

MASTER

Bundling as an ecosystem value proposition for an incumbent retail group

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Bundling as an ecosystem value proposition for an incumbent retail group

Written in partial fulfilment of the requirements for the degree of
Master of Science in Innovation Sciences
Eindhoven University of Technology

By

C. de Bruin

Student no. – 0850741

Supervised by

Dr. B.M. Sadowski (Eindhoven University of Technology)

Dr. E. M. Mas Tur (Eindhoven University of Technology)

Dr. E. Raiteri (Eindhoven University of Technology)

R. Nooij (Ahold Delhaize)

J. Fortuijn (Ahold Delhaize)

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Submitted by

C. de Bruin (0850741)

Supervisors

Dr. B.M. (Bert) Sadowski (Faculty of Industrial Engineering and Innovation Sciences, TU/e)

Dr. E. M. (Elena) Mas Tur (Faculty of Industrial Engineering and Innovation Sciences, TU/e)

Dr. E. (Emilio) Raiteri (Faculty of Industrial Engineering and Innovation Sciences, TU/e)

R. (Richard) Nooij (Chief Financial Officer, Albert Heijn Belgium and AH to go)

J. (Jasper) Fortuijn (Proposition manager loyalty & payments, Albert Heijn)

Place, date

Utrecht, 24th of January 2020

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Preface

I am happy to present you my master's thesis. Many hours of hard work were devoted to creating this report. These hours of hard work would not have been so happily and successfully fulfilled without many people supporting me on the process.

I would like to especially thank you, Marieke Coumans for supervising me on prior research, which created the foundation upon which this research was based. Also, thanks helping me to further connect me to Ahold Delhaize.

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Finally, family and friends, thank you for supporting me in this research and in life in general. Special thanks to my parents, whom have facilitated me throughout the whole study. Even in the last period of the study, you have created conditions in which I could focus especially well on finishing this thesis.

Executive summary

The rise of online marketplaces and the introduction and popularization of the term ‘new retailing’, introduced by Alibaba, shows the disruption of retailing. The disruption of the retail industry is mainly dominated by multi-sided platforms (MSPs), such as Alibaba, Amazon, Mercado Libre, and Rakuten, which are operating as online marketplaces. They have disrupted the global retail industry and are still growing rapidly. Recently, Alibaba has opened its own physical grocery store, the HEMA. Also, Amazon has opened their own physical grocery store, the Amazon Go. Additionally, Amazon has acquired WholeFoods, showing their willingness to expand their business into the offline sales channels. Both Amazon and Alibaba leverage elements of their digital ecosystem into the offline channels.

Incumbent retail groups (e.g. Ahold Delhaize, Walmart, Carrefour) are looking for new ways to compete with the ecosystems of the disrupting online marketplaces (e.g. Alibaba, Amazon, Rakuten). Where online marketplaces are able to use complementary products or services from their digital channels towards new store concepts or innovations, incumbent retailers are having challenges in developing the complementary products or services. Even though some retail groups have acquired e-commerce players (e.g. Walmart with Jet.com and AD with bol.com), they have not yet been able to develop and leverage complementary effects between the digital brands to the extent that online marketplaces have done. After several initial discussions at AD in order to explore the research topic, it was found that the efforts towards joint value creation with its brands towards the materialization of ecosystem value propositions are challenging.

This thesis aims to add knowledge to the possible strategic responses of incumbent retail groups in order to compete with the rapidly growing online marketplaces. The objective is to find out what constrains an incumbent retail group in its efforts to jointly create value with their brands and show how bundling can be leveraged as an ecosystem value proposition. This has been analyzed by identifying the constraints that incumbent retail groups face with joint value creation efforts between their brands and by proposing a bundling strategy. By doing so, this research aims to generate valuable strategic insights for traditional retail groups, which can help them form a strategic response to the increased competitiveness in the retail industry

Theory

In order to identify the constraints towards joint value creation at an incumbent retail group, an ecosystem approach has been taken. The increased complexity of joint value creation efforts requires the alignment of involved actors, for which the ecosystem approach provides relevant typology and concepts. In order to address the complexity of value creation among the brands of incumbent retail groups, this study adopts an innovation ecosystem and ecosystem emergence approach. Several alignment and materialization conditions have been tested, namely protovision, envisioned interdependencies, envisioned control points, internal momentum, external momentum, and legitimacy of the ecosystem leader.

Additionally, in order to propose an ecosystem value proposition for an incumbent retail group in order to create complementary effects between the different brands of an incumbent retail group, a bundling strategy has been suggested. Bundling is the combination of several products in a packaged sale. Traditionally, the different forms of bundling that are considered are mixed or pure bundling, and product or price bundling, which can be combined (e.g. mixed price bundling or product pure bundling). This research has primarily focused on mixed price bundling. Mixed price bundling concerns the sales of bundled products at a discount. Separate sales are still existent at the original price. This stimulates consumers to purchase multiple products, since the bundled products will be cheaper than purchasing the separate products.

Methodology

The research approach that is taken in this study is a multi-method approach, consisting of qualitative and quantitative methods. The methodological considerations have been subdivided into two research designs. The first part of this research is aimed at answering the first sub question by taking a qualitative research approach and has used an in-depth case study design. The incumbent retail group that has been analyzed is Ahold Delhaize (AD). The alignment and materialization conditions that were introduced by Dattee et al. (2018) were tested through conducting thirteen semi-structured interviews with employees from the different AD brands that were involved in joint value creation among the AD brands. The focus has especially considered the alignment and materialization process of one EVP (project A), that stranded before its materialization. Additionally, some employees that were not necessarily involved with project A, but were involved in other joint value creation efforts of the AD banners were also interviewed. The results from these interviews have been linked back to the ecosystem literature.

The second part has taken a quantitative research approach. A customizable mixed price bundling model has been proposed that is aimed at profit maximization for an incumbent retail group. Simultaneously, the model was aimed at showing how bundling can create demand side economies of scope, such that bundling can create value for the end-customer. The proposed bundling model considers a bundling strategy in a competitive environment, in which independent rivals are unable to imitate the bundling strategy. Due to the customizable nature of the proposed bundling strategy, the model, in essence, provides similarities with volume discounting. Also, while the majority of bundling models consider zero marginal costs, a new modeling approach has been suggested in order to deal with cannibalization of existent sales.

Empirical results and conclusion

The main constraints towards alignment and materialization of ecosystem emergence for incumbents was found to be the need to envision and leverage control points, based on incumbent consumer-facing value propositions. Since the ecosystem value proposition (EVP) consisted of a mix of two incumbent value propositions fulfilling the same function for different brands, upon trying to combine the two incumbent value propositions, the envisioning of control points stranded. It was found that the ecosystem actors tried to leverage ecosystem carryover, by leveraging the success of the incumbent value proposition into the new EVP. Combining the two incumbent value propositions was found to be challenging and constrained the alignment and materialization of the EVP. Additionally, the success of the materialization of the EVP was likely to cannibalize the incumbent value propositions, emphasizing the need to leverage ecosystem carryover to jump-start the success of the EVP. Where ecosystem carryover is a concept that is only briefly introduced and mentioned by Adner (2012; 2015), it has not received further attention. Nonetheless, it was found that for incumbents, the willingness to leverage ecosystem carryover for two incumbent value propositions created challenges around the envisioning of control points.

From the bundling analysis, it was found that the introduction of customizable mixed price bundling by the AD brands is profitable. The scenario in which all AD brands were included, the profitability of all brands increased, except for bol.com, which had a decreasing profitability. The decrease in contribution margin of bol.com created a situation in which marginal costs approximated marginal revenue (contribution margin = 0,74%). Accordingly, the existent sales of bol.com are expected to be more profitable with the contribution margin before providing discounts, than the increased bundled sales after providing discount. While bol.com is actually required for the strategic value in the inimitability of the provided bundling strategy, it has been suggested to compensate bol.com for the decreased profit in order to

maximize the profitability of the introduced bundling scenario. In the other scenario, in which only AH and bol.com were included in the bundling strategy, increased the profitability of both brands nearly equally.

It has been shown that bundling can serve as an EVP. The DSES that are created following the discount, create value for the customer. Discounting products between the AD brands creates complementary effects between the brands. The customizability of the introduced bundling strategy addresses the heterogeneity of the idiosyncratic customer needs. Therefore, the customer has the ability to customize the composition of complementary products in order to suit his/her individual preferences. The complementary effects between the products of the different AD brands are created by the price discount between the products of the different AD brands. Consequently, the increase in SC probability, shows that the customer is also drawn towards the AD brands.

Practical implications

Where the online marketplaces (e.g. Amazon, Alibaba, Rakuten) are able to include the physical sales channels in their ecosystem strategy, this research has proposed a strategic response for incumbent retailers in order to create an ecosystem strategy. Where the ecosystems of Amazon and Alibaba can be seen as exemplary retail ecosystems (and beyond), bundling might be a first approach to create complementary effects for incumbent retail groups. The proposed bundling strategy can be utilized to create complementary effects between the different brands of an incumbent retail groups.

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Abbreviations

ABS	Average basket size
AD	Ahold Delhaize
AH	Albert Heijn
CM	Contribution margin
EVP	Ecosystem value proposition
MC	Marginal costs
MS	Market share
MSP	Multi-sided platform
MR	Marginal revenue
PED	Price elasticity of demand
RP	Reservation price
SC	Store choice
SCE	Store choice elasticity
VP	Value proposition

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1. Introduction

Alibaba has again broken record sales during the most recent singles day (similar to black Friday) by selling goods worth of \$38,4 bln, which is much higher than last years \$30,7 bln (Singh, 2019). The rise of Alibaba and their introduction and popularization of the term ‘new retailing’ shows the disruption of retailing. And it is not just Alibaba that is disrupting retail. The disruption of the retail industry is mainly dominated by multi-sided platforms (MSPs), such as Alibaba, Amazon, Mercado Libre, and Rakuten, which are operating as online marketplaces. They have disrupted the global retail industry and are still growing rapidly. Walmart is still the biggest retailer measured by revenue, however in terms of profitability Alibaba and Amazon have already surpassed Walmart (Deloitte, 2019).

1.1 New retailing

The abovementioned MSPs have been able to grow at the expense of incumbent retailers (Hänninen & Smedlund, 2019). In retail, the MSPs are facilitating the interaction, transaction, and exchange between third-party providers (mostly sellers) and end-customers (buyers) (Hänninen & Smedlund, 2019), such that they are able to create a marketplace, bazaar, or hypermarket experience in a digital environment. They have created ecosystems by enabling sellers and buyers to respectively sell and buy on the platform. While marketplaces, bazaars, and hypermarkets have been popular for a long time, the online marketplaces have been able to thrive, amongst others due to the ‘platform revolution’.

The highly successful retail platforms and the disruption that they cause, pressures the way in which incumbent retailers have done business. (Weill & Woerner, 2015) showed that organizations that had a narrow focus solely on supply chains have a disadvantage over ecosystem payers. They showed that “companies that had 50% or more of their revenues from digital ecosystems and understood their end customers better than their average competitor had 32% higher revenue growth and 27% higher profit margins than their industry averages” (Weill & Woerner, 2015, p. 28).

Digitization is increasing the opportunity in knowledge generation that is gathered from customers and products. Whereas, the MSPs enable “*different vendors selling similar (or even identical) products — often at different prices or service levels — and fast feedback that allows vendors to improve their products and services.*” (Weill & Woerner, 2015, p. 29). The MSP has access to the data of the activity on its platform or ecosystem, which allows for the leveraging data from the customer side and simultaneously leveraging data from the supplier side. Thus, the success of online marketplaces is due to the creation of elaborate data ecosystems, consisting of supplier data as well as consumer data.

MSPs have large scalability, due to the low amount of required physical resources and the ability to enable interaction between large groups of suppliers and consumers (Gawer & Cusumano, 2013). The Chief Strategy Officer of Alibaba mentioned in his book ‘Smart Business’ that the two key elements of success for Alibaba are ‘network coordination and data intelligence’. These ‘new retailers’ have the ability to utilize different kinds of value propositions than the incumbent retailers. A brief summary of the differences between traditional approach to retailing and the new approach to retailing is shown in table 1. Especially, in the online channels, MSPs seem to be more effective than incumbent retailers.

Table 1. The characteristics of traditional retailing and new retailing (as copied from Hänninen, Mitronen, & Kwan, 2019, p. 383)

Characteristic	Traditional Approach	New Approach
Business Model	Reseller	Marketplace
Primary Channel	Offline	Online
Distribution	Integrated	Outsourced
Selection	Limited	Long-tail
Touchpoint	Store(s)	Online interface
Market	Local	Global
Supply-chain	Integrated	Disintegrated
Role of technology	Limited	Integral
Customer service	Mass customized	Personalized
Margins	Low	High

1.1.1 Platform ecosystem strategy

In China, the ecosystem of Alibaba is beyond the retail industry. Alibaba uses several complementary elements in order to lock-in the consumer in the Alibaba ecosystem. Amongst others, Alibaba uses Alipay (the dominant payment method in China), Weibo (similar to Twitter), Youku (similar to YouTube), and additional services in order to complement the core commerce services of Alibaba. In the US, Amazon has also expanded its services beyond retailing. They provide an extensive value proposition beyond retail with the Amazon Prime loyalty program. Amazon Prime allows users to access Amazon Prime music, video, photos, Kindle library, Select deals (i.e. discounts on several products), and faster and free delivery (Same-day or 2-day shipping). Amazon also provides smart home appliances, such as Alexa, the voice assistant. Also, its business to business cloud services, Amazon Web Services generated 13% of Amazon's total revenue in Q3 of 2019 (Novet, 2019). In Japan, Rakuten has also created an ecosystem beyond retailing, consisting of, amongst others, financial services, e-reading, video on demands, and mobile messaging. Through these additional services, the 'new retailers' have access to different channels of value creation.

1.1.2 Online marketplaces to offline sales channels

Recently, Alibaba has opened its own physical grocery store, the HEMA. The approach to their physical store is different than the physical stores of traditional retailers. The HEMA is designed in order to provide a seamless omni-channel experience, in which the physical store is also utilized as a distribution center for online sales, serving customers within a radius of 3 kilometers. Online orders are picked by order pickers, whom collect the groceries in the store and give the order to last mile delivery agents. This new way of retailing changes consumer expectations and shows the willingness of online retailers to utilize bricks and mortar stores too.

Amazon has also recently opened their own physical grocery store, the Amazon Go. Amazon Go uses innovative product registration tools, which enables a shopping experience without requiring a checkout. Also, Amazon has acquired WholeFoods, showing their willingness to expand their business into the offline sales channels. Amazon is integrating their digital presence in the offline channels, by enabling discounts for Prime members and requiring the Amazon GO app, in order to check in at Amazon GO stores.

1.2 Incumbent retailers

Most incumbent retailers are operating as resellers, controlling or operating in a linear value chain (Weill & Woerner, 2015). Their sophisticated supply chains and the knowledge of their products is extensive, such that they can generate value through their effective and efficient sales of their products based on their knowledge of the products. The incumbent retailers are

increasingly pressured by value propositions of the online marketplaces, especially since the online marketplaces are moving their business in the offline channels too. Therefore, incumbent retailers need to change their strategy in order to be able to compete with online marketplaces. The increased movement towards online channels, in a multi- or omni-channel approach, shows that many retailers are ready to change their retailing approach. However, compared to the online marketplaces, traditional retailers have relatively little knowledge of their customers, as they are unable to trace the customer in the way that the platforms can trace the customer in their digital ecosystems. Some of the incumbent retailers might be suited to create their own ecosystem. For their competitive strategy, it seems that incumbent retail groups have several options:

1. Go at it alone (business as usual)
2. Build an own proprietary ecosystem
3. Join an ecosystem / join an open platform
4. Sell out (like RT-mart and Wholefoods did in the US)

In the US, Walmart tried to create its own online marketplace, in order to respond to the growing strength of Amazon. After disappointing results, “Walmart management concluded that it didn’t have the right technology or the right team, and it needed to acquire those capabilities” (Cusumano, Gawer, & Yoffie, 2019, p. 156). Therefore, in 2016, Walmart changed its approach to creating an online marketplace by acquiring e-commerce players, such as Jet.com, and tried to utilize them to create a jump-start as an online marketplace (Cusumano et al., 2019). Recently, Walmart has also partnered with Rakuten (Deloitte, 2019). It is still to be proven whether acquiring and partnering with online marketplaces will be successful for Walmart.

In the Netherlands, Ahold Delhaize (AD), a large incumbent retail group that operates the largest liquor store (Gall&Gall), supermarket (Albert Heijn), e-commerce player (bol.com), and second largest drug store (Etos), has acquired bol.com, a Dutch online marketplace in 2007. Even though bol.com is successful, since it is the largest e-commerce player in the Netherlands measured by revenue and profit, there are limited shared value propositions between the AD brands. Where Amazon is able to include wholefoods and Amazon Go in its ecosystem strategy at a rapid pace, AD has, thus far, not been able to create extensive shared value propositions between its brands in the Netherlands.

1.2.1 Omni-channel retailing

Not only are online marketplaces growing rapidly, but e-commerce (i.e. the sales through online channels) in general is growing rapidly. Even though online sales channels are often less profitable than the physical sales channels, amongst others due to additional costs in last mile delivery, incumbent retailers are investing in their online channels. Many incumbent retailers have created online sales channels, providing another shopping experience. This enables customers to access different channels for their purchases. Currently, many retailers are embracing the omni-channel experience. Where retailers already embraced multi-channel retailing (i.e. sales through either online or offline channels), retailers are currently integrating the online and offline channels into a ‘seamless’ omni-channel experience. As shown by Hagberg, Jonsson, & Egels-Zandén (2017) and Jocevski, Arvidsson, Miragliotta, Ghezzi, & Mangiaracina (2019), rather than seeing e-commerce and brick and mortar stores as separate channels that require different digitalization strategy, the integration of these channels is increasingly observed. Omni-channel retailing is defined as “*an advanced and integrated cross-channel customer experience*” or “*a single-customer journey across multiple-channel interactions*”. Several authors have reflected on the incentives, challenges, and consequences of adopting an omni-channel strategy.

The movement towards the omni-channel retailing shows that retailers are ready to change their conventional way of operating. They are increasingly integrating their online and offline channels. As a result of the increased digitalization of retail and the included data generation, traditional retailers could be able to grab opportunities beyond their traditional reseller BMs. With the increased competition from the new retailers and their extensive ecosystem, incumbent retailers are considered to either join the platform of the new retailer or create an own ecosystem (Coppens, 2019). Nonetheless, the online marketplaces seem to be able to grasp complementarities in their ecosystem strategy that incumbent retailers are, at the time of doing this research, unable to grasp.

1.3 Research question and research approach

Incumbent retail groups (e.g. Ahold Delhaize, Walmart, Carrefour) are looking for new ways to compete with the ecosystems of the online marketplaces. Where online marketplaces are able to use complementary products or services from their digital channels towards new store concepts or innovations, traditional retailers are having challenges in developing the complementary products or services. Even though some retail groups (e.g. Walmart and AD) have acquired e-commerce players, they have not yet been able to develop and leverage complementary effects between their brands to the extent that online marketplaces have done. After several initial discussions at AD in order to explore the research topic, it was found that the efforts towards joint value creation with its brands towards the materialization of ecosystem value propositions are challenging.

This research aims to add knowledge to the possible strategic responses of incumbent retail groups in order to compete with the rapidly growing online marketplaces. The objective is to find out what constrains incumbent retail groups in their efforts to jointly create value with their brands and show how bundling can be leveraged as an ecosystem value proposition. This will be analyzed by identifying the constraints that incumbent retail groups face with joint value creation efforts between their brands and propose a bundling strategy. By doing so, this research aims to generate valuable strategic insights for traditional retail groups, which can help them form a strategic response to the increased competitiveness in the retail industry. The following research question has been drafted in order to research this topic:

Why is bundling an ecosystem value proposition for different brands of an incumbent retail group?

To answer this research question, two sub-questions have been formulated:

SQ1. *Which alignment and materialization conditions constrain the envisioning and materialization of ecosystem value propositions with the brands of incumbent retail groups?*

SQ2. *To what extent can bundling the products of different brands of incumbent retail groups be utilized in order to increase profitability?*

1.3.1 Theoretical foundation

In this research, an innovation ecosystem and an ecosystem emergence approach has been taken, in order to provide an answer to the first sub question. Those approaches provide relevant concepts that are required for the analysis of complex value creation and the underlying alignment conditions of relevant actors to materialize the value proposition (Adner, 2012, 2017; Dattee et al., 2018). Even though the brands of incumbent retail groups are not independent, since they all operate for the benefit of the umbrella organization, upon an initial screening, it was found that the problems that the individual brands face are best explained by an ecosystem approach.

Also, a bundling approach is taken in order to analyze the change in profitability from introducing a bundling strategy for an incumbent retail group. Bundling literature with an economic approach has been used in order to analyze the optimal bundling strategy for an incumbent retail group. The economic approach of the bundling literature specifies on the market conditions and the bundling approach that can be used in those conditions. Following the bundling approach that can be taken and its inherent constraints, an optimization framework has been developed and analyzed. Additionally, literature on demand-side economies of scope has been analyzed in order to show how bundling can be used to create value for the customer (Henten & Godoe, 2009).

1.3.2 Methodological approach

The research approach that is taken in this study is a multi-method approach. The methodological considerations have been sub-divided into two research designs. The first part of this research is aimed at answering the first sub question by taking a qualitative research approach and has used an in-depth case study design. The incumbent retail group that has been analyzed is Ahold Delhaize (AD). The alignment and materialization conditions that were introduced by Dattee et al. (2018) were tested through conducting semi-structured interviews with thirteen employees from the different AD brands that were involved in joint value creation among the AD brands. The focus has especially considered the alignment and materialization process of one EVP (project A), that stranded before its materialization.

The second part has taken a quantitative research approach. A customizable mixed price bundling model has been proposed that is aimed at profit maximization for an incumbent retail group. It considers a bundling strategy in a competitive environment, in which independent rivals are unable to imitate the bundling strategy. Due to the customizable nature of the proposed bundling strategy, the model, in essence, provides similarities with volume discounting. A new modeling approach has been suggested in order to deal with cannibalization of existent sales.

1.4 Scientific relevance

The findings presented in this paper, contribute to the academic literature of innovation ecosystems and ecosystem emergence in several ways. This thesis aims to contribute to the academic literature in several ways. First of all, this research contributes to the innovation ecosystem and ecosystem emergence literature. As Dattee, Alexy, & Autio (2018) state, empirical data around ecosystem emergence is scarce. This research will add to this topic, by gathering empirical data and analyze ecosystem emergence for incumbent retail groups. To the best of my knowledge, the alignment and materialization conditions that constrain the ability of incumbent ecosystem actors towards joint value creation, have not been researched. It was found that, for incumbents, it is relevant to consider the necessity to utilize ecosystem carryover for existent consumer-facing value propositions.

This research proposes a way in which an incumbent retail group can create and capture value by introducing customizable mixed price bundles. This research has modeled the consumer behavior when the brands of an incumbent retail group combine their product variety into customizable bundles. This research adds to the bundling literature by modeling a scenario in which price bundling in a competitive environment does not lead to a price war, due to independent rivals being unable to copy the introduced bundles. To the best of my knowledge, this has not been researched before, since most of the price bundling literature in competition, considers that the competition imitates the price bundling, resulting in the price war. Additionally, where all of the multi-product bundling literature considers zero-marginal costs, the proposed model for this research, addresses the implications when marginal costs are greater than 0. To the best of my knowledge, the cannibalization effects in multi-product

bundling models has not been considered before. It was found that profitability increased, and bundling can address demand-side economies of scope, such that it can be used to address the heterogeneity of the idiosyncratic customer needs.

1.5 Report outline

This research consisted of two different analyses, which created a different structure than the usual report. In order to deal with the two analyses, each chapter has been subdivided into three parts. For each chapter the first part addresses the first analysis, the second part the second analysis, and the third part addresses the combination of the two analyses. Furthermore, this report is structured as follows. Following this introduction, chapter 2 will provide an overview of the relevant academic literature on which this research is based. The academic literature on innovation ecosystem, ecosystem emergence, bundling, and economies of scope is elaborated. Chapter 3 describes the methodology, which elaborates the methodological approach that is taken for this research. Amongst others, it introduces the multi-method approach that is taken and the single case study design that has been used to analyze the research question. Chapter 4 presents the analysis of the ecosystem analysis on the joint value creation efforts of the chosen case study (AD), provides an overview of the results of the proposed customizable mixed price bundling model, and links the results of the bundling model to the findings from the ecosystem analysis. Chapter 5 concludes the research by providing an overall summary and answering the research question. Finally, chapter 6 provides a reflection and an elaboration of the limitations of this study.

