsreaders bring to advertisers. This means that to calculate the optimal pricing for side A one should know the production cost of side B (the newspaper) and the value that side A brings to advertisers to calculate the subsidization amount for side A. The model states also that advertisers (the value drawing side) have to be taxed, above the cost of their input to the platform, by the amount the other users "dislike" their input. This means that advertisers are taxed above the cost of producing the advertisements by the amount side A dislikes these advertisements.

2.2.8 Implementing Weyl's (2010) model to the case company

To implement Weyl's (2010) pricing model to the case company is a bit more complicated. First, Weyl (2010) defines in his example the newsreaders as the value adding side,

because they bring value to advertisers and advertisers the value drawing side. In the case of advertisers, the case is pretty straightforward but in the case of newsreaders it is a tempting thought to think that they also draw some value from reading the newspaper, otherwise they would not pay for it. Weyl does not state this explicitly in his study, he only speaks about the newsreaders value they bring to advertisers. I am not sure if a platform can be simultaneously a value drawing and a value adding side. The assumption I will make, is that a platform group must be either or.

Following the logic by the Weyl (2010) model, the value adding side in the case company are the consumers (side A). This means that the merchants (side B) and the chauffeurs (side C) would be the value drawing sides. The same double role can be seen in the case company for the consumers as in Weyl's model as the consumers are also the value-drawing side. According to Weyl's (2010) model the value adding side should be subsidized and the value drawing side charged. If the consumers are the value adding side, they should be subsidized according to the model. This is true in the case company as the consumers are subsidized the most in the case company, with e.g. free delivery fees. This means that the two value drawing sides in the case company should be taxed. The merchants are taxed but the chauffeurs are paid. Could this mean that chauffeurs are drawing value from the platform? The variable costs for the platform are the chauffeurs that transport the goods from merchants to the consumers. In the case company there are no advertisers as in Weyl's model. In the case company the "dislike" that Weyl uses, can be thought of as the cost of transportation. The dislike is hence consumers' dislike to the cost of transportation.

In the author's example he uses newspaper as the platform. In the case company, since ordering the products through the platform is the same as acquiring them from the vendors directly, the value for side A (consumers), comes in the form of the delivery. In this sense the consumers should be subsidized product below the cost of producing the service, by the amount the side A creates value to side C (chauffeurs) I will calculate these price points for the case company from the data they have provided and provide the results at the end of this study.

To know the amount of "dislike" from side A to side C (chauffeurs) should lead to correct pricing according to Weyl's (2010) model. Interesting enough, the case company has a very unique method of figuring out this amount as will be shown in the chapter 3 of this study. The case company does this, by asking the participant of side A, their price sensitivity for the service of platform side C. According to the standard Pigouvian pricing

rule in the study, the pricing for side B should be the private cost of producing the goods less any external benefit, i.e. the value side B brings to other platform sides. This would yield a simple equation of

$$PB = CB - BC \quad (4)$$

where PB is the price side B participants, CB is the cost of producing the service on side B and BC is the external benefit. The problem for the case company in this situation is that they don't know the cost of production for side B. They can guess it, but they don't know the exact amounts of manufacturing costs of the goods provided by the merchants. Also, the external benefit that the side B brings to the platform is hard to define. Later on, in the study I will calculate the optimal pricing for the case company's side A.

Weyl's (2010) study, is set to examine, the implications of, "different sources of user heterogeneity" (Weyl, 2010). The user heterogeneity consists of interaction and membership values in this context. For this study, the most interesting and relevant part is to evaluate the utility, meaning the value that a single platform user can derive from the platform. This can then be further utilized in pricing decisions.

2.3 Platform value creation

According to Schiff (2011), "Two-sided platforms create value by bringing together two distinct consumer groups and enabling some kind of interaction or transaction between the two sides" (Schiff, 2011). To understand platform pricing, it is needed to understand how platforms and digital platforms create value. Platforms in today's economy, "comprise a large and rapidly growing share of the global economy" (Eisenmann, Parker, & Van Alstyne, 2011). As platforms exist in nearly every market in today's business world, their value creation is a key point in understanding them thoroughly. Digital platforms, "use digital technology to create self-sustaining positive-feedback loops" (Cusumano et al., 2020). This rich culture of communication is the basis of potential value creation to each new platform participant (Cusumano et al., 2020).

Platforms create value by pooling, legalizing and facilitating interaction among its participant groups (Hagiu, 2014). Furthermore, "the value of platform access to each side is higher, the more members are present on the other side."(Hagiu, 2014). This is what

Rochet and Tirole (2006) have also stated in their study, “Two sided markets: progress report”.

According to Hagiu (2014), “Successful MSPs create enormous value by reducing search costs or transaction costs (or both) for participants” (Hagiu, 2014). This is not only an answer to how platforms create value, but also an answer to why platform companies exist in the first place. Uber, Amazon, Facebook, Youtube, Ebay and Android are all famous platforms and also digital platforms. Digital platforms are “online businesses that facilitate commercial interactions between at least two different groups” (Series, 2018). A simplified definition could be that digital platforms are platform companies that utilize internet in their business model to at least to a certain extent. In platform value creation, efficiency is a key term and the use of internet either enables or fortifies this. For digital platforms internet has enabled their whole business model and thus value creation. For non-digital platform, internet has not changed their value creation as dramatically.

2.4 Platform Profitability

A platform’s journey to profitability starts often from being clearly unprofitable. In order to become profitable, the platforms usually need to increase their prices after the growth phase. Price increases can happen in a couple of ways in platforms. First, there are freemium models, where the service is available for free and for a premium (chargeable) option, full amount upfront payment or slowly raising prices as the platform’s user base grows enough. The challenge in the first option is how to convince customers already using the service for free start paying for the same service. This is a very delicate moment in the platform’s life. The second option is quite forward, but the usage of this pricing model requires a very established service and relatively little alternatives for the service e.g. operating systems. The last option is probably the most common alongside with the first option. Raisin prices after a critical mass is reached is a valid and common strategy for platforms seeking profitability.

Once users experience high enough value from the platform’s service and want to use it advertisement free or to get new features, they are willing to start paying for it. This phase in platforms needs to be also considered in the context of competitive landscape. If a platform starts implementing fees for the usage, it takes a risk, that users will change to another, similar, not necessarily as good, but a cheaper platform. This is why pricing strategy has to be always considered in the context of competitive landscape. For platforms

that do not experience that much competition, the correct pricing needs to be reflected to other substituting services, not necessarily platforms.

Platforms carry involuntarily a structural risk unique to their business model. This matter needs to be considered in pricing. One company representative pointed out to me, in a casual conversation about platform pricing that some users might use the platform only for a couple times, before striking a deal directly with the service provider outside of the platform. He mentioned that, this can happen especially with transportation platforms, such as Uber and Bolt, and with accommodation platforms, e.g. booking.com. (Bergmann, 2020). I think that this is a valid point, that needs to be considered in platform pricing strategy. The main aspects to consider are the amount of repetitive use of the service (high repetitiveness correlates with the likelihood of cutting out the platform) and the possibility to be cut out as the "middle" man. Credit cards and gaming platforms provide a good example of platforms, that are very hard to be left out as a facilitator between the seller and buyer side.

Hagiu (2009) argues in his study that the more there are platform participants on each side of the platform, the more valuable the access to the platform becomes. This means that as users' utility increase and the platform grow, the platform operators are able to charge more for the access or use of the platform. This comment is in line with the utility model I presented in chapter 2.2.1. with increasing utility from the initial point of purchase in platform companies. Furthermore, Hagiu (2009) explains that, "a critical problem for platforms is to choose how much to charge each side for access (or membership in the language of Rochet and Tirole, 2006) in order to maximize profits" (Hagiu, 2009). This same challenge was addressed by the case company's representative. The interviewee concluded that in the early phases of the case company's service, they emphasize growth over profit maximization and for the question of for how long, the company representative provided a clear answer, "in the early stages of the service, there can be a situation of low growth, this means that chauffeur margins are quite high and thus our efficiency is poor, but if that market grows ten folded and efficiency doubles, we simply lower the chauffeur fees." (Steven, 2020b). In this example the duration of subsidization is tied to growth numbers.

In the case company's framework, when a new location is launched and if there is no direct competition, pricing becomes even more challenging according to the interviewee. In these types of situations, they use industry benchmarking. This means comparing their planned prices to a relevant industry, not necessarily a direct competitor. In their case it

can mean local taxi operators or other low paying jobs, such as cashiers at McDonald's (Steven, 2020). This will give them a "ballpark" figure and make the price prediction easier. The interviewee calls this pricing technique "sanity checking". This pricing tactic is used for the new locations of the service that do not have direct competitors (Steven, 2019b).

2.4.1 The role of information in pricing

Asymmetric information in pricing between sellers and buyers means an uneven distribution of information usually to the favor of the seller side. They simply know more about a product's or service's true value. However, perceived utility is another thing and it can be a significant value driver for the buyer side. Perceived utility can have considerable deviation from the objective utility of a product or service. In the long run, the roles of asymmetric information might change. If for example a pioneering company sets a price with an unnecessary large margin, and similar products emerge with a lower price, consumers can feel betrayed by the first mover company and choose to use other providers because of too aggressive pricing tactics. Of course, there can be a situation where the seller does not know the exact price for its product or service, but as a market matures, the laws of demand and supply will modify the prices eventually on a level that are agreed by most of the counterparties.

Today's data-rich world can introduce new possibilities to use more complicated and sophisticated pricing models, as more and more relevant data will be available. In this context, the findings from the case company are quite surprising but also impressive. Despite all the data available and complex mathematical models, their robust but quite accurate pricing model relies on unstructured interviews, thus not utilizing large amounts of existing data nor mathematical price modeling. As pricing in platform context is more demanding than in traditional firms (Eisenmann et al., 2006) the correctness of price decisions plays an even more important role.

2.5 Flow of revenues and costs in digital platforms

Below, in figure 4 is presented the pricing mechanics in platform companies. The main thing to understand about platform pricing is that any given platform has to make at least two pricing decisions, one for the buyer side of the platform and one for the seller side of the platform. These two prices need to be thought through and set before launching the

platform. Of course, prices can be changed later on but raising prices is usually received with negative feelings. A distinctive characteristic of these two prices, is that they have to be thought of and set simultaneously, as one side's price will eventually affect the demand of the other side as well. It is important to remember that this is an illustration of the minimal situation. In figure 4, there is described a two-sided platform with only one price decision to each side of the platform. Often platforms need to consider more than just two prices.

Platform's costs are usually a fraction of the same type of pipeline company (Van Alstyne et al., 2016). Platform companies do not own the products or raw materials they sell, they simply provide a platform to exchange the goods and services. Platforms also facilitate the communication for third parties. Uber is one the biggest logistics companies, but their costs of equipment is quite different compared to e.g. airlines. Uber probably owns some cars for its staff etc. but its main business is not based on owning the transportation hardware but connecting the ride-providers and ride-seekers.

