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The impact of customer-initiated communication and customer behaviour on contract renewal likelihood: An empirical study

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LIST OF ABBREVIATIONS

Table 1: Abbreviations

Abbreviation	Meaning
CLV	Customer lifetime value
CIC	Customer-initiated communication
FIC	Firm-initiated communication
CUSAMS	Customer asset management of services
CRM	Customer relationship management

ABSTRACT

PURPOSE

The purpose of the thesis is to contribute to customer retention literature by developing an empirical model explaining which drivers affect renewal likelihood in a contractual context. The framework consists of two primary constructs: customer-initiated communication and customer behaviour. The thesis has three main objectives: To evaluate the effect of customer-initiated communication (i.e. inquiries and complaints) on renewal likelihood; to evaluate empirically the effect of customer behaviour as predictor of renewal likelihood; and to explore how the interaction between multichannel contract and cross-category usage affects renewal likelihood.

SCOPE

The research is based on panel data with a sample of 30 003 users of an online product/service in collaboration with a leading Scandinavian media group.

FINDINGS

The thesis has empirically shown the relationship between customer-initiated communication (i.e. inquiries and complaints) and renewal likelihood. Contrary to previous research, complaints seem to have a positive influence on renewal likelihood, which suggest that a voiced complaint may signal customer commitment. Furthermore, behavioural variables such as cross-category usage, multichannel contract and past renewals have a positive impact on renewal likelihood contract subscription. Lastly, the interaction between multichannel contract and cross-category usage have negative effect on renewal likelihood, suggesting a tension between channel value propositions (i.e. overlapping offers, limited added value), which negatively influence the utility derived from a multichannel contract.

CONTRIBUTION

The paper provides valuable insights related to customer-initiated communication and behavioural influence on the likelihood of renewal in a contractual context. Existing retention literature focuses on customer complaint or attitudinal variables (e.g. satisfaction, commitment), but rarely include inquiry as customer-initiated communication along with behavioural variables in a contractual context within the same model.

1 INTRODUCTION

"The subscription e-commerce market has grown by more than 100 percent a year over the past five years. The largest such retailers generated more than \$2.6 billion in sales in 2016, up from a mere \$57.0 million in 2011."

(Chen, Fenyo, Yang, & Zhang, 2018)

The above quote reflects the emergence of subscription-based online models, which have significantly changed every-day usage of services (e.g. Netflix, LinkedIn Learning, and Microsoft Office 365). Customers are shifting from the traditional ownership model (i.e. transactional economy) to an access-based model (i.e. digital membership economy); where the value is not what you buy instead what you can access. This business model has the potential to provide a more predictable and continuous cash flow for companies compared to a traditional ownership model, due to the payment structure. However, the model is highly dependent on a stable and growing customer base, further increasing the urgency to understand which factors predict customer retention. There are several companies transitioning and even more are considering the business model (e.g. Harvard Business Review, Forbes, The Economist). Despite the emergence of the subscription-based business model, the literature has primarily focused on non-contractual settings, while omitting the contractual context. We aim to fill this gap and obtain a greater understanding of its implications.

An essential dimension for firm profitability and customer lifetime value (henceforth CLV) is customer retention, which counterpart is customer churn. Scott A Neslin, Gupta, Kamakura, Lu, and Mason (2006) posit that churn directly affects how long a customer stay with a company and thereby the CLV. This has been a major concern in industries where cash flows are directly linked to customers (e.g. magazine subscriptions, streaming services, telecom services) and the residual value of the business is closely linked to the size and quality of its customer base (N. Kim, Mahajan, & Srivastava, 1995). According to a McKinsey & Company survey of more than 5000 U.S. consumers, e-commerce consumer cancel services that fail to deliver tangible benefits, where they experience poor service delivery or become dissatisfied with the

perceived value (Chen et al., 2018). The focus of identifying and addressing customer pain points quickly is essential for a continuous product/service improvement orientation. A way to approach the issue is by encouraging customers to interact (i.e. inquiries or complaints) before cancelling their subscription, not only giving the firm an opportunity to resolve the issue at hand, but also to learn and improve the product/service based on user feedback. The marketing literature has primarily focused on customer-firm communication such as complaints and contact initiated by the firm (e.g. direct mail) (see Table 2). It is surprising that customer-initiated inquiry is under-researched, since they tend to occur more often than complaints and may have a different effect on the customer-firm relation. It is therefore of interest to investigate the effect of communication initiated by the customer (i.e. inquiries and complaints) on renewal likelihood in a contractual context.

Firms that have an access-based subscription model (e.g. telecommunications, health clubs, streaming services) are highly dependent on their ability to create enduring customer-firm relations, which is affected by competitive pressure and volatile switching costs. Accenture published “Global Consumer Pulse Research”, which further reiterate the impact of the new economy. In 2014, switching costs alone totalled \$6.2 trillion in 17 key markets, which is expected to increase. Put into perspective, the U.S. national debt was about \$18 trillion the same year, and it took 240 years to accumulate (Pombriant, 2016). Therefore, the identification of potential defectors is of utmost importance not only to address customers at risk, but also to learn and improve the current product/service. Although customer satisfaction and intention to stay have been widely studied, the effect of customer behaviour (e.g. cross-category usage) on the likelihood of renewing a subscription is an area not yet fully understood (Keaveney & Parthasarathy, 2001). It is therefore of interest to investigate the effect of cross-category usage on renewal likelihood.

The general notion of a multichannel customer is that they are more valuable (i.e. CLV) than a single channel customer (Yohn, 2015), due to flexibility, convenience (Pookulangara, Hawley, & Xiao, 2011) and the different roles that channels may play during a purchase process (e.g. “research shopper”) (Heitz-Spahn, 2013; Verhoef, Neslin, & Vroomen, 2007). Other studies have found product/services categories to significantly impact of the value of the customer, rendering the multichannel

generalization inaccurate (Konus, Verhoef, & Neslin, 2008; Kushwaha & Shankar, 2013). Based on the variety of results available, we believe it is important to investigate the effect of a multichannel contract on renewal likelihood.

Furthermore, the interaction between cross-category usage and multichannel contract is of interest, given the nature of product/services in a subscription-based model, which tend to be offered through multiple channels (e.g. newspapers). The delivery of varied content (i.e. depth) attract new subscribers and multiple channels offer the convenience of access (i.e. breadth). The combination of both has the potential to enhance the growth of the customer base, which is critical for the existence of any firm that chooses a subscription-based business model. We therefore want to investigate the interaction effect between multichannel contract and cross-category usage on renewal likelihood.

Despite the evident impact and growth of the access-based subscription model, there is scant empirical research on the combination of retention and usage behaviour in a contractual setting (Ascarza & Hardie, 2013; Ascarza et al., 2018). To the best of our knowledge, there has not been any study that investigate the impact of both customer-initiated communication (i.e. inquiry and complaints) and customer behaviour (i.e. breadth, depth and length) on the renewal likelihood. Our study aims to contribute to a greater understanding of this gap.

In sum, we aim to investigate the following objectives:

- Empirically evaluate the effect of customer communication (i.e. inquiries and complaints) with a firm on renewal likelihood.
- Empirically evaluate the effect of customer behaviour (i.e. length, breadth, depth) on renewal likelihood.
- Empirically evaluate the interaction effect between multichannel contract and cross-category usage on renewal likelihood.

2 LITERATURE REVIEW

2.1 CUSTOMER-INITIATED COMMUNICATION

Complaint behaviour has been widely studied since the early 1990s (Bowman & Narayandas, 2001; Oster, 1980). However, it is not until recently that inquiries and complaints has been combined into a dimension of interest in the literature (Bolton, 1998; Bowman & Narayandas, 2001). Bolton (1998) defines customer-initiated communication (henceforth CIC) as “facilitating transactions that occur when the customer seeks out an encounter with the organization, typically to obtain information about existing service, purchase additional products/services, ask about his/her bill, and so forth”. In other words, CIC refers to any interaction between customer and the firm, initiated by the customer and is primarily related to complaints in B2C settings, while this is not the case in a B2B context. (Venkatesan & Kumar, 2004). Their rationale is that customers interact with the firm for several reasons in a B2B context (e.g. inquire about a training program), while there are fewer reasons to engage with the firm in a B2C setting.

The literature suggest that customers reveal an interest in the product/service of the firm when he/she chooses to interact (Berger et al., 2002). Furthermore, CIC is shown to have a bigger profit impact than an offline FIC, which only reinforces the importance of encouraging customers to interact with the firm (Wiesel, Pauwels, & Arts, 2011). This is related to level of firm responsiveness to CIC, which affect the level of satisfaction and evaluation of the product/service (Goodman, Fichman, Lerch, & Snyder, 1995). The importance of firm responsiveness can be understood in the lens of the “opportunity cost” of unvoiced complaints, which stem from dissatisfied customers that decide to not interact. The implication of the "opportunity cost" become critical in light of Tax, Brown, and Chandrashekar (1998) findings, suggesting that satisfaction from previous complaints positively impact trust and commitment, which encourages CIC in the future.

Table 2 present studies that have investigated CIC (i.e. inquiry and/or complaint) effect on the likelihood of renewal (e.g. retention, churn, repurchase behaviour, contract renewal, and intention to leave). Although there are several studies

that have evaluated renewal likelihood, there are no studies to our knowledge that have considered both inquiry and complaint effect on the likelihood of renewal in a contractual setting.

Table 2: Comparison of existing studies – CIC and customer behaviour in a contractual setting

Author	Renewal (DV) _a	Contractual setting?	Customer-initiated communication (CIC)		Customer behaviour		
			Inquiry	Complaint	Breadth _b	Depth	Length _c
Mittal and Kamakura (2001)	✓						
Rust and Zahorik (1993)	✓						
Goodman et al. (1995)	✓		✓				
Depren (2018)	✓			✓	✓	✓	
Knox and Van Oest (2014a)	✓			✓			✓
Lapidus and Pinkerton (1995)	✓			✓			✓
Chang and Zhang (2016)	✓					✓	✓
Reinartz and Kumar (2000)	✓						
Park, Park, and Schweidel (2014)	✓				✓		✓
Nyer (2000)	✓			✓			
Buttle and Burton (2002)	✓	N/A _d		✓			
Zineldin (2006)	✓	N/A _d		✓			✓
Bolton, Lemon, and Verhoef (2004)	✓				✓	✓	✓
Lemon, White, and Winer (2002)	✓ _d	✓					

Table 2: Comparison of existing studies – CIC and customer behaviour in a contractual setting.
Continued.