2. Theory

As mentioned, this research has been divided into two parts. The first is to identify the conditions that constrain the ability of incumbent retail groups to create an ecosystem strategy creates complementary effects between their brands. In the ecosystem literature, value creation among independent stakeholders is well described. In order to explain the theory of ecosystem thinking and to clarify on the different existing perspectives, this chapter aims to elaborate the concept of ecosystem thinking for organizational strategy. The second part aims to analyze the opportunity around the introduction of bundling as an ecosystem value proposition (EVP) for the brands of an incumbent retail group. In order to provide insights into the relevant academic literature, this chapter elaborates on the broadly discussed bundling literature that is relevant to this research and additionally summarizes the literature demand side economies of scope.

2.1 Ecosystem approach

In the business strategy literature, there has been a surge of interest towards the transformation of separate products and services towards more complex value propositions that require - or are complemented by - complementary products or services (Adner, 2012, 2017; Adner & Kapoor, 2010b; Dattee et al., 2018; Jacobides, Cennamo, & Gawer, 2018; Moore, 1993; Walrave, Talmar, Podoyntsyna, Romme, & Verbong, 2018). The complex value propositions that can arise in combination with other complementary products, arise, when actors collaborate into delivering the appropriate coherent value. Traditional business strategy frameworks and concepts do not seem to grasp the full extent of the value capture and value creation of organizations that operate towards collaborative value propositions (Adner, 2012, 2017; Jacobides et al., 2018; Moore, 1993), therefore the ecosystem construct has been developed.

The academic literature is divided about the similarities and differences between different types of ecosystems, amongst others there is confusion around the business ecosystem and innovation ecosystem. An elaborate analysis is provided by Adner (2017), Jacobides et al. (2018), L. D. W. Thomas & Autio (2019), and Gomes, Facin, Salerno, & Ikenami (2018). I will refer to their typology, since, in my opinion, they provide the most clarifying elaboration on the topic. For this research, it is relevant to understand the ecosystem literature that is applicable to the researched topic, which concern the business ecosystem, innovation ecosystem, ecosystem emergence, and ecosystem value propositions (EVPs).

2.1.1 Business ecosystems

Jacobides et al. (2018) state that, in the academic literature, the business ecosystem “is conceived as an economic community of interacting actors that all affect each other through their activities, considering all relevant actors beyond the boundaries of a single industry” (Jacobides et al., 2018, p. 2257). Several other authors argue that the business ecosystem is generally focused on “*exploitation*” (Gomes et al., 2018), or “*value capture*” (Adner, 2017). This shows that the focus of the business ecosystem literature concerns the capabilities and dynamics within an economic community around capturing value. Business ecosystems generally concerns an economic community around an already established ecosystem, which can also be referred to as an incumbent ecosystem.

Also, Adner (2017) refers to the business ecosystem as ‘ecosystem-as-affiliation’, which focuses on the affiliation of the network of actors and the value capture dynamics among the network of an existent network of interdependent actors. He argues that the business ecosystem construct focuses on the characteristics of affiliation of the network of organizations whose value capture performance is linked to the affiliation structure of the network and the way in which they can break industry boundaries (Adner, 2017). It considers an economic community

that relies on the internal affiliation for the value capture of the affiliated organizations. The community depends on the involved actors for the effectiveness and survival of the ecosystem.

2.1.2 Innovation ecosystem

The innovation ecosystem construct is defined by Adner as “*the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize*” (Adner, 2017, p. 40). The main focus of innovation ecosystems concerns the customer-facing value proposition and the activities and alignment structure of actors that can either complement the value proposition or are required for the complex customer-facing value proposition to materialize (Adner, 2017; Gomes et al., 2018; Jacobides et al., 2018). Adner (2012; 2017), and Adner & Kapoor (2010) refer to the innovation ecosystem construct as being focused on the activities around the focal value proposition, rather than the focal firm, which is done in the business ecosystem. In other words, the focus of the innovation ecosystem is on the EVP and the required alignment structure, interaction, and activities among partners, in order to realize the joint value creation.

By focusing on value propositions, the focus of innovation ecosystems is on value creation for final customers, rather than value capture of the firm that introduces the innovation. Adner (2017) refers to value propositions as “*the promised benefit that the target of the effort is to receive*” (p. 43). Therefore, with the value proposition as the central unit of analysis, the value proposition that is being analyzed creates the boundaries of the respective ecosystem (Thomas & Autio, 2019).

2.1.2.1 Ecosystem value propositions

Figure 1 compares the ecosystem-based value system with traditional value systems. It visualizes the differences in the value creation structure of the involved actors between the hierarchy-based value system, innovation ecosystem-based value system, and market-based value system. The roles that are used in figure 1 are briefly summarized in table 2.¹ As can be seen in the figure, the end-customer has access to the focal firm product and to complementors that enhance the value of the focal firm’s product. Therefore, a relevant distinction between the ecosystem approach and traditional approaches, is the system-level output.

System-level outputs are defined by L. D. W. Thomas & Autio (2019) as “*products and services that are compatible with one another, often adhering to a modular product architecture that allows the user to assemble a customized composition of modules to suit individual preferences*” (p. 9). In other words, the system-level output is enhanced by complementors, which increase the value and customizability of the ecosystem output. Therefore, the ecosystem output increases the benefits that can be received by the heterogeneous final customer and its idiosyncratic needs. Dattee et al. (2018) confirmed that the system-level output is the output that needs to be considered for ecosystem analyses. They stated that a new approach is needed to consider how value is created, “*namely by consumers choosing certain bundles around a key value proposition in order to satisfy their idiosyncratic needs*” (p. 468).

Consequently, the ecosystem-level output is “*greater than any single participant could deliver alone*” (L. D. W. Thomas & Autio, 2019, p. 9). The increased value from system-level output of innovation ecosystems, increases the value of an ecosystem value proposition (EVP) as compared to a single-firm value proposition. It requires the complementary effects that can be created between the outputs of different actors. Considering that the output of an ecosystem

¹ If the intermediary role (table 2) would be included in the ecosystem-based value system visualization, it would be between the focal firm’s product and the final customer or between the complementors and the final customer.

output considers a system-level output, I refer to the ecosystem value proposition (EVP) as the promised benefit that the target (final customer) of the ecosystem output is to receive.

Table 2. The different roles of partners in innovation ecosystems (Adner, 2012)

Actor	Description
End [Final] customer	The final target of the value proposition
Supplier	Actor that delivers inputs [components] that are needed to build the offer of the focal firm
Intermediary	Actor that stands between the focal firm and the end customer (not visualized in figure 1)
Complementor	Actor that can increase the value by creating additional services or products

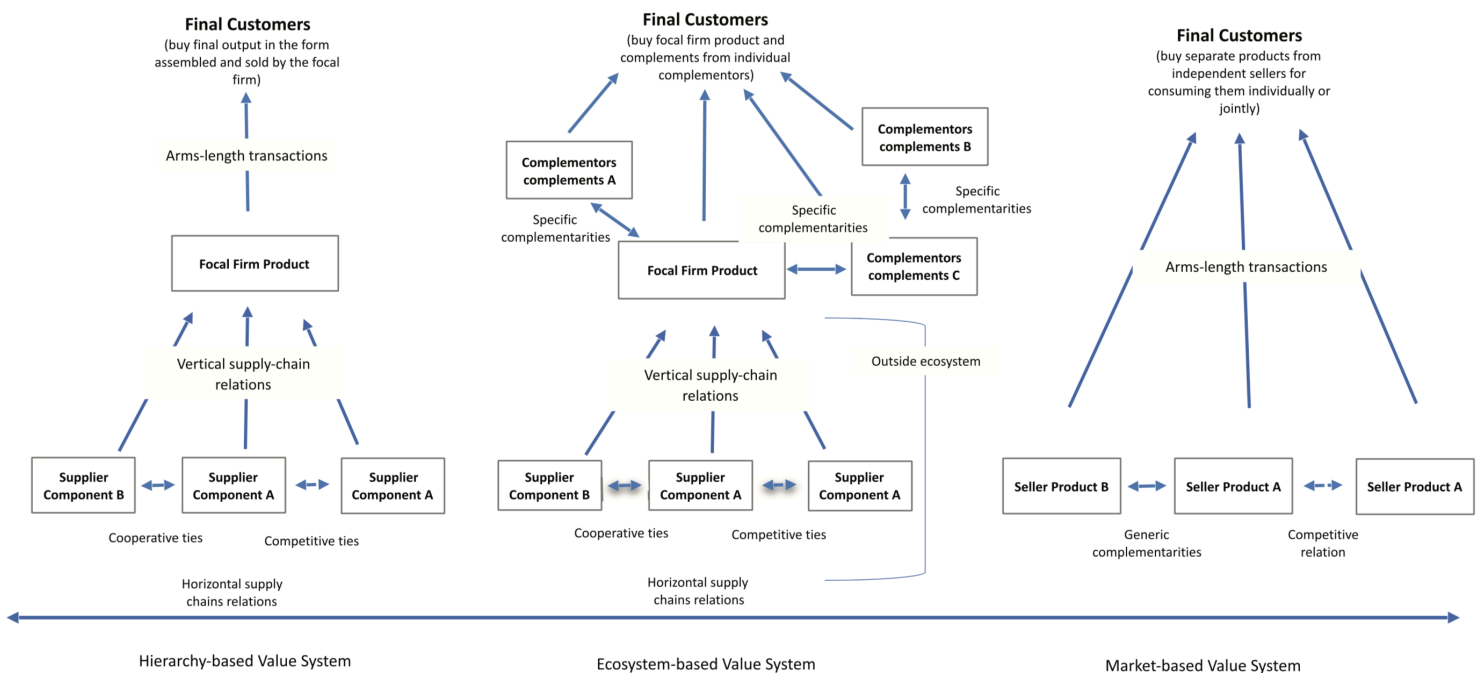


Figure 1. The structure of different types of value systems, as copied from (Jacobides et al., 2018, p. 2261)

2.1.2.1.1 Complementors

Jacobides et al. (2018) see complementors and their complementary effect on the customer-facing EVP as underpinning the ecosystem. As visualized in figure 1, the complementors can be seen as underpinning the increased value of ecosystem output compared to single firm-based value propositions. Following this logic, the increased value for the end-customer arises due to complementary effect of the complementors on the focal value proposition, which results in the EVP. Teece (2018) distinguishes between several type of complementarities, from which Jacobides et al. (2018) have made a relevant distinction between two types of complementarities that are relevant for innovation ecosystem value creation. They showed that a relevant distinction has to be made between unique complementarities and supermodular complementarities. A brief description of unique complementarities, is where product A does not function without product B. In other words, product B is required for product A to be utilized, such as two ends of a pipeline. Supermodular complementarities concern the effect that more of product A increases the value of product B. For example, the number of available apps on the iPhone increase the value of the iPhone.

2.1.2.1.2 Lock-in

An important aspect in ecosystems is that the final customers must also “affiliate” with an ecosystem rather than a product. When a customer is using/consuming a part of the EVP, (s)he

is more easily drawn towards complementors within the ecosystem. This effect is known as customer lock-in. Apple is an often-used example, since they have created clear lock-in effects. In the example of Apple, iPhone users are likely to use the complementary app-ecosystem. Additionally, when iPhone users have already purchased apps or are using specific apps, they are more likely to purchase another iPhone upon end-of-life of their current iPhone, since the purchased apps can be used on their next iPhone. In other words, they are locked into the Apple ecosystem. Amazon is also affiliating users to its ecosystem rather than solely its separate channels, by using Amazon Prime. When users subscribe to Prime, they are more easily drawn towards shopping at Amazon stores, use Prime Music, Video, Photo's, etcetera. Thus, Prime creates lock-in effects in several of Amazon's products and services.

2.1.2.1.3 Switching costs

The more complementary effects are being used by the user in the ecosystem, the higher the switching costs of that user are towards another ecosystem. Switching costs are the costs of the user when it wants to switch ecosystem, which can be monetary, time-based, effort-based, or psychologically. For example, Amazon Prime users pay a yearly fee, in order to use the Prime services. This is a monetary lock-in that prevents users to switch to competitors, at least for the time that they have paid for Prime. Additionally, when the user is getting used to Prime music, video, and photo, the psychological and effort-based switching costs also increase. So, the more a customer is using products and complementors in an ecosystem, the less likely (s)he is to switch to another ecosystem. This creates incentives for organizations to create more complex ecosystem by leveraging complementary effects, in order to create higher switching costs in the business ecosystem.

2.1.2.1.4 Generic and non-generic complementarities

For ecosystem analyses, it is important to differentiate between generic and non-generic complementarities. Generic complementarities are standardized to an extent that organizations or customers can have access to it with negligible risk or uncertainty (Jacobides et al., 2018). For example, electricity is needed for all electronic devices, yet it is accessible (at least in the west) to an extent that it does not pose risks or uncertainties to the EVP. Therefore, they can be neglected in ecosystem analysis. The important components for an ecosystem approach are the non-generic complementarities, for which some degree of customization is required for it to add value in the ecosystem. Adner (2012) confirms to exclude generic components in ecosystem analyses, however he mentions that if a generic component needs to be changed or an actor needs to change its activity, it should still be considered as a non-generic component. For example, if an electric utility has to increase its capacity or change its provision terms, it does require alignment towards the EVP and therefore should be included in the ecosystem analysis.

2.1.2.2 Ecosystem carryover

Another opportunity for ecosystem players to is ecosystem carryover (Adner, 2012). Adner refers to ecosystem carryover as, "*using existing positions in existing market spaces to jump-start a winning position in a new market space*" (Adner, 2015). Even though this concept was only briefly elaborated in his book, the concept is not frequently being used in ecosystem literature. Yet, due to its strategic implication for incumbents to leverage their position, it is necessary to elaborate on the concept.

In order to explain the concept, I refer to the often-used example of the Apple ecosystem, which is also an illustrating case of ecosystem carryover. Before introducing the iPhone, Apple had already built its iPod ecosystem output with iTunes, the iTunes store and a good quality mp3 player, the iPod. Apple was able to jump-start its position in the smartphone market by leveraging ecosystem carryover, by carrying over a part of its iPod ecosystem (iTunes, iTunes store, and iPod functionalities) into its value proposition of the iPhone. "*Of the 22 million*

iPhones sold during the 2007 holiday season, 60 percent went to buyers who already owned at least 1 iPod” (Adner, 2012, p. 213). This quote shows that the iPhone was not just a new entrant in a market that had to establish a customer base, rather it was a new iPod with additional functionality. This way Apple could compete in the already established smartphone market and enjoy the ‘carried over’ customer base from the iPod ecosystem. Similarly, other products of Apple enjoy the effects of ecosystem carryover, such as the iPad and the Apple watch that enjoy ecosystem carryover effects from other Apple ecosystems, such as the iTunes store, App store and hardware products.

Amazon is utilizing ecosystem carryover as well. With the acquisition of WholeFoods, Amazon was able to jump-start into a new market, by leveraging Amazon Prime as the loyalty program for WholeFoods. This way, they were able to jump-start the WholeFoods customer-base by leveraging the Prime subscriptions. With the introduction of discounts for Prime members in Wholefoods stores and Amazon GO, Amazon is utilizing its ecosystem in order to draw upon the already installed customer base of Prime members. Subsequently, the acquisition of Wholefoods strengthened the proposition of Prime, and simultaneously carried over part of its ecosystem (Prime) users towards Wholefoods.

2.1.2.1 Value blueprint

For the initiation of an ecosystem, it is mostly important that the initiator defines a vision and selects the complementors and/or actors that will create value in the EVP (Adner, 2006, 2012, 2017; Jacobides et al., 2018). The initiator need not be the developer, rather it needs to communicate a vision that can attract and align relevant complementors or actors in the ecosystem. A tool that is used to structure the required elements (or complementors) and actors that together create the EVP, is the value blueprint, developed by Adner (2012). It provides a visualization of the dependencies of actors and is used to identify the expected changes in activities that is required of relevant actors. The value blueprint should contain “*one vision that clearly defines the ecosystem value proposition (i.e. what value is created, how, and for whom) and associated structures of governance and interaction (i.e. who does what, who controls what, and how everyone will benefit)*” (Dattee et al., 2018, p. 467). Simply put, the value blueprint should provide a vision on the created value and governance structures to achieve materialization. In order to create alignment and to reduce the risks and uncertainties that are elaborated before, the ecosystem leader should develop a compelling value blueprint, and try to persuade the relevant actors to contribute to the EVP. When used successfully by the ecosystem leader, the value blueprint is considered to persuade relevant actors, reduce uncertainty and facilitate coordination of the involved actors (Dattee et al., 2018).

2.1.2.2 Strategic implications

Following the ability to leverage complementors in order to enhance the system-level output of ecosystems, the strategic considerations around value creation in ecosystems become increasingly complex. It requires the alignment of multiple independent yet interdependent actors in order to materialize an EVP. In order to address the increased complexity that is not addressed in traditional strategy frameworks, an ecosystem strategy has to address the risks and uncertainty involved following the “alignment structure of the multilateral set of actors”.

2.1.3 Ecosystem emergence

For the emergence of ecosystems, it is relevant that alignment of the multilateral set of actors that are required for the materialization of the EVP is created. Adner stated that “*alignment is the extent to which there is mutual agreement among the [ecosystem] members regarding positions and flows*” (Adner, 2017, p. 42). Adner suggested that an important differentiation between participation and alignment has to be considered. He shows that alignment “*refers not only to compatible incentives and motives but also raises the question of actors’ consistent construal of the configuration of activities*” (p. 42). The mutual agreement towards the

“consistent construal of the configuration of activities”, is important to consider for the alignment in ecosystems emergence.

2.1.3.1 Alignment in poor visibility

Most of the innovation ecosystem literature is built on the assumption that a value blueprint can be envisioned *ex-ante* and is tangible to an extent that it can persuade required actors towards alignment of the “consistent construal of the configuration of activities”. To the best of my knowledge, Dattee et al. (2018) are the only ones that have researched ecosystem emergence in a situation in which there is no clear *visibility* of an EVP, such that a value blueprint cannot be accurately envisioned *ex ante* by the ecosystem leader(s). Consequently, they argue, the consistent construal of the configuration of activities may be unknown, such that it is very challenging to align required actors towards an *invisible* EVP. Dattee et al. (2018) point out that ecosystem emergence can actually be a lengthy process of, simultaneously, discovering and implementing a complex value proposition with a set of partners. In their 10-year longitudinal case study, they have analyzed ecosystem emergence in a situation where there is *poor visibility*. The poor visibility creates a situation in which it is hard for the ecosystem leader to accurately determine a value blueprint, which, following the uncertainty and contestability of an inaccurate value blueprint, creates difficulties for an ecosystem leader to create alignment of relevant actors.

When the value blueprint cannot be clearly envisioned, due to poor visibility, the alignment of different ecosystem actors becomes more challenging. Dattee et al. (2018) have analyzed ecosystem emergence in *poor visibility* and have induced a dynamic process model to describe how ecosystem leaders can compel other towards committing to the ecosystem when visibility is low. Additionally, they suggested that as soon as firms try to develop an ecosystem that does not yet exist (i.e. play the ecosystem game), the “static approach to control based solely on ownership of specific assets deemed to be currently valuable broke down the moment firms entered the ecosystem game” (p. 487). The static approach refers to the ability of firms to be able to visualize the ecosystem *ex ante*, rather than developing the vision over time. The dynamic model that Dattee et al. (2018) have developed is visualized in figure 2. They have also proposed feedback mechanisms that enable ecosystem creators to practice dynamic control of the ecosystem creation process and enable ecosystem leaders to re-align actors when drifting or sliding away.

The goal of this research does not concern a strategic response of incumbent ecosystem actors, nor does it concern a dynamic approach to ecosystem emergence, rather it concerns the identification of alignment conditions that constrain the envisioning and materialization of an EVP. Nonetheless, the themes that are described in the dynamic process model of Dattee et al. (2018) do provide a logic around the interplay of relevant themes that shape the alignment of joint value creation and envisioning of actors. They developed the dynamic model to analyze the options of organizations to maneuver in poor visibility. However, in doing so, the identified factors also analyze the state of alignment in the envisioning and creation of the ecosystem. The themes that are identified in their model actually provide the boundary conditions upon which alignment can be controlled. Consequently, the analysis of these themes can provide a clear context in ecosystem emergence that describe to what extent alignment is present in ecosystem emergence.

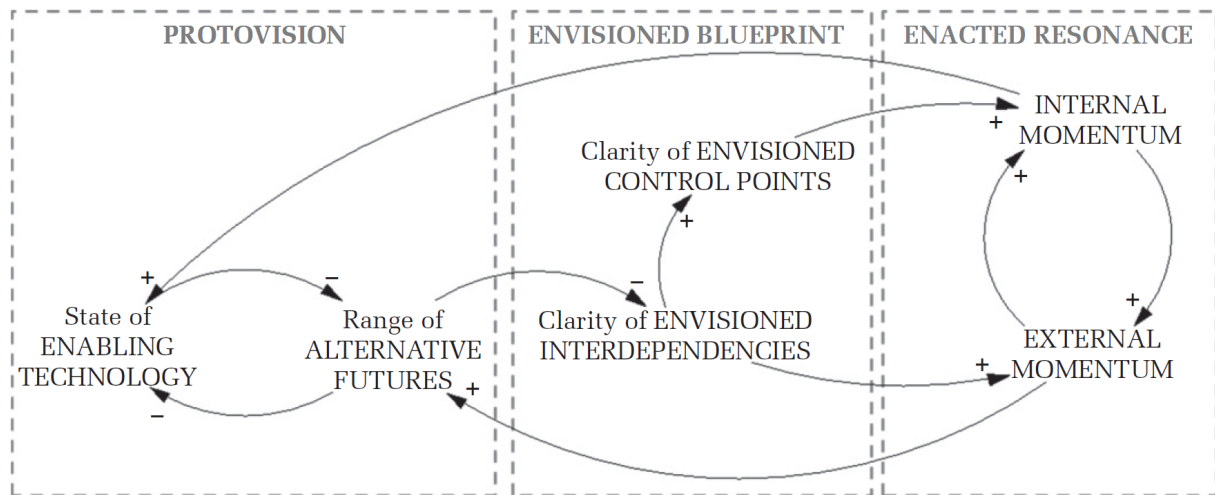


Figure 2. The dynamic process model induced by Dattee et al. (2018)

2.1.3.2 Alignment conditions

The alignment conditions in innovation ecosystem literature has been broadly researched. However, the majority of literature considers the alignment conditions in established and successful innovation ecosystems. Except for the study of Dattee et al. (2018), the alignment conditions around ecosystem emergence have, to the best of my knowledge, not been discussed. Also, previous ecosystem emergence literature has not developed a framework that can identify the alignment conditions. Therefore, I will use the themes that are shown in the dynamic process model developed by Dattee et al. (2018). Where they have primarily used their model to clarify on the visibility of the ecosystem creation efforts, the model also describes the process towards alignment and materialization of the ecosystem creation efforts. The model is used to describe the effect of uncertainty, induced from poor visibility, on the alignment of relevant actors in their efforts of ecosystem creation. Therefore, the themes in the model also describe the alignment and materialization conditions of the relevant actors in the ecosystem. Following this logic, the themes in the model can be used as a framework to describe the alignment conditions. For an overview of the relation between the themes and first-order concepts that Dattee et al. (2018) analyzed, please refer to Appendix B. How the themes apply to this research is elaborated underneath.

2.1.3.2.1 Protovision

The protovision refers to the level of visibility. Dattee et al. (2018) used their model to describe general purpose technology, from which a broad application range can be envisioned. Therefore, the state of enabling technology was directly related with the potential range of alternative futures. The technology may be useful in other applications or use cases, such that the uncertainty involved in compelling others towards a single vision when a broad range of alternative futures can be imagined can be high. Accordingly, *ex ante* envisioning of the EVP was very difficult. Therefore, the alignment condition ‘protovision’ refers to the clarity (visibility) with which an ecosystem leader can *ex ante* envision an EVP or value blueprint. The protovision does not directly test the alignment of relevant actors, however it does indicate to what extent the envisioning actors are able to outline the consistent construal of the configuration of activities.