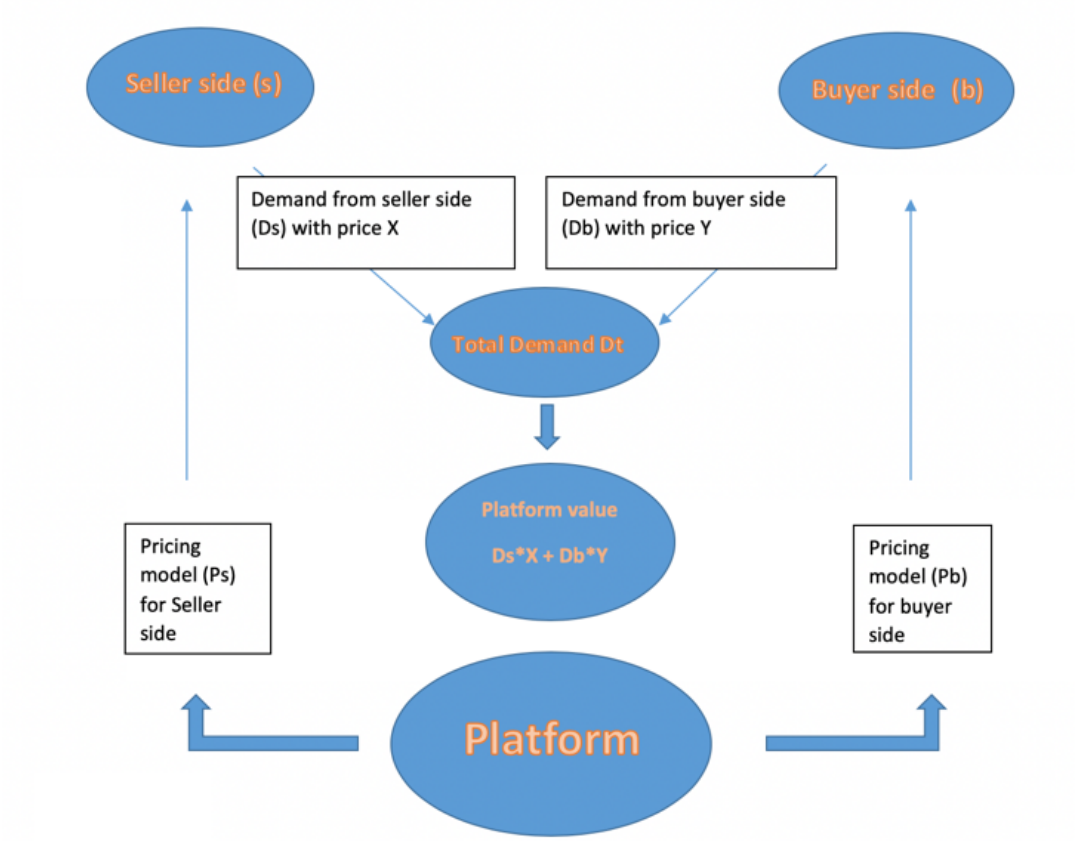

Figure 4 Platform Pricing Structure

The figure shows the pricing decisions that a platform operator must make for its participating sides. These prices drive effectively the demand on from those platform sides.

2.5.1 Pricing model by Armstrong 2006

In his paper, "Competition in two-sided markets", Armstrong (2006) examines three competitive scenarios for two-sided markets. He lists them as follows: a monopoly platform, a competing platform where platform participant groups do not participate in competing platforms and a model where one side of a platform joins all competing platforms. This situation he calls 'competitive bottlenecks'.

In his study he defines "three main factors that determine the structure of prices offered to the two groups." (Armstrong, 2006). The two groups here mean platform participating groups. These three defining factors he states are, "relative size of cross-group externalities; fixed fees or per-transaction charges; and single-homing or multi-homing" (Armstrong, 2006). Armstrong explains in his study each of these price determining attributes and their role in competitive situations. However, he does not go through all the competitive situations in every attribute but explains one competitive situation when this pricing determinant has or does not have an effect to a certain extent.

Although Armstrong (2006) provides examples of non-digital platforms in the beginning of his study, he does not explicitly mention that his models would be only applicable to non-digital platforms. The context of the models is rather tied to a certain type of competitive situation of a platform. The case company experiences the same issues presented in this paper. Their competitive situation is between the competing platforms and competitive bottlenecks. In his study, Armstrong (2006) provides qualitative matters for pricing tactics in platform companies but also builds a mathematical model. Armstrong's model is thoroughly examined later on in the thesis.

2.6 Quantitative models

2.6.1 Model by Kung & Zhong (2017)

Kung & Zhong (2017) study in their paper "the optimal pricing strategy for two-sided platform delivery in the sharing economy" the optimal pricing strategy to maximize profits also by considering network externality. These are membership-based pricing, transaction-based pricing and cross-subsidization.

They find that," When time-discounting of revenues is absent and consumers' order frequency is insensitive to price, the three strategies are equivalent." (Kung & Zhong, 2017). They clarify that this means that all the strategies are, "equally good in incentivizing the players in this system" (Kung & Zhong, 2017). All these pricing strategies will eventually, according to the authors, "result in the same number of consumers, shoppers, and platform profits." (Kung & Zhong, 2017). The authors build a quantitative model based on Armstrong's (2006) model and use the qualitative characteristics provided by Armstrong (2006), but build mathematical models to optimize prices under each different pricing strategy that Armstrong suggests. The case company uses cross-subsidization in a same manner as is suggested in the study of Kung & Zhong (2017).

2.6.2 Model by Sun et al., 2019

A study by Sun, Teunter, Babai, & Hua (2019) "Optimal pricing for ride-sourcing platforms" provides a good example of the evolution of a taxi company called Didi Chuxing. It is an online car hailing platform, such as Uber and Lyft. The study tells a story of how the company first started by connecting a ride-seeking customer to the first responding driver and then moved to a more intelligent and thus profitable business model, of connecting the ride-seeking customer to the nearest driver. The study summarizes that this way they could lower waiting times, and also charge higher prices, resulting to a bigger profit margin. Two pretty significant changes. The downside of this change, as the study points out, is that the drivers have complained the model being unfair, compared to the earlier model of first-to-respond. In addition the loss of freedom to choose one's customers independently has been criticized, as the platform now does the connecting of drivers and passengers automatically (Sun et al., 2019). The study presents the pricing strategy differences of the two aforementioned connection models and the differences in profit between the two strategies. This model is researched in the context of a two-sided platform with a delivery service.

The authors of this study point out an insight concerning digital platforms with a delivery service. They state that, "pricing is a more complex task for online car hailing platforms than for most other two-sided markets." (Sun et al., 2019). The authors credit this to the fact that different locations of drivers and customers affect the waiting and driving times. This on the other hand affects, "the cost for customers and the profit for the drivers" (Sun et al., 2019). This is an interesting statement referring to the challenging

nature of pricing in ride-hailing platforms. The case company has a similar functionality in its platform, the need to connect drivers to merchants and customers. The case company has a third side to the platform in addition to the chauffeurs and consumers, but the similarities are still high between the case company's model and Sun et al.'s (2019) model. The authors of the study claim that this connection decision is overlooked in other studies concerning the matter and thus their study will have more accurate and relevant results (Sun et al., 2019).

2.7 Network effects

Network externality in platform context means the utility that a consumer receives based on the number of other people using the same product, and especially on how many people "on the other side" of the platform might be using it (Katz & Shapiro, 1985). This basic theory of network effects is same across all types of platforms. A good example of network effects is a phone. A phone does not itself provide much value to its user, if there are no other people who also have one. This same logic applies to modern digital platforms; such as Airbnb and Uber, where the value that a consumer receives, is dependent on the amount of people on the other side of the platform. This is commonly referred to as cross side network effects. Network effect can also be negative, which means that an additional user on the platform decreases the value for current users. Network effects can be positive, negative, direct (same-side) or indirect (cross-side) network effects (Clements, 2004). Direct and indirect network effects mean the incremental value an additional user will have to existing users to either side of the platform. The number of users on platform sides as cross-side and same-side network effects, refer to the user growth within the same platform. Katz & Shapiro's (1985) pioneering paper on the matter, lets a reader to familiarize with the topic more in depth.

3 Methodology of the thesis

To understand how digital platforms, make crucial pricing decisions, a total of nine pricing models are presented in this study. Of these models eight are from academic literature and one from the case company. The approach of this study is chosen to able to present a pricing model from real life and compare it to pricing model found from academic literature. The models presented in academic literature rarely have a real-life application mentioned. This study is in contrast to this, as it is able to present a pricing model in full and in detail with a real-life application.

3.1 Research approach and design

Bengtsson (2016) describes the starting point for any academic study the following way, "In all research, it is essential to begin by clarifying what the researcher wants to find out, from whom and how" (Bengtsson, 2016). The topic was first clear to me, the pricing models in digital platforms. Next, I acquired the case company. As the case company was a delivery platform that narrowed the scope of the study. From the case company, I wanted to learn how they price their service. The people that I wanted to approach were of course knowledgeable with their pricing procedure.

The method for the study is a case study method. This choice is supported by Zainal (2007), "Case study method enables a researcher to closely examine the data within a specific context." (Zainal, 2007). The context in this study is very important. Zainal further explains the core approach of case study method, "Case studies, in their true essence, explore and investigate contemporary real-life phenomenon through detailed contextual analysis of a limited number of events or conditions, and their relationships" (Zainal, 2007).

Between inductive and deductive methods, this study is more of an inductive one and according to the definition by Zainal (2007)[6] a descriptive study. According to Bengtsson, (2016), "Inductive reasoning is the process of developing conclusions from collected data by weaving together new information into theories" (Bengtsson, 2016). This describes the methodology of this study quite accurately. The findings from the empiria are presented,

[6] "descriptive case studies set to describe the natural phenomena which occur within the data in question" (Zainal, 2007)

evaluated and compared to academic literature. To build a theory from the empiria would require more interviews and possibly support from another case study. To build a theory based on the empiria and the academic findings could be possible, but not solely on the empirical part.

The findings from the data collection in the case company were documented and analyzed. One of the study goals is to explore a case company's pricing model. For this, the interview-based method was the most suitable. The case company was chosen because of its fit for the research scope. Only one case company was chosen based on the advice of the thesis supervisor. The contribution of the study is to present pricing models found from academic literature and describe in detail the case company's equivalent. Platform entrepreneurs can use this study for the purposes of comparing pricing models, or to evaluate a suitable pricing model for their platform. The amount of data received from the case company about their pricing process, contributes a great deal to the quality of this study.

3.2 The data collection

3.2.1 Interviews

The empirical part consists of six semi-structured interviews, which were recorded and analyzed. In three other occasions information was collected with email. The interviews were done in Finnish language. The purpose of the interviews was to collect data to understand how the case company does their pricing decisions. This includes their pricing model, tools, people and different steps in the pricing process. The first two interviews were transcribed to written format. The other four interviews were analyzed directly from the recordings, as the most complex information was gathered in the first two interviews.

3.2.2 Questions planning

For the first interview, the questions were planned and written before-hand and send to the interviewee. The nature of the first interview was to learn about the aspects that play the most important role in the company's pricing and also aimed to grasp an understanding of the big picture concerning the pricing process at the case company. In regard to questions planning in other occasions, only for the second interview, did I send the questions before-hand. In other occasions, I planned the questions but did not send them beforehand to the interviewee. During the interviews all planned questions were asked and responded.

However, there was also room for additional questions and some extempore discussions on important relative issues in the interviews. In the first two interviews the questioning structure was from general to more detailed. In other occasions, there was no specific structure for the questions. All the interviews were recorded and then analyzed. Four of the interviews were done at the company office and two via phone.

