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THE IMPACT OF SERVICE ELIMINATION ON CUSTOMERS IN THE TELECOMMUNICATIONS SECTOR

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TABLE OF CONTENTS

I

List of figures

List of tables

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1   INTRODUCTION

"The future isn't ahead of us.
It has already happened."
(Philip Kotler)

Service elimination is a potential tool for portfolio renewal, as it enables unlocking service firms' resources and thus, accelerates the launch of new portfolios. Due to the short life-cycles of services, they might accumulate in a firm's system very quickly, requiring the management of a relatively big service portfolio. In today's fast-paced economy, service elimination is seen as a requirement for business competitiveness and innovation; through the simplification of a business portfolio, both customer and firm value could be increased.

Despite the managerial relevance, service elimination is rather neglected in the literature, as from the 1980s onwards; practice mostly focused on service development that drove research as well the service development field. This usually resulted in very complex service portfolios, which should be simplified by eliminating existing services, thus reducing maintenance and portfolio performance-management challenges. This makes service elimination a possible area of new discovery.

A highly relevant issue both from an academic and a practical perspective is the impact of service elimination on customers. Without systematic planning and execution, service elimination might result in customer churn. Indeed, service providers struggle with finding the best way to minimize customer churn following service elimination due to both strategic considerations and limited information about the process.

This research is positioned in the context of customer reactions to service elimination, as the service elimination process itself contains the risk of losing existing customers and revenue. The objective of this research is to understand customer reaction following service elimination, which determines the success of service elimination.

As practical relevance comes from churn reduction in the case of service elimination with a primary focus on customer satisfaction, there are basically three directions the literature takes: differences between product elimination and service elimination, service elimination (pre-elimination, implementation of service elimination, and post-elimination),

1

and theories explaining the impact of service elimination on customers (social exchange theory, justice theory).

1.1 DEFINITION OF SERVICE ELIMINATION

To contribute to the service elimination field with this dissertation, it is essential first to define the main concepts. Service elimination is defined first, with a review of currently existing definitions in academia. Next, a definition is created that is applied throughout the dissertation.

Gounaris *et al*. (2006) define service elimination as an action by service firms that involves both the closing and the elimination of existing service(s).

Argouslidis (2006) determines service elimination as contraction or rationalization, which refers to strategic decisions to eliminate a service, or to replace it with a new, improved one. This type of definition is closer to the service portfolio management, or corporate portfolio management (CPM) view, which is also linked to innovation, as service elimination could accelerate the innovation process.

Argouslidis (2001) defines service elimination and new service development as part of service range management (Figure 1). Service range management activities are influenced by customers; competitors; a firm's characteristics, objectives, and resources; and the political, economic, and socio-technological environment. This view links service elimination to new service development. In this way, new and improved products/services are associated with the discontinuation of products/services and a "renewal effect" of the firm's products/services occurs (Crowley, 2017). Process innovation is associated with product/service discontinuation compared to product/service innovations (Crowley, 2017). Discontinuation is defined as follows: *"if the firm has discontinued a major new product line or service over the last 3 years"* (Crowley, 2017, p. 256.).

Figure 1. Service range management and the forces of influence
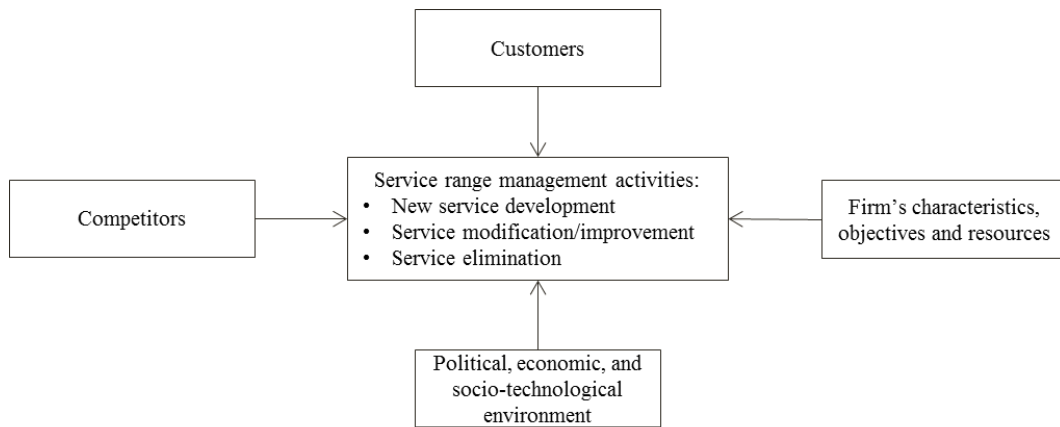
Source: Argouslidis (2001: p. 34.)

Argouslidis (2001) differentiates between three types of elimination: closing, elimination of existing services, and closing from specific customer segments, but he refers to it as "operationalization." He also draws attention to partial elimination strategies, including service closing, simplification, service merging, etc. Service closing still enables keeping existing subscriptions for existing customers, and it is only closed to new customers, service elimination requires the closing for both new and existing customers. Regarding the type of elimination, there are various possible forms both in terms of the execution of elimination (immediate drop, replacement, harvesting, etc.) and timing (voluntary or forced) that have a serious impact on customer retention.

Although full elimination is possible, many firms apply it only in the case when there is a change in the legislative environment. Similarly, Harness and Mackay (1997) called this "core product" elimination, which they refer to as the most complex and dangerous strategy.

Based on the literature review, the definition of service elimination used in this research is formulated: service elimination is a process by which a service firm eliminates its existing services by migrating existing customers to new service packages.

1.2 SIGNIFICANCE OF SERVICE ELIMINATION

The relevance of service elimination needs some justification, as it is a relatively under-researched area. Service elimination has the potential to become a source of innovation and has many unrevealed capabilities to bring about a competitive advantage for companies.

Service elimination is a special field for companies, as it involves different reactions from customers compared to service development. This shapes the strategy formulation of

companies; however, its significance is not recognized yet in many cases. As the whole service elimination process affects customers, it has a serious effect on companies' revenues as well.

Service elimination has become an important concern in many service industries (Avlonitis & Argouslidis, 2012); however, service elimination remains among the least studied and least understood topics in service management literature. Despite the well-grounded literature on product elimination, the theoretical constructs of product elimination do not hold true for services. Thus, additional research is needed to address this issue.

The relationship between service elimination and new services is clear. Ennew (1995) states that: *"Excessive product proliferation can then result in overly long service lines, which can cause confusion amongst customers. Consequently, any line stretching exercise must consider not only the potential to add new lines but also the scope of rationalizing existing lines"* (Ennew, 1995, p. 107.). There is interdependency between the two concepts (Argouslidis, 2001).

Argouslidis (2001) argues that service elimination is no longer a source for shrinkage and stagnation for the financial sector, but there is a need for service range expansion and rationalization, with an improved effectiveness to expand. He also calls for a change in top management's attitude towards service elimination. Competitive pressure, legislative changes, technological changes, or a combination of these forces might accelerate the need for service elimination.

He also verifies the need for increased formality during the service elimination decision-making process, and for greater attention to post-elimination reviews. The main problem is that, in most cases, elimination is partial, so the process cannot be closed after implementation. Through more organized post-elimination reviews, the re-marketing of the service can also be proactive.

Although his results are valid for financial institutions, their relevance in the telecommunications industry should be empirically tested as well. Service elimination should not only assess some sectors, but also have an overall view of the business. There are differences in service sectors too, so the generalization should be made with caution (Lovelock, 1983).

On the other hand, the management of service elimination is challenging in practice in many fields, including telecommunications (Somosi & Kolos, 2014). Managers tend to leave

existing services stand and only focus on service development that ends in human, monetary, and temporal resource loss (Palmer, 1998).

The process of service elimination entitles risks, due to migrating customers to new service packages, because customers often change providers in such cases. Service switching is defined as replacing or exchanging the current service provider with another (Holland, 1984; Carpenter & Lehmann, 1985; Kasper, 1988; Reichheld & Sasser Jr, 1989; Yi, 1990; Bucklin & Srinivasan, 1991; Keaveney, 1995). Switching costs are the *"onetime costs that customers associate with the process of switching from one provider to another"* (Burnham *et al*., 2003, p. 110.). These costs include time, money, and psychological costs (Dick & Basu, 1994).

In services sectors, switching costs typically determine customer loyalty, as companies usually apply them to keep customers. Service provider switching, customer loyalty, and customer retention are interrelated terms; switching refers to a negative outcome, whereas customer loyalty and retention refers to a positive one (Bansal & Taylor, 1999).

The literature suggests that there is a positive relationship between loyalty and higher levels of switching cost (Ping, 1993, 1997; Caruana, 2004; Kim *et al.,* 2004; Aydin & Özer, 2005). The strategy of high switching costs is common in sectors where new acquisition offers include many discounts for the customer. In this way, customers get locked in to certain service offerings, due to penalties they must pay when leaving the operator earlier than committed; this is considered a factor of competitiveness (Jones & Sasser, 1995).

High switching costs are usually combined with price promotions as a tool to attract new customers in many markets (Thomas *et al.,* 2004; Chuang & Tsaih, 2013), but there are contradictory views in the literature as to whether it might have an effect in the long run (Lewis, 2006) or what effects price promotions have in terms of customer retention. In sum, customers should be selected based on their profitability, rather than based on acquiring costs (Thomas *et al.,* 2004). A series of diminishing discounts was found to be better than a single deep discount in terms of customer retention (Lewis, 2005).

Switching cost is related to the switching barrier that is either the difficulty of changing service provider due to dissatisfaction with the existing service or the financial, social, and psychological burden felt by the customer (Fornell, 1992).

The key determinants of switching behavior are service performance (e.g. core service failure, service encounter failure, response to service failure, ethical problems) and costs of

switching (e.g. price, inconvenience, involuntary switching, and competition) (Keaveney, 1995).

The unfavorable execution of service elimination can be interpreted as a service failure by the customer. Indeed, what telecommunication practitioners often perceive is that involuntary switching, often called forced migration, dramatically increases the churn ratio in the case of service elimination (Somosi & Kolos, 2014).

It is important that service elimination become more an area of focus for companies, recognizing that with adequate management of the process they can enhance the structure of their service portfolios, accelerate service innovation, reuse locked resources, and most importantly, they can avoid losing customers. These results will help companies in the management of service elimination as well as academics.

1.3 CONTEXT OF THE STUDY: THE TELECOMMUNICATION SECTOR

As service elimination research has focused on the financial sector in Western Europe primarily (Harness & Mackay, 1997; Argouslidis, 2001, 2006; Harness & Harness, 2007), the goal is to broaden the empirical results on service elimination in telecommunications in the Central and Eastern European (CEE) region, because it is seen as an ideal strategy to foster innovation. Its relevance is growing due to the high-tech nature of telecommunication markets that makes service portfolios crowded.

Telecommunication in the CEE region is the context used in this dissertation, which is ideal to analyze customer reactions following service elimination, due to short life cycles and full elimination by forced migration that seriously increase the risk of customer churn. This is, however, a somewhat different setting than popular areas of service elimination studies, such as the financial sector. A broader introduction of the telecommunications sector will be presented later in Section 2.4.

CEE includes Albania, Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic, Slovenia, and the three Baltic States: Estonia, Latvia, and Lithuania (OECD, 2000). The list is sometimes expanded with Austria (Roland Berger, 2017).

De Jong and Vermeulen (2003) differentiate between production-intensive services (e.g. banks, insurance, telecommunications, transport, and wholesale services) that focus on simplification and standardization; services dominated by suppliers (e.g. personal services, hotels, restaurants, retail stores), which are considered less innovative; and continuous or

incremental innovation due to high knowledge intensity (e.g. IT services, engineering). Telecommunications is defined as a high-tech knowledge-intensive service (Eurostat, 2017).

1.4 AIM AND STRUCTURE OF THE DISSERTATION

The aim of this dissertation is to widen the scientific research results of service elimination, and help practitioners better plan and execute the whole process.

In Chapter 2, a literature review is presented. First, the foundations of services marketing are introduced, including main theories related to understanding the concept of service elimination (characteristics of services and service-dominant logic). Second, international and Hungarian service research priorities are described to position this research within current research trends. These give the basis for service elimination, which is explained in detail, including service elimination's relation to current research priorities, and related theories that are essential to build a more in-depth understanding of service elimination's broader aspects.

Third, the main area of this research, service elimination literature is presented based on the three phases of service elimination: pre-elimination phase, implementation of service elimination, and post-elimination phase. As the main focus of this research is the impact of service elimination on customers, theories explaining the impact of service elimination are described (social exchange theory and justice theory) that are linked to the post-elimination phase.

Fourth, telecommunication sector characteristics are introduced that shape the interpretation of service elimination success. As service elimination was principally investigated in the financial sector and telecommunications was involved only in multi-sector studies, it is essential first to understand the structure of the telecommunications market in the CEE region that has a significant effect on what success in terms of service elimination means. Customer retention is defined as a success factor in the telecommunications literature, which is, however, increasingly becoming a challenge in stagnating markets. As a result, eliminating services incorporating a high risk of customer churn becomes a factor of competitiveness of telecommunication operators.

The literature review is followed by research questions and methodology in Chapter 3, where, based on the conceptual framework, research questions are formed. Due to the limited information available on service elimination generally in the literature, and more specifically,

post-elimination success in a telecommunications environment, a case study was designed comprising qualitative methodology (in-depth interviews with telecommunications operator decision-makers) to understand the main issues related to the success of service elimination. These results and the literature review jointly form the basis of the hypotheses presented at the end of Chapter 3, grouped into two separate methods (experimental design and database analysis).

Chapter 4 presents the research that consists of three main studies: two studies based on experimental design and one study based on database analysis (Heckman sample selection). As this research focuses on customer reaction to service elimination, the methodology has been designed accordingly: respondents are exposed to a situation of service elimination in the form of experimental design based on scenarios, which broadens the pool of respondents compared to a survey of customers involved in a service elimination situation in the past. Study 1 and Study 2 are both based on experimental design, according to two main groups of theories explaining the impact of service elimination on customers (social exchange theory and justice theory, respectively) that are described in Chapter 2. Bearing in mind the limitations of the experimental methodology, the research methods are extended with a database analysis in Study 3 modeling real customer behavior using Heckman sample selection during a service elimination project of a telecommunications operator.

The dissertation concludes with a summary of results, expected contribution, and managerial implications in Chapter 5.

The aim and structure of the dissertation is illustrated in Figure 2. Three main areas include the literature review, research focus, and practical relevance. The literature review is organized to understand service elimination: the foundations of services marketing and current research trends shape the definition and relevance of service elimination. Further, as the context of the study is telecommunications, it also affects how service elimination is interpreted. Then, the rest of the figure is based on the three phases of service elimination: the pre-elimination phase that affects the implementation of service elimination, which determines the post-elimination phase including impact on customers and impact on firm. The focus of this research is the impact of service elimination on customers, which also has practical relevance. Customer reactions to service elimination determine the success of the service elimination strategy. Although it is not possible to measure the direct impacts on firm because it requires companies to conduct post-elimination reviews to assess the decrease in

maintenance and development costs and revenue savings, practical relevance is obvious in both aspects of the post-elimination phase. As this is a customer perspective study, it can fill a gap in the literature and help companies in the formulation of the right service elimination strategy.

Figure 2. Aim of the dissertation
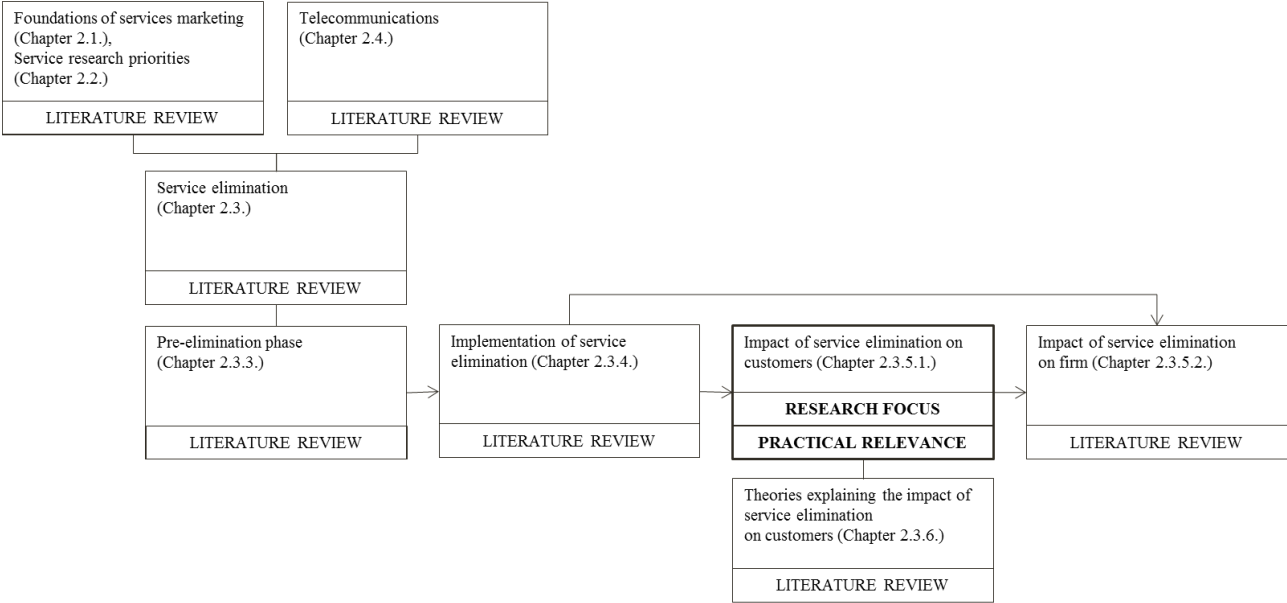
Source: own construction

2   LITERATURE REVIEW

"All knowledge and understanding of the Universe was no more
than playing with stones and shells
on the seashore of the vast imponderable ocean of truth."

(Isaac Newton)

Service elimination is an unreasonably under-researched area in the literature, although its relevance is growing in practice. The neglect of service elimination can be also because it is a highly complex topic linking several, seemingly unrelated, areas together. The most trivial connection comes from the distinction between products and services. There is well-grounded literature on their different attributes, which goes back to the formulation of services marketing. After services were defined, their dominance was emphasized in the literature, as they started to dominate the economy worldwide. Like the debate between products and services, there are similarities and vital differences between product elimination and service elimination. Current research priorities show the direction of future studies, which is relevant in terms of service elimination, considering that eliminating services has the potential to accelerate service innovation by unlocking a firm's resources.

The second connection to other theories comes from assessing service elimination from different perspectives: the firm perspective usually focuses on the decision-making process, but the customer perspective is missing in many areas of service elimination, although it requires an understanding of how such a decision affects customers. This relates to a large group of theories: first to customer reactions (customer retention, satisfaction, commitment, loyalty, and word-of-mouth (WOM)) and second, theories explaining this impact on customers (social exchange theory and justice theory).

Thus, in the literature review a broader perspective of services literature is reviewed that shapes the formulation and relevance of service elimination. This helps us define the main questions related to service elimination, and most importantly, the outcome of service elimination.

To understand these links between theories, the literature review follows the evolution of services marketing starting from the basic services definitions, followed by the service-dominant logic. The fit between service elimination and the most current service research trends is then assessed, which leads us to explain service elimination, service elimination

research gaps, antecedents, characteristics, and consequences of service elimination. As the impact on customers forms an essential part of this study, theories related to customer perspective (customer reactions and theories explaining the impact on customers) are described. Finally, since telecommunications is not a usual context to study customer effects of service elimination, the evolution of the telecommunications market in the CEE region is described, and the relevant telecommunications literature to understand links to service elimination.

2.1 FOUNDATIONS OF SERVICES MARKETING

In the following section the changes in the formulation of service's definition is reviewed, then the evolution of services marketing, which leads to current trends. Within services marketing, those areas that are determinant in terms of understanding the various aspects of service elimination are highlighted.

The service output of the GDP is 63% worldwide (2016 est.) (Central Intelligence Agency, 2017), but the EU ratio is even higher (70.5%). Hungary is between the two, with 64.7%. In today's economy, the service sector dominates agriculture and industry (manufacturing and mining) in most countries, which means that marketing should also step away from the traditional manufacturing view to better adapt to the service culture.

2.1.1 CHARACTERISTICS OF SERVICES

The dominance of the service industry established the definition of services in the literature compared to products. There have been many variations in the definition of services that first did not define the differences between products and services, but only pointed out that *"together with a product definition, it exhausts the category of 'economic goods'"* (Judd, 1964, pp. 58-59). All further attempts to define services included only emphasizing what products are not. For example, *"Services marketing refers to the marketing of activities and processes rather than objects"* (Solomon, 1985, p. 106). Or they defined service as "a process or performance rather than a thing" (Lovelock, 1991, p. 13.). Within the debate of the correct definition of services, it should be noted that there is a separate dimension dealing with the type of service, namely professional services (Gummesson, 1978).

Some emphasize the duality between products and services and in this way the question is not about product or service, but rather the ratio between the two within services: *"Services are economic activities performed by one party to another. Often time-based, these*

performances bring about desired results to recipients, object, or other assets" (Wirtz & Lovelock, 2016, p. 21.). *"In exchange for money, time and effort, service customers expect value from access to labor, skills, expertise, goods, facilities, networks, and systems. However, they do not normally take ownership of the physical elements involved"* (Edvardson *et al.*, 2005, p. 112.).

Surprisingly however, the debate is still not closed between products and services, but there are certain common aspects that appear in most of the definitions: "activities" or "processes" with a reference to direct or indirect services (Vargo & Lusch, 2004): *"the application of specialized competences (skills and knowledge), through deeds, processes, and performances for the benefit of another entity or the entity itself (self-service) through the provision of tangible goods; goods are distribution mechanisms for service provision"* (Vargo & Lusch, 2004, p. 326.).*"*

This means that services include goods as well or goods can be attached to services, and so it becomes more of an inclusive definition. This approach is followed, because in this case, service elimination is also usually a combination of products (physical goods) and services.

The difference between products and services point out four significant characteristics of services that are the following: heterogeneity, intangibility, perishability, and inseparability. This is called the HIPI principle in the services marketing literature, which was in the focus of academic research in the 1980s (Zeithaml *et al.*, 1985). It also relates to risk reduction, because all the strategies applied by customers to cope with the HIPI characteristics they engage with in extended decision process, the role of personal information is crucial; this is more effective in the case of services than products, especially internal sources in comparison with external ones (Murray, 1991).

After the debate between goods and services, there has been other eras of services marketing that have an impact of today's services marketing literature. Fisk *et al.* (1993) define three eras of services marketing:

1. Crawling out (pre-1980): This era goes back to the birth of services marketing in 1953, and is mostly described by the aforementioned debate between goods and services. Many of today's famous services marketing authors started their work during this period (e.g. John Bateson, Leonard Berry, Stephen Brown, John Czepiel, Pierre Eiglier, William George, Christian Grönroos, Eugene Johnson, Eric Langeard, Christopher Lovelock, and Lynn Shostack).

2. Scurrying about (1980-1985): During these years, a larger audience joined the services marketing field, and thus, the literature increased significantly. Fisk *et al.* (1993) draw attention to two significant developments that triggered this process: the deregulation of service industries and the interaction generated by the American Marketing Association's conferences. Also, two prominent journals were founded: the *Service Industries Journal* in 1980 and the *Journal of Professional Services Marketing* in 1985. The basics of services marketing were grounded: classification schemes for services (Lovelock, 1983), conceptual framework summarizing the unique characteristics of services (Zeithaml *et al.,* 1985), and critical components of service encounters and interaction between the service provider and the customer (Solomon *et al.*, 1985).

3. Walking erect (1986-present): The topics in this era include service quality (Lehtinen & Lehtinen, 1982; Grönroos, 1983; Parasuraman *et al.,* 1991), service encounter/ experience (Solomon *et al.,* 1985; Surprenant & Solomon, 1987), service design (Shostack, 1984,1987; Kingman-Brundage, 1989), customer retention and relationship marketing (Crosby & Stephens, 1987; Hart, 1988; Crosby *et al.,* 1990; Hart *et al.,* 1990; Berry & Parasuraman, 1991), internal marketing (Grönroos , 1981; George, 1990), etc. Nonetheless, the focus is more on the cross-disciplinary and international nature of the field (Larsson & Bowen, 1989; Bitner, 1992). The articles also became more empirical rather than describing conceptual debates. Two journals were founded: the *Journal of Services Marketing* in 1987 and the *International Journal of Service Industry Management* in 1990.

Although these findings do not describe current trends, reviewed in Section 2.2., it is clear that sophisticated service elimination research was simply not adequate before the 2000s, because most services marketing concepts were still under definition. Service elimination requires a quite mature services marketing domain, where service developments are handled on a portfolio level, and thus, service elimination is considered part of those decisions.

2.1.2 *SERVICE-DOMINANT LOGIC (SDL)*

There have been many changes in the services literature. At the beginning, it was the service's distinction from the goods-based manufacturing model that is in a sense, an ongoing debate. The second significant paradigm shift that defines today's services marketing, however, is the appearance of service-dominant logic (SDL) (Vargo & Lusch, 2004).

Way before Vargo and Lusch's famous article, however, there had been various scholars who emphasized the outdatedness of the traditional goods and services view (Webster Jr, 1992; Rust, 1998; Achrol & Kotler, 1999; Day & Montgomery, 1999). For example, Gummesson (1995) highlighted that customers are buying offerings, and it is the value that is created through goods or services. The service-centered view in this sense is more about the customer perspective rather than differences between goods and services.

According to SDL, products and services are analyzed from a value-creation perspective, where value is created from the cooperation between the customer and surrounding market players. As a result, it is not the corporate value creation that drives business strategy, but rather co-creation; value is generated by the customer with the assistance of the firm. Thus, resources that stimulate co-creation become the source of competitive advantage.

The main idea behind SDL, therefore, is that the customer is a co-creator of services, more than just a receiver. This questions the former way of product development, because there is no end-consumer in the process in the traditional way of thinking; the consumer is rather a participant in the firm's activity.

The key concepts related to SDL are intangibles, competences, dynamics, exchange processes and relationships, and operant resources (Vargo & Lusch, 2004). The distinction between operand and operant resources is defined by Constantin and Lusch (1994): operand resources are those, on which an operation or act is performed to produce an effect; whereas operant resources are employed to act on operand resources. The dominance of skills and knowledge as the most important resources sheds light on operant resources, which was recognized by Zimmermann (1951) and Penrose (1959). As Penrose framed it: *"It is never resources themselves that are 'inputs' to the production process, but only the services that the resources can render"* (Penrose, 1959, pp. 24-25.)

Vargo and Lusch define the service-centered view as follows (Vargo & Lusch, 2004, p. 5.):

1. Identify or develop core competences, the fundamental knowledge, and skills as a source of potential competitive advantage;
2. Identify other entities (e.g. potential customers) that could benefit from these competences;

3. Involve customers in developing customized, competitively compelling value propositions to meet specific needs;

4. Collect feedback by analyzing financial performance from exchange to improve the firm's offering to customers and firm performance.

Later on, Vargo and Lusch (2008) refined SDL emphasizing that:

- Knowledge and skills form the fundamental unit of indirect exchange;

- Goods are distribution mechanism for services;

- Knowledge is the primary source of competitive advantage;

- All economies are service economies;

- The customer is a co-producer;

- The enterprise cannot deliver value, only value propositions;

- The service-centered view is always customer oriented and relational;

- The primary goal of organizations is to integrate and transform competences into services.

Therefore, SDL is linked to value creation. As it gives the possibility to offer services only complying with consumer standards, ideally there should be no meaningless service development anymore. However, this is not always the case: the firm is still dominant in creating value (Strandvik *et al.,* 2012). Vargo *et al.* (2016) nowadays are expressing a service ecosystem as an extension of SDL. In turn, digitalization enables customized, high-quality services with stronger customer relationships.

Most recently, in relation to SDL, two approaches have appeared: servitization focusing on the analysis and formulation of product-service systems (Pawar *et al.,* 2009; Demeter, 2010; Demeter & Szász, 2012) and service infusion emphasizing that the growth of services is an intersectorial and international strategy, which is the only possibility for development (Zeithaml *et al.,* 2014). Both concepts point out that competition is principally about introducing services, thus competitive advantage comes often from additional services.

2.2 *SERVICE RESEARCH PRIORITIES*

After a review of the services marketing literature, it can be confirmed that service is clearly dominating today's economy, and literature followed this trend towards new service development, service range management and co-creation. Through a more in-depth understanding of customer reactions during service elimination, the topic may contribute to

the most current trends that shape the future. Thus a brief overview is given about current service priorities, first globally, then in Hungary, to position our research.

2.2.1 OVERVIEW OF SERVICE RESEARCH

Ostrom *et al.* (2015) identified 12 research priorities in service research grouped in 5 main areas (Figure 3). These are the following: strategic priorities, design/delivery priorities, value creation priorities, outcome priorities, and cross-cutting priorities that can relate to any of the four groups. The main groups show the process nature of services, as all new service development definitions highlight this aspect. There is first of all the strategy level that prioritizes service development, which is incorporated into service design reengineering throughout the corporation that creates value and well-being as a desired output at the end. Technology fosters the process, as many service innovations are technology-related nowadays, but there are many exceptions as well, such as a new service concept, client interface, or delivery system (De Jong & Vermeulen, 2003).

Strategic priorities include stimulating service innovation; facilitating servitization, service infusion, and solutions; and understanding organizational and employee issues relevant to successful service. Service innovation within complex service systems and value networks becomes a major challenge for companies, due to the interrelationships between customers and partners during the innovation process, and the types of different innovation forms (service-product, service-process, and business-model innovation). Second, servitization (Kastalli & Van Looy, 2013) refers to new business model development with transformation processes required and supporting technologies, whereas "service infusion" expresses how customer-centered services become a part of a product-centered business model (Zeithaml *et al.,* 2014). Third, employee issues highlight the "dehumanization of services" as a dramatic change companies need to handle.

Design/delivery priorities are developing service networks and systems, leveraging service design, and utilizing big data to advance service. Services are designed, produced, and consumed in networks that are enabled by information systems. Second, service design is the human-centered, creative, iterative approach to the creation of new services (Blomkvist & Segelstrom, 2010), which, through a combination of co-creation, can enhance the service experience. Third, big data can utilize the big amounts of data coming from sales records,

customer messages, social network posts, location data, etc.; however, companies need to be aware of the customer's desire for privacy and personalized services.

Value creation priorities are understanding value creation and enhancing the service experience. Understanding value creation refers to the fact that value is created from a collaboration of many actors and perceived by the customer at the end, thus it involves the integration of roles and resources and many challenges due to the coordination of value creation. Second, service experience can be enhanced in various ways, such as co-creation, noting, however, that complex, diverse offerings and channels need to be managed during this process.

Outcome priorities are improving well-being through transformative service and measuring and optimizing service performance and impact. Services are not only about delivering value for companies; the question is more about society. Transformative service research includes all research that investigates the well-being implications of a service, such as sustainability, using technology to improve well-being, designing services for vulnerable consumers, etc. Second, assessing service performance is also an outcome priority that expresses the need for better measurement tools to estimate the value and return on investment from a service, creating service standards and metrics, etc.

Cross-cutting priorities include understanding service in a global context and leveraging technology to advance service. The two cross-cutting priorities are interrelated with all four previously described priorities, stressing the importance of global studies and the role of technology in developing services for the mutual benefit of both customers and companies.

Figure 3. Service research priorities

STRATEGIC PRIORITIES	DESIGN/DELIVERY PRIORITIES	VALUE CREATION PRIORITIES	OUTCOME PRIORITIES
Stimulating Service Innovation	Developing Service Networks & Systems	Understanding Value Creation	Improving Well-Being through Transformative Service
Facilitating Servitization, Service Infusion & Solutions	Leveraging Service Design		
Understanding Organization & Employee Issues Relevant to Service	Utilizing Big Data to Advance Service	Enhancing the Service Experience	Measuring and Optimizing Service Performance & Impact

CROSS-CUTTING PRIORITIES

Understanding Service in a Global Context

Leveraging Technology to Advance Service

Source: Ostrom *et al*. (2015: p. 129.)

2.2.2   RELATION OF SERVICE ELIMINATION TO MAIN RESEARCH PRIORITIES

Service elimination is related to four relevant service research priorities (Table 1): stimulating service innovation, leveraging service design, enhancing the service experience, and leveraging technology to advance service. Service elimination itself is a complex process. Starting from the strategic priority to continuously innovate services, which helps to optimize the structure of the service portfolio, it also needs to enhance service experience, otherwise customers could be lost. At the end, the main goal of improving the well-being of individuals and in a broader sense, communities should be reached, which nowadays in most cases is not achievable without technology-related developments.

Service elimination has probably the most direct effect on service innovation, as through the elimination of services, new service developments can be accelerated, alongside service process and business model innovation. Through the management of service elimination, companies might rejuvenate and refresh service portfolios, with an accelerated innovation process.