2.1.3.2.2 Envisioned blueprint

The condition of envisioned blueprint refers to the mutual agreement of relevant actors on the interdependencies and control points in the envisioned blueprint. This is rather similar to the value blueprint as described by Adner (2012), however it explicitly consists of interdependencies and control points. This condition is where the alignment of the actors towards the value blueprint can be tested. Rather than referring solely to envisioning the

blueprint, as done by Dattee et al. (2018), this research will also consider the mutual agreement on the envisioned blueprint.

2.1.3.2.3 Envisioned and agreement on interdependencies

The interdependencies refers to the dependency of the increase in value of the ecosystem on different actors. This refers to the extent to which additional actors are required in order to enhance the value of the ecosystem output. Dattee et al. (2018) also refer to the “*need for complementary products and services*” or the “*need to work with many partners/ecosystem arrangements*” (p. 474). Generally, high recognition of the required interdependencies creates mutual agreement on the relevance of the involved actors, by recognizing that the interdependency enhances the value of the EVP. Therefore, alignment of the relevant actors on the envisioned interdependencies in a value blueprint, refers to both the envisioned interdependency and the mutual agreement on the added value of each of the involved actor.

2.1.3.2.4 Envisioned and agreement on control points

Control points refer to positions of power in the future ecosystem. It is considered that controlling these positions enables an organization to create and capture relevant value in the future. The goal for envisioning and capturing control points enables firms to “(1) *know where to steer development of ‘their’ ecosystem for eventual value capture, and (2) identify unwanted developments of others’ value capture in their ecosystem and prevent them from taking shape*” (Dattee et al., 2018, p. 479). Alignment in the envisioned control points refers to the mutual agreement that ecosystem actors can envision control points and agree on the different actors that capture different control points in the future ecosystem.

2.1.3.3 Materialization conditions

Where the above-mentioned alignment conditions refer to the extent of mutual agreement towards the envisioned blueprint, resulting from the alignment, are the internal momentum and external momentum of ecosystem actors. Whereas, internal momentum and external momentum in an ecosystem can only be achieved once there is mutual agreement of relevant actors on the value blueprint. Therefore, momentum is considered the result of alignment, referred to as materialization. After achieving alignment, additional conditions may constrain the ability of ecosystem actors to materialize the EVP. These conditions are referred to as materialization conditions.

2.1.3.3.1 Momentum

Internal and external momentum can be created after the involved ecosystem actors have reached mutual agreement on the envisioned blueprint and the construal of configuration of activities. Momentum refers to the extent to which materialization activities are set in motion or executed. Internal momentum refers to the momentum of the ecosystem leader, and external to other ecosystem actors, generally in the role of the follower. Factors such as creation of business cases, incentives, and resource commitment are relevant for testing whether there is momentum at a firm. Dattee et al. (2018) do not consider this theme to refer to materialization, rather they refer to the successful envisioning of the chosen path. However, the materialization should be the result of the successful envisioning, which can be tested in a firm by analyzing the abovementioned factors, such as resource commitment.

2.1.3.1 Legitimacy of an ecosystem leader

The last condition that needs to be tested, which is not included in the dynamic model of Dattée et al. (2018) concerns the ecosystem leader. In their analyzed ecosystem emergence, they have not included the relevance of legitimacy of an ecosystem leader. Dattee et al. did consider the internal momentum, referring to the ecosystem leader, but solely based the associated creation of external momentum as an interplay with the internal momentum. Other ecosystem literature denotes, that legitimacy of an ecosystem leader is a necessary concept in the alignment of ecosystem actors. However, in order to apply the themes in the dynamic process model towards

an all-encompassing understanding of the alignment and materialization conditions towards joint value creation the legitimacy of an ecosystem leader has to be considered. For this concept, I refer to other research that has shown that legitimacy of an ecosystem leader is required for an ecosystem to function or for an innovation ecosystem to materialize (Adner, 2017; Thomas & Autio, 2013).

The innovation ecosystem literature recognizes the presence of an ecosystem leader (also referred to as keystone actor or focal firm). The ecosystem leader is the actor that takes responsibility for creating alignment of relevant ecosystem actors and coordinates the ecosystem emergence efforts. Generally, it is the actor that imposes governance rules, determines timing, and is often the actor that captures most of the value from ecosystem creation. Adner (2017) mentioned that ecosystem leaders need not be a single firm, for example it can also be a collaborative consortium (as shown in Dattee et al. (2018)).

In order to create alignment, a successful ecosystem leader in innovation ecosystems is one that followers are willing to follow. The actual ecosystem leadership comes with more nuance, such as determining the right course of action, but for now, for identifying the presence of an ecosystem leader's capability for creating alignment this is enough. In order to provide guidance to the ecosystem creation activities that actors are willing to follow, it is relevant that the ecosystem leader has legitimacy. Legitimacy is the "*generalized perception or assumption that the actions of an entity are desirable, property or appropriate within some socially constructed system of norms, values, beliefs and definitions*" (Suchman, 1995, p. 574). Legitimacy has been associated with innovation ecosystems and its leader-follower by Sharapov, Thomas, & Autio (2013). The alignment condition 'legitimacy' aims to identify (1) the presence of an ecosystem leader, and (2) the legitimacy that the ecosystem leader has (i.e. whether followers are willing to follow the leader).

2.1.4 Summary

To summarize the discussion on the ecosystem theory, elaborated so far, it was shown that there exists a relevant distinction between the business ecosystem and the innovation ecosystem (Jacobides et al., 2018). The business ecosystem focuses on established ecosystems and the mechanisms and dynamics between actors for capturing value. The innovation ecosystem focuses on the alignment structure of relevant actors in order to create value, by focusing on the actors that are required for the materialization of ecosystem value propositions (Adner, 2012; 2017).

It was shown that the majority of ecosystem theory has analyzed established ecosystems, yet the emergence of ecosystems has not been widely researched. The only academic work that has considered the dynamic process of ecosystem emergence is Dattee et al. (2018). They have addressed the complexity and lengthy process around envisioning an ecosystem value proposition and addressing the consistent requirement of alignment in their developed model, which is relevant for this research. Therefore, the themes identified in their dynamic model, will be used to analyze the alignment and materialization conditions in ecosystem emergence.

2.1.4.1 Alignment and materialization conditions

For this research, it is considered that the identification of the alignment and materialization conditions that made the joint value creation efforts of a multilateral set of partners in incumbent retail groups fail can create new insights in the reasoning behind constraining alignment conditions at incumbent retail groups. Following the elaborated innovation ecosystem and ecosystem emergence literature, the following alignment and materialization conditions are relevant to consider for the materialization of an EVP.

- Alignment conditions
 - Protovision

- Value blueprint
 - Envisioned interdependencies
 - Envisioned control points
- Materialization conditions (Are we able to materialize the EVP?)
 - Internal momentum
 - External momentum
- Legitimacy of ecosystem leader

2.1.4.2 Contribution

This research will contribute to the academic knowledge by showing that the themes identified by Dattee et al. (2018) provide a framework for addressing the alignment and materialization conditions that may constrain ecosystem actors in envisioning and materializing an EVP. Therefore, this research shows how the alignment and materialization conditions in an ecosystem emergence process can be researched. Where they primarily used their model to show the collective discovery of envisioning and materializing an EVP, I show that the model can be used to analyze the alignment and materialization conditions in ecosystem creation efforts. To the best of my knowledge, other than Dattee et al. (2018), no other academic research has provided a holistic approach to researching ecosystem emergence.

Additionally, Dattee et al. (2018) emphasize that additional research is required to address whether the *“applicative distances between a generative technology and a range of alternative futures leads to the same ecosystem creation dynamics as our model predicts”* (p. 492). This research aims to contribute to this research gap by gathering and analyzing new empirical data that aims to unravel the conditions that limit the ability of incumbent retail groups towards ecosystem emergence. Additionally, this research addresses the constraints that incumbents face in their efforts towards joint value creation. To the best of my knowledge, the constraining conditions towards ecosystem emergence have not been researched before. Therefore, the insights gained from this part can provide valuable insights into the ecosystem emergence approach for incumbent ecosystem actors and the academic literature.

2.1.4.3 Limitations

By mainly referring to Dattee et al. (2018) for the analysis of alignment and materialization conditions, some limitations are relevant to consider. The generalizability of their results may be limited, since they have analyzed the ecosystem emergence around a general-purpose technology. Nonetheless, due to the heterogeneity of consumers that access the customizable EVPs, it can be considered that EVPs share similarities with general-purpose technologies. Also, following the above-described research gap, empirical data is needed to confirm whether the model from data is applicable to other technologies.

By only using ecosystem literature, the research may stay superficial. Where Adner (2017) has indicated that for ecosystem analyses, more perspectives can be taken, this research part only takes an ecosystem perspective. While the objective is to identify the constraints that are present for incumbent retail groups towards joint value creation, it is likely unable to provide a solution for the identified constraints. In order to dive more into depth on the identified constraints, it is likely that additional literature streams are required.

2.2 Bundling

In order to understand how bundling can be used as an EVP, it is relevant to introduce what bundling is and to elaborate on the relevant academic work in the broadly discussed bundling literature. The goals here are two-fold. The first is to elaborate on the bundling options that are applicable to this research, in order to provide the required information for developing and analyzing a bundling model. Secondly, it is relevant to understand how bundling can link back to the ecosystem literature. Following these goals, first, I will provide a brief introduction to bundling. Thereafter, the bundling literature that is applicable to this research will be summarized. Following that, bundling will be linked back to the ecosystem literature, by showing how bundling can create demand-side economies of scope and create value for consumers.

2.2.1 An introduction to bundling

Bundling is broadly defined as the “*sale of two or more separate products in a package*” (Stremersch & Tellis, 2002, p. 55). For example, the packaged sales of TV, Internet, and telephone, in one package is a bundle. A differentiation can be made between different types of bundling, namely product bundling and price bundling. Stremersch & Tellis (2002) defined price bundling as “*the sale of two or more separate products in a package at a discount, without any integration of the products*” (p. 56). Since no additional value is created by integrating the products of the bundle, the price of the bundle is equal or lower than the sum of the RPs for the separate products. Thus, other than the decrease in price, the price bundle does not create additional value for the customer, rather it can incentivize customers to buy the bundle through decreasing the price for the bundle. When considering a price bundle of good A and good B. When considering the price of good A (P_A) in separate sales and the price of good B (P_B) in separate sales, the price of the bundle of goods A and B is P_{A+B} . Price bundling follows the rule $P_{A+B} < P_A + P_B$, which shows that the price of the price bundle is always lower than the price of the separate components.

(Stremersch & Tellis, 2002), define a product bundle as “*the integration and sale of two or more separate products or services at any price*” (p. 57). “At any price” indicates that the price of the bundle can also be greater than the sum of the prices of the separate products. Raising the price requires an increase in value due to the integration of the products, compared to the separate sales. For example, the value of an integrated stereo system is likely higher than the unbundled components (e.g. amplifier, speakers, CD-player).

For the combination of products into bundles, it is relevant to make a distinction between three types of product categories, namely complements, substitutes, and independent. For complements it can generally be considered that good A increases the value of good B. For substitutes, good A decreases the value of good B. And for independent goods, the value of good A and good B can be considered independent. Following this logic, the price of a bundle of two complement products can be greater than the sum of the separate RPs. However, bundling substitute products will result in a price below the sum of the separate RPs.

Another distinction has to be made between pure bundling and mixed bundling. Pure bundling means that a firm offers only the bundle and not (all of) the products separately. This has been done with Apple’s Macintosh, which bundled software and hardware. Another bundling option is mixed bundling, which concerns the option of a firm selling the bundle and also selling the products in the bundle separate from the bundle. This is often done in Telecom bundles, in which TV, internet and fixed telephony can be bought as a bundle or separately.

Table 3. Different bundling forms, as copied from Stremersch & Tellis (2002, p.57)

Term	Definition	Examples
Bundling	The sale of two or more separate products in one package	Opera season ticket, multimedia PC
Price bundling	The sale of two or more separate products as a package at a discount, without any integration of the products	Luggage sets, variety pack of cereals
Product bundling	The integration and sale of two or more separate products at any price	Multimedia PC, sound system
Pure bundling	Selling only the bundle and not (all) the products separately	IBM's bundling of tabulating machines and cards
Mixed bundling	Selling both the bundle and (all) the products separately	Telecom bundles

2.2.2 Bundle pricing

Introducing bundles can be considered a differentiation of a firms' product variety. It can be used as a pricing strategy that can enhance a firms' competitiveness and/or increase profitability. The general principle of bundling is rather straightforward, however it becomes more complex when wanting to determine optimal pricing and the effect of bundling on different market structures. In their literature review on product bundle pricing, Rafiei, Rabbani, Razmi, & Jolai (2013) have reviewed the bundling literature. They have defined product bundle pricing as "*a pricing strategy in which several products, services, or any combinations of them are presented to the customers as a single package with a single price*" (Rafiei, Rabbani, Razmi, & Jolai, 2013, p. 109). The literature on bundle pricing can be categorized into three literature streams; the economic approach, marketing approach, and a category that analyzes pricing optimization frameworks (Rafiei et al., 2013). The economic and pricing-optimization approach are relevant for this research.

The aim of the developed bundling model is to show to what extent the introduction of bundling can be profitable for incumbent retail groups and serve as an EVP, it is relevant to have an understanding of the literature of optimum pricing of bundles. Therefore, the optimization approach is relevant for this research, since it enables us to model the optimum bundle prices *with respect to different conditions and factors from both customers and sellers* (Rafiei et al., 2013, p. 111). Where the majority of bundling literature has focused on monopolistic markets, it is relevant to gain a brief understanding of the bundling implications in a competitive market, since incumbent retail groups generally operate in competitive markets. In order to understand the consumer and market behavior upon introducing bundles in a competitive market, I refer to some papers that have addressed the competitive environment. The academic discussion on bundling in a competitive market will be briefly elaborated underneath.

2.2.3 Bundling in a competitive market

Following Balachander, Ghosh, & Stock, 2010; Belleflamme & Peitz, 2010; Gans & King, 2006; Matutes & Regibeau (1992), for price bundling in a competitive environment, it is considered that unbundling (i.e. separate sales) is nearly always the better option compared to either mixed bundling or pure bundling. Only when economies of scope are present at one firm, the introduction of mixed price bundles can increase profitability of that firm or lower consumer surplus (Heide, White, Grønhaug, & Østrem, 2008; Thanassoulis, 2007). Otherwise, most authors argue that, in a competitive environment a prisoners dilemma is present, in which the introduction of a bundle will trigger a response from the competitors, such that the competing organizations will move into a price war, in which marginal revenue (MR) will approximate marginal costs (MC). As a result, all competing firms will move towards near zero

profit. Following this logic, it would not make sense to introduce price bundling in a competitive environment. Yet, Stremersch & Tellis (2002) argue that the assumption upon which the competitive response is based, is questionable. Amongst others, this assumption considers that firms recognize the consequences of embarking in a mixed price bundling competition, which is a questionable assumption.

Stremersch & Tellis (2002) state that the pervasiveness of mixed price bundling strategies in highly competitive industries, such as telecommunications and banking services, shows that bundling apparently is a way to differentiate and increase product variety in competitive environments. Yet, in their argument they do not show the effect of mixed price bundles in highly competitive on profit of the competing organizations. Thus, even though bundling might be a way to differentiate the offered product variety in their analysis Stremersch & Tellis do not show whether the organizations have increased or decreased their profitability as a result of providing the mixed price bundle.

2.2.3.1 Mergers to mitigate a price war

Even though there is a discussion among academics whether the introduction of mixed price bundling would result in a price war (Balachander et al., 2010; Stremersch & Tellis, 2002), merging with a 'complementary' firm can overcome the possibility of a price war upon introducing price bundles. Choi (2008) has considered the merger of two firms in a competitive market. They have shown that independent rivals that sell single components are unable to reduce their prices as much as the merged firms. Therefore, they will be unable to imitate the price-levels provided by the merged firms and, consequently, lose market-share to the merged firms, and the merged firms will increase their profitability. Only upon counter-merging would the competition be able to compete (Choi, 2008). For this research, it is relevant to consider that independent rivals that are unable to imitate the introduced bundles, are unable to compete on price-levels. Also, it is relevant to consider the increased profitability of the merged firms (i.e. the firms from which the bundles are inimitable, unless competitors are counter-merging) and the loss of market share from independent rivals.

2.2.1 Multi-product bundling

Most of the bundling literature considers the bundling of two products. Due to the complexity following the modeling of more than two products, only a limited number of studies have addressed the introduction of bundles consisting of more than two products. Even fewer studies have discussed the optimization of prices for combining a wide variety of products into customizable bundles. The ones that were found are briefly elaborated underneath.

Bakos & Brynjolfsson (1999) have analyzed the introduction of bundling a wide variety of unrelated products for a multiproduct monopolist. They have shown that the introduction of bundles consisting of many goods increases profitability when products have near-zero marginal costs. In a subsequent study, Bakos & Brynjolfsson (2000) have analyzed the introduction of a variety of customized bundles consisting of information goods aimed at different market segments in a competitive market. They found that the variety of bundles was better able to address the unpredictable idiosyncratic customer needs. Both of the researched considered an evenly distributed consumer demand for a wide variety of products, which is a questionable assumption. Also, Wu (2002) has analyzed multi-product bundling.

The studies that analyze multi-product bundling are limited, additionally there are some studies that consider customizable pricing of bundles, yet only very few studies were found on customizable bundles (Hitt & Chen, 2005; Wu, Hitt, Chen, & Anandalingam, 2008). In other words, bundles in which the components can be customized, such that they can even better address the idiosyncratic customer needs. Wu, Hitt, Chen, & Anandalingam (2008) have studied the introduction of customizable multi-product bundles, for customization of CDs.

They have shown that introducing customized bundling can enhance a seller's profitability and dominates pure bundling and separate sales. However, all of the studies mentioned in this paragraph consider information goods, characterized by $MC = 0$. The respective authors consider that their findings are not applicable to physical goods.

For this research it is relevant to consider that customized bundling can address the idiosyncratic needs of a heterogeneous customer base and enhance the seller's profitability. To the best of my knowledge, there has been no academic that has addressed the introduction of multi-product customizable mixed price bundling. Studying this phenomenon in a competitive environment in which independent rivals cannot imitate the bundle will contribute to the scientific knowledge. This research will address this research gap by analyzing customizable mixed price bundling in a competitive environment in which independent rivals are unable to counter-bundle.

2.2.2 Economies of scope

Now that the background of bundling is provided and the ability of bundling to increase profits for organizations is shown, it is relevant to provide an understanding of how bundling can create value for the customer. In order to do so, I refer to demand-side economies of scope (DSES). First, (supply-side) economies of scope will be elaborated, thereafter DSES will be explained.

Economies of scope can be referred to as multi-product economies of scale. It refers to the idea that joint production or consumption of two products can be cheaper when produced by one organization (or in one factory) than compared to separate organizations (Panzar & Willig, 1981). *"Whenever the costs of providing the services of the sharable input to two or more product lines are sub-additive (i.e., less than the total costs of providing these services for each product line separately), the multi-product cost function exhibits economies of scope"* (Panzar & Willig, 1981, p. 268). For example, the production of laptops, tablets, and phones, may require similar components, therefore it can be cheaper to use one factory for the different products, rather than producing each product in separate factories. Panzar & Willig argue that, when the costs of operating and producing multiple products is cheaper than operating and producing separately, economies of scope *"is the precise condition required for the emergence of multiproduct firms in a competitive environment"* (p. 272).

2.2.2.1 Demand side economies of scope

Henten & Godoe (2009) provide a discussion on the concept of demand side economies of scope. Where generally, discussions on economies of scope are (e.g. Panzar & Willig (1981) and Teece (1980)) are generally focused on the supply side economies of scope, in which the cost reduction is reaped in production or in the supply, Henten & Godoe argue that economies of scope can also occur at the demand side. They argue that economies of scope are *"advantages reaped on the demand side – by the customers, i.e. as a consumer benefit"* (Henten & Godoe, 2009, p. 28). They also show that the popularized definition of demand side economies of scope, which considers marketing and distribution on the demand side, are not benefits reaped by the consumers, therefore they are not demand side economies of scope (DSES). Even though they do provide the boundaries for the definition of economies of scope, they do not provide a single definition. Following the above theory, I suggest that demand side economies of scope occur *when the costs of consuming multiple (related) products or services is cheaper than consuming the goods separately.*

According to the above definition of DSES, the increased availability of product variety provided by one player has the potential to diminish search costs of consumers. Henten & Godoe (2009) provide an example in which DSES are created through leveraging bundling in the case of multi-play in telecommunications, through increased convenience and discounts.

Convenience is increased through decreasing transaction costs that are saved when buying a bundle rather than separate services, and price is decreased by providing a price bundle.

When offering a price bundle, in which the difference between the separate prices and the discounted bundle is utilized on the demand-side, the savings are realized by the customer. Therefore, DSES exist when bundling reduces the price of the bought components or products. In other words, bundling creates value for the customers. For this research, it is relevant to consider that DSES can be created by introducing bundles. As indicated in the bundling literature, this can be done by increasing the value of the bundled products through product bundling, or by decreasing the price of products through price bundling.

2.2.1 Summary

To summarize on the bundling literature, bundling is the combination of several products in a package. Traditionally, the different forms of bundling that are considered are mixed or pure bundling, and product or price bundling, which can be mixed (e.g. mixed price bundling or product pure bundling). The monopolistic environment has been the most widely researched bundling topic, yet the competitive market has received only limited attention (Rafiei et al., 2013).

Most of the bundling literature has considered the combination of products. Due to the increased complexity, most of the literature considers bundling of two products. The implications from bundling a wide variety of products has only been considered very few academics. Additionally, the research on multi-product bundling consider information goods, characterized by near-zero marginal costs. Only two researches have been found that address customizable multi-product bundling, which shows the limited knowledge on the topic. Also, customizable multi-product bundling in a competitive environment has not been researched.

2.2.1.1 Contribution

As Rafiei et al. (2013) show in their literature review, the bundling literature on price optimization of bundles is very limited. To the best of my knowledge, there has been no prior research on price optimization for a customizable mixed price bundling strategy for four firms in a competitive environment, in which the independent rivals are unable to imitate the introduced bundles. Additionally, the studies that have addressed customizable bundling, have considered information goods with near zero marginal costs. This research adds to the academic literature by developing and analyzing a bundling model that addresses the above conditions for physical goods (characterized by $MC > 0$).

Additionally, this research will add to the academic knowledge by modeling a bundling scenario in a competitive market in which imitating the bundle is impossible for competitors, unless counter-merging. Additionally, the model will address an optimal pricing strategy for bundling with a wide variety of physical products, sold by different firms. Rather than analyzing the combination of different products, this research considers the implications of bundling between stores that already offer a wide variety of products in typical retail markets (grocery, liquor, drug store, e-commerce).

2.3 Bundling as an ecosystem value proposition

Probably without them meaning it in this sense, Dattee et al. (2018) argued that a new approach is needed to consider how value is created in ecosystems, “*namely by consumers choosing certain bundles around a key value proposition in order to satisfy their idiosyncratic needs*” (p. 468). While Dattee et al. (2018) probably meant to use the word ‘bundles’ in a figurative sense, this research will show that it can be literally implied. Where they have researched general purpose technologies and probably did not try to imagine the literal introduction of bundling as an EVP, the above quote is directly applicable to bundling.

The developed theory of Dattee et al. (2018) generally concerns the ecosystem emergence for digital technologies, which is characterized by a value proposition which can be complemented by different modules. For bundling of different products that are not related, it is relevant to show that complementary effects are created between the products that can be bundled by the bundling firm(s). Henten & Godoe (2009) showed that bundling has the ability to create DSES, which create value for the end-customer and complementary effects between different products. Simultaneously, bundling can address the idiosyncratic needs of customers by customizing towards the heterogeneous customers. Multi-product bundling was found to better address the customers' idiosyncratic needs than bundles consisting of two products (Bakos & Brynjolfsson, 1999), and customizable multi-product bundles were found to even better address the involved heterogeneity (Wu et al., 2008). Upon creating value for customers, by creating complementary effects between the bundled products, bundling can be seen as an EVP. This research will show how bundling can be introduced as an EVP, by showing that bundling addresses the heterogeneity of the idiosyncratic customers' needs and create complementary effects between the bundled products in a system-level output.