Table 1 Interview and data collection summary with case company

Interview and data collection summary with Case Company

Event	Interviewee	Position	Method	Duration (min)	Date
Interview 1	Steven	Head of Expansion	Teleconference	83	11.9.2018
Interview 2	Steven	Head of Expansion	In-person meeting	27	14.4.2019
Interview 3	Steven	Head of Expansion	In-person meeting	24	3.5.2019
Add. Information 1	Steven	Head of Expansion	E-mail	0	3.6.2019
Interview 4	Steven	Head of Expansion	In-person meeting	8	6.9.2019
Add. Information 2	Steven	Head of Expansion	E-mail	0	14.10.2019
Interview 5	Steven	Head of Expansion	In-person meeting	30	23.1.2020
Add. Information 3	Steven	Head of Expansion	E-mail	0	27.1.2020
Interview 6 (Proofreading&Comments)	Steven	Head of Expansion	Teleconference	25	19.5.2020

3.3 Validity and reliability of the study

Zainal (2007) mentions triangulation as a suitable manner to increase a study's validity when using only one case company. In the data collection I used three methods; in person interviews, phone interviews and emails. In regard to the informant at the case company, he is a senior employee with a vast understanding about the company's pricing structure and process. He has been with the company almost from the beginning and was there when the first pricing decisions took place.

Traditional approach to interview-based data gathering - interviewing until information saturation is reached through multiple interviewees - was not possible at the company. However, the interviewee was the most senior person of all the people knowledgeable with pricing. The additional interviewees would have had lower seniority and breadth of scope on pricing-related questions. In the case of contradicting information from the interviewees, the answer of the most senior interviewee (the one interviewed for this study) would have had the most weight on it. All the interviews were recorded. The case company data was kept in one computer folder and in a cloud platform. This data cannot be provided to outside people due to high confidentiality of the data.

The reliability of the study's findings is subject to the interviewer's possible bias, and data collection methods. The reliability of the empirical parts builds on the fact that

there was one topic, that was discussed in nine different occasions, to build as accurate as possible description of the phenomenon. There were no real incentives that would bias the interviewer, the incentive was to be as objective as possible, by this I mean there was no hypothesis tested that could have motivated for a result bias, as the study was completely descriptive. From the technical point of view, as all the interviews were recorded, it was easy to go back and evaluate a piece of information and the context it was given in. In terms of the other pricing models presented in this study, the correct presentation and interpretation of these models have the biggest effect on the results validity. As there are 8 models presented in the study, the reliability of the comparison results between case company's model and the other models, should be on a good level.

4 Case Company

4.1 Case company description

The case company of this study is a European digital platform with a delivery service. It operates in more than 50 locations around Europe (spring 2020). The case company has three-sides and it delivers physical goods to private people and companies. Their business model is to deliver goods to consumers from selected merchants.

The company has an application for all of its platform participant groups consumers, chauffeurs and merchants. The platform's task is to facilitate the communication among the aforementioned participant groups. The platform's task is also to choose the merchants, that it wants to be on its platform and to provide optional training to its chauffeurs (Steven, 2019b).

For the three distinctive platform participating groups, the platform operators need to make a total of 7 different pricing decisions every time they open a new location, they wish to operate in. These seven pricing decisions are the following: One decision to merchants, four decisions to chauffeurs and two decisions to consumers (Steven, 2019). An interesting insight to the case company's pricing strategy is that the price levels change from location to location. This creates the need to rethink the seven price points, every time a new location is opened. A new market means, in this context, a new city of operations. Locations vary in terms of their infrastructure, i.e. how time consuming it is to deliver goods in that specific area. Other location specific characteristics that the case company's pricing model takes into account are user's price sensitivity, average spending and competitive landscape. The crucial pricing decisions have to be made beforehand of opening the service. This requires from the platform's pricing model quite a lot, as it has to produce seven different price points, which will impact not only the platform participant group in question, but also other users on the platform through cross-side network effects. Needless to say, is that the pricing model has a great effect on platform's profitability.

4.2 The case company's business model

The case company connects three different platform participant groups and facilitates their communication with each other through the platform. The basic idea of the service is to provide a delivery service for existing products of third-party producers. Selecting the

producers with the most aspired products, is a key part of the case company's business model and success. The product providers are selected based on their suitability to the platform and popularity among local consumers. For the consumers, there are two main reasons to use the platform: first, a consumer can pre-order the product from the shop and go pick it up or secondly, order the products delivered straight to the recipient's location. The delivery feature is the company's main business.

To make profit out of this business model, the platform charges a commission from the goods providers, for the extra demand that they bring to them. The other revenue source are the consumers and businesses using the platform. These two platform participant groups represent the revenue side of the platform. The chauffeurs represent the cost side of the platform. The platform covers the cost of the drivers from the above-mentioned revenue sources. These are the sources of revenue and cost for the case company. For the time being there is no revenue coming in from advertising (Steven, 2019).

4.2.1 Pricing decisions at the case company

There are three different platform participant groups that need to be priced correctly, simultaneously and before a location is opened. The pricing decisions are always a dilemma between charging too high prices and leaving valuable profits on the table. Furthermore, changing a price includes a high risk of creating imbalance in the platform, as the price change of one side will affect the other sides' demand through cross network externalities and thus the whole platform's performance. In the case company, the total number of pricing decisions is relatively high because four out of the seven pricing decisions, are made to one platform participant group only, the chauffeurs. Here is listed all the pricing decision that the case company must do:

1. For the product producers: commission
2. For consumers: 1. Base fee for delivery and 2. distance fee for delivery
3. For the chauffeurs: 1. hourly target level, 2. base fee for delivery (cost of delivery), 3. distance fee for delivery and 4. bonus system

The consumer price is a combination of the cost of goods, (this price is determined by the merchants, not the platform) and the cost of delivery. For consumers the platform operators set two prices: the basic fee and the distance fee. Both of these pricing decisions concern

the cost of delivery. The basic fee is how much consumers are charged for the transportation at minimum and the distance fee is how much they are charged extra for longer delivery distances. These prices are different from the ones that are paid to the chauffeurs for the deliveries they make. The end price for consumers is a combination of the cost of goods and the cost of transportation. According to the interviewee, very often the price that the chauffeurs require is more than what the consumers are willing to pay for the delivery. In this case the case company must use the commission revenue it collects from merchants, to make up the difference in the logistics operations. The main revenue source for the case company is the commission they collect from the merchants. In a rare occasion, there is a possibility that consumers are willing to pay more for the delivery than what the chauffeurs ask to make the deliveries, in this case it will be an additional revenue stream.

This clarification of the case company's pricing decisions is a good example of the real-life situation and challenges that platforms face in their pricing logic. The key take-away is that for the same output (deliveries) the case company needs to gather information from two different user groups; chauffeurs and consumers and set two prices. As mentioned, the price on the one side does not need to be hugely off balance, to affect the whole platform's performance. Two different prices, for which data collection happens from two different target groups.

4.3 Case company revenue model

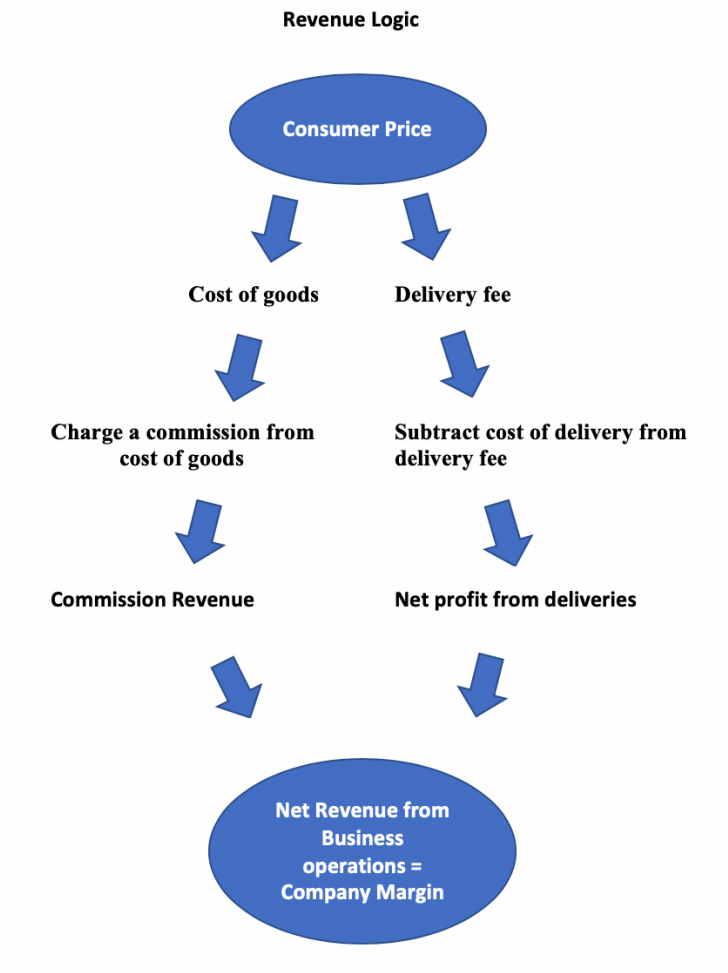

Figure 5 Case company revenue logic

Above is described the case company's revenue streams and the allocation of the consumer price. The customer price describes the end user price that is then shared among service enablers. The first category is the revenue share paid to the producers. The price of the product is same at the case company's platform as it is, if the producer would sell its products directly (Steven, 2019c). From this revenue, the case company charges a commission. This commission represents the main revenue stream of the case company.

The price that the consumer pays is also used to pay for the cost of delivery. The delivery service enablers are a separate entity from the producers; thus, this cost is considered separately. As explained earlier, the case company figures out, through its pricing model, how much the deliverers need to get paid and respectively how much the consumer is willing to pay for the delivery. If the price that the chauffeurs require to be

paid is smaller than what the end consumer is willing to pay, the excess revenue is net margin from delivery. Alongside the commission from product producers these form the company's net profit from operations. As mentioned earlier, the price that the chauffeurs need to be paid is often greater than what the consumers are willing to pay for the delivery. (Steven, 2019).

Here are described the main revenue streams of the case company:

$$Company\ Revenue\ = Commission\ revenue + delivery\ fee \quad (5)$$

$$Company\ Margin = Commission + delivery\ fee - cost\ of\ delivery \quad (6)$$

These two equations lead to the fact that the net revenue from deliveries is positive, if the delivery fee collected from consumers is greater than what the cost of delivery is paid to the chauffeurs.

$$net\ revenue\ from\ delivery\ fees > 0, \quad (7)$$

$$if$$

$$cost\ of\ delivery\ (chauffeur\ price) < base\ fee\ for\ delivery\ (consumer\ price\ for\ delivery) \quad (8)$$

Cost of delivery is the cost or price that the chauffeurs require in order to be willing to participate to the case company's platform and provide their logistics services.

The delivery fee is the price that the consumers are willing to pay for the delivery. As it is often the case according to the interviewee, that the cost of delivery paid to the chauffeurs is greater than the delivery fee collected from consumers, the difference between the two prices, must be compensated with the commission revenue, received from the producers.

$$If\ cost\ of\ delivery > consumer\ price\ for\ delivery \quad (9)$$

$$then,$$

$$Cost\ of\ delivery\ =\ consumer\ price\ for\ delivery\ +\ a\ percentage\ from\ commission\ revenue \quad (10)$$

4.4 Platform participating groups

As explained earlier, all types of platform companies have platform participating groups. These are distinctive groups of people with a similar interest towards the platform, e.g. chauffeurs in the Uber's platform. The value that a platform creates, is that it facilitates the communication among its platform participating groups. For a company to be a platform, there needs to be at least two platform participant groups.