Second, by the rationalization of the service portfolio, firm resources are unlocked reducing both maintenance and development costs. As a result, service design will be enhanced. Further, if new service offers are co-created with customers, both service design and service experience can be greatly increased.

Third, service elimination has many connections to service experience, which is determined by the design and process of service elimination: missing information about the process and available new offers can create low customer service experience. This can be avoided by a thorough introduction of the project, and by provision of a constant interaction if required from the customer.

Finally, technology is seen as an enabler during the service elimination process, one that can be used to simplify the process of service elimination (e.g. notifications sent to the customer, general communication tools tailored to customer needs, individual offers). Social media is a highlighted tool that could improve service elimination, by providing the opportunity of constant feedback from the customer.

Table 1. Relation of service elimination to service research priorities

STRATEGIC PRIORITY	RELATION TO SERVICE ELIMINATION
Stimulating service innovation	• Service elimination can accelerate service innovation, including both service process and business model innovation; • Eliminating outdated services enables the development of services that are tailored to customer needs.
DESIGN/DELIVERY PRIORITY	**RELATION TO SERVICE ELIMINATION**
Leveraging service design	• Development and maintenance costs can be reduced due to simplified service portfolio; • Structure of the service portfolio can be optimized; • Customer co-creation and codesign can enhance both service design and service experience during service elimination.
VALUE CREATION PRIORITY	**RELATION TO SERVICE ELIMINATION**
Enhancing the service experience	• Service experience during service elimination can be improved through the appropriate design of service elimination process; • Service experience during service elimination can be enhanced through detailed information about elimination and available new offers before service elimination by direct communication with the customer.
CROSS-CUTTING PRIORITY	**RELATION TO SERVICE ELIMINATION**
Leveraging technology to advance service	• Using technology as an enabler of service innovation and new business models that simplifies the process of service elimination; • Social media enables direct communication between the customer and service provider that reduces risks of losing customers during service elimination; • Service elimination helps to optimize the service architecture that facilitates intra-and interorganizational integration.

Source: own construction based on Ostrom *et al*. (2015)

Within these research priorities, there are two underlying concepts that have the strongest consequences for service elimination: service innovation and co-creation. Service

innovation can be interpreted as a process, starting from a strategic decision reaching the overall well-being of society, whereas co-creation emphasizes the customer being a co-producer in this process, not only a receiver. If the customer is involved in all the steps listed by the service research priorities, firm strategy and service design can be aligned to customer needs and result in higher value being created, thus well-being can be improved. In this sense, service innovation and co-creation are in many ways interrelated.

The first concept strongly related to the research priorities is service innovation. One driver of sustained service innovation might be if service elimination is regularly organized within the company that stimulates sustainable service innovation, as service maintenance is part of new service development (Gustafsson & Johnson, 2003). The link between current research priorities and service elimination undoubtedly lies in innovation. Furthermore, existing frameworks do not support service innovation in ongoing customer relationships, which is resolved by finding alternative service innovation paths (Gremyra & Witell, 2013). Service elimination could be one of these alternative solutions, if managed correctly by the firm.

There is a diversity of definitions on innovation; mostly all of them refer to it as a process. One of the oldest is by Thompson (1965): *"Innovation is the generation, acceptance and implementation of new ideas, processes products or services"* (Thompson, 1965, p. 2). Kimberly (1981) stresses the different stages of innovation: *"There are three stages of innovation: innovation as a process, innovation as a discrete item including, products, programs or services; and innovation as an attribute of organizations"* (Kimberly, 1981, p. 108). Damanpour (1996) emphasizes the change related to innovation, which is widely accepted: *"Innovation is conceived as a means of changing an organization, either as a response to changes in the external environment or as a pre-emptive action to influence the environment. Hence, innovation is here broadly defined to encompass a range of types, including new product or service, new process technology, new organization structure or administrative systems, or new plans or program pertaining to organization members"* (Damanpour, 1996, p. 694).

There is an old debate about service innovation, whether it is different from product innovation, as mentioned in Section 2.3. Nijssen *et al.* (2006) find that the main difference between new service development (NSD) and new product development (NPD) is that internal organizational factors are more important in case of service developments.

Edvardsson and Olsson (1996) also noted that *"it is not the service itself that is produced but the pre-requisites for the service"* (Edvardsson & Olsson, 1996, p. 1476.).

Schumpeter (1934) differentiates two main patterns of innovation: the first is a creative destruction that is introduced by those firms that did not innovate before; therefore, it is called a "widening" type of innovation (Mark I). The second is the creative accumulation, applied by those firms that did innovate before, so it is the "deepening" type of innovation (Mark II).

Though there are many definitions emphasizing different aspects of innovation, it should be noted that there is no commonly accepted one (Gopalakrishnan & Damanpour, 1997). There are common concepts, however, such as the generation of new ideas or processes. Gopalakrishnan and Damanpour (1997) define five groups in the innovation literature: economists, contextual and organizational technologists, and variance and process sociologists. Regarding the type of innovations, they do not name services, only products, where services are inclusive of products by all groups.

The main difference between products and services can be described by the HIPI principle (Zeithaml *et al.,* 1985; Johne & Storey, 1998) as explained in Section 2.1. There is a difference in terms of firm performance though; the radicalness of innovation positively influences firm performance, slightly stronger in case of services than products (Nijssen *et al.,* 2006). Due to heterogeneity, intangibility, perishability, and inseparability, service innovation mostly involves small changes, usually in processes and procedures and they are easier to imitate (Atuahene-Gima, 1996).

In service ecosystems, innovation is driven by social practices and processes, where technology is seen as an outcome and medium of value co-creation and innovation (Vargo *et al.,* 2015). In most cases, innovation is related to technology, as the new technological developments help to create solutions to people's problems.

Technology-based service innovation also requires innovation acceptance, where the most widespread models are DOI –diffusion of innovations (Rogers, 1985) and TAM– technology acceptance model (Davis, 1989). The factors that discourage customers from using new technologies are altogether called ITU (inhibitors of technology usage). Missing personal relationship, trust, and feeling of security keeps customers from using self-services (Cenfetelli & Schwarz, 2011).

Although there is a wide range of opinions on the definition of innovation, it is related to the creation of something new, which is undoubtedly related to service elimination:

eliminating services enables the transformation of firm resources, to support new service development.

The second underlying concept of service elimination and current research priorities is co-creation. The involvement of customers in the process of service elimination could be a way to reduce the risk of churn following elimination. Customers should have an active participatory role starting from the assessment of services to be eliminated, to avoid a decision not aligned with the customer. For example, if a service with strong added value for the customer is going to be eliminated, but it is not unique on the market, customers are going to leave the company after the service is no longer available. Constant dialogues with customers can develop solid knowledge of their service preferences to avoid such issues.

As SDL highlighted, customers are co-producers of services (Vargo & Lusch, 2004; Vargo & Lusch, 2008). Customer participation determines value co-creation, so it is essential to encourage customers to participate in the value creation process (McColl-Kennedy & Sparks, 2003). Service-range management should increase customer value that should be integrated between firms and customers.

Grönroos and Voima (2013) highlight the customer's role from a value creation perspective in the co-creation process as *"The customer is the value creator in direct interaction, but when inviting the provider into this process (a merged dialogical process), value is co-created with the provider"* and the provider's role as *"The provider may get an opportunity to engage in the customer's value creation process as a co-creator"* (Grönroos & Voima, 2013, p. 9.). This means that the customer can be a co-designer or a co-developer in the service-creation process. In this way, there is more room for both the firm and the customer to influence each other's value creation. The firm offers value propositions together with the customer, by influencing their value creation.

Prahalad and Ramaswamy (2004) define co-creation as a *"joint creation of value by the company and the customer"* (Prahalad & Ramaswamy, 2004, p. 8.). They create the blocks of interaction during the process: dialogue, access, risk-benefits, and transparency. In this view, the market is more than a simple exchange of value (products and services) as introduced in the traditional concept; it becomes inseparable from the value creation process, because the firm and consumers are collaborators in co-creating value. Therefore, the market can be called a forum, where the firm and consumer converge.

Services have become increasingly interdisciplinary. Marketing researchers have also been looking consciously for linkages with other fields, first with human resources management and production management. According to a study, there are 24 academic fields dealing with service research within the conceptual framework of service discipline (Spohrer *et al*., 2014). This research marks also that there is a need for an interdisciplinary service approach that focuses on the development of service systems, and particularly co-creation.

New service development in telecommunication markets highlights the contribution of end-users to new idea generation for technology-based self-service, thus co-creation is crucial. Service operators are encouraged to involve customers early in the innovation process to capture latent needs (Matthing *et al.,* 2004). Johne and Storey (1998) highlight the "offer" development within service development, which means that not the whole product or service is enhanced, rather a part of the offering, or a supplementary offer related to the core offering.

As international service research trends were reviewed, and their relation to service elimination, the importance of also assessing the status of service research in Hungary came to light, as it forms part of this area of study. Hungarian trends are introduced in the next section.

2.2.3 *TRENDS OF SERVICE RESEARCH IN HUNGARY BETWEEN 1992-2016*

Service research goes back for many decades, both in the international and in the Hungarian literature. An article by Shostack was published in the *Journal of Marketing*, titled "Breaking free from Product Marketing" (Shostack, 1977), in which he draws attention to the differentiating attributes of services. Service research has become a separate discipline, which is also marked by the growing number of journals, articles, books, and conferences on the topic.

The growing dominance of the service sector has fostered these changes; nowadays almost the two-thirds of GDP is generated by the service sector in developed countries (The World Bank, 2017). The business environment has also advanced significantly, primarily through the dominance of the role of technology (Internet of Things, mobile technology, big data, etc.), and as a result the links between the consumer and the firm have been principally realigned (Kenesei & Kolos, 2016).

At the same time, the intensification of service research as illustrated herein is having a much lower impact in Hungary, or is only affecting special areas.

The goal of this review is to give an overview of the Hungarian service research attributes, and their evolution in the past 25 years, and to give suggestions for research possibilities corresponding to the Hungarian business environment.

Ninety-six articles published in *Budapest Management Review* and *Marketing & Menedzsment* between 1992 and 2016 were exampled. These journals were chosen because they are considered as determinant and recognized sources by marketing and other scientific disciplines.

The analysis contains every service-themed article in the mentioned journals. Articles were classified based on year of publication, main topic, context of the analysis, and methodology. Articles were then analyzed using content analysis to define the topic, research questions, methodology, and main results.

The 96 service articles of the two publication outlets were published by 135 authors. It is impressive that in *Marketing & Menedzsment* there was a record number of service articles published in 1999, whereas in case of *Business Management Review* the year 2009 is outstanding. Regarding the number of articles, in *Business Management Review* there were altogether more articles published than in *Marketing & Menedzsment* during the period in review (37 in *Marketing & Menedzsment* and 59 in *Budapest Management Review*).

After examining general trends, three main eras were defined, which form the basis of for recommendations for future research directions.

During the analysis of service literature, two criteria were applied:

1. Scientific issues: sector-independent topics related to the characteristics of services, such as measuring service quality.
2. Methodology: service literature is quite diverse in terms of applied methods; the research area defines primarily the type of selected method.

The general topic of the articles was examined based on the popularity of research topics within main trends (Table 2).

Table 2. Service research topics published in *Marketing & Management* and *Business Management Review* (1992-2016)

Research topic	Number of articles (1992-2016)
Services marketing	21
Market players and mechanisms	20
Service quality	16
Production and service	11

Linkage between customer and firm	9
Knowledge management	3
Organizational structure	3
Outsourcing	3
Cooperation between firms	2
The role of ICT within services	2
Financial behavior	2
Project marketing	2
Performance assessment	2

Source: own construction

The most researched topic is services marketing, which became an area of focus from the beginning of the 1990s to 2000, and primarily appeared in theoretical constructions (Vályogos, 1994; Bányai, 1995; Bányai, 1995; Ványai, 1996; Gyöngyösy, 1998; Veres, 1998). One of the research streams within services marketing is interpreting the foundations of marketing in the case of services, such as adopting marketing management and marketing concept to a business service environment (Vályogos, 1994), approving customer orientation (Kolos & Berács, 1999), or finding a link between secondary and primary services (Várady, 1994).

Some of the questions related to consumer behavior are also in focus since services marketing was created from the concept that consumers apply different decision methods in the case of services than products, mostly due to the intangible nature of services. Thus, the evaluation and the decision involve a higher perceived risk. Related research topics include the evaluation and selection criteria of consumers based on service types (Kolos & Demeter, 1995), the importance of satisfaction assessment (Koósa, 2001), measuring loyalty (Hetesi & Rekettye, 2001), the importance of retention (Farkas, 2003), the analysis of service failures (Ercsey, 2004), service design (Gyöngyösy, 1999; Heidrich, 2006), and relationship marketing and communication (Hetesi & Révész, 2004; Fiáth *et al*., 2010).

Third, some fields of application were in the center of interest of researchers, such as public services marketing (Dinya, 1999), tourism services (Nemeskéri, 1999), the significance of B2B services (Vágási, 1999), credit institutional marketing (Varga & Fojtik, 2004). Finally, some methodological articles were also published, for example revealing the opportunities and methods of mystery shopping (Durugy *et al*., 2016).

The following topics were classified in the category "Market players and mechanisms": characteristics of public services (Jenei, 1997; Marián, 2001; Schwartz, 2006; Somogyi, 2006;

Pásztor, 2008; Jobbágy, 2010; Jenei & Kuti, 2011; Takács, 2015), education policy and the restructuring of further education system (Jenei & Kemenes, 1992; Hetényi, 1992; Kemenes & Váradi, 1992), competition emerging from the 2000s (Ercsey, 2000), management issues (Jenei, 2000), and competitiveness (Horváth, 2012). Besides these, the financial sector is also mentioned, principally in theoretical articles presenting the characteristics of financial sector (Hámori, 1994; Németh, 1995; Ványai, 1997; Fazekas & Tóth, 1998; Incze, 2013).

Service quality is an overarching topic, independent of industries, that appears both in theoretical constructs (Papp, 1995; Kovács, 2000; Papp & Rózsa, 2003; Veres, 2008), and empirical studies on the financial sector (Párkányi, 1996; Kenesei & Szántó, 1998; Fojtik & Farkas, 2001), in the hospitality industry (Kenesei & Kolos, 2008), in health care (Vajda, 2014), and in the context of cultural services (Somogyi, 2013; Ercsey, 2014). The main aim of the analyses is the identification of service quality methods (e.g. SERVQUAL) (Kenesei & Szántó, 1998; Becser & Paprika, 2004; Vajda, 2014), the interconnectedness of service and consumer satisfaction (Kovács, 2000; Somogyi, 2013) and related to this, the effectiveness of complaint handling (Kenesei & Kolos, 2008), and the gap analysis between required and perceived state of satisfaction (Veres, 2008). Besides these, quality management and TQM also appear (Salamon, 2011).

The other relatively comprehensive topic assesses the main differences between products and services, and how services become increasingly dominant during this period of analysis. In this topic, both theoretical (Gyöngyösy, 1999; Demeter & Gelei, 2002; Heidrich & Somogyi, 2003; Heidrich & Somogyi, 2005; Koltai *et al.*, 2009), and empirical studies can be found; the latter mostly compare service and production companies (Chikán & Demeter, 1994; Letenyei & Papp, 2005; Demeter, 2009; Demeter, 2009; Gelei & Gémesi, 2010; Demeter & Szász, 2012; Bálint, 2014). Almost all these studies analyze the differences between products and services in various contexts, adding the characteristics of supply chains (Gelei & Gémesi, 2010).

Links between customer and firm emphasize the active participation of the customer (Hans-Reinhard *et al.*, 1996; Kenesei, 1996; Osman, 1997; Takács, 1998; Veres, 1998; Gyöngyösy, 1999; Németh, 1999; Pintér, 2004), which increases trust toward services and thus has a great influence on market share as well (Takács, 1998).

Through the appearance of IT outsourcing besides theoretical constructs introducing the term (Drótos, 1995), the authors developed a secondary analysis of libraries (Mikulás, 1998) and shared service centers (Szabó & Vida, 2009).

Newer topics are the role of ICT within services and knowledge management (Berács, 2006; Dobrai & Farkas, 2009; Kővágó, 2014) that were only analyzed from the 2000s. Other issues within this topic include the quality of Internet sites and websites (Rekettye & Pintér, 2006), and the application of ICT in the tourism sector (Grotte, 2010).

There are several subtopics in relation of the operation of firms: organizational structure, where literature focuses on the interorganizational connectedness of service quality (Heidrich & Somogyi, 2003); the development of organizational unit structure (Pandurics & Pusztai, 2006); the HR issues of call centers (Fehér & Bencsik, 2007); and project marketing (Mandják, 1995; Veres & Sajtos, 2011) that deals with perceived value and risk of project-like services. Regarding the cooperation between firms, the authors introduce a special form of cooperation between banks and insurance companies, the bank insurance (Pintér, 2002; Szüle, 2006), and they analyze the links between organizational performance assessment and evaluation and business performance in the context of water public utilities (Székely, 2007), and policy-based governance (Jobbágy, 2010). Apart from these financial sector is represented through the assessment of control and financial attitude (Mihály *et al.*, 2014; Zsótér *et al.*, 2015).

The timeline of methodology is presented in Figure 4. Quantitative methods came to the fore after the 2000s, whereas the beginning of the period was characterized by theoretical articles.

Figure 4. Service research methods of articles published in *Marketing & Management* and *Business Management Review* (1992-2016), N=96
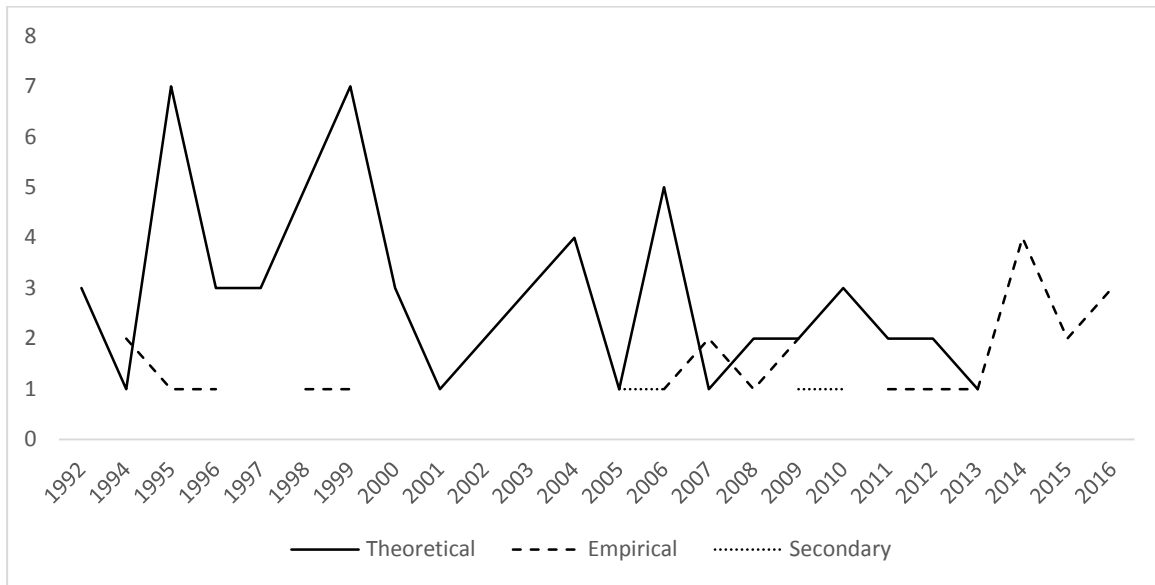
Source: own construction

Figure 5 highlights the methodological particularities. Theoretical articles dominate all the areas, which is probably because authors interpret international trends in the context of Hungary. It is still interesting though, within the topic of market players and mechanisms, that there are almost no other articles but theoretical ones, whereas production and service are most diverse in terms of methodological points of view. This can be because the differences between products and services can be well tested empirically beyond defining concepts. Theoretical pieces also dominate the area of linkage between customer and firm. Empirical studies primarily can be found in service quality and services marketing.

Figure 5. Service research methods of articles published in *Marketing & Management* and *Business Management Review* categorized based on main topics (1992–2016), N=96
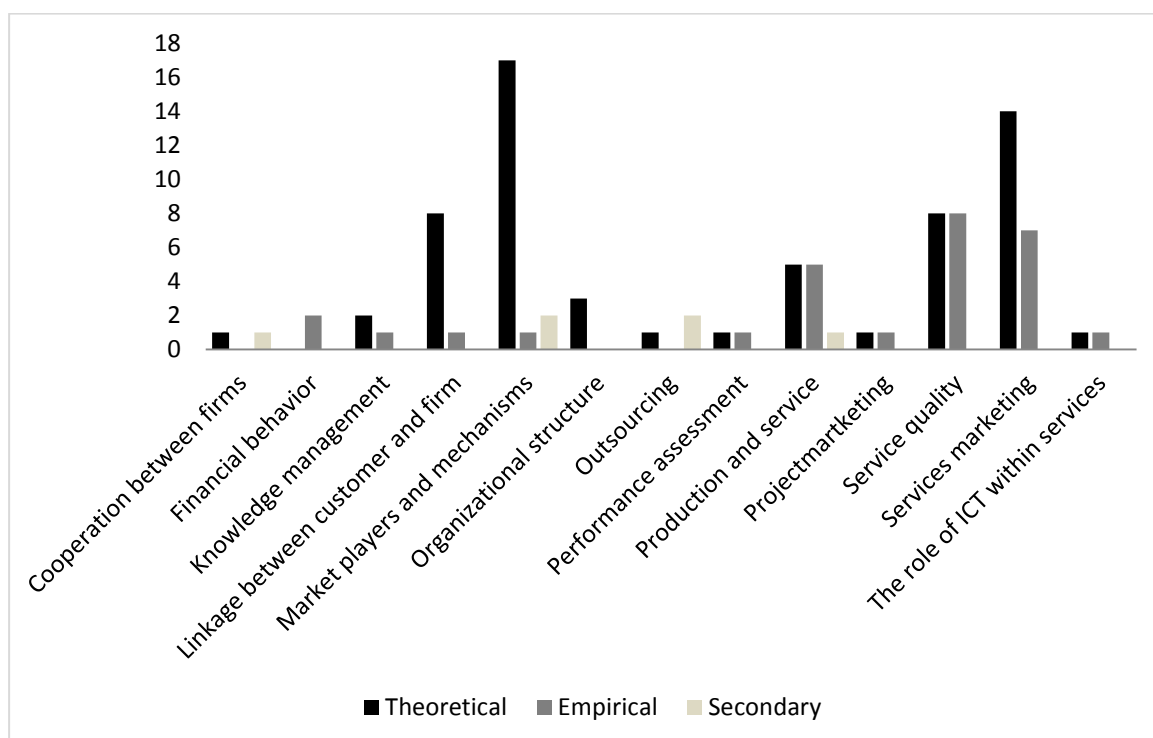
The next step in this analysis of the development of Hungarian service research was defining main eras. Common points and determinant turning points based on the content of analyzed articles were sought. The assessment resulted in three main eras:

1. 1992–1999: The beginnings

Service literature at the beginning was characterized by the dominance of topics referring to market players and mechanisms, principally with theoretical constructs that raised the attention as to the importance of further education in the public sector (Jenei & Kemenes, 1992; Hetényi, 1992; Kemenes & Váradi, 1992). Further, services marketing appeared, first also with theoretical articles that defined basic terms and models (Vályogos, 1994; Bányai, 1995). Relating to this, the issue of service quality was also raised (Veres, 1995), and quality models were introduced (Kenesei & Szántó, 1998). Additionally, the assessment of customer expectations is part of the basic terms in services marketing (Kolos & Berács, 1999; Kolos & Demeter, 1995). Other typical areas in this era include the formulation of stronger relationships with the customer, active customer policy (Hans-Reinhard, Herbert, & Kuhár, 1996; Kenesei, 1996; Osman, 1997; Takács, 1998; Veres, 1998; Németh, 1999).

2. 2000–2009: Quality focus

Service quality has become a primary factor defining firm competitiveness. Parallel with this process several methods related to quality assessment were emerging, such as TQM (Papp & Rózsa, 2003; Salamon, 2011), or the Hungarian adaptation of the SERVQUAL scale in services marketing, in relation of customer satisfaction and loyalty assessment (Becser & Paprika, 2004; Hetesi & Rekettye, 2001). In the context of quality assessment, the research of complaint handling became more important (Kenesei & Kolos, 2008), and the application of critical incident technique (Kolos & Berács, 1999).

3. 2010+: The diversification of service research

After 2010, similar to the international literature, the expanded interpretation of the service context is somewhat perceivable. Within this, products and services (Demeter & Szász, 2012; Bálint, 2014), the differences between service or manufacturing firms and their supply chains (Gelei & Gémesi, 2010), and the optimization of related systems emerge as important research questions.

Principal research priorities in the international literature is another characteristic of this era, such as servitization (Bálint, 2014; Demeter & Szász, 2012), co-creation and culture (Ercsey, 2014), and knowledge-intense business services (Kővágó, 2014).

Consumer satisfaction assessment has become increasingly popular, giving the basis for the emergence of quantitative methods (Somogyi, 2013; Vajda, 2014; Ercsey, 2014).

Narrower research topics also occurred, such as financial culture and attitude (Mihály, Mészáros, Kovács, Madarász, & Horváth, 2014; Zsótér, Béres, & Németh, 2015); perceived control and the role of emotions (Kenesei & Kolos, 2016); compensation (Kenesei & Szilvai, 2016); or special, or less researched areas until then, for example chamber of commerce (Fülöp, 2012) or the role of district heating (Horváth, 2012).

The thematic differences between eras are illustrated in Figure 6. There is a declining tendency in the relationship between the customer and service firm, whereas the market players and mechanisms are rather constant during the whole period of analysis (Figure 6).

Figure 6. Service research articles published in *Marketing & Management* and *Business Management Review* categorized based on main topics in the 3 main eras (1992–2016), N=96
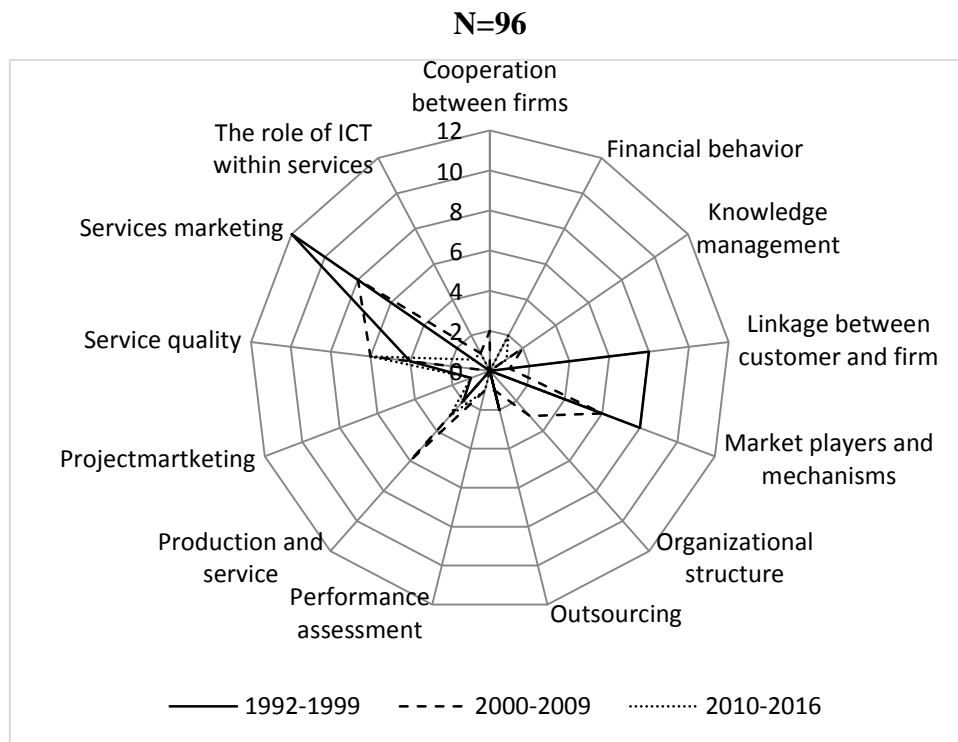
Source: own construction

Reviewing the three main eras, it is clear that in the Hungarian service research service quality has had a prominent role in the past 25 years. Although most significantly it was the primary interest of researchers between 2000 and 2009, more or less in all three eras it comes up as a research topic. Thus, it is expected that new methods of service quality assessment will appear that are proposed to spread quickly in Hungary through the rapid change of technological environment. These might include data-mining techniques related to big data (e.g. Python).

This fits quite well the service performance assessment and optimization within international research trends (Ostrom, *et al.*, 2015) and is probably a significant topic in the Hungarian service literature as well.

It is also worth fostering the application of the interdisciplinary approaches. The studies of the analyzed period also assessed multiple fields (e.g. marketing, knowledge management, informatics, public services, business development), although each and every publication usually stays within the boundaries of a research field. Hungarian service research could be made richer through the development of interdisciplinary research groups and workshops. The

research topics defined as a research priority in the international literature can mostly be handled like this: more emphasis should be put on the relationship between design and service innovation, organizational issues of services (service culture, the role of employees), and the analysis of the impact of digitalization (mobile technology, smart services) both in a B2C and a B2B context.

In the Hungarian service research, transformative service research explicitly has not occurred until now. This area assesses the interconnectedness of services and the social/individual wellbeing, where health care and education are primary contexts: How can the quality and assessment opportunities be improved in case of these services? How can services be sustainable?

Service research in Hungary incorporates a variety of research topics, such as the characteristics of public services or measurement of service quality. The objective of this paper is to review articles focusing on services and published between 1992 and 2016 and to determine future trends and research directions. Analysis revealed that besides industry-specific issues (public services, financial services); there are dominant research areas within service research that overarch various industries and time periods such as service quality. In the conclusions, it is noted that with technological development, the emergence of new methods for modeling service quality can be expected, such as data mining and analysis of big data. More emphasis will be given to interdisciplinary approaches and to transformative service research.

In summary, service research has a great tradition in Hungary, and in terms of future research opportunities perspectives are promising. To further development of the area, an interdisciplinary approach and the more impactful participation of international research networks are crucial.

2.3 SERVICE ELIMINATION

After reviewing the service literature and current research trends, the focus turns to the main topic, service elimination.

As service elimination was defined in the first chapter, it is a process by which a service firm eliminates its existing services by migrating existing customers to new service packages. An important addition to this research is that partial elimination or service closing are not incorporated in the definition of service elimination. According to many types of service elimination (Argouslidis, 2001), this research is restricted to the so-called full elimination, which means that existing services are eliminated, and all affected customers are migrated to new service packages.

This research is positioned on this type of elimination, because this is the least studied aspect of service elimination. Full elimination, sometimes called "core product" elimination (Harness & Mackay, 1997), is known as a complex, rather dangerous strategy, which is due to the high risk of customer churn. Another issue is that this risk is influenced by the type of migration (voluntary or forced). Practical evidence shows that 20–30% churn in the telecommunications sector is quite usual during service elimination, and losing approximately one-third of the affected customer base is not acceptable, especially in stagnating markets. Thus, many firms try to avoid this type of elimination, and apply partial elimination (e.g. service closing, where service is only closed from new customers following service elimination; closing from certain customer segments, where the service is closed only from some segments following service elimination; simplification, where parts of the service are not available following service elimination; and service merging, where two or more services are partially or fully merged following service elimination), which, however, does not provide all obtainable benefits compared to full elimination. Resources remain locked, and the complexity of the service portfolio cannot be reduced significantly by closing only some services, or from some segments. As a result, development and maintenance costs remain high, which hinders service innovation.

A more thorough analysis on how the high risk of customer churn during full elimination can be reduced is required to provide insights into this special field that could enlarge the pool of empirical results, and support company practice.

To understand the whole process of service elimination, this section follows the structural map in Figure 2. The relationship between service elimination and product

33

elimination is first reviewed, and then a structured summary of the rather narrow service elimination research area is given, revealing potential research gaps. The rest of this section is organized based on the three stages of the process (pre-elimination, implementation of service elimination, and post-elimination phase), including related theories that explain the impact of service elimination.

2.3.1 DIFFERENCES BETWEEN PRODUCT ELIMINATION AND SERVICE ELIMINATION

To understand service elimination in more detail, the main differences between service and product elimination (product elimination) are revealed. Although service elimination and product elimination are different concepts, they have some common attributes that can be used in this research.

Product elimination is defined as: *"(...) the elimination process starts when an organization identifies a change which questions the viability of keeping a product at market"* (Harness & Harness, 2007, p. 198.), which is similar to the service elimination case in terms of dominant reasons, objective, and benefits of elimination.

Product elimination has strategic importance, too: *"product elimination can generate outcome benefits for the organization in four areas: simplification/concentration of management and sales effort; improved product portfolio performance; customer management related; improved physical and financial resource management"* (Harness & Harness, 2012, p. 56.). Harness *et al*. (2012) analyzed primarily the effects in the case of product elimination, but in the case of financial services they received similar results. These are seen as shared benefits between product elimination and service elimination.