This research will analyze whether bundling can be utilized as an EVP, by addressing the ability of bundling to address the customers idiosyncratic needs. As shown in the ecosystem theory, EVPs utilize customizable complementors in order to enhance a value proposition, such that the EVP can create more value than traditional value propositions. This research will analyze the potential for customizable multi-product mixed price bundling to create value for the customer through DSES and, additionally, analyze the potential for value capture for the firm that introduces the bundles. In other words, this research will provide empirical evidence that bundling can be used as an EVP that creates value for the customer and simultaneously create additional profit for the firm(s) that introduce the bundles.

3. Methodology

This research has been based on the research perspectives that were presented in the previous chapter. These consist of an ecosystem emergence perspective and a bundling perspective. Due to the inherent difference in the required analysis of these approaches, this research has adopted a multi-method approach. While the required analyses for both parts are different, both parts combined create holistic insights towards potential ecosystem strategies for incumbent retail groups.

In order to explain the methodological approach for both parts, this chapter will be divided into two parts. The first part elaborates on the methodological approach that is taken to answer the first sub-question. The second part elaborates on the proposed bundling model that has been developed in order to answer the second sub question. Finally, the last part will show how the approaches are integrated to provide an answer to the main research question.

3.1 Alignment and materialization conditions

This part explains the methodological choices that have been made in order to answer the first sub question, by addressing the alignment and materialization conditions that constrain ecosystem emergence for incumbent retail groups. Additionally, this chapter aims to justify the reasoning behind the chosen methodological research approach. This chapter first explains the reasoning behind the choices for the research design.

3.1.1 Research design and unit of analysis

The first part of the research is based on a qualitative research approach. The previous chapter has indicated the limited prior research towards ecosystem emergence for incumbents and indicated the complexity of ecosystem emergence. Therefore, a qualitative exploratory approach was required for the identification of the alignment and materialization conditions that have been identified in the previous chapter.

The research framework that is chosen is an in-depth single case study. According to Yin. (2008), this allows the researcher to gain in-depth knowledge on the phenomena of interest. The single case study allowed the researcher to examine the joint value creation activities and its processes at incumbent retail groups into depth. The unit of observation for this research is Ahold Delhaize. While this research is also conducted on behalf of AD, it was the logical choice to collect and analyze data from this specific retail group. This part of the research is deductive in nature, since it aims to apply the theory of ecosystem emergence to a single case study.

3.1.2 Case selection

While this research is conducted on behalf of Ahold Delhaize (AD), it was the logical and convenient case selection. AD is an incumbent retail group, operating on a global level in, amongst others, the US, the Benelux (Belgium, the Netherlands, Luxembourg), and other parts of Europe. Additionally, it is one of the worlds' largest food retail groups and also the leading retailer in the Netherlands and Belgium. This research will solely focus on the AD brands that are active in the Netherlands, where AD operates several highly successful banners. These AD brands consist of Albert Heijn (AH), which is the leading supermarket in the Netherlands, bol.com, the largest e-commerce player in the Netherlands, Gall&Gall, the largest liquor store in the Netherlands, and Etos, the second largest drug store.

Due to the increased convenience of gathering data from AD was a logical choice, as an incumbent retail group trying to create complementary effects through EVPs, it is also a suited case to study the phenomenon of interest. The efforts for ecosystem emergence processes of AD are of interest, since, similar to Walmart, they aim to provide ecosystem value propositions together with an online marketplaces, yet struggle to realize them.

3.1.2.1 Joint value creation at Ahold Delhaize

As mentioned in the introduction, AD has acquired bol.com in 2007. However, when compared to Alibaba and Amazon that are integrating their physical sales channels in their ecosystem strategy, AD seems to have limited ecosystem value propositions. Nonetheless, several value propositions have been implemented in order to create complementary effects between its brands. A general understanding of the activities towards creating EVPs between the AD brands in the Netherlands was created upon conversations with employees at AD. A brief description of some of the implemented consumer-facing value propositions are elaborated underneath. These mainly concern collaborations between AH and bol.com. Please note that there is more collaboration between the AD brands, but other collaborative efforts concern the efficiency of supply chain and delivery. In other words, rather than creating value for the customer, they are not aimed at capturing value for the AD brands.

3.1.2.1.1 Pick-up points

The pick-up points is a shared value proposition of bol.com and AH, in which packages that are ordered at bol.com can be delivered at an AH of the customer's choice. When customers are not at home at the time that packages can be delivered, it can be convenient to pick-up a package at a location near the customer. Since AH has many stores and since the shopping frequency at grocery stores is generally high, the customer can, upon its next visit at AH, pick-up the package at the nearest AH store.

3.1.2.1.2 Bezorgbundel and Select

During a 12-month period, Select, the loyalty program of bol.com was provided for free for customers of a 12-month subscription of the Bezorgbundel (delivery bundle) of AH. It was expected that the addition of Select with the Bezorgbundel would increase the value of the offer. Consequently, more customers would purchase the bundle. Simultaneously, it is expected that revenue from Select users is increased, as they will be able to utilize the benefits that Select offers, such as Select deals and better delivery options at bol.com.

3.1.2.1.3 Single sign-on

On the website of AH, it is possible to use your bol.com account to log-in. When users do not have an account at AH but do have an account at bol.com. The single sign-on allows users that want to register, to utilize their bol.com credentials in order to log-in to AH.com. A similar proposition is used by Facebook, enabling Facebook users to use their Facebook credentials to log-in to several other services, such as Spotify and Groupon. Since bol.com has the widest online customer base, bol.com is seen as the logical actor to develop the single sign-on. It is assumed that the value of the user account at bol.com is increased, as its functionality increases. Also, it is assumed that the conversion rate of registration at AH is increased, while conversion loss (i.e. loss of users in the registration flow) associated with effort around registration is overcome.

3.1.2.2 Project A

While the details of this value propositions may not be provided due to confidentiality, this EVP will be referred to as project A. Project A, a joint value creation effort among the AD brands that stranded, was analyzed into depth. Since it was considered a more complex value proposition than the EVPs that were realized by AD, the in-depth analysis of the involved ecosystem emergence processes was considered to provide useful insights. Project A was considered more complex, since its materialization required the commitment of resources from the involved actors and, accordingly, the alignment of the actors. It can be seen as a sort of Loyalty & Personalization platform that enabled the customer to access a variety of value propositions between the different AD brands and was described as the 'link' between the "great local brands". It was assumed that project A would be able to create complementary effects between the brands that would create lock-in effects of the customer and increase

switching costs. Identifying the conditions that constrained the alignment and materialization towards the development of project A was considered to provide useful insights in order to answer the first sub question.

3.1.3 Data collection

The chosen case study design has allowed the researcher to use multiple types of empirical data sources, enhancing the credibility of the used data (Yin., 2008). Primarily, semi-structured interviews have been conducted in order to learn about the constraints that the different AD brands experienced in developing and materializing EVPs. Semi-structured interviews can create a rich understanding of relatively unexplored topics (BRON), such as ecosystem emergence. Additionally, conducting interviews allowed the author to gain an understanding of the different perspective of the involved actors in the process of creating alignment and materialization in ecosystem creation efforts. The semi-structured nature of the interviews provided flexibility in the interviews, enabling the author to address unexpected, yet relevant topics during the interviews.

In order to analyze project A and the realized EVPs, employees that have been involved in project A and other joint value creation, have been interviewed. Secondary data has also been used, primarily in order to prepare for the interviews. Documents on project A and evaluation documents of other joint value creation efforts have been analyzed in order to prepare for the interviews. Strategic documents, such as visionary documents, roadmaps of cross-banner projects, and evaluations of cross-banner activities have been analyzed. Additionally, in order to provide a clear context of the AD brands and gain additional information on the AD brands, annual reports have been analyzed.

Upon analyzing the secondary data and upon initial conversations with employees at AD, an interview guide was developed aimed at exploring the alignment and materialization conditions that were introduced in ‘chapter 2’. The interview guide is shown in Appendix A. While the aim is to identify the conditions that constrain joint value creation at incumbent retail groups, focusing only on project A was not considered to provide generalizable results. Therefore, besides an in-depth analysis of project A, other realized EVPs have been analyzed as well. The author chose that theoretical saturation was reached at the point at which an additional interview did not provide new insights.

3.1.4 Participant selection

Specific organs within AD were responsible for decision-making around cross-banner activities. In order to identify constraints related to the joint value creation, AD employees that were involved in these organs were approached for an interview through mail or face-to-face at the offices of AD. Some of the AD employees (3) that were involved in the cross-banner organs were assistants of the executives of the respective banner. For example, they prepared the required documents or topics of discussion for the meetings with these executives. Additionally, other employees that were not involved in the cross-brand organs but were involved with project A have been interviewed. At Gall&Gall, the employees involved in joint value creation activities were not available, therefore another employee has been interviewed in order to create a general understanding of the perspective of Gall&Gall. Additionally, employees in the global support office have been considered to have knowledge on the dynamics between the AD banners.

In total, 13 interviews have been conducted with different employees at AD. Most of the interviews were conducted face-to-face at the AD main office in Zaandam (Gall&Gall, Etos, Albert Heijn) or in Utrecht (Bol.com), and 4 interviews were conducted over the phone. Employees from all of the brands have been included and 3 interviews have been conducted with the Global Support Office (GSO), which supports all of the AD brands. The interviews

lasted between 28 and 63 minutes. Table 4 shows an overview of the number of interviews. Four of the interviews were recorded, whereas most participants preferred not to be recorded, due to the sensitivity of the topic. Due to the strategic nature of this topic, interviewees stressed to provide extra care to the sensitivity of data that may be harmful to AD. The recorded interviews were transcribed by the author. During and immediately after each interview, I have actively taken notes, in order to be as accurate as possible. Also, for the research that were not recorded, I have taken extra care in taking detailed notes, in order to quote the interviewees exact words. Some of the employees were already working at AD for a long time and had working experience in multiple brands. Names of the interviewees are not provided, as most interviewees preferred to be anonymous.

Table 4. Details on the conducted interviews and the interviewees

Banner	Location	No. of interviews	of involved in project A	Average duration	Date	Position
Albert Heijn	Zaandam (3)	4	2	40 min	12/11/2019	3 senior management
	Phone (1)				30/10/2019	Assistant to the CEO
					3/10/2019	
					1/11/2019	
bol.com	Utrecht (1)	3	3	46 min	11/10/2019	3 Senior management
	Phone (2)				23/9/2019	
					15/10/2019	
Gall&Gall	Zaandam (1)	1	0	63 min	17/10/2019	senior management
Etos	Zaandam (1)	2	0	53 min	28/10/2019	senior management
	Phone (1)				18/10/2019	Executive
Global Support Office	Zaandam (3)	3	1	44 min	16/9/2019	2 senior management
					9/10/2019	1 assistant to CEO
					23/10/2019	

3.1.5 Data analysis

The guidelines of Creswell (1994) were followed for conducting qualitative research. The ecosystem analysis is based on the alignment conditions that were introduced in chapter 2. In order to provide a systematic approach to the qualitative data, a template was used. Illustrative quotes that were gathered from the interviews were linked back to existing concepts within the ecosystem, creating a systematic overview of the interview data. While several of the quotes consisted of sensitive information, it was chosen not to include template in this report. Nonetheless, the template approach provided a useful way for the author to create an overview of the perspectives of the involved AD brands and the conditions that constrained the alignment and materialization according to the respective interviewees.

3.1.6 Data validation

One way in which the data was validated, was by checking in hindsight whether the interviewees agreed with the quotes. The quote was mailed to the interviewee, along with the context in which it would be provided in the report. This reduced the risk of misinterpretation. After analyzing the interview data, the alignment and materialization conditions that were often returning were considered valid. Quotes that illustrated a condition that was only mentioned

by few (< 2) interviewees were validated with the respective interviewee, in order to test for misinterpretation.

Additionally, several insights were tested with other interviewees. When new knowledge was gained from an interview, the new knowledge was brought up in following interviews, in order to test whether the insights were reliable. Additionally, many conversations with AD employees were held, discussing the findings of the interviews. Even though, these discussions were not attributing to the empirical knowledge, they allowed the author to triangulate the findings with different employees.

3.1.6.1 Reliability

Issues around reliability in single case-study design, primarily concern the uniqueness of the case study in a specific context (Creswell, 1994). By focusing on several joint value creation efforts, the generalizability of joint value creation processes was at least addressed at the level of the incumbent retail group, rather than the level of the value proposition. Additionally, in order to be able to provide generalizable findings on the level of incumbent retail groups, the context around the identified constraint has been provided, such that the reader can understand whether the identified constraint is also applicable to his/her own case. It is expected that the findings of this research are generalizable for most of the incumbent retail groups that aim to create an ecosystem strategy with their brands.

3.2 The proposed bundling model

Chapter 2 has elaborated on the academic literature around bundling and its opportunity as an EVP. From an ecosystem perspective, the aim of this bundling scenario is to show the opportunity of bundles to address the idiosyncratic needs of the heterogeneous customers. The proposed bundling model should enable analyzing the value creation and value capture from introducing a mixed price bundling strategy in an imperfect competition.

In this section, I formulate the optimal bundling approach and pricing problem for the introduction of customized mixed price bundling. The model is developed from the perspective of the sellers, the banners of the incumbent retail group. From the sellers' perspective, the main concern is how to price the bundles in order to maximize the profits. The proposed model is subject to a set of consumer behavior constraints and profitability constraints that are, amongst others, induced by an imperfect competition. The proposed model will analyze the optimal pricing of the bundles, by analyzing how much discount should be provided on the mixed price bundle in order to reach profit maximization for the incumbent retail groups. Additionally, the model will show how DSES are created. In order to address the value creation aspect. In this section I will elaborate on the proposed bundling model and the underlying logic, its constraints, and the required assumptions.

First, the market conditions and the applicable type of bundling will be specified, such that the reader gains a clear understanding of the underlying logic of the chosen bundling type in the market of AD. Secondly, the implications of the market dynamics on the approach to the bundling model has been elaborated. Thereafter, the bundling approach itself will be elaborated, with the bundling objective, the required parameters and variables, along with the underlying logic, and the required constraints and assumptions. Finally, it will be elaborated how the relevant data was collected.

3.2.1 Bundling options

The model has been developed from the perspective of the AD banners that operate in the Netherlands, which are Albert Heijn (AH), bol.com (bol), Etos, and Gall&Gall (Gall). The model is developed from the perspective of AD, for which the goal is to introduce a bundling strategy that maximizes the profitability of AD as a whole. In order to understand the type of bundling that can be introduced, it is relevant to have a general understanding of the market conditions in which the AD banners operate.

All of the AD banners operate in a competitive market, which is characterized by high competition. Yet, it is an imperfect competition, in which all of the banners benefit from economies of scale. Therefore, pure bundling is considered not viable for the AD brands, since the separate sales occur in the competitive environment. If AD would introduce pure bundles, consumers that would be willing to buy the separate product, but not the bundle, would refer to competitors. It is assumed that the loss of separate product sales would be too high to consider pure bundling for AD. Also, it is assumed that AD cannot raise the price of the bundle, since consumers would refer to buying the bundled products separately in the competitive market, upon raising the price. Therefore, mixed price bundling is assumed to be the only viable bundling strategy. This follows the logic of Stremersch & Tellis (2002), whom stated that, in competitive markets, “*a mixed price bundling strategy dominates a pure price bundling strategy*” (p. 67). Accordingly, it is chosen to consider the introduction of mixed price bundling for the AD banners.

Where much of the bundling literature on mixed price bundling in competitive markets embarks in a discussion around the competitors response resulting in a price war, this research considers market conditions in which independent rivals are unable to copy the bundles that can be introduced. Following the Dutch retail sector, there is no other organization than AD

that provides the amount of product variety that AD does. Whereas, in the Netherlands, there is no organization, other than AD, that can offer the wide variety of products that is offered by the AD banners. Therefore, following the logic described in ‘mergers to mitigate price wars’, it is assumed that the introduction of mixed price bundling does not result in a price war (Choi, 2008).

3.2.1.1 Customizability

The above logic shows that a mixed price bundle is the logical bundling strategy for AD. For the bundling options, it is relevant to also consider the customizability option for the proposed model. Whereas, rather than focusing on the product-level bundling, modeling the introduction of bundles for incumbent retail groups has to consider the firm-level. The wide product variety that is sold by the AD brands, allow for near infinite bundles. Additionally, for all of the AD banners it has to be considered that customers, rather than purchasing a product, purchase a basket filled with a customizable number and variety of products. Therefore, rather than considering the effect of specific products, it is relevant to assess the effect of introducing bundles that apply to the bundling of baskets of the different AD brands. In practice, this would mean that shopping at all of the AD brands is rewarded with a discount, indicating that unlimited versions of the price bundle are available. Since each of the AD banners provides a wide variety of products, it is assumed that customers are able to bundle all of the product variety offered by the AD brands into any customizable price bundle. This directly addresses the customizable nature of the provided bundling strategy. As shown by Wu et al. (2008) customizable bundling is better able to address the heterogeneity of customer’s idiosyncratic needs.

When considering a discounting strategy in order to address heterogeneity in customers, it is relevant to consider the type of price discrimination that is being utilized. While some types of price discrimination are unlawful, it is relevant to outline the degree of price discrimination. The proposed bundling strategy considers second-degree price discrimination, since it discriminates price based on quantity sales. The proposed bundling model aims to stimulate consumers to purchase a higher quantity of goods, and provides discounts, based on the amount of provided discount. Therefore, the proposed bundling strategy will not use first-degree price discrimination, rather prices will be set, based on expected quantities sold.

3.2.2 Demand response in an imperfect competition

The majority of the academic literature has determined the optimal price levels of bundles by determining the reservation prices of different customer segments. Following the considerations of modeling an imperfect competition, the proposed model needs a different approach to model the demand response of customers. The proposed model considers price competition with uncertain costs. In order to model the purchase behavior of (potential) customers, rather than reservation prices, purchase behavior has been modeled by using market-level and store-level data. Following Stole (2003), consumers’ past purchase behavior can be used in order to estimate price purchase behavior. By doing so, the exogenous switching costs is included in the estimation, based on historical purchase behavior, providing a more realistic scenario.

Following the above description of the market in which the AD banners are operating, the bundling strategy considers an imperfect competition in a market where independent rivals are unable to imitate the provided bundle. Following the assumption that competitors cannot imitate the provided bundles, the competitors’ response is not taken into account. Nonetheless, it is actually expected that, upon introducing mixed price bundling, independent rivals will lower prices (Choi, 2008). Choi (2008) has also shown that, unless counter-merging, the independent rivals are unable to provide lower prices than the bundle provided by the AD brands, and the ‘merged firms’ are expected to increase their profitability. Therefore, the

modeled price discount is assumed to be independent from a competitors' decrease in price. Nonetheless, this assumption may slightly increase the profitability of the bundled scenario.

Consumer behavior has been modeled by using market-level data on past purchase behavior of the average consumer at stores. Therefore, the developed model in this research considers market-level data in order to address the consumer response. Additionally, rather than modeling the bundling of specific products, the proposed model considers the sales of a customizable basket filled with products of the respective AD brand. Therefore, firm-level data is required in order to make assumptions on the specifications of the basket sizes. How the required data is gathered and utilized will be elaborated later in this chapter.

3.2.3 The bundling approach

Now that the implications of modeling in an imperfect competition are elaborated, the modeling sequence and the approach will be elaborated. The proposed model considers an imperfect price competition with uncertain costs. Since the competitors' response is not considered, the proposed model is a static model, indicating decision-making at a single point in time, considering the current market conditions. The proposed model optimizes the pricing strategy for the current market conditions, as it does not consider potential competitors' response. In order to find the optimal price levels for the model objective, a mixed integer linear programming framework has been used. As shown by Venkatesh & Mahajan (2009), this is the logical approach when a large number of components and bundles are involved. As shown before, consumer behavior is modeled, based on store-level and market-level data.

3.2.3.1 The bundling objective

Following Choi (2008) it is expected that the introduction of mixed price bundling in a competitive environment, in which independent rivals are unable to counter-bundle (i.e. introducing price bundles does not result in a price war), is profitable for the firm(s) that introduces the bundle. The aim of this model is to confirm the expectation that profit can be increased upon introducing price bundles and analyze the optimal price level for profit maximization. This is done by modeling the potential for profit maximization following the introduction of customizable mixed price bundling. The effect of discounts on consumer behavior is expected to affect store sales and store traffic (Karande & Kumar, 1995). The approach to model these effects is elaborated underneath.

3.2.3.1.1 Increasing profits

From the perspective of AD, just like any firm, the strategic objective is profit maximization. The customer behavior that is considered to increase profits for the bundling firm is two-fold. Following Guiltinan (1987), upon introducing mixed price bundles, the effect of price discounts on customer behavior can be two fold. First of all, through cross-selling current customers who buy at one (or some) of the brands, but not at all of the firms. For example, in the case of AD, if a potential customer intends to buy a barbecue at bol.com, but is not intending to buy products at the other brands (e.g. meat at AH and beer/wine at Gall&Gall), one of the goals is to incentivize the potential customer to buy products at the other brands too. Secondly, through price discounts new customers can be acquired that currently buy nothing at the other firms. Those customers are considered to buy their products at competitors. Figure 3 visualizes the first strategic objective of the mixed price bundle.

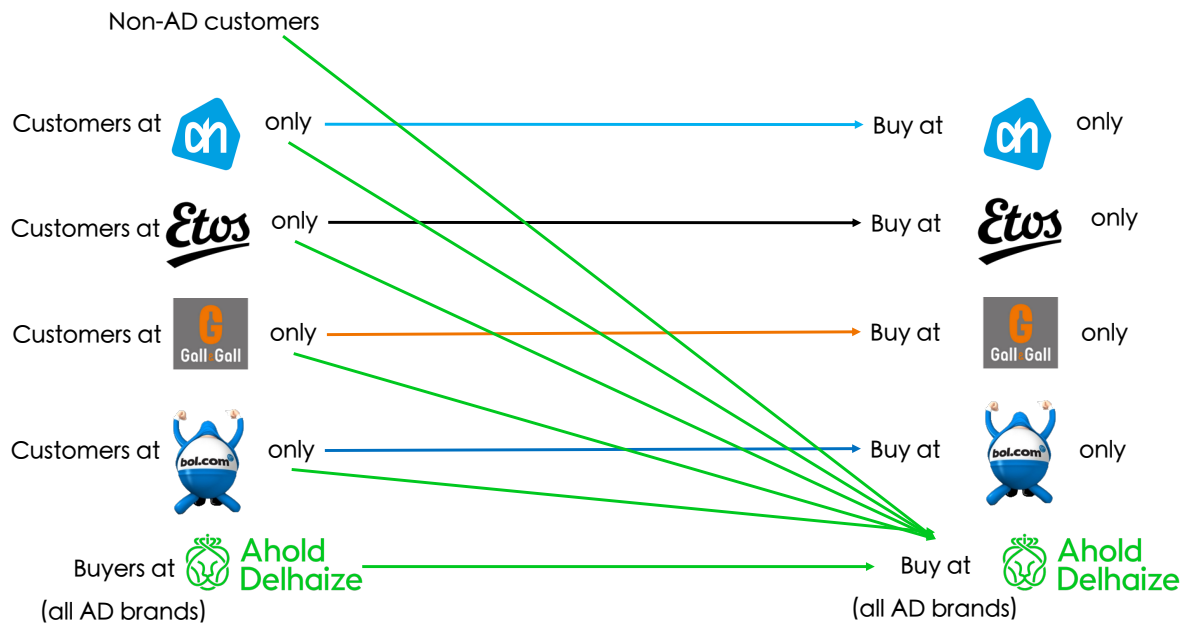


Figure 3. The effect of discount on consumer behavior that lead to the strategic objective of profit maximization

3.2.3.1.2 Decreasing profits

As Guiltinan (1987) shows, upon introducing price bundles, the provided discounts can also decrease profitability. First of all, when providing discounts that are higher than the CM, the bundled sales cannot generate profits. Logically, the discount may not exceed CM in order to be profitable. Another relevant effect to consider is the cannibalization of existent sales (Guiltinan, 1987). The reduced profit margins among customers that would have already purchased all of the bundled products without providing the discount cannibalizes the margin of existent sales. These effects have to be considered in order to maximize the profitability of the firms introducing the mixed price bundle.

While the price bundling scenario considers the combination of products that are already being sold, it is relevant to include the effect that the bundle will have on existent sales. If, upon introducing the bundle, customers that are already buying the products of each brand, now have the opportunity to buy their wanted products at a lower price, AD will have diminished profitability. Therefore, the introduction of the bundle will have a cannibalizing effect on margins of existent sales. The cannibalization of ‘base game’ is new to the bundling literature, yet relevant to include in order to accurately estimate the profitability considerations of incumbents.