Author	Renewal (DV) _a	Contractual setting?	Customer-initiated communication (CIC)		Customer behaviour		
			Inquiry	Complaint	Breadth _b	Depth	Length _c
Bolton, Lemon, and Bramlett (2006)	✓	✓					✓
Gustafsson, Johnson, and Roos (2005)	✓	✓					✓
Bolton (1998)	✓	✓		✓			✓
Woisetschläger, Lentz, and Evanschitzky (2011)	✓	✓					✓
Andreassen (2001)	✓	✓		✓			✓
Verhoef (2003)	✓	✓		✓			✓
Gruen, Summers, and Acito (2000)	✓	✓		✓			✓
Fader, Hardie, and Shang (2010)	✓	✓					✓
Bhattacharya (1998)	✓	✓				✓	✓
Hellier, Geursen, Carr, and Rickard (2003)	✓	✓					✓
Aurier and N'Goala (2010)	✓	✓			✓	✓	✓
Pablo Maicas Lopez, Polo Redondo, and Sese Olivan (2006)	✓	✓			✓	✓	✓

Table 2: Comparison of existing studies – CIC and customer behaviour in a contractual setting. Continued.

Author	Renewal (DV) _a	Contractual setting?	Customer-initiated communication (CIC)		Customer behaviour		
			Inquiry	Complaint	Breadth _b	Depth	Length _c
Schweidel, Fader, and Bradlow (2008)	✓	✓			✓		✓
Boehm (2008)	✓	✓			✓	✓	✓
Hitt and Frei (2002)	✓	✓			✓	✓	✓
Verhoef and Donkers (2005)	✓	✓			✓	✓	✓
Campbell and Frei (2010)	✓	✓	✓ _e		✓	✓	✓
Lemmens and Croux (2006)	✓	✓	✓				
Tax et al. (1998)		✓		✓			
Bearden and Teel (1983)				✓			
Our thesis	✓	✓	✓	✓	✓	✓	✓

a. Retention, churn, repurchase behaviour, contract renewal, intention to leave, repeat business, propensity to switch, length of membership before lapsing, customer purchase pattern, attrition, CLV
 b. Cross-category usage, cross-category consumption, cross-buying, spending across categories, number of products, financial relationship (increase business), membership upgrade, upgrade,
 c. Relationship age, relationship duration, past renewal, repeat purchase, relationship length, loyalty intention, return business, future intent

d. Study does not specify contractual or non-contractual.

e. Online query history and ATM inquiries.

2.1.1 INQUIRY

A CIC, more specifically an inquiry, can be something as mundane as an information request about a product/service (Bowman & Narayandas, 2001; Polo & Sese, 2016). Although marketing literature highlights the role of CIC as evidence for loyalty and commitment (Bowman & Narayandas, 2001; W. J. Reinartz & V. Kumar, 2003), most studies solely focus on complaining behaviour. The emergence of social media and its implications on marketing has sparked an interest investigated CIC in an online context (Wiesel et al., 2011). CIC has for example been operationalized as «leads» both online and offline, referring to daily requests for information received website or offline (e.g. salesforce, telephone)(Wiesel et al., 2011). The same study posits that online CIC has a higher profit impact compared to offline CIC, implying important variations between online and offline contexts. On a firm level, inquiries and context is relevant for understanding and improving the level of responsiveness to customer inquiries, which affect the customer experience of the firm and its core product/service (Goodman et al., 1995).

Although CIC encompass complaints and inquiries, they differ in terms of mechanism and impact on satisfaction. To the best of our knowledge, inquiries have not been extensively investigated in the retention literature. We therefore consider inquiries to be of interest and will examine how it affects renewal likelihood.

2.1.2 COMPLAINT

Complaint definitions found in the marketing literature are mostly consistent, often including a customer expressing dissatisfaction/frustration with firm's product/service, due to an initial expectation not being met. Table 3 provides an overview of select complaint definitions.

There are at least three major commonalities among the definitions. First, a customer initiates the process by choosing to express their dissatisfaction to the specific firm. Second, the underlying motivation of expressing a complaint is associated with a desired outcome, either compensation (Singh & Widing, 1991) or to change the current practice (Crie, 2003). Third, the sentiment of a complaint is linked to dissatisfaction,

which has an explicitly negative connotation. The differences are primarily to which extent the definition include post-complaint factors. Some studies define a complaint as an outcome based on motivators such as dissatisfaction (Bell, Mengüç, & Stefani, 2004; Depren, 2018; Knox & Van Oest, 2014a; Landon Jr, 1980), while other studies include the post-complaint outcome (e.g. compensation, apology) as another motivating factor (Crie, 2003; Fornell & Wernerfelt, 1988; Lhoest-Snoeck, van Nierop, & Verhoef, 2014).

For the purpose of this study, we use Bougie, Pieters, and Zeelenberg (2003) definition of complaint, which consider a complaint to be valuable CIC for the firm, since it represents an opportunity to remedy a problem in a specific market transaction.

Table 3: Overview of complaint definitions

Source	Definition	Journal
(Fornell & Wernerfelt, 1988; Lhoest-Snoeck et al., 2014)	CIC to the service provider, with the aim of being compensated for a disadvantaged situation.	Marketing Science, Journal of Interactive Marketing
Singh and Widing (1991)	Customer's protest to a firm with the goal of obtaining an exchange, refund or apology	European journal of marketing
Crie (2003)	Constructive response with an expectation of change in an organization's practice, policy and responses	Journal of Database Marketing, Customer Strategy Management
Bell et al. (2004)	Negative customer feedback	Journal of the Academy of Marketing Science
Bougie et al. (2003)	Complaint behaviour refers to consumer-initiated communications to the service provider to obtain remedy or restitution for problems in particular market transactions	Journal of the Academy of Marketing Science
Depren (2018)	A complaint is a verbal or written expression of dissatisfaction with the policies, products or services that are provided by a company	European Journal of Business and Social Sciences
(Knox & Van Oest, 2014a; Landon Jr, 1980)	Customer-initiated expressions of dissatisfaction to the company	Advances in Consumer Research, Journal of Marketing

Table 2 offer an overview of studies from the retention literature investigating complaints as independent variable. The literature suggest that complaints stem from a negative experience with the product/service, which affect the level of satisfaction (Bearden & Teel, 1983) and ultimately the likelihood of buying more from the same firm (Knox & Van Oest, 2014a). Most studies emphasise firms' responsiveness to ensure an effective customer relationship management (henceforth CRM) system, which goal is to encourage customers to complain, resolve problems and reduce customer pain points by learning from interaction with the customer. The long-term firm commitment to improving responsiveness is the first step towards a better complaint-handling function, which may increase satisfaction (Depren, 2018) and in the long-run, increases customer loyalty (Woisetschläger et al., 2011).

Complaint as valuable information instead of solely an indicator of a poor product/service, has led to studies recommending firms to encourage customers to complain (Nyer, 2000; Woisetschläger et al., 2011). The literature suggest a significant correlation between complaints and satisfaction (Bearden & Teel, 1983; Haverila & Naumann, 2010), but also that complaining is the start of a service recovery process (Gronroos, 1988). Based on these findings, we aim to contribute to the literature by further investigating the effect of a complaint on renewal likelihood.

2.2 CUSTOMER BEHAVIOUR

The customer behaviour construct is based on customer asset management of services (henceforth CUSAMS) framework, consisting of depth (i.e. multichannel contract), breadth (i.e. cross-category usage) and relationship length (i.e. past renewal) (Bolton et al., 2004; Wangenheim, Wunderlich, & Schumann, 2017). The framework provides the basis for a behavioural analysis, while also encouraging future research to investigate interactions over time (Bolton et al., 2004), which we present in the theoretical framework chapter.

Table 2 offer an overview of studies investigating customer behaviour (i.e. breadth, depth, and length) effect on renewal likelihood. Although there are several studies that evaluate the likelihood of renewal, we found two studies that had similar objectives as our thesis, which is to investigate the effect of customer behaviour on the likelihood of renewal in a contractual setting. Pablo Maicas Lopez et al. (2006) evaluate the effect of relationship characteristics (i.e. breadth, depth and length) on customer switching behaviour in the fixed-line telephone sector. Their study differs from our study in terms of operationalization of the relationship characteristics. Their breadth (i.e. answer, phone service), depth (i.e. service usage), and length (i.e. recent acquisition of fixed-line telephony) are different from our operationalization of the variables due to the nature of the product/service. Aurier and N'Goala (2010) investigates how overall satisfaction impacts relationship duration in the European retail banking sector, while also evaluating the meditating effect on trust and commitment on satisfaction. However, their dependent variable is captured by calculating the relationship length from the opening date of the current account for a limited period (i.e. two periods over one year), whereas our dependent variable is calculated as the number of subscription renewals over a longer period (i.e. two years and nine months). In other words, they measure relationship length from a start date, while we consider the active renewal mechanism in our case. Therefore, we aim to contribute to the literature by further investigating the effect of customer behaviour of the likelihood of contract renewal.

2.2.1 PAST RENEWAL

The literature suggests that duration of a relationship and customer retention, which is included in the CUSAMS framework as relationship length, positively affects renewal likelihood (W. J. Reinartz & V. Kumar, 2003; Verhoef, Franses, & Hoekstra, 2001). This may be based on the level of satisfaction derived from experiences over time (e.g. past contract renewal, past experiences with the product/service), which impacts the decision to renew a contract (Bolton et al., 2006; W. J. Reinartz & V. Kumar, 2003; Rust & Zahorik, 1993). We therefore aim to further investigate the effect of past renewal of the likelihood of renewal.

2.2.2 MULTICHANNEL CONTRACT

There are several definitions of multichannel in the field of marketing. The meaning can refer to communication channels (e.g. TV, radio, and social media) or distribution and to sell/buy channels (e.g. retail shops, online stores). Scott A Neslin et al. (2006) broadly define a channel as “a customer contact point or a medium through which the company and the customer interact”. In our case, “multichannel contract” refer to the type of service a customer purchases (i.e. cross buying) and through which channel the service is accessed (i.e. multichannel: digital or print version). The relevant literature considers channel to be a point of contact (Scott A Neslin et al., 2006) and cross-buying behaviour, since a “multichannel contract” represent the acquisition of two subscription services from the same firm. Definition of cross buying vary according to the context of a study and has been studied in both contractual (Bolton, 1998; Ngobo, 2004) and non-contractual settings (Kumar, George, & Pancras, 2008; Kumar & R. Venkatesan, 2005; W. J. Reinartz & V. Kumar, 2003; Venkatesan & Kumar, 2004).

In a contractual setting, cross-buying refer to buying additional products/services from the existing provider beyond the customer owns (Ngobo, 2004). Kumar et al. (2008) define cross-buying as the total number of different product/service categories a customer has purchased from a firm since the time of the first purchase. Cross-buying can therefore be described as the number of different product types a customer has bought from the firm (Kumar & R. Venkatesan, 2005). The same study found cross buying to positively affect multichannel behaviour.

