MASTER

Customer channel migration in Omni-channel retailing

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Customer Channel Migration in Omni-Channel Retailing

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"Difficulties mastered, are opportunities won."

-Winston Churchill-
Abstract
In the retail world there is a relatively new form of managing multiple channels, namely omni-channel retailing. An omni-channel retailer aims for fully integrated channels, to create a superior shopping experience, in which customers can switch seamlessly between channels. Although the experience in an omni-channel can increase the satisfaction and loyalty of customers, it also becomes more difficult to predict how customers will make purchases when they can switch effortlessly between channels. In this master thesis we studied how channel integration influences customer channel migration (CCM). Channel integration can be achieved by implementing omni-channel features. A research model is created to examine the effects of certain omni-channel features on customer migration between the online and offline channel. The model was tested using 242 responses on a questionnaire about purchase behavior. The relationships in the model are analyzed with multiple linear regression. The results indicate that all considered omni-channel features stimulate CCM between the online and offline channel. Furthermore, interviews with six omni-channel experts were conducted. Findings from the interviews implicated that the omni-channel features which add value to the webshop are basic requirement for an omni-channel retailer, whereas the omni-channel features that add value to the in-store experience are the new key differentiators.
Preface

This report is the result of my last project as student Innovation Management at the Eindhoven University of Technology. For my final project as student I was blessed with the opportunity to conduct research at Docdata about an interesting and relevant topic for both the business and academic world.

I would like to express my gratitude to those that have helped and supported me during the process of conducting my final master project. First of all, I would like to thank my TU/e supervisors Sharon Dolmans, Néomie Raassens and Bob Walrave. Sharon, I was glad to have you as my mentor, supporting me in every decision during my master program. You gave me the freedom to select my preferred final master project and enthusiastically pointed me in the right direction during the project with useful advice and feedback. A perfect example of such great advice was asking Néomie Raassens to supervise my master project as well. Néomie, I really liked your involvement in the project. You are a true professional in your field and a great supervisor, who gave me helpful recommendations on both main issues and details in the project. Especially the feedback sessions we had in the last phase of the project motivated me to get the best out of myself for finalizing the thesis. Furthermore, I would like to express my gratitude to Bob Walrave. Bob, thank you for taking the responsibility of second supervisor in the final stage of the project.

Next, this research could not have been conducted without the support of Docdata. Docdata not only provided me with the opportunity to do my graduation project, but also with the opportunity to get to know the company and the rapidly changing world of e-commerce. In particular, I would like to thank my company supervisors Jorg Megens and Maurice Smedts. Jorg, I really appreciate how much effort you paid in supervising me during the entire project. In every meeting and discussion we had, you contributed to my research with valuable feedback and important insights from practice. Maurice, as experienced e-commerce professional you have been of great support by sharing your connections for the interviews and by mentioning suggestions to improve the practical relevance of the project. Additionally, I would like to thank my colleagues at Docdata for their help and the great working atmosphere.

As this project also concludes my student career, I would like to thank all people who contributed to an unforgettable student life, such as my friends from l’Eon Dix, the Vboys, the IRP 2014, and UNIST (South-Korea).

Last but not least, I would like to express my gratitude to my parents, brother, sister, and girlfriend for their unconditional support. I could never have accomplished this without you.

Gillis van de Zande
Executive summary
This report presents the results of a research project about customer channel migration (CCM) in omni-channel retailing. The research project is conducted at Docdata, an Ingram Micro company that is recognized as a professional service provider in the dynamic world of e-commerce. Docdata strives to be ‘thought leader’, who guides their clients to growth with innovative solutions. Omni-channel retailers are one of the four client types of Docdata. This research provides Docdata with insights to lead that client type towards the direction for further growth.

Background
In retail a channel is a contact point through which companies and customers interact. Selling goods via more than one channel is generally known as multiple channel retailing. Within multiple channel retailing there is a relatively new form, known as omni-channel retailing. An omni-channel retailer aims for completely integrated channels to create a superior shopping experience, in which customers can seamlessly switch between channels. The demand for an omni-channel proposition comes from the modern shopper who tends to use multiple channels for making purchases. In an omni-channel environment multiple channel shoppers are more satisfied and become more loyal to the retailer than single channel shoppers. However, it becomes harder to predict which purchase channels will be used due to lower channel switching efforts for customers. The occurrence of customers switching between channels is known as customer channel migration. The demand for channel integrations from customers and simultaneous uncertainty about the effects on CCM for retailers formed the main relationship of interest of this study, namely the effects of channel integration on channel migration.

Research question
To become more “omni-channel”, retailers have different options to integrate channels. Those channel integrations are known as omni-channel features (OCF’s). This research examined the effects of omni-channel features on customer migration between the online and offline channel. Therefore, the main research question is:

What are the effects of omni-channel features on customer channel migration?

In the study we particularly focused on the effects of four omni-channel features on CCM between the webshop (online channel) and physical stores (offline channel). The four omni-channel features of interest have been marked as the channel integrations with the highest priority for an omni-channel retailer. Those prioritized omni-channel features are:

- Buy online, pick up in-store (OCF-A);
- Buy online, return in-store (OCF-B);
- Online in-store inventory visibility (OCF-D);
- Buy in-store, ship to customer (OCF-D).

Research methodology
Based on an extensive literature study a research model was created to examine the effects of omni-channel features on CCM (Figure 0.1). A survey was conducted to test the relationships between the variables in the research model. In the survey 242 respondents filled in questions about a purchase process at a multiple channel retailer. In the questionnaire the respondents had to answer questions about a purchase process, the importance of omni-channel features,
and their probable purchase channel for future purchases at the same retailer. Clothing and electronics were selected as products of interest, to test if the effects would differ per product category.

Besides the questionnaires, six interviews and one case study were conducted in this research. The interviews were conducted to gain more insights from practice about the current omni-channel struggles and developments regarding channel integration and CCM. In the case study a method to measure CCM was tested for one particular retailer.

![Figure 0.1: Research model and hypotheses](image1)

![Figure 0.2: Results of the research model](image2)

**Analysis and results**

Constructs from other studies were used or adapted to create measurement scales for all variables of the research model. With the data from the questionnaires, the modeled relationships were tested using multiple linear regression. The results of the regression analysis indicated seven significant effects (Figure 0.2). From the research model outcomes, the most important findings were the indicated positive effects of the four channel features on CCM, as OCF-A and OCF-B tend to stimulate CCM from offline to online, and OCF-C and OCF-D tend to stimulate CCM from online to offline. The found results were consistent across the two product categories, except for the effect of OCF-D on CCM which was non-significant for electronics.

In addition, from the six interviews could be derived that OCF-A and OCF-B are seen as basic requirements in omni-channel retailing, whereas OCF-C and OCF-D have been marked as the new key differentiators. Hence, the interviewees implied that omni-channel retailers should focus on the omni-channel features that increase the in-store experience.

However, the case study could not support nor reject the applicability of a measurement method for CCM due to the characteristics of the examined case. Only marginal effects of the online channel on the offline channel were found.

**Conclusion and implications**

When reviewing the main research question with the results in mind, it can be concluded that omni-channel features positively influence CCM. Channel integrations lead to channel migration. Nevertheless, omni-channel retailers should not intent to prevent CCM, but rather attempt to
stimulate it. Migrating customers use multiple channel, experience more services, become more loyal, and are consequently more profitable for a retailer.

Considering the two directions of migration between the webshop and physical stores, omni-channel retailers should focus on how to get customers in-store. Besides allowing customers to collect or return online orders in-store, omni-channel retailers should aim for omni-channel features that add value to the in-store purchase experience.

Physical stores are essential for the omni-channel formula. However, omni-channel retailers struggle with stimulating in-store traffic and keeping the stores profitable. As OCF-C and OCF-D lower the barriers for customers to shop in-store, these should both be a must-have in the new age of omni-channel retailing. Successful implementations of those omni-channel features have indicated higher customer satisfaction levels, as well as additional inventory cost savings.

Moreover, omni-channel retailers should know more about the behavior of the modern shoppers in their omni-channel. The way customers use different channels to make purchases becomes more unpredictable, yet more important to understand. Retailers can improve their interaction and communication with customers by consolidating both online and offline customer data. With more knowledge about how customers behave across channels, retailers can better meet the needs of their customer with their omni-channel proposition. A unified customer account or loyalty cards across channels can help omni-channel retailers to better track and understand their omni-channel shoppers.
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<td>Brand Loyalty</td>
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<td>CCS</td>
<td>Cross-Channel Searching</td>
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<td>CST off-on</td>
<td>Channel Switching Tendency from offline to online</td>
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<tr>
<td>IM CFS</td>
<td>Ingram Micro Commerce &amp; Fulfillment Solutions</td>
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<td>on-CS</td>
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<td>PO</td>
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1. Introduction

This report presents the results of our study on customer channel migration in an omni-channel retailing context, conducted at Docdata, an Ingram Micro Company. Docdata is a dynamic full service company, which is active in the field of e-commerce and fulfillment. Docdata operates in a business-to-business environment and divides its customers into four categories: (1) General resellers, (2) Omni-Channel resellers, (3) Brands, and (4) Specialized resellers. In this study we focus on a business phenomenon at omni-channel resellers in particular.

Docdata defines omni-channel resellers as companies that offer their products or services both on online and offline channels, and aim to deliver a seamless customer experience by integrating the online and offline channel. The aim for a seamless customer experience across the online and offline channel is a desire that arises from the modern shopper, who uses multiple channels for making purchases (Jansen, 2014). As omni-channel resellers create a more seamless customer experience, the boundaries for switching between the online and offline channel for a purchase diminish for customers (Brynjolfsson, Hu, & Rahman, 2013).

The process of customers switching from channel for making new purchases is also known as customer channel migration (CCM) (Thomas & Sullivan, 2004). The demand for seamless shopping and the expected increase in migration behavior, require omni-channel resellers to consider how to cope with CCM.

Previous research has mainly focused on the customer migration at retailers with independent or marginally integrated sales channels (Ansari, Mela, & Neslin, 2008; Biyalogorsky & Naik, 2003). Theoretical knowledge about CCM in fully integrated omni-channels is scarce (Picot-Coupey, Huré, & Piveteau, 2016). However, the demand for omni-channel insights is growing as more and more customers use different channels to evaluate products, order, pay, collect and return their purchases (DHL, 2015). This trend has been triggering many multiple channel retailers to develop an omni-channel program, which should function as roadmap to become an omni-channel retailer.

Therefore, this thesis examines a topic that is both interesting and relevant from a theoretical and practical perspective. The gap in the literature and the demand for knowledge from practice led to the following main research question for this research project:

What are the effects of omni-channel features on customer channel migration?

The first chapter of this thesis serves as an introduction of the report. Section 1.1 describes the company at which the study is conducted. Then we introduce the concept of omni-channel retailing in section 1.2 and explain the phenomenon CCM in section 1.3. Section 1.4 elaborates on the stated research question and formulates the additional sub questions. Thereafter, we describe the scope and research structure of this study in sections 1.5 and 1.6. We conclude this chapter with the outline of the remainder of this report in section 1.7.

1.1 Company background

This research project is conducted at Docdata, which has become an Ingram Micro company by the end of 2015. The integration of Docdata in the Ingram Micro organization is currently in process. Together with the existing commerce and fulfillment activities of Ingram Micro Europe, Docdata forms the Commerce & Fulfillment business unit of Ingram Micro that is active in Europe. We refer to this organization part as Ingram Micro Commerce and Fulfillment services
Europe (IM CFS Europe). The activities of IM CFS Europe are similar to those of Docdata in the last decade. They can best be explained by describing the Docdata services and putting it in perspective of the company Ingram Micro.

1.1.1 Docdata
Docdata was founded in 1987. The company started with the replication of CDs and DVDs. However, Docdata’s core business shifted to the distribution of goods. The established collaboration with Bertelsmann On-line in 1999, now known as Bol.com, played a major role in this development. Both Docdata and Bol.com grew rapidly with the rise of the e-commerce market. During that period Docdata expanded their activity portfolio with e-commerce and payment services. Docdata evolved into a dynamic full service e-commerce company with main activities in the Netherlands, Germany, France, Italy, Poland, Spain, Switzerland, and the United Kingdom. Besides Bol.com, some well-known customers of Docdata are Zalando, De Bijenkorf, and ASOS.

In terms of size Docdata experienced intense growth. The start-up that once started in 1987, accounted €169 million in total revenues and €7.3 million in net profit over 2014, serving more than 150 customers. The number of permanent employees grew to approximately 1,500 by the end of 2015, just before the acquisition by Ingram Micro.

In the European e-commerce market, Docdata is recognized as a professional service provider of e-fulfillment, online payments, and return logistics. Moreover, in the Netherlands Docdata was awarded with the VLM Dutch Logistics Award 2015 for its smart logistic solutions. Docdata presents itself as a ‘thought leader’ who thinks ahead together with clients about innovative solutions in the still rapidly changing field of e-commerce. In the perspective of thought leadership, this research project should provide Docdata with insights to lead their omni-channel customers to the right direction for growth.

1.1.2 Ingram Micro
In October 2015, Docdata has been acquired by Ingram Micro, the worlds’ largest wholesale technology product distributor. Ingram Micro is an American company that was founded in 1979, and is headquartered in Irvine, California. Currently, Ingram Micro counts nearly 22,000 employees worldwide, through which its serves 200,000 customers in 160 different countries.

The value proposition of Ingram Micro can be divided into four business units: Technology Services, Commerce & Fulfillment, Cloud, and Mobility (Figure 1). The technology services have been the core business by Ingram Micro since its existence. This core capability involves particularly the distribution and sales of a large variety of electronics from 1,700 suppliers, including Acer, Apple, Cisco, HP, IBM, Lenovo, Microsoft, and Samsung.

![Figure 1: Business units of Ingram Micro](image-url)
The three other business units are Cloud, Mobility & Lifecycle Services, and Commerce & Fulfillment. Those business units have not been the core capabilities since its foundation, but can be seen as the growth opportunities of Ingram Micro. With the acquisition of Docdata, Ingram Micro aims to expand its Commerce & Fulfillment proposition in Europe.

1.2 Omni-channel retailing

Selling goods through multiple sales channels is a concept that exists for more than 100 years. One example is Sears, an American chain of department stores that started with mail-ordered sales in 1886. The first Sears retail store followed in 1925, a registry kiosk in 1996, and their fourth channel was launched in 1998: sears.com (Cao, 2014).

A channel is as a customer contact point, or a medium through which companies and customers interact (Neslin et al., 2006). The retailing literature distinguished different forms of managing multiple channels. A relatively new form of multiple channel retailing is omni-channel retailing (Brynjolfsson, Hu, & Rahman, 2013). Omni-channel retailing aims to improve the value proposition for the customer by aligning the channels, such that a seamless shopping experience is created before, during, and after the purchase process of the customer. As modern shoppers tend to use multiple channels for making their purchases, the ability to seamlessly switch across channels of the retailer is crucial in their shopping experience (Jansen, 2014).

The word omni means “all, or in all ways”. In the perspective of omni-channel, it refers to the modern omni-channel shopper who wants to be able to purchase a product in all possible ways. In other words, customers should be able to seamlessly switch channels at every step of the customers’ journey (Verhoef, Kannan, & Inman, 2015). This synergistic use of channels is an evolution in customer behavior, and is named omni-channel shopping (Rigby, 2011). Although an omni-channel proposition attracts the modern shoppers, it also raises complexity for the retailers. Firstly, because retailers need to offer interactions between the channels, which enables customers to switch effortlessly. This requires retailers to dismantle channels, which generally functioned as independent silos (Brynjolfsson, Hu, & Rahman, 2013). Secondly, the predictability of the customers’ actual purchase channel decreases due to the lower channel switching efforts. As it becomes more difficult to predict the demand per channel, it is harder to allocate resources or stock to the channels (Kilcourse & Rosenblum, 2015).

Nevertheless, when customers use multiple channels for shopping, they are exposed to a broader spectrum of the companies services, and are therefore expected to be more satisfied and loyal (Venkatesan, Kumar, & Ravishankar, 2007). According to Kushwaha and Shankar (2005), multiple channel customers spend 20 to 30 percent more than single channel customers, due to this increased satisfaction level. Additionally, driving more sales and profit is the second most important reason for becoming an omni-channel company, after the capability to serve today’s customer expectations (Forrester, 2014). The phenomenon that overall sales increase due to channel interaction, is known as a synergy effect (Huang, Lu, & Ba, 2016). In order to create a synergy effect, retailers must integrate their channels such that they strengthen one another and provide a better shopping experience (Jansen, 2014).

This research project focusses on the integration of the two major channels of a multiple channel retailer: the online webshop and the offline physical stores. There are several integrations between online and offline that can increase the seamless shopping experiences. Becoming omni-channel is all about implementing those integrations.
There are multiple disciplines in which channel integrations can be realized and contribute to the aimed seamless shopping experience. The different disciplines are displayed in Figure 2. As not all disciplines can be considered in this research project, we examine the effects of four integrations in particular. Those are related to product collection, product returns, and inventory visibility.

Figure 2: Different components through which channel integrations can be realized

The integrations that are considered in this research project are selected, because those are seen as the top priorities for retailers in becoming omni-channel (Forrester, 2014). In this report those integrations are denoted as omni-channel features. The four omni-channel features of interest are:

- **Buy online, pick up in-store:** the option to collect an online ordered product at the physical stores of the retailer (product collection);
- **Buy online, return in-store:** the option to return an online ordered product at the physical stores of the retailer (product returns);
- **Online in-store inventory visibility:** the possibility to online check the inventory availability of products at the different physical stores of the retailer (inventory visibility);
- **Buy in-store, ship to customer:** the option of home delivery of products that are ordered in a physical store, even when a product is out of stock (product collection).