In the case company, there are three different participating groups, consumers, chauffeurs and product producers. In order for the platform to function, i.e. carry out a single transaction through it, it needs to have all three platform participating groups present on the platform simultaneously and having them contribute their share of the service. Here are presented the case company's participating groups with a short description about their operational functionality on the platform and a few words related to the pricing mechanics unique to each participating group and the platform participant group's role in the revenue logic of the platform.

Service users – consumers

This user group represents the demand side on the platform and thus the revenue side as well. Service users are private people and companies, who in this industry are catered with various possibilities. The success of the case company's platform ultimately depends on the acceptance and usage of this participant group. According to (Eisenmann et al., 2006) the most valuable side of the platform should be the most subsidized. In the case company they use subsidization for consumers to attract more demand on the platform. This is done for example by removing the delivery fee for a certain period. For this participating group the upside of using the case company's service are time savings and convenience it brings. The platform offers them the possibility to have certain products delivered to home or any other location. The case company operates in pre-screened locations, in populated enough cities where the service can be of great benefit for busy people.

Chauffeurs

This participant group represents the cost side on the platform. Chauffeurs are the enablers of the service. The number of chauffeurs available on the platform is subject to fluctuations. This platform participant group needs to be incentivized enough to guarantee their crucial presence during demand spikes. In addition to the low requirements of entry for this job, the case company has the possibility to offer its chauffeurs a safety net fee that acts as a backup, in case there are difficulties beyond the power of the chauffeurs to reach their target level of earnings level. Flexible working hours and an opportunity to be available for work whenever they like, also aim to make the job easy to access and desirable. The low requirements to become a chauffeur, also help attracting this platform participant group to the platform. To become a chauffeur, one needs to own either a car, scooter or a bike and a valid driver's license. The case company provides optional training to the chauffeurs. In comparison to the goods providers, the platform is responsible of acquiring and training the chauffeurs. Besides fixed costs of the platform, chauffeurs represent the cost side of the platform.

Goods providers

For goods providers, the incentive to participate to the platform are the extra sales, that the platform brings, otherwise unattainable, according the case company. Goods providers for the platform are selected based on their popularity and suitability to the service. The products that are ordered through the platform are existing products of the merchants. Thus, the incentive to join the platform without any extra cost seems a good deal. The merchants are charged a commission from the revenue that the platform generates for them. Another beneficial aspect to the merchants, is that they do not have to handle the payments for the orders, as they are done in the platform and then paid to the merchants by the platform company. In most markets the platform also takes care of the order receipts on behalf of the producers.

This separation of platform participant groups is meant to help readers understand the dynamics of the case company's platform. The participating groups have all their separate applications to the service, through which they communicate with each other and the platform operators. It is free for all the platform participating groups to join the platform and there are no costs related to being available on the platform, e.g. for the merchants. This means that the case company does not use subscription model, but a pay-per-usage pricing model.

4.5 The pricing logic for each participant group

The case company has seven pricing decisions to decide upon. For goods providers the case company needs to determine the commission, that varies from location to location and even within one location. The first step in figuring out the correct commission for a certain location, the case company seeks for benchmark prices from competitors and analyze the competitive landscape of the location. Then they go see potential local product producers and ask for their opinion for a reasonable level of commission that they would be comfortable paying for from the additional sales generated by the platform should they join the platform. This type of unformal opinion seeking, is the company's main tactic in figuring out the commission pricing, that they would receive in a certain location.

For consumers, the price consists of the price of the goods and the price of transportation. If the consumer decides to order from the platform and pick up the goods by himself, then the cost is just the cost of goods. The cost of products is always same on the platform as it is at the merchants own catalogue (Steven, 2019). To determine the consumer prices, the case company uses competitive analysis and similar type interviewing as for the merchants.

The price components for chauffeurs are hourly target level, base fee per delivery, distance fee per delivery and a bonus system. This means that the case company has to consider four different prices for this participant group. The first price to decide upon is how much a chauffeur should earn per each hour. Based on this number, the base fee and distance fee are designed so that at realistic operating efficiencies, the chauffeur earns the desired hourly income. If a chauffeur does not complete enough deliveries, the case company will top up the fees to match the desired hourly earnings. In some cases this is called the hourly guarantee remuneration, according to the case company. The purpose of this pricing component is to act as a safety net, in case there are technical difficulties or low efficiency in the market and the chauffeur is not able to operate at a desired level. This is an important number that the case company uses, when assessing the profitability of a certain location. If this price is set too high, it is hard to get the platform profitable as the platform will have over supply of chauffeurs and they are costly with the high price they are getting for just being online and if this price is too low there are not enough chauffeurs to deliver the requested orders from consumers. This is a good example of the problematic nature of price setting in platforms and digital platforms (Steven, 2019b).

The second price component that the case company considers for the chauffeurs is the *per-delivery compensation*, that the chauffeurs will receive once they make a delivery of any distance. This is an interesting price component and it comprises from the fee received from the end customer but usually partly as well from the merchant commission. Hence, this price that the chauffeurs receive is not cross subsidized from the consumer completely, as the interviewee mentioned.

The third pricing decision is the *per-distance fee* which is a fixed amount after the distance covered by the basic fee has been surpassed. When I asked the case company interviewee about dynamic pricing, he said that there is not a price that would change in real time with the demand in their service and thus this, per kilometer pricing, is as close to dynamic pricing as it gets in the case company. Some might consider it dynamic pricing, but in this thesis, it is not considered as such.

The final pricing decision for the chauffeurs, is the *bonus system*, which is an incentive system to make more deliveries at certain time periods with high demand. (Steven, 2019b) For this pricing component I do not have any further information, other than by delivering more, the chauffeurs will be rewarded more than the basic salary would be, from deliveries made.

The basic logic behind the chauffeur pricing is that, to get enough riders on the platform, the case company uses a safety net, that guarantees a certain hourly income for the chauffeurs, if there are not enough deliveries to be made. In normal conditions, the base fee for delivery and the distance fee for delivery comprise the earnings of a chauffeur. (Steven, 2019a). The interviewee pointed out that, the safety net is more common in early phase locations and that in mature locations, the safety net is not needed that much anymore. He mentioned that, currently in most of the locations the chauffeurs earn their salary based solely on per-delivery and per-distance fees as well as the bonuses. This is of course the better situation for the case company as well, because these fees are always percentages from revenue and also mean higher earnings for the chauffeurs. The hourly guarantee fee will be paid whether there is revenue or not to the case company. For the case company, it is very important to understand the different price components of their service, before opening a certain location.

4.6 Pricing procedure for the service in a new location

In this section I will describe in detail how the case company makes their pricing decisions for a new location that they consider as a potential market for their service. In the

beginning of the platform's lifecycle, the price model and the price levels are set on a level, that emphasizes growth rather than profit maximization (Steven, 2019). The interviewee from the case company provided also confirmation on the importance of pricing before the service opens for public, "pricing is just something that you need to get right in the first place." (Steven, 2018). Price the service too high, and the platform never takes off due to lack of users and price it too low and the service level is poor, profits are lost, and the future of the platform is risked.

4.6.1 Competitive landscape and benchmarking

The first step in the case company's pricing procedure is a competitive analysis of current local, global and direct competitors in the desired market. This screening helps the case company get information on current price points, but also to understand their strategic goals for pricing. This is related to targeting locations where there are already similar services available and use their prices as a benchmark for their own pricing process.

The case company interviewee said, that they utilize a lot of competition benchmarking to get ballpark figures for their pricing whenever this is possible. Also benchmarking to the general price level of transportation is something that they utilize for the starting place of their pricing. This means that they can check for example local taxi companies' prices for reference points. They also benchmark their prices to other low-paying jobs in the locations.

4.6.2 Pre-screen phase

In the pre-screen phase, a memorandum is conducted about the suitability of a location for the service to be opened. This is done by the case company's own employees. In this phase they look at a location's; population, habitant density, average spending, average income, city infrastructure and other matters that will help them assess the goodness of a location. The case company might utilize legal consulting, but other than that, no outside reports are used for this phase.

4.6.3 Travel to location – further data collection

Once the pre-screen analysis is done and accepted, there is either a decision to travel to the location for further investigation or a rejection of the location. If the pre-screen phase indicates that a location is worth further investigation, a small team of two to three people is then sent to the location for approximately 5 to 7 business days to further examine the

suitability of a location for opening the service. This is a very important part of the analysis and also one of the most interesting findings of this study.

Once the small team arrives to a location, they will start conducting interviews with all the platform participant groups; goods providers, chauffeurs as well as end customers. From these discussions, which are usually very informal and even unplanned in nature, the case company collects opinions on correct price points for each participant group. They interview with several participants (around 15) from each group to form as educated as possible estimate of the correct price level. These opinions on the prices are gathered to an Excel cost-accounting model, which the location team updates as they receive more opinion to the prices from the interviews. In the model they have all the service-related in- and outputs. Once enough opinions are gathered from all the user groups, this model is used to calculate, whether a certain location makes economically sense to be opened.

The interviewee points out that they consider the local people as experts on the issue of correct price levels for the service. At first, this was quite unexpected, as I had expected a more analytical or formal method to price a platforms service. However, this method makes a lot of sense, as local people can usually say whether a certain consumer price is reasonable or not for a service that is not too complicated to understand. By gathering enough of these opinions, as the case company does, a confidence starts to build that a certain price level is correct for the service at a certain location.

4.6.4 Cost-accounting Excel tool in pricing

The Excel spreadsheet that the case company uses in its pricing procedure, has all the relevant inputs and outputs relevant to pricing. The opinions asked from different participant groups are recorded there and updated throughout the data collection process as new opinions are received.

4.6.5 Analysis of case company's pricing method

The method described above of collecting and gathering crucial price-setting information is the biggest finding of this study. The method itself is not anything extra-ordinary, but to use unstructured and unplanned interviews to price a platform's service, was a finding that is unique in the context of this study's research. The utilization of local people as the experts is the true aha-moment here. I think the method is almost too obvious to be considered valid, at first thought. The interviewee did not mention, whether the case company had considered any other pricing models during their existence. In regard to their

chose of method for pricing, he mentioned that, due to their service being very new, there are no outside experts that would know better their industry than themselves, meaning professional consultants for example.

The interview process that the case company uses, can be described as informal and unstructured in terms of how the interviews are planned and agreed upon. The interviewee explained that the investigation team often goes to co-working spaces to interview potential users.

The key take-away from this finding is that the true power lies on the simple method of using local people as the "real experts" on consumer prices on a service that they already are familiar with. In this sense the case company utilizes the power of the many or crowd sourcing as a method for gathering crucial information. I have encountered a similar type of method used for service innovation through interactive customer feedback, but as a method for price-setting this was a unique finding. At the end of the day it is an effective way of gathering relevant information from people most knowledgeable on the matter. When I asked from the interviewee, whether they use price analysis by outside firms, he pointed out that no outside analyst can really beat the expertise of a local person on this issue. These four phases described above are the main data collection methods and steps in the case company's pricing procedure.

Figure 6 Pricing process components of case company

4.7 Detailed steps in the pricing procedure

In this section I present and describe all the steps that are included in the pricing process of the case company. In the previous chapter, the most important and defining steps were described. To get a complete understanding about their price setting procedure, it is good to go through all of them. A tool that the company uses as a part of the pricing process, not presented in the previous chapter, is the greenlight memo that the team that travels to a promising location, creates. The people involved in pricing, are the case company's own workforce. They conduct the desktop analysis, travel to the locations, conduct the data collection and create the greenlight memo. The case company's COO and executive board will review every greenlight memo and decide whether a certain location will be opened or not. If the service is decided to be opened at a certain location, the final touches for the prices are done with the help of the same local people used for the initial interviews, in the role of new employees of the company. This is the final pricing adjustment before going live with the service.