The literature has not reached a consensus regarding categorization of channels in the multichannel literature, exemplified by terms such as “multi-channel” (Scott A Neslin et al., 2006; Verhoef et al., 2007), “omni-channel” (Brynjolfsson, Hu, & Rahman, 2013) and “cross-channel” (Montoya-Weiss, Voss, & Grewal, 2003). From a contract and retention perspective, there are studies that have examined the influence of Internet use on renewal likelihood (Boehm, 2008; Campbell & Frei, 2010; Hitt & Frei, 2002; Verhoef & Donkers, 2005). To the best of our knowledge, there are few studies providing empirical evidence of the relation between multichannel contract and renewal likelihood in a contractual context. Table 2 provides an overview of existing studies of the effect of multichannel on retention.

2.2.3 CROSS-CATEGORY USAGE

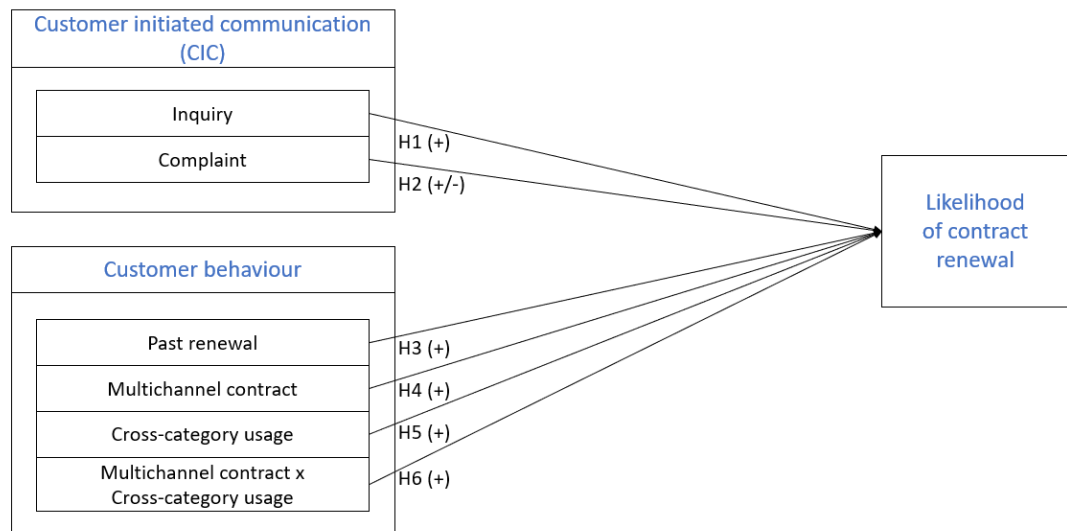
To the extent of our knowledge, the effect of cross-category usage on contract renewal has been scantily investigated. However, Braun and Schweidel (2011) highlighted the importance of including detailed data on the ownership and usage of individuals services, to better understand how to manage customer retention, cross-selling and up-selling (Braun & Schweidel, 2011; Chiu, Hsieh, Li, & Lee, 2005). Interestingly, Keaveney and Parthasarathy (2001) reported that no studies directly investigated the relation between service usage and switching behaviour, recommending further investigation into what usage of a service means for switching behaviour. Table 2 provides an overview of select studies with an emphasis on the effect on cross-category usage on renewal likelihood. Bolton et al. (2004) did include relationship depth (i.e. service usage) in the CUSAMS framework, which enable firms to understand the effect of their marketing instruments on customer behaviour and assess the value of a customer (i.e. CLV). Park et al. (2014) proposes a modelling framework for customer base analysis, which allow the quantification of individual/multiple categories effect on CLV. However, the context differs from ours, as Park et al. (2014) investigate shopping basket categories (e.g. cream, makeup, serum, basics) in a retail setting, whereas our context is an access-based subscription in which several categories are available at no extra cost. We therefore wish to further investigate cross-category and include the variable in our construct as a driver of satisfaction, which in turn may increase likelihood of contract renewal.

3 THEORETICAL FRAMEWORK

3.1 CONCEPTUAL FRAMEWORK

We propose a conceptual framework of CIC and customer behaviour effect on the likelihood of contract renewal. The first construct, CIC, consists of inquiry (H1) and complaint (H2 +/-). While the second construct, customer behaviour, consists of past renewal (H3), multichannel contract (H4) and cross-category usage (H5). Lastly, we include an interaction effect between multichannel contract and cross-category usage (H6). The direction of the variables is visualised as positive (+) or negative (-) effects, next to the respective hypothesis. We discuss the hypotheses in section 3.2 and 3.3 of this chapter.

Figure 1: Conceptual framework



3.2 MAIN EFFECTS

3.2.1 CUSTOMER-INITIATED COMMUNICATION

Interactions are necessary for establishing a relation between a customer and a firm, regardless of who engages first (Cambra-Fierro, Melero-Polo, Sese, & van Doorn, 2017). There are essentially two forms of contact between a customer and a firm, namely firm-initiated communication (henceforth FIC) and CIC. FIC is considered any contact with a customer initiated by the firm (brand-owned and partner owned touch points), while a CIC is any communication with a company initiated by a customer (current or prospective) (Bowman & Narayandas, 2001; Lemon & Verhoef, 2016; Wiesel et al., 2011). A CIC could be soliciting technical advice, enquire about product/service usage, requests for refunds, complaints, and feedback about products/services (Bowman & Narayandas, 2001; Polo & Sese, 2016). It is important to establish this division, since our thesis investigates CIC, which is associated with inquiries and complaints in a contractual B2C setting (Venkatesan & Kumar, 2004).

3.2.1.1 INQUIRY

An inquiry can be an essential source of information for firms, due to unidentified problems (e.g. software-related issues, logistical mishaps) and other concerns from a user point of view. The value derived from encouraging customers to engage through inquiries is a cornerstone of the CRM literature. Customer-firm interactions may increase firm understanding of which relational drivers that truly matter in the pursuit of improving customer loyalty, which influences customer-related assets and ultimately, the firm profitability and value (Edeling & Fischer, 2016). We therefore expect inquiries to positively affect renewal likelihood through trust (i.e. willingness to interact), commitment (i.e. contact frequency) and satisfaction (i.e. positive inquiry experiences).

Any relationship is contingent on underlying drivers, such as trust, commitment and satisfaction, which affect the degree of customer loyalty to a firm (Garbarino & Johnson, 1999). The drivers are affected by every customer-firm experience and shapes the evaluation of whether to extend the relation. They therefore provide the necessary foundation for interacting with the firm (e.g. inquiry). Trust and commitment are

reflections of relational attachment, while satisfaction is the customer evaluation of the firm and its services, which is continuously updated based on experiences with the product/service and interactions with the firm (Garbarino & Johnson, 1999). First, trust is revolved around the willingness to rely on an exchange partner and is based on the customers confidence in the given partner (i.e. any customer-firm relationship is contingent on at least two partners), as well as the reliability of the product/service quality delivered (Moorman, Zaltman, & Deshpande, 1992). Trust is therefore a prerequisite for inquiries. Second, commitment is an enduring desire to maintain a valued relationship (Moorman et al., 1992), reflected through calculative commitment (also instrumental commitment), affective commitment and a temporal dimension, highlighting the importance of consistent behaviour throughout the relationship (Gundlach, Achrol, & Mentzer, 1995). The desire of a customer to alter the current state with CIC (e.g. inquiry about product/service usage) may be an indicator of commitment, as in the willingness to invest in the current relation by engaging with firm. This is in contrast to a passive response, which not only deters the firm from resolving the problem at hand, but also hinders the firm from learning about customer pain points, which reduces the chance of improving the product/service based on user input. Third, satisfaction is a measure based on all previous transactions and the experience with a product/service over time, in which a transaction-specific situation is aggregated into cumulative satisfaction (Garbarino & Johnson, 1999). The level of satisfaction captures the overall evaluation of the performance to date, while serving as a proxy to measure the effect of activities implemented to reduce pain points (Gustafsson et al., 2005).

The three drivers provide the foundation for building relations, while the value of the relationship itself is contingent on the contact frequency (also contact intensity or frequency of interaction), which is related to CIC per period (Dagger, Danaher, & Gibbs, 2009). Contact frequency reflects customer and firm commitment to the relationship (Nicholson, Compeau, & Sethi, 2001), enabling parties to gather information about each other (Kamakura, Wedel, De Rosa, & Mazzon, 2003; Paulssen, Leischnig, Ivens, & Birk, 2016) and strengthening their social bonds (Bendapudi & Berry, 1997). The benefits of learning about customer preferences and needs is the potential to better serve the customer than the competitor, thereby developing customer

loyalty in the long run. This is contingent on the intensity of satisfactory interactions with the customer, which ultimately promoting continuity of the relation (Kamakura et al., 2003). In sum, inquiry positively affect renewal likelihood through trust (i.e. willingness to interact), commitment (i.e. contact frequency) and satisfaction (i.e. positive inquiry experiences). Therefore,

H1: Inquiries increase the likelihood of contract renewal.

3.2.1.2 COMPLAINT

We present competing hypotheses regarding the effect of complaint on renewal likelihood. First, we present the case for that complaints positively affect renewal likelihood through affective commitment and satisfaction. Second, we present the case for that complaints negatively affect renewal likelihood through dissatisfaction and calculative commitment.

A complaint is a valuable CIC for any service provider, since it represents an opportunity to remedy a problem in a specific market transaction (Bougie et al., 2003). The majority of dissatisfied customers do not complain directly due to conflict aversion, inadequate channels for complaint delivery, or due to a disbelief in resolution based on complaining (Haverila & Naumann, 2010; Zeithaml, Berry, & Parasuraman, 1996). The share of customers that choose to complain are actively voicing their problem to the firm (i.e. voice behaviour) (Hirschman, 1970; Singh, 1988), defined as any attempt at changing, instead of escaping any objectionable state, through various types of actions and protests (Hirschman, 1970). The action of interacting with the firm suggest a willingness to let the firm attempt to remedy the failure. The desire of a customer to change the current state (e.g. voicing a complaint) may indicate commitment, which can improve the complainant satisfaction (Hirschman, 1970; Moorman et al., 1992; Sparks & McColl-Kennedy, 2001).

Any deeply held commitment is essential for long-term relationship continuity (Hur, Kim, & Kim, 2013) and is contingent on both parties desire to maintain the value of the relationship (Moorman et al., 1992). The affective dimension of commitment (i.e. emotional motives of loyalty) may offer an explanation, as it reduces the likelihood

of exit behaviour due to its cognitive evaluation of a brand (Amine, 1998). An example of this type of commitment is apparent when considering football supporters commitment to a club (e.g. “madridista” or member of the Real Madrid football club). The effect of identifying with values and goals of a given product/service may increase the likelihood of staying, which is in contrast to the other commitment type. Calculative commitment (i.e. opportunistic loyalty) only sets the threshold for the absolute minimum utility derived from the product/service, compared to the cost incurred of switching to another provider (Amine, 1998). A positive experience is likely to increase the importance of the affective dimension, further reinforcing emotional commitment, which is related to a long-term positive effect on the customer-firm relationship. This process is a continuous adjustment of the subjective expectation of the product/service, based on an initial state (Bolton, 1998).