There is well-grounded literature on product elimination including various firm perspective studies on several topics:

- General description of product elimination practice (Hise & McGinnis, 1975; Avlonitis & James, 1982; Avlonitis, 1983-1984; Hise *et al.,* 1984; Greenley & Bayus, 1994);
- Pre-elimination decision- making phase: precipitating circumstances (Hart, 1988, 1989; Mitchell *et al.*, 1997);
- Product elimination decision-making process: identification of candidates for elimination (Banville & Pletcher, 1974; Avlonitis, 1986), analysis and revitalization/modification (Avlonitis, 1985c; Saunders & Jobber, 1994), evaluation and

decision-reaching (Evans, 1977; Avlonitis, 1984, 1993; Saunders & Jobber, 1994; Mitchell *et al.,* 1997), implementation (Rothe, 1970; Avlonitis 1983, 1985c, 1993);

- Post-elimination phase: performance outcomes (Avlonitis, 1987);

- Organizational and structural issues: participation (Avlonitis, 1985b); decision-making structure (i.e., formalization) (Avlonitis, 1985a), decision speed (Avlonitis, 1985a);

- Ethical aspects (Hise & McGinnis, 1975; Avlonitis, 1983);

- Product elimination and the product life-cycle concept (Avlonitis, 1990);

- Typologies of product elimination decisions (Avlonitis *et al.,* 2000);

- Historical, regulatory and economic aspects of product exits (Rosegger & Baird, 1987; Stavins, 1995; Greenstein & Wade, 1998; Putsis & Bayus, 2001; Hooker *et al.*, 2002; Ruebeck, 2002; Hitsch, 2006).

Product elimination involves some challenges for managers, as they are reluctant to take actions due to product elimination's effect on loyalty (Homburg *et al.*, 2010). It is an existing problem in the case of service elimination as well.

The implementation of the elimination is usually very different in the case of services than products: in the case of service elimination the company seeks to re-direct its clientele to purchase a different service (replacing the one dropped or already existing) (Gounaris *et al.*, 2006).

The reasons leading to product elimination might be slightly different. At product elimination, overall poor performance (e.g. sales drop), product management within the portfolio or external factors (e.g. regulations) (Harness & Harness, 2007) or limited shelf space drive the elimination. In the case of services, however, there might be many other causes for elimination besides these. It is rather part of service's short life-cycle and the requirement of a quick new portfolio launch in service industries. This means that the service elimination decision is mainly related to the need of managing demand and leading customers out of the service that is about to be dropped (Harness & Mackay, 1997).

The rapidly growing innovations result in short product lifecycles, especially in the case of high-tech products (Wu *et al.*, 2006). In the case of telecommunications, the trend is similar, service operators continuously innovate to gain sustainable competitive advantage.

Based on this, the similarities and differences between service elimination and product elimination in a B2C context are summarized (Table 3). The most important similarities are dominant reasons, objective, and benefits of elimination. But, as analysis highlights, in the

success of service elimination, the crucial difference in this sense between service elimination and product elimination is that no forced migration is happening in case of product elimination. Because customers do not have a contract, they can buy a replacement product. This has a direct effect on customer churn, so this aspect cannot be analyzed by using common attributes between products and services.

Table 3. Similarities and differences between service elimination and product elimination

	Service elimination	**Product elimination**
Dominant reasons for elimination	− overall poor performance; − service management within the portfolio; − short life-cycles; − external factors.	− overall poor performance; − product management within the portfolio; − short life-cycles; − external factors. − limited shelf space in retail.
Objective of elimination	re-directing clientele to a new service/product	
Notification of customer	direct communication with customer	limited/lack of communication with customer
The effect of elimination on storage costs	not relevant	storage costs might decrease
The effect of elimination on maintenance costs	system maintenance costs might decrease	maintenance costs might decrease
Training	required	
Result of elimination	normal or forced migration	replacement product
Benefits of elimination	− simplification/concentration of management and sales effort; − improved product/service portfolio performance; − customer management related benefits; − improved physical and financial resource management.	

Source: own construction

36

Service elimination was studied only by a small group of researchers (Argouslidis & McLean, 2003; Argouslidis, 2007a; Argouslidis & Baltas, 2007), and although the first studies on service elimination were published in 2001 (Argouslidis, 2001; Argouslidis & McLean, 2001a), the area is still under-researched. Even if the importance of the topic is clear in the literature (Argouslidis, 2001; Avlonitis & Argouslidis, 2012), there are many areas of service elimination that are still uncovered, such as the post-elimination phase or customer perspective studies. To close this gap, this research aims to find empirical evidence for customer reactions on service elimination, with a primary focus on the post-elimination phase.

In the literature, product elimination and service elimination are often studied together; however, there are differences between the two concepts already defined. Avlonitis and Argouslidis (2012) provide an overview of the field, which has been restricted to service elimination only, due to these differences between product and service elimination. There are three phases of the service elimination process itself: (1) the pre-elimination phase, which defines the objectives; (2) service elimination decision-making phase, which determines the attributes of the elimination process; and (3) the post-elimination phase, which focuses on the result of the service elimination. From the service elimination literature review, it is clear that service elimination is mostly studied in the financial sector, from the firm perspective (Argouslidis, 2001; Argouslidis & McLean, 2003; Argouslidis, 2007a; Argouslidis & Baltas, 2007).

Performance outcomes are only studied in manufacturing sectors and success factors in financial service sector and multi-sector studies. Surprisingly, there is no customer perspective analysis in the service area combined with post-elimination phase, especially success-factors, which is a significant gap in the extant literature (Table 1). Only two studies were found in the product elimination field using customer perspective (Avlonitis, 1983; Homburg *et al.*, 2010). Harness (2004) draws attention to the missing empirical evidence of the customer perspective, because elimination effects are mainly studies from the firm's point of view. That is why this area is the focus of this study.

Within the post-elimination phase of service elimination, the role of strategic decision and company type were highlighted as determinants of service elimination success (Harness & Marr, 2004; Gounaris *et al.,* 2006). This is in accordance with the choice of telecommunications as a field of study: company type may account for differences in service

elimination, which cannot be captured by studies only focusing on financial sector, including some multi-sector studies.

The literature review on service elimination gave the foundation for both the main topic and context of this study: customer perspective on assessing the success factors of service elimination in telecommunications.

Table 4. Summary of service elimination literature

BROAD TOPICS	FIRM PERSPECTIVE	
	FINANCIAL SERVICES	**OTHER OR MULTI-SECTOR**
General description of service elimination practice	(Argouslidis & McLean, 2001a)	
1. Pre-elimination decision-making phase		
Pursued objectives	(Argouslidis & McLean, 2001b) (Argouslidis P. , 2006)	
Precipitating circumstances	(Harness *et al*., 1998) (Argouslidis, 2007b)	
2. Service elimination decision-making process		
Identification of candidates for elimination	(Argouslidis & McLean, 2003) (Argouslidis & McLean, 2004)	
Analysis and revitalization/modification	(Argouslidis & McLean, 2004)	
Evaluation and decision-reaching	(Harness D. R., 2004) (Argouslidis, 2007a)	
Implementation	(Harness & Marr, 2001) (Argouslidis, 2004)	
3. Post-elimination phase		
Performance outcomes		
Success factors	(Harness & Marr, 2004)	(Gounaris *et al*., 2006)
4. Organizational and structural issues		
Participation		
Decision-making structure (i.e. formalization)	(Argouslidis & Baltas, 2007)	
Decision speed	(Argouslidis, 2008)	
5. Historical, regulatory and economic aspects of service exits		(Chisholm & Norman, 2006)

Source: own construction based on Avlonitis & Argouslidis (2012)

The literature review showed that the methodology of the studies is mostly a mixed qualitative-quantitative type. Argouslidis and McLean (2003) used the combination of qualitative and quantitative research: in-depth interviews and mail surveys. The article presents qualitative and quantitative empirical evidence on (1) the way in which British financial institutions analyze the deviant performance of financial services, which have been identified as candidates for elimination; and (2) the remedial actions that they consider to

38

restore a deviant performance, when possible and feasible. Later studies in the financial sector (Kent & Argouslidis, 2005; Argouslidis, 2007a) applied a similar methodology, exploring formalization in financial institutions' product line pruning decisions, and maintaining a link between service elimination decision-making and the structural characteristics of organizational decision-making. Service elimination decision and implementation is also key in the work of Gounaris, Avlonitis, and Papastathopoulou (Gounaris *et al.*, 2006).

Although post-elimination success factors are identified as a gap in the service elimination literature, the relevance of the topic is highly dependent on a contractual setting. When there is no contract between the customer and the service company, customers can be easily migrated to other service packages after the current service is no longer available. Contract-based service research shows that the contract itself changes the whole relationship; customer reactions in particular. Therefore, this research focuses on the contract-based relationships within post-elimination phase of service elimination.

Lovelock (1983) defined the main types of relationship between the service organization and its customer. The so-called membership relationship includes contract-based services; informal relationships are those, when there is no contract between the two parties.

Service elimination is relevant primarily in the case of membership, because otherwise neither party has legal obligations, so the service organization is not required to offer a new service, and the customer can leave the company without paying any penalties. Altogether the non-contract situation is so much different from the contract-based one that they require entirely different strategies. In this research, service elimination in a contract-based environment is studied.

One important implication of the service elimination literature review is that the pre-elimination and process phases are basically covered. What remains relatively unstudied is the post-elimination phase. Second is the customer side, which is rather neglected. This research is positioned in these areas, because service elimination may have many potential outputs affecting customers that influence customer retention, satisfaction, and loyalty, which enables the discovery of new findings in the field.

The conclusion arrived at is that the understanding of customer side might be able to fill the research gap consisting of service elimination and customer retention combined with customer perspective and thus accelerate portfolio innovation and reduce customer churn in these cases.

The accelerated technological environment driven by IT developments makes service elimination a prerequisite for service developments. Thus, as it is a neglected area in research, its importance is about to change.

In the next part, the main factors are identified according to the three main phases of service elimination: pre-elimination, implementation, and post-elimination. The customer perspective is followed with this type of classification, because the primary goal is to assess the effects of service elimination on customers. There are firm perspective studies (e.g. Argouslidis, 2001) that analyze pre-elimination, service elimination decision-making and post-elimination phases, but in terms of the customer focus, the concentration is on the implementation process and the service elimination outcome affecting customers, rather than on how elimination decisions were made within the organization. Within the phases of service elimination, the typology of Argouslidis (2001) is followed, with a change of focus to implementation due to post-elimination success: the decision-making process is dealt with as part of the pre-elimination phase, which is followed by the implementation phase and post-elimination.

2.3.3 PRE-ELIMINATION PHASE

Pre-elimination includes the causes, decision-making process, triggers, and barriers. The process involves the execution of service elimination. The post-elimination phase entails impact on firm and customers.

2.3.3.1 CAUSES AND OBJECTIVES

Argouslidis (2001) finds that the main objectives of service elimination are the following[1] (Argouslidis, 2001): the improvement of financially related indicators, the concentration of corporate resources, rationalization to minimize customer confusion, and rationalization to control cannibalization. He further identifies problem situations in the same study, such as declining customer demand and customer rejection, declining profitability, legislative changes and new regulations, incompatibility with current corporate focus, changed business positioning, technical problems with the service delivery process, or a person with a vital role in the delivery process left the company. Although there are well-defined reasons for

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[1] In this chapter, results obtained in the financial sector are applied for telecommunications in many cases, due to the fact that there are no such results available in the field of service elimination for telecommunications, and they are similar in a sense that both financial services and telecommunications are membership services.

elimination, what companies usually do is to apply service elimination as an end of life cycle decision (Kurtz & Clow, 1998; Palmer, 1998; Kasper *et al.*, 2008). It should be noted however that although declining profitability is an important driver of elimination, it is not necessarily related to the end of the life cycle of a service: another driver is usually service innovation (Section 2.2.2.).

2.3.3.2 DECISION-MAKING PROCESS OF SERVICE ELIMINATION

Argouslidis (2001) defines the phases of the service elimination decision-making process as follows: identification of candidates for elimination, analysis and revitalization/modification, evaluation and decision-reaching, and implementation. Further, there are audit criteria that shape the identification of elimination candidates, including profitability, sales volume, market growth potential, customers' perceptions, activities of competitors, market share, service's position on the life cycle curve, operational problems (i.e., with the design, the blueprinting, and the delivery of a service). It is important to bear in mind that the organization has to handle the impact of service elimination on customers, corporate image, other services, full-line policy (policy to offer full range of services), similar service available on market, and the potential loss of competitive advantage.

He finds that the most important participants in the elimination decision are (in ranked order): marketing, finance/actuarial, the manager of the eliminated service, sales, management committee, managing director, customer-contact personnel, CEO/president, board of directors, general manager, and administrative staff, and that the average time of the decision-making process is 5.6 months (the trimmed mean is 4.7 months).

The role of formalization is highlighted during the decision-making process (Argouslidis & Baltas, 2007).

2.3.3.3 TRIGGERS OF SERVICE ELIMINATION

Triggers are usually more influential on the management's decision than on the evaluation process itself, because elimination is involved with product replacement (Avlonitis & James, 1982). Triggers are seen as one of the most important ones nowadays too. As there is a rush to launch new service portfolios, it certainly drives the elimination of current service offerings. What is also common, however, is that new service development is introduced without elimination (Somosi & Kolos, 2014).

Argouslidis (2001) differentiates between trigger types of service elimination in the case of financial services: externally led, strategically led, operationally led, sales led, and customer led.

2.3.3.4 BARRIERS OF SERVICE ELIMINATION

Barrier of service elimination are defined as *"something that is imposed on the organization from an external source – legislative controls and contractual agreement"* (Harness, 2004, p. 171.). The existence of both these barriers is to prevent any change in the product/service unless the customer has agreed to it. The execution of elimination, i.e., whether a full elimination can happen, is highly dependent on external barriers, for example legislative controls, contractual obligations, and internal constraints that are created by the organization to maintain customer relationships after elimination. So, barriers often exist to prevent full elimination. The three types of elimination are: no barriers or customer-created constraints (this either happens due to an external force to fully eliminate the product, or high maintenance costs of the service), self-imposed customer-oriented constraints by the organization, or external barriers preventing full elimination (partial elimination strategy) (Harness, 2004). Companies apply the self-imposed barriers usually to minimize customer churn associated with forced migration in the case of full elimination.

2.3.4 IMPLEMENTATION OF SERVICE ELIMINATION

As mentioned already when defining service elimination, there are many alternative forms of service elimination besides full elimination (or sometimes referred as immediate drop). Other types include partial elimination, service closing, closing some segments, service merging, service simplification, etc. These alternatives strategies of elimination reflect the differences between service elimination definitions.

The implementation of service elimination is highly dependent on the quality of communication and general interaction between the firm and the customer. This is linked to interaction intensity that has been proved to influence quality and satisfaction (Bateson, 1985; Mills & Morris, 1986; Hill, 1988; Kelley *et al.*, 1990; Cermak *et al.,* 1991), which, in terms of service elimination, means that direct interaction between the service provider and the customer can increase service quality perceptions of the customer that might lead to customer retention.

In this sense, co-creation (Prahalad & Ramaswamy, 2004) with the customer can foster the success of service elimination, by tailoring the new service after removal of the current one to the customer's needs.

Besides these, the implementation should be the result of a strategic decision, because the attitude of the top management and the overall formalization determines the quality of service elimination (Argouslidis & Baltas, 2007).

During the service elimination process, customers face monetary and non-monetary costs as well that are primarily related to finding the new alternative service after the elimination of the current service they are using. Among the huge amount of search costs (comparing alternatives available on the market, and at their current operator), there are many types of non-monetary costs as well, including time, physical effort, psychological burdens (mental effort, perceived risks and anxiety, cognitive dissonance, feelings of fear, etc.), and sensory burdens (crowd, noise, unpleasant smells, excessive temperature conditions, uncomfortable and/or unappealing waiting rooms. etc.) (Wirtz & Lovelock, 2016). This links to social exchange theory (Homans, 1958).

2.3.5 POST-ELIMINATION PHASE

The literature review showed that there is a significant gap in the post-elimination phase of service elimination: *"The post-elimination phase is almost completely neglected by the elimination literature"* (Argouslidis, 2001, p. 421).

Argouslidis (2001) draws attention to the post-elimination phase, because (1) a more integrated reference about the process can be used for future reference, (2) existing or potential new customers can be affected by the process, (3) there are cases, when the service is not completely eliminated (e.g. partial elimination strategies, pseudo-elimination implementation strategies, simplification, service merge, service closing). He emphasizes that the process should handle existing customers more favorably than potential customers, and show ethical behavior toward them.

The most important question within post-elimination is, however, whether service elimination was successful. Surprisingly, only two studies address this issue in a service setting (Harness & Marr, 2004; Gounaris *et al.*, 2006), which conclude that success is primarily related to treating elimination as a strategic decision with systematic decision behavior and multi-departmental teams.

The success of elimination is also dependent on the definition of service elimination; for example, in the case of a partial elimination, it can be also considered a success, if customers remain within the service offering (Harness, 2004). In this study, however, service elimination is considered as full elimination.

There are various methods to assess the outcome of service elimination (Argouslidis, 2001), such as customer retention rate, profitability and sales of the new service, and level of customer complaints, from which the customer retention rate perspective is followed.

2.3.5.1 IMPACT OF SERVICE ELIMINATION ON CUSTOMERS

Customer reaction involves many concepts that primarily affect the outcome of service elimination and thus are relevant to this research. These concepts include satisfaction, loyalty, commitment, WOM, and complaining. The importance of those constructs for this study can be underlined by the fact that they have an impact on customer retention. In the following section, churn is discussed as a measurement of customer retention. This is followed by a description of satisfaction, loyalty, commitment, and WOM, with a special focus on their relation to customer retention.

To understand more the process of service elimination, the three-stage model of service consumption (Wirtz & Lovelock, 2016) is used. The pre-purchase stage is not relevant in the case of service elimination, because a service is going to be eliminated, not purchased. Second, the service encounter stage is the service elimination itself, where general terms like moments of truth, or servuction system can be interpreted, as the elimination process-related customer experience itself determines the customer's final evaluation of the service provider. An unpleasant experience affects customer retention; it is sometimes more effective than the content of the new offer. Third, the post-encounter stage contains all concepts relevant to customer reaction (confirmation/disconfirmation of expectations, dissatisfaction, satisfaction and delight, service quality, WOM, repurchase and loyalty) in case of service elimination, which is the focus of this research.

It should be noted however that customers are different, and according to the Servicescape Model (Bitner, 2000), there are customer- and employee-response moderators, which means that the same service environment can have different effects on different customers depending on their own preferences.

In the next part, the main concepts related to customer reaction are introduced.

Customer retention is defined as *"the probability of a customer being "alive" or repeat buying from a firm" (*Gupta *et al.*, 2006, p. 144.). Repeat purchase also means customers are loyal to the company, which leads us to customer retention. There is a difference though between contractual and non-contractual settings: in the case of the former, customers inform the firm about their termination intention, but in the case of the latter, the firm needs to inform about customer activity.

Churn is an operational measurement of customer retention (Gustafsson *et al.*, 2005). In the wireless telecommunications service industry, the term *customer churn* is used to denote the customer movement from one provider to another; *churn management* describes an operator's process to retain profitable customers (Berson *et al.*, 2000).

The outcome of service elimination is assessed by multiple methods in the financial sector; one of them is customer retention (Argouslidis, 2001, p. 238.): sales of the replacement financial service; profitability of the replacement financial service; solution to operational problems; actual cross-selling impact; actual level of customer complaints; customer retention rates; customers' view of the company; propensity of customers to do incremental business with the company; and new customer acquisition rates. Argouslidis (2001) also notes that it is typical that financial institutions do not conduct post-elimination reviews to assess the appropriateness of an elimination decision.

Because the focus is on customer reactions following service elimination, customer retention is used to assess the outcome of service elimination and thus find a connection between customer reaction resulting in churn in the case of service elimination. Churn studies can be categorized as cause of churn, retention, and type of churn (Braun & Schweidel, 2011). This research focuses on retention.

There are various churn prediction models in the telecommunications literature that highlight multiple data mining methods (e.g. decision trees, neural networks, K-means cluster etc.) (Hung *et al.*, 2006).

Risselda *et al.* (2010) study the evolution of churn prediction models. This is important as one key performance indicator (KPI) of measuring the success of service elimination is the reduced churn rate. This research combines churn and service elimination, which is usually not adapted to measure the effect of service elimination on customers. Churn has been chosen because it is a frequent KPI in service industries to determine the satisfaction of customers with the current service. Service elimination is very specific in this case: the elimination

process means forced migration in most cases, which changes the behavior of the customers. Therefore, churn is a key issue in the context of telecommunication.

Neslin *et al.* (2006) draw the attention on the importance of methodology; it can cause significant differences in the profitability of churn management campaigns and in performance, when using a variety of modeling approaches. This means that although the intention is to explore what can lead to a successful service elimination, the choice of methodology can result in entirely different findings. That is why both customer survey and database modeling are used (Studies 1–3).

This quantitative approach of modeling churn is linked to the analytical CRM (customer relationship management), which is the process of collecting and analyzing a firm's information regarding customer interactions to enhance the customers' values to the firm (Kamakura *et al.,* 2005). They further add that CRM can be organized along the customer lifecycle, including customer acquisition, development, and retention strategies. A successfully planned and executed service elimination can be part of the retention strategy within CRM.

Among these categories, this research is a retention strategy, which aims to reduce churn in case of service elimination. The problems perceived during the pilot study (e.g. frustrated customers affected by service elimination) might be due to a wrong categorization of service elimination; it needs to be further investigated whether service elimination is treated indeed more as a customer lifecycle issue rather than retention.

Knox and Oest (2014) measure the likelihood of churn by measuring the effects of prior complaints, prior purchase, and complaint recovery. They find that the number of prior complaints increase the probability of churn, whereas complaint recovery leads to less churn. The surprising fact is however that the effect of purchase reducing churn is much higher (315 days) than the effect of complaints (8 days) (Knox & Oest, 2014, p. 48.). This means that if the customer does not leave after the first complaint, they are expected to stay with the company.

Based on the churn literature, service elimination can be viewed as a situational factor that modifies customer satisfaction and engagement, which has an impact on customer retention strategy. Thus, the models determining normal customer churn rate (Rust *et al.*, 1995; Ho & Zheng, 2003; Kamakura e*t al.,* 2005; Prince & Greenstein, 2011; Kumar & Petersen, 2012) needs to be modified to assess the effect of service elimination. In the service

elimination and churn literature, a huge potential can be seen in adding these results that might help to reveal the aspects that make churn modeling different in the case of service elimination.

Among customer reaction, other related concepts are introduced, such as satisfaction, loyalty, commitment, and WOM, because they also influence customer retention. To enhance the post-elimination phase of service elimination, these relevant concepts need to be investigated. The main differences between them are now explained.

Customer satisfaction is defined as a customer's overall evaluation of the performance of an offering to date (Johnson & Fornell, 1991). It generally refers to the customer's reaction to the state of fulfillment, and the customer's judgment of the fulfilled state (Oliver, 1997). The main factor determining customer satisfaction is perceived service quality (Zeithaml, 1996). Service quality in telecommunications has been measured by call quality, pricing structure, mobile devices, value-added services, convenience in procedures and customer support (Kim, 2000; Gerpott *et al.*, 2001; Lee *et al.,* 2001). Kim *et al.* (2004) find that customer satisfaction in telecommunications is primarily influenced by call quality, value-added services (e.g. mobile internet, multimedia services, location-based services) and customer support.

The dyadic relationship between the customer and firm was the focus of early research on the topic. Surprenant and Solomon (1987) define service encounter as the main driver of satisfaction. Performance expectations and perceived performance create confirmation or disconfirmation that leads to satisfaction outcome (Oliver 1997). In terms of service success, it is critical how satisfaction affects repeat purchase, which is not only affected by the overall satisfaction of the service, but also by perceptions of the firm's service quality. In this way customers try to predict the quality of a next possible service by the same firm they have already contacted. If they are generally satisfied with the service, one unsatisfactory visit might not influence their return. However, if dissatisfaction levels increase with upcoming visits, this reduces the probability of repeat purchase (Wirtz & Lovelock, 2016). Thus overall satisfaction has a strong positive effect on customer loyalty intentions across a wide range of product and service categories, including telecommunications services (Fornell, 1992; Fornell *et al.*, 1996).

Customer satisfaction is the topic of several research studies in the Hungarian literature that, besides forming theory (Hofmeister *et al.*, 2003), primarily assess the relationship

between satisfaction and loyalty (Hetesi & Veres, 2005; Bátor, 2007), and their connection with service quality (Rekettye *et al.*, 2002; Hetesi, 2003). Other topics include customer management (Piskóti, 2008).

Commitment is usually defined as the extent to which an exchange partner desires to continue a valued relationship (Moorman *et al.*, 1992). The distinction between affective and calculative commitment lies in the fact that they are the drivers of loyalty: affective commitment, as created through personal interaction, reciprocity, and trust; and calculative commitment, as created through switching costs (Morgan & Hunt, 1994; Bendapudi & Berry, 1997; Garbarino & Johnson, 1999; Fullerton, 2003). The difference between commitment and satisfaction is that affective commitment is forward looking, while satisfaction is a retrospective evaluation (Verhoef, 2003). In terms of this research, it means that commitment drives customer retention.

Allen and Meyer (1990) define three main types of commitment, adding normative commitment to affective and continuance (calculative) commitment in an organizational setting. The normative component refers to feelings of obligation, the affective component is the emotional attachment, and the continuance component, similarly to calculative commitment is calculated from costs associated with leaving the company. Affective commitment is a function of the type of exchange and the level of behavioral commitment (Cook *et al.*, 2003).

Commitment is highly dependent on power balance, as large imbalances lead to low levels of commitment, while a well-balanced relationship promotes commitment relationships (Molm *et al.*, 2000). This is relevant in the case of the firm and the customer during service elimination, as during the service elimination process, there is no power balance between the two parties, particularly in the event of forced migration.

Regarding the relationship between customer retention, satisfaction, and commitment, many publications point out that satisfaction is a prerequisite of customer retention, Kotler states that *"The key to customer retention is customer satisfaction"* (Kotler, 1994, p. 20.). Gustafsson *et al.* (2005) define the three main factors of retention as composed of overall *customer satisfaction*, *affective commitment*, and *calculative commitment* and like Kotler, they see customer satisfaction as the driver of customer retention. They also use scales for measuring satisfaction, calculative, and affective commitment, and investigate the relationship between customer satisfaction on commitment and customer retention.

Hennig-Thurau and Klee (1997) construct a conceptual model between customer satisfaction and customer retention: customer satisfaction influences immediate quality, which is the immediate antecedent of customer retention. They further define the overall quality perception, as an antecedent of both commitment and trust, where commitment is the target variable.

Rust and Zahorik (1993) investigated the factors which determine retention using combined qualitative and quantitative measurement techniques, for example logit and factor analysis. They build a mathematical framework based on the defensive marketing view of market share (Fornell & Wernerfelt, 1987). The main result is that the retention rate is the most important component of market share and it is driven by customer satisfaction. This highlights also the importance of these concepts for managers, as they are directly linked with market share and the connection between satisfaction and retention.

Dick and Basu (1994) define loyalty as *"the relationship between the relative attitude toward an entity (brand/service/store/vendor), and patronage behavior"* (Dick & Basu, 1994, p. 100.).

Customer churn can be reduced primarily by enhancing customer loyalty through value analysis and loyalty drivers, and the firm can also apply membership-type relationships and use CRM systems. What often happens in the case of service elimination is that the switching costs are either too high, or when they are low, churn analysis and/or effective complaint handling is missing.

Customer loyalty can be defined based on the behavioral (stochastic approach), attitudinal (deterministic approach), and integrated approach (Oh, 1995). The behavioral view expresses that the customer's preference structure is reflected in the customer's behavior (Ehrenberg, 1988), whereas the attitudinal view assumes loyalty as an attitude (Fournier & Yao, 1997).

The wheel of loyalty (Wirtz & Lovelock, 2016, p. 459.) consists of three main pillars: foundations for loyalty (target the right customers; match firm capabilities with customer requirements; search for value, not just volume; use tiering of the customer base to focus resources and attention on the firm's most valuable customers; and deliver service quality to win behavioral and attitudinal loyalty), loyalty bonds (deepen the relationship through bundling and cross-selling; offer financial and non-financial loyalty rewards and higher-level loyalty bonds such as social, customization, and structural bonds), and reduce customer churn

(churn analysis; address key churn drivers; effective complaint handling and service recovery), increase switching costs, for example positive switching costs (soft lock-in strategies, e.g. loyalty bonds), and contractual and other hard lock-in strategies (e.g. early cancellation fees)).

Complaint handling is often related to customer loyalty, so it is crucial how a company handles it. Complaining takes place not necessarily publicly, but it is still harmful for the firm, as it might lose customers or damage a good reputation. There can be many reasons behind complaining; the first thing = necessary is to be able to organize a successful complaint handling process. It is interesting, however, that it is mostly people in higher socioeconomic levels who complain, and they tend to have also more product knowledge (Wirtz & Lovelock, 2016).

The link between loyalty and satisfaction is often studied, and although there are many contradictory views, it is still supported that customer satisfaction has an influence on loyalty (Fornell *et al.*, 1996).

Bolton *et al.* (2000) studied the link between loyalty and retention in the financial sector, also with database analysis using logistic and tobit regression. Dependent variable is a stay decision (like churn), with predictor variables relating to satisfaction and loyalty. They conclude that loyalty programs do not influence customer retention per se, but act together with other interactional variables, such as comparing the company's offers to the competition. The main effect of loyalty program lies in the fact that customers in loyalty programs are less sensitive to losses from the overall price advantages compared to competition. In this analysis, this means that loyalty programs would probably lower economic and psychological costs.

Verhoef (2003) found that affective commitment and loyalty programs have significant positive effect on customer retention, while the positive effect of satisfaction on customer retention could not be proved empirically. The relationship between satisfaction and customer retention are much debated due to different empirical results.

Aksoy *et al.* (2013) measure the relationship between overall satisfaction and loyalty intensions of mobile telecommunications customers. They found that satisfaction is an important predictor of recommendation/repurchase.

The main topics in Hungarian literature on loyalty include the clusters of loyalty (Hetesi, 2007), assessment issues regarding loyalty (Hetesi, 2002; Hetesi, 2003; Hetesi & Rekettye, 2005), and the role of trust (Simay, 2012), but as in the international literature, the connection

between satisfaction and loyalty is also studied (Hetesi, 2003; Hetesi & Veres, 2005; Bátor, 2008; Simay, 2014).

WOM (word-of-mouth) refers to informal communications between private parties concerning evaluations of goods and services (Dichter, 1966; Fornell & Bookstein, 1982; Westbrook, 1987; Singh, 1988). WOM can be positive (e.g. relating pleasant, vivid, novel experiences, recommendations to others), neutral, or negative (relating unpleasant experiences, rumor, private complaining) (Anderson, 1998).

Regarding WOM, Anderson (1998) measures the effect of customer satisfaction on loyalty and WOM. They used a utility-model of WOM and data from Sweden and the USA. The results show an asymmetric U-shape figure: highly dissatisfied customers engage in higher WOM than highly satisfied ones, but these are the highest values. They also found that negative communication has a greater effect on WOM than positive communication. They suggest that it would be important to understand the differences across product and service categories. Regarding this, this research contributes to the analysis of the effect of service elimination on WOM in relation to satisfaction in the telecommunication sector.

Affective commitment influences WOM activity (enthusiasm and detail) and WOM praise (favorableness) service quality positively relates to WOM praise and negatively relates to WOM activity (Harrison-Walker, 2001).

Customer satisfaction is affected by cause of failure and perceived distributive and interactional justice during a service recovery. Further, in the case of a service failure, satisfaction (complaint) levels are higher (lower) after service recovery efforts compared to situations, when no service failure occurs (Hocutt *et al*., 1997). This means that firms can have a serious effect on customer complaining, depending on how firm reacts to a service failure.

Usage intensity in telecommunications is measured by minutes of use per month (Bolton & Lemon, 1999). Knowledge and expertise are both indicators of usage intensity (Wangenheim, 2004).

Interaction intensity between the firm and customer is positively related to frequency of usage. Thus, direct communication is a predictor of future service behavior and upgrading. (Venkatesan & Kumar, 2004). Thus, firms should move their customers toward direct communication (Wangenheim, 2004).

The strongest motivations for firms to deal with service elimination is saving revenue and fostering innovation. The link between service elimination and these performance KPIs is not always clear, which reduces engagement in service elimination strategies. Although in case of product elimination, the effect has been defined: *"product additions may contribute to an increase in sales volume and profits; product elimination, likewise, may not only eliminate unnecessary costs associated with 'weak' products, but may also result in increased total sales revenue and profits through reallocation of resources to more productive efforts"* (Avlonitis, 1986, pp. 1-2.).