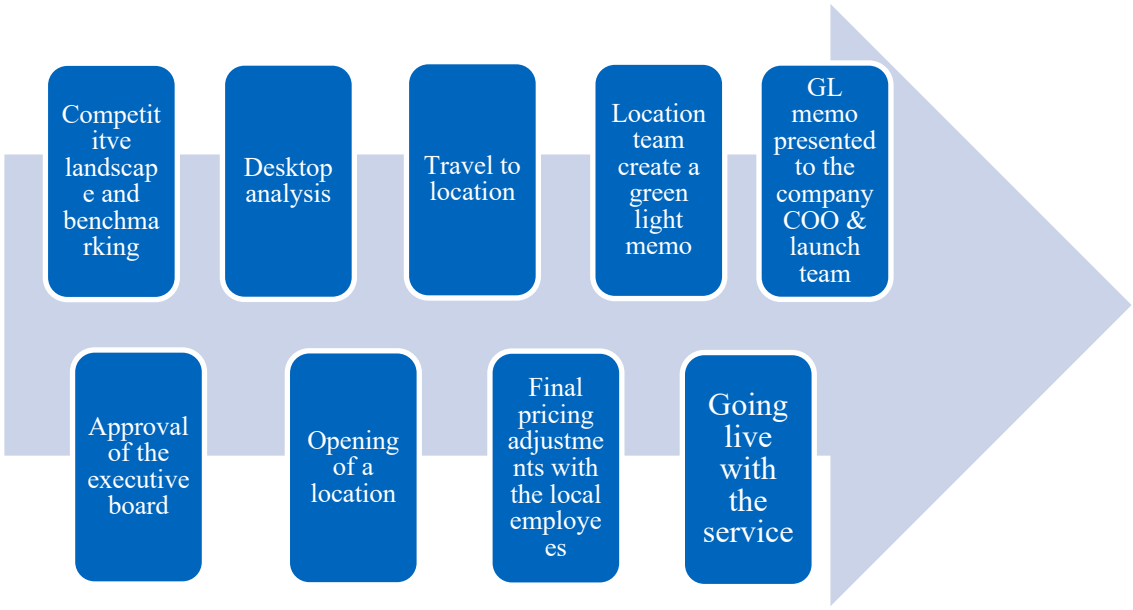

Figure 7 Steps of the pricing process in the case company

The figure 7 showcases the steps in the pricing process, in the case of a successful opening of a location. The pricing process can be ended after desktop analysis or after travel to location if the location is deemed unsuitable. This the company interviewee did not call part of pricing specifically. The first step, competitive landscape and

benchmarking, is usually continued to be assessed throughout the pricing process. He added that usually pricing process is not started if there is no decision to open a location. (Steven, 2019).

4.8 Data Sources for the pricing process

Below is illustrated the four main components of the case company's pricing process. After the desktop analysis is done and the first inputs to the cost-accounting table software are put in, starts the fine and unique part of data collection with interviews. As new information is gathered from the interviews the cost-accounting table is updated. This happens constantly and as an evolving process (Steven, 2019). The cost accounting model is an important tool that is updated constantly, and it keeps an up-to-date view on current price points. Four main data sources are:

1. Competitive Analysis and Benchmarking
2. Desktop Analysis for background info and robust analysis for profitability
3. Interviews with target group participants
4. Local employee knowledge

The data collection for correct price points goes in chronological order from the above-mentioned sources. First there is a competitive analysis and benchmarking, which provides information on markets that already have a similar service in operation. This according to the case company interviewee are the most suitable locations for their service. Secondly is the desktop analysis which yields the first inputs to the cost-accounting model, with city population, spending, density etc. The third part is the unique and interesting part of data collection from local target group users. Finally, the knowledge from local employees of the company to the cost-accounting tool is gathered for final price adjustments. Gathering more and more information and updating the cost accounting model eventually leads into the final price points that the service will then be opened with.

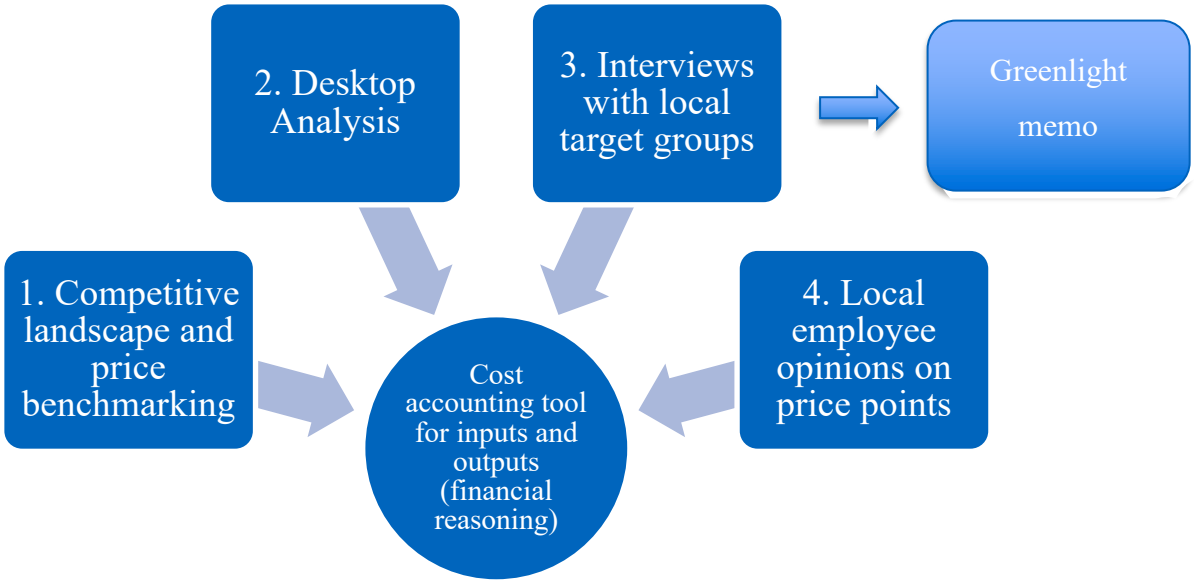

Figure 8 Data Sources for pricing process

If the desktop analysis indicates that a location has potential to be financially profitable, the case company proceeds to phase 3 of the data collection process. This phase takes up to, on average 6 to 7 working days per location. The information from the steps 1,2 and 3 are gathered to form the greenlight memo, which is then presented to the COO and executive board of the company for revision and approval. The fourth phase happens only if the location is decided to be opened, but it is a demonstration of utilizing local people knowledge on correct price points.

4.8.1 Pricing process tools and data utilization

There are four different data collection steps, as explained in detail in the previous chapter. These steps are used for the first box below in figure 9. The tool that the case company uses for their pricing, is a cost accounting spreadsheet model presented in the second box off figure 9. It has all the inputs and outputs affecting the individual price points, signaling the profitability of a single location. The third box are the best estimates for the 7 prices that need to be set before opening a location.

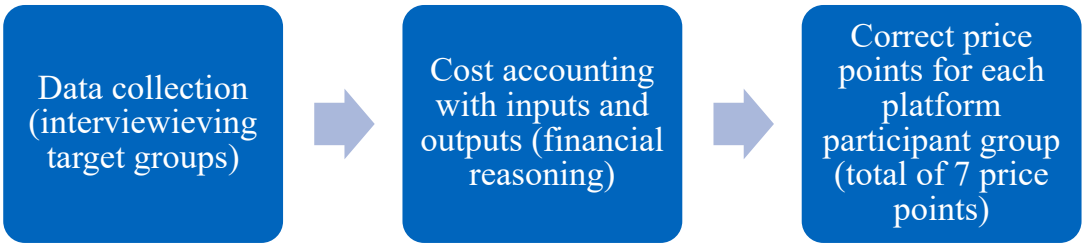

Figure 9 Pricing structure of the case company

4.9 Timeline for opening a new location

Pricing decisions for the service in the case company happen in steps. For this matter, here are presented these steps with their respective durations. The purpose of this part is to let a reader to understand the time invested in the whole process, as well as per individual step. The pricing process is a sum of different steps done with different tools and methods. Here is described how time is allocated to each step in their pricing procedure and also the total time spent from the beginning of the process to the end.

1. Step – Desktop analysis – Less than 1 month, usually a bunch of good candidate countries reviewed as a bunch, of which the most suitable ones are then cleared for the next phase.
2. Step – Travel to location and planning and execution of memorandums and – 4 to 5 weeks.
3. Presentation of location specific greenlight memorandums to company COO and launch team. – 1 week. For locations needing bigger investments, extra 2 to 4 weeks are required.
4. Process of opening the new location, including recruitment of local team and setting up all the practicalities – 3 to 5 months.

From these steps, the most time is taken by the last step. However, at this is point the decision to open up a location is already done. Hence, for the pricing procedure and data collection before opening a location, the time span is roughly two to three months, after which the location is decided to be opened. If a location is deemed unsuitable after travel to the location the pricing process end there. The interviewee added, that the final price adjustments may be done once a location is opened, with the help of group management and the local team. (Steven, 2020a)

4.10 Tools and methods that the case company uses for pricing

The case company uses some analytical tools (desktop analysis phase and cost-accounting model in Excel), but most of all its pricing procedure relies on unstructured and even on unplanned "interviews" to gather relevant data from local people who are considered representatives of one of the three platform participant groups. This means that the case company's employees travel to a location and interview all of its platform participating groups; 1. Consumers, 2. Chauffeurs and 3. Goods providers. From these platform participating groups, they ask about their opinion of how much they would be willing to pay or willing to receive from this type of service. From each interviewee the case company gets a relevant opinion about the price points which they record to the unit economics Excel sheet. Once they have interviewed enough people, 15 to 20 people (Steven, 2020), and they feel that they have formed educated enough estimate of the price points for each participating group, they compare these numbers together with other information in the cost-analysis tool in Excel, to construct a view of a certain locations economic suitability.

For the desktop analysis part, the case company utilizes public information to layout a basic profile for a profile. These include; number of inhabitants, average spending and population density. They also consider the logistical structure of the locations, in order to analyze the delivery service's efficiency in that location. For the desktop part, the company does not use any highly sophisticated tools, outside reports nor company external workforce. For this, the interviewee pointed out that, they themselves are the biggest experts on this industry, and thus acquiring analysis from third parties does not make sense for them. The one software that my case company mentions using, is Microsoft Excel for the data collection part and analyzing the cost-related information.

The main method of pricing as mentioned, are unstructured and unplanned interviews, with a targeting on expected target group representatives of the service. From

these interviews the most crucial data is collected, cumulated and compared to the earning logic tool. The interviews are where the case company extracts their most valuable information.

4.10.1 Evidence on the pricing model's performance

In this chapter I will share data from the case company's pricing forecasts, i.e. what the company's pricing model forecasted for the service prices in a certain location, and what the actualized prices have been after months in operation. In the table below we can see the prediction for the average purchase for the service before opening the service compared to the realized sum.

The purpose of this table is to provide evidence on the validity of the pricing method that the case company uses to predict correct price points. To demonstrate the accuracy of their model, I have calculated also the standard deviations for five operating locations of the service. From the calculations we can see that the differences between the forecasted average purchase and actualized ones are quite small and the average standard deviation among all these five locations is only 15,63. In addition to this, only in one of these five location the estimated average price was above the actualized price point. That leads us to think, that the model that the case company uses is tuned to be more conservative in its approach to rather underestimate the price points than overestimating.