There are studies, such as Coussement and Van den Poel (2008), which posit a strong relationship between the percentage of complaints of all customer-company interactions and customer churn behaviour in a B2C context. This may be explained by the positive experience related to the complaint process or dissonance reduction derived from venting negative emotions in form of complaints (Halstead & Page, 1992). Similarly, Ashley and Varki (2009) posit that complaining customers may be most loyal and that such customers are potentially more open to service recovery efforts. The customer level of satisfaction is affected by how the firm handles the complaint. However, the act of complaining is necessary to begin this process. In sum, a complaint does not solely result in exit behaviour or negative word-of-mouth but may positively affect loyalty, given that the firm successfully turns complaining customers into loyal customers (Fornell, Johnson, Anderson, Cha, & Bryant, 1996). In sum, complaints positively affect renewal likelihood through affective commitment and satisfaction. Therefore,

H2: Complaints increase the likelihood of contract renewal

A complaint is a CIC stemming from dissatisfaction with a product/service experience outside of a customers’ acceptance zone (Tronvoll, 2007), which is associated with an increase in the chance of not purchasing more of the current product/service (Knox &

Van Oest, 2014a). The literature suggest that satisfaction is negatively related to complaint activity, which implies that dissatisfaction is related to switching behaviour (i.e. the act of switching to another provider) (Bearden & Teel, 1983; Bolton & Bronkhorst, 1995; Wirtz, Xiao, Chiang, & Malhotra, 2014). The effect of a dissatisfied customer can lead to exit behaviour, the worst possible outcome for a firm, which is the most common response to dissatisfaction in competitive environments (e.g. telecommunications, packaged goods) (Fornell & Wernerfelt, 1987). In other words, the likelihood of exit behaviour is inversely related to customer satisfaction (Bolton & Bronkhorst, 1995; Eshghi, Haughton, Teebagy, & Topi, 2006; Keaveney, 1995). Another effect of satisfaction is its reciprocal relation to loyalty (Shankar, Smith, & Rangaswamy, 2003), in which loyalty may prevent exit behaviour (i.e. switching to another provider) and encourage the customer to interact through CIC (i.e. complaining) (Hirschman, 1970). The customer may be loyal, but only based on calculative commitment, an opportunistic type of behaviour. This type of commitment merely relies on the current utility derived from the product/service being higher than the cost of switching to an alternative provider.

The firm's ability to address any problem a customer experiences is important for the outcome of the CIC. There are several negative effects that can arise from a poorly handled complaint, effectively contributing to customer defection (Fornell et al., 1996). A poorly managed complaint seems to have a double negative effect, first, about the original issue and second, about the quality of the recovery process (Stone, 2011). Generally, the most dissatisfied customers tend not to complain, while angry customers have a whole repertoire of responses aimed at service recovery or to discouraging the firm from doing what initially caused the anger (Bougie et al., 2003). The frustration of a product/service experience being outside of the customers' acceptance zone (Tronvoll, 2007), lead to an increase in the probability of a customer to exit or actively seek a change in the current state by voicing a complaint. In sum, complaints negatively affect renewal likelihood through dissatisfaction and calculative commitment. Therefore,

H2: Complaints decrease the likelihood of contract renewal

3.2.2 CUSTOMER BEHAVIOUR

We propose a construct to address customer behaviour based on the CUSAMS framework (Bolton et al., 2004). The construct consists of the following dimensions: Past renewal (i.e. length), multichannel contract (i.e. breadth) and cross-category usage (i.e. depth). The first dimension, past renewal, is an operationalization of relationship length and refers to the times a customer has renewed their subscription in the past. Multichannel contract is an operationalization of breadth and refers to the current contract and whether it includes a single channel (digital) or multiple channel (digital and print) access. Lastly, cross-category usage is an operationalization of relationship depth, which is linked to the usage pattern of the customer, more specifically if he/she consumes several categories of the service.

3.2.2.1 PAST RENEWAL

The first dimension of the customer behaviour construct is included to assess the effect of past renewals on renewal likelihood. We expect past renewals to positively affect renewal likelihood through commitment and switching costs.

A relationship exists when the exchange between the customer and firm is viewed as a continuation of past exchanges and that likely to continue (Bendapudi & Berry, 1997). This implies a desire to commit and further invest in a relationship based on previous experiences, which is in line with research suggesting a positive relationship between commitment and relationship duration (Bolton et al., 2004). Commitment can be divided into two types, namely affective and calculative, where relationships based on the affective commitment (i.e. free choice and emotional attachment; “want to stay”) should result in more persistent relationship than on a calculative foundation (i.e. economic benefits and non-viable alternatives; “have to stay”) (Bendapudi & Berry, 1997; Marshall, 2010).

Switching costs, which is the cost of changing from a provider to another, is related to commitment and can either be monetary (e.g. termination fee before expiration) or non-monetary (e.g. changing payment instructions, search cost for alternatives, loss of access to desired content) (W. J. Reinartz & V. Kumar, 2003). A past renewal can be a result of past utility evaluation of the product/service in

comparison to alternatives. The choice of renewing the product/service in the past may signal of a desire of continuity, which increases both monetary and non-monetary switching costs. The value added of prolonging the current service (e.g. Harvard Business Review allows access to bookmarked articles and online subscriber exclusive content), would imply a loss beyond the core product/service (e.g. magazine and articles) by switching provider. The experience and value accumulated through usage (e.g. loss of bookmarked and/or subscriber-only content) may affect both types of commitment. Assuming that a larger value derived from the current product/service than the alternative, the affective commitment is likely to matter more than the calculative version. This implies less resource spent on searching for alternatives and an increase in the current calculative evaluation of the service. In sum, past renewals positively affect contract renewal through commitment and switching costs. Therefore,

H3: Past renewals increase the likelihood of contract renewal.

3.2.2.2 MULTICHANNEL CONTRACT

The second dimension of the construct is multichannel contract, which entails a subscription with digital access and another subscription for one/several print products. We expect multichannel contract to positively affect renewal likelihood through switching costs and satisfaction.

A single channel delivers content through a channel of preference (i.e. digital) with a specified scope of content (i.e. specific print product or access to several products with the digital option). Multiple channel options provide the customer with several sources of information, multiple ways of interacting and consuming a product/service (e.g. Time magazine offers print, digital, and print plus digital subscription) (Srisuwan & Barnes, 2008). Therefore, a multichannel contract may incur switching costs that differ from a single channel contract (digital only). Expenses related to switching cost from the payment procedure (monetary), content provided or search effort for alternatives (non-monetary), increase the dependence on the current firm, positively affecting renewal likelihood (Lam, Shankar, Erramilli, & Murthy, 2004). The expense mechanisms can be exemplified by the automation of a

subscription payment and the distancing between the payment and usage, possibly leading to a status quo bias (i.e. a psychological switching cost) (Sun, Li, & Sun, 2015). Search cost is related to the non-monetary cost of remembering to change subscription/firm, the amount of time spent searching and selecting another product/service, which increases the switching cost.

Lam et al. (2004) suggest that increased utility, and consequentially increased overall satisfaction, derived from a multichannel contract, may positively impact renewal likelihood. The change in overall satisfaction, which is the overall evaluation based on purchase and usage over time (Anderson, Fornell, & Lehmann, 1994), affect switching cost, namely the cost incurred by changing from a firm to another (Heide & Weiss, 1995). The multichannel literature suggests that customers who consume through multiple channels are less likely to churn, due to an increase in customer satisfaction and switching costs (Blattberg, Malthouse, & Neslin, 2009). In sum, multichannel contract positively affects renewal likelihood through switching costs and satisfaction. Therefore,

H4: Multichannel contract increases the likelihood of renewal.

3.2.2.3 CROSS-CATEGORY USAGE

The third and last dimension of the construct is cross-category usage. We expect cross-category usage to positively affect renewal likelihood through commitment and satisfaction.

Cross-category usage is a sign of relational depth, which according to CUSAMS framework (Bolton et al., 2004) suggest that the higher the usage, the deeper the relationship between customer and firm. Consequently, the level of depth may be affected by the level of commitment. Cross-category usage (or consumption) have a positive impact on the likelihood to stay, since it provides a basis for a broader scope of interaction, which is essential for an enduring relationship (Moorman et al., 1992; W. J. Reinartz & V. Kumar, 2003).

Bolton and Lemon (1999) posit a link between satisfaction and usage, more specifically, customers with higher usage reflect higher level of satisfaction based on

the utility of the service. This is in line with customer service usage being contingent on cumulated experiences with the service (Bolton et al., 2004). A decision to renew involves an analysis of the monetary cost, which in a contractual setting is the fixed price. A business model based on fixed fees may reinforce satisfactory experiences, since customers are encouraged to use the service more frequently (Bolton et al., 2004). In other words, the nature of a subscription service (e.g. all-access for a fixed fee) implies the convenience of one-stop-place to consume and consequently, increase the usage and reduces the mental unit cost per category (i.e. itemized portion and slack) (Stilley, Inman, & Wakefield, 2010).

In sum, cross-category usage increases the non-monetary utility, which combined with the monetary utility derived from a fixed fee, reinforces satisfaction. In addition, customers that have a high level of commitment are likely to expand their relationship and enhancement through cross-category usage (Bendapudi & Berry, 1997). Consequently, cross-category usage positively affects renewal likelihood. Therefore,

H5: Cross-category usage increases the likelihood of contract renewal.

3.3 INTERACTION EFFECT: MULTICHANNEL CONTRACT AND CROSS-CATEGORY USAGE

The customer future decision to renew is contingent on variety (i.e. depth) and availability (i.e. breadth) of the product/service (Sun et al., 2015), which continuously updates the overall satisfaction and intent to extend the relationship (i.e. contract renewal) (Zeithaml et al., 1996). We expect the interaction between cross-category usage (i.e. depth) and multichannel contract (i.e. breadth) to increase the positive effect renewal likelihood through an increase in overall satisfaction and relationship enhancement.

Customers that consume from more than one category are more likely to stay with the firm, due to a broader scope of interaction, which suggests a stronger relationship (W. J. Reinartz & V. Kumar, 2003). Furthermore, a multichannel contract may contribute by increasing the opportunities for customer-firm interactions, effectively deepening and/or broadening the relation. The continuity of the relation also increase the customer awareness of the product/service offered, which help to form realistic expectations, effectively reducing incidents of disconfirmation and increasing satisfaction (Anderson & Sullivan, 1993; Pablo Maicas Lopez et al., 2006).

The increased utility is linked to satisfaction, which impact on contract renewal has been extensively studied (Depren, 2018; Gustafsson et al., 2005; Lapidus & Pinkerton, 1995; Woisetschläger et al., 2011). Customers tend to maximize their utility based on money and time constraints. Consider a customer with a multichannel contract (i.e. print and digital subscription). The convenience along with the fixed fee paid for services is likely to result in high utility, which increase the overall satisfaction. Customers that consume across categories (e.g. Netflix categories such as horror, comedy, etc.) deepen their relationship with the firm and gain added value, which further increases satisfaction. Meanwhile, a single category consumer may be underutilizing the service, which hinder he/she from obtaining the potential added value and the same increase in utility as the cross-category user.