Harness (2004) found that in the case of financial services, elimination success is grouped into three main areas: financial performance related benefits (elimination improves product area profitability, removes risk and cost), management and product delivery related benefits (elimination removes product duplication, enables a new product to be launched, frees management time, improves sales efficiency, improves the balance of sales portfolio), and customer related benefits (elimination removes a confusing product for the customer, and removes a high level of customer complaints).

2.3.6 *THEORIES EXPLAINING THE IMPACT OF SERVICE ELIMINATION ON CUSTOMERS*

As the literature review showed, there is a research gap in the post-elimination success factors of service elimination customer perspective studies. To appropriately address this issue, attention now turns to those theories that explain the impact of service elimination on customers.

There are basically two directions in the literature to assess any kind of customer experience related to a service: the first approach is social exchange theory that uses costs to estimate the effect of the certain event on customers, because these costs are the measurable part of the experience and have a great influence on customer evaluation. Costs primarily include economic costs that express the direct monetary effects of change, and psychological costs that include all, sometimes hardly or non-measurable parts of the total costs related to the change, such as time, effort, and feelings of loss or anxiety.

The second approach is justice theory that relates to social exchange theory, as it assesses the evaluation of the customer following the customer experience, but uses a somehow broader concept to explain the changes, and whether the whole process was fair.

This fairness has various dimensions, but the three most common elements of fairness are distributive, procedural, and interactional justice. Some interrelatedness with social exchange theory can be found, as distributive justice – like economic cost – measures monetary changes during the event, whereas procedural justice captures impressions related to the process, and interactional justice refers to the quality of interaction perceived by the customer.

These concepts are now introduced in detail.

2.3.6.1 *SOCIAL EXCHANGE THEORY*

Homans defines social exchange (1958) as *"an exchange of goods, material goods but also non-material ones, such as the symbols of approval or prestige"* (Homans, 1958, p. 606.). Blau (1964) adds that it *"involves favors that create diffuse future obligations (...) and the nature of the return cannot be bargained"* and *"only social exchange tends to engender feelings of personal obligations, gratitude, and trust; purely economic exchange as such does not"* (Blau, 1964, pp. 93-94.).

This gives an explanation for the phenomenon that during social exchange there are psychological costs besides economic costs, and it also helps to describe their effect on customer retention. These costs are used to measure the impact of service elimination on customers. Further, social exchange can assist in understanding mediating variables between procedural and interactional justice that have an impact on customer reactions (Masterson *et al.*, 2000). Social exchange during service elimination refers to the relationship between the service provider and customer.

Social exchange theory links to the exchange paradigm view, where the goods are being exchanged; the value, utility or reward associated with the goods can be either personal or market related and can change through time and negative value is cost; a transaction and at least two actors are involved (Carman, 1980).

These explain that, in social exchange, psychological costs are also present besides economic costs, and they influence customer retention. These are used to measure the effect of service elimination on customers. Social exchange might also help to understand the mediating variables between procedural and interactional justice on customer reaction (Masterson *et al.,* 2000). In the case of service elimination, social exchange refers to the relationship between the service provider and the customer.

Social exchange theory is linked to social status, influence, social networks, fairness, coalition formation, solidarity, trust, and affect and emotion (Cook *et al.*, 2003). For us, the connection between social exchange theory and fairness is the most relevant, which emphasizes the emotional side of exchange (Jasso, 2006).

According to Homburg *et al.* (2010) *"eliminating a product may result in severe economic and psychological costs to customers, thereby seriously decreasing customer satisfaction and loyalty"* (Homburg *et al.*, 2010, p. 531.).

Economic cost "reflects the degree of a customer's perceived economic burden and expenditures due to the product elimination" (Homburg *et al.*, 2010, p. 533.). *Psychological cost* is perceived as the cost stemming from social exchange (e.g. staff-customer relations) that appears over the course of time and the uncertainty/risk of the unused brand, because the customer perceives a high risk regarding a brand they have never used (Sharma & Patterson, 2000). Risk exists especially in services, where customers prefer a rival service provider, because service quality cannot be evaluated before purchasing (Sharma *et al.*, 1997). The concept of psychological costs has relevance in the case of service elimination, when due to service elimination, the customer is exposed to evaluate the competitor's offer. This uncertainty about the migration decision involves a service evaluation risk for the customer and the risk of churn for the company.

Foa and Foa (1974; 1980) describe the difference between *economic* and *psychological costs* as follows: economic costs and benefits are the 'hard factors' of an exchange; psychological costs and benefits represent the 'soft factors', such as reliability, flexibility, and cooperativeness.

The relationship between service elimination and customer satisfaction also affects customer retention: *"psychological costs of the elimination reflect the degree to which the customer becomes uncertain about the eliminating company owing to the product elimination, as the elimination can raise customer doubts about the wisdom of engaging in a business relationship with this company"* (Homburg *et al.*, 2010, p. 533.).

Switching cost is the sum of economic, psychological, and physical costs (Jackson, 1985). The economic or financial switching cost is a sunk cost which appears when the customer changes their brand, for example the costs of closing an account with an operator and opening another with a competitor (Klemperer, 1987).

Economic and psychological costs are related to the concept of switching costs, which include not only those costs that can be measured in monetary terms, but also the psychological effect of becoming a customer of a new firm, and the time and effort involved in buying a new brand (Klemperer, 1995; Kim *et al.,* 2003). In this sense, service elimination might make customers get involved in a situation like this: If the new offer is not acceptable to them, the customer should consider other alternatives by competitors, where switching costs influence this decision.

Social exchange theory gives the foundation of service-elimination-related costs for the customer that significantly influences the final outcome of service elimination. In this way, social exchange theory helps to understand customer reaction following service elimination.

2.3.6.2 *JUSTICE THEORY*

In the following part, the main findings about the application of justice theory in the field of service failures are summarized and their relevance in terms of service elimination highlighted.

Justice theory is a relevant service marketing concept in this research, which was mostly applied in the case of service recovery (Andreassen, 2001; Wirtz & Mattila, 2004). It is seen as a tool for customer loyalty. Boshoff *et al.* (2000) define service recovery as follows: *"Efforts made by the firm to return aggrieved customers to a state of satisfaction following a service failure"* (Boshoff & Allen, 2000, p. 63.). Although service elimination is not a service failure, very similarly, it can involve a negative customer attitude and complaints that might lead to customer churn, if service elimination is not handled adequately.

To assess the effect of service elimination, three types of fairness in justice theory are relevant: distributive, procedural, and interactional fairness. Distributive justice refers to the outcome, while procedural justice is the sum of processes, policies, and rules (Smith *et al.,* 1999). Interactional fairness includes apology, perceived helpfulness, courtesy, and empathy of the service staff (Wirtz & Mattila, 2004).

Distributive justice is sometimes called outcome justice, as it refers to the restitution or compensation that a customer receives. This is not only compensating the failure of the service, but the time, effort, and energy during the whole process of service recovery as well (Wirtz & Lovelock, 2016). Procedural justice affects interactional justice that influences

outcome justice, which altogether create customer satisfaction with the service recovery (Tax & Brown, 1998).

The effect of justice theory on satisfaction and commitment is often studied within an organization (McFarlin & Sweeney, 1992; Moorman *et al.*, 1993; Martin & Bennett, 1996; Bakhshi *et al.*, 2009), but also in relationship between the organization and the customer (Tax & Brown, 1998; Smith *et al.*, 1999; Davidow, 2003). Our study relates to the latter.

Other areas of research include the connection between justice theory and more favorable repatronage intentions and decreased likelihood of negative WOM (Blodgett *et al.,* 1997). Another relevant research issue concerns the combination of service recovery tools. Based on Wirtz and Mattila's results (2004), compensation is not always required due to procedural and interactional justice: in the case of service failure, an immediate recovery and apology makes compensation unnecessary; however, compensation has no impact when the customer perceives procedural and interactional injustice during the process.

Compensation only had an influence on customer satisfaction, when either an immediate recovery happened without apology or a delayed reaction with apology. This means that an immediate recovery with an apology without compensation might be the most satisfying and cost-effective solution for companies.

According to justice theory, it is possible to differentiate between customer perception regarding moral principles (what should have happened) and how it would have felt in terms of distributive, procedural and interactional justice (McColl-Kennedy & Sparks, 2003).

Justice perception is affected by organizational response (compensation, favorable employee behavior, organizational procedures), and influences post-complaint satisfaction that influences customer behavioral intentions (loyalty and positive WOM) as shown in Figure 7 (Gelbrich & Roschk, 2011). These variables are used to assess the effect of service elimination on customers.

Figure 7. Meta-analytic framework for post-complaint behavior
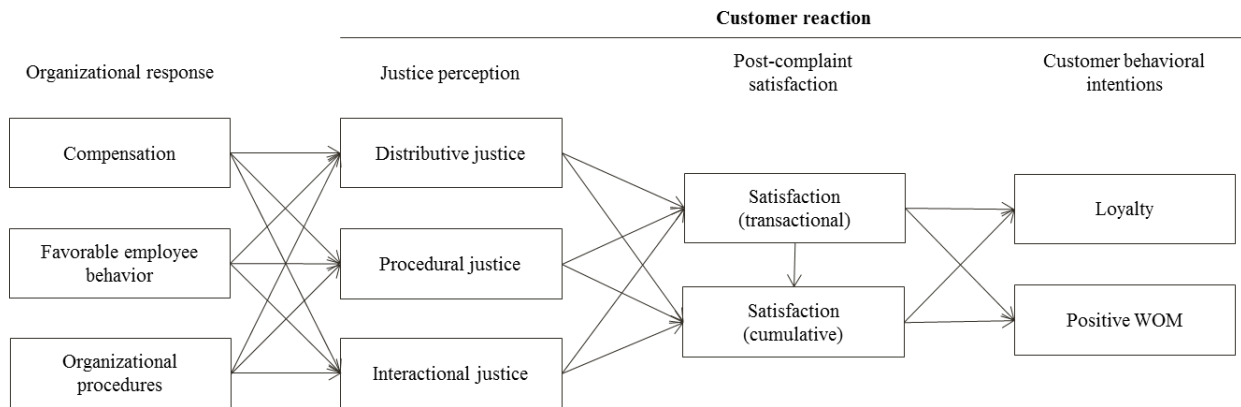
Source: Gelbrich & Roschk (2011: p. 25.)

The use of service recovery tools and the underlying justice theory contribute to the understanding of customers' complaining behavior, which is also a potential consequence in the case of service elimination and might affect churn. Overall, it can be concluded that the understanding of service recovery and justice theory helps us to get a better insight into the way (fairness) service elimination is implemented and the reasons why it may have a positive or negative attitude on customers.

2.4 TELECOMMUNICATIONS

Telecommunications customers are in a sense the same as any other customer in a service setting, like the financial sector, for example, because the purchase is determined by services properties described according to the HIPI principle (Zeithaml *et al.*, 1985). The service products themselves are only different, and thus, usage patterns might differ. Thus, the aim is to identify what are those areas where service elimination in telecommunications could be dissimilar to service elimination in the financial sector, which is the most common context to study service elimination in the literature. One highlighted difference is that the customer's long-term relationship with the operator once connected to a telecommunications network is of greater importance in terms of the success of the company compared to any other industry sector (Gerpott *et al.*, 2001). This can be due to network effects, noting that the role of this is becoming less significant in stagnating markets.

Section 1.3 explained how telecommunications is an ideal service sector to study service elimination, both due to limited research in the area, and growing significance from practice. To combine service elimination with telecommunications, this section provides an

overview of the general telecommunications literature, focusing on common concepts with service elimination.

The telecommunications industry is used as a field of study for this research, because the practical relevance of the topic: on the one hand, telecommunication operators have difficulties finding the most suitable service elimination strategies without losing existing customers and revenue; on the other hand, it is a challenging decision for customers that affects their everyday life. Second, short life-cycles of services in telecommunications make service elimination a more common practice than before. It is an important issue, and with the large customer databases of companies, the process and its outcome could be significantly enhanced. The telecommunications industry is suitable for service elimination analysis; it is ideal to understand the special characteristics of services during elimination. Knowledge gained from the financial services sector and some multi-sector studies could be broadened.

Telecommunication services *"refer to basic telephones or computers with Internet access in emerging market countries, broadband Internet access in developed countries, and computer-based applications of telecommunication services"* (Ramírez & Richardson, 2005, p. 298). Telecommunication services contribute to social, economic, and livelihood dimensions that are interrelated (Hillier, 2000).

Based on the Hungarian telecommunications market, the trend is clear: voice subscriptions are strongly declining (Analysis Mason, 2014) with basically constant market shares by the three operators (Telekom, Telenor, and Vodafone). With regards to churn in the Hungarian market (not in service elimination situations, but normally), the National Media and Infocommunications Authority publishes several results (NMIA, 2013). It is quite surprising that the pre-post migration is very low, only 2%. Five percent of the clients terminated their subscription; 4% changed because another operator's offer was better. Regarding client migration, the ratio of new entrants is very low (1%). Migration is rather typical of those who already have a subscription, but the vast majority does not migrate. This also signals that service-elimination-related churn cannot be assessed based on churn models used in normal situations, because they might not include all relevant factors in terms of customer reaction that determine the final outcome of service elimination.

Price-independent churn in telecommunications is between 2 and 4% monthly (Aydin & Özer, 2005), which means a huge amount of lost revenue. Palmer (1998) brings the example of Orange, where the acquisition cost of every new customer was £256, and decreasing the

churn rate from 20% to 10% would have resulted in annual savings of over £25 million. Although voice trends in telecommunications have been changed ever since, the acquisition costs of a new customer today is approx. $315 (Entrepreneur, 2017). Thus, churn management in telecommunications is crucial, not only due to the high acquisition costs, but also due to stagnating markets.

These trends show the difficulty of acquiring new clients, which is possible only if operators convince clients to change their current operator or strengthen retention strategies, the latter which has an increased value under these market conditions. Therefore, it is important to examine consumer preferences as accurately as possible to make service elimination an effective tool of retention, noting that operators should no longer focus only on acquisition, but more on retention.

The literature suggests that the overall customer satisfaction has a significant impact on customer loyalty that influences customer retention. Further, mobile service price, personal service benefit perceptions, and number portability are identified as supply-related variables with the strongest effects on customer retention (Gerpott *et al.*, 2001).

In stagnating markets, such as the CEE region, operators must create new types of portfolios in which the role of service elimination will be key: service elimination is a prerequisite of portfolio innovation, which means that eliminating services enables the redesign of the whole service portfolio, although it is a neglected area in practice.

2.4.1 PROFILE OF THE TELECOMMUNICATIONS MARKET IN THE CEE REGION

This study uses the CEE telecommunications market as a context, primarily analyzing the telecommunications characteristics of service elimination, and not giving overall results for the region. Still, however, CEE characteristics determine some aspects of the study's conclusions, most specifically due to the saturated nature of the telecommunications market in the CEE. Countries in this region share some features, which were established during the formulation of today's telecommunication markets. The entrance of market players on the market and market dynamics have a significant effect on how the strategies of operators should be built to sustain competitive advantage. Today's trend of acquisition seems to be outdated, due to the declining number of potential new customers in the market. Retention should have a bigger role, which is also seen as a key priority of service elimination.

The contribution of telecommunication to total GDP was around 1% in Czech Republic and Hungary in 1995, which was well below the OECD average (above 2%) (International Telecommunications Union, 1995). Telecom service revenue is expected to decline to 1.2% of the CEE region's nominal GDP in 2019 (2.1% in 2013), which is mostly due to market maturity similar to Western Europe (Analysis Mason, 2014).

As in the case of other innovations, an increasing number of firms in the telecommunication markets accelerated the diffusion of innovation, which is well-grounded in economic literature (Reinganum, 1989). The telecommunications industry also started from the natural monopoly state, but the switch from analog to digital transmission technology widened the size of the market (Calhoun, 1988).

At the beginning, price setting resulted in insufficient resource allocation in the telecommunications sector due to political objectives. Simultaneously, the quality of service was very poor, with high call-failure rates, frequent breakdowns, and long waiting times. Revenue per line was low, and price was not adjusted to costs. The reasons behind this led mainly to the Communist views of the telecommunications sector as not being a productive one (Lüngen, 1995) and that was further aggravated by restrictions (Coordinating Committee for Multilateral Export Controls- COCOM) and currency shortages. Thus, the needs of private users were neglected. Since the fall of Communism, significant effort has been made to modernize the infrastructure but still, the number of mainlines per 100 inhabitants were way below in the CEE region (35 by 2000) compared to the EU average (51 in 1997). The customer expectation of low price levels also shaped the telecommunications environment in the CEE region. Since the era of fixed lines has vanished, mobile telecommunications technology has enabled lower entry barriers for providing telecommunications services, and thus markets have been moved toward a competitive setting from a monopoly. This change was primarily advanced by digital technology from analog (Gruber, 2001).

Looking at the evolution of technologies, the CEE region was applying the same analog system in every country, in comparison with Western European countries. At the beginning of 1990s, however digital, technology was emerging, which was the driver of digital expansion. In the EU, digital technology had two-thirds of the market by 1997, instead of less than half of the market in 1995. There was a big fluctuation between penetration rates among CEE countries, however (Gruber & Verboven, 2001).

What is interesting in terms of today's market structure is that GSM (Global System for Mobile) technology was introduced in most of the CEE countries in the form of duopoly (in Slovenia and Bulgaria there was only one operator, and in Estonia three). The form of entry, however, determines the level of competitiveness, and in all the countries there was a sequential entry, not a simultaneous one (Table 5). This explains the one dominant operator in each country, and the obstacle for other players to gain market share. This has a serious effect on the inefficiency of acquiring new customers in many cases. Under such market circumstances, the role of retention should be vital, but still, acquisition is the main focus of operators. This has an important implication in terms of eliminating services: due to several insufficiencies in the process lost customers might not be acquired again, or only at high levels of costs.

Although the benefits in case of a simultaneous entry could not be verified, there were considerable asymmetries in various countries, for example Hungary, Poland, Romania, and Slovakia (Gruber, 2001).

Table 5. Starting dates of mobile telecommunications firms in CEE

	Analogue	GSM 1	GSM 2	GSM 3
Bulgaria	December 1993	September 1995		
Czech Rep.	September 1991	July 1996	September 1996	
Estonia	January 1991	September 1993	January 1995	May 1997
Hungary	October 1990	March 1994	April 1994	
Latvia	October 1991	January 1995	March 1997	
Lithuania	February 1992	March 1995	October 1995	
Poland	June 1992	September 1996	October 1996	
Romania	May 1993	April 1997	June 1997	
Slovak Rep.	September 1991	January 1997	February 1997	
Slovenia	October 1990	July 1996		

Source: Gruber (2001: p. 26.)

Today's trends move from 2G, 3G, and 4G to the yet partly unknown benefits of 5G. Ease of access is no longer an issue, rather how can service firms transform their service portfolios to meet current challenges. Voice trends are becoming irrelevant; data revenues are estimated at 25% (Analysis Mason, 2014), and it is growing rapidly.

The question is, how can telecommunication operators survive in such saturated markets? Customer loyalty is driven by customer satisfaction and switching barriers (Kim *et*

al., 2004), which can be considered as soft and hard factors of loyalty. Customer satisfaction is determined by service quality (call quality, value-added services, customer support) and switching costs (loss cost, move-in cost, interpersonal relationship) (Kim *et al.,* 2004).

The answer probably lies in combining these two, but as the relation of service elimination to service research priorities has highlighted, service innovation combined with co-creation defines today's strategies, so telecommunication operators probably should follow this direction. Telecommunication services, however, have many special attributes that determine customer loyalty, one of them is the short service life cycle that is strongly connected to innovation.

2.4.2 *SERVICE LIFE CYCLE*

Service life cycle has a significant effect on how and when service elimination happens, so it is relevant in terms of this research in telecommunications.

The product life cycle model was originally developed for products, not services (Abernathy, 1978; Abernathy & Utterback, 1979; Utterback, 1994). The model differentiates between three phases of maturity of a new product: fluid, transitional, and specific (Utterback, 1994). The fluid phase is separated by the dominant design from the transitional and specific phases. Dominant design is considered a result of choices of producers and/or customers. It has two aspects: a technical aspect relating to the dominant configuration of the product or service, and a functional one relating to the product feature preferences of users (Cusumano *et al.,* 1992). In the transitional phase, firm orientation changes to process innovation from product innovation, and in the specific (mature) phase, competition focuses on differentiated products or services (Cusumano *et al.,* 1992; Van Den Ende, 2003).

Based on this, a new service of a mobile operator can be considered to be in the fluid phase, when it offers such new features that it creates a new market (e.g. location-based services). Transitional- or mature-phase developments include close copies of existing services that are already offered on other channels (e.g. electronic telephone book). Technological and market uncertainty are highest in the fluid phase, and lowest in the mature phases. Another aspect of the life cycle perspective is the urgency in product and service development. Urgency refers to the need for the innovator to develop products in a timely manner to acquire the dominant design (Lambe & Spekman, 1997). Telecommunications is

defined as a high uncertainty and high urgency market during the fluid phase (Van Den Ende, 2003).

Service management in telecommunications involves the creation, supervision, update and removal of a service (Brunner & Stadler, 1999), which is linked to the service life cycle (SLC) including the phase of design, negotiation, provisioning, usage, and deinstallation (Garschhammer *et al.,* 2001). Specification of required functionality, Quality of Service (QoS) parameters, cost assessment, potential customers (gross adds, migrations, and churn), returns and costs are estimated in the design phase. After the service is created, the service is offered for the customer starting with the negotiation phase, when all usage parameters are discussed (e.g. price plans, discounts, QoS, penalties). The service is installed during the provisioning phase, which means implementation, configuration, and testing of the service, and ends with the statement of acceptance signed by the customer. Usage phase includes operation, which describes all the services required for supporting the normal use of selected service (support, monitoring, maintenance, reporting, billing, etc.), and change that affect service functionalities, quality, or other parameters. Changes in the original contract might require an additional service agreement. The last phase is deinstallation, which is the end of the service by removing complete implementation and releasing involved resources (Garschhammer *et al.*, 2001). Service elimination deals with the deinstallation phase only.

Yelmo *et al.* (2007) add the tasks of the deinstallation phase, which they call service withdrawal: deactivation, unpublishing, deregistration, unprovisioning, and physical uninstallation. They do not define service elimination among the reasons behind withdrawal, only substitution or evolution of service is supposed.

Shortening product and service life cycles dominate the global economy that results in rapid product-innovation cycles and increasingly complex manufacturing and supply-chain partnerships. New technologies are also accepted more rapidly in the mobile phone industry and replaced more frequently than other technology markets, creating short product life cycles (Wu *et al.*, 2006).

3 METHODOLOGY

"It's never enough to just tell people about some new insight…
Instead of pouring knowledge into people's heads,
you need to help them grind a new set of eyeglasses
so that they can see the world in a new way.
That involves challenging the implicit assumptions that
have shaped the way people have historically looked at things."
(John Seely Brown, cited in: Wirtz-Lovelock, 2016: p. 4.)

After discussing main concepts related to the research and gaps in the literature, the rationale behind the conceptual framework and research questions are explained, followed by hypotheses and research methodology that consists of three studies.

3.1 CONCEPTUAL FRAMEWORK

Based on the literature review a conceptual framework of service elimination is proposed, which could be used as the basis of research methodology formulation (Figure 8). The literature review concluded that service elimination has three main phases: causes, process indicators and consequences of service elimination.

A broader conceptual framework is used to have an overview of the antecedents, process and impact of service elimination. Antecedents of service elimination include causes (e.g. sales drop, low margin rates, new product portfolio launch, shorter service life-cycles, mother company decision, etc.), and triggers (e.g. technology, global trends). Antecedents affect service elimination characteristics (e.g. service elimination process, strategic level service elimination, customer handling, economic and psychological costs, enforcement of justice elements, etc.) that have an impact on both customer (churn, satisfaction, loyalty, affective and calculative commitment, WOM) and firm (customer management, maintenance and development costs, management and sales effort, resource management, service portfolio performance). Barriers (e.g. legislative environment, government regulations, refurbishment of out-dated services, long-term contracts) moderate the relationship between antecedents of service elimination and service elimination characteristics.

Impact on customers and firm have a key role in service elimination research, because these are the areas, where the success of service elimination can be principally measured. In our research the focus is on the impact of service elimination on customers.

As it was emphasized by the definition of service elimination, full elimination is measured, not partial, so success is defined as the ratio of customers staying with the company after elimination.

Figure 8. Conceptual Framework of service elimination
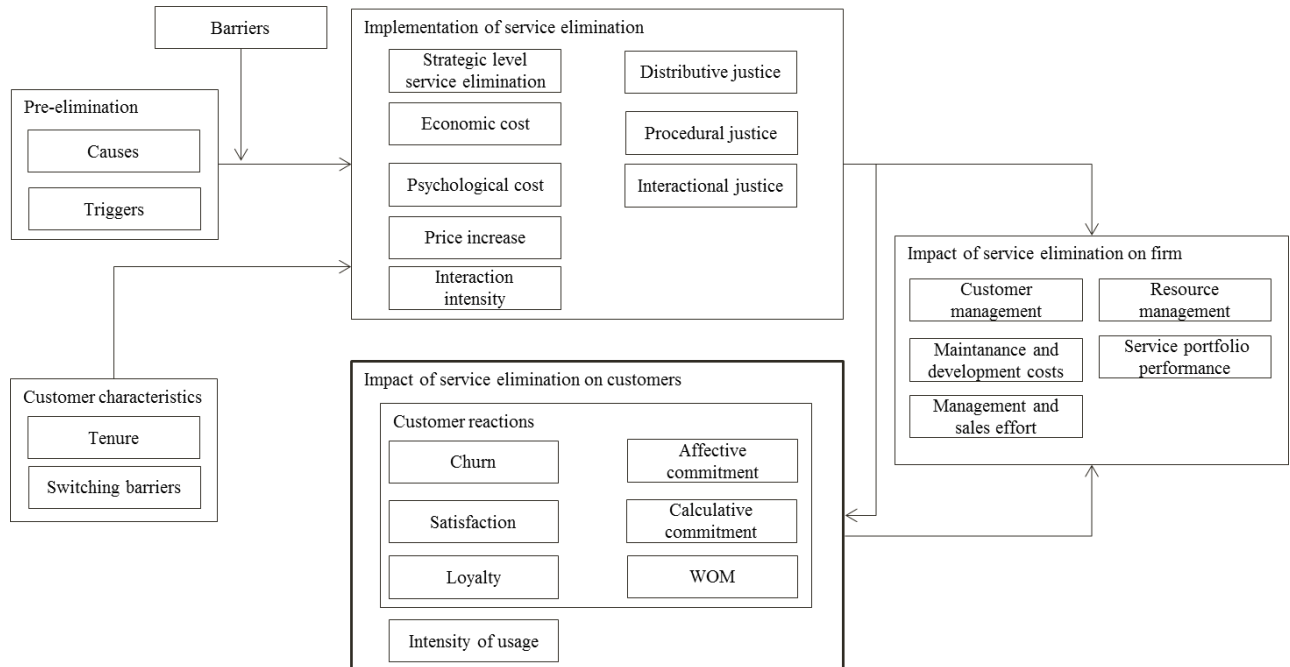
Source: Own construction

3.2 CASE STUDY: QUALITATIVE RESEARCH

There are only a few empirical studies in the area of customer reaction to service elimination, therefore, before conducting an empirical analysis, a case study was designed to reveal the main aspects of the topic. Thus first the case study results are presented that are used in the formulation of the methodology. We intended to understand, whether it is a situation involved with risk of losing customers for companies, what are the causes of service elimination strategies, and then how the whole process is built up. So the aim of the case study is to analyze service elimination strategies, through the example of the telecommunication industry, because it is ideal to understand the special characteristics of services during elimination. Main causes of service elimination at a strategy level are analyzed with in depth interviews. The qualitative research is suitable to understand causes, process and the output of service elimination. We aim to reveal main concepts, problems during the process, which helps to develop the success of service elimination.

In the Hungarian telecommunications sector, the competition is very though on the basically stagnating market, the total rearrangement of current portfolio might be the only solution for increasing sales and revenue. Telecommunication operators cannot introduce new solutions, until capacity is locked for supporting out-of-date tariff plans. Therefore, service elimination has a central role in reaching new sales targets of the operators.

Before conducting the case study, a secondary research phase was constructed with the aim of analyzing internal company data of the telecommunications operator, including documents describing the service elimination process.

The primary analysis of the qualitative research is an in-depth interview technique with semi-structured questionnaires. The reason for this choice is that certain questions should be asked to discover main mechanisms here, but it is important to keep it wider than a questionnaire, because it might turn out during the interviews that there are new directions brought up by the respondents, which are worth to investigate in more detail.

The case study was carried out in January 2014 at Hungarian telecommunications operator including 3 in-depth interviews with managers as interviewees, who have been involved in one of the biggest tariff simplification project of the company in 2012-2013 (guidelines are in Annex 1.).

The case study intended to get first-hand information from Hungarian telecommunications operator about their last bigger service elimination project. As it was shown in the Conceptual Framework, we were first interested in the causes and process of service elimination (see Figure 8.).

There were not many publically available sources for investigating service elimination in a telecommunications environment, so the interviews provided the first possibility for us to gain insights about the whole service elimination process at the company.

The *first interviewee* was a Portfolio Manager at a Hungarian telecommunications operator, who is organizing regular governance meetings, required to approve a new portfolio. There are detailed processes behind a new service portfolio launch, and the decision committee consists of Head ofs, and in the last round the GMT (General Management Team) approves or rejects the proposal.

So we were first interested whether there is a similar process behind service elimination. It turned out that service elimination is treated on an ad-hoc basis and there is no such management forum to decide about the eliminated tariffs:

"The decision about the elimination is usually made by one person."

"We needed to launch the tariff simplification project mainly because the offer [tariff in the billing systems] testing and the maintenance is very costly, we have about 2500 offers currently."

"The customer might decide to terminate the subscription if we ask his/her tariff preferences after elimination."

(Portfolio Manager at a Hungarian telecommunications operator)

He suggested some research directions for us: the ARPU (average revenue per user) change is not calculated between the original service and the service after migration; churn is very high that should not be accepted even in case of service elimination; goals are not clearly defined during the service elimination process. These suggestions were involved in the quantitative research.

Another issue came up, when the process behind elimination was analyzed: the current model –which aimed to determine the most suitable service package for the customer after elimination- had an 11% success ratio only. 11% means that 11 customer out of 100 migrated to the service package predicted by the model.

The model in this project used the following dependent variables, which could be extended in the churn model by taking additional explanatory variables (see Chapter 4.4.): service monthly fee + monthly fees of supplementary services – discounts + (traffic- traffic allowances [minutes or data included in the service] - offer allowances) + paid amounts.

To better understand the exact problem here, a *second interview* was made at the Customer Value Management (CVM) field at the company, with the Planning and Commercial Manager, who prepared the service migration model during the project.

He also emphasized that the main causes of the elimination were due to high costs and maintenance issues of the existing services in the billing system. What regards the causes of service elimination, he had very straightforward answers, similar to our previous interviewee.

"The tariff [service] simulation model created the pricing of all available tariffs based on the calling habits of the customers."

"The 11% success ratio is due to the low response rates in the communication part of the elimination process: telesales can reach ca. 60% of customers affected, where we had an

unexpectedly high response rate of 20-30%. The rest of the customers is contacted by DM letters, where there was only a 2% success rate."

"The eliminated tariff [service] is usually old, so there is no business rationale to keep it; there are very few subscribers; or based on the tariff profitability calculations the margin is very low; or in most cases there is a new portfolio to be launched."

(CVM Planning and Commercial Manager, Hungarian telecommunications operator)

He mentioned also that segmentation needs to be used among customers, because according to their life-cycles very different tools might be required in the case of service elimination: the most dangerous segment consists of those customers in this sense, who are in contract with the operator for more than 2 years, because with the eliminated tariff they do not have to pay penalty for terminating the contract. Thus, those customers already out-of-contract (which is in Hungary usually 2 years, but in other countries it can be 1 year or without contract) have higher probability of churn. Tenure and switching barrier variables in Study 3 are used to differentiate between these customers.

He gave us suggestions in terms of the model: a potential development direction could be to build the migration model on usage instead of revenue, because out-of bundle usage was usually higher than the in-bundle usage (customers were spending more on average than the usage included in their tariff plans). In Study 3 usage data is incorporated as well to predict churn status.

He also helped us to better understand the quantitative model: the 11% success ratio is not due to modeling issues (the model determined the most suitable new tariff after elimination within a 5% confidence interval), but nonetheless, the customer decided to leave. This was an important message for us that we should focus on the customer side within the quantitative part of our research (Study 1 and 2), besides the churn model.

The questions about the process itself highlighted important problems: there remained many customers, who could not be reached by the company. They had to be force migrated to the basic service package (which has very unfavorable conditions, high price per minute prices and high monthly fee), where the churn was around 20-30%. This also draws the attention on churn reduction following service elimination.