The entire list of possible online-offline integrations (omni-channel features) and their related discipline can be found in section 2.2 (Table 1).
1.3 Customer channel migration
Retailers that offer their products both online and offline encounter changing sales levels, due to customers that change from purchase channel and possibly adapt their purchase volumes after the transition. The occurrence of existing customers that switch between channels for transactions is known as customer channel migration (Thomas & Sullivan, 2004). Within the field of multiple channel retailing, CCM has always been a sensitive subject, because it affects costs, revenues, and thus the company’s profits (Ansari, Mela, & Neslin, 2008). On a large scale retailers have been fearing channel cannibalization, because one channel “eating” another channel’s sales was interpreted as a risk that could lead to a lower sales performance (Deleersnyder, Geyskens, Gielens, & Dekimpe, 2002). In particularly the cannibalization by the online channel has been feared, as customers moving to this channel would adapt their purchase behavior. Firstly, it would increase the focus on price and provoke price wars, as the price comparisons can easily be performed on the Internet. Secondly, customers might decrease their number of purchases through the online channel, because of a reduced probability on impulse purchases (Machlis, 1998). Thirdly, because it is more difficult to build customer loyalty online (Ansari, Mela, & Neslin, 2008). Moreover, inconsistencies between the online and offline channel could lead to channel conflicts that decrease the purchase experience of customers, because one channel might create expectations that another channel cannot meet (De Carvalho & Campomar, 2014). For instance, due to differences in price, assortment, or available product information.

However, in the retailing literature there has been a change in perspective on CCM, which states that the effects of cannibalization are outweighed by the synergy effect (Huang, Lu, & Ba, 2016). In other words, despite customers are migrating between channels, the overall sales will grow because the channels strengthen one another. Omni-channel retailing attempts to enhance the synergy by integrating the online and offline channel (Jansen, 2014). Yet, online-offline integrations lower customers' barriers to switch between the online and offline channel, which creates a stimulating CCM environment (Brynjolfsson, Hu, & Rahman, 2013). Hence, it is important to know which integrations trigger CCM and to what extent. In this research project, the effects of four online-offline channel integrations on CCM are examined.

1.4 Research question
This study has a scientific and practical objective. The scientific objective is to extend the academic knowledge about CCM in the relatively new field of omni-channel retailing. The practical objective is to provide Docdata with insight on how the implementations of certain omni-channel features affect CCM. As Docdata presents itself as thought leader and offers commerce services that support the selected omni-channel features, Docdata should be able to give their multiple channel customers an indication what the effects of the integrations are on CCM.

In order to serve the scientific and practical objective, the following general research question is formulated:

What are the effects of omni-channel features on customer channel migration?

To answer the main research question piecewise, it is divided into smaller parts. We define the smaller parts in four sub questions:

1. What factors influence customer channel migration between the online and offline channel in an omni-channel?
2a. To what extent do certain omni-channel features affect customer channel migration?
2b. Do the effects of omni-channel features on customer channel migration differ per product category?
3. How can customer channel migration between the online and offline channel be measured in an omni-channel?

1.5 Scope
The research explores omni-channel retailing and examines the effects of certain omni-channel features on CCM. However, both omni-channel retailing and CCM are broad topics, related to many aspects outside and within a company. In order to define the focus of this research, certain (design) decisions are made to narrow the scope and increase the concreteness of the research project. We can summarize the scope of the research project in three delineations:

- **CCM within the company** – In this research project we only focus on the migration of customers between two channels of multiple channel retailers. Examining how many current customers will migrate to other companies or how many new customers are attracted because of omni-channel implementations, are not part of this research. We solely focus on how omni-channel features influence the movements between the online and offline channel of the current customer base.

- **Online versus offline** – In the context of CCM we only consider migration between the online and offline channel of the retailer. The online channel is the webshop and the offline channel is the range of physical stores of a retailer. Sales via, for instance, a catalog or e-mail channel, fall beyond the scope of this research. We focus on the migration between the online and offline channel, because the integration of those channels is most important in omni-channel retailing (Brynjolfsson, Hu, & Rahman, 2013; Herhausen, Binder, Schoegel, & Herrmann, 2015).

- **Business-to-consumer** – Selling through both an online and offline channel occurs in the business-to-business (B2B) and business-to-consumer market (B2C). However, both business models have strongly varying characteristics, such as the number of customers, purchase volumes, and the buying process (Gibbs, Kraemer, & Dedrick, 2003). The multiple channel customer base of Docdata mainly consists of B2C players. As the aim is to deliver Docdata insights on how to assist those customers in their market, we focus on the B2C principles in this research project.

1.6 Research structure
The research structure follows the reflective model for design-based problem solving by Van Aken, Berends, and Van der Bij (2007), see Figure 3. This design-based model is derived from the problem solving cycle and is suitable for more generic type of business problems, such as CCM. The outcome is not only a specific solution to a specific business problem, but a generic design proposition for managing a type of business problem (Van Aken, Berends, & Van der Bij, 2007). Furthermore, in the third phase of this approach, analysis and diagnosis, we use the quantitative research model of Mitroff, Betz, Pondy, and Sagasti (1974) as guideline for the quantitative part of the research (Figure 4).

The method of Van Aken, Berends, and Van der Bij (2007) starts with formulating a research question based on a business phenomenon that is not addressed extensively in the existing academic literature. As will be explained in Chapter 2, the existing studies on CCM in multiple channel retailing generally have been one-sided and the omni-channel literature is still in its
infancy (Piotrowicz & Cuthbertson, 2014; Verhoef, Kannan, & Inman, 2015). The second phase explains how CCM is embedded in multiple channel retailing, and more specifically in omni-channel retailing. Furthermore, this phase describes what factors influence CCM and what the consequences of CCM are for a retailer.

Figure 3: Reflective problem solving model by Van Aken, Berends, and Van der Bij (2007)

Analysis and diagnosis form the third phase. The third phase is divided in a quantitative and qualitative part. The quantitative part consists of constructing and testing a conceptual model. For constructing the model the approach of Mitroff et al. (1974) is followed, using four steps: conceptualization, modeling, model solving, and implementation.

Figure 4: Quantitative research model approach (Mitroff et al., 1974)

The approach starts with conceptualizing a problem situation from reality into a conceptual model. The conceptual model is created with input from omni-channel reports and introductory discussions with omni-channel experts from Docdata. Subsequently, the conceptual model is translated into a scientific model to ensure the academic value of the research. For this step models from journal articles within the research field are used as academic examples. Finally, the results provide insights about the relationships in the research model (solution).

The qualitative part of the analysis and diagnosis phase consists of interviews with omni-channel experts at Docdata’s customers. The aim of the interviews is to get the newest insight
about omni-channel management and CCM from practice, and to validate the results from the research model.

The fourth phase of the reflective model by Van Aken, Berends, and Van der Bij (2007) is also named solution. However, this phase focusses on translating the results of the analysis and diagnosis into aggregate recommendations for omni-channel retailers. Finally, we mention future research opportunities.

In summary, to conduct the research as described, we use the following research methods:

- **Questionnaires** – A survey among end-customers is conducted to collect the input for the research model.
- **Interviews** – To get an indication from practice about the current omni-channel struggles and developments regarding CCM, interviews are conducted with omni-channel experts.
- **Case study** – By conducting a case study on CCM at a customer of Docdata, a method to measure CCM is tested.

### 1.7 Report structure

The design-based problem solving framework of Van Aken, Berends, and Van der Bij (2007) is followed through the entire report (Figure 5). Chapter 2 describes the results of an extensive literature study on the development of omni-channel retailing and CCM. Furthermore, it mentions which omni-channel factors influence CCM and which are considered in the research model. In Chapter 3 the research model and the related hypotheses are explained extensively. Chapter 4 describes the research methodology, by explaining the three used research methods. The data analysis and results of each research part follow in Chapter 5. Finally, Chapter 6 present the conclusion, implications, limitations, and opportunities for future research.

![Figure 5: Report structure following the problem solving framework](image-url)
2. Literature review

This chapter explores the available literature about omni-channel retailing and CCM. The first section starts with categorizing the multiple channel retailing forms, of which omni-channel retailing is the newest. In section 2.2 we provide an overview of online and offline channel integrations that are related to omni-channel retailing. From that overview four are selected for the research model. Finally, section 2.3 addresses the potential costs and benefits of CCM.

2.1 Multiple channel retailing categorization

Although selling products through more than one channel is not a new concept, the interest in multiple channel retailing has been growing rapidly since the introduction of the Internet and the rise of e-commerce (Schramm-Klein & Morschett, 2005). The Internet created a new medium through which companies could reach many potential customers easily. Many pure e-commerce companies arose and were quickly building large customer bases. As a response, most traditional retailers reacted by also launching a sales channel on the Internet. Despite most retailers were inexperienced in managing an online channel, the concept of both retailing online and offline was born. Due to the adoption of e-commerce, traditional retailers that added an online channel were able connect with new customer segments and benefit from extra sales (Dorman, 2013).

In contrast to traditional retailers who launched an online channel, there is also a relatively new trend of pure online players who start opening physical stores (Pauwels & Neslin, 2015). One of the first major examples was Dell who used to solely sell its products online, but added an offline channel via Walmart in 2007. Even the biggest online Internet store of all, Amazon, is currently opening bricks-and-mortar stores. The underlying thought is the same. By adding physical stores to the existing online channel, companies try to extend their customer base, increase customer satisfaction, and consequently generate more revenues (Pauwels & Neslin, 2015). This statement is supported by the Ecommerce Benchmark & Retail Report of 2016, which indicates that omni-channel companies have a higher share of repeat buyers. Moreover, the report shows that for companies over 100 FTE, the online revenue growth of omni-channel players is more than twice as high as the online growth of pure online players, respectively 48% versus 20% for companies with 100 to 250 FTE, and 36% versus 14% for companies with more than 250 FTE.

Selling through multiple channels is interesting as more customers can be reached, but also because multiple channel shoppers tend to spend more money than single channel shoppers (Kushwaha & Shankhar, 2005). Although value of multiple channel retailing is acknowledged in most articles, there has been an evolution on how to manage multiple channels (Verhoef, Kannan, & Inman, 2015). In the multiple channel retailing literature, Beck & Rygl (2015) distinguished three forms of multiple channel retailing: multi-, cross-, and omni-channel retailing (Figure 6). The distinction between the three forms is based on the level of integration between the channels of the retailer.

![Figure 6: Categorization multiple channel retailing](image-url)
As a practical note, we use MC retailing to refer to multiple channel retailing in the remainder of this report. Thus, when mentioning MC retailing we refer to all forms, and not specifically to the multi-channel retailing form.

2.1.1 Multi-Channel retailing
Multi-channel retailing can be labeled as the first form of MC retailing. In the concept of multi-channel retailing, multiple channels function as independent entities in order to align channels to specific customer segments (Zang et al., 2010). This means that the separated channels are independent sales points, without any channel interaction. The argument for a multi-channel approach is that when the channels are linked to certain targeted customer segments, channels do not overlap and cannibalization is minimized (Schramm-Klein & Morschett, 2005). Cannibalization can be interpreted as the decrease in sales of one channel, due to the migration of sales to another channel. However, previous research has shown that the fear for cannibalization has been largely overstated (Cao, 2014). In addition, the siloed approach becomes inefficient when customers want to shop via more than one channel (Picot-Coupey, Huré, & Piveteau, 2016). In that case, customers demand integrated channels in which efforts for channel switching are low. A lack of integration between the channels can lead to poor customer satisfaction and a loss of sales when customers want to shop seamlessly across channels (Cao, 2014). For that reason, the focus on channel integration increased and led to a new concept: cross-channel retailing.

2.1.2 Cross-Channel retailing
The transition from multi- to cross-channel retailing can be seen as the first step to deliver a seamless shopping experience. In cross-channel the focus is on the suppression of the frontiers between the channels in order to enhance the channels’ respective roles and minimize the potential frictions when moving from one channel to another (Picot-Coupey, Huré, & Piveteau, 2016). The objective of the channel integrations is to allow cross-channel movements of products, money, and information (Chatterjee, 2010). For example, the in-store collection of an online ordered product. However, whereas cross-channel retailing mainly focusses on improving the in-store channel experience, the emphasis of omni-channel retailing is on the interplay between the channels and brands (Verhoef, Kannan & Inman, 2015).

2.1.3 Omni-Channel retailing
Omni-channel retailing is the new age of MC retailing in which the distinctions between the physical and online channel vanish, turning the world into a showroom without walls (Brynjolfsson, Hu, & Rahman, 2013). The main difference with multi- and cross-channel retailing is that omni-channel retailing is focussing on creating a customer brand experience, instead of designing a specific channel experience (Picot-Coupey, Huré, & Piveteau, 2016). The aim is to deliver a superior seamless shopping experience, regardless of the customers’ purchase channel (Piotrowicz & Cuthbertson, 2014). Customers’ buying behavior is changing drastically, as they are always connected through the Internet nowadays and typically tend to move across different channels based on individual preferences. Today’s customers expect to be able to search, purchase, and collect products at any time in their preferred personal way (DHL, 2015). The challenge for retailers is to deliver this omni-channel experience, in order to lock the customer in the brand ecosystem (Verhoef, Kannan, & Inman, 2015). However, a seamless purchase decision process across multiple channels remains a distant future goal, rather than current reality, because retailers have difficulties with integrating and aligning the online and offline
channel (Beck & Rygl, 2015). Omni-channel is still in its early stages, because today the elements of the experience are still fragmented (McDermott, 2015).

To conclude, we use the following definition when referring to omni-channel retailing: Omni-channel retailing is a set of activities involved in selling products or services through multiple channels, whereby the retailer aims for full channel integration and the customer can experience full channel interaction. Hence, omni-channel retailing consists of synergistic management of the available channels and numerous customer touch points, in such a way that the customer experience across the channels and the performance over the channels is optimized (Beck & Rygl, 2015; Verhoef, Kannan, & Inman, 2015).

2.2 Channel integration
An omni-channel is the highest state of channel integration in MC retailing. As omni-channel customers move freely between the online and offline channel, the online-offline integration is essential in an omni-channel strategy (Herhausen et al., 2015). Integration can enrich the customer value proposition and prevent customer confusion, because customers perceive more options to interact with the retailer during the customer journey (Gallino & Moreno, 2014).

However, the advantages offered by channel integration are not without potential downsides. The integration makes it more difficult to predict at which channel customers will make the actual purchases (Kilcourse & Rosenblum, 2015). Consequently it is more complex for a MC retailer to determine the optimal inventory level per channel. Another risk of channel integration is the stimulation of research shopping, which is defined as the habit of customers to search in one channel and then purchase through another (Verhoef, Neslin, & Vroomen, 2007). This decreases channel-specific lock-in effects and increase cross-channel free-riding, whereby customers orient on products at a store or webshop of one retailer, but buy them elsewhere (Herhausen et al., 2015). Moreover, negative spill-over effects from one channel to another can harm firms harder if the channels are more aligned (Van Birgelen, De Jong, & De Ruyter, 2006).

Despite the risks of channel integration, MC retailers are forced to consider omni-channel retailing as customers are expecting it. Good customer experience in one channel is no longer enough to maintain customer loyalty (Kilcourse & Rosenblum, 2015). On the other hand, the risks of channel integration can be compensated, because omni-channel customers are considered to be more profitable (Forrester, 2014).

To become "omni-channel", MC retailers must integrate the online and offline channel by implementing omni-channel features. Omni-channel features are the capabilities of the retailer that serve the goal to deliver a seamless shopping experience. Table 1 lists the 30 most relevant omni-channel features derived from omni-channel market reports of DHL (2015), Forrester Consulting (2014), Payvision (2015), and Retail Systems Research (2015).