The overall satisfaction is based on cumulative experience with the product/service, regardless of the format through which it is offered. A digital subscription offers similar benefits as most self-service technologies (Ju Rebecca Yen

& Gwinner, 2003), namely convenience (i.e. specific product and a broad scope of digital content), perception of being in control of the product/service, access to new and varied content (i.e. access to several products compared to a print option), and several formats of usage (e.g. print, tablet, mobile, desktop). Consider the example of the multichannel subscription (i.e. digital and print) to Harvard Business Review, which offer a monthly print version, access to their online magazine archives and an exclusive section in the digital version. The digital subscription adds the possibility of discovering (i.e. recommendation algorithm) articles related to those found in the print subscription, which serve as a starting point for experiencing the entire offer (i.e. breadth and depth) of the product/service. A well-executed multichannel contract avoids overlapping value propositions (Deleersnyder, Geyskens, Gielens, & Dekimpe, 2002) and offers added value through varied content (i.e. cross-category) on customizable platforms, increasing the overall utility derived from the product/service.

In sum, the interaction between cross-category usage and multichannel-contract increases the positive effect on renewal likelihood, due to increased satisfaction derived from the customer-firm relation enhancement. Therefore,

H6: The interaction between multichannel contract and cross-category usage increase the positive effect on renewal likelihood.

4 METHODOLOGY

4.1 DATA SET DESCRIPTION

Our data is from one of the leading Nordic region media groups with activities in 30 countries and 6 600 employees. The group generated EUR 1.5 billion in 2017. The media group produces magazines, comics, book, educational material, movies and TV programs, which is distributed in both offline and online channels. Depending on the service, they offer non-contractual and contractual options for the customer to choose. For this study, we focus on data from a specific service, which only offer a contractual and digital option, due to the richness of the data available. The media group provided five Excel files containing data from 30 003 unique customers. Furthermore, we have access to data from December 12, 2014 to September 14, 2017, approximately two years and nine months since the initial invoice date.

The main Excel file had missing information about 118 customer IDs; after enquiring the company to clarify the situation, we discarded the information corresponding to free subscriptions or user tests the company created to test its service. After cleaning the data and removing customers with missing information, we had a data set with 29 885 unique IDs and 200 081 data points. We have access to data about the subscription length and the number of renewals registered at different point in time for each customer. Another file contains data regarding cross-category usage, where the average subscribed to four out of eight possible categories. There is also data about customer channel choice, indicating whether a customer contract consists of a digital subscription only or both digital and print subscriptions. The data set also include a complaint log file, identifying the customer, complaint dates (complaint start and end), codification of the complaints and a description of the complaint incident. Most of the incidents reporting as complaints, indicates inquiries in the detailed description of the incident. The company had already stored complaints and inquiries into a variety of categories (e.g. complaints about unsatisfactory distribution, inquiry about service usage), which meant that we could easily further group the categories into either a complaint or inquiry category for further analysis.

4.2 MEASUREMENT OF VARIABLES AND PROCEDURE

Our objective is to empirically assess the effect of customer behavioural variables and CIC (complaint and inquiry) on contract renewal. We use logistic regression, due to the binary outcome of our dependent variable, namely if a customer renews or not. Our independent variables are specified in Table 4 and Table 5. A discussion regarding the descriptive statistics is presented in the results chapter.

Table 4: Explanation of independent variables, CIC

Variable	Operationalization	Levels	Mean	S.D.
Inquiries	Number of inquiries during the last contract	Discrete variable	.19	.665
Complaints	Number of complaints during the last contract	Discrete variable	.05	.274

Note: N = 200 081

Table 5: Explanation of independent variables, Customer behaviour

Variable	Operationalization	Levels	Mean	S.D.	Min	Max
Past renewals	Number of previous contract renewals (digital subscription, excluding trial period)	Discrete variable	11.18	8.955	0	33
Multichannel contract	Whether the customer pay for both digital and print subscription (multichannel contract =1) or only has a digital subscription (multichannel contract = 0)	Binary variable	.66	.475	0	1
Cross-category usage	Number of product categories a customer has accessed during her/his last digital contract	Discrete variable	5.20	2.105	1	8

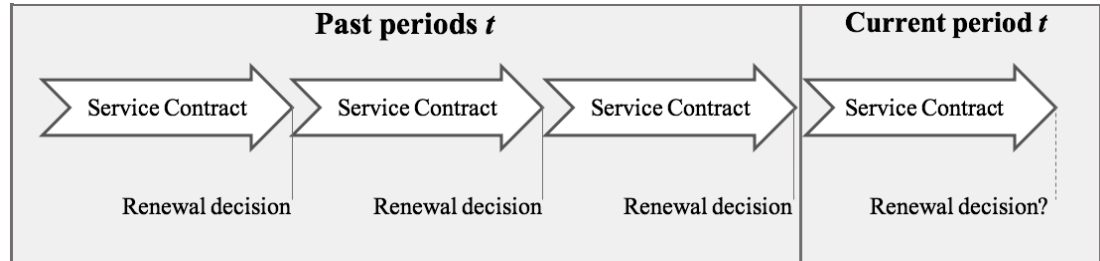
Note: N = 200 081

Model

To identify the explanatory power of the endogenous variables, we carried out the logistic procedure in SPSS Statistics® version 25. We present the model result in Table 6. The model proposes that a customer i who decide to renew by comparing their behaviour (i.e. multichannel contract and cross-category usage) in the current contract period t and CIC (i.e. inquiry and complaint) in the current contract period t . The model

also includes past behaviour as predictor of future renewal by including past renewal decisions or renewal decisions before period t (see Figure 2) (Wangenheim et al., 2017).

Figure 2: Customer renewal decision in a subscription context



Therefore, our generalized model is as follows:

$$\begin{aligned}
 & \text{Logit of } (Renewal_{i,t}) \\
 & = \alpha + \beta_1.inquiry_{i,t} + \beta_2.complaint_{i,t} + \beta_3.past\ renewal_{i,t} \\
 & + \beta_4.multichannel\ contract_{i,t} + \beta_5.crosscategory\ usage_{i,t} \\
 & + \beta_6.(crosscategory\ usage_{i,t} * multichannel\ contract_{i,t})
 \end{aligned}$$

The parameter estimations are presented in Table 8 in the results chapter.

5 RESULTS

Descriptive statistics

Nearly half (53%) of the sample had previously renewed their online contract. Most of the contract combinations (87%) had not initiated any form communication (i.e. inquiries or complaint) with the company. Table 4 presents the inquiry average ($M = .19$, $SD = .665$), which is slightly higher than the complaint average ($M = .05$, $SD = .274$). Among customers that had initiated communication (i.e. CIC), inquiries are more frequent (9%) than complaints (1%). Furthermore, some customers presented both inquiries and complaints in the same contract period (3%).

Most of the customers in the dataset (66%) are multichannel-contract customers (see Table 5), which mean that they have subscribed to both digital and print, while 34% only have a digital subscription. The majority are cross-category customers (94%) with an average of five categories in usage during the last contract ($M = 5.2$, $SD = 2.105$) (see Table 5).

Model fit

Our findings confirm the effect of CIC and consumer behaviour variables on renewal likelihood. We evaluated the model fit by assessing the measures of overall model fit (i.e. Pseudo R-square measure: Nagelkerke) and the goodness of fit (i.e. Hosmer-Lemeshow).

Table 6: Model evaluation

Test	Model 1			Model 2		
	Main effects only			Main effects and interactions		
	χ^2	Df	Sig.	χ^2	Df	Sig.
Overall model evaluation						
Nagelkerke R-Square	.251	6	.000	.254	5	.000
Goodness-of-fit test						
Hosmer & Lemeshow	1804.311	8	.000	2448.258	8	.000

Note: SPSS output results

First, the overall correct classification rate improves to 68.4 %, compared to a naive model with 52.9% in overall correct classification rate. In short, the overall classification improves with the predictors in the model. We found the overall model to have an adequate fit (see Table 6) by testing two models to evaluate the effect of the interaction. Model 1 includes the main effects with five predictors and an interaction, while Model 2 only includes the main effects (see Table 6). The model fit (i.e. discrimination among groups) was good in the model without interaction, based on the Nagelkerke R-square equal to .251 with a 95% confidence interval ranging from .15 to .29 (Steiger & Fouladi, 1992). Furthermore, after including the interaction (Model 1), the pseudo R-square measure improved, based on the Nagelkerke R-square equal to .254. Second, we assessed the goodness of fit with the Hosmer-Lemeshow test, which yielded a $\chi^2(8)$ of 2 448.258 and was significant ($p < .000$) (see Table 6), suggesting that the model fit the data.

We also ran the model using STATA (IC/15 version) to ensure the model and results were consistent, while also enabling more analyses. The measures of fit showed a difference between Model 1 (i.e. main effects and interaction) and Model 2 (i.e. main effects only). A comparison of log-likelihood ratios (Table 7) for models with and without interaction showed a statistically significant improvement when including the interaction between multichannel contract and cross-category usage, with a difference in LR of $\chi^2(1, N = 200\ 008)$ equal to 418.386 and $p < .05$. Similarly, the McFadden R-squared shows an improvement in the proportion of the variance in renewal, which is explained by the variance in the independent variables in the model.

Table 7: Measures of fit in Stata

	Model 1	Model 2	Difference between Model 1 and Model 2
	Main effects and interactions	Main effects only	
Likelihood Ratio test (LR)	42158.371(6)	41739.986(5)	418.386(1)
Prob > LR	.000	.000	.000
McFadden's R2	.152	.151	.002

Note: Stata output results

In sum, the measures of fit provide a strong support of overall significance for the full model (Model 1) versus the model without interaction (Model 2). In the following section, we analyse the predictive power of our full model.

Predictive power

We evaluated the predictive power of the model using a lift analysis (see Figure 3). The lift analysis measures the predictive power as the ratio between results obtained by including and excluding our generalized model (Mutanen, 2006)). We measured renewal probabilities for all customers, sorted them by probabilities, followed by split-ranking them into ten equally large groups (i.e. deciles). Finally, we computed renewal rate from actual renewals within each group. In other words, the lift analysis visualizes the accuracy of the current predictive model in terms of renewal decision versus a random lift curve (i.e. no model). In Figure 3, consider contacting the first 50% of customers with random lift curve (i.e. no model), which will result in identifying 50% of renewals. However, acting over the same 50% of customers using our model (i.e. Model 1), the accuracy improves to 67% of true customer renewals.