We were interested in the process issues more, so we organized the *third interview* with the CVM SOHO Manager at the company. She talked about the process in detail, which shed light on the causes of the high churn rates:

"The customer first receives a notification letter, 60 days before the elimination. If the customer has not replied to this, he/she gets automatically migrated to the base tariff after 60 days. This involves huge number of complaint handling, because in such cases we have to verify that they did receive the notification at least two times, or that the recommended tariff was not good."

(CVM-SOHO Manager, Hungarian telecommunications operator)

It was clear from our conversation that the customer is very frustrated during the whole service elimination process. Posting service is probably not the best method to notify the affected customers, because they recognize the problem only after the forced migration (receiving significantly higher invoices), which results in immediate churn. This means that it should be necessary to change communication tools usage as well during the process. Further, service elimination needs to be properly assessed as a retention strategy and not handled as a normal lifecycle event.

Based on the case study carried out during January 2014 at a Hungarian telecommunications operator, some critical points during the process were identified, which gave the foundation for our hypotheses for Study 3. First, the call of telesales is not a mandatory element in the CVM-based process, there is an option of e-DM as well, which increases the psychological cost (meaning late notice as it was used as a variable in the experimental design in Study 1) of the customer (Figure 9). This letter raises the uncertainty of the customer, and there is an option of forced migration, which is usually unfavorable for the customer. In practice, customers are many times shocked, when they receive the first bill of the force migrated service package, and due to its usually unfavorable conditions compared to their current service package, they immediately end their subscription. This part of the process is seen as a factor increasing potential customer churn.

The discrepancies perceived during the in-depth interviews at the company are clearly shown on the process diagram (Figure 9). The process used in practice contains a risky element: if customers is notified by an e-DM and are not open to migrate, they are force migrated to the basic service package that is the least favorable offer for the customer in most

cases causing both economic and psychological costs for the customer. As a result, due to forced migration the potential of churn is much higher in these cases.

Figure 9. Process of service elimination
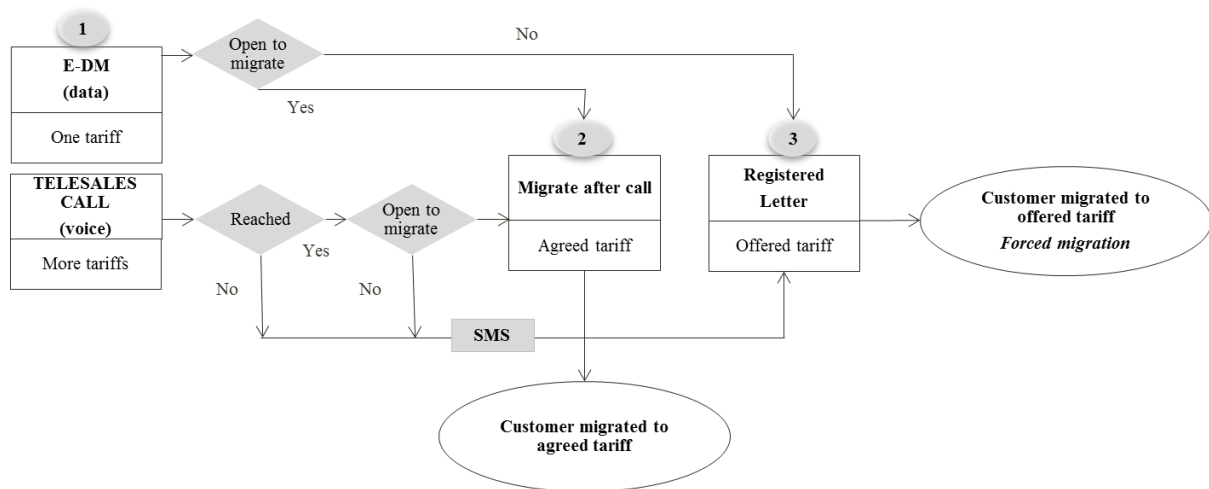
Based on the results of the case study the following hypothesis is formulated:

Churn rate during service elimination is higher than normal churn rate.

The case study showed that there is a need from practice to reduce customer churn in case of service elimination, which requires service elimination processes to be better adapted to customer's needs and an improved model of determining the customer's suggested service package after elimination is also needed.

So the case study has three main implications:

- Success-factors of service elimination are relevant to study from a managerial perspective;
- Within success-factors, there is a need from practice to design a better model for determining the customer's new service package that is leading to decreased customer churn;
- Service elimination process needs to be better adapted to customer's needs and treated more as part of retention in order to reduce customer churn.

As the case study highlighted, the topic is relevant for further analysis, especially regarding customer retention and churn. Study 1-3 were planned accordingly.

The case study is limited in a sense that it consisted of only three in-depth interviews at one Hungarian telecommunications operator, which could be extended with more insights

from other operators. However insights on causes and process of service elimination were gained that form the basis of further research.

3.3 RESEARCH QUESTIONS AND HYPOTHESES

Based on the literature review and case study results the following research questions were formulated:

1. How can social exchange theory be applied to explain customer reaction (churn, satisfaction, loyalty, affective and calculative commitment, WOM) following service elimination?
2. How can justice theory be applied to explain customer reaction (churn, satisfaction, loyalty, affective and calculative commitment, WOM) following service elimination?
3. Is churn higher in case of service elimination compared to normal churn rates?
4. How post-elimination churn is influenced by service elimination characteristics and customer characteristics?
5. How post-elimination usage intensity is influenced by service elimination characteristics and customer characteristics?

As each of our research questions requires different methodology, our research was designed accordingly:

- Research Question 1-2: quantitative methodology- experimental design based on scenarios using customer survey (Study 1 and Study 2);
- Research Question 3-5: quantitative methodology- database analysis using Heckman sample selection (Study 3).

Based on the literature review and conceptual framework, three studies were implemented to answer our research questions and test hypotheses, which will be presented in detail in the following sections.

The objective of Study 1 is to get a better understanding of consumer reaction following service elimination in a telecommunications context using social exchange theory to investigate the impact of service elimination on customers.

To the author's knowledge, existing literature has not linked social exchange theory in the context of the outcome of service elimination focusing on customers yet, this study can provide empirical results and thus contribute to this significant gap in the literature. A broad range of dependent variables is used as the goal of the study is to explore various aspects of customer reactions.

In Study 1, we focus on Research Question 1:

1.   How can social exchange theory be applied to explain customer reaction (satisfaction, loyalty, churn, affective and calculative commitment, complaining and WOM) following service elimination?

The economic costs of elimination reflect the financial loss or expenditure the customer faces during service elimination (Homburg *et al.,* 2010). With the increased financial burden, the customer is less satisfied with the service provider and find less value in maintaining a relationship with them , thus is more likely to churn,.

On the theoretical bases of economic cost, customer retention, satisfaction, and commitment literature, the following is expected:

Hypothesis 1: Economic cost increases churn and WOM, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.

Psychological cost refers to the reliability, flexibility, and cooperativeness of the company during service elimination (Foa & Foa, 1974; Foa & Foa, 1980) and reflects the degree to which the customer becomes uncertain about the eliminating company and has doubts about the wisdom of staying with them (Homburg *et al.,* 2010). Psychological costs represent an unpleasant inner state which in turn may lead to a decrease in trust. Thus psychological cost is expected to increase intention to churn, and decrease satisfaction, loyalty and commitment.

On the theoretical bases of psychological cost, customer retention, satisfaction, and commitment literature, the following is expected:

Hypothesis 2: Psychological cost increases churn and WOM, and decreases satisfaction, loyalty, affective and calculative commitment in case of service elimination.

Customer perception of economic cost could also be altered by psychological costs. "Hard factors" could be modified by the service provider with the use of appropriate "soft factors" (Foa & Foa, 1974; Foa & Foa, 1980), through psychological cost effects.

In order to explain the interactions between economic and psychological costs, the concepts of cognition and affect are used, which are the focus of several research studies (e.g. Oliver, 1980; LaBarbera & Mazursky, 1983; Oliver & DeSarbo, 1988; Westbrook & Oliver, 1991; Mano & Oliver, 1993).

Kempf's (1999) study suggests that for functional (vs. hedonic) products, cognitions are more important drivers of product evaluations than affect. Telecommunication is considered to be a functional service. It is also assumed that economic costs correspond to the cognitive approach, while psychological costs are rather related to affect. When economic cost is involved, cognition is likely to dominate affect, while in the absence of economic cost, affect will have a stronger impact.

It is therefore expected that:

Hypothesis 3: There will be interaction effects for economic and psychological costs in case of service elimination.

3.3.2 STUDY 2: EXPERIMENTAL DESIGN: CUSTOMER REACTIONS TO SERVICE ELIMINATION AFFECTING SERVICE ELIMINATION OUTCOME BASED ON JUSTICE THEORY

The objective of Study 2 is to get a better understanding of consumer reaction following service elimination in a telecommunications context using justice theory to investigate the impact of service elimination on customers.

To the author's knowledge, as existing literature has not yet linked justice theory in the context of the outcome of service elimination focusing on customers, this study contributes to the empirical results of justice theory also.

After the results of Study 1, churn, satisfaction and loyalty are used to explore the main aspects of customer reactions, as this is the focus of the service elimination's outcome. Other variables explored in Study 1 are not revealing core aspects of the topic (such as different dimensions of commitment).

In Study 2, we focus on Research Question 2:

2. How can justice theory be applied to explain customer reaction (satisfaction, loyalty, churn, affective and calculative commitment, complaining and WOM) following service elimination?

Three dimensions of justice are used in the research (Clemmer & Schneider, 1996): distributive justice focusing on perceived fairness of service elimination outcome, procedural justice reflecting the fairness of policies and procedures related to the production of the service elimination outcome, and interactional justice referring to the interpersonal treatment during the service elimination process.

The concept of fairness have been applied in many areas, e.g. pay raises (Folger & Konovsky, 1989), labor relations (Greenberg, 1990), legal settings (Thibaut & Walker, 1975), and in buyer/seller relationships (Clemmer, 1993; Oliver & Swan, 1989). The latter is the closest to service elimination, but they share that justice has psychological (such as satisfaction and loyalty) and behavioral outcomes (repurchase intentions, which can be interpreted as customer retention in case of service elimination) as well. These concepts are used as part of customer reactions.

Distributive justice has its origins in social exchange theory (Blau, 1964), and emphasizes the perceived fairness of the outcome of a dispute, negotiation, or decision involving two or more parties (Blodgett *et al.*, 1997). Service marketing literature suggests that distributive justice evaluations influence customer satisfaction, perceived service quality and repurchase intentions (Fisk & Coney, 1982; Mowen & Grove, 1983; Oliver & DeSarbo, 1988; Oliver & Swan, 1989; Huppertz *et al.*, 1978).

Although perceived justice to the author's knowledge is not yet linked to service elimination, it can be interpreted as a service failure, where perceived justice affects customer behavioral intentions (Blodgett *et al.*, 1997). Loyalty is defined as the customer's favorable attitude toward the electronic/mobile vendor that results in repeat buying behavior (Srinivasan

et al., 2002; Lin & Wang, 2006). In terms of loyalty, perceived justice has a positive impact on the customer's revisit intention (Ha & Jang, 2009).

On the theoretical bases of distributive justice, customer retention, satisfaction, and loyalty literature, the following is expected:

Hypothesis 4: Distributive justice decreases churn, and increases satisfaction, and loyalty in case of service elimination.

Procedural justice refers to the perceived fairness of the policies, procedures and criteria arriving at the outcome (Thibaut & Walker, 1975; Lind & Tyler, 1988; Alexander & Ruderman, 1987). A central concept within procedural justice is the speed (Clemmer & Schneider, 1996; Hart *et al.*, 1990; Kelley *et al.*, 1990), which reflects timeliness, responsiveness and convenience of the complaint handling process (Blodgett *et al.*, 1997). Negative emotional states and dissatisfaction are caused by perceived unfairness or long waiting time in service situations (Katz *et al.,* 1991; Venkatesan & Anderson, 1985).

There is a direct effect of justice dimensions (distributive, procedural and interactional justice) on retention (Blodgett & Tax, 1993; McCollough *et al.,* 2000). Justice (distributive, interactional, and partly procedural justice) affects exit-loyalty through emotions (Chebat & Slusarczyk, 2005).

On the theoretical bases of procedural justice, customer retention, satisfaction, and loyalty literature, the following is expected:

Hypothesis 5: Procedural justice decreases churn, and increases satisfaction and loyalty in case of service elimination.

Interactional justice expresses the manner in which people are treated during the process, such as with courtesy and respect or rudely (Bies & Moag, 1986; Bies & Shapiro, 1987).

Among the three elements of justice, interactional justice is the most important predictor of customer retention (Chebat & Slusarczyk, 2005; Wang *et al.,* 2011), where interactional justice affects the exit-loyalty behavior both directly and indirectly through emotions. Both procedural and interactional justice was found to have a positive effect on customer loyalty, and higher interactional justice weakens the relationship between service failure severity and customer loyalty (Wang *et al.,* 2011).

In a marketing context interactional justice was found to contribute to satisfaction with service encounters (Bitner *et al.*, 1990; Tyler, 1987), enhanced evaluation of service quality (Parasuraman *et al.,* 1985) and repurchase intentions (Blodgett & Tax, 1993).

On the theoretical bases of interactional justice, customer retention, satisfaction, and loyalty literature, the following is expected:

Hypothesis 6: Interactional justice decreases churn, and increases satisfaction and loyalty in case of service elimination.

The combination of the three dimensions of justice form the customer's overall perceptions of justice. Regarding the direction of the three elements, there are various views in the literature. Interactional justice may offset partially lower levels of distributive justice, and higher levels of procedural justice may compensate for lower levels of distributive justice (Blodgett *et al.*, 1997). Further, interactional justice and procedural justice may be complementary: judgments of procedural justice are influenced by the adequacy of procedures and the manner of treatment during the process (Bies & Moag, 1986; Tyler & Bies, 1989).

It is therefore expected that:

Hypothesis 7: There will be interaction effects for distributive, procedural and interactional justice in case of service elimination.

3.3.3   STUDY 3: DATABASE ANALYSIS: CUSTOMER AND SERVICE ELIMINATION CHARACTERISTICS AFFECTING SERVICE ELIMINATION OUTCOME AND USAGE INTENSITY AFTER ELIMINATION

The database analysis will focus on the consequences of service elimination, and more specifically: the relationship between the success-factors of service elimination and customer reaction, from which the reduced churn rate is a key issue.

The main aim of the database analysis is to find correlation between churn and service package elements and customer characteristics. As from the churn literature reducing strategies evolve, the use of Dummy variable, churn enables the use of only some marketing research and econometrics methodology.

In Study 3, we focus on Research Questions 3-5:

3. Is churn higher in case of service elimination compared to normal churn rates?

4. How post-elimination churn is influenced by service elimination characteristics and customer characteristics?

5. How post-elimination usage intensity is influenced by service elimination characteristics and customer characteristics?

Based on the results of the case study the following hypothesis is formulated:

Hypothesis 8: Churn rate during service elimination is higher than normal churn rate.

Customer retention is defined *„as the future propensity of a customer to stay with the service provider"* (Ranaweera & Prabhu, 2003, p. 381.). Two forms of retention (Dawes, 2009) include product-specific retention rate and broader relationship retention rate. Our research handles retention as a broader retention rate, because as the service is eliminated, the service-specific retention is not relevant in our case. Thus churn is defined, when the customer leaves the company due to service elimination. Due to high churn rates in case of service elimination, retention can be one of key success indicators of the process that is applied in our study.

It is acknowledged that the contract status of the customer usually is linked to customer retention (Lam *et al.*, 2004): as an in-contract status significantly increases switching costs, it can be interpreted as a switching barrier that inhibits churn, determines the success of service elimination in terms of its timing, and selection of service packages to be eliminated.

Tenure is the time that passed from the customer`s enrollment until churn (Allison, 1995), so it expresses how long is the contract between the customer and the firm. Switching barriers represent any factor that make more costly for customers to change providers, and thus they have a significant impact on loyalty (Colgate & Lang, 2001; Jones *et al.*, 2002; Lee & Cunningham, 2001). Interaction intensity in our case refers to the number of interactions between the service company and customer (initiated both by the customer and operator) during the whole period of the contract (Czepiel & Gilmore, 1987).

„Service loyalty is the degree to which a customer exhibits repeat purchasing behavior from a service provider, possesses a positive attitudinal disposition toward the provider, and considers using only this provider when a need for this service arises" (Gremler & Brown, 1996, p. 173.). Within the two main definitions of loyalty -attitudinal (Fournier, 2003) and behavioral loyalty (Kenningham *et al.*, 2007)-, the behavioral view of loyalty is followed in

our research, because it refers to churn in a measurable way, which is also directly related to customer retention.

Service firms usually offer discounts for new customers that are often not available for current customers. As a result, rational customers might assume that any low price might be temporary, which makes always profitable to choose the lowest priced firm for new customers. On the other hand, this also means that locked-in customers face higher prices. So switching behavior is determined by customer's expectations on future price levels (McSorley *et al*., 2003).

On the theoretical bases of customer retention and price increase, the following is expected:

Hypothesis 9: Price increase is associated with a lower propensity to retain customers during service elimination compared to price decrease.

Based on our hypothesis, price increase has an effect on customer retention, customers are more likely to leave the company. Bolton and Lemon (1999) suggests that reservation price is crucial in switching behavior. If the new price is lower than the customer's reservation price, then he may increase his usage, whereas if the new price is higher than the reservation price, it increases the probability of churn.

Those, who stayed at the company, usage is higher by those customers who experienced price increase, because they intend to compensate the price increase effect by higher usage levels, whereas price decrease reduces usage intensity (Bolton & Lemon, 1999). Similar effects are expected in case of service elimination, where new price is the price of the service package after elimination and the old price is the fee of the eliminated service.

On the theoretical bases of usage intensity and price increase, the following is expected:

Hypothesis 10: Price increase is associated with a heightened propensity of higher usage after service elimination compared to price decrease.

A longer relationship corresponds to customer retention (Dagger, *et al*., 2009). Dawes (2009) findings also suggest that longer relationship tenure indicates lower probability of customer churn. As he defined churn as a product-specific retention, this effect needs to be investigated whether it holds true for a broader relationship retention rate well, in case of

service elimination. However there is a gap in the literature regarding the case of service elimination (Avlonitis & Argouslidis, 2012).

On the theoretical bases of customer retention and tenure, the following is expected:

Hypothesis 11: Longer relationship tenure with a service provider is associated with a heightened propensity to retain the customer during service elimination compared to a shorter relationship tenure.

There is a well-grounded literature on the relationship between switching costs and customer retention (Bansal & Taylor, 1999; Gremler & Brown, 1996; Lee *et al*., 2001). Burnham *et al*. (2003) found that switching costs explain 30% of customer's intention to stay with the provider. There is also a relationship between contractual switching cost and loyalty (Caruana, 2004).

Klemperer's (1987) typology of switching costs is followed, who defines transaction costs, learning costs and artificial or contractual costs. In the study we focus on contractual costs that are seen as part of the benefit loss cost (Burnham *et al*., 2003).

Contractual cost is defined as the costs related to contractual linkages that create economic benefits for staying with an incumbent firm (Guiltinan, 1989) to ensure that customers remain loyal for a certain period of time (Caruana, 2004). Customers should pay an exit penalty, if they are leaving the company earlier than committed. This implies that out-of-contract status increases the risk of churn.

Considering that service elimination is a situation involved with forced migration many times, which means that customers are automatically migrated to a new service package after the elimination of the current one, this switching can be even higher. Literature however does not handle how service elimination churn might be reduced by switching barriers, only in a general retention case (Lam *et al*., 2004).

On the theoretical bases of customer retention and switching barriers, the following is expected:

Hypothesis 12: Switching barriers are associated with a heightened propensity to retain the customer during service elimination compared to no switching barriers present.

Interaction intensity is emphasized as one of the key characteristics of services. Many scholars have concluded that the interactions between service provider and customers may

have a significant effect on perceptions of quality, satisfaction and repurchase intentions (Bateson, 1985; Cermak *et al*.,1991; Jeanne Hill, 1988; Kelley *et al.,* 1990; Mills & Morris, 1986), thus it can influence customer retention.

As customer expectations may vary regarding interaction intensity according to different situations (Berthon & John, 2014), pre-elimination interaction is considered as an important strategy based on customer expectations. A more intense relationship with the service provider can either have a positive or negative effect for the customer. As customer behavior and expectations vary, too frequent interpersonal contact might work in opposed the provider's intention. Hence it is necessary to determine the optimal level of interaction, which ideally supports the formation of trust and increases loyalty.

On the theoretical bases of customer retention and interaction intensity, the following is expected:

Hypothesis 13: A higher level of interaction intensity is associated with a heightened propensity to retain customer during service elimination compared to a lower level of interaction intensity.

As already noted, service elimination requires a direct interaction between the customer and service provider to decrease churn. Pfisterer and Roth (2015) found that customers differentiate usage processes with direct or indirect interaction. Regarding this, service elimination requires direct communication, first due to the end of life-cycle (service reaches the decline stage of its life-cycle and cease to exist) and second, due to the characteristics of service elimination. Direct and more intensive interaction compared to the other stages of the life-cycle might have an attention raising role of the service package elements as well that influences the usage behavior of the customer after elimination, if the customer stays with the company. However even if he chose to stay with the company, his usage might be lower due to a more conscious usage after the elimination than before. Literature is ambiguous regarding these aspects.

On the theoretical bases of usage intensity and interaction intensity, the following is expected:

Hypothesis 14: A higher level of interaction intensity is associated with a heightened propensity of lower usage after service elimination compared to a lower level of interaction intensity.

3.4 SUMMARY OF RESEARCH HYPOTHESES

The conceptual framework is extended with research hypotheses in Figure 10 below:

Figure 10. Conceptual Framework with research hypotheses of service elimination
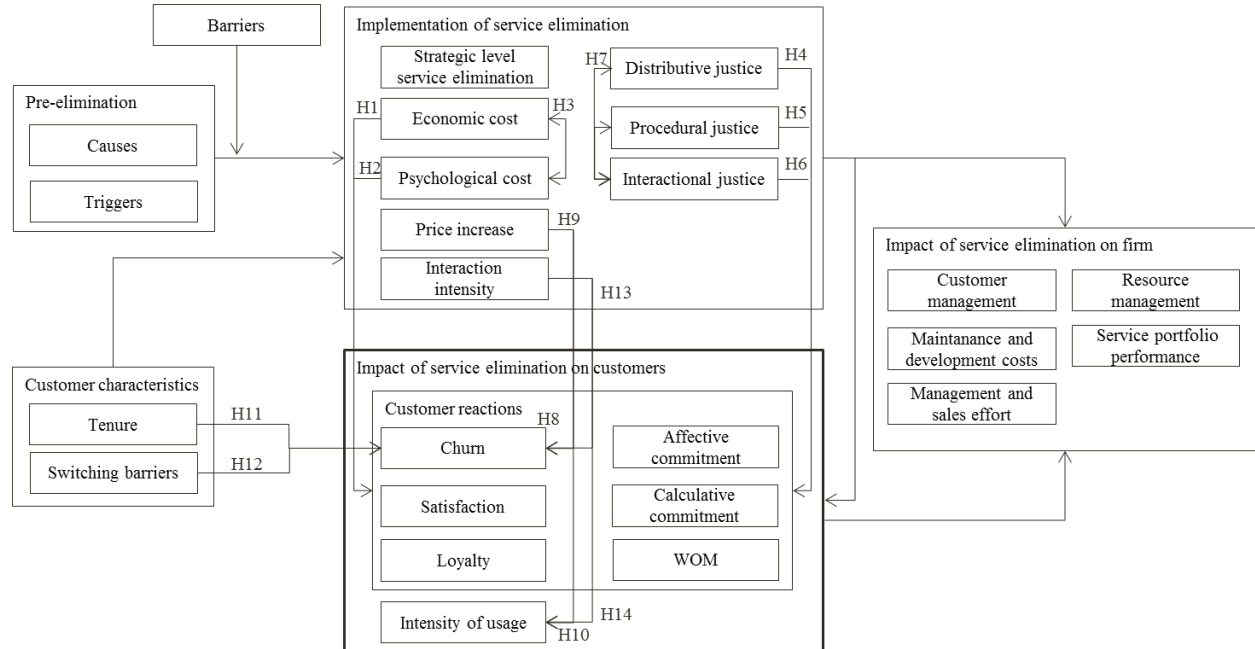
Source: own construction

The research hypotheses are summarized in Table 6:

Table 6. Research hypotheses

Study 1	Study 2	Study 3
H1: Economic cost increases churn, WOM, and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.	H4: Distributive justice decreases churn, and increases satisfaction and loyalty in case of service elimination.	H8: Churn rate during service elimination is higher than normal churn rate.
H2: Psychological cost increases churn, WOM, and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.	H5: Procedural justice decreases churn, and increases satisfaction and loyalty in case of service elimination.	H9: Price increase is associated with a lower propensity to retain customers during service elimination compared to price decrease.
H3: There will be interaction effects for economic and psychological costs in case of service elimination.	H6: Interactional justice decreases churn, and increases satisfaction and loyalty in case of service elimination.	H10: Price increase is associated with a heightened propensity of higher usage after service elimination compared to price decrease.
	H7: There will be interaction effects for distributive, procedural, and interactional justice.	H11: Longer relationship tenure with a service provider is associated with a heightened propensity to retain the customer during service elimination compared to a shorter relationship tenure.
		H12: Switching barriers are associated with a heightened propensity to retain the customer during service elimination compared to no switching barriers present.
		H13: A higher level of interaction intensity is associated with a heightened propensity to retain customer during service elimination compared to a lower level of interaction intensity.
		H14: A higher level of interaction intensity is associated with a heightened propensity of lower usage after service elimination compared to a lower level of interaction intensity.

Source: own construction

82

4 RESEARCH RESULTS: MEASUREMENTS AND ANALYSES

"Nothing in life is to be feared, it is only to be understood.

Now is the time to understand more, so that we may fear less."

(Marie Curie)

Portfolio innovation is a requirement of service industry, but as companies were focusing on service development from the 80s onwards, many of their resources are locked increasing their development and maintenance costs. Thus, an overcrowded service portfolio is a serious drawback that hinders innovation, which is although seen as a basic requirement of competitive advantage in the 21st century.

As a consequence, service elimination is seen as a pre-requisite of portfolio renewal. It is key however that the company does not lose its customers during this process that would demolish all potential benefits obtainable by the simplifying of portfolio, such as process optimization, maintenance and development cost reduction. Thus, customer retention is crucial for companies during service elimination.

Based on the literature review (Argouslidis, 2007; Argouslidis & McLean, 2003; Argouslidis & Baltas, 2007; Avlonitis & Argouslidis, 2012), the definition of service elimination was formulated in chapter 1.1. that is used in our research: service elimination is a process, when a service firm eliminates its existing services by migrating existing customers to new service packages. According to our definition, only full elimination is analyzed, excluding the partial forms of elimination, such as service closing or service merging. Although service closing still enables to keep existing subscription for existing customers, and it is only closed from new customers, full service elimination requires the closing for both new and existing customers. Service elimination can be voluntary or forced that influences customer retention as well.

The meta-analysis by Avlonitis and Argouslidis (2012) suggests that the service literature is lacking empirical evidence regarding the outcome of service elimination, which is the main topic of our research. This gap in the literature affects company practice too: portfolio managers are uncertain about how customer retention might be enhanced in these, not everyday situations. 20-30% churn ratio in service elimination situations (Somosi & Kolos, 2014) is unacceptably high compared to the 2-3% telecommunication industry

averages (ClintWorld GmbH., 2013). Based on this, the combination of service elimination with customer retention would be able to contribute both to academics and practice.

Our case study at a Hungarian telecommunications operator concluded that service elimination is not organized at a strategic level, however the service packages stored in the billing systems have serious costs that need to be cut in order to launch a new service portfolio (Somosi & Kolos, 2014). So service elimination retention strategy is seen as part of the service portfolio management, where customer side needs to be deeply discovered in order to improve the efficiency of the service elimination process, and thus make it more successful in the end. So in Study 1-3 we focus on this perspective.

In Study 1-3 success-factors of service elimination are investigated: although success can have a variety of meanings, from the combination of customer retention and service elimination literature is clear that success is preliminary defined as reduced churn rate among customers affected in the service elimination process, so this definition is followed throughout our research. So churn, the operative KPI of customer retention, is used as the primary factor to decide whether the elimination was successful.

4.1 STUDY 1: EXPERIMENTAL DESIGN: CUSTOMER REACTIONS TO SERVICE ELIMINATION AFFECTING SERVICE ELIMINATION OUTCOME BASED ON SOCIAL EXCHANGE THEORY

Our aim with the experiment design based on scenarios is to determine the relationship between costs of service elimination (economic and psychological costs) and customer reaction, including churn, the operative KPI of customer retention, as the primary factor to decide, whether the elimination was successful.

An experimental design instead of a normal consumer survey was chosen, because the aim is to reveal economic and psychological costs, and the causal relationships between customer reactions. As such data are not available from other sources (e.g. from a database), this method based on our self-developed scenarios was chosen.

Modeling real customer behavior could be an alternative, but it has several barriers. Only few of those customers involved in this service package simplification agree to get in contact due to marketing purposes, so the sample would be very low. On the other hand, as service elimination is usually not organized systematically, there are a limited number of such projects available in the past, especially for research purposes. This might explain the rationale of the multi-sector studies in the service elimination literature: service elimination

researchers usually combine telecommunications with financial services to obtain higher number of cases, ideal for quantitative analysis.

The most important benefit of the experimental design is thus its internal validity. In order to ensure the external validity of our research and analyze real customer behavior, results are compared with a database received from the Hungarian telecommunications operator, which is based on a service elimination project in 2012-2013. These results are presented in Study 3.

Based on the literature review and the case study results, in Study 1 a 2x2 between-subject experiment design based on scenarios was carried out (N=163) (Somosi & Kolos, 2017), with economic and psychological costs as independent variables that are used to measure the effect of service elimination on customers. The following dependent variables express customer reactions: churn, satisfaction, loyalty, affective and calculative commitment and WOM.

As Homburg *et al.* (2010) have not specify the exact measure of psychological cost, and other ways of operationalizing the variable are not available in the literature, the meaning of psychological cost was refined based on social exchange theory in case of our study carried out in a telecommunication context: economic cost means that the service package is better/worse as the current one (which is to be eliminated) (Homburg *et. al.*, 2010), and psychological cost refers to the fact of prior notice in the form of direct communication received by the customer before the elimination. It was defined as whether the service elimination is expected for the customer, which means that the role of notice will be emphasized here: if the customer gets a prior written and verbal notice about the service elimination, psychological costs are expected to be lower, and their effect to be marginal. As the written prior notice is a legal requirement as well during the service elimination process, it is important to add that psychological cost here refers to the case, when only written notice is received without any verbal clarification received by the customer before the elimination, e.g. through retention call.

Psychological cost refers to whether the customer had received prior notice besides the legal requirement of receiving a letter and was contacted e.g. by phone before elimination, that is, the service elimination was not unexpected, thus representing a lower level of psychological cost. *Economic cost* is incorporated into the scenarios as the cost of the service package for the customer, which is defined as a dummy variable that takes the value of 1 if

the cost of the offered service package is higher than current one, and 0 if the cost is lower than current one.

So the variables of Study 1 are the following:

- *Independent variables:* economic cost and psychological cost
- *Dependent variables:* churn, satisfaction, loyalty, affective and calculative commitment, WOM

The four scenarios are as follows (Figure 11):

1. A more favorable price-value service package after elimination; customer receives notification also by phone before elimination.
2. A least favorable price-value service package after elimination; customer receives notification also by phone before elimination.
3. A more favorable price-value service package after elimination; customer does not receive notification by phone before elimination.
4. A least favorable price-value service package after elimination; customer does not receive notification by phone before elimination.

Figure 11. Scenarios in Study 1
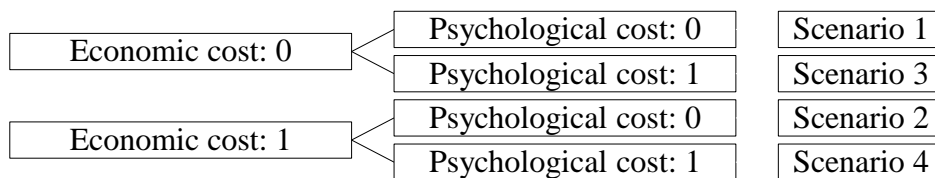
Source: own construction

Description of scenarios:

- Scenario 1: Your telecommunications service provider eliminates your service package. Before the elimination, they call to inform you about this and to help you to choose a new subscription. You tell the call center operator that you don't want a new subscription, as the current one is perfect for you. The operator can offer you a new service package with lower monthly fee, more internet and lower PPM. One week after the call you receive a letter notification as well about the change.

- Scenario 2: Your telecommunications service provider eliminates your service package. Before the elimination, they call to inform you about this and to help you to choose a new subscription. You tell the call center operator that you don't want a new subscription, as the

current one is perfect for you. The operator can offer you a new service package with a higher monthly fee, less internet and higher PPM. One week after the call you receive a letter notification as well about the change.