3.2.3.2 Parameters and variables of the model

Table 5 defines the parameters and variables that are used in the model. Please note that the variables for the separate sales are applicable to each of the four modeled AD banners. Additionally, Wu et al. (2008) showed that the introduction of customized bundling is likely to involve additional costs. They showed that overhead costs may exist while the seller has to maintain a price list with consumer choices. For this research these additional costs may be neglected, while they are already included in the operational expenses for retailers. A more elaborate description on the details of the given parameters will be elaborated later in this chapter. Table 5 also provides an overview of the variables that were calculated based on the given parameters. It shows the intermediate variables, and the underlying formula from which the variable is calculated. Additionally, the final output parameters are shown in the same table.

Table 5. Definitions of the given parameters and the intermediate variables and their underlying formulas

... $S^{\cdot X}$ denotes variable of separate (s) brand 'X' before applying the discount (e.g. ... $SBOL$, denotes variable of bol.com)

... $DS^{\cdot X}$ denotes variable of separate brand 'X' after applying the discount

... $S^{\cdot AD}$ denotes variable applicable to AD as a whole before applying the discount

... BAD denotes variable applicable to AD as a whole after applying the discount (i.e. the combined AD banners)

Given parameters

$Q_{S^{\cdot X}}$ = Quantity purchased per average consumer (Average Basket Size)

$CM_{S^{\cdot X}}$ = Contribution Margin² of each brand (profit per additional sale)

$PED^{\cdot X}$ = Price Elasticity of Demand

$\alpha_{S^{\cdot X}}$ = Probability that a consumer in the market of 'X' visits AD banner 'X' (Store Choice probability)

$SCE_{S^{\cdot X}}$ = Store Choice Elasticity

D = The % discount that is provided for the bundle

	Intermediate variables	Following from
1	$Q_{DS^{\cdot X}}$ = Average Basket Size	= $Q_{S^{\cdot X}} * PED^{\cdot X} * D$
2	Q_{DAD} = Total Average Bundled Basket Size	= $\sum Q_{DS^{\cdot X}}$
3	$CM_{DS^{\cdot X}}$ = Contribution Margin	= $CM_{S^{\cdot X}} - D$
4	$\alpha_{DS^{\cdot X}}$ = Store Choice probability	= $\alpha_{S^{\cdot X}} + D * SCE_{S^{\cdot X}}$
5	α_{SAD} = Store Choice probability	= $\alpha_{S^{\cdot AH}} * \alpha_{S^{\cdot BOL}} * \alpha_{S^{\cdot ETOS}} * \alpha_{S^{\cdot GALL}}$
6	α_{DAD} = Store Choice probability	= $\alpha_{DS^{\cdot AH}} * \alpha_{DS^{\cdot BOL}} * \alpha_{DS^{\cdot ETOS}} * \alpha_{DS^{\cdot GALL}}$
7	$\Delta\alpha_{DAD}$ = Increase in Store Choice probability	= $\alpha_{DAD} - \alpha_{SAD}$
8	$\Delta\alpha_{DC^{\cdot X}}$ = Cannibalized Store Choice probability	= $\alpha_{SAD} + \Delta\alpha_{DAD} * \alpha_{S^{\cdot X}}$
9	$TP_{S^{\cdot X}}$ = Profit that would have been captured when not providing the bundle ³	= $\Delta\alpha_{DC^{\cdot X}} * Q_{S^{\cdot X}} * CM_{S^{\cdot X}}$

Outputs⁴

10	$\Delta TPC_{DS^{\cdot X}}$ = Decrease in profit from cannibalized margins ⁵ (= $\Delta\alpha_{DC^{\cdot X}} * (CM_{DS^{\cdot X}} * Q_{D^{\cdot X}} - CM_{S^{\cdot X}} * Q_{S^{\cdot X}})$)
11	$\Delta TP_{DS^{\cdot X}}$ = Increase in profit after providing discount (= $\Delta\alpha_{DAD} * CM_{DS^{\cdot X}} * Q_{DS^{\cdot X}}$)

² CM = Marginal Revenue – Marginal Costs

³ Please note that the variable $\Delta\alpha_{DC^{\cdot X}}$ is used. This is done in order to include the estimated cannibalization of separate sales when consumers that would have shopped at the separate brands refer to the bundled sales

⁴ Please note: the profitability describes the profit from a random customer that intends to purchase in the markets in which the AD brands are active

⁵ ΔTP_s , Results from the reduction in profit margins on sales from customers already buying all products in the bundle

12 $TP_{DS'X'} = \text{Change in profit after providing discount } (= \Delta TP_{DS'X'} + \Delta TPC_{DS'X'})$

13 $\Delta TPC_{DAD} = \text{Decrease in profit from cannibalized margins } (= \sum \Delta TPC_{DS'X'})$

14 $\Delta TP_{DAD} = \text{Increase in profit after providing discount } (= \sum \Delta TP_{DS'X'})$

15 $TP_{DAD} = \text{Change in profit after providing discount } (= \Delta TP_{DAD} + \Delta TPC_{DAD})$

3.2.3.1 Profitability considerations

Following Guiltinan (1987), upon introducing mixed price bundles for sales of existent products, the profitability considerations should also include the reduction of margins from sales that would have occurred without the introduction of the bundle. Therefore, the expected profitability can be expected to increase due to cross-selling and acquiring new customers, but decrease, following the cannibalization of margins on customers that would have already purchased the bundled components. According to the above logic, the objective function (1) maximizes the profitability of the seller upon changing the provided discount for the model.

$$\text{Max } \sum_X (\Delta TP_{DS'X'} + \Delta TPC_{DS'X'}) \quad (1)$$

Substitution of the variables in the above equation, following the logic from the decision variables or intermediate variables shown in table 5, provides the following equation.

$$\text{Max } \sum_X ((\Delta \alpha_{DAD} * CM_{DS'X'} * Q_{DS'X'}) + \Delta \alpha_{DC'X'} * (CM_{DS'X'} * Q_{D'X'} - CM_{S'X'} * Q_{S'X'})) \quad (2)$$

3.2.3.2 Constraints

The objective function is subject to several constraints, which are shown in table 6 and are further elaborated underneath.

Table 6. The constraints to which the objective functions is subject to

Subject to constraints:

1 $\Delta TPC_{S'X'} < 0$

2 $D_{BOL} = D_{AH} = D_{ETOS} = D_{GALL}$

3 $\Delta TPC_{S'X'} = \alpha_{SAD} * (CM_{DS'X'} * Q_{D'X'} - CM_{S'X'} * Q_{S'X'})$

4 $\Delta TP_{DS'X'} = \Delta \alpha_{DS'X'} * CM_{DS'X'} * Q_{DS'X'}$

5 $\alpha_{AD} = \alpha_{AH'} * \alpha_{BOL'} * \alpha_{ETOS'} * \alpha_{GALL'}$

6 $\Delta \alpha_{DS'X'} = \alpha_{DS'X'} + SCE_{S'X'} * D$

7 $Q_S < Q_D$ (providing discounts will increase the basket size at each brand)

8 $SC_S < SC_D$ (providing discounts will increase store choice)

Please note that constraint 1, shows that the cannibalization effect $\Delta TPC_{S'X'}$ (constraint 1) has to be a negative number. If constraint 1 is not met, the firm that is modeled should rethink its pricing strategy, since decreasing the price is likely to increase its profitability. Accordingly, the demand condition for success, which shows under which conditions the bundle is profitable, is met when the following condition is met

$$\sum \Delta TP_{DS'X'} > \sum \Delta TPC_{DS'X'} \quad (3)$$

Constraint 2 follows from the consideration that the discount is not allowed to change per store. Rather, the discount is applicable only in the situation where the bundle is bought. Therefore, the same discount applies to all of the stores from which the ABS is included in the model.

3.2.3.2.1 Cannibalization effect

As mentioned before in ‘decreasing profits’, there is an expected decrease in profit margins from customers already buying at all the AD banners without providing a discount. Constraint 3 formulates the expected decrease in profit from customers that would have already bought the bundle without the discount (estimated by SC_{SAD}), for which two considerations have to be considered. Providing discount ‘D’ decreases the CM, therefore the cannibalization of margins has to be considered. On the other hand, the ABSs of the customers that would have already bought at each store are expected to increase due to the effect of PED. If the change in profit following the increased basket size, while having decreased margins, is increasing profits in the single-firm condition, the firm should double-check its pricing strategy. Therefore, the two effects that have to be considered are, (1) a decrease in contribution margin (CM) over ‘already-buying’ customers, and (2) an increased average basket size, due to PED (only for the already-buying customers). In order to describe the expected decrease in profit, the implied logic gives the function described in table 5, variable 10. Accordingly, ΔTPC_{SAD} calculates the cannibalization effect on the combined AD banners, by summing the decreased profits of all the brands.

Besides cannibalization of the profit margins, it has to be considered that the *increase* in SC probability ($\Delta\alpha_{DAD}$) may also come from customers that would have already bought products at the separate AD brands or a random set of AD brands. Therefore, the increase in SC probability is expected to partly cannibalize existent sales of separate brands. The margins of the separate brands, therefore, are expected to be cannibalized following an increasing number of customers referring to the discounted bundle. As shown in table 5, intermediate variable 8, the expected probability that a random customer that was already shopping at one of the AD brands refers to the bundle, is referred to as cannibalized SC probability. Even though it is not exactly cannibalized SC probability, I refer to cannibalized, since it is a required variable to estimate the cannibalization of existent sales. For these customers, the cannibalized margins for these shoppers have to be considered. It has been calculated by multiplying the increased SC probability of customers that refer to the bundle after providing the discount ($\Delta\alpha_{DAD}$) with the SC probability at each brand before providing a discount ($\alpha_{S \cdot X}$).

3.2.3.2.2 Effect of additional customers

Constraint 4 ensures that the expected increase in customers that purchase the bundle (estimated by $\Delta SC_{DS \cdot X}$) is expected to increase the profit for AD. The expected increase is modeled by modeling the effect of discounts on contribution margins and on consumer behavior, resulting in a change in SC and CM. As specified before, following a discount, consumer behavior is expected to increase profitability of the AD brands by an increase in (1) AD banner store choice (SC), and (2) average basket size (ABS) (only for new customers). Following the above logic, in order to describe the expected increase in profit for each AD banner the function described in table 5, variable 17 has been used. Accordingly, ΔTP_{DAD} calculates the effect of new customers on the combined AD banners, by summing the increase in profit of all the brands.

3.2.3.2.3 Independence

Constraint 5 assumes independent store choice probabilities between the modeled stores. In other words, shopping at one of the stores does not affect the probability that the customer embarks in a shopping trip at another store. The stores are assumed to be neither substitutes nor complements. According to this assumption, the SC probability of the combined AD banners is simply a multiplication of the SC probability of the separate banners (Belleflamme & Peitz, 2010). Consequently, upon increasing $SC \cdot X$ of each brand, the multiplication effect will increase the effectivity if bundling.

Constraint 6 assumes linearity of the store choice ‘elasticity’. While this is unlikely to be true, due to simplicity it was chosen to model all elasticity variables linearly. Accordingly, constraint 7 also assumes linearity of the price elasticity of demand. The behavior of the average consumer, through the effect on the average basket size (ABS), it is expected that the average consumer acts homogeneously. The involved heterogeneity is expected to be addressed by averaging the heterogeneity of the customer base of each seller.

3.2.4 Data collection

Now that the underlying logic behind the proposed model has been elaborated, the data collection will be elaborated. This part elaborates how the data on the ‘given parameters’ was gathered. The required data was primarily collected from two sources, from the selected case study (AD), and from academic literature. This section elaborates which data has been collected from AD and where academic literature has been used acquire approximations. Due to the sensitivity of some of the financial data, some data from the AD banners could not be used. Therefore, assumptions have been made in order to deal with confidentiality of the required data. The eventual approximations that were used will be shown and elaborated in the analysis.

3.2.4.1 Average basket size

As elaborated before, rather than using reservation prices of customer segments, this model uses ABS as a measure of purchased quantity (Q). As shown by Kim & Kim (2017), in the supermarket industry, rather than analyzing products, the focus is on shopping baskets consisting of the purchased products in a customizable basket. Even though, it can be a validly assumed that the basket sizes follow a Gambel distribution (Kameshwaran, Viswanadham, & Desai, 2007), due to the involved complexity in gathering the data, standardizing it, and analyzing it, for the four involved brands in this model, it was simplified by taking the averages of all customer transactions at a brand. This will be sufficient for this research, while the aim is to show that bundling is a valid EVP and has the ability to increase the profits of incumbent retail groups. In order to address the heterogeneity in the purchase behavior of customers, the ABS was taken for each of the AD banners. Following the law of large numbers and the amount of consumer transactions that each AD banner has per year, averaging these transactions into an ABS per customer is considered a reliable homogenizing effect. The ABS was readily available at each of the AD banners. Due to sensitive nature of these data, these data are not provided in this report. In order to provide reliable ABSs, the original values have been randomized in a range of 25% from their original values.

3.2.4.1.1 Price elasticity of demand

In order to estimate the effect of discount on the basket size, the effects of $PED_{S \cdot X}$ on the $Q_{S \cdot X}$ (= ABS) has to be considered. While the purchased basket is a customized set of products, the purchased quantity is subject to change, upon changing prices of the goods in the basket. PED data considers the extent to which the ABS changes upon a decrease in price. Proxies have been made from academic literature, that show the extent to which discounting affects the purchased quantities in different markets. Additionally, following the modeling of customizable basket and, consequently, basket sizes, it is relevant to consider that the basket sizes are also influenced by pricing. This will also be addressed, through analyzing price elasticity of demand data

3.2.4.2 Store choice

In order to estimate the probability that a potential customer embarks in a shopping trip at the AD banners, this model has used a different approach than the usual bundling literature. Most of the bundling literature refers to a probabilistic approach, such as a discrete choice model to determine customer purchase behavior. This research has used a probabilistic approach to estimate $\alpha_{S \cdot X}$ ($SC_{S \cdot X}$), but does so by making an assumption based on market-level data.

Several assumptions are required to be able to utilize the market-level data. First of all, it is assumed that customers only respond to price, such that exogenous loyalty considerations are not considered. Also, it is assumed that a potential customer is a customer in each of the markets in which the respective AD brands operate. In other words, the modeled customer is intending to buy in the respective market in which the AD banner operates. Additionally, it has been assumed that the ABS of each AD banner is equal in the market that it operates. Following these assumptions, SC can be considered as the market share of the respective AD banner. Market share data was gathered from the annual report of AD.

One of the objectives of the bundling model concerns increasing SC upon providing discounts. The influence of several variables on SC has been studied by several academics. Amongst others, the effect of price on store choice has been studied by several academics. This research uses store choice to estimate the effect of a discount on the store choice probability of a potential customer in the market. In order to analyze the influence of price on store choice probability that a potential customer embarks on a shopping trip at a specific store (= $SCE_{S \cdot X}$), an approximation was based on academic literature or on market research from trustworthy sources. For example, market research from Euromonitor International has been used in order to estimate the change in demand for alcoholic drinks upon price discounts. Euromonitor International is one of the world leading independent providers of global strategic market research (Euromonitor International, 2019). In order to approximate SCE, it was assumed that competitors are not responding to the price discounts of the bundle. This allowed the usage of approximations of price effect on regional demand (national or continental), since the increase in demand will be assumed to be captured by the firm that is decreasing its price levels, i.e. the bundling firm(s).

3.2.4.1 Contribution margin

AD has provided specific brand-level data. Profit and loss statements (P&L) were analyzed in order to estimate the CMs of the different banners. The CMs are calculated by looking at the proportion of fixed costs compared to variable costs. This was done by analyzing the (P&L) of each brand and estimating the ratio of fixed and variable costs together with a brand-employee responsible for the P&L. The P&L statements were at the brand-level, such that no differentiation was made between performance of different stores or between the online and offline sales channels. Rather, the average of all sales per banner has been analyzed in order to estimate the CM. Due to sensitive nature of these data, these data are not provided in this report. In order to provide reliable CMs, the original values have been randomized in a range of 25% from their original values.

For bol.com, an additional consideration has to be mentioned. Bol.com is an e-commerce player that sells its own stock, but simultaneously acts as an online marketplace that facilitates the interaction and transaction between third party merchants and buyers. For the sales of products in its own stock, the average CMs are higher, compared to the CMs of the sales of products from third-party merchants. Since the wide product variety that is offered follows from affiliating third-party merchants provides a strategic advantage in the customizable nature of the bundling. For the proposed model, the weighted average of the margins has been considered.

3.2.5 Summary

In the competitive environment in which the AD brands operate, it was shown that mixed price bundling is the only possible bundling strategy. Additionally, due to the wide product variety that is offered by the AD brands, it is considered that independent rivals in the Dutch market are unable to copy the customizable bundling strategy. Following the customizable nature of the proposed bundling strategy, classic economic theory can be used for the model. The

proposed bundling model is developed in order to calculate the maximization of profits for AD by estimating the optimal discount level.

3.2.5.1 Assumptions

During the elaboration of the model, several assumptions have been made. An overview of these assumptions is provided underneath

- All of the product variety can be bundled into a customized price bundle that suits each customer's needs
- The provided discount is similar for all AD brands. In other words, the consumer receives a discount on the bundle as a whole bundle, rather than a different discount per AD banner
- Shopping at either one of the AD banners is independent (the AD banners are neither substitutes, nor complements)
- ABS is similar for the market in which the AD banner is operating, such that market shares can be used as an estimate for SC probability
- Consumer behavior of the average customer (modeled by ABS) is homogeneous
- PED is linear
- Store choice elasticity is linear
- Constant marginal costs, such that CM is constant
- This model only addresses random customers that intend on buying in each of the respective markets

3.2.5.2 Contribution

The proposed model shows a new way to model multi-product bundling by assuming that the wide product variety of the modeled firms can be bundled into any customizable bundle. This allows the model to address the heterogeneity of the idiosyncratic customers' needs and use classic economic logic in order to model consumer behavior. This is, to the best of my knowledge, the first model that addresses multi-product bundling in a competitive environment for which $MC > 0$.

Additionally, following from $MC > 0$, the proposed model shows a way to model the cannibalization of existent sales. The cannibalization of the profit margins of existent sales is included in the profitability calculations. Additionally, the increase in store choice probability, is also modeled for customers that would have already purchased at one of the separate brands. Accordingly, the proposed model sketches an all-encompassing estimation of the profitability considerations for firms that aim to introduce customizable mixed price bundling.

The proposed bundling model has shown a new modeling approach for multi-product bundling in a competitive environment. This specific model is fit to the assumptions that were made, which consider that bundling occurs in an imperfect competition, in which independent rivals are unable to imitate the bundle pricing strategy, and the introduced bundles can be customizable to fit the customers' needs. The proposed model can be utilized in future studies, if the bundling strategy falls within the above assumptions. Additionally, the proposed bundling model has shown a new way to estimate the cannibalization of existent sales. By using economic logic to the bundling literature, the cannibalization of margins from old and even new customers that already shop at one of the separate AD brands that now refer to the bundle has been calculated. For bundling with physical goods, in which $MC > 0$, the cannibalization has to be considered.

3.2.5.3 Limitation

The proposed model solely models the cannibalizations for a situation where consumer move from none or one of the firms to all of the firms. For the proposed model, cannibalization is only included the possibility to calculate the effect of the cannibalized SC probability

($\Delta\alpha_{DC^X}$), by including the separate brands. In reality, the cannibalization also occurs from sets of separate brands. For example, customers that buy at both Etos and AH, may refer to the AD bundle, resulting from the discount. The effect of the cannibalization of multiple brand shoppers has not been included due to the increased modeling complexity. Excluding the possibility that customers from 'sets of AD brands', refer to the AD bundle, is expected to slightly increase the expected profitability in the results. On the other hand, it can also be considered that bundles can be introduced for a customizable set of brands. However, due to the involved complexity this is not modeled.

Buying frequency is not taken into account. Since this model assumed that the modeled behavior considers consumers that intend to buy in each of the respective markets in which the bundling firms is active, the buying frequency can be neglected. However, in order to make a more accurate estimation of consumer demand and the potential frequency of the bundled sales, buying frequency should be included. For this model, the proposed bundle will only be purchased as often as the products in the market with the lowest purchase frequency.

Also, the proposed model neglects the competitors' response. As Choi (2008) indicated, competitors are unable to compete with the price levels offered by the bundling firm(s), but are expected to decrease their prices, in order to keep a part of their market share. The decrease in competitors' prices is not included in the model, which is expected to provide more positive profitability for the firm(s) that introduce the bundle.

3.3 'Aligning' the multi-method approach

The qualitative and quantitative data collection and analyses have been performed simultaneously, whereas they did not require one another for their results. Nonetheless, the results of both analyses are expected to be complementary. The answer to the first sub question provides the constraints that incumbent retail groups face in their efforts towards joint value creation. This should provide an elaborate understanding of why an incumbent retail group is constrained in the creation of complementary effects between its brands. Having gained an understanding of the challenges, the answer to the second sub question can be applied to the identified constraints. Suggestions can be made for how bundling as an EVP can be utilized in order to overcome the identified constraints towards joint value creation by an incumbent retail group.

The combination of the two methods have been used to provide a holistic answer to the main research question. It should provide empirical evidence in order to show how bundling can be utilized as an EVP by creating complementary effects between the AD brands. Additionally, the combination of both sub question should provide an understanding why bundling is specifically suited for incumbent retail groups by addressing the identified constraints.

4. Analysis

Like the other chapters, this chapter has been sub-divided into two parts. The first section will provide the findings from the ecosystem analysis. The second section will present the results from the bundling model, along with a discussion of the results.

4.1 The importance of ecosystem carryover and legitimacy

This section presents the findings of the qualitative analysis, by answering the first sub question of this thesis:

“Which alignment and materialization conditions constrain the envisioning and materialization of ecosystem value propositions with the brands of incumbent retail groups?”

In order to do so, an innovation ecosystem and ecosystem emergence approach has been taken. First, it is justified why the ecosystem approach can be used to analyze the joint value creation at incumbent retail groups. Thereafter, the results of the interviews are linked back to the alignment and materialization conditions that were elaborated in the theory chapter.

4.1.1 Ecosystem approach

First of all, the results of the interviews justified the assumption that an ecosystem approach was the valid approach to be used, in order to identify the alignment conditions towards joint value creation. With their slogan “great local brands” AD emphasizes that the separate AD brands get all of the freedom to develop their own strategy independently of the other brands. All of the interviewees confirmed that the brands are being rewarded and evaluated on the performance of each separate brand. Consequently, the brands are incentivized towards the realization of VPs that maximize the value of the separate brand, requiring alignment of ‘independent’ actors in order to achieve joint value creation. It has to be noted however, that for joint value creation that may require an actor similar to one of the AD brands, the AD brands will try to develop it together. For example, bol.com did not try to implement the pick-up points in collaboration with JUMBO, rather bol.com collaborated with AH. Nonetheless, for the AD brands value propositions in which the value of another brand value is not increased, but the value of the own brand increases to an extent that it results in a net positive value enhancement for AD, are often not realized. Interviewees showed that the profit loss from committing to joint value creation is only tolerated, if brand A “needs something” of the other brand in the near future. This shows the independence of the brands, justifying an ecosystem approach for the analyzation of joint value creation at the AD brands.

Where the EVPs thus far developed by the AD brands are relatively simple (see ‘case selection’ for an overview), visionary documents have been created in order to envision and compel the AD brands towards more complex joint value creation. One specific joint value creation effort (project A) that stranded has been analyzed more into depth. Details on this project A are not provided, due to the strategic sensitivity. The underlying process that resulted in the failure of project A provided an opportunity to identify the alignment conditions that constrained the envisioning and materialization of project A.

4.1.2 Alignment conditions

The framework of alignment conditions that have been elaborated in the theory chapter are used for the analysis. The results for the interviews are linked back to the elaborated conditions, from which the results are elaborated underneath.

4.1.2.1 Protovision

In order to test whether the *visibility* around the creation of a compelling vision for the involved actors was clear enough, it was tested through analyzing secondary data and conducting

interviews, whether it was possible for the AD brands to *ex ante* envision an EVP and clarify whether it was concrete enough to crowd out the range of alternative futures.