<table>
<thead>
<tr>
<th>Category</th>
<th>Omni-Channel Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotions</td>
<td>1. Coupons can be redeemed across all channels</td>
</tr>
<tr>
<td></td>
<td>2. Cross-channel loyalty card reward program (i.e. point can be earned and redeemed across channels)</td>
</tr>
<tr>
<td></td>
<td>3. On-the-go promotions (e.g. with use of beacons)</td>
</tr>
<tr>
<td></td>
<td>4. Personalized in-store offers or discount, based on online purchase information</td>
</tr>
<tr>
<td>Product collection</td>
<td>5. <strong>Buy online, pick up in-store</strong></td>
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<tr>
<td>--------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
<td>6. Buy online, collect at pick-up point (e.g. a locker, post office, supermarket)</td>
</tr>
<tr>
<td></td>
<td>7. <strong>Buy in-store, ship to customer</strong> (e.g. when a product is difficult to carry or when a product is out-of-stock)</td>
</tr>
<tr>
<td></td>
<td>8. Buy in-store, pick up from another store of the retailer</td>
</tr>
<tr>
<td>Product returns</td>
<td>9. <strong>Buy online, return in-store</strong></td>
</tr>
<tr>
<td></td>
<td>10. Buy in-store, return by mail</td>
</tr>
<tr>
<td>Product information</td>
<td>11. Leverage product knowledge and information assets across channels</td>
</tr>
<tr>
<td></td>
<td>12. Accessibility of detailed product information in-store with smartphones (e.g. by scanning e-Tags)</td>
</tr>
<tr>
<td></td>
<td>13. In-store navigation via smartphones to locate products</td>
</tr>
<tr>
<td>Inventory visibility</td>
<td>14. <strong>Online inventory visibility of the physical stores on the website or webshop of the retailer</strong></td>
</tr>
<tr>
<td>Traceability</td>
<td>15. Order traceability across all channels regardless from where the order is generated</td>
</tr>
<tr>
<td></td>
<td>16. Tracking the customers’ route through the store (e.g. heat mapping)</td>
</tr>
<tr>
<td>Consolidation</td>
<td>17. Unified customer account with purchase history across channels</td>
</tr>
<tr>
<td>Consumer data</td>
<td>18. Recognize the customers that enter a store and provide personnel with relevant information (e.g. about online purchase history)</td>
</tr>
<tr>
<td></td>
<td>19. Webshop recommendations via customer account, based on past purchased across channels</td>
</tr>
<tr>
<td></td>
<td>20. Allow to write and access customer reviews anytime</td>
</tr>
<tr>
<td>Customer service</td>
<td>21. Online reservation of an in-store product (e.g. to fit or test)</td>
</tr>
<tr>
<td></td>
<td>22. Interactive screens in-store for product orientation or ordering</td>
</tr>
<tr>
<td></td>
<td>23. Shopping assistance via social media</td>
</tr>
<tr>
<td></td>
<td>24. Virtual expert advice on the webshop</td>
</tr>
<tr>
<td>Assortment</td>
<td>25. Offering a consistent assortment, which can be collected entirely across all channels</td>
</tr>
<tr>
<td>Payments</td>
<td>26. Offering a mobile payment option in-store</td>
</tr>
<tr>
<td></td>
<td>27. Sending invoices of in-store purchases by e-mail</td>
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<tr>
<td>Brand identity</td>
<td>28. Create a single brand identity across channels</td>
</tr>
<tr>
<td></td>
<td>29. Perfect online product visualization (e.g. 360 degree view)</td>
</tr>
<tr>
<td>Pricing</td>
<td>30. Pricing across channels is consistent and fully controlled by the retailer (i.e. no price or discount differences between channels)</td>
</tr>
</tbody>
</table>

The above mentioned omni-channel features increase the seamless shopping experience, which nowadays customers are searching for. There is no concrete classification which features retailers should possess to be an official omni-channel retailer, as there is no ratio scale to measure the degree of channel integration. Besides, the importance of the integrations may vary across different businesses. An integrated omni-channel experience for a coffee shop might be that customers can use their smartphone to order and pay a drink in advance, when they are walking to the shop. In contrast, for a fashion retailer, the option to return online ordered clothing in-store is presumably more important (McDermott, 2015).

As it is not feasible to examine the effects of all omni-channel features in this research project, we decided to focus on the following four (also marked in bold in Table 1):

- Buy online, pick up in-store;
- Buy online, return in-store;
- Online in-store inventory visibility;
- Buy in-store, ship to customer.

These omni-channel features are marked as the highest prioritized services for a retailer to become omni-channel, according to reports of DHL (2015), Forrester Consulting (2014), Payvision (2015) and Retail Systems Research (2015).

### 2.3 Customer channel migration

The occurrence of existing customers switching between the channels of the retailer for transactions is known as customer channel migration (Thomas & Sullivan, 2004). Offering the customers a customer journey, in which they can seamlessly switch between the online and offline channel, yield higher customer satisfaction levels and encourage customers to allocate a higher share of their wallet to the firm (Venkatesan, Kumar & Ravishanker, 2007).

However, this value proposition by the retailer also raises challenges. The uncertain effects of channel integration on CCM is one of them (Herhausen et al., 2015). As the barriers for switching between the channels lower when the retailer implements omni-channel features, the way customer use different channels to make a purchase becomes less predictable (Kilcourse & Rosenblum, 2015). Results of a study by Schramm-Klein et al. (2011) support and explain this effect in a research about the effect of perceived channel integration on differentiated multiple channel use. According to the study of Schramm-Klein et al. (2011) channel integration enhances differentiated channel use via two mediating factors: image and trust. As channels are perceived as more integrated, it improves the retailer’s image and increases customers’ trustworthiness in the multiple channel system. Consequently, both lead to channel switching behavior.

The consequences of this channel switching behavior for the MC retailer are a controversial subject in the literature. For instance, Falk et al. (2007) state that the channel migration of customers is a zero-sum game in the best case scenario. Channels cannibalize one another, but the overall sales do not grow. In contrast, other researchers emphasize that channel migrating customers are more profitable than the non-migrating segment (Ansari, Mela, & Neslin, 2008). Customers who can switch easily between the online and offline channel may experience a synergy effect, which increase their willingness to shop at the MC retailer (Herhausen et al., 2015; Montoya-Weiss, Voss, & Grewal, 2003; Venkatesan, Kumar, & Ravishanker, 2007).

However, this research is not focusing on the profitability argument, but on how online and offline omni-channel integrations affect the customers’ channel choice. Yet it is unclear to what extent CCM migrations are triggered by specific channel integrations. Ideally, retailers should know the exact effects of each channel integration on CCM (Figure 7).

![Diagram of Channel Integration and Channel Migration](image)

**Figure 7: Visualization of the main examined relationship of this research project**
3. Research model and hypotheses

In this chapter we present the research model and formulate the related hypotheses that are tested in this research. The research model is explained stepwise in section 3.1. We start with explaining the aggregated constructs of the model and describing the dependent variables extensively. As the research model contains two dependent variables, the research model can be divided into two parts: study 1 and study 2. For both studies the independent variables are introduced and explained. Subsequently, section 3.2 provides an overview of the complete research model with the hypotheses about all relationships, based on findings from previous research.

3.1 Research model

The aim of this study is to understand how certain integrations of the online and offline channel, denoted as "Omni-Channel Features", influence CCM. Seen previous studies (e.g. Ansari, Mela, & Neslin, 2008; Gupta, Su, & Walter, 2004; Montoya-Weiss, Voss, & Grewal, 2003), CCM can presumably not be explained by omni-channel features exclusively, as there are other important influencing factors. In order to increase the explained variance by the research model, channel satisfaction and customer characteristics are included as aggregated constructs. Moreover, it gives insight into what extent omni-channel features affect CCM compared to channel satisfaction and certain customer characteristics.

Evaluations of previous purchases at a channel have a major influence on the decision at which channel customers will make future purchases (Montoya-Weiss, Voss, & Grewal, 2003). Independent on what an alternative channel is offering, experience effects can create channel loyalty, which might lock-in customers at a specific channel (Gensler, Verhoef, & Böhm, 2012). Channel satisfaction resembles a customers’ overall evaluation of purchase experiences at a certain channel (Olsen & Johnson, 2003). Both online channel satisfaction and offline channel satisfaction have proven to have a significant effect on the channel repurchase intention of customers (Devaraj, Fan, & Kohli, 2002; Falk et al., 2007). In order to examine the influence of previous channel experiences on customers’ intention to switch channel, channel satisfaction is included in the research model.

Next to previous channel experiences, a retailer can influence CCM by lowering the barriers for online and offline channel switching. Lowering the barriers can be achieved by becoming omni-channel, or in other words by implementing omni-channel features to integrate the online and offline channel (Brynjolfsson, Hu, & Rahman, 2013). To examine specific effects on CCM, four omni-channel features are included in the research model, which are considered as most important by market experts (DHL, 2015; Forrester, 2014; Kilcourse & Rosenblum, 2015).

Besides previous experiences with a channel and omni-channel features, characteristics of the customers themselves also affect the customers’ channel switching tendency (Ansari, Mela, & Neslin, 2008). Different behavior patterns can be observed before customers decide to make a purchase. The customers’ orientation in the pre-purchase phase have a significant influence on the intentions for a channel choice or switch (Gensler, Verhoef, & Böhm, 2012). For example, some shoppers tend to make purchases spontaneous, where others make well prepared purchases after an extensive search process among different channels. In order to account for the effect of this shopping behavior, price orientation and cross-channel searching are included in the model as customer characteristics. Both have found to be significant predictors of channel choice behavior (Choi & Park, 2006; Konuş, Verhoef, & Neslin, 2008).
In summary, CCM, channel satisfaction, omni-channel features, and customer characteristics are the aggregated constructs of our research. Together those constructs form the preliminary research model (Figure 8). The complete research model follows in section 3.2, after explaining the explicit dependent and independent variables.

3.1.1 Holistic perspective on CCM
This study examines CCM from a holistic perspective. The holistic perspective on CCM considers channel migrations of customers in two directions, namely from offline to online and from online to offline. By examining the customers’ intention to switch from channel for their next purchase decision, the likelihood of CCM can be assessed (Gupta, Su, & Walter, 2004). Channel Switching Tendency from Offline to Online (CST off-on) and Channel Switching Tendency from Online to Offline (CST on-off) are the two dependent variables of the research model. Together they measure CCM between the retailers’ physical store and the webshop (Figure 9). CST off-on reflects how current offline channel shoppers are intended to switch to the online channel, and CST on-off reflects how current online channel shoppers are intended to switch to the offline channel.

Figure 8: Preliminary research model

Figure 9: Dependent variables of the research model

This method to assess CCM based on channel switching tendency is used before by Gupta, Su, and Walter (2004), who empirically studied how consumers migrate from traditional to electronic channels for purchasing books, airline tickets, wine, and stereo systems. However, Gupta, Su, and Walter (2004) only examined channel migration from offline to online and the importance of purchase attributes such as price and delivery time, whereas this research is interested in the relationships between overall channel migration and channel satisfaction, customer characteristics, and most importantly omni-channel features. The explicit variables of the research model are presented and described in Table 2.
Table 2: Variable overview of the research model

<table>
<thead>
<tr>
<th>Aggregated constructs</th>
<th>Variables</th>
<th>Abbreviations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Channel Migration</td>
<td>Channel Switching Tendency (Offline to Online)</td>
<td>CST off-on</td>
<td>The intention of a customer to switch from the offline to online channel for future purchases at the same retailer.</td>
</tr>
<tr>
<td></td>
<td>Channel Switching Tendency (Online to Offline)</td>
<td>CST on-off</td>
<td>The intention of a customer to switch from the online to offline channel for future purchases at the same retailer.</td>
</tr>
<tr>
<td>Channel Satisfaction</td>
<td>Offline Channel Satisfaction</td>
<td>off-CS</td>
<td>The customers’ satisfaction about the offline channel, based on previous purchases at the offline channel of the retailer.</td>
</tr>
<tr>
<td></td>
<td>Online Channel Satisfaction</td>
<td>on-CS</td>
<td>The customers’ satisfaction about the online channel, based on previous purchases at the online channel of the retailer.</td>
</tr>
<tr>
<td>Omni-Channel Features</td>
<td>Buy online, pick up in-store</td>
<td>OCF-A</td>
<td>The extent to which customers value a “buy online, pick up in-store” service in their decision process to purchase a product at the online or offline channel of the retailer.</td>
</tr>
<tr>
<td></td>
<td>Buy online, return in-store</td>
<td>OCF-B</td>
<td>The extent to which customers value a “buy online, return in-store” service in their decision process to purchase a product at the online or offline channel of the retailer.</td>
</tr>
<tr>
<td></td>
<td>Online in-store inventory visibility</td>
<td>OCF-C</td>
<td>The extent to which customers value an “online in-store inventory visibility” service in their decision process to purchase a product at the online or offline channel of the retailer.</td>
</tr>
<tr>
<td></td>
<td>Buy in-store, ship to customer</td>
<td>OCF-D</td>
<td>The extent to which customers value a “buy in-store, ship to customer” service in their decision process to purchase a product at the online or offline channel of the retailer.</td>
</tr>
<tr>
<td>Customer Characteristics</td>
<td>Price Orientation</td>
<td>PO</td>
<td>The degree to which customers consciously searched for the lowest price of the last purchase.</td>
</tr>
<tr>
<td></td>
<td>Cross-Channel Searching</td>
<td>CCS</td>
<td>The use of a cross-channel search before making the last purchase (i.e. search online, purchase offline, or search offline, purchase online).</td>
</tr>
</tbody>
</table>

Because the research model has two dependent variables that have to be explained, the research model can be divided into two parts:

1. Explaining the CST off-on of offline shoppers (study 1);
2. Explaining the CST on-off of online shoppers (study 2).

The two parts together form the complete research model with a holistic view on CCM. In order to better understand the two parts, sub-section 3.1.2 and 3.1.3 describe them in more detail.
3.1.2 Channel Switching Tendency Offline to Online

The first part of the research model examines what factors influence offline shoppers to switch to the online channel for a future purchase (Figure 10). There are five variables considered as predictors of CST off-on.

The first variable is offline channel satisfaction. This variable measures to what extent the overall evaluation of a previous offline purchase process at a retailer (Falk et al., 2007) influences the intention to switch channel in the future at the same MC retailer.

Additionally, study 1 examines the effects of two omni-channel features that presumably make customers more willing to use the online purchase channel in the future. The effects of the options to pick up and return online purchases in-store are examined, as they have been marked as top strategic priorities in omni-channel programs (Forrester, 2014; Kilcourse & Rosenblum, 2015).

The last two independent variables that study 1 considers are price orientation and cross-channel searching. Price orientation assesses how conscious customers take price into account when making a purchase (Lichtenstein, Netemyer, & Burton, 1990). We already know that price consciousness is a very important characteristic in the purchase decision process of the customer (Bruce & Biswas, 2002). The influence of the customers’ price consciousness on channel choice is interesting, for instance to know if promotions change the purchase channel of customers. In the perspective of study 1, cross-channel searching examines if customers who tend to search on the webshop, before making an in-store purchase, have a higher willingness to switch to the online channel. In other words, does the orientation on the online channel enhance the probability that a customer will also make purchase on the online channel in the future?

3.1.3 Channel Switching Tendency Online to Offline

In contrast to the first part, the second part of the research model examines what factors influence online shoppers to switch to the offline channel for a future purchase at the same retailer (Figure 11). The second part of the research model is comparable to the structure of the first part. Also study 2 contains five independent variables, derived from the same aggregated constructs, i.e. channel satisfaction, omni-channel features, and customer characteristics.
Online channel satisfaction, price orientation, and cross-channel searching are considered as predictors of CST off-on, with the same underlying thoughts as in study 1. A previous evaluation of the experience with the online channel, the customers’ view on price, and the habit to search in-store are all expected to influence CST on-off.

However, in contrast to study 1, this part of the research model examines two different omni-channel features that would affect CCM from online to offline. Study 2 examines the effect of online in-store visibility and the option of home delivery to the customer after an in-store purchase or when a product was out of stock. Those two omni-channel features presumably stimulates customers to shop in-store instead of on the webshop. Also these omni-channel features ranked high on the top priorities for omni-channel programs, respectively as number three and two on the list (Forrester, 2014). Moreover, DHL marks inventory visibility across channels as the key enabler in becoming omni-channel (DHL, 2015).

Figure 11: Part 2 of the research model (explaining CST on-off) – Study 2

3.2 Hypotheses

Although we examine a relatively new research field in MC retailing, there are some studies from which expected directions of the relationships can be derived. Based on findings from previous research in the MC retailing and e-commerce literature, hypotheses are proposed. Figure 12 provides an overview of the complete research model (study 1 and 2 combined), including hypotheses.

3.2.1 Channel Satisfaction

In the decision to switch from purchase channel, customers obviously take evaluations of their experiences with their usual purchase channel into account (Falk et al., 2007). Due to the importance of previous experiences on future purchase decisions, a channel evaluation is considered as a predictor of customers’ channel switching tendencies. The evaluation of a channel is assessed by “satisfaction”, as satisfaction is a cumulative and abstract construct that reflects the total experience of a customer (Johnson, Anderson, & Fornell, 1995). In that perspective, channel satisfaction corresponds with an overall evaluation of experiences with a certain channel (Falk et al., 2007).
When individuals are confronted with several purchase methods, they prefer to stick with their usual purchase process, according to the status quo bias theory (Kahneman, Knetsch, & Thaler, 1991; Samuelson & Zeckhauser, 1988). Moreover, status quo behavior makes individuals reluctant to take alternative courses of action that would lead to higher utility levels (Ritov & Baron, 1992). Therefore, the perception of the value of an alternative channel must more than outweigh the current satisfaction level of the customers’ current channel.

With the status quo bias theory in mind, Falk et al. (2007) studied customers’ switching tendency from offline to online in a multichannel environment. In their study, Falk et al. (2007) find a strongly reducing effect of traditional offline channel satisfaction on the probability that customers would switch to the new online channel. A higher offline satisfaction level generates channel loyalty and reduces the willingness of customers to take the “risk” to use the online channel. In accordance with the results of Falk et al. (2007), Montoya-Weiss, Voss, and Grewal (2003) found that customers’ overall evaluation of the offline channel negatively influence online channel use. In other words, higher offline channel satisfaction of the customer is expected to result in a lower tendency to switch to the online channel. This results in the following hypothesis:

**H1: Offline Channel Satisfaction decreases the Channel Switching Tendency from offline to online.**

Moreover, Montoya-Weiss, Voss, and Grewal (2003) examined the drivers of customers’ online channel use, and found that customers’ evaluations of the online channel positively influence online channel use. When online customers are satisfied with their bought product and online purchase, their perceived risk of the online channel use decreases significantly. This results in more repeating purchases on the online channel. Hence, the following hypothesis is stated:

**H2: Online Channel Satisfaction decreases the Channel Switching Tendency from online to offline.**
3.2.2 Omni-Channel Features

In the integration of online and brick-and-mortar stores, the option to “click and collect in-store” and the ability to return online purchases in-store become basic requirements in MC retailing (Beck & Rygl, 2015). However, these services change the role of the physical store significantly. The new role of the traditional store may vary per product category, but transits from a purely sales channel to a service “hub” for the customer in most cases (Piotrowicz & Cuthbertson, 2014). At those service hubs it is also possible to collect and return online orders, as the physical stores assist the webshop with delivery and after sales service.