Table 2 Actual purchases vs. Forecasted purchases

Actual purchases vs. Forecasted purchases

	Location 1. CEE	Location 2. CEE	Location 3. Nordics	Location 4. Nordics	Location 5. Baltia
Actuallized Avg. purchase*	96,78 €	53,23 €	190,50 €	156,47 €	78,04 €
Forecasted Avg. purchase**	87,03 €	45,91 €	175,00 €	196,00 €	70,00 €
Stdev	8,00	4,05	16,66	39,63	9,84

* First five months average of actualized prices since service launch
** Forecasted price point of average purchase on the service

Average Standard deviation of forecasts from actualized 15,63

The forecasted prices and the actualized prices deviate from each other, because there can be price adjustments after a location is opened and the forecasted prices are average purchases, not fixed service prices.

4.10.2 Chicken and egg problem in the case company

The interviewee pointed out that, the hardest part in opening a new location for the service, is in the beginning, when they have to estimate the consumer's demand for the service and then attract enough, but not too many chauffeurs online to the platform. He adds that, especially in markets, where there are no similar services in operation, the beginning is especially challenging. For these situations the case company uses incentives. Using incentives is not an uncommon method in platform companies to drive the demand on each side of the platform. Once the case company has decided to start operating in a new location, they need chauffeurs to be available on the platform for deliveries. The safety net feature that the case company provides for its chauffeurs is a good example of an incentive system. This is especially true in the newer locations. Eventually, when a market stabilizes, the safety net becomes redundant and the payments to the chauffeurs will follow a "market economy" type of structure, meaning that chauffeurs earn their target level with base and distance fee components.

However, according to the interviewee, it can take several years until the demand is predictable enough for the market economy model to work, because the service usually keeps on growing which makes the prediction of demand hard for quite a long time after the opening. This on the other hand means that the case company predicts the demand, publishes the needed number of hours to the chauffeur platform and then the chauffeurs book the hours for themselves that they are willing to work on. If there is a situation of low efficiency in the markets and the chauffeurs cannot reach their target fee, the case company covers the difference between the set target level and realized remuneration. This can be seen as the main incentive that the case company uses to get the drivers online to the platform. Should a market be in a more mature state, the case company does not need to publish the hours anymore as chauffeurs know the demand spikes and come online at peak hours.

For producers, there are no such price incentives or price components changing along the demand. Once a producer is chosen to be part of the platform' service, a fixed commission is negotiated separately with each goods provider. For consumers there are incentives for longer periods. For them, the delivery fee might be removed for weeks or even months, to drive up the demand from that side (Steven, 2019c).

5 Model evaluations and comparisons

5.1 Analysis of the case company's model

As described in the earlier chapter, the case company relies heavily on unformal and unstructured means of collecting vital information, from which they will eventually create the price point opinions for all the necessary individual price points in their service. Compared to existing pricing models researched in this study, the case company's pricing method is unique. No other study, presented in this thesis states a similar type of data collection method, informal interviews, as a vital source of pricing information. The models presented in other journal articles usually build a mathematical model, that will generate optimal price points for a platform. These types of models can be suitable for more generic markets with similar price elasticities of demand and more stable market conditions than the ones that the case company operates in. However, the real benefit of the case company's pricing model is its robustness, ease of customizing and repeatability. It can generate prices for various market conditions and take into account multiple location-specific price opinions. The case company's model goes from forking out a price range with competitive analysis and benchmarking towards more precise estimations, as opinions from different target group users cumulate and steer the price points towards more educated predictions. Naturally, there are still variance among locations, on the successfulness of the pricing strategy, even though the same model is applied to all new and existing locations. The proof about the pricing model's correctness comes from the business. The case company has not yet (Spring 2020) been forced to close any of its locations due to poor performance. Also, the table presented in chapter 3.11. presents the actualized prices against the forecasted ones as an evidence on the pricing model's performance. The average standard deviation also presented in the abovementioned table, fortifies the fact that, the case company's pricing model does perform quite well in terms of predicting the correct price points for both market types, the ones with existing competition and the ones that there are no similar services already available.

Another strength of the model is utilizing crowd sourcing and the real experts on local price points, the local people. In my thinking, it would be hard to achieve the same results with only mathematical models. Should the case company utilize mathematical models, the ones that use price elasticity of demand could be the most useful ones, for

predicting correct price points. Still it is hard to imagine that a mathematical model would be better than the pricing procedure of the case company from beginning to end.

5.2 Other Platform pricing models

5.2.1 Kung & Zhong (2017) model

Kung & Zhong (2017) compare in their study three basic pricing strategies; membership-based pricing, transaction-based pricing, and cross-subsidization. They find out that," all the three strategies result in the same numbers of shoppers, consumers, and profits in equilibrium". This means that according to them, all the strategies have the, "same efficiency of incentivizing users to join". (Kung & Zhong, 2017). In their study they: "construct a game-theoretic model featuring sharing economy and network externality to examine a grocery delivery platform's two-sided pricing strategy" (Kung & Zhong, 2017). The study will eventually come up with optimal price levels under each strategy.

However, should the consumer's order frequency be, "affected by the per-transaction fee" (Kung & Zhong, 2017), as it is often the case in real life, the authors conclude that in this situation the membership-based fee would earn a platform the highest profits, because it collects the money up-front and maximizes, "the price-sensitive order frequency."(Kung & Zhong, 2017). This is an interesting finding when thinking about the case company. The case company is not using membership-based pricing, but according to the results of Kung & Zhong, the case company would result in same level of profitability with fixed fee pricing for deliveries. As Kung & Zhong mention in their study, the common business model of platform delivery companies is transaction-based fee, although some of the players in the field have experimented with fixed-fees for the deliveries, e.g. Instacart[7].

5.2.2 The Armstrong (2006) model

Below is the comparison of the pricing attributes that Armstrong (2006) presents in his paper to the case company's context.

[7] https://www.instacart.com/help/section/360007797952

Relative size of cross-group externalities

First *relative size of cross-group externalities* means the difference in value among the platform participant groups that they each bring to the platform and then its effect on platform's pricing strategy. Armstrong's main idea in this definition is that the price for one side of the platform is defined by that group's benefit to the other side. If one platform participant group benefits more from the other platform participant group, then that side bringing in the most value is usually subsidized more heavily. This is because the platform needs this platform participant group more than the other or they are harder to get to join the platform.

In the case company the logic is a bit more complicated. According to the interviewee a right selection of goods providers is the most important thing in their service, otherwise there is no demand. This means that goods providers would be the most valuable user group to the platform and thus should be subsidized the most. The user group that draws the most benefit from the platform on the other hand are the end users. According to the Armstrong's model the platform participant group that brings in the most value to the platform is usually the most subsidized (example from night clubs, where women bring more value to the platform and thus are given more often free entrance.) In the case company, the only platform group that are effectively paid are the chauffeurs. Surprisingly, the all-important merchants are not paid, as they are charged a commission from the price of the goods sold, for their participation to the platform. This is an interesting dynamic as, according to the interviewee, the merchants are the single most important part of their platform. Without popular goods providers, there would be no customers and thus no need for the chauffeurs either. Even though the merchants bring value directly to consumers and indirectly to chauffeurs, as popular merchants mean more deliveries and thus earnings to chauffeurs, they are charged for their participation.

Fixed fees vs. per-transaction fees

The second platform characteristic affecting the pricing strategy according to Armstrong (2006) is whether a platform uses fixed fees or per-transaction charges. This is an important decision faced by all platform companies. This is probably the most common pricing decision that platform companies do. In his paper, Armstrong states that the differences between these two-pricing logics only matter when there are competing platforms around. In this situation, he suggests that the per-transaction fee should make a

platform more profitable. This is due to lessened platform participant externalities (the effect in value created by one participant on one side to the other side).

In the case company, there are both of these pricing decisions applied. The merchants pay a commission, which is a fixed fee price and revenue to the case company. For chauffeurs, there is a fixed fee called guaranteed minimum remuneration per hour and then per-transaction payments, the base fee and distance fee. Also, the bonuses are per-transaction. By this categorization I have to decide which pricing logic is used more often. It is a hard task as there are almost equal number of these in the case company, two fixed prices (merchant commissions and hourly guarantee for riders) and three per-transaction prices (per-delivery fee, per-kilometer fee and bonuses, which are not at least fixed.) For consumers the case company uses per transaction fee and the other price strategies are a mixture of fixed fees and per transaction fees.

Multi-home or single home

The third and final platform characteristic that defines the pricing structure according to Armstrong's (2006) model, is whether the platform participant groups multi-home or single home. To be able to compare the case company to Armstrong's (2006) model, we need to consider whether the case company participants multi-home, i.e. participate to several competing platforms or use mainly one. I asked about this subject from the interviewee and his answer provides some clearance on the topic: "many consumers probably use multiple delivery platforms, but exact information on this we do not have." (Steven, 2019). As the interviewee has been in the case company for about 95% of its existence, I think his sense on the topic is a good guess. If the consumers, do multi-home, then this would suggest that the case company should use Armstrong's competitive bottlenecks model. When talking about the other participant groups, chauffeurs and merchants, the case company interviewee clarifies the situation from their part the following: "When it comes to the merchants, my belief is that they also use multiple delivery platforms. In terms of the chauffeurs, it is a bit different story as it is hard for them to participate to many competing platforms at the same time, as the demand spikes are same in competing platforms, than in ours." (Steven, 2019).

5.2.3 The optimal pricing for the case company using Weyl's model

In this section I will calculate the optimal amount of subsidization for the platform side A according to Weyl's (2010) model. To calculate this, I use the average purchasing basket of the case company and the realized cost of delivery that was charged from platform participant group A (end customers). The side A should be, subsidized below the cost of providing the service by the value they bring to side C (Weyl, 2010).

The value that side A brings to side C in terms of the delivery is calculated by dividing the average cost of delivery by the average purchase basket. The cost of producing the service to side A are the manufacturing costs of goods, added by the cost of delivery

$$CA = CG + CD \qquad (11)$$

where CA is the cost of producing the service to side A, CG is the manufacturing costs of goods and CD the cost of delivery. According to the data from the case company the average cost of delivery is 11% from the average basket purchased on the platform[8]. The result is calculated from five different locations in Europe. In one of the locations the delivery fee was set to zero, thus affecting the average.

The value of the average purchase basket from the same locations is 60. This number represents the cost of producing the goods in this context. With these figures, we can calculate the optimal amount of subsidization to side A. Then the optimal amount of subsidization S for side A is given by,

$$SA = 60 * 0{,}11 \qquad (12)$$

$$SA = 6{,}6 \qquad (13)$$

and the optimal price PA for side A is thus,

$$PA = 60 - 6{,}6 \qquad (14)$$

$$= 53{,}4 \qquad (15)$$

The average cost of delivery, i.e. value to platform side C is 11% and the optimal subsidization for side A, according to the model is 6,6. In the case company a common way to subsidize side A is by removing the delivery fee. The problem in this implementation is that I have used the average cost of delivery as the value that side A

[8] These calculations can be seen in Appendix A

brings to side C. It should be another number that there could be an evaluation of how well the model predicts price points. The fee that the chauffeurs require, i.e. the value they want to draw from the platform is often bigger than what the consumers are willing to pay for the delivery as is stated by the case company representative. This means that the side A's "dislike" to side C's service is greater than what the value they bring to side C is.