After analyzing secondary data, such as visionary documents on project A, it was found that the documents that described the value creation of project A were rather concrete. One document elaborated in fine detail what the EVP of project A was supposed to be. It elaborated on the functions that project A would have, how it would face the user, which tools the user would need in order to utilize the VP, the channels of information provision, different mechanisms of value capture, and the integration of the AD brands was envisioned. Additionally, even some interfaces were pre-imagined, and the way in which consumer-data privacy would be ensured was envisioned. It was even found that two independent consultants had developed similar visions. Subsequently, following the concreteness of the analyzed documents, and the limited range of alternative futures, it was identified that there was rather clear *visibility*, such that the protovision condition did not constrain the alignment of the relevant actors.

4.1.2.2 Envisioned blueprint

The envisioned project A considers a sort of platform that provides a standard interface with functionalities that can be utilized across all of the AD brands. This involved functionalities that were expected to create value for the customer and increase customer lock-in effects within the AD 'ecosystem'. It was considered to be the link between the AD brands.

4.1.2.2.1 Agreement on the envisioned interdependencies

Rather than only describing the value creation of the EVP, the visionary document also described how the involved brands were linked in the EVP. It was described how each brand would be involved in the EVP to an extent that the potential added value of each brands was shown. Accordingly, it was clear that the interdependencies has been envisioned. In order to test whether there was also mutual agreement by the involved brands on the envisioned interdependencies between the brands, the interviewees of the brands were questioned on this topic. All of the interviewees that were involved in project A, confirmed that their respective brands saw the potential value that could be created and saw a role of their brand in project A. This indicated that the interdependencies and complementary effect from involving the ecosystem actors was recognized.

Nonetheless, upon trying to concretize project A and the consistent construal of the configuration of activities for its materialization, the project stranded. One of the interviewees (bol.com) who was involved at the beginning of the project mentioned that, even though there was a recognition of the interdependency, upon concretization of how the project would be materialized, the project stranded. The interviewee mentioned that the visionary documents failed to concretize the required steps towards reaching the value proposition. Another interviewee (AH) confirmed this by pointing out that the visionary document only considered the 'front-end', whereas the required configuration of activities to materialize project A were not considered. This shows that, while the AD brands reached mutual agreement on the added value of the different brands in the EVP, the associated structures of governance (i.e. who does what, who controls what) were not concretized to an extent that mutual agreement was achieved.

Even though the underlying governance structures were not made concrete, the problem towards concretizing the governance structures seemed to lie within the mutual agreement around the control points. Further questioning was required in order to identify why the AD brands, whom seemed to have reached mutual agreement on the potential value creation and the requirement of the different AD brands in project A, did not further concretize the envisioned interdependencies and its governance structure.

4.1.2.2.2 Disagreement on the envisioned control points

Interestingly, project A was related to successful incumbent VPs at the separate brands. Due to the relatedness of project A to the incumbent VPs, several alignment constraints were identified around the envisioned control over control points. Project A can be considered a combination of the VPs of the separate brands. Consequently, this created opportunities to leverage ecosystem carryover for the brands. On the other hand, upon its materialization, the adoption of SVP A was likely to cannibalize the incumbent VPs.

Following the potential cannibalization effect, in order to align the brands, it was required that there was a genuine believe that project A enabled more value creation and capture than the separate VPs for each of the brands. While, when the implementation of project A would cannibalize the incumbent VP of a brand, yet, would create less value than the incumbent VP for the brand, it would likely not be considered a success by the brand. Therefore, it was required that the envisioned control points enabled value creation and capture, greater than the already proven incumbent VPs for each brand. One of the interviewees (bol.com) made the following statement:

“Upon trying to concretize [project A], how the [VP AH] should be linked to [VP bol] was very difficult and stranded the project”

Another interviewee (bol.com) confirmed the difficulties that arose due to the need to combine the two incumbent VPs. In order to try to maximize the value from the combination of the incumbent VPs, the brands tried to envision how to leverage ecosystem carryover in the combination of their VPs. It was believed that leveraging the success of the incumbent VPs, was the way to go in order to ensure the success of project A. Besides replicating the inherent success of the incumbent VPs, the carryover of the consumers that already use the incumbent VPs was expected to result in a jump-start of the EVP, consisting of an existent customer base of the separate VPs.

However, the inherent differences between the two VPs created complexity in the combination of both VPs. For these specific VPs, it was difficult to envision how the different value offerings, fulfilling (sort of) the same function in a different structure, could be combined. Following this difficulty, it was found that project A would be more similar to either one of the incumbent VPs, while departing from the other VPs. Secondly, the metrics of success of the VPs differed to an extent that comparing the success of the separate consumer-facing VPs was complex. The differences in nature of the business between the brands required different metrics of success, additionally, requiring different approaches to the VPs. Consequently, determining which type of VP should be the baseline in terms of creating the most profitable scenario for the combined brands was unknown.

The inability to find a solution for the combination of the two VPs, created potentially different scenarios for the vision of project A. This may follow from the path dependence of the successful incumbent consumer-facing VPs. Following the need to leverage ecosystem carryover and minimize cannibalization of the incumbent VPs, the AD brands envisioned different control points. Following the need to leverage different control points, it increased the range of alternative futures. While not creating many different futures, it created few strong alternatives. Even though the model of Dattee et al. (2018), does not describe a direct link between the envisioned control points and range of alternative futures, the above description suggests that the envisioned control points can create different alternative futures.

Thus, it was found that the alignment of the relevant actors and their activities was constrained by the complexity induced from path dependence of incumbent consumer-facing VPs. The alignment conditions following the different routes of envisioned control points from project A was decreased by the few, yet, strong alternative futures, following from the presence of two

inherently different, successful incumbent VPs. Following the success of the incumbent VPs, it was required that the VPs were combined in order to leverage ecosystem carryover and mitigate cannibalization. It is expected that path dependence has created the inability to combine the VPs such that the mutual agreement on the envisioned control points was constrained. In order to further study this problem, path dependence theory might provide a good theoretical perspective to study this phenomenon.

Following the difficulty to reach mutual agreement on the way to leverage ecosystem carryover, it was difficult to define the governance structure. In order to define ‘who does what’, and ‘who controls what’, it had to be considered how ecosystem carryover of the incumbent VPs would be leveraged. Therefore, the misalignment following the complexity in envisioned control points simultaneously created difficulty in envisioning and materializing the envisioned interdependencies.

4.1.2.3 Materialization conditions

Due to the absence of a clearly defined ecosystem leader, it is difficult to differentiate between internal momentum (momentum of ecosystem leader) and external momentum (momentum of followers). Also, as found in the ‘followers’ part, resource commitment of Gall&Gall and Etos is mainly dependent on AH. Therefore, the internal and external momentum here is considered for bol.com and AH. Where project A stranded around concretization of the envisioned control points, the line of questioning considered the expected conditions that constrained the resource commitments of the AD brands at project A, and constraints towards resource commitment in other EVPs.

4.1.2.3.1 Momentum creation at Albert Heijn

Most of the interviewees indicated that the ‘traditional retailers’ (e.g. AH, Gall&Gall, Etos) are focused on short-term profits. One interviewee (AH) pointed out that the shareholders of AD generally value the stability of the AD shares. Consequently, the AD brands are steered towards risk averse investments that generally provide stable growth. Additionally, it is expected that investing in complex value propositions can create volatility of the shares. Thus, the shareholders may discourage radical innovation, which may cause volatility in the shares. For this case, it is assumed that other incumbent retail groups shares are also valued for their stability. Investopedia shows that Walmart’s shares are also valued for its stability, but this should be tested further. This risk averse climate is likely strengthened by an accounting scandal that was exposed in 2003. One interviewee (AH) pointed out that after the accounting scandal, strong emphasis was provided on accurately monitoring the financial performance of Ahold. Following the stability of the AD shares and the accounting scandal, the interviewee assumed that this resulted in a risk averse investment climate.

4.1.2.3.2 Investment climate and estimating returns

One of the interviewees (AH) stated that, for the materialization of complex value propositions, such as project A:

“investments have to be made without having tangible returns”

The above quote shows the uncertainty of the realization around the ability to capture the created value. It mainly followed from the inability to predict and quantify the potential captured value, due to the complexity of the VP. AH is able to make investments into systems that increase the efficiency of their operations due to the ability to relatively accurately quantify the increased efficiency from, for example, robotization of their warehouses. For example, the increased operating efficiency from opening a new distribution center or automating a distribution center can be estimated relatively accurately compared to complex EVPs. The quantification of the increase in value captured from an EVP comes with uncertainty, for instance, due to unknown customer response and no knowledge of competitors response.

Another interviewee (AH) stated that developing VPs is already challenging for AH without including the other AD brands. The interviewee argued that the multidisciplinary approach that is required for AH to develop net VPs is already complex enough:

“We need to be a good store, we need to have good products, we need to have a good marketing campaign, we need to develop an app. Due to the broad nature of our business, we need many disciplines to create value for the customer”

Furthermore, the interviewee argued that involving the other brands makes the process even more complex, which can be confirmed from the ecosystem literature. Due to the complexity of value creation for AH, and the increased complexity from value creation with other actors, the inability to quantify the estimated returns, create risky investments. Accordingly, it can be expected that investing in complex VPs can increase the volatility of the shares.

4.1.2.3.3 Focus on control

Some interviewees (bol.com and AH) that were involved with the development of the pick-up points had some interesting insights. For the envisioning of the pick-up points, it was unclear what the exact benefits and costs would be. On the one hand it can be assumed that bol.com customers are drawn towards the AH stores upon having their packages delivered at the AH stores. This could increase the revenue generated by additional customers. On the other hand, AH also has costs, since employees are required to handle packages and floor space is required for storing the packages.

Due to AH’s focus on control and short-term sales, the value distribution had to be quantified before the actual implementation of the pick-up points. One of the interviewees (bol.com) mentioned that bol.com would have rather implemented the pick-up points and correct the financial details in hindsight. Due to the controlling nature of AH, it is required that the amount of value that can be captured from a VP developed by AH, is quantified before involving in its materialization. The external momentum (when considering the pick-up points is a value proposition in which bol.com is the ecosystem leader), constrained the internal momentum at bol.com. Therefore, the focus on control is a constraining factor in the dynamics of internal and external momentum, since it creates a lengthier materialization time.

For AH (and likely Gall&Gall and Etos too), it seems that the risk averse innovation climate, following from the focus on control and the need for stable shares, constrains the ability to commit resources to complex value creation, since complex value creation is often paired with an inability to quantify the value capture. This concerns internal organizational structures that may need to be changed in order to overcome the constraint. The above described conditions constrain AH towards creating internal momentum towards materialization of EVPs. Consequently, following the dynamics described in the dynamic process model in figure 2 it can be expected that the momentum of the other brands is also constrained.

4.1.2.3.4 Momentum creation at bol.com

The interviewees from bol.com mentioned the innovation-driven approach of bol.com and a general focus on value creation and scaling its business. Also, an interviewee from GSO mentioned that, where the other AD brands are focused on short-term sales and profitability, bol.com is generally the player within AD that is focused on creating new value propositions. The interviewee (GSO) also argued that bol.com is the actor within AD that creates enthusiasm among other brands for the creation of VPs. This shows that bol.com is generally the player that may create momentum at the brands.

Generally, bol.com is focused on scaling and growing its business. Consequently, bol.com is focused on longer-term innovations. Following the before-mentioned focus on stability of shareholders, it may be expected that bol.com (since it is part of the Ahold Delhaize holding) should also provide stable results. Yet, with the acquisition of bol.com, it was promised that

bol.com would be able to operate autonomously, without interference from the AD brand, in order to maintain its focus on innovation.

4.1.2.1 Ecosystem leader

In order to test the legitimacy of the ecosystem leader, both the roles of the AD brands in project A and other joint value creation activities were analyzed. For project A, it was found that, following the absence of a clearly defined construal of activities, for the envisioning, coordination and materialization of project A, it was found that there was no clearly defined ecosystem leader role. One of the interviewees (AH) stated that

“it was unclear which brand should make the costs for the project, nor which brand should devote its time and effort into leading the project”

This shows that it was unclear who should be the ecosystem leader in the further envisioning and materialization of project A, such that an actor that guides the transition and designs the alignment structure was absent. The before-mentioned complexity around envisioned control points and ecosystem carryover is expected to affect the clarity around who should be the ecosystem leader in the case of project A. Additionally it is expected to affect the legitimacy of a potential ecosystem leader as well, since the cannibalization of the incumbent VPs of different actors had to be taken into account.

Besides taking into account the cannibalization and ecosystem carryover effects, which was expected to affect the commitment of the respective brands towards the ecosystem leader, several interviewees were also questioned on joint value creation processes around other EVPs. This was done in order to provide generalizable findings towards joint value creation processes at incumbent retailers, rather than specifically addressing one EVP. Interviewees were questioned on their perception of roles in AD around joint value creation with the brands were.

4.1.2.1.1 Followers

Relative to the other AD brands, Etos and Gall & Gall are small. The annual consumer sales of Etos and Gall&Gall combined, are lower than 1 bln. Compared to AH, which has annual consumer sales around €14 bln, Etos and Gall&Gall are small. One of the interviewees (AH) mentioned that Etos and Gall & Gall operate in the slipstream of AH. Also, the interviewees from Etos and Gall&Gall also mentioned that, for the allocation of resources, AH is nearly always prioritized. In other words, for projects that require development effort, such as IT-developers or funding from AD, AH nearly always gets priority. Besides that, Gall&Gall and Etos are selling their product through the online sales channels of AH online, and Gall & Gall is also selling its products through bol.com as an affiliated third party. This shows that Gall&Gall and Etos generally have the follower role.

4.1.2.1.2 Ecosystem leaders within Ahold Delhaize

The AD brands that generally have a more leading role in joint value creation are bol.com and AH. However, following from conversation with many different employees from the respective brands, it was found that there is a certain rivalry between the brands. In order to explore the legitimacy of both brands, interviewees were questioned about the different joint value creation between the brands.

4.1.2.1.3 AH

AH is the largest supermarket in the Netherlands, which creates most of the profits for AD. Since most of the revenue and profit is generated by AH, the effect of introducing a VP is expected to have the most impact on the revenues of the AD brands if it is introduced by AH. Consequently, being the largest profit-generating engine creates a believe that innovations driven by AH may have the greatest impact on revenue and consequently profit for AD. Additionally, customer buying frequency is high at supermarkets, creating many touch points with the customer. Due to the frequent buying of customers, AH is able to sketch a relatively

detailed profile of its frequent shopping customer base. Also, AH is a very famous Dutch brand. The brand recognition could also create additional benefits to the creation of EVPs.

4.1.2.1.4 Bol.com

On the other hand, bol.com is a fast-growing e-commerce player, and shares similarity with other dominant online marketplaces, characterized by network effects and a digital ecosystem. However, it has to be stressed that the Dutch market is much different than the other markets, whereas the notion of copying the success of VPs of Amazon and Alibaba cannot be taken for granted. Bol.com is the fastest growing AD brand and is the market leader in Dutch e-commerce (Ahold Delhaize, 2019). Also, bol.com has relatively high scalability, due to its platform-nature, compared to AH. When considering the expansion into Belgium, it may be more likely that EVPs can be materialized between bol.com and Delhaize, rather than Delhaize and AH. Whereas, AH and Delhaize can be considered perfect substitutes, while both AD brands are bricks and mortar supermarkets. Also, bol.com has a relatively wide customer base (>10 mln annual customers), which show their ability to involve customers online. Compared to bol.com, the online customer bases of the other AD brands are relatively small.

4.1.2.1.5 Legitimacy at Ahold Delhaize

The abovementioned pros and cons of bol.com and AH creates a difficult situation in determining a legitimate ecosystem leader. Additionally, the difference in culture between bol.com (value proposition focus, rapid development) and AH (short-term sales focus, control oriented) analyzed in the materialization conditions, creates a complex situation in creating a leader-follower relation. Additionally, trying to reach consensus by acting as a consortium was also difficult for in project A, while, as shown in the “envisioned control points”, the combination of the incumbent VPs was complex. Therefore, it is assumed that the alignment condition ‘legitimacy’ created a rather political situation in which the undivided legitimacy from either bol.com or AH to the respective others was difficult to assure. Additionally, in the efforts for joint value creation around project A, there has been no clarity on who should coordinate the project.

The complexity around legitimacy for an ecosystem leader when creating joint value with an online marketplace and a strong ‘traditional’ retailer, which is explained above, may be applicable to other strong incumbent retailers that try to create joint value with online marketplaces. Since the identified characteristics may generally apply to online marketplaces and incumbent retailers, these results might be generalizable. However, to provide a reliable answer, future research should test whether this assumption holds for other cases.

4.2 Customized mixed price bundling

The proposed bundling model that has been elaborated in chapter 3, has described how profit can be maximized for the brands of AD. This chapter shows the result from applying the model to the Dutch retail sector by focusing on the AD brands that operate in the Netherlands. First, an overview of the acquired inputs is shown. Thereafter, the results of the model are provided. Finally, it is shown how the proposed bundling strategy creates DSES by applying the results to the DSES theory and show how bundling can be used as an EVP.

4.2.1 The required inputs

Table 7 shows the input parameters and the source from which they were collected. A detailed description on how the approximations for the given parameters are acquired has been elaborated in ‘Appendix C’.

Table 7. The input parameters and the respective source from which the approximation is gathered

Given parameter	Collected from
$Q_{S^*X^*}$	AD (Randomized in range of 25%)
$CM_{S^*X^*}$	AD (Randomized in range of 25%)
$PE_{D_{S^*X^*}}$	Academic literature
$\alpha_{S^*X^*}$	Ahold Delhaize annual report (market shares)
$SCE_{S^*X^*}$	Academic literature and Euromonitor International
D	Optimization variable

An overview of the acquired approximations for the required input parameters is shown in table 8. Again, for a detailed description on these sources and the reliability of the found inputs, please refer to Appendix C. It has to be noted that it was difficult to acquire a reliable approximation for SCE. Some sources indicated that price alone is not a very reliable indicator of a consumers switching behavior (Hellström, Tsvetkova, Gustafsson, & Wikström, 2015).

Table 8. The acquired approximations for the required input parameters for the bundling model

Respective market	Brand	$\alpha_{S^*X^*}$ (%)	SCE	$Q_{S^*X^*}$ (€)	PED	$CM_{S^*X^*}$ (%)
groceries	AH	34,70	- 0,54	20,50	- 0,60	18,43
e-commerce	Bol	11,75	- 2,31	46,24	- 1,86	9,17
Drugstore	Etos	15,35	- 0,52	14,19	- 0,88	36,11
Liquor store	Gall	38,24	- 0,88	21,75	- 1,82	24,37
Combined	AD	0,24	N/A	102,68	N/A	N/A

4.2.2 Results

After providing the required inputs in the model, a solver model was used in order to determine the discount levels that maximizes the profit for AD. The logic that has been described in ‘The Proposed Model’, has been followed in order to provide the results. Two scenarios have been analyzed. The first scenario considers a bundling strategy in which all the AD brands participate. The second scenario considers a strategy where only AH and bol.com. In this section, first, the calculated intermediate variables will be provided, thereafter the results of the objective function will be provided for both scenarios.

4.2.2.1 All of the brands

First of all, it is interesting to note that none of the single brands could increase its profits by providing discounts for separate sales, according to the model and the provided inputs. Therefore, bundling is required to be able to increase profits by providing discounts. The first

scenario that is modeled considers the profit maximization for the combined profit of all AD brands. By using the Excel Solver function to maximize the profitability of the AD brands from the introduction of price bundles, the optimal pricing strategy was modeled by changing the percentage of provided discount (D). Figure 4 shows the calculated profitability (y-axis) for several provided discounts (x-axis). The profitability in the figure shows the combined profitability of all AD brands. As can be seen in figure 4, profit is maximized around 8%. However, the figure is slightly inaccurate, since it is modeled based on rounded numbers for the provided discount. The solver model found that the profit is maximized for a provided discount of 8,43%.

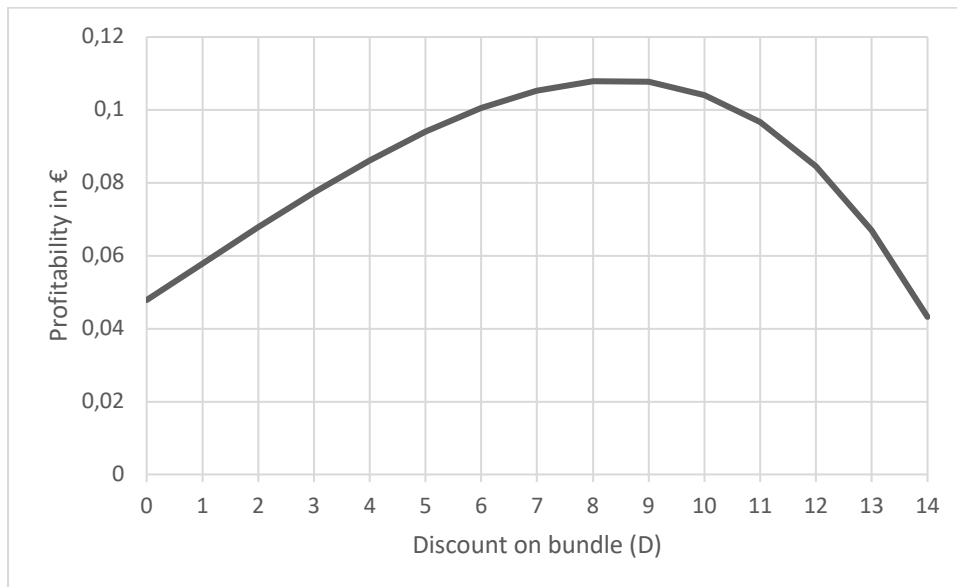


Figure 4. The expected profit per random customer in the respective markets after providing discount (D) on the average bundle

4.2.2.1.1 Intermediate variables

For the calculated bundle discount of 8,43%, the intermediate variables have been calculated. The underlying logic for the intermediate variables is provided in ‘The Proposed Model’. An overview of the calculated intermediate variables is shown in table 9. As shown in the table, the chance that a random customer that intends on buying in all of the respective markets, buys the bundle at all of the modeled AD brands is 1,10%. As shown in the table, the SC is increased by 0,87%, showing the customer base shopping at all of the AD brands is nearly doubled. Especially, the increase in SC ($\Delta \alpha_{DSBOL}$) for bol.com is notably large, while it almost tripled. This is due to the high SCE that was found for the e-commerce market. Nonetheless, the profit margin of bol.com fell to near zero (0,74%), indicating that an additional sale would only minimally increase the expected profits.

Table 9. The calculated intermediate variables, based on a provided discount of 8,43%

	$\alpha_{S'X}$	$\alpha_{DS'X}$	$\Delta \alpha_{DS'X}$	$\Delta \alpha_{CD'X}$	$Q_{DS'X}$ (€)	$\Delta Q_{DS'X}$ (€)	$CM_{D'X}$
AH	34,70	39,25%	4,55%	0,54%	21,54	1,04	10,00%
Bol	11,75	31,23%	19,48%	0,34%	53,49	7,72	0,74%
Etos	15,35	19,73%	4,39%	0,37%	15,14	1,02	27,68%
Gall	38,24	45,67%	7,42%	0,57%	25,09	3,55	15,9%
AD	0,24	1,10%	0,87%	N/A	115,26	13,39	N/A

4.2.2.1.2 Profitability

The calculated profitability shows the change in profit for a random customer that intends to purchase in the respective markets in which the AD brands are active. As shown in table 10, the change in profit from bundled sales relative to the profit before providing the discount is +48,37% for AH, -67,17% for bol.com, +173,72% for Etos, +89,90% for Gall, and +97,70% for all the brands combined. Please note, while these percentages may look unacceptably high, this increase only denotes the increase in profit from the small number of consumers that is intending to buy in all markets in which AD is active. The absolute increase in profit for AD, for a random customer in all respective markets is €0,77.