The customers’ decision for a specific channel during search, order, payment, and collection stages depends on tradeoffs they make between waiting time and effort needed to make a purchase (Hyun-Hwa & Kim, 2009). “Buy online and pick up in store” is an additional service of the webshop, which offers the customers the low efforts of searching, ordering and paying online, while still benefitting from a fast and usually costless collection process in the store (Chatterjee, 2010). Moreover, customers benefit from the freedom to select a moment to pick up an order in-store and in-store services as product advice, which makes it more convenient than home delivery for some customers. For that reason, we state the following hypothesis:

\[ \text{H3: A buy online, pick up in-store service increases the Channel Switching Tendency from offline to online.} \]

A similar increased switching intention is expected for a buy online, return in-store service, as this extra return option decreases the perceived risk by the customer to order online (Ofek, Katona, & Sarvary, 2011). Hence, we propose:

\[ \text{H4: A buy online, return in-store service increases the Channel Switching Tendency from offline to online.} \]

Nowadays, customers expect that products are on stock and will not waste time to go to a store if that is uncertain (Forrester, 2014). For that reason, many customers decide to purchase at the online channel instead, because it has information about the product availability. However, according to Forrest Consulting (2014), those customers can be re-attracted to the physical store if retailers provide online in-store product availability information. In that case customers can profit from a higher certainty that the online checked products are available and in-store advantages such as direct collection. Based on this reasoning, we propose the following hypothesis regarding online in-store inventory visibility:

\[ \text{H5: Online in-store inventory visibility increases the Channel Switching Tendency from online to offline.} \]

Inventory visibility is one solution to stimulate customers to visit the physical store. Another option is (fast) product shipment to the customer’s home in case a product is out of stock in the store of a MC retailer. The research of Forrest Consulting (2014) indicates that multiple channel shoppers are more likely to use a buy in-store, ship to customer service, than buying it from another retailer. Moreover, MC retailers rank the service as second omni-channel priority (Forrester, 2014). In support, Bell, Gallino, and Moreno (2015) state that a buy in-store, ship to customer service stimulates customers to shop in-store, because it diminishes the consideration of a potential out of stock situation. Consequently, we propose:

\[ \text{H6: A buy in-store, ship to customer service increases the Channel Switching Tendency from online to offline.} \]
### 3.2.3 Customer Characteristics

Price orientation is the degree to which customers focus on paying low prices (Lichenstein, Netemeyer, & Burton, 1990). There are different views on how price orientation influences channel choice. Results of a study by Gensler, Verhoef, and Böhm (2012) state that price perception does not drive channel choice. However, the ease of price comparison varies per channel and does therefore influence channel choice according to Verhoef, Neslin, & Vroomen (2007). For instance, the Internet provides customers with the possibility to easily compare prices across broad assortments. Hence, customers who value price orientation highly, can experience a higher utilitarian value on the online channel than on the offline channel (Noble, Griffith, & Weinberger, 2005). Therefore, we propose:

**H7a: Price Orientation increases the Channel Switching Tendency from offline to online.**

Following the same logic, we expect that online shoppers with higher degree of price orientation are less likely to switch to the offline channel. Hence, we propose:

**H7b: Price Orientation decreases the Channel Switching Tendency from online to offline.**

Increasingly, customers use a different search and purchase channel in their customer journey. According to an omni-channel trend report of DHL (2015), 88% of US consumers admit to have done “web-rooming” – searching online and then buying in-store. Additionally, almost 70% of the US consumers admit to have purchased via “show-rooming” – visit physical stores, before purchasing it online. Both web- and show-rooming are a form of cross-channel searching behavior. According to Konuş, Verhoef, and Neslin (2008), customers that use different channels for the orientation and actual purchase are more likely to switch to the orientation channel for future purchases. Those customers are classified as multichannel enthusiasts, which are more innovative and explorative and therefore more willing to purchase via another channel in the future (Konuş, Verhoef, & Neslin, 2008). We thus propose the following two hypotheses:

**H8a: Cross-Channel Searching increases the Channel Switching Tendency from offline to online.**

**H8b: Cross-Channel Searching increases the Channel Switching Tendency from online to offline.**

### 3.2.4 Control variables

In addition to the relationships between the dependent and independent variables mentioned in the hypotheses (Figure 12), the influences of certain control variables on CCM are examined. According to the literature of multiple channel consumer behavior, specific psychographics and demographics of the customers also play a role in the channel decision (Neslin et al., 2006). However, many opposing effects are found in past researches (Konuş, Verhoef, & Neslin, 2008). To control for the influences of some psychographics and demographics of the customers, their direct effects on CCM are tested by adding them as independent variables in the model. Online purchase experience, brand loyalty, and shopping enjoyment are added as psychographic control variables. Internet purchase experience should lower the perceived risk of an online channel and therefore stimulate CCM from offline to online (Herhausen et al., 2015). Konuş, Verhoef, & Neslin (2008) suggest that brand loyalty decrease CCM, while on the other hand shopping enjoyment would increase CCM. Brand loyal customers deliberately cut off other options and thereby focus on one channel, whereas shopping excited people are open for new experiences. Finally, the model controls for possible influences of age and gender as general demographics.
4. Research methodology
This chapter describes the three research methods that are used to study CCM in an omni-channel retailing context. Section 4.1 describes the questionnaire that was used to test the research model. Subsequently, section 4.2 explains the interviews that were conducted with omni-channel experts to examine the current omni-channel developments and issues in practice. The final section (4.3) explains the case study that is executed to test a measurement method for CCM between an online and offline channel.

4.1 Questionnaire
The most elaborate part of the research project is based on testing the research model with the input of questionnaire responses. In the questionnaire, people were asked to answer questions about a previous purchase situation and how certain services (omni-channel features) would influence their tendency to switch to another channel for a future purchase at the same retailer. The research model particularly focused on two product categories, namely clothing and electronics. Docdata divides products into soft-line and hard-line products. Soft-line products are difficult to compare and often have an emotional involvement. In comparison, hard-line products are easy to compare with readily available product information and are mainly bought based on price. In order to test for the relationships across product categories in the research, the soft-line products are represented by clothing and the hard-line products by electronics. Additionally, the research model is also tested for both products individually to control for product category influences. The used questionnaire can be found in Appendix A.

4.1.1 Sample
The target group of the questionnaire existed of people who purchased clothing and/or electronics at a MC retailer in the past. In the context of the questionnaire, a MC retailer was defined as a retailer who offers its product both online on a webshop and offline in physical stores. If an individual never purchased clothing or electronics at a MC retailer, the individual did fall outside the target group of the survey.

Because the research model examines CCM from a holistic perspective, both online and offline shoppers at MC retailers were required for the sample. Data was collected in two ways: (1) by approaching people in the main shopping areas of Eindhoven, Waalwijk, Rotterdam, and Amsterdam, to fill in a hardcopy version of the questionnaire, and (2) by spreading an online version of the exact same questionnaire via social media (LinkedIn, Facebook, Twitter) and putting the electronic questionnaire on websites (surveystudent, enqueteplanet) for additional response collection.

4.1.2 Questionnaire design
First the questionnaire was designed hardcopy. Subsequently, an online version of the same survey was made in Google Forms. Completing a questionnaire would take 5 to 10 minutes for the respondents. The questionnaire contained three sections:
1. Introduction and target group check;
2. Evaluation of last purchase experience of clothing and/or electronics at MC retailer(s) and the related channel switching tendency;
3. General questions about online purchase experience, shopping enjoyment, brand loyalty, age and gender.
Respondents would only be allowed to fill in the questionnaire if they bought a clothing and/or electronics product at a MC retailer in the past. Additionally, based on the answers of the target group check, respondents would receive different follow up questions in section 2, because the channel switching tendency of online and offline shoppers was tested for different omni-channel features. The questions in section 2 were specifically about the last purchase situation of a clothing and/or an electronics product at a physical store or webshop of a MC retailer. Table 3 summarizes the target group check, which was also the approach to determine the follow up questions in section 2. In a nutshell, respondents could respond on two purchase situations if they ever purchased both clothing and electronics at MC retailers, and only response on one purchase situation if they ever purchased either clothing or electronics products at a MC retailer.

Table 3: Target group check and method to determine section 2 follow up questions

<table>
<thead>
<tr>
<th>Purchased clothing at a MC retailer?</th>
<th>Purchased electronics at a MC retailer?</th>
<th>Yes, last product in physical store</th>
<th>Yes, last product at webshop</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, last product in physical store</td>
<td>V1: clothing offline, electronics offline</td>
<td>V3: clothing offline, electronics offline</td>
<td>V2: clothing online, electronics online</td>
<td>V6: electronics offline</td>
</tr>
<tr>
<td>Yes, last product at webshop</td>
<td>V4: clothing offline, electronics online</td>
<td>V2: clothing online, electronics online</td>
<td>V7: clothing online</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>V5: clothing offline</td>
<td>V8: electronics online</td>
<td>Not in target group</td>
<td></td>
</tr>
</tbody>
</table>

When conducting the survey on the streets, the right version of section 2 questions was handed over to the respondents after the target group check. In the online version, the right follow up questions would automatically appear through the “go to page based on answer” functionality of Google Forms. The last section of the questionnaire was identical for all respondents, as it contained the general questions for the control variables.

A draft version of the questionnaire was tested in a pilot by the supervisors, three colleagues, and five fellow students. Based on the feedback of the pilot, several questions were reformulated in an easier way. Additionally, fill in questions about the product type and the name of the MC retailer were added to validate the plausibility of the purchase at an MC retailer afterwards. To increase the incentive to participate in the survey, respondents could win a fashion voucher of €25. Eight vouchers were raffled afterwards.

4.1.3 Measurement

The questions and measurement scales of the variables of the research model are derived from previous academic studies. An overview of the measurement scales per variable and their related source can be found in Appendix B.

Customer Channel Migration

Gupta, Su, and Walter (2004) examine CCM from offline to online by measuring the customers’ channel switching intentions. According to the theory of reasoned action (TRA) purchasing decisions depend on behavioral intentions (Ajzen & Fishbein, 1980). Social psychology research advocates that intentions are the best predictor of actual behavior, since they allow each individual to incorporate all relevant factors that may influence their actual behavior (Fishbein & Ajzen, 1975). Based on the TRA, Gupta, Su, and Walter (2004) consider the degree to which people express their intentions to purchase at the online and offline channel, as a reasonable predictor of their actual behavior, and thus as a good indication of the channel switching
tendency. To measure the Channel Switching Tendency from offline to online (CST off-on), Gupta, Su, and Walter (2004) asked respondents about their intentions to purchase online and their intentions to purchase offline for certain products, in case they had to buy the product in the next month. The study used 7-point Likert scales, and derives the CST off-on from the difference between the online and offline purchase intentions. In our study, we use a similar measurement scale. The only difference is that we combine the separate questions for online and offline purchase intentions into one construct. Instead of asking how probable a future online and offline purchase is, we measure the CST off-on by asking where the respondent will probably buy the specific product if he or she had to buy it in the next month (1=very probable in the physical store, 7=very probable at the webshop). The same construct is also used for CST on-off, only then the scale is reversed afterwards (1=very probable at the webshop, 7=very probable in the physical store). We made this adaption, because it is more concrete and emphasizes the decision between the online and offline channel for the future purchase of a similar product.

**Channel Satisfaction**
As explained in Chapter 3, a previous experience at a certain channel may have a major influence on which channel a customer will use in the future. The satisfaction level of a previous purchase experience at a specific channel, provides a good indication of the customers’ channel satisfaction (Montoya-Weiss, Voss, and Grewal, 2003). In order to measure overall satisfaction, Montoya-Weiss, Voss, and Grewal (2003) use one question about how satisfied customers were, considering all experiences in the purchase process (1=very dissatisfied, 7=very satisfied). This measurement scale has also specifically been used for offline channel satisfaction (Falk et al., 2007) and online channel satisfaction (Devaraj, Fan, & Kohli, 2002). Consequently, we use a similar one-dimensional construct to measure online and offline channel satisfaction, by asking MC retail customers about how satisfied they were with their last purchase process in the physical store or at the webshop (1=very dissatisfied, 7=very satisfied).

**Omni-Channel Features**
Based on important and recognized omni-channel reports, the impact of four omni-channel features on CCM are examined. To measure the effects of the omni-channel features in the same way, an approach of Gupta, Su, and Walter (2004) was used to create comparable constructs for each omni-channel feature. The construct for each omni-channel feature consisted of two items. The first item addressed to what extent the omni-channel feature would increase the intention to buy a comparable product at the opposite channel of his last purchase at a MC retailer. For instance, if a customer bought his last clothing in a physical store at a MC retailer, the questionnaire stated if the service to collect webshop purchases in-store, would increase the intention to buy a comparable future products on the webshop of the same retailer (1=strongly disagree, 7=strongly agree). The second item of the constructs examines the relative importance of the omni-channel features in the decision to buy the product either in the physical store or on the webshop (1=not important, 7=very important). Together, the intention and the importance in the purchase decision resemble the influence of the omni-channel feature.

**Customer Characteristics**
Price orientation and cross-channel searching were both measured by one-item constructs. Because the questions about the previous experience at a MC retailer were purchase situation specific, the most valuable information about the search process is at which channel the
customer searched for the product before buying it in the physical store or on the webshop (Verhoef, Neslin, & Vroomen, 2007). To check for cross-channel searching, online shoppers were asked if they saw the product in a physical store before purchasing it online, and offline shoppers were asked if they saw the product on a webshop before purchasing the product in-store. In order to measure price orientation, the construct of price consciousness by Konuș, Verhoef, and Neslin (2008) and the construct about the economic shopper by Choi & Park (2006) were used as input. This led to the question how conscious a customer did search where he or she could purchase the product for the lowest price (1=not conscious, 7=very conscious).

**Control variables**

In the last section of the questionnaire the respondents had to answer questions about their psychographic and demographic characteristics to measure the control variables. The online purchase experience of customers was tested first by asking about how often they purchase products online (Bijmolt, Huizingh, & Krawczyk, 2014), and how long they have been using the Internet as a purchase channel (Yang, Jun, & Peterson, 2004). With this two-item approach both the frequency and history of purchasing online could be measured. For measuring shopping enjoyment and brand loyalty two-item constructs from Konuș, Verhoef, and Neslin (2008) were used. By responding on four straightforward statements (1=strongly disagree, 7=strongly agree), shopping enjoyment and brand loyalty were measured. Furthermore, gender and age were checked as demographic characteristics. Age was measured using five age categories (Mathwick, Malhotra, & Rigdon, 2001). The classification divides the respondents in different general life phases, which might influence their purchase behavior. For instance, shoppers between 25 and 35 years of age generally have a job and thus more income than shoppers of 24 years or younger, who usually have significantly less income.

**4.1.4 Statistical analysis method**

To examine the research model with the mentioned measurement scales, multiple regression is used. Multiple regression is a preferred statistical method for analyzing the relationships between several independent variables and a single dependent variable (Field, 2009). In multiple regression the values of the independent variables are used to explain or predict the value of the dependent variable (Hair et al., 2009). As our research model consists of two studies with each five independent variables and one dependent variable, multiple regression is appropriate for examining both parts of the research model.

The regression coefficients indicate the direction (positive or negative) and strength of the relationships between the independent variables and the dependent variable. In other words, the regression coefficients indicate the change in the dependent variable when the independent variable changes by one unit (Hair et al., 2009). Furthermore, multiple regression assesses if the independent variables are significant predictors of the dependent variable and tests if the model itself is significant. The goodness of fit between the regression model and the actual observed values of the dependent variable is given by $R^2$. The $R^2$ represents the percentage of the variation in the outcome that can be explained by the model. The relative impact of the independent variables on the dependent variable can be discovered by interpreting the standardized beta coefficients, as they eliminate the problem of different measurement scales via standardization (Hair et al., 2009).

The minimum ratio of observations to independent variables is 5:1, but the preferred ratio is 10:1 or 15:1 according to Field (2009), or even 15:1 or 20:1 according to Hair et al. (2009).
ensure that the results from the research model are reliable, a minimum threshold for the sample size was based on the 10:1 ratio of Field (2009).

Within multiple regression there are several methods to select and add independent variables to the model. However, for exploratory model building as in our research, the stepwise method is preferred and mostly used among researchers (Hair et al., 2009). We also use the stepwise method in our analysis. The stepwise method is an automatic procedure that includes significant predictors sequentially, based on their contribution to the model (i.e. variables that significantly explain the most variance are added first).

The last step of the regression analysis is checking the regression assumptions. The following assumptions must be examined, before drawing conclusions (Field, 2009; Hair et al. 2009):

1. **Multicollinearity** – There should be no perfect linear relationship between two or more predictors.
2. **Independent errors** – The residual terms should be uncorrelated or independent.
3. **Homoscedasticity** – The residual terms at each level of the predictors should have the same variance.
4. **Linearity** – The relationship between outcome variable and the predictors should be a linear one.
5. **Normally distributed errors** – The residuals in the model should be random, normally distributed with a mean of zero.

### 4.2 Interviews

Besides collecting quantitative data via the questionnaire, semi-structured interviews were used as qualitative tool to collect omni-channel and CCM insights from practice, and to better interpret the found results from the research model. Six official interviews were conducted with omni-channel experts. Five of them were retail channel experts at different customers of Docdata. The other one was an expert working at an omni-channel retailer, which was not a Docdata customer. He was approached based on an article about omni-channel retailing in a well-known e-commerce report. Input from the company supervisors was used to select the interviewees. Among the interviewees there was a COO, a Director Multi-Channel & IT, a Digital Producer, a Director Customer Collaboration, and two E-Commerce Managers. The interviewees work at different MC retailers in different industries: four in different segments of the fashion industry, one in the electronics industry, and one in the food industry. The companies were in different stages of omni-channel realization. Three of the companies could be labeled as advanced omni-channel retailers, while the other three retailers were currently in the transition phase towards omni-channel retailing.