Another option to calculate the same optimal amount of subsidization and price point would be to use industry knowledge. According to the industry knowledge in everyday consumer goods, a product with a selling price of 100 has the costs of raw materials of 25, meaning 25%. The side A should be then subsidized below this cost by the amount they bring to side C. service. The optimal subsidization is something that puts the side A's participation price below this cost by the amount they bring to side C. This would yield

$$SA = 25 * 0{,}11 \quad (16)$$

$$= 2{,}75 \quad (17)$$

and the optimal price point PA would then be,

$$PA = 25 - 2{,}75 \quad (18)$$

$$= 22{,}25 \quad (19)$$

As a conclusion, it can be said that the model by Weyl (2010) seems to work fairly well for this part of the case company's price setting. The problem or risk with mathematical models in high-growth platform companies is that they might over optimize some details with the cost of not being robust enough for the fast-changing situations. I think that using a model, such as Weyl's (2010) could be utilized in the more mature locations of the case company. The successfulness of the case company's current pricing procedure is best supported by the evidence of its predictive accuracy showed in table 2 in section 3.10.1. Based on this it is not advisable to change to current pricing model with the data collection method.

5.2.4 Sun et al. model for digital platforms with a delivery service

The study of Sun et al. (2019) focused on the customer and driver waiting and driving times. The cost side of their model provides another reference point to the case company.

Cost side of the Sun et al. (2019) model

The total cost of e-hailing by Sun et al. (2019) is given by

$$C_E = F + \tau \cdot \frac{r_i}{v}, \qquad (20)$$

where C_E is the total cost of e-hailing. F is the price for a ride and τ is the waiting cost per time unit. Waiting time equals to r_i/v. r_i is the distance from driver i to the customer's departure point. V is the average speed of driver per hour (Sun et al., 2019).

"Platform's optimal pricing strategy when selecting the first driver to respond" (Sun et al., 2019)

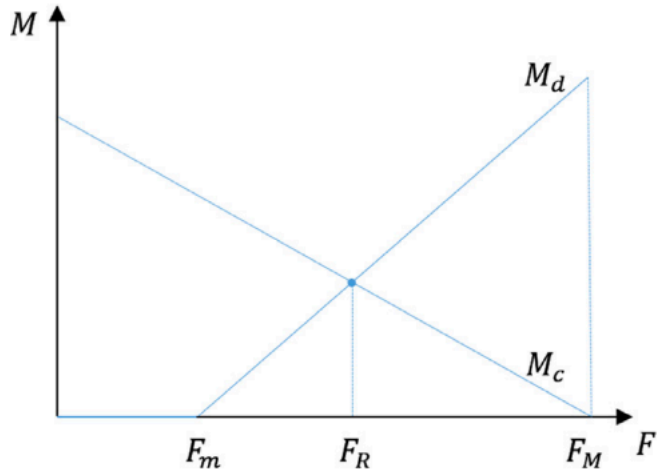

Figure 10 "Maximum acceptable distance of customer and drivers as a function of ride price F" (Sun et al., 2019)

The case company does have waiting times. From the time the order is placed until the order is received. At the case company, the variance of delivery distances, is coped with charging additional costs for longer deliveries per an individual delivery. The waiting times for the consumers are controlled by encouraging people to utilize close-by producers, by charging extra for the distance. Also taste for product variety is quite high in the case company, thus, ensuring that a high enough number of different merchants are located within a reasonable ordering distance, is a key component of controlling waiting times but at the same time provide a high service level.

6 Results

The goal of this study was to examine and present how digital platforms conduct pricing decisions. This was done by presenting eight academic pricing models and one model from a European digital platform. The research questions reflect the research agenda of this study. In this section, the research questions are answered with the evidence found from academic studies and the case company. The research questions were:

How do digital platform companies with a delivery service determine correct price points for their service?

Can a digital platform with a delivery service make accurate pricing decisions based on a qualitative model?

Table 3 below summarizes the main functionalities of the pricing models studied for this thesis. A total of nine platform pricing models were presented in this study. Of them, six models were studied more in depth. From these six models, four were considered explicitly in the context of delivery platforms. Some of the models were given more attention than others, and the decision to implement Weyl's model to the case company, was done based on the model's applicability to the case company's available attributes.

For the pricing models studied in the context of delivery services, there seems to be a common nominator, the usage of mathematical modeling to determine the optimal price levels. From the four models presented in this study for platforms with a delivery service, three use mathematical modeling to calculate the optimal pricing for delivery platforms. The model of the case company stands in clear difference to this, as it utilizes platform user-group interviews as its main source of data for price level decisions. The pricing models for delivery platforms found from academic research are somewhat similar to each other, as they utilize all mathematical formulas to calculate the optimal price levels for the platforms. They might measure different attributes, but the methodology is very similar.

The pricing models presented and studied in this Thesis can be divided into two categories, based on their use of quantitative or qualitative methods. The qualitative models presented in this study are: Eisenmann et al. (2006), Hagiu (2009) & (2014), partly Armstrong (2006) and the case company's model. Quantitative models are Kung & Zhong (2017), Riquelme et al. (2015), Sun et al. (2019) and Weyl (2010). Not all the models studied in this thesis were studied in platform delivery context. The pricing models studied in the context of delivery platforms were: (Kung & Zhong, 2017; Riquelme et al., 2015;

Sun et al., 2019) and the case company's model. The pricing models studied in other industries were: (Armstrong, 2006; Eisenmann et al., 2006; Hagiu, 2009, 2014; Weyl, 2010)

Of the four pricing models for delivery platforms, two were studied in ride-sharing platforms; Riquelme et al. (2015) and Sun et al. (2019). The other two delivery models were studied in the context of delivery platforms with physical goods; The model by Kung & Zhong (2017) and the case company's model.

The results for the first research question can be seen summarized in table 3. In short, digital platforms with a delivery service make pricing decisions 75% of the time with mathematical models. The evidence from the case company provides the remaining share and as a pricing model differs notably from the other three delivery pricing models. There are no mathematical equations utilized in the case company's pricing model, other than the basic calculations. The most quantitative tool that the case company utilizes is the Excel spread sheet cost accounting model for recording price-related information and to calculate financial soundness of a location. No other functionalities than subtractions, adding, multiplying and dividing is used in this spreadsheet model. It calculates the inputs and outputs related to pricing and reveals whether certain price points yield profitable results.

The three quantitative pricing models for delivery services presented in academic literature, all calculate different types of mathematical equations where the inputs are e.g. a platform's membership fee, price elasticity of demand, user's utility or an optimal number of people on one side of the platform. Weyl's (2010) model considers three-sided platforms (newspapers) and two-sided platforms (credit cards). The other models are for two-sided platforms. The qualitative models presented in this study are a listing of key strategic decisions that a platform needs to take, pricing being one of them.

As a result, for the first research question, it can be concluded that there is a clear tendency towards using mathematical models to reach optimal price levels for platforms with a delivery service. The exception to this is the case company's qualitative model. The contribution of the non-delivery pricing models to the first research question, come with a reservation. These models study pricing in platforms and in digital platforms, not explicitly delivery platforms or any other type of platform for that matter. Should we ignore this fact, their contribution would pull the results a bit more towards qualitative models, but this is subject to the dilemma described above. I would say that the strongest evidence is from those studies explicitly mentioned to be for delivery platforms and thus be mathematically dominated.

From the interviews conducted with the case company, I learned about a new type of price formulating strategy, for which I did not found an equivalent in existing literature. The pricing model that the case company uses differs from the other pricing models. It can be seen as a mixture of some quantitative modeling (the unit price economics Excel spread sheet) and qualitative methods (unprepared, unstructured ex-tempore interviews with potential platform users). Still the model hinges greatly towards being a qualitative model. The case company's methods to reach optimal price points are price benchmarking, competitive analysis, background analysis and most importantly the use of local knowledge in price determination. They utilize informal and sometimes even unplanned interviews with platform participant groups, to cumulate crucial information on correct price points. Granularly, after receiving 10 to 20 opinions from the potential platform participants, the case company arrives closer to the price points, with which the service is eventually opened. All the price components are added along the way to the cost-accounting Excel and if the model indicates profitable operations, the company's service is decided to be opened. These prices are not necessarily the final ones, as they might get adjusted still by the opinions of the local employees once the decision to open a location is made.

To answer the second research question, there is one important clarification to be made. I consider the pricing model of the case company to be a qualitative one. The only quantitative part of the pricing model is a spreadsheet model to keep track on the price point opinions that are constantly updated to the model as the data collecting process cumulates more and more price opinions from platform user group participants. This spreadsheet does not contribute to the correctness of the pricing model, other than keeping track of the price opinions and providing a clear look on the economics for a certain location.

With this clarification we can answer the second research question. The short answer to this question is yes. The evidence for this answer is to a great extent from the case company. The pricing guidelines from the qualitative models presented in this study, can be seen applicable to delivery platforms as well, and thus contributing to the affirming answer of yes to the second research question. However, these guidelines cannot be showed to be used explicitly by any certain delivery platform. An example of this type of evidence is the finding by Eisenmann et al. (2006). They state that Adobe (a platform with digital content delivery) uses a pricing strategy where, the more price sensitive platform side is subsidized more and the side of which demand is the most correlated with opposing

side's growth, is charged (Eisenmann et al., 2006). The example they use in their study, is a digital platform, but not a physical goods delivery platform. The problem is that, even if the company in the example was e.g. Uber, a platform with a delivery service, could this type of finding be considered as a strengthening finding to the second research question? Taking into consideration that the qualitative pricing models researched in this study present similar types of pricing guidelines as the evidence presented above from Eisenmann et al.'s (2006) study, their finding can be considered as an affirming finding to the second research question. However, as the second research question asks whether a delivery platform can make accurate pricing decisions based on a qualitative model, the support for this question should be a pricing model from a delivery platform that yields price levels. Can these types of pricing guidelines or, phrases describing a platform's pricing, be considered yielding accurate pricing decisions? In my opinion no. In this sense the strongest evidence to the second research question is still from the case company, and as a finding it is a unique one, as it seems there are now equivalent pricing models presented in academic literature.

Table 3 Pricing Model Comparisons

Pricing Model Comparisons

Model Name	Model Type	Delivery objects	Model Measures:	Model is for two-sided platforms	three-sided platforms	method of the model	Company or industry specific model?
Case Company model	Delivery	Goods	Price opinions /sensitivity	Possible	Yes	User group interviews	Company specific
Sun et al. model	Delivery	People	Waiting times	Yes	Not mentioned	Mathematical formula	Company/ Didi Chuxing
Kung & Zhong model	Delivery	Goods	Utility/ profit maximization	Yes	Not mentioned	Mathematical formula	General model
Riquelme et al. model	Delivery	People	Queuing / Dynamic pricing	Yes	Not directly	Mathematical formula	Industry specific / Lyft
Weyl's model	Other	-	Sources of user heterogeneity	Yes (credit cards)	Yes (Newspapers)	Mathematical formula	Industry specific
Hagiu 2009 model	Other	-	Profit extraction/maxim.	Yes	Yes	Mathematical formula	General model
Armstrong model	Other	-	Utility/Decision to join	Yes	Maybe applicable	Mathematical formula/listing	General model
Eisenmann model	Other	-	No model	Yes	Not directly	Guideline listing	General model
Hagiu 2014	Other	-	No Model	Yes	Yes	Guideline listing	General model

6.1 Analysis of results

From the case company's pricing process, the informal interviews as a source for critical pricing data, is the most surprising finding of this study, when compared to the mathematics-heavy queuing models. The pricing model of the case company is not a qualitative model similar to Hagiu (2014) or Eisenmann et al. (2006) models, which are a listing of strategic decision or guidelines contributing to the successfulness of a platform. The case company's pricing model is not similar to the mathematical models either, with complex queuing or utility models using mathematical formulas. The case company's model is thus a unique finding as a pricing model. The generality of the case company's pricing model is subject to the business model of a company. Much attention is needed to pay to assess whether these types of user group interviews are possible, and can the answer be trusted. The more quantitative models could be applicable to the case company at some point, although it seems quite unlikely that they would change their current pricing model completely. The case company's pricing strategy allows them, to get the most reliable opinions on correct prices for their three platform participant groups. The interviewee pointed out that, of course there are better and worse performing locations, but the company has not yet had to close a single location because of their pricing decisions. As the case company operates in multiple of different locations in different countries, they have to assess the correct price levels many times during a year and every time they open a new location there are 7 prices to figure out.