Table 10. An overview of the output data from the bundling model for AH and bol.com

	TP _{S'X'} (€)	Δ TPC _{DS'X'} (€)	Δ TP _{DS'X'} (€)	TP _{DS'X'} (€)	TP (%)
AH	0,0204	- 0,0088	0,019	0,0099	48,37%
Bol	0,0145	- 0,0131	0,0034	- 0,0097	-67,17%
Etos	0,0189	- 0,0034	0,036	0,033	173,72%
Gall	0,0302	- 0,0074	0,035	0,027	89,90%
AD	0,084	- 0,033	0,093	0,060	71,70%

Interestingly, all brands more than double their profitability, except for bol.com, which has negative profitability from introducing the bundling strategy. Even though the increase in SC probability ($\Delta \alpha_{DSBOL}$), and the increase in ABS (ΔQ_{SBOL}) of bol.com is relatively high, the profit of bol.com is decreasing. This follows from the CM_{DBOL} being only 0,7%, which indicates that, for the provided discount, bol.com has almost reached MC=MR. Since bol.com had the lowest CM of all the brands, relative to its original value, the margin of bol.com was cannibalized the most. Also, since an additional sale by the other three brands was more profitable than the profit loss from an additional sale by bol.com, the optimal pricing for the combined brands, lead to a decrease in profitability for bol.com.

It is also interesting to note that the firms that profit the most are the ones that sell a limited range of product variety with high profit margins. Even though those firms are of lesser strategic value to the firm, due to the limited increase in inimitability of their added product variety, they seem to grasp the most profit from the introduction of bundles. Accordingly, there is a mismatch between the strategic value that a firm with large product variety and low margins, and the profitability of the firm that creates the strategic value. The mismatch may also be a result from excluding buying frequency in the bundling model. Whereas, firms with large product variety may also have higher buying frequency.

4.2.2.1 Compensating bol.com

As shown in the results of the first bundling scenario, the profitability of bol.com decreases. Several options exist in order to deal with the decreased profitability of bol.com. Bol.com could be compensated for their profit loss, bol.com could be left out of the bundling effort, or the provided discount could be decreased increasing the CM of bol.com. From an economic perspective, it may be the logical choice to exclude bol.com from the bundling efforts. However, strategic considerations have to be taken into account. While bol.com provides a large product number of product categories that bol.com sells, it would be unwise to leave out bol.com, due to increased imitability of the bundles. There are plenty of retailers that can offer product categories present in supermarkets, drugstores, and liquor stores combined. However, very few can include the product variety of bol.com to the before mentioned categories. Therefore, from a strategic perspective, it would be unwise to exclude bol.com from the bundling strategy.

Taking the above strategic consideration into account, from an economic perspective, the most profitable scenario now becomes the compensation of bol.com for their decreased profitability. The increased profitability of the other brands can be distributed, such that the loss of bol.com is compensated. Upon decreasing the amount of discount provided, the total combined profitability of the brands decreases. Therefore, in order to maximize profitability, the compensation of bol.com is the most logical option.

4.2.2.1.1 Online marketplaces

The CM of the sales from affiliated third-party merchants on bol.com is likely to be smaller than the CMs used for the model. Accordingly, only a small discount can be provided, before cannibalizing the CM. Therefore, the model may have different implications for online marketplaces. Where the profitability of bol.com is already lower, compared to providing no discount, the profitability will decrease further if the CM_{BOL} has a lower value. Accordingly, as discussed before, the compensation of the online marketplaces for incumbent retail groups should be considered.

Even though the goal of this chapter is not to propose solution, I want to mention one way in which this problem can be solved too. Online marketplaces may utilize bundling as a tool to offer to its affiliated merchants. The online marketplaces could offer an expected increase in revenue, if the affiliated merchant is willing to lower its CMs for the proposed bundle. This way, the affiliated merchants may benefit from an increase in revenue, against lower CMs. The online marketplace may then be able to raise its CM, such that the bundling strategy remains more profitable to the online marketplace.

4.2.2.2 Albert Heijn and bol.com

The previous chapter has pointed out that for decision-making around joint value creation efforts Gall&Gall and Etos are often not taken into account. Additionally, many products that Gall&Gall and Etos sell, are also sold by AH and bol.com. Therefore, it can be assumed that several product categories between Gall&Gall and AH, and between Etos and AH, are substitutes. For this scenario it is assumed that AH and bol.com introduce a customizable mixed price bundling strategy. The proposed model is also used to model profit maximization in the case that AH and bol.com provide price bundles with their product variety. The first scenario results were modeled by including all of the brands in the modeling sequence, for this model, only the parameters and variables for AH and bol.com were required (i.e. Gall&Gall and Etos are simply excluded). The contribution to the profitability of AD as a whole is solely calculated by modeling AH and bol.com.

Following the substitution assumption, it may be assumed that an increase in sales at AH and bol.com, can decrease the sales at Gall&Gall and Etos. For a more accurate estimation, the substitution effect should be considered. However, in order to model this, the distribution of the product categories in the ABS should be calculated. This data was not available and would increase the complexity of the model. Therefore, the substitution effect is not considered. Therefore, the contribution to the profitability of AD may be higher for this model, compared to a scenario in which the substitution effect is included in the model.

Again, the Excel Solver model was used to maximize the profitability by changing the provided discount (D), in this case for AH and bol.com. Figure 5 shows the calculated profitability for a range of provided discounts. The profit shown in the figure, considers the profit of AH and bol.com combined. As can be seen in the figure, the profit is at a maximum between 3% and 4%. Again, the figure used rounded discount numbers to estimate the profitability, therefore the profitability not detailed enough to use the graph accurately. The solver model calculated that profitability was maximized for AH and bol.com, when the provided discount was set at 3,69%.

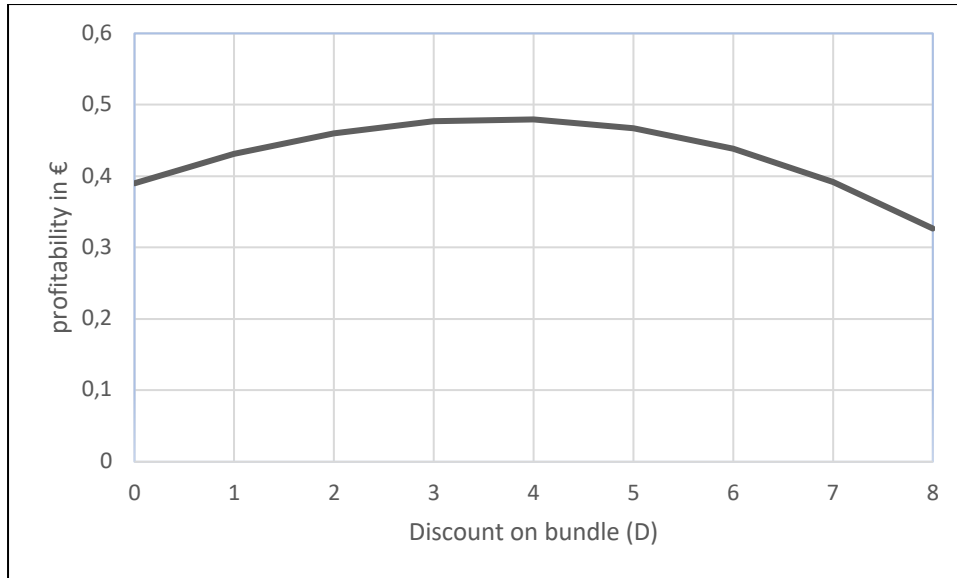


Figure 5. The expected profit per random customer in the respective markets after providing discount (D)

4.2.2.2.1 Intermediate variables

The intermediate variables have been calculated for a provided discount of 3,69%. An overview of the calculated intermediate variables is shown in table 11. Logically, compared to the previous scenario, the store choice probability is much higher. This is due to the lower number of firms participating in the bundle. Still, the results presented in the table show that the SC probability for the bundle is almost doubled, from 4,08% to 7,44%. Interestingly, the increase primarily comes from bol.com, due to the high SCE for the e-commerce market. Also, the increase in basket size is primarily driven by bol.com due to the high PED and the relatively basket size before providing the discount. Interestingly, the CM for bol.com is much higher (+4,74) compared to the previous scenario, in which bols' margins were cannibalized to an extent that the profit of bol.com was decreased. This follows from the lower amount of discount (D) that is provided.

Table 11. The calculated intermediate variables, based on a provided discount of 3,63%

	$\alpha_{s'x'}$	$\alpha_{DS'x'}$	$\Delta \alpha_{DS'x'}$	$\Delta \alpha_{DC'x}$	$Q_{DS'x'} (\text{€})$	$\Delta Q_{DS'x'} (\text{€})$	$CM_{D'x'}$
AH	34,70	36,69	1,99	5,24	20,95	0,45	14,74
Bol	11,75	20,27	8,52	4,47	49,41	3,17	5,48
AD	4,08	7,44	3,36	N/A	70,36	3,63	N/A

4.2.2.2.2 Profitability

The calculated profitability shows the change in expected profit for AH and bol.com, from a random customer that intends to purchase in e-commerce and groceries. As shown in table 12, the change in profit without providing a discount, the profit growth for AH is 34,16% for AH, and 11,88% for bol.com, and 23,26% for the two brands combined, compared to the profits that the combined brands would have captured for a random customer in the market without providing a discount.

Table 12. An overview of the output data from the bundling model for AH and bol.com

AH & BOL	$TP_{s'x'}$	$\Delta TPC_{DS'x'}$	$\Delta TP_{DS'x'}$	$TP_{DS'x'}$	TP (%)
AH	0,20	- 0,036	0,10	0,068	34,16

Bol.com	0,19	- 0,068	0,091	0,023	11,88
AD	0,39	- 0,10	0,19	0,90	23,26

Even though the margins of bol.com are nearly half of their original value (from 9,17% to 5,48%), bol.com remains profitable in this scenario. The increase in SC probability ($\Delta \alpha_{DS^*X^*}$) and the increase in ABS ($\Delta Q_{DS^*X^*}$) from bol.com are higher than that of AH. Therefore, even though the margins of bol.com are cannibalized to a greater extent (relative to the original value) than those of AH, the increase in SC probability and increase in ABS for bol.com create a profitable scenario for both brands. Therefore, even though the online marketplace may be characterized by low margins, the high PED and SCE for the e-commerce market, create much more sales volume compared to supermarkets.

4.2.3 Comparing both scenarios

It is shown that the high PED and SCE cause a high increase in SC probability ($\Delta \alpha_{DS^*X^*}$) and in ABS ($\Delta Q_{DS^*X^*}$). Nonetheless, the decrease in CM is relevant to consider for the change in profitability. As shown in the scenario with all AD brands, the low CM of bol.com created a decrease in profitability for bol.com, even though the SC probability and ABS of bol.com was increased the most. However, upon providing a lower discount, as in the scenario with AH and bol.com, the increase in profitability of bol.com is similar to that of AH.

Both scenarios are profitability, indicating the expected potential to capture value form the introduction of bundles among the AD brands. Interestingly, the increase in combined profit of AH & bol.com in the second scenario is around 20 times higher than in the previous scenario. This follows from the effect of multiplying several SC probabilities ($\alpha_{DS^*X^*}$). The multiplication effect between the SC probabilities of the different brands weighs stronger against the profitability than the effect of the linear PED on ABS, or the sum of the increased profitability of the different brands. The SC probability for AH and bol.com is more than six times higher than the SC probability for all brands.

4.2.3.1 Introducing both bundling strategies

According to the above logic, it would be more profitable to introduce a bundling scenario for AH and bol.com rather than for all brands. However, it can also be considered to introduce both scenarios. This would further increase profit, since the profit increase of both scenarios can be leveraged. On the other hand, it has to be considered that both scenarios may also cannibalize one another. For example, customers that are drawn towards buying the bundle from all AD brands, are not buying the bundle from AH & bol.com. Therefore, the profit maximization of both scenarios may have to be recalculated. This can be done by including calculating the new SC probability of AH & bol.com, by subtracting the SC probability of all brands ($\text{new } \alpha_{DAH\&BOL} = \alpha_{DAH\&BOL} - \alpha_{DAD}$). This has not been done for this research, but has to be considered if an incumbent retail groups aims to analyze the optimal pricing strategy after introducing customized mixed price bundling between multiple sets of brands.

4.2.1 Summary

To summarize this chapter, it was found that the introduction of customizable mixed price bundling by the AD brands is profitable. The scenario in which all AD brands were included, the profitability of all brands more than doubled, except for bol.com, which had a decreasing profitability. The decrease in CM of bol.com created a situation in which MC approximated MR (CM = 0,74%). Accordingly, the existent sales of bol.com are expected to be more profitable than the increased sales with the lower margin. It has been suggested to compensate bol.com for the decreased profit in order to maximize the profitability of the introduced

bundling scenario. In the other scenario, in which only AH and bol.com were included in the bundling strategy, increased the profitability of both brands nearly equally.

4.3 Bundling in an ecosystem

The main objective of this research is to show how bundling can be utilized as an ecosystem value proposition (EVP) for incumbent retail groups. As mentioned in the introduction, the inability of incumbent retail groups to create complementary effects between online marketplaces and other incumbent retail brands seems especially challenging to incumbent retail groups. This section will outline how bundling can be seen as an EVP, and how it addresses joint value creation for AD, including also the complementarities between bol.com (i.e. online marketplace) and the other AD brands. This will be done by combining the results from both sections in this chapter.

4.3.1 Demand side economies of scope

In order to show that bundling creates value, it is relevant to show that the introduction of bundling create demand-side economies of scope (DSES). Following the outlined academic literature on DSES in chapter 2, DSES occur “*when the costs of consuming multiple (related) products or services is cheaper than consuming the goods separately*” (see Chapter 2). This chapter has shown that upon introducing customized mixed price bundling, purchasing goods as a bundle at all of the AD brands (or AH and bol.com in the second scenario), is cheaper for the consumer than buying the products separately at the AD brands. Accordingly, introducing customized mixed price bundling creates DSES. Following from the creation of DSES, it can be stated that the advantages of consuming multiple products are reaped on the demand-side, which shows that consumers benefit from the introduction of bundles. Also, considering the introduction of bundling among different actors, bundling can be considered as joint value creation among the involved actors.

4.3.2 Bundling as an ecosystem value proposition

In order to show that bundling can serve as an EVP, it has to be considered whether the customer can utilize complementary effects between the products that are offered by the actors that introduce the bundle. Additionally, the ability of the bundling efforts to address the heterogeneity of the idiosyncratic consumer needs has to be shown. It has to be shown that the consumer can pick a ‘bundle’ of complementors around a focal firms’ value proposition.

The creation of the complementary effect is the discount provided only for shopping at multiple stores. In other words, the bundle discount creates complementary effects between the AD brands through the created DSES. The discount on products that can be bought at the AD brands creates incentives for customers to shop at the other AD brands. Accordingly, the complementary effect is the discount on additional products from AD brands. As shown in the results from the bundling model, SC probability is increased for all of the AD brands upon providing discounts. This shows that upon introducing the bundle, customers are also drawn towards the AD brands, such that they utilize the complementary effect between the firms.

The customizable nature of the modeled bundling scenario addresses the heterogeneity of the idiosyncratic customer needs. Since the model assumes that all of the product variety of the modeled AD brands can be customized, the customer can purchase at one of the AD brands, and accordingly bundle products from the other firms to its individual preferences in order to acquire a discount. Following the definition of the system-level output that is typical for ecosystem output (chapter 2.1.1), customized bundling addresses the system-level output, since it “*allows the user to assemble a customized composition of modules [or products] to suit individual preferences*” (Thomas & Autio, 2019, p. 9). By fulfilling the above conditions, it can be stated that bundling can serve as an EVP.

4.3.3 Addressing the joint value creation constraints of incumbent retail groups

Where the incumbent retail groups have been unable to create complementary effects between the online and offline stores, introducing customizable mixed price bundling provides a strategy that can create complementarities between the incumbent retail brands and online marketplaces. Independent from an online marketplace, mixed price bundling may also be able to create complementary effects with the brands of incumbent retail groups. However, the strategic advantage that is relevant to consider for the inimitability of the bundling strategy for independent rivals, follows from the wide variety of products that is available at online marketplaces. Without including the online marketplaces, the bundling effort may be more likely to be imitable by competitors. Consequently, when excluding the online marketplace, the market may move towards a price war in which MC will approximate MR. Customizable mixed price bundling can be used as an EVP for incumbent retail groups and (acquired) online marketplaces, in order to create complementary effects between the incumbents' brands.

Two of the identified constraints from the previous analysis can be addressed by bundling as an EVP. One of the identified constraints from the previous chapter, concerned the inability to quantify the created and captured value of complex EVPs and the risk averse innovation climate at the AD brands. The proposed bundling model has shown that for this EVP, the created and captured value can be estimated. Therefore, the proposed bundling model may be utilized in order to overcome the constraint around the inability to quantify around the intangible returns. The other identified constraint concerned the required combinations of two incumbent VPs, in order to minimize cannibalization and maximize the potential to leverage ecosystem carryover. The proposed bundling model shows how the cannibalization can be minimalized to an extent that maximizes the profitability. Therefore, it addresses potential difficulties around envisioning the control points that minimize the harm to existent sales or existent business. A solution to the identified constraint around legitimacy of the ecosystem leader is not addressed by bundling as an EVP.

Additionally, as was suggested in the results of the first bundling scenario. From an innovation ecosystem perspective, Adner (2012) has shown that, in order to reach alignment towards the materialization of an ecosystem, compensation may be required in order to improve the success of the joint value creation (Adner, 2012). Therefore, an ecosystem approach can also be used in order to address the problems that arise in the bundling model. This shows that in order to create alignment around the joint value creation of a bundling EVP, an innovation ecosystem perspective may be the right perspective to analyze its implementation.

5. Discussion and conclusion

The goal of this research is to analyze the opportunity to create an ecosystem value proposition for traditional retail groups. In order to do so, the following research question has been analyzed.

Why is bundling an ecosystem value proposition for different brands of an incumbent retail group?

In order to answer the research question, the Dutch brands of Ahold Delhaize (AD), a globally active incumbent retail group has been analyzed. Two sub questions have been constructed, in order to (1) analyze the alignment and materialization conditions of incumbent retail groups that constrain the materialization of an EVP, and (2) to quantify the opportunity around introducing a customizable mixed price bundling strategy of the combined product variety of the AD brands. In order to conclude, this section first provides the conclusion on the first sub question, thereafter the conclusion on the second sub question is provided. Finally, the two parts are combined into a coherent answer to the main research question.

5.1 The alignment conditions for value co-creation / joint value creation

Which alignment and materialization conditions constrain the envisioning and materialization of ecosystem value propositions with the brands of incumbent retail groups?

This question was answered by testing the alignment and materialization conditions that were identified from the dynamic process model of Dattee et al. (2018). The ecosystem emergence literature indicated the lack of empirical research around the envisioning and materialization of EVP in ecosystem emergence. Therefore, the alignment and materialization constraints introduced by Dattee et al. (2018), were used to analyze the ecosystem emergence at AD. The conditions were analyzed by conducting semi-structured interviews with employees that were involved in joint value creation efforts between the brands of Ahold Delhaize (AD) in the Netherlands. It was found that there were several alignment and materialization conditions that constrain the alignment and materialization of EVPs at an incumbent retail group.

To conclude, it was found that, for ecosystem emergence by incumbents in which the EVP is based upon the combination of successful incumbent VPs, envisioning and leveraging control points constrained the alignment towards the materialization of the EVP. The analyzed EVP (Project A), required the combination of the incumbents' successful consumer-facing VPs. By conducting semi-structured interviews and analyzing secondary documents of AD, it was found that the cannibalization of the successful VPs and the willingness of separate brands to leverage ecosystem carryover increased the complexity around the envisioned control points. The presence of the incumbent VPs, the success of the VPs, and the difference in the success metrics of the VPs, decreased the possibility to create consensus on the best way to leverage ecosystem carryover and minimize cannibalization. Additionally, introducing the EVP would cannibalize the incumbent VPs, causing an increased willingness of the separate brands to utilize ecosystem carryover effects, in order to minimize the cannibalization.

Additionally, due to the difference in innovation culture, there seemed to be a constraint between the internal and external momentum of incumbent retailers (e.g. AH, Gall&Gall, and Etos) and online marketplaces (bol.com). The focus of control of AH, following from the accounting scandal and the appreciation of the stable shares of AD, countered the focus on scaling and value proposition of bol.com. This created a decreased momentum for the

materialization of EVPs that were initiated by bol.com. Also, the resource allocation (investment) was related to the shareholders, which generally value the share of AD due to its stability. The complexity of EVPs create uncertainty, due to the height of the investment that is required for the development of the EVP and the inability to quantify the increase in value from the EVP. Investing in EVPs, therefore, can create volatility of the shares, which opposes the stability of the shares. The differences in 'innovation culture' also created legitimacy issues around the leader-follower relation in ecosystem emergence.

5.2 The opportunity for bundling

To what extent can the product variety of different brands of incumbent retail groups be utilized in order to increase profitability?

This sub-question was answered by developing and analyzing a customizable mixed price bundling model. A customizable mixed price bundling model was proposed with the objective of profit maximization for AD. The proposed model showed a new way to estimate profitability of bundling. Where previous research has mostly addressed monopolistic environments or modeled two products or two firms, the proposed bundling model addresses a competitive environment in which independent rivals are unable to imitate the bundling strategy. Therefore, it was assumed that introducing mixed price bundling does not result in a price war. Additionally, the bundling model has shown how cannibalization can be modeled. Much of the multi-product bundling literature has assumed $MC = 0$. This bundling model has shown how customizable multi-product bundling can be addressed when $MC > 0$. It showed how to calculate the cannibalization of existent sales.

To conclude, the introduction of customizable mixed price bundling has been shown to increase profitability for AD. The analyzed bundling model showed that profit can be maximized for bundling with all brands, when providing a discount of 8,98%. It was shown that, when introducing customizable mixed price bundling for all of the Dutch AD brands, the captured profit from a random customer that intends to buy in the respective markets of the AD brands, is increased by 71,70%, or €0,60. In the scenario in which all brands were modeled, the profitability of bol.com decreased. Even though the PED and SCE were relatively high, the MC approximated MR, such that additional profitability decreased.

For the introduction of bundling by AH and bol.com, the bundling model showed that profit was maximized, when a discount of 3,63% is provided. The captured profit for AH and bol.com combined, showed an increase of 23,26%, or €0,90. In the bundling scenario in which only AH and bol.com introduce the bundles, bol.com remained profitable, since the provided discount did not cannibalize the CM as much as in the first scenario. However, for both scenarios, it has to be noted that the approximations that were made for the SCE have to be tested for reliability.

It was also shown that even though the bol.com adds much strategic value due to the large product variety, creating an inimitable bundling strategy, bol.coms' profitability was decreased. The firms with a small range of product variety, but high profit margins were assumed to grab most of the profits from the proposed bundling model. Accordingly, there is a mismatch between the strategic value that a firm with large product variety and low margins, and the profitability of the firm that creates the strategic value. It has to be noted here that the bundling model does not include the buying frequency in the model, which may be higher for firms with large product variety.

5.3 Bundling as an ecosystem value proposition

Having provided an answer to both sub question, this section concludes on the main research question by combining the answers to both sub questions into one all-encompassing answer to

the main research question. As shown in the introduction the incumbent retailer groups seem to have challenges in creating complementary effects between their incumbent brands and (acquired) online marketplaces.

To conclude, it has been shown that customizable price bundling can serve as an EVP for incumbent retail groups. Introducing bundles can increase the profitability of the incumbent retail groups, while create complementary effect between the brands of the incumbent retailers. Therefore, it can serve to create complementary effects between the online marketplaces and brands of incumbent retail groups. Additionally, it was shown that bundling is able to create DSES, such that, upon introducing the bundling strategy, value is created for the customer. Also, due to the customizable nature of the proposed bundling strategy, the bundling strategy is able to address the heterogeneity of the idiosyncratic needs of consumers. Accordingly, bundling can be treated as an EVP, since it enables the combination of a customizable set of complementary elements in a system-level output.

Finally, it is shown that the proposed bundling model is able to address two of the identified alignment and materialization constraints that were identified in the ecosystem analysis. The first constraints concerned the inability to quantify the potential value capture envisioned EVPs. The bundling model showed that the inability to quantify the potential captured value of EVPs can be overcome, since the bundling model enables the calculation of the captured value. The second constraint concerned the need to leverage ecosystem carryover for the separate AD brands in order to minimize the cannibalization of the successful consumer-facing VPs. The proposed bundling model has shown a way in which the cannibalization can be calculated, such that the cannibalization can be minimized. Accordingly, the bundling model can overcome two of the identified constraints.

6. Reflection and implications

The final chapter reflects on the outcomes of this study. First it elaborates on the relevance of the results of this study on the scientific community. Both the findings from the ecosystem analysis and the implication of the results from the bundling model will be addressed. Additionally, the practical implications of this research for incumbent retail groups will be elaborated. Finally, the quality of this work is discussed along with its limitations.