- Scenario 3: Your telecommunications service provider eliminates your service package. Before the elimination, they call to inform you about this and to help you to choose a new subscription. You tell the call center operator that you don't want a new subscription, as the current one is perfect for you. The operator can offer you a new service package with lower monthly fee, more internet and lower PPM.

- Scenario 4: Your telecommunications service provider eliminates your service package. Before the elimination, they call to inform you about this and to help you to choose a new subscription. You tell the call center operator that you don't want a new subscription, as the current one is perfect for you. The operator can offer you a new service package with a higher monthly fee, less internet and higher PPM.

The following hypotheses are tested in Study 1:

Hypothesis 1: Economic cost increases churn, WOM and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination..

Hypothesis 2: Psychological cost increases churn, WOM and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.

Hypothesis 3: There will be interaction effects for economic and psychological costs in case of service elimination.

4.1.1 SAMPLE

Data were collected through an online questionnaire between November 2014 and January 2015. Participants comprising students and their acquaintances for the experiment were recruited using social media, including LinkedIn and university student mailing lists (Somosi & Kolos, 2017). The use of student sample in case of experimental design is confirmed by several researchers (Hocutt *et al.*, 2006).

Scenarios described a telecommunications service elimination situation, where respondents had to answer questions about the process and evaluate the whole experience.

One respondent randomly received only one scenario, so each scenario was evaluated by approx. 37-44 respondents.

The sample contains 163 respondents (a 16% response rate). The male-female ratio is quite balanced (59% and 41%, respectively) and the average age of respondents is 31.

4.1.2 MEASURES

The following scales are used in the experiment, where items are measured on a 5 point Likert-scale[2]:

- Churn is measured by the following items: "I would accept the operator's offer" and "I would leave my current operator after this case" (based on Aksoy *et al.,* 2013). Both items were averaged to create the final churn intention scale.

- Satisfaction and commitment: Gustafsson's scales for measuring satisfaction and commitment are used (Gustafsson *et al.,* 2005). Satisfaction was measured with four items: "I am satisfied with the operator's offer," "The operator exceeds my expectations," "In my opinion the operator is close to the best operator." In addition to these three items, which were based on the work by Gustafsson (2005), the authors added a fourth "I consider the operator's reaction appropriate." The five items were averaged to create the final satisfaction intention scale.

  What regards satisfaction, according to Aksoy *et al*. (2013), an effect of satisfaction on NPS (Net Promoter Score, (Reichheld, 2003)) is expected that was implemented in our research: "I would recommend the operator to my friends and family after the case" (measured on a 1-10 scale).

  Affective commitment was measured by the following statements: "I take pleasure in being a customer of the company" and "I have feelings of trust toward the company." The two items were averaged to create the final churn intention scale.

  Calculative commitment was measured by: "It pays off economically to choose the offer of the company".

- Loyalty: the loyalty scales of Zeithaml *et al*. (1996) are used for loyalty with the four following items: "I will say positive aspects about this operator to other people", "I will recommend this operator to anyone who seeks my advice", "I will encourage my

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[2] The questionnaire was distributed in Hungarian.

friends and family to use this operator", "I will use this operator in the next few years". The four items were averaged to create the final loyalty intention scale.

- WOM: Based on Anderson's (1998) results, WOM is expected to be higher if the customers are not satisfied, which gives the support for H1 and H2 for WOM. Based on Goyette *et al.* (2010) the authors added an item for measuring WOM referring to the content of WOM: "I would tell others, what happened to me".

For the measurement scales, Cronbach's alphas vary between 0,784 and 0,951 (churn: 0,796, satisfaction: 0,784, loyalty: 0,784, affective commitment: 0,804, calculative commitment: 0,785, WOM: 0,951).

4.1.3 MANIPULATION CHECKS

Internal validity expresses that the effects on dependent variables were indeed caused by the modification of dependent variable values. External validity refers to the generalizability of results, which was assessed by the reliability of scenarios: in what extent did respondents feel that the scenarios are realistic and can happen in everyday practice (Kenesei & Kolos, 2008).

Four expert judges (faculty members in services marketing) reviewed and commented on the scenarios and the questionnaire. Slight modifications in wording were made to improve ecological validity. Next, in accordance with the recommendations of Perdue and Summers (1986), manipulations were checked in a quantitative study, independent of the main experiment indicating that the manipulations were effective, with a significant difference between test and control groups for all conditions (N=52).

When developing the manipulation checks, the study relied on the definitions provided by Homburg *et al.* (2010 p. 533.) who described economic costs as perceived economic burden and expenditures, while psychological costs were conceptualized as a feeling of uncertainty, doubt, an unpleasant inner state of tension, and dissonant cognitions.

The manipulation check for the two independent variable was as follows: based on Cannon and Homburg (2001) and Montgomery *et al.* (2005), economic cost used: "I will have to face financial losses," where *M (economic cost)*=4,48 vs. *M (no economic cost)*=1,56, $F(1,51)=118,73$, p<0,000. A one-item measure was used for psychological cost (Dwyer *et al.*, 1987; Noordweier *et al.*, 1990; Arend, 2006): "Following the event I will have doubts about the reliability of the company,", where *M (psychological cost)* =3,73 vs. *M (no psychological*

cost) =3,13, *F*(1,50)=3,117, p<0,01. Thus, the scenarios formulate the independent variables correctly.

Scenarios for realism used the following two-item measure: "I think that the case is realistic" and "This case can happen in everyday life too", where the mean scores on a 5 point Likert-scale were between 3,27 and 3,80 for the 4 scenarios, suggesting the scenarios to be realistic. Further, a telecommunications company manager commented on the scenarios and judged them to be realistic and fitting with their everyday practice.

4.1.4 RESULTS

General Linear Model[3] (GLM) (Field, 2003) with SPSS software (Mitev & Sajtos, 2007) was used to assess the effect of economic and psychological cost on churn, satisfaction, loyalty, commitment and WOM.

The results of the differences in means according to the four scenarios are summarized in Table 7.

Economic cost (0: no cost; 1: there is a cost)

In case of the economic cost all dependent variables behave as expected based on the hypothesis: economic cost increases churn and WOM, decreases satisfaction, loyalty, affective and calculative commitment. So H1 is supported.

Psychological cost (0: no cost; 1: there is a cost)

Psychological cost decreases satisfaction, loyalty and affective commitment as expected. Churn, calculative commitment and WOM are not significant here. So H2 is partially supported.

Interaction between economic and psychological cost

The interactions gave surprising results with economic and psychological cost: customers are more satisfied, loyal, committed and are more likely to stay with the company, if they receive a least favorable service package offer than the current one, but they are not receiving a prior notice compared to receiving such notice. Calculative commitment and WOM are not significant here.

This raises the question of the complexity of offers: it is suspected that the notice is more of an attention raising tool that makes the involved economic costs of the offer more explicit

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[3] A significance level of 5% is used throughout the analysis.

for the customer. This was mentioned by one interviewee in the case study as well (chapter 3.2.).

The interactions between no economic cost, but psychological cost present are meeting expectations: customers are more satisfied, loyal and committed, and they would leave the operator, if they receive a more favorable service package offer than the current one, but they are not receiving a prior notice compared to receiving one. Calculative commitment and WOM are not significant here also.

This second interaction also supports the idea of complexity issue in the offers, because it means that even though customers are offered a better service package than current one after service elimination, if they are not contacted by phone as well by the operator, they cannot recognize the value added of the new offer.

These results altogether support the acceptance of H3.

Table 7. Mean values of dependent variables in the groups based on independent variables (significant means are in bold)

Independent variables		Dependent variables					
		Satisfaction	Loyalty	Churn	Affective commitment	Calculative commitment	WOM
Economic cost		F=335,97 sig. 0,000	F=256,58 sig. 0,000	F=261,85 sig. 0,000	F=136,98 sig. 0,000	F=335,655 sig. 0,000	F=10,251 sig. 0,002
	Yes	**1,62**	**2,41**	**3,88**	**1,66**	**1,63**	**4,26**
	No	**3,68**	**2,69**	**1,81**	**3,19**	**4,07**	**3,75**
Psychological cost		F=6,14 sig. 0,014	F=6,965 sig. 0,009	F=0,39 sig. 0,533	F=5,38 sig. 0,022	F=0,436 sig. 0,510	F=3,236 sig. 0,074
	Yes	**2,45**	**1,63**	2,87	**2,23**	2,80	4,17
	No	**2,69**	**3,64**	2,99	**2,49**	2,69	3,88
Economic cost	**Psychological cost**	F=9,83 sig. 0,002	F=14,309 sig. 0,000	F=11,38 sig. 0,001	F=9,09 sig. 0.003	F=0,764 sig. 0,383	F=0,358 sig.0,550
Yes	**Yes**	**1,66**	**1,70**	**3,63**	**1,70**	1,73	4,45
	No	**1,59**	**1,55**	**4,14**	**1,61**	1,52	4,07
No	**Yes**	**3,37**	**3,24**	**1,99**	**2,84**	4,05	3,84
	No	**4,00**	**4,05**	**1,64**	**3,54**	4,08	3,65

Source: own construction

So interaction hypotheses were supported: the interaction between the two variables is clear, and only economic cost option gave contradictory results in terms of interactions with

psychological cost, which means that economic cost has stronger effect on customer reactions than psychological cost in case of service elimination.

These main effects, however, are qualified by significant two-way interactions. The interaction effects are visualized in Figure 12. In case of economic cost, psychological cost (customer is not contacted by the operator) does not have an effect on satisfaction (satisfaction levels are low). Whereas in the absence of economic cost, the absence of psychological cost (customer is contacted by the operator) increases satisfaction, according to a priori expectations. Loyalty and affective commitment follow a similar pattern. In case of churn however, psychological cost (customer is not contacted by the operator) increases churn in the absence of economic cost, whereas the absence of psychological cost (customer is contacted by the operator) increases churn in the presence of economic cost.

These results provide support for H1 and H3, and partial support for H2.

Figure 12. The interaction of economic and psychological costs[4]

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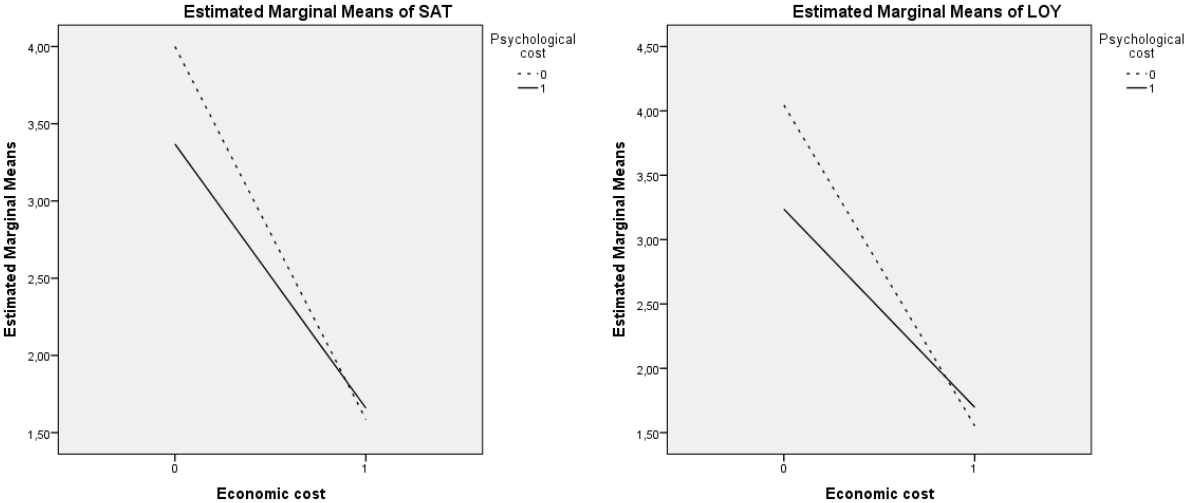
[4] Legend: SAT= satisfaction, LOY= loyalty, CHURN= churn, AFFCOMM= affective commitment

Estimated Marginal Means of CHURN

Estimated Marginal Means of AFFCOMM
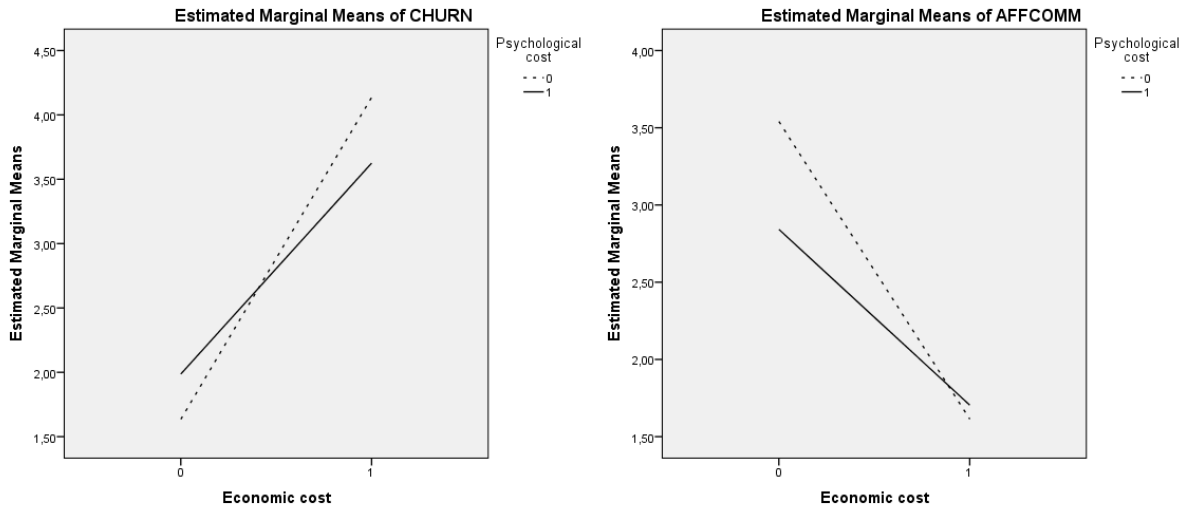
Source: own construction

As Study 1 concluded, practitioners need to be aware that psychological cost might have a more significant role than expected: the form of contact with the customer has a stronger effect on retention than the quality of the offer itself. Perhaps offers only in written form are not clear for the customer, and as such, verbal notification raises their attention. As a result, in case of a least favorable offer, the customer is more likely to switch operators.

The role of psychological cost is emphasized here: with least favorable offers no verbal communication before elimination might lead to lower customer churn, and with more favorable offers to higher customer churn. It is not just the quality of the offer that determines customer retention. Surprisingly, the verbal interaction with the customer has different effects depending on the quality of the new offer: a more favorable new offer should be emphasized more, supposing that the customer does not recognize the benefits of the new conditions. Quite on the contrary, it might be supposed that customers do not notice the exact new conditions of a least favorable offer, but if the operator explains it, they might leave. In sum, interaction needs to be handled with caution: the quality of the new offer influences the effect of psychological cost on customers.

4.2 CONCLUSIONS OF STUDY 1

Study 1 shed light on how service elimination shapes customer retention. Experimental design is used to determine the effects between service elimination and its main success factors, churn, and other variables related to customer reaction (satisfaction, loyalty, commitment and WOM). All hypotheses relating to satisfaction, loyalty and commitment are supported; only interactions between economic and psychological costs gave surprising results. Regardless of economic cost, psychological cost seems to have an attention-raising role for customers. The missing contact from the operator determines the level of satisfaction, loyalty, commitment, and churn. Even if the offer was more favorable, when the customer does not receive a phone call before elimination, the probability of leaving the company is higher compared to a situation, when receiving a phone call before the event. In a least favorable offer scenario, the absence of the call surprisingly improves the situation and results in lower churn rates. This means that the operator's explanation makes the customer realize that they are facing economic loss or gain.

The results indicate that the offers themselves are probably not clear for customers; direct contact with the operator before elimination is more crucial. This might change the focus on "hard factors" (e.g. pricing of the new offer in case of service elimination) in terms of customer retention, and emphasize the role of "soft factors" (e.g. informing the customer before service elimination, and the quality of informing the customer about service elimination).

The limitation of the Study 1 is that a convenience sampling was applied, although based on literature, representative samples are outside of the experimental design requirements.

Further, the measurement of psychological cost needs to be refined, because the call notification of the customer –although a widely accepted tool in practice-, only describes psychological cost indirectly. As results pointed out significant differences referring to the complexity of offers, a variable capturing the complexity attribute of the offer is required, and the consideration of other psychological cost-related elements (e.g. switching costs: time and other sacrifices by the customer to analyze competitor offers, personal interaction with the operator due to service elimination, issues related to number portability process) is advised.

Third, as the case study also concluded, the differentiation between in-contract and out-of-contract customers is required, because economic costs might be significantly different among these groups (primarily due to penalty costs within contract time).

So based on Study 1, the following can be concluded in terms of hypotheses:

Hypothesis 1: Economic cost increases churn, WOM and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.- accepted (Table 7)

Hypothesis 2: Psychological cost increases churn, WOM and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.- partially accepted (Table 7)

Hypothesis 3: There will be interaction effects for economic and psychological costs in case of service elimination.- accepted (Table 7)

4.3 STUDY 2: EXPERIMENTAL DESIGN: CUSTOMER REACTIONS TO SERVICE ELIMINATION AFFECTING SERVICE ELIMINATION OUTCOME BASED ON JUSTICE THEORY

To increase the empirical results on the effects of service elimination on customers, a different theoretical approach as well was applied. Justice theory was chosen, as it is frequently used in a service recovery context. Service failure, to some extent can be considered as similar to service elimination, as already mentioned. Service elimination is a company decision unexpected for the customers, and due to the fact that the service is no longer available for the customer (as service elimination was defined as full elimination), from the customer perspective it can be interpreted as a failure of the current service.

Similarly to Study 1, in Study 2 also experimental design was used to test the effect of service elimination on customers, but instead of social exchange theory, in Study 2 justice theory was applied to refine the results of the previous experiment.

As the literature review of justice theory showed, justice incorporates three main elements: distributive, procedural and interactional justice. Distributive justice refers to the new offer after elimination, whether it is better or worse in terms of costs for the customer. Procedural justice is measured by how much time, money and effort the process requires from the customer in order to receive a new service package after the current one is eliminated.

Interactional justice is measured by the quality of interaction, courtesy, and general positive attitude of the company representative talking to the customer.

It is considered that these justice dimensions capture the costs defined as economic and psychological costs according to the social exchange theory more precisely, because procedural and interactional justice assess the quality of the process and interaction also.

All three dimensions are incorporated into the scenarios as dummy variables that takes the value of 1 if the certain dimension justice is present, and 0 if the certain dimension of justice is not met in the scenario.

Based on the literature review and the exploratory research results, in Study 2 a 2x2x2 between-subject experiment design based on 8 scenarios was carried out (N=178), with two levels of distributive, procedural and interactional justice as dummy independent variables (Blodgett *et al*., 1997) and with the following dependent variables: churn, satisfaction and loyalty. Independent variables based on justice theory are used to measure the effect of service elimination on customers.

Scenarios described a service elimination situation in telecommunication, with different alternatives regarding the strategy of the operator: they either called the customer after sending out the letter (the written notice is a legal requirement), or the customer had to call them, due to complexity of the whole situation and the new offer.

The formulation of the scenarios was pretested in Study 1, but were refined based on justice theory, because procedural and interactional justice altogether capture more precisely the psychological costs of the customer related to service elimination. Further, manipulation checks were conducted to test justice scales and realism of scenarios described.

So the construction of the experimental design based on scenarios is as follows:
- *Independent variables:* distributive, procedural and interactional justice
- *Dependent variables:* churn, satisfaction and loyalty

The eight scenarios are as follows (Figure 13):
1. A least favorable price-value service package after elimination; customer has to contact the service provider many times; the employees does not seem to care about the customer

2. A more favorable price-value service package after elimination; customer has to contact the service provider many times; the employees does not seem to care about the customer

3. A least favorable price-value service package after elimination; customer has to contact the service provider many times; the employees seem to care about the customer

4. A more favorable price-value service package after elimination; customer has to contact the service provider many times; the employees seem to care about the customer

5. A least favorable price-value service package after elimination; customer does not have to contact the service provider; the employees does not seem to care about the customer

6. A more favorable price-value service package after elimination; customer does not have to contact the service provider; the employees does not seem to care about the customer

7. A least favorable price-value service package after elimination; customer does not have to contact the service provider; the employees seem to care about the customer

8. A more favorable price-value service package after elimination; customer does not have to contact the service provider; the employees seem to care about the customer

Figure 13. Scenarios in Study 2

Source: own construction

Description of scenarios:

- Scenario 1: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 2: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 3: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 4: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 5: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not

clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 6: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 7: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 8: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

The following hypotheses are tested in Study 2:

Hypothesis 4: Distributive justice decreases churn, and increases satisfaction and loyalty in case of service elimination.

Hypothesis 5: Procedural justice decreases churn, and increases satisfaction and loyalty in case of service elimination.

Hypothesis 6: Interactional justice decreases churn, and increases satisfaction and loyalty in case of service elimination.

Hypothesis 7: There will be interaction effects for distributive, procedural and interactional justice in case of service elimination.

4.3.1 SAMPLE

Data were collected through an online questionnaire between December 2016 and April 2017 in Vienna. Participants comprising students at a Viennese university were recruited using university student mailing list. The use of student sample in case of experimental design is confirmed by several researchers (Hocutt *et al.*, 2006).

Scenarios described a telecommunications service elimination situation, where respondents had to answer questions about the process and evaluate the whole experience.

The database of survey results contains 178 valuable responses after data cleaning (a 0,72% response rate). The male-female ratio is quite balanced (49,1% and 50,9%, respectively) and the average age of respondents is 28. 63% of the respondents lives in Vienna, and 58,4% is Austrian. Respondents were randomly assigned scenarios. The number of subjects for the different conditions varied between 79 and 91.

4.3.2 MEASURES

The following scales are used in the experiment that are measured on a 5 point Likert-scale[5]:

- Churn is measured by the following items: "If this situation had happened to me I would not accept the service provider's offer", "If this situation had happened to me I would change service provider due to this imaginary case", and "If this situation had happened to me I would never be the customer of this service provider again in the future" (based on Aksoy *et al*., 2013). The three items were averaged to create the final churn intention scale.

- Satisfaction: Gustafsson's scales for measuring satisfaction are used (Gustafsson *et al.,* 2005). Satisfaction was measured with four items: "I am satisfied with the service provider's offer" "The service provider exceeds my expectations," "The service provider is close to my ideal service provider" In addition to these three items, which were based on the work by Gustafsson (2005), the authors added a fourth "I consider the operator's reaction appropriate". The four items were averaged to create the final satisfaction intention scale.

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[5] The questionnaire was distributed in English.

- Loyalty: Zeithaml's scales for loyalty are used for loyalty with the four following items (Zeithaml, Berry, & Parasuraman, 1996): "I will say positive aspects about this service provider to other people", "I will recommend this service provider to anyone who seeks my advice", "I will encourage my friends and family to use this service provider", "For any future telecommunications service I need, I will consider this service provider as the first option". The four items were averaged to create the final loyalty intention scale.

For the measurement scales, Cronbach's alphas vary between 0,786 and 0,915 (churn: 0,786, satisfaction: 0,823, loyalty: 0,915).

4.3.3 MANIPULATION CHECKS

In accordance with the recommendations of Blodgett *et al.* (1997), manipulations were checked in a quantitative study, independent of the main experiment indicating that the manipulations were effective, with a significant difference between all scenarios for all conditions (N=166).

When developing the manipulation checks, the study relied on the following definitions: distributive justice is the perceived fairness of the outcome (Blodgett *et al.*, 1997), procedural justice refers to the perceived fairness of the policies, procedures and criteria arriving at the outcome (Thibaut & Walker, 1975; Lind & Tyler, 1988; Alexander & Ruderman, 1987), while interactional justice is the manner in which people are treated during the process (Bies & Moag, 1986; Bies & Shapiro, 1987).

The manipulation check for the three independent variable was based on Blodgett et al. (1997): distributive justice used: "Taking everything into consideration, the service provider's offer was quite fair", "I did not get what I deserved" (reversed), and "Given the circumstances, I feel that the service provider offered an adequate service package", where *M (distributive justice)*= 4,06 vs. *M (no distributive justice)*= 3,42, $F(1,164)$= 14,788, p<0,000. A three-item measure was used for procedural justice: "The service elimination was handled in a very timely manner", "The service elimination was not resolved as quickly as it should have been", and "The process of the service elimination was customer-friendly", where *M (procedural justice)*= 3,56 vs. *M (no procedural justice)*= 2,96, $F(1,164)$= 20,009, p<0,000. Another three-item measure was used for interactional justice as well: "I was treated with courtesy and respect", "The employees seemed to care about me", "The employees had a rather negative

attitude" (reversed), "I feel that I was treated rudely" (reversed), where *M (interactional justice)*= 3,64 vs. *M (no interactional justice)* = 2,05, *F*(1,164)= 64,642, p<0,000. Thus, the scenarios formulate the independent variables correctly.

Scenarios for realism used the following two-item measure: "I think that the case is realistic" and "This case can happen in everyday life too", where the mean scores on a 5 point Likert-scale were between 2,47 and 3,11 for the 8 scenarios, suggesting the scenarios to be realistic.

4.3.4 RESULTS

General Linear Model[6] (GLM) (Field, 2003) with SPSS software (Mitev & Sajtos, 2007) was used to assess the effect of distributive, procedural and interactional justice on churn, satisfaction and loyalty.

The results of the differences in means according to the eight scenarios are summarized in Table 8.

Distributive justice (0: no distributive justice; 1: distributive justice)

In case of the distributive justice all dependent variables behave as expected based on the hypothesis: distributive justice decreases churn, and increases satisfaction, and loyalty. So H4 is supported.

Procedural justice (0: no procedural justice; 1: procedural justice)

Surprisingly, there are no significant effects for procedural justice. According to the scenarios, there was procedural justice, if the operator contacted the customer, so there were no multiple attempts by the customer trying to reach the operator, or long waiting time. There was no procedural justice, when the customer had to contact the operator due to complexity of the written notice about elimination, had several attempts until reaching the operator with long waiting time.

Based on the results however, there is not a significant difference between the two versions, as both a call received or initiated by the customer can be perceived as inconvenient, although circumstances are much convenient in case of procedural justice. This might be due to operationalization issues, the effects of procedural justice might be captured partly only, although several attempts and long waiting time were incorporated into the formulation of scenatios besides the unexpectedness of the call, based on the definition of procedural justice.

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[6] A significance level of 5% is used throughout the analysis.

Second, when procedural justice conditions are met, it is probably not obviously positive for the customer: a call received by the operator can be also perceived as something inconvenient, due to e.g. loss of perceived control or inadequate timing of the call. So H5 is rejected.

Interactional justice (0: no interactional justice; 1: interactional justice)

Similarly to distributive justice, all dependent variables behave as expected based on the hypotheses: interactional justice decreases churn, and increases satisfaction and loyalty. So H6 is supported.

Table 8. Mean values of dependent variables in the groups based on independent variables (N=178, significant means are in bold)

Independent variables			Dependent variables		
			Churn	**Satisfaction**	**Loyalty**
Distributive justice			F= 17,686	F= 48,830	F= 23,640
			sig. 0,000	sig. 0,000	sig. 0,000
	Yes		**2,61**	**3,09**	**2,77**
	No		**3,28**	**2,04**	**1,93**
Procedural justice			F= 2,034	F=3,015	F= 0,882
			sig. 0,156	sig. 0,084	sig. 0,349
	Yes		2,78	2,81	2,53
	No		3,03	2,45	2,28
Interactional justice			F= 7,053	F= 27,673	F= 25,426
			sig. 0,009	sig. 0,000	sig. 0,000
	Yes		**2,71**	**3,05**	**2,86**
	No		**3,10**	**2,22**	**1,96**
Distributive justice	**Procedural justice**	**Interactional justice**			
			F= 2,253	F= 3,428	F= 3,796
			sig. 0,135	sig. 0,066	sig. 0,053
Yes	Yes	Yes	2,58	3,54	3,27
		No	2,83	2,54	2,14
			F= 8,896	F= 5,904	F= 2,748
			sig. 0,003	sig. 0,016	sig. 0,099
		Total	**2,68**	**3,13**	2,80
			F= 2,253	F= 3,428	F= 3,796
			sig. 0,135	sig. 0,066	sig. 0,053
	No	Yes	1,97	3,69	3,30
		No	2,95	2,60	2,36
			F= 8,896	F= 5,904	F= 2,748
			sig. 0,003	sig. 0,016	sig. 0,099
		Total	**2,54**	**3,05**	2,75
			F= 1,713	F= 2,933	F= 0,911

			sig. 0,192	sig. 0,089	sig. 0,341
	Total	Yes	2,33	3,60	3,28
		No	2,90	2,57	2,27
			F= 2,253	F= 3,428	F= 3,796
			sig. 0,135	sig. 0,066	sig. 0,053
No	Yes	Yes	2,74	2,32	2,21
		No	3,05	2,39	2,09
			F= 8,896	F= 5,904	F= 2,748
			sig. 0,003	sig. 0,016	sig. 0,099
		Total	**2,93**	**2,36**	2,14
			F= 2,253	F= 3,428	F= 3,796
			sig. 0,135	sig. 0,066	sig. 0,053
	No	Yes	3,52	2,29	2,35
		No	3,63	1,16	1,06
			F= 8,896	F= 5,904	F= 2,748
			sig. 0,003	sig. 0,016	sig. 0,099
		Total	**3,57**	**1,77**	1,75
			F= 1,713	F= 2,933	F= 0,911
			sig. 0,192	sig. 0,089	sig. 0,341
	Total	Yes	3,23	2,30	2,30
		No	3,33	1,80	1,60
			F= 0,760	F= 4,531	F= 2,026
			sig. 0,385	sig. 0,035	sig. 0,156
Total	Yes	Yes	3,63	**3,15**	2,93
		No	2,94	**2,46**	2,12
			F= 0,760	F= 4,531	F= 2,026
			sig. 0,385	sig. 0,035	sig. 0,156
	No	Yes	2,80	**2,94**	2,79
		No	3,24	**2,00**	1,81

Source: own construction

Interaction between distributive, procedural and interactional justice

The main effects are qualified by significant two-way interactions that are illustrated on Figure 14. First, in case of satisfaction it is observed that distributive justice always has a positive effect on satisfaction, and interactional justice also leads to higher levels of satisfaction.

Second, in the absence of distributive justice, procedural justice reduces churn and increases satisfaction, whereas in the presence of distributive justice, the effect of procedural justice is the opposite regarding the two variables.

Third, in the interaction between procedural and interactional justice, interactional justice always increases satisfaction, noting that the absence of procedural justice (the customer calls the operator, with multiple attempts and long waiting time to reach the operator) results in higher levels of satisfaction. This also emphasizes the role of the call initiated by the customer, independently of the inconvenient circumstances of contacting the operator, probably due to perceived control.

These results altogether support the partial acceptance of H7.

So hypotheses were partially supported: in terms of main effects, distributive justice and interactional justice reduces churn, and increases satisfaction and loyalty as expected, only procedural justice does not have an effect. What regards interactions, interactional justice can be perceived as a complementary factor in terms of procedural justice, noting that an altogether higher satisfaction can be achieved by a customer-initiated call. Similarly, procedural justice can party compensate the absence of distributive justice, meaning that a least favorable offer's effect on churn and loyalty can be reduced by a simple, smooth procedure of service elimination.

These results provide support for H4 and H6, no support for H5 and partial support for H7.