Figure 3: Cumulative gains chart

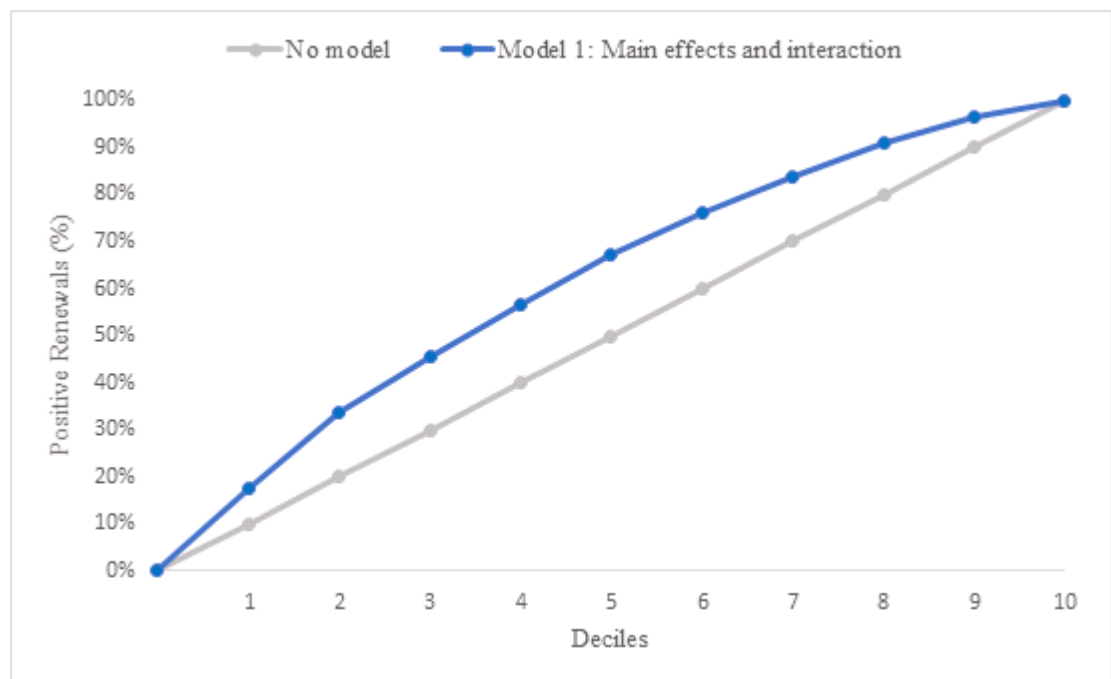
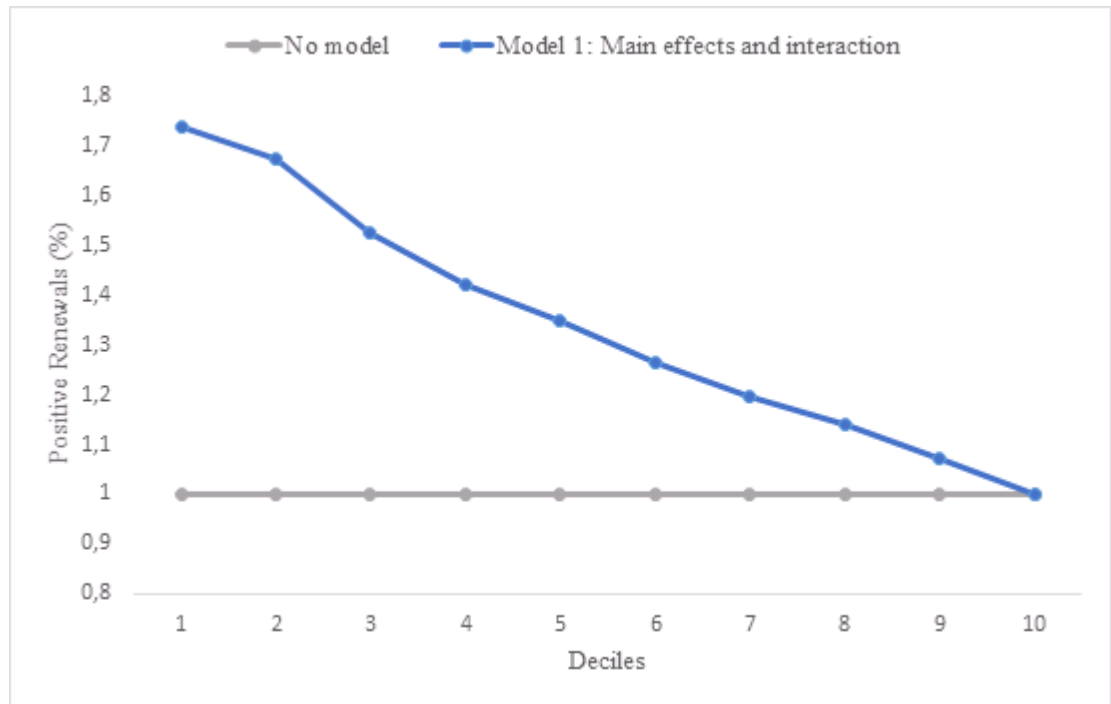


Figure 4 visualizes a lift chart, which can be understood by comparing the percentage of positive renewals using our model versus random lift curve (i.e. no model). For example, the first decile (i.e. Decile 1) have approximately 1.74 times bigger potential of positive renewal than a randomly composed group (i.e. no model).

Figure 4: Lift chart



Parameter estimations

According to the model, the log odds of a customer renewing the subscription is negatively related to multichannel contract ($p < .05$) and positively related to the CIC construct (inquiries ($p < .05$), complaints ($p < .05$) and cross-category usage ($p < .05$)). In other words, the more CIC with a firm, the more likely the customer decides to renew their subscription. The same positive main effect is given by cross-category and past renewals.

Logit of ($Renewal_{i,t}$)

$$\begin{aligned}
 &= -1.852 + .454 * inquiry_{i,t} + .058 * complaint_{i,t} + .097 * past renewal_{i,t} \\
 &- .027 * multichannel contract_{i,t} + .164 * crosscategory usage_{i,t} - .102 \\
 &* (crosscategory usage_{i,t} * multichannel contract_{i,t})
 \end{aligned}$$

The coefficient estimate of inquiries and complaints are significantly positive in the model, which is consistent with our expected hypothesis H1, inquiries increases renewal probability. The results (see Table 8) indicate that inquiries (.454) and complaints (.058) have a positive effect on renewal likelihood, and contrary to expectations, revealed that complaints do not have a negative effect on the likelihood of renewal. Therefore, we find support for H1 and the positive H2 hypothesis, while we do not find support for the negative H2 hypothesis.

Table 8 indicates that cross-category usage (.164) and past renewals (.097) positively affect renewal likelihood, whereas multichannel contract, contrary to expectation, is negative (-.027). In other words, we find support for H3, H4 and H5. Nevertheless, multichannel contract is not significant, when the interaction term is excluded (see Appendix 8.1) The inclusion of interaction terms (see Table 8) explained parts of the variance in renewal likelihood (Model 2: $\Delta R^2 = .003$, $p < .05$) (see Table 7). We also found cross-category usage to have a significant negative interaction with multichannel contract (-.102), which supports H6. Overall, the model explained 68.4 percent of the variance in contract renewal decision. Lastly, we summarize all of the hypotheses and the relevant results in Table 8.

Table 8: Parameter estimates for customer renewal decision – Model 2, main and interaction effects

	β	S.E.	Wald	Df	Sig.	Exp(β)
H1: Inquiry	.454	.011	1728.251	1	.000	1.574
H2: Complaint	.058	.023	6.087	1	.014	1.06
H3: Past renewal	.097	.001	22776.088	1	.000	1.102
H4: Multichannel contract	-0.027	.011	6.419	1	.011	.973
H5: Cross-category usage	.164	.003	2597.104	1	.000	1.178
H6: Cross-category by Multichannel	-0.102	.005	419.839	1	.000	.903
Constant	-1.858	.019	9873.139	1	.000	.156

a. Significant at $p < .05$

6 GENERAL DISCUSSION

Table 9: Hypothesis test results

Hypothesis	Variables	Results
H1	Inquiries have positive effect on renewal likelihood	Supported
H2	Complaints have positive effect on renewal likelihood	Supported
H2	Complaints have negative effect on renewal likelihood	Not supported
H3	Past renewals have positive effect on renewal likelihood	Supported
H4	Multichannel contract has a positive effect on renewal likelihood	Not supported
H5	Cross-category usage have a positive effect on renewal likelihood	Supported
H6	The interaction between multichannel contract and cross-category usage increase the positive effect on renewal likelihood	Not supported

This study finds inquiries to have a positive effect on the likelihood of renewal (H1). Controlling for complaints, past renewals, multichannel contract and cross-category usage, presenting an inquiry during the last contract period increases the odds of renewal likelihood by 57,4%.

Interestingly, complaint behaviour also has a positive effect on renewal likelihood (H2). Complaint during the last contract increase the odds of renewal likelihood by 6%. The finding contrasts previous studies, which suggest that complaints are signs of dissatisfaction and therefore negatively impact retention (Bolton & Bronkhorst, 1995; Manchanda, Rossi, & Chintagunta, 2004).

We conjecture that the small, but positive effect of complaint is due to the effect of deciding to interact by voicing a complaint. The magnitude may explain that a complaint is the first step in service recovery process, which is in line with Bijmolt et al. (2010) study that posits customers experiencing a successful complaint-handling process after being encouraged to complain, are more satisfied than those who complain but were not encouraged to do so. In other words, the level of trust in the firm's ability to remedy the dissatisfaction has to be sufficient to encourage the customer to complain (i.e. reducing the cost of complaining). Furthermore, the desire to stay in the relationship is contingent on CIC, which includes complaint. The action of complaining may signal a desire of continuity.

Another finding emerging from the analysis is that for every one unit increase in past renewals (as measured by the times a customer had renewed his/her contract in the past), the odds of renewal likelihood increase by 10,2%, after controlling for the remaining factors in the model. This is consistent with Bolton (1998), who posit that the longer the customer-firm relationship, the higher cumulative satisfaction scores and, consequently, the smaller the perceived losses after subsequent service encounters (i.e. insulating effect).

With respect to the customer behaviour construct, we find that multichannel contract had a negative impact of -2.7% on the odds of renewal likelihood. Despite the small magnitude, the result was unexpected. The relations may be explained by Deleersnyder et al. (2002), who posit that newspaper circulation is more likely to get cannibalized when the overlap between online and offline version is high. Therefore, the similarity between offers (i.e. print and digital subscription) may negatively influence customers renewal decision through reduced satisfaction. It is also worth consider why a consumer would pay twice to get the same content, besides the convenience of access through multiple channels. Furthermore, the value of convenience (e.g. access to content on multiple formats) or access to multiple magazines, which may be a key benefit of a digital subscription, are contingent on consumer preferences and their respective valuation of the benefits.