Because the interviewees had different functions in companies with varying omni-channel capabilities and knowledge, the method of semi-structured interviews was chosen to leave room for a specific focus in the interviews (Van Aken, Berends, & Van der Bij, 2007). This method was ideal for the collection of qualitative insights in the altered settings, as different topics could be addressed structurally in each interview, while the focus and questions per category could be adapted during the interview based on the expertise of the interviewee. With this approach the interviewees can better share in-depth knowledge, whereas insights among the interviewees can still be compared with the use of categories in the interview (Van Aken, Berends, & Van der Bij, 2007). The interpretation of omni-channel retailing, channel integration, customer channel migration, and the future of omni-channel retailing formed the categories of the interview.
The interviews were conducted face-to-face and had durations of 45 minutes to one hour. In the questionnaire a funneling technique was used. This technique starts an interview with open-ended questions to get a perception of the interviewees’ expertise and the companies situation, followed by further questions about key issues which are relevant for the study (Sekaran, 2003). In addition, the interviews ended with questions about the future of omni-channel retailing to gain more insight about the vision of the company towards omni-channel retailing. To not bias the answers of the interviewee, questions were asked in a neutral way, i.e. without expected response. The list with the general questions of interviews can be found in Appendix C.

Besides the official interviews with the omni-channel experts outside Docdata, meetings with several omni-channel experts within Docdata were planned in the first month of the research project. The input from those meetings are not used for the official results, but served as introduction to the company and to the research topic from a practical perspective.

4.3 Case study

With the use of a case study, a method to measure CCM between the online and offline channel was developed and tested. The method to measure CCM is mainly based on a conceptual model of Biyalogorsky and Naik (2003), who developed a method to measure the cannibalization of the offline sales by the online purchase behavior of customers. In their model, Biyalogorsky and Naik (2003) use aggregate-level market data, as visits of the webshop, number of online orders, online sales, and offline sales to analyze customer online behavior and estimate the CCM from offline to online. The model of Biyalogorsky and Naik (2003) can roughly be divided into two parts:

1. Examining how customer online behavior leads to online purchase behavior, i.e. how website visits result in online purchases.
2. Examining how online purchases influence the online sales and the offline sales.

However, Biyalogorsky and Naik (2003) only considered the influence of online customer behavior on offline sales, as they did not have any data about the offline customer behavior and number of offline purchases. As we research CCM from a holistic perspective and are in the possession of aggregated case data of both the online and offline channel, we extended the model. We duplicated the approach for measuring CCM from offline to online for measuring CCM from online to offline, leading to the adapted model below (Figure 13):

![Figure 13: Adapted model of Biyalogorsky & Naik (2003) for measuring CCM](image)
The first step of the case study is to calculate the effects of the online and offline visits \((X^o, X^f)\) on the number of online and offline transactions \((O^o, O^f)\) using the following model equations:

\[
O^o_t = \beta_1 X^o_t + \beta_3 X^f_t + \epsilon_{1t} \quad (1)
\]

\[
O^f_t = \beta_3 X^o_t + \beta_2 X^f_t + \epsilon_{2t} \quad (2)
\]

In our model the effect of webshop visits on the offline transactions and the effect of the store visits on the online transactions are also considered, because then also the influence of cross-channel searching is examined.

The second and last step of the case study is to calculate the effects of the online and offline transactions on the online and offline sales \((\lambda_1, \lambda_2, \lambda_3, \lambda_4)\). The following equations are used:

\[
S^o_t = \lambda_1 O^o_t + \epsilon_{3t} \quad (3)
\]

\[
S^f_t = \lambda_4 O^f_t + \gamma^o LS^o_t + \epsilon_{4t} \quad (4)
\]

\[
S^o_t = \lambda_3 O^f_t + \epsilon_{5t} \quad (5)
\]

\[
S^f_t = \lambda_2 O^o_t + \gamma^f LS^f_t + \epsilon_{6t} \quad (6)
\]

Consequently, the values of \(\lambda_2\) and \(\lambda_4\) indicate respectively the migration in sales from offline to online per online transaction, and migration in sales from online to offline per offline transaction. Logically the values for \(\lambda_1\) and \(\lambda_3\) should approximate the average online and offline transaction value (Biyalogorsky & Naik, 2003).

4.3.1 Case description

For the case study a MC retailer, which is a customer of Docdata, delivered the required data for the case study analysis. The MC retailer can be labeled as a retailer that is in the transition phase towards becoming omni-channel. The MC retailer sells its products both online on a webshop.
and offline in physical stores. In order to analyze CCM, the visits, transactions, and sales via the webshop and one physical store are examined.

4.3.2 Case data
The data that is gathered covers a period from Januari 2014 to the 23th week of 2016. All data values are on a weekly basis. The online channel data consists of the number of unique webshop visits, the number of transactions, the weekly sales via the webshop, and additional information as the bounce rate and conversion rate. The input of the offline channel consists of data from one specific physical store of the MC retailer. The data of the physical store contains the number of weekly visits, the weekly number of transactions, and the weekly sales in the store. With the use of both online and offline data the case study analysis that is described can be executed.
5. Data analysis and results

The analyses and results of the three research methods are presented in this chapter. Firstly, section 5.1 analyzes the questionnaire data extensively, in order to explore the relationships that are defined in the research model. Section 5.2 summarizes the main findings from the interviews. Those include findings across the main categories of the interviews. Finally, section 5.3 presents the results from the case study about testing a measurement method for CCM.

5.1 Questionnaire analysis

For the analysis of the gathered data from the questionnaires, a procedure of eight steps is followed to come to the results using a structural approach. The consecution of these steps is based on the steps for a multi regression analysis by Field (2009). An overview of the steps in the procedure can be viewed in Figure 14.

![Figure 14: Steps in procedure questionnaire analysis (Field, 2009)](image)

5.1.1 Data examination

The first step in analyzing the questionnaires is checking the data for missing values, outliers, and strange responses. It is important to take into account that one respondent could deliver one response about the purchase of a clothing product and one response about the purchase of an electronics product. When we refer to the word “case”, we mean the response on one particular purchased product. Hence, respondents could deliver two “cases” when they delivered responses for both purchased clothing and electronics at MC retailers. When we refer to the word “form”, we mean the complete response of a respondent (i.e. all delivered cases).

Missing values

As it was not possible to submit the online form with unanswered questions, the responses that were gathered via the online questionnaire did not have any missing values. On the other hand, the hard copy questionnaires that were filled in at the city centers could contain missing values if respondents did not answer all questions. From the responses on the hard copy forms, two forms with missing values were discovered. In both forms all questions in section 3 of the questionnaire, which was about the control variables and the demographics of the respondent, were unanswered. Because there is no reliable imputation method for estimating personal characteristics (Hair et al., 2009), the two forms were deleted from the sample.¹

Outliers

Furthermore, the dataset was controlled for univariate and multivariate outliers. Univariate outliers are extreme values for single variables, which can be identified with the standardized values (z-scores) of all values of the variables. A z-score above 3 indicates a univariate outlier (Hair et al., 2009). However no z-scores above 3 were found, which indicates that there are no univariate outliers in the dataset.

¹ The found significant effects of the research model remain robust when those cases are part of the sample (p’s < 0.05)
Multivariate outliers are unusual combinations of values across all variables that are measured, which can be identified by calculating the Mahalanobis distance ($D^2$) for each case (Hair et al., 2009). The Mahalanobis distance examines the distance between the observed values and the average distribution of the observations. Cases with a $D^2$ which have a probability of 0.001 or less are identified as multivariate outliers and should be examined for curious fill-in behavior (Tabachnick & Fidell, 2007). The Chi² distribution is typically used to calculate the probability. Four cases of multivariate outliers were discovered with the $D^2$ test. The responses were examined and labeled as unreliable, because the cases contained unusual answer combinations on the questions, using only the edges of the Likert scales. An additional graphical method to detect multivariate outliers was used, which plots the mean of the answers versus the standard deviation of the answers by a respondent. From the scatter plots of study 1 and study 2 an extra outlier could be detected, as there was a case in both studies with a mean of 4 and a standard deviation of 0 (Appendix D), meaning that the respondent answered all questions with 4. Both cases were responses from the same respondent (i.e. both cases belonged to the same form). Therefore, the cases from this respondent could also be marked as unreliable. The four multivariate outliers from the $D^2$ test could be observed on the extreme right positions in the plots of Appendix D. Hence, all multivariate outliers were deleted from the sample.

**Strange responses**

Besides missing values and outlier detection, the data was checked for other unreliable responses that could bias the results. As part of the questionnaire, respondents had to fill in the MC retailers of their purchase situations. If the respondent answered the question based on a purchase situation at a single channel retailer, there would be no option to switch to the other channel for a future purchase. Therefore, we checked if the mentioned MC retailers were actually MC retailers with both an online and offline channel. Three incorrect cases were found for clothing (Selected Femme, Zalando, Bol.com) and three incorrect cases were found for electronics (Geekay, Bol.com, LightInTheBox). Those cases were all removed from the dataset.

Other strange responses were duplicated forms. Apparently this could occur with the online form if the submit button was double-clicked. Two of those duplicated forms could easily be identified based on the timestamp and the e-mail address. The duplicated forms were deleted.

### 5.1.2 Descriptive statistics

In total 241 questionnaires were collected, of which 141 were collected via online forms and 100 were collected in the city centers. Considering the demographics of the sample, 126 were male and 115 were female. The number of cases amounted 188 for study 1 and 189 for study 2. The demographic characteristics per study can be observed in Table 5.

<table>
<thead>
<tr>
<th>Table 5: Distribution gender and age category per study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cases Study 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
</tr>
<tr>
<td>103</td>
</tr>
<tr>
<td>68</td>
</tr>
<tr>
<td>24</td>
</tr>
<tr>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cases Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>76</td>
</tr>
<tr>
<td>28</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>
Additionally the mean, standard deviation, and correlations of study 1 and 2 can be observed in Table 6 and Table 7. The strong, significant correlations between the items of the omni-channel features indicate similarity of the measured items (Hair et al., 2009).

Table 6: Correlation matrix - Study 1

<table>
<thead>
<tr>
<th>DV</th>
<th>Mean</th>
<th>St. dev.</th>
<th>CST off-on</th>
<th>off-CS</th>
<th>OCF-A1</th>
<th>OCF-A2</th>
<th>OCF-B1</th>
<th>OCF-B2</th>
<th>PO</th>
<th>CCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CST on-off</td>
<td>3.22</td>
<td>1.730</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV's</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>off-CS</td>
<td>5.47</td>
<td>1.142</td>
<td>-2.69</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-A1</td>
<td>3.42</td>
<td>1.687</td>
<td>0.449</td>
<td>-0.97</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-A2</td>
<td>3.27</td>
<td>1.561</td>
<td>0.433</td>
<td>-0.063</td>
<td>0.781</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-B1</td>
<td>4.76</td>
<td>1.569</td>
<td>0.352</td>
<td>-0.125</td>
<td>0.408</td>
<td>0.281</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-B2</td>
<td>4.56</td>
<td>1.556</td>
<td>0.398</td>
<td>-0.122</td>
<td>0.306</td>
<td>0.406</td>
<td>0.777</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PO</td>
<td>3.40</td>
<td>2.101</td>
<td>0.120</td>
<td>-0.002</td>
<td>0.197</td>
<td>0.339</td>
<td>0.110</td>
<td>0.190</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CCS</td>
<td>0.44</td>
<td>0.498</td>
<td>0.091</td>
<td>-0.053</td>
<td>-0.165</td>
<td>0.233</td>
<td>0.083</td>
<td>0.090</td>
<td>0.558</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 7: Correlation matrix - Study 2

<table>
<thead>
<tr>
<th>DV</th>
<th>Mean</th>
<th>St. dev.</th>
<th>CST on-off</th>
<th>on-CS</th>
<th>OCF-C1</th>
<th>OCF-C2</th>
<th>OCF-D1</th>
<th>OCF-D2</th>
<th>PO</th>
<th>CCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CST on-off</td>
<td>3.10</td>
<td>1.632</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV's</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on-CS</td>
<td>5.80</td>
<td>1.180</td>
<td>-2.62</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-C1</td>
<td>3.89</td>
<td>1.727</td>
<td>0.438</td>
<td>0.008</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-C2</td>
<td>3.85</td>
<td>1.753</td>
<td>0.373</td>
<td>-0.075</td>
<td>0.754</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-D1</td>
<td>4.29</td>
<td>1.682</td>
<td>0.410</td>
<td>-0.054</td>
<td>0.499</td>
<td>0.454</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCF-D2</td>
<td>4.31</td>
<td>1.575</td>
<td>0.340</td>
<td>-0.119</td>
<td>0.395</td>
<td>0.451</td>
<td>0.793</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PO</td>
<td>4.13</td>
<td>2.072</td>
<td>-0.157</td>
<td>0.114</td>
<td>0.114</td>
<td>0.131</td>
<td>0.064</td>
<td>0.098</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CCS</td>
<td>0.28</td>
<td>0.449</td>
<td>-0.022</td>
<td>-0.025</td>
<td>0.121</td>
<td>0.129</td>
<td>0.204</td>
<td>0.295</td>
<td>0.106</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Correlations in italics are significant, correlations in bold are above 0.7

5.1.3 Reflective constructs

Before we could run the regression analysis, we must create composite measures for four constructs (OCF-A, OCF-B, OCF-C, OCF-D), as they are measured with two items. To create the composite measures we use the summed scales method. The method calculates the values of a concept by taking the average of the items that represent it. The weights for each item is assumed to be equal in the averaging procedure. However, before summed scales can be applied, the psychometric criteria must be passed (Hair et al., 2009). The psychometric criteria assess the reliability and validity of reflective constructs. The psychometric criteria examine three aspects:

1. Cronbach’s alpha: measures the reliability of a construct by assuming that the average correlation of a set of items is an accurate estimate of the average correlation of a certain construct.
2. Convergent validity: the extent to which indicators of a specific construct converge or share a high proportion of variance in common.
3. Discriminant validity: the extent to which a construct is truly distinct from other constructs.

The minimum threshold value for Cronbach’s alpha is generally 0.70, but may decrease to 0.60 in exploratory researches (Robinson, Shaver & Wrightsman, 1991). The outcomes of the
reliability analyses can be observed in Appendix E, Table 10. As the Cronbach’s alpha values are all above 0.80 the first psychometric criterion is met.

The convergent and discriminant validity can be assessed by examining the rotated factor matrix (Hair et al., 2009). For convergent validity the items that represent a construct preferably have high loadings on a single factor. As the sample size of study 1 and 2 are between 150 and 200 the minimal factor loadings should be 0.40 to 0.45 for the items that represent a factor (Hair et al., 2009). However, for discriminant validity it is not preferred that items of one reflective construct load high on two or more factors. The general maximum value for cross-loadings is 0.40. The factor matrices in Appendix E (Table 11 and Table 12) indicate that both requirements for convergent and discriminant validity are met, as the factor loadings are above 0.45 and the cross-loadings stay below 0.40.

Hence, all psychometric criteria are passed and the summed scales method is used to create single variables for OCF-A, OCF-B, OCF-C, and OCF-D.

5.1.4 Regression analysis
The next step is running the regression analyses. Due to the structure of the research model we need to run two regression analyses. Firstly to explain the dependent variable CST off-on by the independent variables: CCS, PO, off-CS, OCF-A, and OCF-B (study 1). Secondly to explain the dependent variable CST on-off by the independent variables: CCS, PO, on-CS, OCF-C, and OCF-D (study 2). The SPSS output of the regression analyses can be found in Appendix F.

For study 1 three significant predictors for CST off-on were found, namely off-CS, OCF-A, and OCF-B with a R² of 0.323. For study 2 four significant predictors of CST on-off were found, namely PO, on-CS, OCF-C, and OCF-D with a R² of 0.318. When combining the outcomes of the studies, the following relationships in the research model are found (Figure 15):

![Figure 15: Results of original research model](image)

Numbers on the arrows indicate the standardized betas
** p < 0.01 (1-tailed)
In summary, off-CS, OCF-A, and OCF-B explain 32.3% of the variance in CST off-on, while on-CS, PO, OCF-C, and OCF-D explain 31.8% of the variance in CST on-off. The explained variance (R²) of the dependent variables lays above the acceptable R²-value of 0.25 for opinion based measures (Hair et al., 2009). Moreover, researches that attempt to predict human behavior typically do not have R²-values higher than 0.50.

5.1.5 Control variables

Besides the independent variables of the research model, the influence of certain control variables on CCM are examined. The main difference between the independent and the control variables is that the independent variables are directly linked to the specific purchase situation of a clothing or electronics product, whereas the control variables are consistent customer characteristics over time. Both research models control for the influence of shopping enjoyment (SE), brand loyalty (BL), internet experience (IE), age, and gender.

However, since SE, BL, and IE are measured with two items, we need to test the constructs for the psychometric criteria. In study 1 we find Cronbach alpha values of respectively 0.843 (SE), 0.809 (BL), and 0.469 (IE). In study 2, the alpha's are 0.878 (SE), 0.823 (BL), and 0.349 (IE). In both studies the criteria for convergent and discriminant validity are met as the factor loadings are far above 0.45 on the represented factor and the cross-loadings stay below 0.40. Hence, for SE and BL reflective constructs were created in both studies using summated scales. On the other hand, the alpha values for IE in both studies are below the cut-off value of 0.70 (Robinson, Shaver, & Wrightsman, 1991). When taking a closer look at both items (questions 17 and 18 in Appendix A), we can observe that one of the item measures the length of the respondent's Internet purchase experience history (question 17), while the other item measures the Internet purchase experience frequency (question 18). Because of the low Cronbach's alpha it can be concluded that both items do not measure the same reflective construct. Therefore, we control the research model for both IE components independently (IE history = IE1; IE frequency = IE2).