6.1 Scientific implications

The ecosystem literature has indicated a lack of empirical data in the analysis of ecosystem emergence. This research has shown that the dynamic process model and the relevant themes that were introduced by Dattee et al. (2018), provide a good framework to analyze ecosystem emergence processes. The only theme that has to be added to the themes presented by Dattee et al. (2018) is the legitimacy of the ecosystem leader.

Ecosystem creation by incumbents is poorly understood by academics. This research presented the relevance of ecosystem carryover for ecosystem creation when it requires the combination of incumbent consumer-facing VPs. Ecosystem actors are expected to want to leverage ecosystem carryover effects in order to jump-start the EVP and minimize cannibalization of the incumbent VPs. As shown in this research the process around envisioning how to leverage ecosystem carryover creates difficulties in the creation of alignment of ecosystem actors. The concept ecosystem carryover has only been briefly introduced by Adner (2012; 2015), however this research shows its relevance in innovation ecosystems and ecosystem emergence. Future research that is aimed at ecosystem emergence at incumbents should aim to further show the relevance of the concept, by showing in which contexts ecosystem carryover is applicable and what the consequences of leveraging ecosystem carryover are.

The proposed bundling model has shown a new modeling approach for multi-product bundling in a competitive environment. This specific model is fit to the assumptions that were made, which consider that bundling occurs in an imperfect competition, in which independent rivals are unable to imitate the bundle pricing strategy, and the introduced bundles can be customizable to fit the customers' needs. The proposed model can be utilized in future studies, if the bundling strategy falls within the above assumptions. Additionally, the proposed bundling model has shown a new way to estimate the cannibalization of existent sales. By using economic logic to the bundling literature, the cannibalization of margins from old and even new customers that already shop at one of the separate AD brands that now refer to the bundle has been calculated. For bundling with physical goods, in which $MC > 0$, the cannibalization has to be considered.

6.2 Practical implications

The ecosystem analysis indicated that the willingness to leverage ecosystem carryover constrained the alignment around the envisioned control points. By having identified this constraint, the ecosystem actors should consider what the risks are from cannibalization of their consumer-facing VP, relative to the expected gains from introducing the EVP. Considering the expected lengthy process for the envisioning of the control points and how to leverage them, the speed-to-market of the development of the EVP can be decreased for EVPs that require the combination of incumbent VPs. Therefore, the competitive advantage of the EVP may be decreasing.

Additionally, the divergence between the innovation culture between traditional retailers (e.g. AH, Etos, Gall&Gall) and online marketplaces (e.g. bol.com), can create friction in the development of EVPs. The focus of online marketplaces towards materializing VPs and scaling is slowed by the focus of control of traditional retailers, which causes friction between both

types of organizations. In practice, when aiming to collaborate, the collaborating organizations should consider the other perspective and aim to find a way to minimize the friction in order to achieve their goals. For example, online marketplaces should consider whether the speed to market of their VPs or the added value from the traditional retailer to the VP is more important.

6.2.1 Introducing customizable mixed price bundling

The findings from the analyzed bundling model shows that bundling can be used to increase in profitability for an incumbent retail group. It can be suggested to incumbent retail groups to start introducing customizable mixed price bundling when independent rivals are unable to counter-bundle. Where it has been shown that the combined profitability of the involved actors increases, it was also shown that online marketplaces may have to be compensated for the introduction of the bundling strategy. Upon introducing a comparable bundling strategy, the compensation of the online marketplaces should be considered in order to stimulate its participation.

The proposed model required several assumptions that made the model diverge from reality. In order to show what the implications of these assumptions are in practice, the section underneath will briefly consider how to tackle the assumptions that were made into a practical applicable situation. First of all, the assumption that consumers can bundle all of the product variety offered by the AD brands into any customizable bundle (as long as it consists of products from all of the AD brands), may create difficulties to the implementation of the bundling strategy. The simplest approach is to allow users to achieve a discount on shopping at all AD brands rather than at one brand. Then the bundling model would, in essence, describe volume discounts. This would create complementary effects between the AD brands without having to leverage complementarities between different products or product categories.

The assumption that the AD banners are neither substitutes nor complements is not reliable in practice. There are complementary and substitution effects between the AD brands. For example, complementarities exist, since AH, Etos, and Gall&Gall often have their stores in the same building, which stimulates customers to shop at several of the AD brands, while transaction costs are minimized (i.e. walking distances are very low). On the other hand, substitution effects exist, while AH sells product categories that Gall&Gall and Etos are also selling. Actually, Retail Insider estimated that supermarkets sell around three times more alcoholic beverages than specialized liquor stores (Retail Insider, 2019). These complementarities and substitution effects are neglected in the model for convenience, however existing complementarities provide a starting point for introducing the bundles between the brands.

For the introduction of the first bundles (when not providing the volume discount solution), complementarities between products should be leveraged. The bundling efforts could start by introducing bundles, from which the complementary effects can be induced by simple sense-making. For example, complementary effects are likely to exist between a barbecue, meat, wine and beer, or between a coffee machine, coffee beans, possibly filters, and coffee cups. Where the first complementary effects between products can be induced by simple sense-making, future scenarios can be predicted by an algorithm. Upon knowing many customers among the AD brands, data analysis can analyze whether complementarities exist between different products of the AD brands. Additionally, recommender systems can be used to provide customized and personalized bundles. For example, Beladev, Rokach, & Shapira (2016) have studied the use of item-item and user-user collaborative filtering as a recommender system for recommending bundles to consumers. Leveraging complementarities between products likely increases the PED and SCE of the bundles, such that profitability may be further increased. Future research could analyze to what extent the complementarities could increase the customers' willingness to pay for the bundles.

6.2.1 Bundles at online marketplaces

Online marketplaces facilitate the interaction and transaction between sellers and buyers. The wide product variety required for the bundling may include the products of third-party merchants. When introducing bundles, the expected increase in revenue for specific sellers could be used as a marketing tool for these merchants. Since the bundling is likely to stimulate their sales, the online marketplace might create contracts that lower the margin of the seller against an increase in revenue. Contracts could be negotiated with the merchants, such that the discount does not affect the small margins that online marketplaces have on sales of third-party merchants.

6.3 Limitations and future research

The final section of this research elaborates on the quality of this research and the limitations on the methods that were used. Additionally, it addresses topics for future research that can improve on the found limitations. First and foremost, one general limitation for both research parts concerns the generalizability of the chosen single case study design. It has been assumed that Ahold Delhaize has several characteristics that are similar to other incumbent retail groups, also it has been assumed that bol.com has similarities with online marketplaces or other e-commerce organizations. For example, in the bundling model the suggestion for the compensation of online marketplaces were based on the assumption that online marketplaces provide high strategic value due to the high product variety and simultaneously have low CMs. The reader and future researchers should understand these assumptions when they aim to apply the findings from this research in future studies. The case study has been elaborated to a level that should enable the reader to gain an understanding of the context of the phenomenon.

6.3.1 Ecosystem approach

The analysis of the identified constraints in the ecosystem analysis has remained relatively superficial. Even though the purpose of this research has been to *identify* the constraints, each of the found constraint should be analyzed into depth in order to propose fitting solutions to overcome the constraints. The innovation ecosystem literature and ecosystem emergence literature do not provide a further typology to address the identified constraints into more depth. Other literature streams are required to analyze the identified constraints into depth. For example, future research aiming to address the willingness to leverage ecosystem carryover for successful incumbent VPs, may utilize path creation and path dependence literature.

6.3.2 Bundling model

It is assumed that the wide range of product categories that are offered by the different AD brands create a strategic advantage by assuming that competitors are unable to imitate the bundling strategy. This assumption requires further attention to ensure its validity. The strategic considerations around the inimitability of the bundle is not inherent in the proposed model. Therefore, the assumption has to be tested before considering bundling in a competitive environment. Also, while the model solely considers the effect of price on consumer behavior, the wide variety of product categories that can be combined are not considered. Increasing the variety of product categories that can be bundled, can complement the customizability of the bundle, and affect the strategic considerations for the model. Future research is required to address the effect of increasing the variety of product categories on customizable bundling, in order to show how and whether complementarities can be created between different product categories.

The proposed bundling model only considers the influence of pricing on consumer behavior. In reality, other aspects are important to consider, such as brand loyalty, consumer characteristics, location etcetera. As Briesch, Chintagunta, & Fox (2009) have shown, consumer location is a better approximation to determine store choice for supermarkets than

price. Therefore, solely using price may have provided unreliable results. Especially for the approximation of SCE, the reliability of using price as a measure of SCE has to be tested. Future research should address the effect of price on SC for different markets in order to increase reliability. On the other hand, using the variable SC probability in the proposed model allows future researchers to utilize the proposed model and include other factors than only price in the estimation of SC probability.

Heterogeneity is addressed by averaging the basket sizes of all transactions at each of the AD brands. This is a relatively simple way to address heterogeneity. Several academics have argued that in order to increase the accuracy of the estimate, different consumer groups should be considered. For example, different age groups, locations, and other factors should be included to more accurately predict the heterogeneous customer base.

The estimated cannibalization did not include the cannibalization of consumers that purchase at multiple AD brands and now refer to the bundle. This is expected to slightly decrease the profitability of the introduced bundling strategy. By multiplying the SC probabilities of the different firms, the SC probability of consumers shopping at multiple brands can be calculated. Additionally, the cannibalized margin of the respective stores should then be considered, in order to model the decreased profitability. Future research should aim to increase the accuracy of the estimated cannibalization when consisting of more than two firms.

Finally, as discussed before, the assumption that there is independence between the SC probabilities of the AD brands may not hold. The assumption was required in order to decrease complexity of the model, but also diverged away from reality. Experimenting may be required in order to unravel the substitution and complementary effects between different products that can be bundled at the AD brands. Future research should address the complementary and substitution effects between different product categories.

7. References

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8. Appendices

8.1 Appendix A - Interview guide

It has to be noted that the underneath questions regard a rather generalized superficial interview guide. However, the semi-structured nature allowed the interviewer to follow up on unexpected topics. This allowed the author to go into depth when an interesting or unexpected topic was mentioned by an interviewee. The provided interview questions provided a question that could be used to introduce conversation on the specific topic. Additionally, the guide was adapted upon identifying constraints, such that additional questioning was provided after each interview, aiming to further identify the identified constraints.

“AD brand” staat voor de brand waar de interviewee werkt.

Introduction - general questions

1. Welke positie heeft u en hoe ben je hier terecht gekomen?
2. Wat is uw rol in de gezamenlijke waarde creatie / project A / de organisatie?
3. Bij welke initiatieven voor gezamenlijke proposities voor AD bent u betrokken geweest?

Ecosystem specific

General ecosystem questions:

- Welke uitdagingen heeft u ondervonden in de samenwerking met verschillende brands omtrent project A?
- Wat zijn volgens u de redenen waardoor project A gestrand is?
- Zijn er condities die “AD brand” ervan weerhouden om een waarde proposities te ontwikkelen?
- Welke waarde proposities naar de klant toe zijn wel succesvol en wat is het verschil tussen degene die lukken en degene die niet lukken?
- Zijn er andere condities die gezamenlijke samenwerkingen tegenwerken?
- Wat is er voor nodig om gezamenlijke waarde proposities tussen de AD brands succesvol te ontwikkelen?

provision

- Wat is de toegevoegde waarde van project A voor zowel de klant als voor “AD brand”?

Interdependencies

- Wordt er door elke AD brand waarde toegevoegd aan de propositie van project A?

Control points

- Was het duidelijk hoe “AD brand” zich zou gaan positioneren in de waarde propositie om deze waarde te vangen?
- Was het duidelijk hoe “AD brand” waarde toe ging voegen aan de propositie van project A?

Momentum

- Wat weerhoudt “AD brand” ervan om complexe projecten uit te voeren?
- Zijn er condities die “AD brand” weerhouden van het ontwikkelen van onzekere waarde proposities?

Legitimacy of ecosystem leader

- Welke van de Nederlandse AD brands vindt u het meest geschikt om gezamenlijke waarde creatie aan te sturen, te organiseren, en richting te geven?
- Als AH (of bol) een waarde propositie ontwikkeld, is de manier waarop zij de waarde propositie ontwikkelen dan naar wens van bol (of AH)?
- Zijn er relevante verschillen tussen bol.com en AH die samenwerking moeizaam kunnen maken?

8.2 Appendix B - The dynamic process model and its factors

The dynamic process model that has been developed by Dattee et al. (2018), has induced a process around ecosystem emergence. Figure 6 provides an overview of the first-order concepts and second-order themes that Dattee et al. have used in their research.

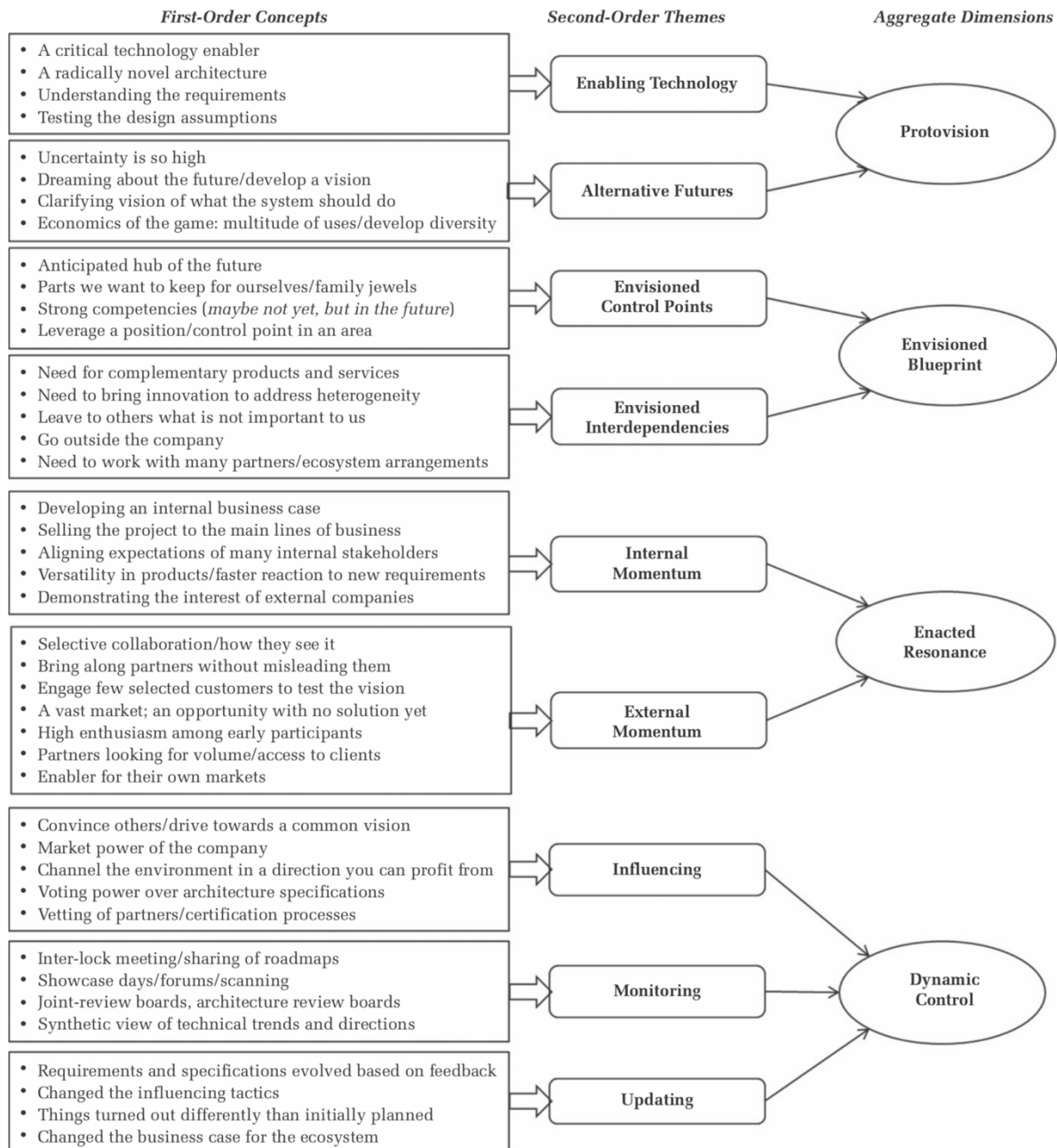


Figure 6. The conditions in the dynamic process mode, as copied from (Dattee et al., 2018, p. 474)

8.3 Appendix C - Details on acquiring the given parameters

This appendix shows how the given parameters were acquired. These data were used in the analysis of the proposed bundling model. Underneath, a description of the sources and the reliability of the data is elaborated.

8.3.1 Contribution margins

The $CM_{S \cdot X}$ have been approximated by randomizing the numbers that were provided by the AD brands. The numbers were randomized by assigning a random value in the range of 25% from the original value. An overview of the used CMs are shown in table 13.

Table 13. The randomized contribution margins (CM) of the AD brands that have been used as input for the proposed model

Banner	Contribution margin (%)
Albert Heijn	18,4
Bol.com	9,1
Etos	36,1
Gall&Gall	24,3

8.3.2 Average Basket Size

Even though the data was readily available from all of the AD banners, the data was not allowed to be made public. Therefore, estimates of the ABS were made. Rather than finding them in literature, they were based on the available ABS, but randomized in a range of 25% from the original value. This was done such that confidentiality was ensured, yet sensitivity of the data was diminished. This way the provided variables remained relatively representative for the case of AD. Table 14 shows an overview of the Q that has been used in the model.

Table 14. The randomized average basket sizes (Q) that have been used as input for the proposed model

Banner	$Q_{S \cdot X}$ (ABS, €)
Albert Heijn	20,50
Bol.com	46,24
Etos	14,19
Gall&Gall	21,75
AD	102,68

8.3.2.1 Average basket size elasticity

The approximations that were used to estimate the PED that influences the customized products in the consumer's basket size were gathered from academic literature. For each of the AD brands, an approximation was sought for its respective market. An overview of the found PEDs are shown in table 15 along with an overview of the limitations and its source. Most of the academic literature tested the PED of specific product categories of the respective markets. Therefore, based on the PEDs for specific product categories, the approximations are assumed to hold for other product categories in the market. Where multiple PEDs were found for the same market, the average of the found estimates was taken as an estimation of the PED for the market.

Table 15. The approximations of price elasticity of demand for the respective AD brands

	PED	Average PED	Limitation	Source	Brand
Grocery	- 0,60	- 0,60	Only non-alcoholic consumptions	(Andreyeva, Long, & Brownell, 2010)	Albert Heijn

e-commerce (books)	- 3,5 (books on BarnesandNoble) - 0,45 (books on Amazon)	- 1,86	High variety between two different e-commerce book sellers: indicating that pricing is not the primary differentiator	(J. Chevalier & Goolsbee, 2003)	Bol.com
e-commerce (fashion)	- 1,62	- 1,86	Only fashion product categories in e-commerce	(Heuer, Brettel, & Kemper, 2015)	Bol.com
Drug stores	- 0,76	- 0,875	Solely provided estimates for branded and generic medication products	(Yeung, Basu, Hansen, & Sullivan, 2016)	Etos
Drug stores	- 0,99	- 0,875	Based on product category of cleaning products, from sales in supermarkets	(Hoch et al., 2017)	Etos
Strong liquors	- 3,52	- 1,82	Only for strong liquor brands. It is expected that wine & beer may have higher PED.	(Mulhern, Williams, & Leone, 1998)	Gall&Gall
Beer & Wine	- 0,83 (beer) - 1,10 (wine)	- 1,82	Data may be outdated	(Gallet, 2007)	Gall&Gall

8.3.3 Store choice

The market share refers to the revenue that is gathered by the AD brand relative to the market that it operates in. In order to estimate SC by using market share, it is assumed that the ABS of customers in the market in which the respective AD brand is active, is the same for the whole market. For example, the ABS of all supermarkets in the Netherlands is assumed to be equal to the ABS of AH. Based on that assumptions, it is considered that $\alpha_{S \cdot X}$ (SC of each brand) is similar to the market share of the respective AD banner. The $\alpha_{S \cdot X}$ for each AD brand is shown in table 16 (Ahold Delhaize, 2019).

Table 16. The market shares of the AD banners that is taken as an estimate for store choice probability (SC)

Respective market	Brand	$\alpha_{S \cdot X}$ (2018, %)
groceries	Albert Heijn	34,7
e-commerce	Bol.com	11,7
Drugstore	Etos	15,3
Liquor store	Gall&Gall	38,2

8.3.3.1 Store choice elasticity

Approximations for SCE were gathered from academic literature. Several studies have analyzed to what extent price discounts affects consumer store choice in different markets (J. Chevalier & Goolsbee, 2003; Kim & Kim, 2017). Most of the studies that considered the effect of price on store choice probability, considered heterogenous customer segments and aimed to address the effect between the differences between these segments on store choice. However, for this research a proxy was required that addresses homogeneous customers. No academic study was found that directly addresses the approximation for a homogeneous elasticity variable. Therefore, when different customer segments were considered, the weighted average of the heterogeneous segments was taken as an approximation for an average homogeneous segment. It has to be noted that the above-mentioned assumption along with the difference in geographical location, decrease the reliability of this assumption. Therefore, future study is required to test the reliability of the found results. Table 17 shows an overview of the values for SCE that have been used in the model.

Table 17. The approximations for the store choice elasticities (SCE) of the different AD brands

Market	SCE	Average SCE	Limitation	Source	Brand
Grocery	- 0,54	- 0,54	Only for every-day-low-pricing supermarkets. Data may be outdated	(Bell & Lattin, 1998)	Albert Heijn
e-commerce (books)	- 2,75	- 2,31	Only two product categories among the widely offered product variety on bol.com	(J. A. Chevalier & Goolsbee, 2003)	Bol.com
e-commerce (fashion)	- 1,87	- 2,31	Only two product categories among the widely offered product variety on bol.com	(Heuer et al., 2015)	Bol.com
Drug stores	- 0,88	- 0,88	Considers the elasticity of demand for the market of medical care products	(Eisenhauer & Principe, 2009)	Etos
Liquor stores	- 0,52	- 0,52	Considers the elasticity of demand for alcoholic drinks in developed countries	(Euromonitor International, 2014)	Gall&Gall

Several sources referred to the difference in pricing format of the several stores. Some stores use hi-low pricing and others use everyday low pricing. Hi-low pricing refers to firms that rely on promotional activities. For example, first a product is priced relatively high, but when the product is not desirable discounts are provided. Everyday low pricing refers to firms selling at a constant low price, without using promotions. Even though, most of the AD brands use a hi-low pricing format, the proposed bundling strategy refers to everyday low pricing, since the provided bundle price is not supposed to change. An estimation for SCE for everyday low-price stores was provided by Bell & Latin (1998), which provided an estimation of several factors, from which one was price, on the store choice probability of consumers. In general, their approximation fits the requirements for this study, but the data is from 1998, which may decrease validity reliability.

The approximations that were used for the e-commerce sector directly addressed the SCE and the competitiveness induced from different price levels. Therefore, these approximations are considered valid. However, due to the wide variety of product categories by bol.com, it was not possible to provide the SCE on all of the product categories. Therefore, SCE on two product categories within e-commerce has been considered. Which are the categories of books and fashion.

For the SCE of liquor stores, an approximation has been based on data from the market research that has been done by Euromonitor International. Euromonitor International has done market research on the price elasticity of demand in different countries. They have generalized between developed and developing countries. For this approximation the price elasticity of demand for the whole market for developed countries has been considered. It is assumed that competitors cannot imitate the price levels, such that increase in regional demand increase is primarily lured to the firm that provides the discount

For the approximation of the SCE of Etos, the price elasticity of demand for the whole market of medical care products has been used as an estimate. Eisenhauer & Principe (2009) consider the elasticity of demand for the whole market in different countries, but not the Netherlands. The average of Luxembourg, Belgium, Denmark, and Germany was found to be relatively similar to each other. They ranged between -0,87 and -0,89, with an average of -0,88. It is expected and assumed that the elasticity in the Netherlands is similar to those countries. Therefore, the average of the PED of the market demand of these countries was considered a

valid estimation for the market PED for the Netherlands. Assuming that competitors cannot imitate the price levels of the AD bundle, it is considered that the increase in market demand is captured by AD. The assumption that the increase in market demand equals the increase in SC is not directly applicable to the increase in SCE, but it was the least limiting estimation that was found.