Cross-category usage, ranging from one (single-category usage) to eight categories used during the last contract period, increases the odds of renewal likelihood by 17.80%. The results support our proposed hypothesis (H5). Li (1995) and Bolton (1998) posit a correlation between satisfaction and increased renewal likelihood, which may an explanation for the result. High usage rates may signal a high level of involvement and familiarity with the firm and its products/services, which increase renewal likelihood due to the “stickiness” effect of commitment (Gustafsson et al., 2005).

Finally, this study does not find support for a positive effect from the interaction between cross-category usage and multichannel contract. We expected a positive effect, but the negative effect of -9,7% odds on renewal likelihood may be due to overlapping offers between contract channels. The result may be explained by Deleersnyder et al. (2002) findings, suggesting that channels which closely resemble

are more likely to experience cannibalization and/or negatively affect the perceived value of the offer.

6.1 THEORETICAL CONTRIBUTION

The thesis contributes to the field of retention in several ways. First, our findings support the case for including customer behaviour in retention analyses. The need to identify factors characterising the profile of a high-risk customer (i.e. not renewing their contract), should not be determined solely by event history data (Li, 1995). The need to deeply understand variables that matter to the customer base, has been a topic of interest in the service marketing literature (Berry, Parasuraman, & Zeithaml, 1994; Rust & Zahorik, 1993). Our research found that multichannel contract, cross-category usage and past renewal are significant and positively affect renewal likelihood.

Second, our research finds inquiries to positively affect renewal likelihood, which to the best of our knowledge, has not been established in a B2C contract-based, multichannel product/service. The finding is highly relevant for marketers, which need to accommodate to the reality of a multichannel world.

Third, this research found, in contrast to the literature, complaints to have a positive effect on the renewal likelihood. The rationale for this small, but positive effect can be attributed to the fact that most dissatisfied customers do not complain, while those who do, are actively choosing to interact with the firm (Huppertz, 2007; C. Kim, Kim, Im, & Shin, 2003).

Lastly, the interaction effect between multichannel contract and cross-category was to our surprise, negative. The result emphasises the need to understand how a product/service is structured to meet the needs of the customer across channels, instead of possibly resulting in cannibalization and reduced value derived from the offers.

6.2 MANAGERIAL IMPLICATIONS

“High rates of customer retention and increasing profitability from long-time committed customers reduce the drain on margins caused by expensive new customer acquisition. The result is a virtuous circle, an economic model in which efficiencies improve over time, and future revenue flows are assured against competitive attack.”

(Reichheld, Markey Jr, & Hopton, 2000)

The quote reflects the potential of deeply understanding and applying predictive analytics to the vast amount of data available. The findings are particularly useful for marketers, since it reinforces the importance of applying behavioural data to understand, iterate current offerings and deliver better product/services. Although there are several approaches to analyse a customer base (e.g. random forests, neural networks, regression), we have presented an empirical investigation using logistic regression. The approach is fairly easy to implement compared to other methods, since most companies have the required data readily available in their database and the analysis is not as complex as comparable methods to perform.

The output of our analysis may contribute to identify the positive impact of complaint and inquiries on renewal decisions. Based on these findings, we recommend to continuously implement and/or improve systems encouraging the customer base to voice their complaints. Furthermore, managers should strive to develop coordinated channels (e.g. chatbots, 24/7 customer support) through which customers can provide feedback (positive or negative) with the goal increasing CIC and possibly improving retention rates.

The behavioural variables in the proposed framework enables managers to analyse other factors that influence retention. We did not find evidence supporting the positive effect of multichannel contract on renewal in this context. The effect may be explained by customer preferences, value evaluation and product overlap. Therefore, managers should leverage customer base analyses to identify and better understand factors driving customer utility in relevant channels. The goal should be to reduce overlapping offers that provide limited added value to the customer base, which

ultimately lead to unwanted outcomes (e.g. churn, cannibalization, reduced share of wallet).

According to our findings, cross-category usage has a positive effect on the renewal likelihood, suggesting that managers should encourage to identify marketing actions directed towards deepening customer-firm relations. For example, developing recommendation algorithms for digital services, enabling customers to discover new categories (e.g. Netflix, Spotify suggestions). The outcome may be two-pronged: First, it has the potential to increase customer utility and thereby increasing their level of satisfaction. Second, a fairly stable (i.e. low relative churn rate) and satisfied customer base increases the attractiveness of the firm to advertisers, which may result in increased advertising revenue.

Furthermore, the obvious effect of multiple channels in traditional product/service industries (e.g. publishing, banking) is increased competition, smaller margins, and the need to deliver high quality products/services at an increasing pace. This study found a negative interaction between multichannel contracts and cross-category usage, which reinforces the effect of consistently delivering differentiated value in each channel to reduce negative outcomes (e.g. cannibalization) and to drive synergetic effects (e.g. spillover marketing effects). Marketers must ensure they provide benefits beyond existing product/service value proposition when considering implementing products/services in new channels. The “low-hanging fruits” of convenience and access may be easy pickings but will not suffice to create a sustained benefit and competitive advantage in the long run.

Finally, we analysed the predictive power of the proposed model using a lift analysis. The lift curve (see Figure 3 and Figure 4) is a useful tool for marketers to classify a customer base by renewal probabilities, enabling more efficient and targeted marketing actions (e.g. direct mail). Moreover, the lift analysis is useful for optimizing marketing spending through its complementarity with other selection rules (e.g. decision trees).

6.3 LIMITATIONS AND FUTURE RESEARCH

This study, as all studies, have limitations that may serve as a basis for future research propositions. The first limitation we can denote is the context of the study, in which the specificity of the industry, along with a contractual offer reduces the generalizability of our findings. An example of context variations making it challenging to interpret our findings, is the importance of switching costs in a non-contractual setting. We therefore encourage the replicability of the study in another industry.

Second, the data set present some limitations. Customer ID is not necessarily a single unique but can be multiple users using a single account. A possible limitation is the operationalization of the customer behaviour construct exclusively based on behavioural measures (i.e. past renewals, multichannel contract and cross-category usage). Although the variables included in the model provided a statistically significant explanation, we argue for the importance of attitudinal variables such as commitment and satisfaction, as a link between our endogenous variables and contract renewal. Due to a lack of satisfaction scores in our data, we had to keep the factor in a theoretical domain. Therefore, future research can and should test both attitudinal and behavioural measure effects on contract renewal.

Third, our study of CIC did not account for the firm response, which is intrinsically important for the interaction. A customer-firm dialogue consists of either FIC/CIC followed by a response, which we did not account for. We suggest including response after the initial contact to better understand customer-firm interactions.

Fourth, we operationalized breadth of the relationship as multichannel contract, but did not account for the order of acquisition (digital or print) which may be an important caveat for the interpreting the output.

Lastly, we did not account for customer heterogeneity in terms of utility and preferences. Future research should therefore allow for unobserved difference across customers by including random effects in the model.

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8 APPENDIX

8.1 Appendix 1: Parameter estimates for customer renewal decision - Model 1, main effects

Parameter estimates for customer renewal decision - Model 1, main effects

	β	S.E.	Wald	Df	Sig.	Exp(β)
H1: Inquiries	0.459	.011	1780.315	1	.000	1.583
H2: Complaints	0.057	.023	6.012	1	.014	1.059
H3: Past renewals	0.097	.001	22630.557	1	.000	1.102
H4: Multichannel	-0.009	.011	.654	1	.419	0.991
H5: Cross-category	0.124	.003	2407.213	1	.000	1.132
Constant	-1.639	.015	11843.931	1	.000	0.194

a. Significant at $p < .05$

8.2 Appendix 2: Preliminary thesis

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Introduction to the research topic

Gupta and Lehmann (2003) stated: “customers are intangible assets that should be valued and managed”. The interest in developing existing relationships with current customers is contingent on an in-depth understanding of the sources that drives value (Bolton et al., 2004). This development popularised the term customer lifetime value (hereafter CLV), which companies are able to track and analyse thanks to customer relationship management (CRM) systems. These systems offer to track customer behaviour, collecting real-time behavioural data and storing the information in dedicated business intelligence programs. The availability of behavioural data, along with financial measurements enables marketer to gain an in-depth knowledge to better understand the drivers of value.

One of the important dimensions of CLV is customer defection, which is also referred to as customer churn in the literature. Scott A Neslin et al. (2006) posits that churn figures directly into how long a customer stays with a company and the CLV to that company. The CRM also encompasses complaint handling, which can have a significant implication on the customer relationship. Lhoest-Snoeck et al. (2014) refers to supporting literature in stating that effective complaint handling can have a significant impact on customer satisfaction, churn rates, reduced negative-word-of-mouth and other factors. The same paper also warns of the implication of an inefficient complaint handling, which increases the likelihood of the customer switching to another provider. The value of defensive marketing strategies, which customer retention is categorized as in the literature, is justified by the potential reduction in total marketing expenses through reduction of offensive strategies (Fornell & Wernerfelt, 1987). We posit that excellent complaint handling is tightly linked to reducing churn rates, which may contribute to an increase in CLV and consequently, company profitability.

Although there is extensive literature on churn and usage in a contractual setting, there is limited empirical research on usage in a contractual setting (Ascarza & Hardie, 2013). Our study is set in a contractual setting, where we include behavioural complexity to assess the implication it has on churn.

Objectives, theoretical background and hypotheses

We have structured this section by firstly explaining the main objective of the thesis, followed by an explanation of the dimensions of our conceptual model. Secondly, we explain the dimensions in detail, highlighting relevant literature and presenting our proposed hypothesis at the end of each section. Lastly, the we present our conceptual model.

Objectives

Knox and Van Oest (2014b) developed a customer base model to assess the effectiveness of recovery in preventing customer churn in a non-contractual setting. The main objective of the thesis is to include behavioural complexity, consisting of cross-category and multichannel usage, into a conceptual model to better understand its effect on customer churn. We will also address parts of Knox and Van Oest (2014b) suggestion for future research, namely dividing complaints into specific types or dimensions.

Dimensions and hypotheses

Complaints and complaint types

Complaints are associated with customer churn, call centres and win-back teams in a corporate setting. The literature proposes several definitions of a complaint, whereas we will focus on a selected few. Wright (2014) refers Singh and Widing (1991) defining a complaint “as a customer’s protest to a firm with the goal of obtaining an exchange, refund or apology”. Bell et al. (2004) defines a customer complaint as a negative customer feedback, while Knox and Van Oest (2014b) defines complaint as “customer-initiated expressions of dissatisfaction to the company (i.e., Landon 1980); they represent an opportunity for the company to remedy a problem (Bijmolt et al. 2010)”. Cho, Im, Hiltz, and Fjermestad (2002) refers to Fornell and Westbrook (1984) and Kelley and Davis (1994), stating that effective complaint management has a

dramatic impact on customer retention, that it may deflect potential word-of-mouth damage and that it can improve profitability. Tax et al. (1998) suggest that effective resolution of a customer problem is linked to customer satisfaction, trust and commitment. Eshghi et al. (2006) reinforces this point by relating customer complaining behaviour, defined as the tendency to report a problem with a company product or service, inversely to customer satisfaction, which influences switching behaviour. Furthermore, Cho et al. (2002) suggest that complaints are associated with an increase likelihood of a customer not buying anymore, depending on prior experience. Knox and Van Oest (2014b) states that prior purchases in fact, do reduce the effect of a complaint long-term, while prior complaints increase the magnitude of the effect in a short-term perspective. Therefore,

H1a: Prior complaints increase the likelihood of churn.