Gender and age are examined as demographic control variables. The influence of those variables is tested by adding them as categorical variables in the regression.

After running the regression models for both studies including the control variables, the conclusion can be drawn that only one of the control variables significantly influences the research model, namely brand loyalty (BL). For both study 1 and study 2, BL has a significant negative effect on the CST (study 1: st. β = -0.130, p = 0.037; study 2: st. β = -0.183, p = 0.002). Moreover, adding BL in the model slightly increase the R²-values from 0.323 to 0.340 (study 1) and from 0.318 to 0.350 (study 2). This finding suggests that customers who are more brand loyal, are less likely to switch from channel. Konuş, Verhoef and Neslin (2008) found the same effect and support it by the reasoning that brand loyal customers search less extensively, cut off purchase options, and therefore focus on one channel only. In addition, when adding BL to the model the initial found significant effects of the research model remain robust (p's < 0.05).

The non-significance of the other control variables is consistent with findings that consumer behavior demographics (gender, age) and lifestyle variables (SE, IE1, IE2) only explain a small fraction of choice behavior (Rich & Jain, 1968).

5.1.6 Assumptions

Before drawing general conclusions based on the findings, the constructed research model must be checked for five multiple regression assumptions. As mentioned in Chapter 4, there are five
assumptions that must be checked, i.e. multicollinearity, independent errors, homoscedasticity, linearity, and normally distributed errors. The research model, with BL included as significant control variable, is tested for the five assumptions.

**Multicollinearity**

Multicollinearity means that several predictors are closely correlated to one another. To test for multicollinearity the variance inflation factors (VIF) or the tolerance (1/VIF) should be assessed (Field, 2009). VIF values above 5 or tolerances below 0.2 indicate a potential multicollinearity problem (Bowerman & O'Connell, 1990). The regression results (see Appendix G) indicate that there is no presence of multicollinearity according to the VIF values and tolerance levels.

**Independent errors**

Independent errors mean that the residual terms should be uncorrelated. Not meeting this assumption might indicate that there is an underlying factor that systematically influences the error term. The assumption can be tested using the Durbin-Watson test (Field, 2009). Preferably the value of the test is close to 2, meaning that the residuals are uncorrelated. A rule of thumb is that values below 1 or above 3 define concerns (Field, 2009). However, as can be observed in Appendix G the values of the Durbin-Watson tests are 1.902 (study 1) and 1.624 (study 2), implying independent errors.

**Homoscedasticity**

The residual terms at each level of the predictors should have the same variance. The assumption of homoscedasticity can be assessed graphically by the plots of the standardized residuals versus the standardized predicted values of the regression model (Field, 2009). The graph should look like a random array of dots evenly dispersed around zero. If the graph funnels out, then there is a chance of heteroscedasticity, which indicates an increasing variance across the residuals. When assessing the plots for study 1 and 2 in Appendix H (Figure 20 and Figure 21), it can be concluded that there is no sign of heteroscedasticity.

**Linearity**

The relationship between the outcome variable and the predictors should be linear. Linearity can be evaluated by the same graphs developed for the homoscedasticity assumption (i.e the standardized residuals against the standardized predicted values of the regression model). When the dots in the graphs reflect a certain pattern, it might indicate a non-linear relationship and violate the assumption of linearity (Field, 2009). For instance, when a curved shape can be observed, the relationship is probably curvilinear. However, as no pattern can be observed in the dots of Figure 20 and Figure 21 (Appendix H), the assumption of linearity is not violated.

**Normally distributed errors**

The residuals in the model should be random, normally distributed with a mean close to zero. The normality of the errors can be assessed graphically with a P-P plot and numerically with use of the skewness and kurtosis values (Field, 2009; Hair et al., 2009). The P-P plots in Appendix H (Figure 22 and Figure 23) indicate normal distributed residual terms. This is supported by the skewness and kurtosis values that should be within -1 and +1 (Hair et al., 2009). The skewness and kurtosis values are respectively 0.532 and -0.008 for study 1, and 0.246 and -0.464 for study 2. Hence, the residuals appear to be normally distributed.

As the five assumptions for multiple regression are met, it is allowed to generalize conclusions of the model beyond the sample of the research (Field, 2009).
5.1.7 Product categories

One of the sub-questions of the research is whether the effects of the omni-channel features on CCM differ across different product categories. To examine this question, we used the same research model with BL included and did run the regression model again for the cases of clothing and electronics separately. The results of the analyses are given in Table 8 below:

Table 8: Regression analyses results among product categories

<table>
<thead>
<tr>
<th></th>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Across categories (n=187)</td>
<td>Clothing (n=113)</td>
</tr>
<tr>
<td>CCS</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>PO</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>off-CS</td>
<td>-0.202**</td>
<td>-0.206**</td>
</tr>
<tr>
<td>OCF-A</td>
<td>0.382**</td>
<td>0.408**</td>
</tr>
<tr>
<td>OCF-B</td>
<td>0.227**</td>
<td>0.173*</td>
</tr>
<tr>
<td>BL</td>
<td>-0.130*</td>
<td>ns</td>
</tr>
<tr>
<td>R²</td>
<td>0.340</td>
<td>0.313</td>
</tr>
</tbody>
</table>

Number in the table indicate the standardized betas
** p < 0.01 (1-tailed)
* p < 0.05 (1-tailed)

The results of study 1 indicate that there are no major differences among the product categories clothing and electronics. In the perspective of the omni-channel features we can see that OCF-A has a slightly higher standardized beta for clothing and OCF-B has a slightly higher standardized beta for electronics. More interesting are the results across the two categories in study 2. It appears that the significant predictors of CST on-off differ for clothing and electronics. Although on-CS is significant in the study across the product categories, it is non-significant (p = 0.278) for the CST on-off of clothing, meaning that the significance is driven by the cases of electronics. The same can be observed for PO (p = 0.081) and OCF-D (p = 0.138) of the CST on-off for electronics, indicating that the significance in the model across categories in study 2 is driven by the cases of clothing. Another remarkable observation is the significance of gender (p = 0.024) in the CST on-off for electronics. This points out that men are less likely to switch from the online to the offline channel for future purchases of electronics at MC retailers. For the other control variables no significant effects were found in the analysis of the specific product categories.

5.1.8 Hypotheses outcomes

The results of the research model in terms of tested hypotheses are presented in Table 9. As can be seen in Table 9, seven out of ten hypotheses were supported.

First of all, the results show that channel satisfaction influences CCM negatively. The support of H1 and H2 indicate that satisfied offline and online shoppers are less likely to switch to the opposite channel of a MC retailer for future purchases. Secondly, the hypotheses about all four omni-channel features are supported. The significant positive effects of the omni-channel features indicate that customers migrate between the offline and online channel in an omni-channel due to the availability of those features. Moreover, it suggests that MC retailers can expect CCM between the physical store and webshop when implementing those features. When assessing the effects of the customer characteristics price orientation and cross-channel searching on CCM, we only find one supported hypothesis, as the other relationships are non-significant. The non-significance of H6 suggests that the degree of price orientation of offline
shoppers does not explain their channel switching behavior. In contrast, from H7 can be deduced that more price oriented online shoppers have a lower CST from online to the offline channel. This makes sense, since price orientations on the online channel can be performed effortlessly in comparison with the offline channel. Finally, the results indicate no significant effect of cross-channel searching in both directions of CCM. Despite 44% of the respondents declared to have searched online before purchasing offline (study 1), and 28% of the respondents in study 2 searched offline before ordering online (study 2), there appears to be no relationship between habits of CCS and CCM.

<table>
<thead>
<tr>
<th>Table 9: Results hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis</strong></td>
</tr>
<tr>
<td>H1</td>
</tr>
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** p < 0.01 (1-tailed)

5.2 Interviews analysis

The analysis of the interviews summarize the findings about omni-channel management, the integration of the physical store and the webshop, customer channel migration, and the future of omni-channel retailing. Moreover, we attempted to put the found results from the research model into perspective with the output from the six interviews.

5.2.1 Interpretation of omni-channel retailing

From the interviews could be derived that there are strongly varying views toward omni-channel retailing. The diversity in views arises from the different interpretations of omni-channel. When defining the word omni-channel, the term consistency is key in four out of the six interviews. Consistency refers to a similar shopping experience in-store and on the webshop. In addition, effortlessly switching between channels and alignment to personal preferences are mentioned. One of the interviewees defined omni-channel as follows: “Integrating the channels such that the customer has full control over how and when he or she purchases a product. The online and offline service levels should be equal, that is the ultimate experience.” In contrast, two other interviewees approached the term omni-channel from a logistic perspective by emphasizing product availability. One of them defined the main omni-channel thought as: “Buy from anywhere, ship from anywhere.” A complement statement is provided by another interviewee, who mentions that the customers should not care about whether a product is on stock in an omni-channel, because that is a problem which should be solved by the omni-channel retailer. Hence, from the responses about the interpretation of omni-channel we can distinguish two main objectives in omni-channel retailing: (1) creating a superior consistent experience amongst channels (front-end) and (2) bringing products as fast as possible to the customer independent of the purchase channel (back-end).
5.2.2 Channel integration
In order to determine the methods from practice to integrate the offline and online channel, the interviewees were questioned about the omni-channel initiatives of their companies. Most interviewees mentioned the option to buy online, pick up in-store (OCF-A) and the option to buy online, return in-store (OCF-B) as implemented channel integrations. However, the period of presence of these omni-channel features at the companies varied greatly, leading to differences in the perceived value of the features. An interviewee at one of the further developed omni-channel companies stated: “If collecting or returning online purchases is not possible, you are still living in the Stone Age of MC retailing. Those are basic requirements to call yourself omni-channel.”

Another interviewee that works at an omni-channel retailer in development, mentioned that they just implemented those services a few months ago: “As we serve a niche market, our customers are mostly store-focused. However, we detected a growing demand for online purchases from our in-store customer. Subsequently, we decided to insource our webshop management because we think that the know-how and integration with the physical store is key in serving the customer by becoming more omni-channel.”

In contrast to the availability of OCF-A and OCF-B at most companies, OCF-D was only present at half of the interviewees’ companies and OCF-C just at one. It became clear that those omni-channel features are usually implemented in a later stage of online-offline channel integration. As the implementation of OCF-C and OFC-D tend to occur in a later stage of omni-channel development, this does not mean that it has less priority. The implementations are just more complicated due to IT and logistic difficulties. The following statement emphasizes the importance of OCF-C: “The number one question at our call centers is if that dress on the webshop is also available in a specific store.” Another interviewee marks OCF-D as the most relevant feature: “You do not have to ‘sell a no’ to an in-store customer when a product is not on stock. The revenues can grow directly, because of this service. At a shoe retailer who implemented it, I heard that it resulted in a 1.5% to 2.5% increase in overall sales.”

From the six interviews a shared view about the omni-channel features can be deduced. OCF-A and OCF-B can be marked as basic requirements an omni-channel retailer should possess. OCF-C and OCF-D can be seen as the new omni-channel key differentiators.

Besides the four researched omni-channel features, other integrations of importance that were mentioned in the interviews were customer loyalty programs across channels, collecting and consolidating online and offline customer data, the option to online reserve an in-store product, online styling advice, and drop shipments.

5.2.3 Customer channel migration
The goal of the questions about CCM was to determine how the companies perceive channel migration, how they attempt to measure the extent of CCM, and if they experienced an influence of the four omni-channel features on CCM.

All interviewees indicated that they perceived a growing demand for the online channel in their markets. The degree of migration to the online channel is however product and regional dependent, according to the interviewees. In addition, two interviewees noted that they see the webshop sales grow for every new store they open. The simulation of offline sales via the online channel was mentioned by one interviewee: “Our stores experience that our online activities, such as online adds for local stores near the customer’s home, bring them new customers.” However,
most interviewees admitted that they do not (exactly) know and are not able to measure to what extent customers of their current customer base switch between their online and offline channel. “Collecting specific customer data about their offline channel use is difficult. Connecting it to the online customer data is even harder.”

Hence, the questions how the omni-channel features exactly affect CCM could not be answered by all interviewees. One of the interviewees stated: “You cannot measure the exact influence of those omni-channel features on channel migration. However, they do lower the barrier to make a repurchase at your company.” Another interviewee commented: “As we see that those omni-channel services are extensively used, we know that they are of added value for the customer. That is most important for us.”

In conclusion, based on the interviews the exact effects of the omni-channel features on CCM are not known at the omni-channel retailers. Their motivation to implement the features is to increase the service proposition toward customers and not to steer CCM.

5.2.4 Future of omni-channel
The last section of the semi-structured interviews challenged the interviewees to state what will become important omni-channel aspects in the future and what their companies would like to accomplish with omni-channel activities on the short and long term.

Many of the answers were related to improvement of collection and interpretation of customer data across channels. “When we can connect online and offline customer data we are able to better understand and communicate with the customer. For example by a personalized website or in-store advice based on purchase history across channels.” For that reason two interviewees mentioned the implementation of an online-offline integrated customer loyalty card as a short term omni-channel objective. Considering the same topic, journey maps to track the customers movement across channels in his entire purchase process was mentioned as a long term objective. “I could imagine that retailers will put RFID-chips in customer loyalty cards in the future.”

Other important issues that were mentioned considering the future of omni-channel retailing were close collaborations between suppliers and retailers, keeping the physical stores profitable, and an increased value of a flagship store.

5.3 Case study analysis
In the case study a measurement method for channel migration was tested. The two channels of interest were the webshop and one physical store of a MC retailer. Of both channels the weekly number of visits, weekly number of transactions, and weekly sales are used in the analysis. The dataset ranges from Januari 2014 to week 23 of 2016.

5.3.1 Data examination
The dataset did not contain any missing values. Subsequently, the data and trends of the visits, transactions, and sales of both channels were explored. The first observation was the stability of the visits, transactions, and sales of the physical store, versus the growing and unstable growing pattern of the visits, transactions, and sales of the webshop (Figure 16 and Figure 17). In the next step the data was explored for univariate and multivariate outliers.
To discover univariate and multivariate outliers in the dataset, a same procedure was used as in the exploration of the questionnaire data. The standardized values (z-scores) were used to identify extreme values and the Mahalanobis distance ($D^2$) was used to find multivariate outliers. Both $z$-scores and $D^2$ analysis indicate outliers in the same cases, namely the offline visits, transactions, and sales in week 16 of 2014, 2015, and 2016. The cause of the outliers could be derived from a major yearly event near the physical store. However, as the method of Biyalogorsky and Naik (2003) takes seasonal effects into account, the values remained in the dataset.

Both $z$-scores and $D^2$ analysis indicate outliers in the same cases, namely the offline visits, transactions, and sales in week 16 of 2014, 2015, and 2016. The cause of the outliers could be derived from a major yearly event near the physical store. However, as the method of Biyalogorsky and Naik (2003) takes seasonal effects into account, the values remained in the dataset.

Other remarkable values were found in the first 20 weeks of the online transactions and sales of 2014. In that particular period the weekly transactions via the webshop were significantly lower. The observation was checked with the e-commerce manager of the webshop. According to the e-commerce manager, the low amount of weekly transactions in that period could be explained due to the date the webshop went live, which was at the end of December 2013. Therefore, the first 20 weeks of 2014 are removed from the dataset as they can be seen as the startup phase of the webshop. After those 20 weeks, the number of weekly transactions has a proper minimum threshold, seen the values of the transactions after this particular moment. Furthermore, as the measurement method requires data over a period of exactly two years, the period of week 20 of 2014 to week 20 of 2016 is used in the analysis.

### 5.3.2 Parameter estimation

As the method of Biyalogorsky and Naik (2003) consists of a conceptual model assuming linear relationships (without intercept), linear regression is used to find the values for the estimators in the model. As we are testing a measurement method for CCM we would like to know all values of the model parameters ($\lambda_1, \lambda_2, \lambda_3, \lambda_4, \beta_1, \beta_2, \beta_3, \beta_4, \gamma^n, \gamma^f$) and their related significance level. Since the model is explorative, we use the backward regression method for determining the values of the pre-established equations. This method starts with including all variables in the model and subsequently calculates if the predictive value of the model increases if variables are removed (Field, 2009).

By using the described estimation method, first the values for the effects of the online and offline visits on the online and offline transactions were determined ($\beta_1, \beta_2, \beta_3, \beta_4$). The results of the first step of the analysis are shown on the next page, with the significance level of the predictors in the parentheses.
Step 1:

\[
\begin{align*}
O_t^n &= 0.0042 X_t^n + 0.00055 X_t^f + \varepsilon_{1t} \\
O_t^f &= 0.231 X_t^f + 0.0014 X_t^n + \varepsilon_{2t}
\end{align*}
\]

Subsequently, in the second step of the model the values for the effects of the online and offline transactions on the online and offline sales follow \((\lambda_1, \lambda_2, \lambda_3, \lambda_4)\) including the additional scale coefficients of last year’s online and offline sales \((\gamma_n, \gamma_f)\). Note that \(\lambda\)'s can be interpreted as effect in euro's and the \(\gamma\)'s as annual growth indicator.