Some of the steps in the case company's pricing process are a bit more common when looking at what has been presented in the existing academic literature on the subject. These are numerical first-phase background check for a potential location as well as the unit economics model, that is used to calculate whether a certain location makes economically sense to be opened. The main part of the pricing procedure, however, still remains unmatched, from the studies presented in this Thesis. The results from the other three pricing models studied in delivery platforms were much more anticipated and more align what I was expecting to find from the case company as well.

The evidence for the goodness of the case company's pricing model comes from the fact that none of the opened locations have been closed. Also, the table 2 (Actual purchases vs. Forecasted purchases) provides information about the predictions for correct price levels in different locations and the realized price levels. This table serves as the main

proof and validation for the second research question. The answer to the second research question is that, apparently a digital platform with a delivery service can execute correct pricing with a mainly qualitative model, supported by the evidence from the case study.

6.2 Conclusions

This study was conducted for the purpose of researching pricing methods in digital delivery platforms in an explorative manner. The research results of this study serve as an overlook to pricing models for digital platforms with a delivery service. The reader learns more about pricing models in digital platforms, with a focus on delivery platforms and about the dynamics of digital platforms' pricing in general. Another contribution of the study is the presentation of pricing model from real-life. The comparison of the findings from the case company to existing models provides an interesting possibility to see the differences between academic pricing models and one from real-life. The presentation of the case company's pricing model is the most interesting part of this study. The possibility to have access to a real-life business' complete pricing process was a unique opportunity.

The quality of the study could have been improved with additional interviewees from the case company, but unfortunately that was not possible. However, through the many interviews held and emails sent back and forth with the case company representative, I am confident that their pricing model is accurately described in this study.

Some of the pricing models, presented in this study were not from a delivery service, but rather from a ride-sourcing service and two from other platform contexts. The discussion of how business-type specific these platform pricing models are, is an important thing to take into account. The applicability of the case company's pricing model to other digital platform companies is unresearched but the approach to that, was discussed in the previous chapter.

6.3 Discussions

A platform's pricing decisions should never be done in a vacuum. The pricing strategy is closely related to the platform's service and market conditions. Another important factor for determining an optimal pricing strategy, is the growth phase of the platform. An optimal pricing strategy for a platform in its early phase, before critical mass is reached, can be very different from the one of a mature phase platform seeking to maximize profitability after critical mass of users and the value proposition of the service have been

reached. A good example of a pricing decision in the case company was related to price benchmarking in competitive locations, “The decision was to operate with shorter distances with a lower price than competition but in long distances be more expensive than competition.” (Steven, 2019)

The case company interviewee reflected his thoughts about the early phase pricing and pricing tactics given a company’s current goals: “I have spent some time on thinking, whether we should have set the price at the same level or a bit higher as the competition, because we do have a better service than them, so it would be justified. However, this opens up the discussion about the current focus of our firm, which is growth and not profitability maximization.” (Steven, 2018). This quote is a good demonstration about the intertwined nature of pricing strategy and overall platform strategy, sometimes also dictated by the growth stage of a platform. As mentioned earlier, in the early stages of platforms, the most important thing is growth in the user numbers, until a critical mass is obtained. He further continues: “In addition to this, people are very price sensitive, that is why we want to be in par or cheaper than our competition in terms of pricing.” (Steven, 2018). The case company’s representative has categorized them as a “luxury” service; hence the price sensitivity of their users can be expected to be somewhat high. Pricing strategy is thus, naturally related to the platform’s service and consumer’s perception of the services’ role in their personal life.

Pricing in platforms is a multifaceted challenge, that all platforms alike face and must solve. Pricing cannot be executed in solitude, without considering competitive landscape, company’s goals or the maturity or the nature of the service. All these attributes should be considered when building a pricing mechanism for a platform company. After these factors have been considered, it is reasonable to start screening for an optimal pricing model for the company. The model can be a mathematical queuing model, such as Weyl’s or a mostly qualitative pricing model, relying on informal interviews with potential platform participant groups, such as the one of the case company. The hardest part for a platform company, figuring out an optimal pricing strategy and model, is that there is no ready formula for this. All the mentioned factors mentioned above should be thought through. Of course there can be useful information about a competitor’s pricing model, but usually this information is not public and furthermore, if there is a difference in services’ nature, e.g. cost-effective vs. more luxury service, this alone can demand for a different type of pricing model compared to a competitor’s otherwise similar one.

Using mathematical models, such as Weyl (2010) or Kung & Zhong (2017) for pricing in the case company, could be an interesting topic for further studies. Somewhat it seems that as platforms play with different rules than traditional companies, the current mathematics heavy research in pricing models maybe too finetuned for real-life platforms to consider as their pricing models. In this sense, the main findings of this study from the case company's pricing model carry significance in the research of pricing in digital platforms, especially in real-life context.

6.3.1 Theoretical implications

Understanding the role that the main findings of this study can have on studying pricing models in digital platforms with a delivery service, is probably the most impressive theoretical contribution of this thesis. When I researched the topic of pricing models in digital platforms and in more precisely in delivery platforms, I found out that it is common that new pricing models are an extension of some model presented earlier. This can saturate the research towards more precise findings in certain models but contributing the literature with a stand-alone and working pricing model, can steer the research towards more real-life focused. In this sense the pricing model of the case company, described in detail in this study can serve as a base model for qualitative pricing models in delivery platforms or as a supportive finding in this category, should there emerge other similar findings.

On my opinion, with digital platform pricing models, the research agenda should be tied more to the performance that the models bring. Examples of complex mathematical models are presented in literature to reach optimal price points for platforms, but the evidence from real life is something that would validate a model effectively. The power of a pricing model is in its applicability to real-life businesses. In general, it would be nice to see more research made with case studies. For example, as Kung & Zhong (2017), present their model, it would be nice to know whether this model is actually used by some delivery company, or is it only their own best-guess for a delivery platform. In this sense, I would say that the most convincing theoretical contribution of my study, is presenting a pricing model for a digital platform with a delivery service, that is known to be in use, and there is evidence provided on its performance, (see Table 2, in section 3.11.).

It is understandable that companies are very secretive about their pricing models, and maybe e.g. Kung & Zhong (2017) are not allowed to mention whether the pricing model

they present, has some real-life applicability. This is a clear difficulty when studying pricing in general; the access to data and pricing models in companies.

I consider the method that the case company uses to price their service a somewhat unique, compared to other pricing models that I found from current academic literature. This means that the uniqueness of the model in the study context is true when reflected to current academic literature. Another theoretical aspect is the applicability of this pricing model. At a first look, the biggest restriction of the model is the business type that it will be suitable for. This pricing model should work equally well for two, three and multiple sided platforms. The number of the sides in a platform should not be a restriction.

6.3.2 Managerial implications

As the case company's pricing model relies on unstructured interviews, for the model to be applicable to other types of businesses, first there should be a possibility for the other companies to interview their potential platform participant groups. This method requires that a potential user is knowledgeable enough about the service to able give a valid opinion for the correct price level. Thus, this type of questioning model will work best for platform services that have a service that is easily understandable, and the potential users can be interviewed. With the condition that a platform participant understands a service, their opinions are valuable in planning the correct pricing for a platform.

All platforms that provide a service, of which core benefit can be communicated clearly to platform participant groups, should be able to benefit from this type of pricing model. A restricting factor to this is apparently service innovativeness. The platform operators need to take into account that with this type of pricing model, highly innovative ideas can end up with a wide range of opinions, with differing opinions as the idea is understood incorrectly. The high and low levels of expected utility are subject to personal preferences and misinterpretation of the platform service's value proposition.

6.4 Contribution to existing research

I present in this study a relevant, proven-to-be successful pricing model for a multisided digital platform with a delivery service. The key findings of the study are the data gathering method of the case company's pricing model. Researching and presenting the case company's pricing model in its entirety is the greatest contribution to academic literature, as I am able to show that a similar type of pricing model was not found on

academic literature. The contribution extends its applicability to real-life businesses as the model has been used for several years and continues to be used for 100% of the pricing decision made in the case company. I was also able to show that, a qualitative pricing model with interview-based data gathering method can yield accurate pricing decisions.

6.5 Restrictions of the study

One of the restrictions to this study, is to understand that rarely companies will be open about their pricing processes and the tactics they use to formulate prices. This can affect to the fact that there are no similar models presented in existing literature. Publications on this topic usually include a mathematical queuing model or a qualitative listing of guidelines for pricing model possibilities and a comparison of their performance in one ecosystem. This leads to that there are only models presented in research that are not firm specific pricing models. This is understandable and might also diminish the findings of this study.

A second clear restriction to the results of this study is that many of the studies used in this research, state that they are examined in two-sided platforms, e.g. Hagiu (2009) and Weyl (2010). Their applicability to the case company can be challenged. Strictly speaking, two-sided and three-sided platforms are different. However, the differences between them can be quite marginal and the three-sided platform can have the same functionalities in it than a two-sided platform. The applicability of pricing models across different types of platforms, with differing business models, is a more restraining factor in my eyes, than the number of sides of the platform.

6.6 Further studies

The topic of pricing and platforms is an interesting one. It would be fascinating to learn more about data collection based on interviews and on informal discussions as a pricing tactic. Based on what I have learned during this study is that, this type of pricing method can work effectively if conducted with care and thought. A practical matter is that this type of data collection method requires time and effort, but it does yield results, otherwise probably unattainable. Another interesting study topic would be using mathematical models, such as Weyl (2010) and Kung & Zhong (2017), in platforms that are used to price their service with qualitative models, e.g. the case company. This type of study could be interesting, especially for the more mature locations of these types of platforms.

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Appendix A: Subsidization calculations, Weyl model

Table A1: The cost of delivery on average

Service Location 1.	Northern Europe		Price of one product	
average purchase		97,97203042	48,98601521	
Cost of Delivery		13,08		13 %
Service Location 2.	Northern Europe			
average purchase		80,56972395	40,28486198	
Cost of Delivery		11,64		14 %
Service Location 3.	Eastern Europe			
average purchase		40,13385344	20,06692672	
Cost of Delivery		4,5		11 %
Service Location 4	Eastern Europe			
average purchase		26,97	13,485	
Cost of Delivery		4,77		18 %
Service Location 5.	South Europe			
average purchase		49,77	24,885	
Cost of Delivery		0		0 %
Total Average				11 %

These are not the actual prices; they have been randomized, but the ratios are correct and thus the percentages.