Estelami (2000) provides the major reasons for complaints in goods and service markets, in order of percentage of complaints in the study: Product defects, service failures, billing, scheduling, slow service, pricing, inappropriate employee behaviour, consumer did not like product anymore, product did not fit, product not compatible, delivery problem, poor repair work, product damaged in repair, poor product design. This study show that the nature of a complaint may have different underlying reasons for initiating it to begin with. The way a firm manages a complaint depends on the customer reaction. It is therefore reasonable to focus on the initial dissatisfaction of the customer, leaning heavily on Hirschman (1970) framework, which includes the terms exit, voice and loyalty. Exit response suggest that the customer will stop purchasing the goods or service and/or switch to another provider. The loyalty concept closely resembles brand loyalty (Dowding, John, Mergoupis, & Vugt, 2000), which can result in a passive, non-response. Wright (2014) interprets this as a “wait-and-see-approach”. Loyalty can also be linked to the customer level of commitment, which Moorman et al. (1992) define as an enduring desire to maintain a valued relationship. According to Larivet and Brouard (2010), we find complaints in the category of voice responses, which Crie (2003) refer to as a behavioural and public response type, or a “constructive response with an expectation of change in an organisations practice,

policy and responses". This leads us to believe that the nature of a complaint type differs in terms of the effect it has on the likelihood of churn. Therefore,

H1b: Complaints increases or decreases the likelihood of churn, contingent on the complaint type.

We define and propose a construct to address behavioural complexity, henceforth customer quality, comprising of three dimensions, namely renewal, multichannel and cross-category usage. The first dimension revolves around whether a customer renew their subscription. Multichannel usage dimension is related to whether the customer consumes the service through a single channel, online, or both, namely online and print. The third and last dimension is linked to the usage pattern of the customer, more specifically whether the customer consumes several categories.

Renewal

The first dimension of the customer quality construct, renewal, is included in our framework with the purpose of better understand the effect prior purchases have on the likelihood of a customer renewing their subscription (H2). According to Pansari and Kumar (2017), customer repurchases do have a direct impact of the firm performance. We believe that a satisfied customer is more willing to renew a subscription and to stay longer with a specific company than otherwise. This tendency is related to commitment, which Bolton et al. (2004) divide into two types, namely affective and calculative. The affective type is the desire to maintain a relationship based on emotional factors such as loyalty, while calculative is a rational approach, determined by switching costs and other price-related factors. In a contractual settings, the renewal of a contract is the action which marks the intent to continue with the relationship. W. Reinartz and V. Kumar (2003) conceptualised profitable relationship as function of the characteristics of the relationship, such as purchase frequency and purchase composition (single and cross-category). This mean that the more a customer purchase, the more profitable the relationship is. Consequently, we believe that it may reduce the

likelihood of churn. Bolton et al. (2004) posit that earlier research suggest a positive relationship between commitment and relationship duration. The longer the relationship, meaning more renewals, the more profitable the customer is for the firm, ultimately due to the reduced likelihood to churn and reduction of marketing costs related offensive strategies.

H2a: Prior renewals reduce the likelihood of churn.

Multichannel usage

The second dimension of the customer quality construct is multichannel usage. Consumers with multichannel purchasing behaviour are shown to be more valuable than single-category purchasing (Thomas & Sullivan, 2005). We are leaning on Scott A. Neslin, Vroomen, Verhoef, and Vroomen (2007) definition of a channel as “the customer contact point or a medium through which the company and the customer interact”. According to Ahlers (2006), there are four customer market segments, two of which are relevant for our study, namely “online-only” users, using online sources for consumption, and “multichannel users, which use offline sources roughly the same as online sources for consumption. We believe that this approach is feasible for the data set we are analysing, where multichannel usage refers to distribution channels. In other words, multichannel usage is related to where customers can access the product/service, either using an online source or using online and offline source. Multichannel customers are shown to buy more and contribute to an increase firm sales (Scott A. Neslin et al., 2007). The literature posit that customer who consume through multiple channels, are less likely to churn, primarily due to an increase in switching costs and/or an increase in customer satisfaction (Blattberg et al., 2009).

H2b: Multichannel usage decrease the likelihood of churn.

Cross-category

Lastly, the third dimension of the customer quality construct, cross-category usage. V. Kumar and R. Venkatesan (2005) found that multichannel customers are more likely to partake cross-buying (cross-category users in our case) and also are customers for longer periods (Scott A. Neslin et al., 2007). Similarly, customers who consume more than one category may be positively related to the likelihood to stay with the firm, because a “broader scope of interaction constitutes a stronger relationship” (W. Reinartz & V. Kumar, 2003). We believe that customers who consume more than one category, may be the most committed with the brand/service. Garbarino and Johnson (1999) referred to Moorman et al. (1992) definition of commitment in their paper, namely "an enduring desire to maintain a valued relationship". Bendapudi and Berry (1997) paper on commitment theory, argue that customers who have a higher level of commitment are more likely to seek greater relationship expansion and enhancement (W. Reinartz & V. Kumar, 2003).

H2c: Cross-category usage decrease the likelihood of churn.

Subscription length

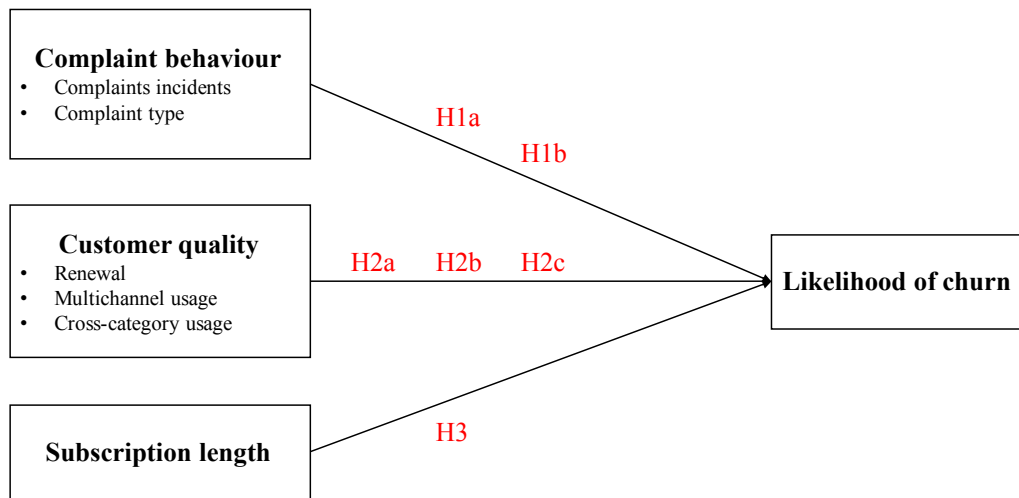
The fourth variable, subscription length, encompasses the possible subscription length, and how that affects the likelihood of churn. Coussement and Van den Poel (2008) found that variables related to subscription (e.g. length of the current subscription, elapsed time since last renewal, month of contract expiration) are the most important predictor of churn. H.-S. Kim and Yoon (2004) found that the subscription length, which they relate to the lock-in effect (e.g. switching costs, buyer inertia), is negatively associated with churn probability.

H3: The length of a subscription decreases the likelihood of churn.

Model description

The previously mentioned hypotheses are included in the conceptual model (Figure 1). The framework consists of a dependent variable, the likelihood of churn and three independent variables, namely complaint behaviour, customer quality and subscription length. The previously mentioned hypotheses are included in the conceptual model.

Figure 1: Conceptual model



Methodology

In the following section, we will present a description of the data set, measurement of independent and dependent variables, and lastly, the analysis method we propose to use.

Data set description

Our data is from one of the leading media groups in Scandinavia, with over 6 000 employees, ranked in “The World’s 54 largest Publishers” by Publishers Weekly (Milliot, 2017). The media group produces magazines, comics, book, educational material, movies and TV programs, which is distributed in both offline and online channels. Depending on the services in question, they offer non-contractual and contractual options for the customer to choose from. For this study, we will focus on data from a service which only offer a contractual and online option, due to the richness of the data available.

The media group provided five Excel files containing data from 30 003 unique customers. We have access to data from the first invoice date, December 12, 2014, until September 14, 2017, approximately two years and nine months since the initial invoice date. We have data about the subscription length and the number of renewals registered at different point in time. Another file contains data regarding cross-category usage from 26 675 customers, where the average customer subscribed to four out of eight possible categories. There is also data on customer channel usage, multichannel as in online only or online and offline use, where 16 201 customers use both channels. Similar to Knox and Van Oest (2014b), the data set include a complaint log file, identifying the customer, complaint dates (complaint start and end), codification of the complaints and a description of the complaint incident. There are 3 673 complaints recorded from 2 320 unique customers, and the average customer complaints 1,58 times. The original data set identifies 29 types of complaints (e.g. invoice issues, late delivery, system errors) but we believe using factor analysis to cluster and thereby reducing that amount is reasonable further analysis.

Measurement of variables

In the following table (Table 1) we present how we propose to measure the independent variables derived from the data set and the conceptual model (Figure 1).

Table 1: Measurement of dependent variables

Dependent variable			
Likelihood of churn			
Independent Variables	Measured as	Hypothesized	Directional
		Impact on Likelihood of churn	
Complaint incidents	Number of complaints	(+)	
Complaint types	Dummy variables	No directional hypothesis	
Renewal	Dummy variable: 1 = prior renewal, 0 = no renewal	(-)	
Multichannel usage	Dummy variable: 1= Online and Offline, 0 = only Online	(-)	
Cross-category usage	Dummy variables, 8 categories	No directional hypothesis	
Subscription length	Number of months passed since subscription date	(-)	

Analysis of the results

We propose the use of factor analysis to identify latent variables to reduce the number of variables, for example for complaint types, which there are 29 types of in the original data set. We are going to analyse the proposed hypotheses using logistic regression as the primary method of analysis. We expect that the proposed method of analysis is appropriate for testing the significance of all interactions in question. In order to validate the results, we will run the model using hold-out sample randomly selected from the data set.

Plan for thesis progression

Milestones

January 15 th	Preliminary report – Submission
February 1 st	Refinement of hypotheses and supporting literature
March 1 st	Data cleansing
April 1 st	Data analysis, testing hypotheses
May 1 st	First draft completed
June 1 st	Second draft completed
July 1 st	Final version - Submission

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