Step 2:

\[
\begin{align*}
S_t^n &= 89.534 \Omega_t^n + \varepsilon_{3t} \\
S_t^f &= 4.658 \Omega_t^f + 1.553 LS_t^n + \varepsilon_{4t} \\
S_t^f &= 56.889 \Omega_t^f + \varepsilon_{5t} \\
S_t^f &= 18.195 \Omega_t^f + 0.831 LS_t^f + \varepsilon_{6t}
\end{align*}
\]

5.3.3 Case study results

The findings of the values in step 1 indicate how the transactions on the webshop and the transaction in the physical store relate to the online and offline visits. Seen the non-significance of \(\beta_4 (p = 0.801)\) it can be concluded that the visits to the physical store \((X_f)\) do not influence the number of transactions on the webshop \((O^n)\). According to the model outcomes the transactions on the webshop are fully driven by the online visits \((X_n)\). In contrast, we can observe that the weekly online visits \((X_n)\) do have a small significant effect on the number of transactions in the physical store \((O_f)\). This suggest that there is a part of the customer base using the webshop for orientation to subsequently buy in the physical store.

For the model outcomes of step 2, we particularly focus on equation 4 and 6 as they should give an indication of the sales migration between the channels. However, seen the non-significance of \(\lambda_4 (p = 0.308)\) we are not able to explain how the offline transactions \((O_f)\) influence the sales on the webshop \((S^n)\). On the other hand, \(\lambda_2\) is significant \((p = 0.007)\). This indicates that the number of online transactions do have an effect on the sales in the physical store. A negative \(\lambda_2\) would indicate channel migration from online to offline. Notably, the value of \(\lambda_2\) is positive \((18.195)\), meaning that online transactions also lead to additional offline sales in this case.

5.3.4 Validation

The results from the case study are validated in two ways, i.e. numerically and with insights from practice from the e-commerce manager of the retailer. Numerically, the values in equation 3 and 5 should give an indication of the average value of an online and offline transaction (Biyalogorsky & Naik, 2003). The averages of the actual online and offline transaction value are respectively 83.59 and 63.75. As the estimates are close to the averages of the data set, it indicates reasonable model outcomes. The gap between the online and offline transaction value could be explained by the fact that the offline transaction values are excluding tax and additional shipping costs for online transactions. In addition, the e-commerce manager explained that...
online transactions in some cases occur together with offline transactions, as personnel can point customers to the webshop if a product is not on stock in the store. This might explain the positive relation between online transactions and offline sales.

Moreover, the non-significant and minor significant effects can be clarified due to the low degree of channel integration between the webshop and the physical store. From the four omni-channel features, only OCF-D was implemented recently. Hence, this suggests that the MC retailer of interest currently can be labeled as a cross-channel retailer or omni-channel retailer in development. As the interplay between the channels increase, stronger effects between the store and webshop can be expected.
6. Discussion
The aim of this research project was to examine the effects of omni-channel features on CCM from a holistic perspective. This chapter starts with describing the most important findings, from which the main conclusion will be drawn. Secondly, the theoretical and managerial implications are provided. In the last section of this report, the limitations of the study and related directions for future research are given.

6.1 Conclusion
We start this section with a recap on the main research question:

What are the effects of omni-channel features on customer channel migration?

From an extensive literature study 30 omni-channel features are derived that can integrate the webshop and physical stores of omni-channel retailers (Table 1, section 2.2). As channel integrations enhance differentiated multiple channel use, they influence CCM between the online and offline channel (Schramm-Klein et al., 2011). Because of the uncertainty of the effects of channel integrations on CCM in an omni-channel retailing context (Herhausen et al., 2015), this research examined what drives CCM and to what extent four omni-channel features influence CCM.

When focussing on the effects of the four omni-channel features it can be concluded that all have a significant positive effect on CCM. The option to pick up or return online orders (OCF-A and OCF-B) increase the intention of customers to switch from the offline to the online channel. The switching intention in opposite direction is positively influenced by online in-store inventory visibility (OCF-C) and the option to ship in-store purchases to the customer (OCF-D). The results for the effects of OCF-A, OCF-B, and OCF-C on CCM are robust for the tested product categories. Thus, these omni-channel features have a positive effect on CCM across different product categories. For the channel switching tendency of clothing OCF-D has a significant positive effect. However, for electronics the effect of OCF-D on CST on-off is non-significant. This suggests that the effect of OCF-D on CCM might be dependent on the product category.

In the interviews with six omni-channel experts the importance of the omni-channel features has been acknowledged. Next to CCM, all four omni-channel features increase the value proposition for the customer. Nevertheless, OCF-A and OCF-B are marked as basic requirements for the current omni-channel retailers, whereas OCF-C and OCF-D are considered to be the new omni-channel key differentiators. Hence, we can conclude that the omni-channel retailer’s focus on delivering an online omni-channel experience is shifting towards delivering an in-store omni-channel experience.

Furthermore, it can be concluded that it remains difficult to measure CCM and it is even harder to impute it to omni-channel features. A method to measure CCM is tested, but due to the characteristics of the case the applicability of the measurement method for CCM in an omni-channel retailing context could not be supported nor be rejected.

However, the found relationships between the omni-channel features and the channel switching tendencies of customers provide omni-channel retailers with insights about how omni-channel features influence CCM. This in line with the prospect of Brynjolfsson, Hu, and Rahman (2013) who indicate that as barriers between online and offline vanish in an omni-channel, channel...
loyalty disappears. To cut a long story short, “becoming more omni-channel” will stimulate channel migration among customers.

6.2 Implications
Better understanding the challenges faced by retailers in designing and rolling out a successful omni-channel strategy is currently both a priority issue for retail managers and of critical academic relevance (Picot-Coupey, Huré, & Piveteau, 2016). From the results and conclusion of this research, implications of relevance for theory and practice can be derived. Firstly, the contribution to the multiple channel retailing literature and the most important theoretical insights are discussed (section 6.2.1). Secondly, the recommendations for practice follow in the managerial implications (section 6.2.2).

6.2.1 Theoretical implications
As mentioned in the beginning of this report, the omni-channel literature is still in its infancy (Piotrowicz & Cuthbertson, 2014; Verhoef, Kannan & Inman, 2015). Creating an omni-channel environment is about maximizing the integration between the online and offline channel (Herhausen et al., 2015). In our study we researched the effects of channel integrations on customer channel migration. The way customers use channels becomes more unpredictable due to channel integrations, but is yet important to understand for omni-channel retailers (Kilcourse & Rosenblum, 2015). Whereas previous studies focused on CCM in one direction such as Gupta, Su, and Walter (2004) or Dorman (2013), this study examined CCM from a holistic perspective. In this holistic perspective both CCM from offline to online and offline to online are considered. Principles of the channel switching model of Gupta, Su, and Walter (2004) have been used to create a model that analyzes two-way CCM in an omni-channel environment. The model results suggest that this holistic perspective on CCM makes sense in an omni-channel retailing context, because significant effects are found for both omni-channel features (OCF-A, OCF-B) on CST off-on and omni-channel features (OCF-C, OCF-D) on CST on-off. Moreover, those significant effects indicate that integrations of the online and offline channel can explain a part of the customers’ switching behavior in an omni-channel environment. The findings can be seen as small pieces to solve the bigger theoretical puzzle of CCM. In addition, the findings from previous research about the influence on CCM of channel satisfaction (Montoya-Weiss, Voss, & Grewal, 2003), price orientation (Noble, Griffith, & Weinberger, 2005), and brand loyalty (Konuş, Verhoef, & Neslin, 2008) are also considered to be present in an omni-channel retailing context, according to the research model outcomes. However, as effects tend to vary across product categories, the product category itself also appears to play a role in explaining CCM.

When taking all findings into consideration, this study scientifically contributed by examining customer channel migration in the relative new research field of omni-channel retailing. The influences of channel integrations that have been researched in multi- and cross-channel environments, also tend to play a significant role in the channel decision of customers in an omni-channel environment.

6.2.2 Managerial implications
Next to an academic contribution, this study also has practical implications which are relevant for omni-channel retailers and for Docdata who aims to lead their omni-channel customers to growth as ‘thought leader’.
First, omni-channel retailers should take the final conclusion of this research into consideration, namely that channel integration will lead to channel migration. Implementing omni-channel features enhances the probability that customers will switch channel for making purchases at the omni-channel retailer in the future. However, as omni-channel features lower the barriers to switch between the online and offline, the purchase channels that customers will use for shopping becomes less predictable (Brynjolfsson, Hu, & Rahman, 2013). Nevertheless, omni-channel retailers should not attempt to prevent CCM, but rather try to stimulate it, because migrating customers tend to be more profitable than non-migrating customers (Ansari, Mela, & Neslin, 2008). In addition, those customers are more satisfied than single channel users and consequently become more loyal to the retailer (DHL, 2015). More profitable and loyal customers seem interesting for omni-channel retailers. However, retailers should be sure that they can handle CCM, before implementing new omni-channel features. Hence, fluctuations in the use of specific channels requires a responses from the retailer, such as a reallocations of resources and inventory.

Second, omni-channel retailers should determine how to stimulate multiple channel use in an omni-channel. There are numerous ways to integrate channels. This report mentioned different options by listing 30 omni-channel features. Four of those have been researched extensively. All four examined omni-channel features appeared to have a positive effect on CCM. Therefore, implementation of those four omni-channel features are worth to be considered by omni-channel retailers. When focusing on OCF-A and OCF-B, the options to collect and return online orders in-store does not only stimulate CCM from offline to online, but also leads to extra sales due to increased traffic in-store (ICSC, 2014). Hence, the interviewees marked those omni-channel features as basic requirements for an omni-channel retailer. In contrast, OCF-C and OCF-D have been labeled as the new key differentiators in omni-channel retailing. Those two omni-channel features can be interpreted as the new innovative ways in which omni-channel retailers compete (Brynjolfsson, Hu, & Rahman, 2013). The current importance that is related to online in-store inventory visibility (OCF-C) and a buy in-store, ship to customer service (OCF-D), suggests that omni-channel retailers should focus on enhancing the in-store omni-channel experience. By providing consumers with accurate information about availability in physical stores, retailer can attract people in stores, who might otherwise have purchased online (Brynjolfsson, Hu, & Rahman, 2013). In addition, a (fast) home delivery can compensate a possible disappointment of an out of stock situation in the store (Forrester, 2014). As well as improving customer experience and stimulation of CCM, the implementation of OCF-C and OCF-D may lead to cost savings from inventory optimization, which was implicated in a case study at the omni-channel retailer Macy's (DHL, 2015).

Thirdly, based on the statements of the interviewees, omni-channel retailers should focus on the collection and the consolidation of consumer data across channels. Understanding of the customers’ channel behavior should be the first step in this domain. Cross-channel loyalty cards and an in-store mobile payment option can help retailers with collecting data across channels, whereas a unified customer account can assist retailers in the consolidation of the customer data across channels. The second step is to translate this information into value for the customers, which for example can vary from improved in-store sales advise to a personalized webshop environment.
6.3 Limitations and further research

There are certain limitations that characterize this study, which suggest directions for future research. The first limitation is that the results of the research model are based on purchase intentions. Although using intentions as indicators has generally been accepted in quantitative behavioral research, the bias between indicated intention and reality can affect the predictive power of a construct (Kim & Malhotra, 2005). To confirm the found relations between the omni-channel features and CCM, the actual switching behavior of customers should be observed in a longitudinal research.

Second, this research focused on how omni-channel features affect channel migration, whereas the effect on channel loyalty is not taken into account. For instance, a finding from our study is that OCF-A and OCF-B lead to the migration from a physical store to a webshop of the offline customers, however if OCF-A and OCF-B also lead to repurchases at the webshop for online customers is unknown. Studying customer data about the used purchase channels and use of omni-channel features at an omni-channel retailer could be a method to research the effect on channel loyalty.

Third, our study only considered the effects of eight variables, categorized over three constructs, on CCM. In order to increase the explained variance of CST off-on and CST on-off, the three aggregated explaining constructs (customer satisfaction, omni-channel features, customer characteristics), should be represented by more variables. For instance by dividing the customers’ channel satisfaction level over the different stages of the customer journey (Neslin et al., 2006), to specifically measure the effects of search-, purchase-, and after sales satisfaction on CCM. Additionally, more omni-channel features can be considered from the composed list of 30 features. Examples of other customer characteristics that are researched for one-sided CCM in a multi-channel environment, but not yet in an omni-channel setting using a holistic CCM perspective are innovativeness (Konuş, Verhoef, & Neslin, 2008), income (Gupta, Su, & Walter, 2004), and distance from a physical store of the omni-channel retailer (Venkatesan, Kumar, & Ravishanker, 2007). Moreover, adding a fourth aggregated construct with retailer characteristics can possibly contribute in explaining CCM. The user friendliness of the webshop, the presence of promotions, and the size of a physical store may be interesting variables to consider as possible retail characteristics which might influence CCM.

Fourth, the study only examined the effects on CCM for two product categories. Although the effects are tested for one type of soft-line products (clothing) and one type of hard-line products (electronics), it would beneficial to verify the findings for different types of soft- and hard-line products. Examples could be furniture or cosmetics for soft-line products and toys or books for hard-line products.

Fifth, we could not assess the applicability of the adapted method of Biyalogorsky & Naik (2003) for measuring CCM in the case study. As we examined a case with only sales data of one physical store and strongly fluctuating sales of a webshop under development, the found cross-channel effects were weak or non-significant. A final suggestion for future research is to reassess the applicability of the CCM measurement method with another case study. To test the method properly, the case study should be performed at more omni-channel retailers. Preferably with using data of all or multiple physical stores of the omni-channel retailer, to better represent the offline channel usage.
References


ICSC. (2014). *Shopping Centers; America’s first and foremost marketplace*. New York: ICSC.


Appendix A: Enquête - Aankoopgedrag Kleding & Elektronica

Deze enquête wordt afgenomen in het kader van mijn afstudeeronderzoek bij de TU Eindhoven. Het doel van de enquête is om aankoopgedrag van kleding en elektronica beter te kunnen verklaren. De enquête meet de mate waarin u tevreden bent over voorgaande aankopen en welke aspecten u belangrijk vindt bij het maken van een aankoop in een fysieke winkel of op een webshop. Er zijn geen goede of foute antwoorden. Bij het beantwoorden van de vragen gaat het enkel om uw mening.

Na het volledig invullen van de enquête kunt u uw e-mailadres achterlaten en maakt uw kans op één van de 8 fashion cadeaubonnen ter waarde van €25. Het invullen van de enquête duurt ongeveer 5-10 minuten. De enquête is anoniem en de responses worden vertrouwelijk behandeld. Ik dank u bij voorbaat voor uw medewerking!

Doelgroep controle

De volgende vragen worden gesteld om te bepalen of u binnen de doelgroep van het onderzoek valt.

- Heeft u ooit een **kledingstuk** gekocht bij een keten die zijn kleding zowel in fysieke winkels als op een webshop verkoopt?
  □ Ja   □ Nee
  - Zo ja, wat was het **laatste kledingstuk** dat u kocht bij zo’n keten? (Broek, shirt, overhemd, jurk, etc.)
  - Zo ja, bij welke **keten** was dit? (de keten noemen is optioneel)
  - Zo ja, waar kocht u dit **kledingstuk** bij de betreffende keten?
    □ in een fysieke winkel   □ op de webshop

- Heeft u ooit een **elektronica product** gekocht bij een keten die zijn elektronica zowel in fysieke winkels als op een webshop verkoopt?
  □ Ja   □ Nee
  - Zo ja, wat was het **laatste elektronica product** dat u kocht bij zo’n keten? (Telefoon, PC, laptop, televisie, camera, geluidsinstallatie, etc.)
  - Zo ja, bij welke **keten** was dit? (de keten noemen is optioneel)
  - Zo ja, waar kocht u dit **elektronica product** bij de betreffende keten?
    □ in een fysieke winkel   □ op de webshop

<table>
<thead>
<tr>
<th>Ketens die online en offline verkoopt</th>
<th>Aankoopkanaal</th>
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<tbody>
<tr>
<td></td>
<td>Fysieke winkel</td>
<td>Webshop</td>
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<td>Kleding</td>
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<td>Product categorie</td>
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<tr>
<td>Elektronica</td>
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</tbody>
</table>
### Enquête – Aankoopgedrag V1 (Kf-Ef)

De volgende vragen gaan over het *laatste kledingstuk* dat u kocht in de *fysieke winkel* van een keten die zijn kleding zowel in fysieke winkels als op een webshop verkoopt.

<table>
<thead>
<tr>
<th>Service A: Webshop aankopen kunnen afhalen in een fysieke winkel.</th>
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<tbody>
<tr>
<td>4. Indien <em>service A</em> aanwezig is ben ik eerder geneigd om een <em>vergelijkaar kledingstuk</em> op de <em>webshop</em> te kopen van dezelfde keten.</td>
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<tr>
<td>5. Hoe belangrijk vindt u <em>service A</em> in de <em>beslissing</em> om een <em>vergelijkaar kledingstuk</em> in een fysieke winkel of op de webshop te kopen van dezelfde keten?</td>
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</tr>
<tr>
<td>Service B: Webshop aankopen kunnen terugbrengen in een fysieke winkel.</td>
</tr>
<tr>
<td>6. Indien <em>service B</em> aanwezig is ben ik eerder geneigd om een <em>vergelijkaar kledingstuk</em> op de <em>webshop</em> te kopen van dezelfde keten.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>7. Hoe belangrijk vindt u <em>service B</em> in de <em>beslissing</em> om een <em>vergelijkaar kledingstuk</em> in een fysieke winkel of op de webshop te kopen van dezelfde keten?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>8. Indien <em>service A</em> en <em>B</em> aanwezig zijn en u in de aankomende maand een <em>vergelijkaar kledingstuk</em> zou kopen bij dezelfde keten, waar zou u het dan waarschijnlijk kopen?</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

De volgende vragen gaan over het *laatste elektronica product* dat u kocht in de *fysieke winkel* van een keten die zijn elektronica zowel in fysieke winkels als op een webshop verkoopt.