Figure 14. The interaction of distributive, procedural and interactional justice[7]

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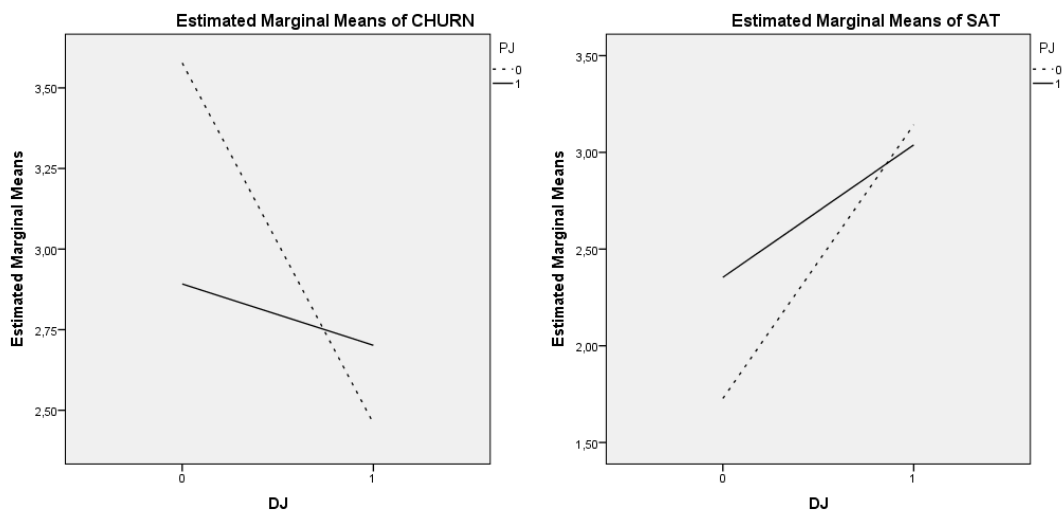
[7] Legend: DJ= distributive justice, PJ= procedural justice, IJ= interactional justice, SAT= satisfaction, LOY= loyalty, CHURN= churn

Estimated Marginal Means of SAT
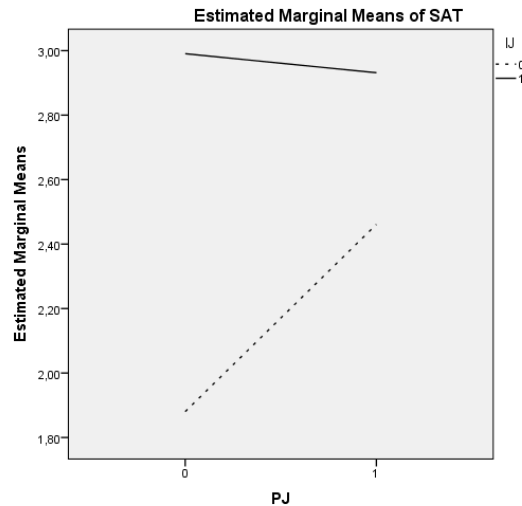
Source: own construction

As Study 2 concluded, procedural justice is not as clear as one might think: a call initiated by the operator might have a worsening effect regarding customer perceptions on service elimination, because maybe those, who experienced already a negative experience during a call center call (e.g. long waiting time, complex IVR, etc.), could value the proactivity of the operator. Otherwise, a received call can be as burdensome for the customer in comparison with an initiated one due to loss of perceived control, disturbance of the customer's daily schedule, inappropriate timing, etc. Second, interactions between the elements of justice distributive justice always have an impact, but procedural justice determines its interactions with the other two elements.

An important practical implication of the results is that in case of a least favorable offer, procedural justice can partially compensate its effects on churn and satisfaction, and similarly, interactional justice might compensate for missing procedural justice. Thus, service providers can compensate the least favorable conditions of a new offer by using an overall simple, smooth procedure for the customer (speed, reflecting timeliness, responsiveness of the service provider, convenience of the service elimination process, perceived fairness and waiting time). Further, another relevant aspect is that the proactivity of the service provider results in lower satisfaction compared to a call initiated by the customer, which raises the question of appointment booking. All in all, the responsiveness of the service provider and the timeliness, convenience of the whole service elimination process influences satisfaction levels and probability of churn. It's important to note that the customer should initiate the call due to the role of perceived control, which can be handled by the use of appointment booking.

106

So based on Study 2, the following can be concluded in terms of hypotheses:

Hypothesis 4: Distributive justice decreases churn, and increases satisfaction and loyalty in case of service elimination.- accepted (Table 8)

Hypothesis 5: Procedural justice decreases churn, and increases satisfaction and loyalty in case of service elimination.- rejected (Table 8)

Hypothesis 6: Interactional justice decreases churn, and increases satisfaction and loyalty in case of service elimination.- accepted (Table 8)

Hypothesis 7: There will be interaction effects for distributive, procedural and interactional justice in case of service elimination.- partially accepted (Table 8)

4.4 STUDY 3: DATABASE ANALYSIS: CUSTOMER AND SERVICE ELIMINATION CHARACTERISTICS AFFECTING SERVICE ELIMINATION OUTCOME AND USAGE INTENSITY

The rapid innovation of service portfolios is required for competitive advantage. In this context, service elimination is a tool of portfolio renewal, where customer retention is a strategic priority for companies. Service elimination usually has higher churn rates than average churn in service industries, thus customer retention is seen as a tool for enhancing service elimination success. The purpose of Study 3 is to identify those factors that increase customer churn in case of service elimination.

A telecommunication operator's database containing usage data 3 months before and after service elimination and contract-related information with 10 065 customers is used to differentiate between high and low churn indicators. The research model was tested using Heckman sample selection. The results show that there is a significant positive relationship between price increase, tenure, interaction intensity and customer retention during service elimination. Furthermore, by those, who stay with the operator following service elimination, a higher monthly fee after elimination increases the customer's usage.

Study 3 contributes to the customer retention and service elimination literature with practical implications for decision-makers in rapidly innovating telecommunication markets.

The following hypotheses are tested in Study 3:

Hypothesis 8: Churn rate during service elimination is higher than normal churn rate.

Hypothesis 9: Price increase is associated with a lower propensity to retain customers during service elimination compared to price decrease.

Hypothesis 10: Price increase is associated with a heightened propensity of higher usage after service elimination compared to price decrease.

Hypothesis 11: Longer relationship tenure with a service provider is associated with a heightened propensity to retain the customer during service elimination compared to a shorter relationship tenure.

Hypothesis 12: Switching barriers are associated with a heightened propensity to retain the customer during service elimination compared to no switching barriers present.

Hypothesis 13: A higher level of interaction intensity is associated with a heightened propensity to retain customer during service elimination compared to a lower level of interaction intensity.

Hypothesis 14: Higher level of interaction intensity is associated with a heightened propensity of lower usage after service elimination compared to lower level of interaction intensity.

4.4.1 METHOD

As the left-handed variable is a Dummy variable, for which probit or logit regression would be suitable. Due to sample selection bias suspected in the database, neither of these methods can be applied. The reason for this is the following: in the study besides modeling churn, differences in customer behavior before and after service elimination are analyzed. After estimating the probabilities for churn in the first stage, in the second stage there are only those customers selected, who did not leave the company after service elimination. This selection is however not a random selection, thus sample selection bias problem needs to be handled in this case.

Literature offers various methods to cope with this issue. One of the most popular one is the (randomized) controlled trials that are usually applied in health care. In case of a database analysis this is not applicable, it is not an experimental methodology. Further methods include difference-in-differences (DID) (Krueger & Card, 1994), which however supposes that those customers are known as well, who were not affected by the elimination, and in this case the control and affected group in terms of elimination, behave the same (Abadie, 2005). This method cannot be applied either, because those customers are not known, who did not participate the service elimination. The third common method is the application of instrumental variables (Arellano & Bover, 1995). In the database there was no appropriate instrumental variable that could predict churn, so this method could not be used. Heckman sample selection

is suggested in those cases, when other methods are not relevant. Thus, Heckman sample selection model was chosen to overcome the problem of sample selection (Heckman, 1979; Gronau, 1974; Lewis, 1974)[8].

The variables in the sample selection model are the following:

Criterion Variables:

- Usage intensity difference (MINDIFF): difference of minutes the customer has spent talking before and after elimination;

- Churn (CHURN): Takes the value of 0, if the customer has changed his/her current mobile operator after service elimination, and 1 otherwise.

Independent Variables:

- Price increase (logMFDIFF): logarithm of the difference between new and old monthly fee;

- Time of contract (TENURE): time elapsed between the start and end date of the contract in days;

- Switching barrier (CONTRACT): takes the value of 1, if the customer is in contract at the time of service elimination, and 0, when he is out of contract;

- Interaction intensity (CC_CALLS): number of calls initiated/received by the call center from the start of the customer's contract;

- Dummy variable of interaction intensity (D_CC_CALLS): Dummy variable for CC_CALLS, which takes the value of 1, if the value is given, and 0 otherwise.

Covariates:

- Usage intensity before elimination (BEFORE_USAGE_MINUTES): number of minutes spent talking before elimination;

- Satisfaction (NPS_CC): Net Promoter Score given by the customer after a call center call;

- Dummy variable of satisfaction (D_NPS_CC): Dummy variable for NPS_CC, which takes the value of 1, if the value is given, and 0 otherwise.

Based on the literature review the effects between the theoretical constructs are operationalized. In the two-stage sample selection model churn (CHURN) is used as a

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[8] See Annex 6 for description of the method

dependent variable in the first stage, and the changes in the customer's service usage intensity using the difference of minutes the customer has spent talking before and after elimination (logMINDIFF) in the second stage. The coefficients of the regression show, which variables predict churn significantly, then with the use of selection equation changes in usage behavior following service elimination are analyzed.

The relationships between independent variables with the six hypotheses are presented in Figure 15.

Figure 15. Hypothesized effects between variables
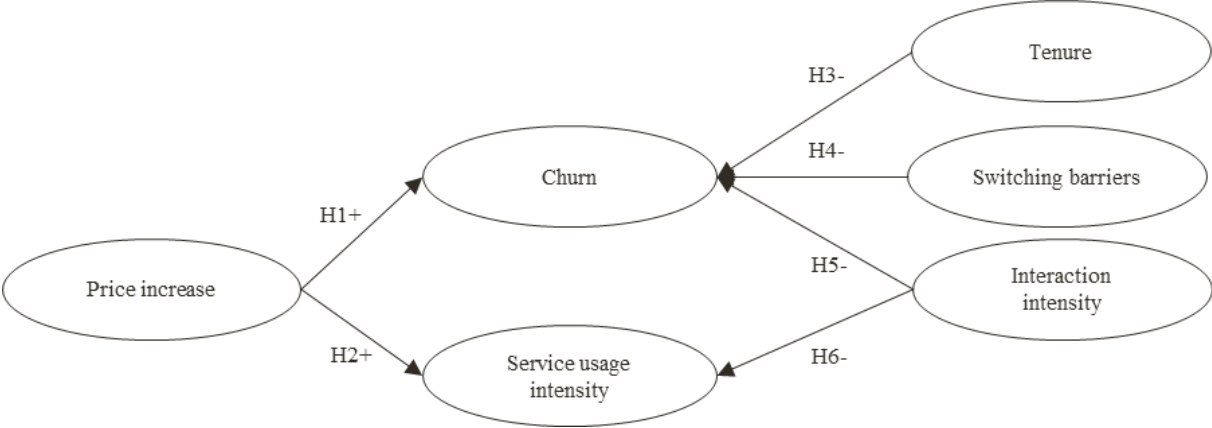
Source: own construction

So the Heckman sample selection equations are the following:

MINDIFF= β_0 + $\beta_1 logMFDIFF$ + $\beta_2 CC\_CALLS$ + $\beta_3 D\_CC\_CALLS$ + $\beta_4 BEFORE\_USAGE\_MINUTES$ + $\beta_5 NPS\_CC$ + $\beta_6 D\_NPS\_CC$ + u_1 (regression equation) and it is assumed that MINDIFF in the regression equation is only observed if in the selection equation:

CHURN= 1 = γ_0 + $\gamma_1 logMFDIFF$ + $\gamma_2 TENURE$ + $\gamma_3 CONTRACT$ + $\gamma_4 CC\_CALLS$+ $\gamma_5 D\_CC\_CALLS$ +$\gamma_6 BEFORE\_USAGE\_MINUTES$ + $\gamma_7 NPS\_CC$ + $\gamma_8 D\_NPS\_CC$+ u_2 (selection equation), where $u_1 \sim N(0,\sigma)$, $u_2 \sim N(0,1)$ and corr $(u_1,u_2)= \rho$.

Based on the literature, it is expected that the logarithm of difference of new and old monthly fees (logMFDIFF), time of contract (TENURE), switching barrier (CONTRACT) and interaction intensity (CC_CALLS) decrease churn (CHURN), and covariates are included to refine the effects between criterion and independent variables, but no hypotheses are related to them. In the second stage the difference of minutes spent talking before and after

elimination (MINDIFF) is used to analyze the changes in usage intensity of those customers, who stayed with the company after elimination.

4.4.2 DATA AND DATA QUALITY

Data is available for the biggest tariff simplification project of a Hungarian telecommunications operator from 2012-2013. The sample includes 25 eliminated mobile service packages (not including fixed line or other services) in the consumer, and 62 in the SOHO segments (small office-home office), the 3 month data of altogether around 10 065 customers before and after elimination, who have been involved in this elimination, and other contract-related information. Of the 10065 customers 1585 have churned, so the churn rate is 15,76%, which is higher than the 2% industry average (ClintWorld GmbH., 2013).

Due to data quality issues, some part of the database had to be modified in order to obtain any results related to the price changes due to service elimination.

The database has an omission problem in case of non-churned customers. If it is supposed that there are customers who did not leave the operator after service elimination, they should have a new subscription, thus the monthly fee should be known. In certain cases however, the data is missing. The company could not reproduce the valid data, because the database was generated in 2012-13, and data is not available in such structure anymore.

To overcome this problem, it was decided to impute missing new monthly fee data of non-churned customers as follows: typical values of old monthly fees were analyzed according to the types of old values, and then missing new monthly fees were replaced by the modus related to the old monthly fee group. These old and corrected new monthly fees were used to calculate log monthly fee differences. In the rest of the database, no obvious mistakes were found.

It must be noted however that despite the data imputation, out of bundle usage data cannot be calculated, thus monthly fee changes are used only throughout the study.

4.4.3 RESULTS

The selected methodology, Heckman sample selection is available in R using the sampleselection package, and with heckman command in Stata. Stata 13 was used for the analysis.

Before running the model, it was controlled for multicollinearity, thus the covariance (Kovács, 2008) of independent variables was checked. A linear regression was run with the variables used in the first stage to calculate the Variance Inflation Factor (VIF), which shows

the seriousness of multicollinearity (Craney & Surles, 2002). Due to the fact that Heckman sample selection is not linear, this step required to run additional linear regression (Annex 7.). The VIF shows that all values are below 10 (Annex 8.) that marks there is no serious multicollinearity between variables (O'brien, 2007). Besides this, the correlation matrix was analyzed as well (Annex 9.), which supported the previous finding that there is no serious correlation between independent variables.

The results of the sample selection model are presented in Table 9. The first stage Heckman results[9] show that a smaller new monthly fee after elimination (logMFDIFF), time of contract (TENURE) and interaction intensity (CC_CALLS) increase the probability of staying with the company after elimination confirming H9, H11 and H13, where switching barrier (CONTRACT) is not significant, rejecting H12. Among the covariates it can be concluded that usage intensity before elimination (BEFORE_USAGE_MINUTES) increases the probability of staying with the company after elimination, whereas satisfaction (NPS_CC) is not significant.

In the second stage it is observed, whether the elimination has any effect on usage behavior by those, who stayed with the operator. The results show that a higher new monthly fee after elimination (logMFDIFF) and the usage intensity before the elimination (BEFORE_USAGE_MINUTES) increase the minutes spent talking after elimination (logMINDIFF), where interaction intensity (CC_CALLS) and satisfaction (NPS_CC) are not significant, rejecting H14. This means that an evidence for H10 was found, as price increase (higher new monthly fee) increases usage after service elimination.

Table 9. Results of Model 1 based on Heckman sample selection

(N=7766, significant values are in bold)

Dependent variable	Coefficient	Standard error	$P > z$
2nd Stage: Estimating usage differences during service elimination by non-churned customers			
logMFDIFF	**0,2515019**	**0,0413102**	**0,000**
CC_CALLS	–0,0145473	0,0075202	0,053
D_CC_CALLS	0,0825613	0,0601285	0,170

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[9] A significance level of 1% is used throughout the analysis.

BEFORE_USAGE_MINUTES	**0,0000180**	**1,28e-06**	**0,000**
NPS_CC	0,0271769	0,0258020	0,292
D_NPS_CC	0,3731505	0,1677520	0,026
Constant	**–1,4339580**	**0,1736240**	**0,000**

1st Stage regression: Estimating probabilities for churn during service elimination

logMFDIFF	**–0,1063136**	**0,0374286**	**0,005**
TENURE	**0,0003147**	**0,0000484**	**0,000**
CONTRACT	–0,0282765	0,0543901	0,603
CC_CALLS	**0,1234887**	**0,0240577**	**0,000**
D_CC_CALLS	**–0,3390464**	**0,0736854**	**0,000**
BEFORE_USAGE_MINUTES	**6,00e-06**	**1,23e-06**	**0,000**
NPS_CC	–0,0332769	0,0410659	0,418
D_NPS_CC	–0,5202374	0,3178663	0,102
Constant	**1,3267610**	**0,3391423**	**0,000**
athρ	0,5020116	0,0552090	0,000
lnσ	0,5172867	0,0124170	0,000
ρ	0,4636977	0,0433382	
σ	1,6774700	0,0208291	
λ	0,7778390	0,0797093	
LR test of indep. eqns ($\rho = 0$)	$\chi^2(1) = 32,00$		0,0000
Number of observations	7 766		
Censored observations	1 502		
Uncensored observations	6 264		
Wald $\chi^2(10)$	269,64		
Log-likelihood	–15 425,09		
Prob > χ^2	0,0000		

Source: own construction

Due to the fact that Heckman sample selection does not compute any information regarding the explanatory power of the model at the end of the two-stage process, R^2 was computed manually. There are various methods for this, such as Nagelkerke or McFadden R^2

(Smith & McKenna, 2013). Nagelkerke R^2 is usually overestimating, so McFadden R^2 was chosen to calculate the explanatory power. For this, it is required to compute the constant only model (Annex 10.).

So McFadden R^2 is the following for Model 1:

$$\frac{\left(-2(-20529,41)\right) - \left(-2(-15425,09)\right)}{-2(-20529,41)} = \frac{41058,82 - 30850,18}{41058,82} = 0,2486.$$

This means that model is explaining 24, 86 percentage of the total variance.

To increase the explanatory power of the model, backward models were run: the variable with the highest level of insignificance was removed in every step, then the second highest insignificant variable and so on. Heckman sample selection does not run forward, or backward models, so the testing of the models was run manually. Backward models were chosen, because they are altogether more reliable than forward models (Sabzevari *et al.*, 2007). The result (Annex 11.) is not the final Model 1., because it is considered to be important to test the hypotheses based on literature. So in the final model, after several iterations switching barrier (CONTRACT) and satisfaction (NPS_CC) were included in the first stage, and interactional intensity (CC_CALLS) and satisfaction (NPS_CC) in the second stage, although they are insignificant, but only this model enabled the hypotheses testing.

The strong significance of λ shows that there is a sample selection bias, which validates the choice of the Heckman selection model. As the Wald test is highly significant, it verifies the significance of the model.

The positive ρ means that the residuals are correlated and there is an effect between exogenous and dependent variables. In this case it means that an unobservable (exogenous) variable is positively related to both churn (CHURN) and the change in usage intensity (MINDIFF). Such exogenous variables could be e.g. brand image or psychological factors influencing usage, which is out of the focus of the study.

Truncation effect can be calculated to see how much usage intensity before and after elimination (MINDIFF) is shifted due to the sample selection bias. The average mills ratio is 0,3, which means that the truncation effect is: λ * average mills value = 0,735 * 0,3 = 0,2205. The interpretation of the truncation effect is that a customer with sample average characteristics who is selected as churned, has a [exp(0,2205)-1] * 100 =24, 67% higher usage than a random selection of customers with comparable characteristics. This also means that churned customers would have higher usage, who are however not observed in the second

stage. The procedure has a sample selection bias: the model assumes that those with a higher phone usage have a higher propensity to churn during service elimination, and those who have lower usage, stay with the service provider. This is a selection bias that the Heckman selection model can correct, which is the primary reason for choosing this method in our research.

4.4.4 ROBUSTNESS ANALYSIS

To check the reliability of results double robustness (Carpenter, *et al*., 2006) was applied, which requires three models: the first model contains the partly or fully observed data; the second only contains the fully observed data; and finally the third estimates the probability of observing data. The study is a database analysis, not an observation, so the third model is not relevant in this case. In Model 1 one variable (logMFDIFF) had to be imputed due to data quality issues.

Based on this, in order to check for robustness, a model was created, where this imputed variable (logMFDIFF) is not present, so it only contains full data (see Table 10.). In Model 2, which does not include the logarithm of old and new monthly fee differences (logMFDIFF), the coefficients of independent variables are not different remarkably compared to Model 1. As a result, there is no hint for omitted variable bias, because in case of omitting an important variable, there would be a significant difference between coefficients in the two models. Robustness analysis should not be checked for the second predictor variable (BEFORE_USAGE_MINUTES), because imputation has not affected this variable.

McFadden R^2 is the following in case of Model 2:

$$\frac{\left(-2(-20529,41)\right) - \left(-2(-17225,01)\right)}{-2(-20529,41)} = \frac{41058,82 - 34450,02}{41058,82} = 0,1609.$$

Model 2 only explains the 16,09% of the total variance in comparison with the 24,86% of Model 1, so based on this, Model 1 is considered better, which also verifies the usage of logarithm of differences between old and new monthly fees (logMFDIFF) in the study.

Table 10. Results of Model 2 based on Heckman sample selection (N=8647, significant values are in bold)

Dependent variable	Coefficient	Standard	*P > z*

		error	

2nd Stage: Estimating usage differences during service elimination by non-churned customers

CC_CALLS	–0,0149312	0,0072252	0,039
D_CC_CALLS	0,1045050	0,0565815	0,065
BEFORE_USAGE_MINUTES	**0,0000174**	**1,22e-06**	**0,000**
NPS_CC	0,0213189	0,0236883	0,368
D_NPS_CC	0,3211523	0,1555119	0,039
Constant	**–1,3587820**	**0,1613297**	**0,000**

1st Stage regression: Estimating probabilities for churn during service elimination

TENURE	**0,0003277**	**0,0000415**	**0,000**
CONTRACT	0,0131845	0,0506456	0,795
CC_CALLS	**0,1167991**	**0,0230705**	**0,000**
D_CC_CALLS	**–0,3164048**	**0,0705425**	**0,000**
BEFORE_USAGE_MINUTES	**5,55e-06**	**1,20e-06**	**0,000**
NPS_CC	–0,0380210	0,0395436	0,336
D_NPS_CC	–0,6001544	0,3101814	0,053
Constant	**1,3759690**	**0,3303945**	**0,000**
athρ	0,4200895	0,0566100	0,000
lnσ	0,5043151	0,0113615	0,000
ρ	0,3970058	0,0476875	
σ	1,6558510	0,0188130	
λ	0,6573826	0,0841658	
LR test of indep. eqns ($\rho = 0$)	$\chi^2(1) = 26,09$		0,0000
Number of observations	8 647		
Censored observations	1 585		
Uncensored observations	7 062		
Wald $\chi^2(10)$	241,26		
Log-likelihood	–17 225,01		

Prob > χ^2	0,0000

To test for the reliability of results, besides Model 2, robust standard errors were calculated for both models, and there is no significant difference in coefficients regarding Model 1 and Model 2 (Table 11. and Table 12.).

Table 11. Results of Model 1 based on Heckman sample selection with robust standard errors (N=7766, significant values are in bold)

Dependent variable	Coefficient	Standard error	$P > z$
2nd Stage: Estimating usage differences during service elimination by non-churned customers			
logMFDIFF	**0,2515019**	**0,0425980**	**0,000**
CC_CALLS	–0,0145473	0,0085981	0,091
D_CC_CALLS	0,0825613	0,0653777	0,207
BEFORE_USAGE_MINUTES	**0,0000180**	**1,12e-06**	**0,000**
NPS_CC	0,0271769	0,0230514	0,238
D_NPS_CC	0,3731505	0,1587034	0,019
Constant	**–1,4339580**	**0,1665296**	**0,000**
1st Stage regression: Estimating probabilities for churn during service elimination			
logMFDIFF	**–0,1063136**	**0,0307152**	**0,001**
TENURE	**0,0003147**	**0,0000552**	**0,000**
CONTRACT	–0,0282765	0,0570230	0,620
CC_CALLS	**0,1234887**	**0,0243091**	**0,000**
D_CC_CALLS	**–0,3390464**	**0,0767526**	**0,000**
BEFORE_USAGE_MINUTES	**6,00e-06**	**1,17e-06**	**0,000**
NPS_CC	–0,0332769	0,0448099	0,458
D_NPS_CC	–0,5202374	0,3422641	0,129
Constant	**1,3267610**	**0,3430156**	**0,000**

athρ	0,5020116	0,0778257	0,000
lnσ	0,5172867	0,0249509	0,000
ρ	0,4636977	0,0610920	
σ	1,6774700	0,0418544	
λ	0,7778390	0,1167677	
LR test of indep. eqns ($\rho = 0$)	$\chi^2(1) = 41,61$		0,0000
Number of observations	7 766		
Censored observations	1 502		
Uncensored observations	6 264		
Wald $\chi^2(10)$	321,10		
Log-likelihood	−15 425,09		
Prob > χ^2	0,0000		

Source: own construction

Table 12. Results of Model 2 based on Heckman sample selection with robust standard errors (N=8647, significant values are in bold)

Dependent variable	Coefficient	Standard error	*P > z*
2nd Stage: Estimating usage differences during service elimination by non-churned customers			
CC_CALLS	−0,0149312	0,0082643	0,071
D_CC_CALLS	0,1045050	0,0597535	0,080
BEFORE_USAGE_MINUTES	**0,0000174**	**1,04e-06**	**0,000**
NPS_CC	0,0213189	0,0213007	0,317
D_NPS_CC	0,3211523	0,1470128	0,029
Constant	**−1,3587820**	**0,1550985**	**0,000**
1st Stage regression: Estimating probabilities for churn during service elimination			
TENURE	**0,0003277**	**0,0000463**	**0,000**
CONTRACT	0,0131845	0,0532785	0,805
CC_CALLS	**0,1167991**	**0,0222748**	**0,000**

D_CC_CALLS	**–0,3164048**	**0,0717977**	**0,000**
BEFORE_USAGE_MINUTES	**5,55e-06**	**1,14e-06**	**0,000**
NPS_CC	–0,0380210	0,0424532	0,370
D_NPS_CC	–0,6001544	0,3288377	0,068
Constant	**1,3759690**	**0,3291671**	**0,000**
athρ	0,4200895	0,0728868	0,000
lnσ	0,5043151	0,0224602	0,000
ρ	0,3970058	0,0613988	
σ	1,6558510	0,0371907	
λ	0,6573826	0,1114652	
LR test of indep. eqns ($\rho = 0$)	$\chi^2(1) = 33,22$		0,0000
Number of observations	8 647		
Censored observations	10 585		
Uncensored observations	70 062		
Wald $\chi^2(10)$	325,82		
Log-likelihood	–17 225,01		
Prob > χ^2	0,0000		

Source: own construction

4.4.5 CONCLUSION

In Study 3 it was found that high customer churn in case of service elimination how could be decreased, and what effects does the process have on customer behavior. As practical evidence shows, service elimination involves high risk for decision-makers due to the high churn involved with the process.

Heckman sample selection was used to define high and low churn indicators in case of service elimination and it was found that price increase, tenure and interaction intensity significantly increase customer retention. Switching barriers do not have a significant impact, which is probably due to the measuring capability of the total switching costs of the Dummy variable. What regards non-churned customers, it can be concluded that according to a priori expectations, higher monthly fee after elimination increases the usage of customers.

It is an important finding for decision-makers that customer churn during service elimination can be decreased by the appropriate pricing of the new offer, because due to low switching costs, the higher monthly fee offered compared to current service package might motivate customers to accept competitor offers. Besides this, new customers, and customers who contact the operator less frequently or are less contacted by the operator are considered to be endangered groups regarding service elimination.

The study has some limitations: first, price increase calculated by using the total spending of customer, instead of monthly fee changes, can have a different effect. Second, switching barriers might be significant, if all costs related to switching could be included. Third, at the time of elimination, the state of the Hungarian telecommunication market would have altered the results, to compare new monthly fees with competitive prices. Further research areas might include more empirical evidence between the relationship of service elimination and customer retention, focusing on the limitations of present study.

So based on the hypotheses testing it can be concluded that:

Hypothesis 8: Churn rate during service elimination is higher than normal churn rate.- supported

Hypothesis 9: Price increase is associated with a lower propensity to retain customers during service elimination compared to price decrease.- supported (Table 9)

Hypothesis 10: Price increase is associated with a heightened propensity of higher usage after service elimination compared to price decrease.- supported (Table 9)

Hypothesis 11: Longer relationship tenure with a service provider is associated with a heightened propensity to retain the customer during service elimination compared to a shorter relationship tenure.- supported (Table 9)

Hypothesis 12: Switching barriers are associated with a heightened propensity to retain the customer during service elimination compared to no switching barriers present.- rejected (Table 9)

Hypothesis 13: A higher level of interaction intensity is associated with a heightened propensity to retain customer during service elimination compared to a lower level of interaction intensity.- supported (Table 9)

Hypothesis 14: A higher level of interaction intensity is associated with a heightened propensity of lower usage after service elimination compared to a lower level of interaction intensity.- rejected (Table 9)

5   SUMMARY

"Imagination is more important than knowledge.

Knowledge is limited. Imagination encircles the world."

(Albert Einstein)

The emphasis on service development overshadows the strategic level assessment of service elimination. This has a significant effect both on customer retention and firm revenue, resulting in high churn rates, higher costs, locked resources, and fragmented service portfolios at service firms.

Through a well-designed and executed service elimination, these portfolios might become more effective. Resources could be allocated to other areas within the company and reduce the cost of service elimination, which supports customer retention following service elimination.

Retention plays a key role in today's economy, as on the one hand service markets are stagnating, and on the other hand companies are still focusing on acquisition in many cases. Retention is also critical during service elimination, because neglecting important effects throughout the process, such as high churn rates, might reduce service companies' existing customer base. The vast majority of customers involved in forced migration leave the company due to perceived economic and/or psychological costs during service elimination. Thus, economic and psychological costs are crucial: the value added of the new offer compared to the current one and how the company interacts with customer during service elimination primarily determine the risk of churn.

Based on these, the thesis analyzed service elimination with a special focus on customer reaction. It intended to gain new empirical results in the field of service elimination by combining the outcome of service elimination with customer perspectives that may also give some new insights and enlighten the service elimination area in a way that is useful for practitioners as well.

From an academic point of view, the literature review showed that there are just a few papers to compare because of this combination of areas within service elimination. Most studies were done in the product field, within services; the cause and process of financial service elimination are analyzed in particular. The literature review of customer insights to

service elimination also concluded that churn is a common measure of customer retention; however, it is not used in the special case of service elimination.

This research, including an experiment designed based on scenarios and database modeling, aimed to reveal churn indicators during the process. All three studies focus on the customer side. Studies 1 and 2 include a scenario-based experiment and Study 3 uses a database analysis. In Study 1, experimental design was used to determine the effects of service elimination and variables related to customer reactions (churn, satisfaction, loyalty, affective and calculative commitment, and WOM) based on social exchange theory with independent variables of economic and psychological cost. The main result of the experiment is that, when these costs interact, the way of interaction influences customer reactions stronger than the quality of the offer. In the case of a least favorable offer, missing verbal notice before elimination reduces churn, whereas in the case of a more favorable offer it leads to increased churn. Thus, the interaction between psychological and economic costs have unexpected results.

Although direct communication with customers might reduce psychological costs, and thus the need for forced migration, customers might leave nonetheless, due to unexpected effects of the explanation given by the service firm. The form of written communication has a limited possibility for helping make the customer understand the value of the new offer, so when the communication becomes more direct (either personal or by phone), it suddenly draws the attention of the customer to the value of a new offer, whether better or worse than the current one, which affects churning behavior. This means that service providers should assess the cases carefully where direct communication is required to reduce churn.

Study 2 also uses an experimental methodology, but based on justice theory, which is another theory to assess the effect of service elimination, or more generally in the literature, service failures, on customers. Results support that distributive and interactional justice are in a positive relationship with customer retention, satisfaction, and loyalty, whereas procedural justice is not significant. In terms of the interactions between the elements of fairness, distributive justice was found to be the strongest in terms of reducing customer churn, and increasing satisfaction and loyalty, but two-way interactions between the elements revealed partial compensating effects for procedural justice in interaction with distributive justice, and for interactional justice in interaction with procedural justice.

Study 3 is based on the customer database of a Hungarian telecommunications operator. The reasons behind high churn rates compared to normal customer churn in the case of service elimination are revealed through the analysis of service package elements and customer characteristics analyzing real customer behavior. The result of Study 3 is that price increase, tenure, interaction intensity, and usage intensity before elimination are strong predictors of churn during service elimination, while the switching barrier does not have a significant effect on churn. Furthermore, for those who stayed with the company after elimination, it was observed that price increase and usage intensity before elimination increase the customer's usage intensity after service elimination. This might be due to customer consciousness; they are probably more aware of their service plan after elimination happens, as they need to consider new conditions. This might explain why a higher new monthly fee, and intensive usage behavior results in higher usage after service elimination than before.

Table 13 summarizes the research questions and hypotheses.