<table>
<thead>
<tr>
<th>Service A: Webshop aankopen kunnen afhalen in een fysieke winkel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Indien <em>service A</em> aanwezig is ben ik eerder geneigd om een <em>vergelijkaar elektronica product</em> op de <em>webshop</em> te kopen van dezelfde keten.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>13. Hoe belangrijk vindt u <em>service A</em> in de <em>beslissing</em> om een <em>vergelijkaar elektronica product</em> in een fysieke winkel of op de webshop te kopen van dezelfde keten?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Service B: Webshop aankopen kunnen terugbrengen in een fysieke winkel.</td>
</tr>
<tr>
<td>14. Indien <em>service B</em> aanwezig is ben ik eerder geneigd om een <em>vergelijkaar elektronica product</em> op de <em>webshop</em> te kopen van dezelfde keten.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>15. Hoe belangrijk vindt u <em>service B</em> in de <em>beslissing</em> om een <em>vergelijkaar elektronica product</em> in een fysieke winkel of op de webshop te kopen bij dezelfde keten?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>16. Indien <em>service A</em> en <em>B</em> aanwezig zijn en u in de aankomende maand een <em>vergelijkaar elektronica product</em> zou kopen bij dezelfde keten, waar zou u het dan waarschijnlijk kopen?</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### Enquête – Aankoopgedrag V2 (Kw-Ew)

De volgende vragen gaan over het laatste kledingstuk dat u kocht op de webshop van een keten die zijn kleding zowel in fysieke winkels als op een webshop verkoopt.

<p>| | | | | | | | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Heeft u het kledingstuk in een fysieke winkel bekeken voordat u het op de webshop kocht? □ Ja □ Nee

De volgende vragen gaan na hoe 2 services (C & D) een toekomstige aankoopbeslissing bij dezelfde keten zouden kunnen beïnvloeden.

#### Service C: Vermelding van de beschikbaarheid van producten in fysieke winkels, op de website van de keten.

4. Indien service C aanwezig is ben ik eerder geneigd om een vergelijkbaar kledingstuk in een fysieke winkel te kopen van dezelfde keten.

5. Hoe belangrijk vindt u service C in de beslissing om een vergelijkbaar kledingstuk in een fysieke winkel of op de webshop te kopen van dezelfde keten?

#### Service D: Thuislevering van bestellingen die gedaan kunnen worden in een fysieke winkel of op de webshop.

6. Indien service D aanwezig is ben ik eerder geneigd om een vergelijkbaar kledingstuk in een fysieke winkel te kopen van dezelfde keten.

7. Hoe belangrijk vindt u service D in de beslissing om een vergelijkbaar kledingstuk in een fysieke winkel of op de webshop te kopen van dezelfde keten?

8. Indien service C en D aanwezig zijn en u in de aankomende maand een vergelijkbaar kledingstuk zou kopen bij dezelfde keten, waar zou u het dan waarschijnlijk kopen?

---

### De volgende vragen gaan over het laatste elektronica product dat u kocht op de webshop van een keten die zijn elektronica zowel in fysieke winkels als op een webshop verkoopt.

9. Heeft u het elektronica product in een fysieke winkel bekeken voordat u het op de webshop kocht? □ Ja □ Nee

10. Hoe bewust heeft u gezocht waar u het elektronica product kon kopen voor de laagste prijs? □ Ja □ Nee

11. Hoe tevreden was u over het aankoopproces van het elektronica product op de webshop? □ Zeer tevreden □ Zeer ontevreden

De volgende vragen gaan na hoe 2 services (C & D) een toekomstige aankoopbeslissing bij dezelfde keten zouden kunnen beïnvloeden.

#### Service C: Vermelding van de beschikbaarheid van producten in fysieke winkels, op de website van de keten.

12. Indien service C aanwezig is ben ik eerder geneigd om een vergelijkbaar elektronica product in een fysieke winkel te kopen van dezelfde keten.

13. Hoe belangrijk vindt u service C in de beslissing om een vergelijkbaar elektronica product in een fysieke winkel of op de webshop te kopen van dezelfde keten?

#### Service D: Thuislevering van bestellingen die gedaan kunnen worden in een fysieke winkel, ook in het geval een product niet op voorraad is.

14. Indien service D aanwezig is ben ik eerder geneigd om een vergelijkbaar elektronica product in een fysieke winkel te kopen van dezelfde keten.

15. Hoe belangrijk vindt u service D in de beslissing om een vergelijkbaar elektronica product in een fysieke winkel of op de webshop te kopen van dezelfde keten?

16. Indien service C en D aanwezig zijn en u in de aankomende maand een vergelijkbaar elektronica product zou kopen bij dezelfde keten, waar zou u het dan waarschijnlijk kopen?
### De volgende vragen en stellingen gaan over uw algemene winkelgedrag.

17. Hoe vaak koopt u over het algemeen producten op het internet?
- □ Eens per week of meer
- □ Eens per maand
- □ Eens per 3 maanden
- □ Eens per 6 maanden
- □ Eens per jaar
- □ Minder dan eens per jaar
- □ Nooit

18. Hoe lang gebruikt u het internet al om producten online te kopen?
- □ Nog nooit gebruikt
- □ Minder dan 6 maanden
- □ 6 maanden tot 1 jaar
- □ 1 tot 2 jaar
- □ 2 tot 5 jaar
- □ 5 tot 10 jaar
- □ 10 jaar of langer

19. Ik houd van winkelen.
- Zeer mee oneens 1 2 3 4 5 6 7
- Zeer mee eens

20. Ik neem er de tijd voor als ik ga winkelen.
- Zeer mee oneens 1 2 3 4 5 6 7
- Zeer mee eens

21. Het merk van een product is belangrijk in mijn aankoopbeslissing.
- Zeer mee oneens 1 2 3 4 5 6 7
- Zeer mee eens

22. Ik koop vaak producten van dezelfde merken.
- Zeer mee oneens 1 2 3 4 5 6 7
- Zeer mee eens

### De volgende vragen gaan over uw algemene kenmerken.

23. Wat is uw geslacht?
- □ Man
- □ Vrouw

24. In welke leeftijdscategorie valt u?
- □ 24 jaar of jonger
- □ 25-34 jaar
- □ 35-44 jaar
- □ 45-54 jaar
- □ 55 jaar of ouder
### Appendix B: Measurement scales

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Measurement item(s) in survey</th>
<th>Measurement (partly) derived from</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Channel Migration</td>
<td>Channel Switching Tendency (offline to online)</td>
<td>- Suppose you need to buy a comparable product next month, where would you probably buy it? (1 = very probable in a physical store, 7 = very probable at the webshop)</td>
<td>Gupta, Su, &amp; Walter (2004)</td>
</tr>
<tr>
<td>Channel Switching Tendency (online to offline)</td>
<td>- Suppose you need to buy a comparable product next month, where would you probably buy it? (1 = very probable at the webshop, 7 = very probable in a physical store)</td>
<td>Gupta, Su, &amp; Walter (2004)</td>
<td></td>
</tr>
<tr>
<td>Channel Satisfaction</td>
<td>Offline channel satisfaction</td>
<td>- How satisfied were you with the purchase process of the product in the physical store? (1 = very dissatisfied, 7 = very satisfied)</td>
<td>Montoya-Weiss et al. (2003), Falk et al. (2007)</td>
</tr>
<tr>
<td></td>
<td>Online channel satisfaction</td>
<td>- How satisfied were you with the purchase process of the product at the webshop? (1 = very dissatisfied, 7 = very satisfied)</td>
<td>Montoya-Weiss et al. (2003), Devaraj et al. (2002)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- When service A is available, I would have an increased intention to buy a product on the webshop of the same retailer. (1 = strongly disagree, 7 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- How important is service A in your decision process to buy a product in a physical store or on the webshop of the same retailer? (1 = not important, 7 = very important)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- When service B is available, I would have an increased intention to buy a product on the webshop of the same retailer. (1 = strongly disagree, 7 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- How important is service B in your decision process to buy a product in a physical store or on the webshop of the same retailer? (1 = not important, 7 = very important)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Online in-store inventory visibility</td>
<td>Service C: Inventory availability of products in physical stores is visible on the website of the retailer.</td>
<td>Forrester (2014), Gupta, Su, &amp; Walter (2004)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- When service C is available, I would have an increased intention to buy a product in a physical store of the same retailer. (1 = strongly disagree, 7 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- How important is service C in your decision process to buy a product in a physical store or on the webshop of the same retailer? (1 = not important, 7 = very important)</td>
<td></td>
</tr>
</tbody>
</table>
### Customer Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-channel searching</td>
<td>- Did you see the product on a webshop before you bought it in the physical store? (Yes or No) &lt;br&gt; - Did you see the product in a physical store before you bought it on the webshop? (Yes or No)</td>
<td>Verhoef et al. (2007), Chou et al. (2016)</td>
</tr>
</tbody>
</table>

### Control variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Question</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>- To what age category do you belong? &lt;br&gt; (24 or younger, 25-34, 35-44, 45-54, 55 or older)</td>
<td>Mathwick et al. (2001)</td>
</tr>
<tr>
<td>Gender</td>
<td>- What is your gender? &lt;br&gt; (male, female)</td>
<td>-</td>
</tr>
<tr>
<td>Online purchase experience</td>
<td>- How often do you buy products on the Internet? &lt;br&gt; (1 = once a week or more often, 2 = one a month, 3 = once every 3 months, 4 = once every 6 months, 5 = once a year, 6 = less often, 7 = never) &lt;br&gt; - How long have you been using the Internet as a purchase channel? (1 = not used it so far, 2 = less than 6 months, 3 = 6 months to 1 year, 4 = 1 to 2 years, 5 = 2 to 5 years, 6 = more than 5 years)</td>
<td>Bijmolt et al. (2012), Yang et al. (2004)</td>
</tr>
<tr>
<td>Shopping enjoyment</td>
<td>- I like shopping. &lt;br&gt; (1 = strongly disagree, 7 = strongly agree) &lt;br&gt; - I take my time when I shop. &lt;br&gt; (1 = strongly disagree, 7 = strongly agree)</td>
<td>Konuş, Verhoef, &amp; Neslin (2008),</td>
</tr>
<tr>
<td>Brand loyalty</td>
<td>- The brand of the product is important for me in my purchase decision. &lt;br&gt; (1 = strongly disagree, 7 = strongly agree) &lt;br&gt; - I generally purchase the same brands. &lt;br&gt; (1 = strongly disagree, 7 = strongly agree)</td>
<td>Konuş, Verhoef, &amp; Neslin (2008),</td>
</tr>
</tbody>
</table>
Appendix C: Questions interview

Algemeen
- Wat is je functie?
- Waarvoor ben je verantwoordelijk?
- Wat heb je met omni-channel van doen?

Omni-Channel
- Hoe definieer je omni-channel?
- Wat doet jullie bedrijf aan omni-channel?
  - Wat is jullie doel om omni-channel te creëren?
  - Wat merkt jullie klant van omni-channel?
- Wat zijn de voornaamste kosten om een omni-channel te kunnen creëren?
- Welke componenten zijn essentieel in een omni-channel?

Online en offline kanaalintegratie
- Hoe integreren jullie online en offline kanalen?
- Wat is de rol van integratie van online en offline kanalen in omni-channel?

Kanaalmigratie
- Merken jullie dat er klanten wisselen van afnamekanaal? (winkel en webshop)
- Wat is de invloed van de zoektocht van de klant op zijn intentie om een product online of offline te kopen?
- Welke van de volgende services bieden jullie aan?
  - Online bestellingen kunnen ophalen in de winkel
  - Online bestellingen kunnen terugbrengen in de winkel
  - Op de website kunnen zien wat een winkel op voorraad heeft
  - Aankopen/orders vanuit de winkel kunnen leveren bij de klant thuis
- Welke van de bovenstaande services hebben een invloed op de intentie van de klant om een product online of offline te kopen?
  - Hoe groot zijn deze invloeden?
  - Welke optie is het belangrijkst voor omni-channel?

Toekomst
- Wat gaat omni-channel in de toekomst veranderen voor klanten en hoe gaan jullie dat realiseren?
- Wat willen jullie op de korte termijn bereiken met omni-channel?
- Wat willen jullie op de lange termijn bereiken met omni-channel?
Appendix D: Scatter plots for graphical outlier detection

Figure 18: Scatterplot mean versus standard deviation of research model variables – Study 1

Figure 19: Scatterplot mean versus standard deviation of research model variables – Study 2
Appendix E: Psychometric tests Omni-Channel Features

Table 10: Construct reliability statistics

<table>
<thead>
<tr>
<th>Reflective construct</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCF-A</td>
<td>0.809</td>
</tr>
<tr>
<td>OCF-B</td>
<td>0.847</td>
</tr>
<tr>
<td>OCF-C</td>
<td>0.860</td>
</tr>
<tr>
<td>OCF-D</td>
<td>0.884</td>
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</tbody>
</table>

Table 11: Rotated factor matrix - Study 1

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS</td>
<td>0.931</td>
<td>0.299</td>
<td>-0.028</td>
<td>0.100</td>
<td>0.029</td>
</tr>
<tr>
<td>PO</td>
<td>0.348</td>
<td>0.886</td>
<td>0.012</td>
<td>0.141</td>
<td>0.075</td>
</tr>
<tr>
<td>off-CS</td>
<td>-0.024</td>
<td>0.008</td>
<td>0.996</td>
<td>-0.040</td>
<td>-0.071</td>
</tr>
<tr>
<td>OCF-A1</td>
<td>0.148</td>
<td>-0.078</td>
<td>0.996</td>
<td>-0.040</td>
<td>0.208</td>
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<tr>
<td>OCF-A2</td>
<td>-0.011</td>
<td>0.329</td>
<td>0.020</td>
<td>0.858</td>
<td>0.176</td>
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<tr>
<td>OCF-B1</td>
<td>0.102</td>
<td>-0.078</td>
<td>0.046</td>
<td>0.193</td>
<td>0.928</td>
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<tr>
<td>OCF-B2</td>
<td>-0.055</td>
<td>0.192</td>
<td>0.056</td>
<td>0.175</td>
<td>0.914</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Table 12: Rotated factor matrix - Study 2

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS</td>
<td>0.986</td>
<td>0.049</td>
<td>-0.010</td>
<td>0.054</td>
<td>0.144</td>
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<tr>
<td>PO</td>
<td>0.048</td>
<td>0.992</td>
<td>0.075</td>
<td>0.070</td>
<td>0.037</td>
</tr>
<tr>
<td>on-CS</td>
<td>-0.010</td>
<td>0.075</td>
<td>0.994</td>
<td>-0.015</td>
<td>-0.051</td>
</tr>
<tr>
<td>OCF-C1</td>
<td>0.034</td>
<td>0.030</td>
<td>0.048</td>
<td>0.907</td>
<td>0.240</td>
</tr>
<tr>
<td>OCF-C2</td>
<td>0.047</td>
<td>0.070</td>
<td>-0.072</td>
<td>0.898</td>
<td>0.240</td>
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<tr>
<td>OCF-D1</td>
<td>0.047</td>
<td>0.001</td>
<td>0.009</td>
<td>0.291</td>
<td>0.904</td>
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<tr>
<td>OCF-D2</td>
<td>0.162</td>
<td>0.055</td>
<td>-0.084</td>
<td>0.211</td>
<td>0.908</td>
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</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.
Appendix F: Regression analyses original research model

SPSS output stepwise regression (study 1, DV: CST on-off):

### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.481</td>
<td>.231</td>
<td>.227</td>
<td>1.521</td>
</tr>
<tr>
<td>2</td>
<td>.532</td>
<td>.283</td>
<td>.275</td>
<td>1.473</td>
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<tr>
<td>3</td>
<td>.568</td>
<td>.323</td>
<td>.312</td>
<td>1.435</td>
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</tbody>
</table>

### Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1,355</td>
<td>.274</td>
<td>4,947</td>
</tr>
<tr>
<td></td>
<td>OCFA</td>
<td>.559</td>
<td>.075</td>
<td>.481</td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>3,324</td>
<td>.602</td>
<td>5,520</td>
</tr>
<tr>
<td></td>
<td>OCFA</td>
<td>.535</td>
<td>.073</td>
<td>.461</td>
</tr>
<tr>
<td></td>
<td>off-CS</td>
<td>-.346</td>
<td>.095</td>
<td>-.228</td>
</tr>
<tr>
<td>3</td>
<td>(Constant)</td>
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<td>.665</td>
<td>3,452</td>
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<td></td>
<td>OCFA</td>
<td>.434</td>
<td>.077</td>
<td>.374</td>
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<tr>
<td></td>
<td>off-CS</td>
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<td>.093</td>
<td>-.207</td>
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<tr>
<td></td>
<td>OCFB</td>
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<td>.078</td>
<td>.219</td>
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### Excluded Variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta</th>
<th>Partial Correlation</th>
<th>Collinearity Statistics</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>t</td>
<td>Sig.</td>
<td>Tolerance</td>
</tr>
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SPSS output stepwise regression (study 2, DV: CST on-off):

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Appendix G: Regression analyses including control variables

SPSS output stepwise regression (study 1, DV: CST on-off):

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**Coefficients**

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a. Dependent Variable: CST off-on
SPSS output stepwise regression (study 2, DV: CST off-on):

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<sup>a</sup> Dependent Variable: CST on-off
Appendix H: Figures for linear regression assumptions

Graphical tests for *homoscedasticity* and *linearity*:

![Figure 20: Plot of ZRESD against ZPRED of the regression model - Study 1](image)

![Figure 21: Plot of ZRESD against ZPRED of the regression model - Study 2](image)

Graphical tests for *normally distributed errors*:

![Figure 22: Normal Probability Plot - Study 1](image)

![Figure 23: Normal Probability Plot - Study 2](image)