Table 13. Summary of research methodology

	Case study	Study 1	Study 2	Study 3
Research questions	-	1. How can social exchange theory be applied to explain customer reaction (satisfaction, loyalty, churn, affective and calculative commitment, complaining, and WOM) following service elimination?	2. How can justice theory be applied to explain customer reaction (satisfaction, loyalty, churn, affective and calculative commitment, complaining, and WOM) following service elimination?	3. Is churn higher in the case of service elimination compared to normal churn rates? 4. How is post-elimination churn influenced by service elimination characteristics and customer characteristics? 5. How is post-elimination usage intensity influenced by service elimination characteristics and customer characteristics?
Hypotheses	-	H1: Economic cost increases churn, WOM, and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination. H2: Psychological cost increases churn, WOM, and complaining, and decreases satisfaction,	H4: Distributive justice decreases churn, and increases satisfaction and loyalty in case of service elimination. H5: Procedural justice decreases churn, and increases satisfaction and loyalty in case of service elimination. H6: Interactional justice	H8: Churn rate during service elimination is higher than normal churn rate. H9: Price increase is associated with a lower propensity to retain customers during service elimination compared to price decrease. H10: Price increase is

	loyalty, and affective and calculative commitment in case of service elimination. H3: There will be interaction effects for economic and psychological costs in case of service elimination.	decreases churn, and increases satisfaction and loyalty in case of service elimination. H7: There will be interaction effects for distributive, procedural, and interactional justice in case of service elimination.	associated with heightened propensity of higher usage after service elimination compared to price decrease. H11: Longer relationship tenure with a service provider is associated with a heightened propensity to retain the customer during service elimination compared to a shorter relationship tenure. H12: Switching barriers are associated with a heightened propensity to retain the customer during service elimination compared to no switching barriers present. H13: A higher level of interaction intensity is associated with a heightened propensity to retain the customer during service elimination compared to a lower level of interaction intensity. H14: A higher level of interaction intensity is associated with a heightened propensity of lower usage after service elimination compared to a lower level of interaction intensity.
Population	Telecommunication operator's managers involved in service elimination	Telecommunication customers	Telecommunication customers	Hungarian telecommunications operator's customer database
Observation unit	Corporation	Customers	Customers	Customers
Data selection	Intensity method: managers involved in service elimination	General method: telecommunication customers	General method: telecommunication customers	Intensity method: customers involved in service elimination
Sample size	3	163	178	10 065
Sampling methodology	Filtering: managers involved in service	Random selection	Random selection	Filtering: customers involved in service

	elimination			elimination
Timing	January 2014	November 2014-	December 2016-	February- November 2016
		January 2015	April 2017	

Source: own construction

5.1 *EVALUATION OF RESEARCH HYPOTHESES*

Among the 14 hypotheses, 9 can be accepted without any limitations, 2 can be partially accepted, and 3 are rejected.

The quality of the offer was measured in three ways among the three studies. Economic cost in Study 1, distributive justice in Study 2, and price increase in Study 3 all capture whether the service package after elimination has a more favorable monthly fee. The conclusion arrived at is that a more favorable offer reduces churn and WOM and increases satisfaction, loyalty, and affective and calculative commitment.

Similarly, the quality of interaction was also similar in all three studies: psychological cost in Study 1, interactional justice in Study 2, and interaction intensity in Study 3. All studies confirmed that the interaction between the service provider and the customer reduces churn and WOM, and increases satisfaction, loyalty, and affective and calculative commitment. Its effect on usage behavior could not be confirmed though; probably it is more of an indirect relationship, influenced by other factors not measured by this research.

The hypothesis referring to the effect of psychological cost, was accepted in the case of satisfaction, loyalty, and affective commitment; it was rejected in the case of churn and WOM. Therefore, the unexpectedness related to service elimination has an influence on customer perceptions, but does not affect churn and WOM intentions.

Similarly, the interactions between justice elements (distributive, procedural, and interactional justice) was accepted in the case of distributive and procedural justice interaction for churn and satisfaction, and in the case of procedural and interactional justice interaction for satisfaction. This means that on the one hand procedural justice can compensate the absence of distributive justice, and on the other hand interactional justice the absence of procedural justice.

The first hypothesis rejected refers to procedural justice, which can be also due to operationalization issues. Customers cannot perceive the difference between an incoming call from the operator or a situation where their uncertainty drives them to contact the operator. It

is still surprising, however, that a long waiting time and multiple attempts to reach the operator do not have significant effect on levels of churn, satisfaction, or loyalty.

As the literature suggests, timeliness, responsiveness, and convenience express the main elements of procedural justice used to form the scenarios. Still, the effect is not significant, which means that in the context of service elimination, the formulation of procedural justice should be altered to a more specific definition: in the case of service elimination, it can express the inconvenience, energy, and time throughout the whole service elimination process. It should not be restricted to the call only. This might be an area for further research.

Second, surprisingly, the operator's practice of using switching barriers as a tool to reduce customer churn was rejected, which is probably due to some measurement problems in the database. The database only contains data of whether the two-year in-contact period has ended, which does not incorporate the information of actual costs related to an in-contract customer churn. Data on all costs related to switching would be necessary to test this hypothesis, which could be a future phase of this research. Collaboration between operators and universities would be required to acquire these data.

Third, the hypothesis referring to the effect of interaction intensity on post-elimination usage intensity was rejected, but as empirical results in the literature are not unified in this sense, this result can be considered to be an area of further research.

The results of the hypotheses are summarized in Table 14.

Table 14. Summary of research hypotheses

Hypothesis	Result	Reference
H1: Economic cost increases churn, WOM, and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.	Accept	Study 1
H2: Psychological cost increases churn, WOM, and complaining, and decreases satisfaction, loyalty, and affective and calculative commitment in case of service elimination.	Partially accept	Study 1
H3: There will be interaction effects for economic and psychological costs in case of service elimination.	Accept	Study 1
H4: Distributive justice decreases churn, and increases satisfaction and loyalty in case of service elimination.	Accept	Study 2
H5: Procedural justice decreases churn, and increases satisfaction and loyalty in case of service elimination.	Reject	Study 2
H6: Interactional justice decreases churn, and increases satisfaction and loyalty in case of service elimination.	Accept	Study 2

H7: There will be interaction effects for distributive, procedural, and interactional justice in case of service elimination.	Partially accept	Study 2
H8: Churn rate during service elimination is higher than normal churn rate.	Accept	Study 3
H9: Price increase is associated with a lower propensity to retain customers during service elimination compared to price decrease.	Accept	Study 3
H10: Price increase is associated with a heightened propensity of higher usage after service elimination compared to price decrease.	Accept	Study 3
H11: Longer relationship tenure with a service provider is associated with a heightened propensity to retain the customer during service elimination compared to a shorter relationship tenure.	Accept	Study 3
H12: Switching barriers are associated with a heightened propensity to retain the customer during service elimination compared to no switching barriers present.	Reject	Study 3
H13: A higher level of interaction intensity is associated with a heightened propensity to retain customer during service elimination compared to a lower level of interaction intensity.	Accept	Study 3
H14: A higher level of interaction intensity is associated with a heightened propensity of lower usage after service elimination compared to a lower level of interaction intensity.	Reject	Study 3

Source: own construction

5.2 *THEORETICAL CONTRIBUTION OF THE RESEARCH*

The significance of the research has three main parts. First of all, the analysis of the post-elimination phase from the customer perspective contributes to the service elimination literature. Success factors in the area of service elimination were only examined in financial or multi-sector studies; on the other hand, the performance outcome was assessed in manufacturing sectors only. Hence, the customer perspective analysis of services in the service elimination literature is a significant gap (Table 4.). Studies focusing on the customer assess product elimination only Avlonitis, 1983; Homburg *et al*., 2010). Missing empirical evidence in the area is well-known (Harness, 2004), which determines the focus of this research.

Second, using social exchange theory and justice theory, insights into the process were gained, which altogether should be better adapted to the customers' needs. Direct

communication can enhance the outcome of service elimination, if the customer shows interest in this, and they are not contacted by the operator unexpectedly. The research can be considered as a development of justice theory, because it extends its application from service failure to the case of service elimination. To the author's knowledge, social exchange theory and justice theory had not yet been applied in a service elimination context to explain customer reactions.

Study 1 reveals customer reactions during the service elimination process using an experimental design based on social exchange theory. The results altogether conclude the churn and WOM reducing, and satisfaction, loyalty, and commitment (affective and calculative commitment) increasing effect of a favorable offer (no economic cost is present), where the unexpectedness of the notification (psychological cost) has a similar effect on customer reaction. The interactions between economic and psychological costs highlight the enhanced role of the notification: depending on the quality of the offer, the psychological cost has a different effect. This phenomenon highly correlates with the complexity of offers, because customers usually do not comprehend a written, legal notice about service elimination. A direct interaction (call notification) specifying the real content of the written notice is needed. Considering this, it can explain how this direct interaction can result in higher churn in the case of a least favorable offer, whereas it has the opposite effect in the case of a more favorable offer, it contributes to customer retention.

Study 2 also uses experimental design, but the understanding of customer reactions is based on justice theory. Results show that the elements of justice (distributive, procedural, and interactional justice) influence customer reactions as costs do, but the interactions in this case revealed the partial compensating effect of procedural justice on distributive justice, and interactional justice on procedural justice.

Third, the literature does not handle the effect of service elimination on customers in such detail, but this basically determines the success of the process. Independent of service elimination, churn is frequently applied as a success indicator in general situations, and used under these special circumstances in this research. Thus, service elimination can be considered as a special circumstance of the general churn modeling. It can contribute to the understanding of churn. The main success factor of service elimination is the post-elimination churn, which highly correlates with the quality of the new offer and the quality and timing of interaction, according to the results of Studies 1 and 2.

Study 3 principally determined the main success indicators of the service elimination process, which revealed the significance of tenure and usage intensity, among other factors identified in Studies 1 and 2 (such as the quality of the offer and interaction intensity). As a result, groups threatened during the service elimination process in terms of churn are the new customers and/or light users.

The results confirm the churn-reducing effect of price decrease and tenure described in the general churn literature. With regard to interaction intensity and usage intensity, however, the churn literature is quite dispersed and in this sense the results contribute to widen the pool of empirical results.

The diverse results in the literature regarding these variables can be because the service life cycle primarily determines interaction intensity. The introduction and elimination phases of a service may require a more intense interaction; during other phases of the life cycle the customer does not necessarily need this. Opinions are divided on the timing of a more intense interaction. The results of Study 3 confirm the view that the elimination phase requires a more intense interaction between the service provider and the customer. Otherwise, usage intensity is an even more debated area in the churn literature. The results support the churn-reducing effect of usage intensity. Besides this, price increase has a usage-intensifying role, which is also a less studied area in churn literature.

Fourth, service elimination can be considered essential in service portfolio innovation and management both in terms of its academic and practical relevance. Service innovation and service elimination are both part of service range management (Argouslidis, 2001), the latter of which is less represented in such context. The elimination of existing services can help to accelerate service innovation, the significance of which is important to emphasize. Thus, it is crucial that the research has practical implications as well, regarding the implementation of insights obtained through customer reactions into the service elimination strategy. The quality of interaction with the customer and its timing can be considered of highlighted importance.

5.3 PRACTICAL RELEVANCE OF THE RESEARCH

5.3.1 SERVICE ELIMINATION CHURN CAN BE REDUCED BY A MORE FAVORABLE OFFER AND GOOD QUALITY OF INTERACTION

Two important churn indicators were identified in this research in all three studies: a least favorable offer after elimination and missing or poor quality (including indirect communication, or direct communication forms without expressing respect and care for the customer) interaction between the operator and the customer.

A least favorable offer was shown to have high levels of churn, which is a challenge for operators in practice too, as sometimes eliminated service packages have some special discounts for the customer other service packages of the operator do not include. In these cases, churn is unavoidable, especially if competitors have something similar to the current service package. The question is, how can this perception of a least favorable offer (if the operator does not have an offer with similar discounts as the current one) altered? With interactions between the quality of the offer and direct communication to notify the customer about changes and explain new offers, it turned out that in the case of a least favorable offer direct communication only highlights the drawbacks of the offer, thus leading to increased churn, whereas in the case of more favorable offers it was found to have a churn-decreasing effect.

In general, customers do not understand the whole process without direct explanation from the operator; the legal requirement of sending a letter is not enough. On the other hand, the quality of interaction is also crucial: call center operators should show respect for and have patience with the customer, and help them find a better alternative.

Further, churn predictors were identified in Study 3: customer's tenure and usage intensity before elimination. Both express the customer's engagement with the operator; as with a longer relationship and intensive usage it becomes stronger. So groups threatened during service elimination are the new customers, customers informed before service elimination only indirectly, and in terms of usage, light users.

5.3.2 A LEAST FAVORABLE OFFER IN CASE OF SERVICE ELIMINATION CAN BE PARTIALLY COMPENSATED BY THE QUALITY OF INTERACTION PERCEIVED DURING THE PROCESS

Studies 1 and 2 highlighted interesting aspects of interactions between the elements of justice.

Study 1 pointed out that in the case of a least favorable offer (the monthly fee of the new service following service elimination is higher than the customer's current monthly fee), notifying the customer by phone before the service elimination increases the probability of churn. This is probably due to the customer's limited knowledge of and interest in the exact conditions of the service, and thus, such a call has an attention-raising role, which can be favorable in the case of a more favorable offer, but in the case of a least favorable offer it is counterproductive.

Study 2 stresses first the role of perceived burdens during the whole service elimination process, as the timeliness, convenience, perceived fairness, or waiting time, and the responsiveness of the service provider during the process can partially compensate the effects of a least favorable offer on churn and satisfaction. An important addition to the definition of procedural justice in the case of service elimination would be to extend the perceived burdens to the whole process, instead of the retention call only. Thus, service providers may pay more attention to the conditions of the whole process, starting from notifying the customer about the change, until the change of service package.

Second, Study 2 also highlighted the importance of perceived control, as higher satisfaction levels can be achieved with showing courtesy and respect toward the customer, if the customer initiated the call. Even if the customer is interested in knowing more about service elimination, an inappropriate timing of a call might disturb their daily routine. A good quality interaction cannot compensate for the negative feelings related to loss of perceived control. An altogether higher satisfaction can be achieved by a customer-initiated call. Appointment booking could provide a solution for this issue.

In sum, an unencumbered service elimination process with good quality interaction between the service provider and the customer, the timing of the call, and the customer's interest in service elimination (i.e., the customer is the one deciding to directly interact with the service provider) can reduce the negative customer perceptions related to an unfavorable offer.

5.3.3 PRICE INCREASE RAISES THE CUSTOMER'S USAGE INTENSITY AFTER ELIMINATION

Study 3 had some implications regarding the customer's usage intensity after elimination besides identifying churn indicators, which is influenced by two factors, supposing they stay

with the company after elimination. Price increase and usage intensity before elimination increase the usage intensity after elimination.

Price increase means that the customer has a higher monthly service fee package than before the service elimination, and they are using this service more intensively than before.

The explanation for this is linked to the quality of interaction. As already seen, even in the case of a least favorable offer, the interaction has an attention-raising role for the customer. But, if the customer contacts the operator, the quality of this direct communication still can improve perceptions on satisfaction and loyalty. So those receiving a least favorable offer, but staying with the company, probably had several conversations with the operator about new conditions, and thus are more aware of the changes. The higher monthly fee is probably not the main factor influencing the decision to stay with the operator; this is rather the result of a price-value ratio consideration. Heavy users also tend to stay more with the company, which altogether reflects the acceptance of higher prices, if it is compensated with services valuable for the customer.

5.4 *MANAGERIAL IMPLICATIONS*

Service elimination enables the simplification of the business portfolio that is a requirement for a new service portfolio launch. Due to the limited number of elimination projects available in the past, managers struggle to find solutions for handling the unusually high churn rates in the case of service elimination.

Besides its academic relevance, this research contributes to service elimination practice, by suggesting methods to handle negative customer reaction resulting in churn. As highlighted in the research methodology, service elimination is a complex area, where both the planning and execution are crucial in terms of the success of service elimination. Perceived costs for the customer and the complexity of offers determine satisfaction, loyalty, commitment, and WOM that have an effect on customer retention. So, the type of communication and the selection of customer base contacted directly by the service firm, determines the success of service elimination.

The practical relevance of the topic is also confirmed by the case study: telecommunication operators are not handling service elimination on a strategic level and this makes service development processes less effective. There is a need for solutions resulting in decreased customer churn in the case of service elimination. To support this, the service

elimination process needs to be better adapted to the customer's needs and treated more as part of retention in order to reduce customer churn.

From a managerial perspective, this research project can contribute to solving current service-elimination-related problems in companies: as service elimination is a rather complex area, where planning and execution are key in terms of the success of service elimination. Costs for the customer and the complexity of offers determine satisfaction, loyalty, commitment and WOM that have an overall influence on customer retention. Thus the way of communication and the direct interaction with the selected customer base determines the success of service elimination.

5.5 *LIMITATIONS OF THE RESEARCH AND FUTURE RESEARCH DIRECTIONS*

There are some limitations of this research. The case study used three in-depth interviews from one telecommunications operator that could be extended by other interviewees from other operators, and from other countries in the CEE region.

Second, there are also limitations due to the methodology of experimental design, which cannot measure real service elimination behavior, thus it is only able to test imagined reactions to service elimination. Still, most effects could be captured in the case of service elimination as described in the literature in other settings (such as service failure), except the effect of procedural justice on behavioral variables (such as churn and loyalty). Thus, further research should step forward in terms of operationalization of variables. First of all, there is a need for a valid scale formulation of psychological cost. Because of missing empirical evidence, a psychological cost focusing on the unexpectedness of service elimination and interactions during the process was designed; there could be better ways to measure these costs. Similarly, procedural justice is also different in a service elimination setting than in other contexts, and thus the general descriptions of procedural justice should be tailored to the whole service elimination process.

Third, while database analysis can capture data on real service elimination behavior, there were several issues related to data quality. Due to missing data, price increase was limited to changes in monthly fee; however, the total costs for the customer could modify the effects of service elimination. The insignificance of switching barriers is not accordance with literature and practice. This could be due to limited data on switching costs, because in-contract status is not able to capture the switching barrier as a whole. Also, data on

competitive prices of the Hungarian telecommunications market are also missing from the database and these could support the explanation of churn indicators.

The internal generalizability of the research is ensured by using random sampling and the use of manipulation checks. Although telecommunications was chosen because of its adequate characteristics for service elimination analysis, the external validity could be increased by including other sectors. Service elimination is analyzed in the telecommunications sector, and only in Hungary. Further plans include the broader ICT sector analysis in an international environment, which would be the next step toward an overall view of the relationship between service elimination and customer retention.

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APPENDIX

ANNEX 1: CASE STUDY: IN-DEPTH INTERVIEW GUIDELINES

Please remember a case when you decided to eliminate one or more of your services.

- What were the causes of the service elimination?
- Do you think there were external triggers also besides those? How did you plan the process of elimination?
- Were there any barriers that limited your actions?
- What were the steps of the service elimination process? Did your company have constant communication with your customers?
- Does your company have a certain strategy for service elimination?
- What were the consequences of the service elimination? Did you manage to reach the expected results?
- Was your service elimination successful? What does success mean for you in this aspect? Does your company have an evaluation system for service elimination?

ANNEX 2: STUDY 1: EXPERIMENTAL DESIGN QUESTIONNAIRE

In Study 1 4 scenarios were used to which the same 15 questions were assigned to measure the effects on dependent variables. The questionnaires were distributed in Hungarian.

- Scenario 1:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly ask you to fill this questionnaire, if the starting letter of your surname is between A-F. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

Before elimination, the operator contacts you by phone to inform you about this change and to help you to choose a new service package.

The agent can offer you a service package with lower monthly fee, more internet and lower PPM than your current subscription.

One week after the phone call you receive a letter notification as well about the migration.

- Scenario 2:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly ask you to fill this questionnaire, if the starting letter of your surname is between G-L. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

Before elimination, the operator contacts you by phone to inform you about this change and to help you to choose a new service package.

The agent can offer you a service package with a higher monthly fee, less internet and higher PPM than your current subscription.

One week after the phone call you receive a letter notification as well about the migration.

- Scenario 3:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly ask you to fill this questionnaire, if the starting letter of your surname is between M-R. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

The operator is informing you by post about the elimination, but you cannot remember receiving this letter, so the elimination is unexpected for you.

You call the call center of the operator. The agent can offer you a service package with lower monthly fee, more internet and lower PPM than your current subscription.

- Scenario 4:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly

ask you to fill this questionnaire, if the starting letter of your surname is between S-Z. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

The operator is informing you by post about the elimination, but you cannot remember receiving this letter, so the elimination is unexpected for you.

You call the call center of the operator. The agent can offer you a service package with a higher monthly fee, less internet and higher PPM than your current subscription.

- Questions assigned to each scenario:

	1	2	3	4	5
Q1 I consider the operator's reaction appropriate.					
Q2 I am satisfied with the operator's offer.					
Q3 The operator exceeds my expectations.					
Q4 In my opinion the operator is close to the best operator.					
Q5 I will say positive aspects about this operator to other people.					
Q6 I will encourage my friends and family to use this operator.					
Q7 I will use this operator in the next few years.					
Q8 I would accept the operator's offer.					
Q9 I would leave my current operator after this case.					
Q10 I would tell others, what happened to me.					
Q11 I would file a complaint at the operator due to the case.					
Q12 I take pleasure in being a customer of the company.					
Q13 I have feelings of trust toward the company.					
Q14 It pays off economically to choose the offer of the company.					
Q15 I will encourage my friends and family to use this operator.					

ANNEX 3: STUDY 1: MANIPULATION CHECKS QUESTIONNAIRE

In Study 1 4 scenarios were used to which the same 7 questions were assigned to measure the effects on dependent variables. The questionnaires were distributed in Hungarian.

- Scenario 1:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly ask you to fill this questionnaire, if the starting letter of your surname is between A-F. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

 You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

Before elimination, the operator contacts you by phone to inform you about this change and to help you to choose a new service package.

The agent can offer you a service package with lower monthly fee, more internet and lower PPM than your current subscription.

One week after the phone call you receive a letter notification as well about the migration.

- Scenario 2:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly ask you to fill this questionnaire, if the starting letter of your surname is between G-L. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

Before elimination, the operator contacts you by phone to inform you about this change and to help you to choose a new service package.

The agent can offer you a service package with a higher monthly fee, less internet and higher PPM than your current subscription.

One week after the phone call you receive a letter notification as well about the migration.

- Scenario 3:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly ask you to fill this questionnaire, if the starting letter of your surname is between M-R. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

The operator is informing you by post about the elimination, but you cannot remember receiving this letter, so the elimination is unexpected for you.

You call the call center of the operator. The agent can offer you a service package with lower monthly fee, more internet and lower PPM than your current subscription.

- Scenario 4:

Dear Respondent! This questionnaire is part of the research conducted at Corvinus University of Budapest, which is anonymous and only takes a few minutes to fill. We kindly ask you to fill this questionnaire, if the starting letter of your surname is between S-Z. This is required for the randomization of questionnaire; we are not able to identify anyone based on this information. Thank you for your time and support.

You are satisfied with your mobile phone subscription. Your operator eliminates your service package.

The operator is informing you by post about the elimination, but you cannot remember receiving this letter, so the elimination is unexpected for you.

You call the call center of the operator. The agent can offer you a service package with a higher monthly fee, less internet and higher PPM than your current subscription.

- Questions assigned to each scenario:

	1	2	3	4	5
Q1 The offer pays off economically for me.					
Q2 I feel that the service elimination is an enormous financial burden for me.					
Q3 After the case I doubt whether I can still rely on the					

eliminating company.					
Q4 After the case I feel that the company is more of inflexible towards me.					
Q5 I appreciate the company's helpfulness.					
Q6 I think that the case is realistic.					
Q7 This case can happen in everyday life too.					

ANNEX 4: STUDY 2: EXPERIMENTAL DESIGN QUESTIONNAIRE

In Study 2 8 scenarios were used to which the same 17 questions were assigned to measure the effects on dependent variables. The questionnaires were distributed in English.

Intro text

Q0 Dear Respondent! Vienna University of Economics and Business is doing a Ph.D. research about telecommunication services. The time to take this survey is about 5 minutes. Your answers and data are confidential and not shared with third parties. Please indicate how much you agree or disagree with each of these statements (1- strongly disagree; 5- strongly agree). If you have any questions, please send an email to us: agnes.somosi@uni-corvinus.hu. Thank you for your support!

Scenarios

- Scenario 1: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 2: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 3: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 4: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 5: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 6: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 7: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the

changes. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 8: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

Questions

Q0 Please indicate how much you agree or disagree with each of these statements (1- strongly disagree; 5- strongly agree).

	1	2	3	4	5
Q1 I consider the service provider's reaction appropriate.					
Q2 I am satisfied with the service provider's offer.					
Q3 The service provider exceeds my expectations.					
Q4 The service provider is close to my ideal service provider.					
Q5 I will say positive aspects about the service provider to others.					
Q6 I will recommend this service provider to anyone who seeks my advice.					
Q7 I will encourage my friends and family to use this service provider.					
Q8 For any future telecommunications service I need, I will consider this service provider as the first option.					
Q9 If this situation had happened to me I would not accept the service provider's offer.					
Q10 If this situation had happened to me I would change service provider due to this imaginary case.					
Q11 If this situation had happened to me I would never be the					

customer of this service provider again in the future.					
Q12 If this had happened to me I would complain to my friends and relatives about this service provider.					
Q13 If this had happened to me I would file a complaint to the service provider.					
Q14 This service provider would not have a great deal of personal meaning for me.					
Q15 I would not feel 'emotionally attached' to this service provider.					
Q16 It would have been very hard for me to leave my service provider, even if I wanted to.					
Q17 It would not have been too costly for me to leave my service provider in the near future.					

Demographics

Q1 What is your gender?

- Male (1)
- Female (2)

Q2 What is your age?

Q3 What is the highest degree or level of education you have completed?

- Less than high school (1)
- High school graduate (2)
- Some college, no degree (3)
- Associate's degree (4)
- B.Sc. degree (5)
- M.Sc. degree (6)
- Ph.D. (7)

Q4 What is your country of origin?

Q5 What is your nationality?

Q6 What is your city of residence?

Q7 What is your profession?

- Student (1)
- Intern (2)
- Entry level (3)
- Manager (4)
- Senior manager (5)
- Director (6)
- President or CEO (7)
- Owner (8)
- Unemployed (9)
- Q8 What best describes the type of organization you work for?
- For-profit (1)
- Non-profit (2)
- Government (3)
- Health-care (4)
- Education (5)
- Other (6)

Q9 Counting all locations where your employer operates, what is the total number of persons who work there?

- 1 (1)
- 2-9 (2)
- 10-24 (3)
- 25-99 (4)
- 100-499 (5)
- 500-999 (6)
- 1000-4999 (7)
- 5000+ (8)

Q10 What is your marital status?

- Single (1)
- In a relationship (2)
- Married (3)
- Divorced (4)

Q11 What is your average monthly income (EUR)?

- 0-499 (1)
- 500-999 (2)
- 1000-1499 (3)
- 1500-1999 (4)
- 2000-2499 (5)
- 2500-2999 (6)
- 3000-3499 (7)
- 3500-3999 (8)
- 4000-4499 (9)
- 4500-4999 (10)
- 5000+ (11)

ANNEX 5: STUDY 2: MANIPULATION CHECKS QUESTIONNAIRE

In Study 2 8 scenarios were used to which the same 12 questions were assigned to measure the effects on dependent variables. The questionnaires were distributed in English.

Intro text

Q0 Dear Respondent! Vienna University of Economics and Business is doing a Ph.D. research about telecommunication services. The time to take this survey is about 5 minutes. Your answers and data are confidential and not shared with third parties. Please indicate how much you agree or disagree with each of these statements (1- strongly disagree; 5- strongly agree). If you have any questions, please send an email to us: agnes.somosi@uni-corvinus.hu. Thank you for your support!

Scenarios

- Scenario 1: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 2: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 3: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 4: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, so you decide to contact the telecom company by phone. After several phone calls and long waiting time, you are finally able to talk to a competent operator. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 5: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not

clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 6: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is unfriendly and does not seem to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

- Scenario 7: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% higher price than your current subscription.

- Scenario 8: Your telecommunications service provider eliminates your service package, which means that the conditions of your service package are not available anymore. The telecom company sends you a letter in which they offer new conditions. The letter is not clear for you, but fortunately, the telecom company calls you soon to inform you about the changes. The operator is friendly and seems to care about your preferences, and can offer you a new service package with altogether 10% lower price than your current subscription.

Questions

Q0 Please indicate how much you agree or disagree with each of these statements (1- strongly disagree; 5- strongly agree).

	1	2	3	4	5
Q1 Taking everything into consideration, the service provider's offer was quite fair.					
Q2 I did not get what I deserved.					
Q3 Given the circumstances, I feel that the service provider offered an adequate service package.					

Q4 The service elimination was handled in a very timely manner.					
Q5 The service elimination was not resolved as quickly as it should have been.					
Q6 The process of the service elimination was customer-friendly.					
Q7 I was treated with courtesy and respect.					
Q8 The employees seemed to care about me.					
Q9 The employees had a rather negative attitude.					
Q10 I feel that I was treated rudely.					
Q11 I think that the case is realistic.					
Q12 This case can happen in everyday life too.					

Demographics

Q1 What is your gender?

- Male (1)
- Female (2)

Q2 What is your age?

Q3 What is the highest degree or level of education you have completed?

- Less than high school (1)
- High school graduate (2)
- Some college, no degree (3)
- Associate's degree (4)
- B.Sc. degree (5)
- M.Sc. degree (6)
- Ph.D. (7)

Q4 What is your country of origin?

Q5 What is your nationality?

Q6 What is your city of residence?

Q7 What is your profession?

- Student (1)
- Intern (2)
- Entry level (3)
- Manager (4)
- Senior manager (5)
- Director (6)
- President or CEO (7)
- Owner (8)
- Unemployed (9)

Q8 What best describes the type of organization you work for?

- For-profit (1)
- Non-profit (2)
- Government (3)
- Health-care (4)
- Education (5)
- Other (6)

Q9 Counting all locations where your employer operates, what is the total number of persons who work there?

- 1 (1)
- 2-9 (2)
- 10-24 (3)
- 25-99 (4)
- 100-499 (5)
- 500-999 (6)
- 1000-4999 (7)
- 5000+ (8)

Q10 What is your marital status?

- Single (1)
- In a relationship (2)
- Married (3)
- Divorced (4)

Q11 What is your average monthly income (EUR)?

- 0-499 (1)
- 500-999 (2)
- 1000-1499 (3)
- 1500-1999 (4)
- 2000-2499 (5)
- 2500-2999 (6)
- 3000-3499 (7)
- 3500-3999 (8)
- 4000-4499 (9)
- 4500-4999 (10)
- 5000+ (11)

ANNEX 6: STUDY 3: THE HECKMAN SAMPLE SELECTION

Heckman sample selection is unique by handling selection bias, for which James J. Heckman was awarded with Economics Nobel Prize in 2000 (Nobelprize.org, 2017).

In the general model of Heckman, he revealed the factors determining wages incorporating the information that no wages can be observed in case of unemployed and the selection of employers is not random, the selection bias needs to be handled in this case (Heckman, 1979). The model involves a normal distribution assumption.

The model uses a probit regression in the first stage to estimate probabilities of employment:

$$Prob(D = 1 \mid Z) = \Phi(Z_\gamma),$$

where D is a Dummy variable, referring to status of employment; Z is the vector of dependent variables, γ is the vector of unknown variables, Φ is the cumulative distribution function of normal distribution.

In the second stage self-selection is corrected with a new, transformative dependent variable that is calculated from individual probabilities:

$$\omega^* = X\beta + u,$$

where ω^* expresses wage levels, which is observed only in case of employed.

Based on this, the expected level of wage in case of employed:

$$E[\,\omega \mid X, D = 1\,] = X\beta + E[\,u \mid X, D = 1\,].$$

Under the assumption that the error terms are jointly normal, the model is the following:

$$E[\,\omega \mid X, D = 1\,] = X\beta + \rho\sigma_u\lambda(Z_\gamma),$$

where ρ is the correlation between unobserved determinants of propensity to work (ε) and unobserved determinant of wage offers (u); σ_u is the standard deviation of u and λ is the inverse Mills ratio in point Z_γ.

Wage equation can be estimated also by replacing γ with the probit results obtained in the first stage, which we use to calculate λ that is applied as an additional variable in the second state.

One of the disadvantages of the method is the usage of limited information maximum likelihood (LIML), because the full information maximum likelihood (FIML) gives a more precise estimation, but it is more difficult to implement (Puhani, 2000). Another critique refers to the assumption of multivariate normal distribution, as if the sample does not meet this criteria, estimates are inconsistent, which is an important issue particularly in case of small samples (Goldberger, 1983).

ANNEX 7: STUDY 3.: CHECKING FOR MULTICOLLINEARITY- LINEAR REGRESSION

Dependent variable: CHURN	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
TENURE	.0000579	.0000105	5.50	0.000	.0000373	.0000785
CONTRACT	.0162866	.0127253	1.28	0.201	-.0086581	.0412313
CC_CALLS	.0050164	.0016796	2.99	0.003	.001724	.0083089
D_CC_CALLS	-.1039337	.0118543	-8.77	0.000	-.127171	-.0806964
logMFDIFF	-.0104603	.0081803	-1.28	0.201	-.0264957	.005575
BEFORE_USAGE_MINUTES	1.17e-06	2.64e-07	4.41	0.000	6.47e-07	1.68e-06
NPS_CC	-.0049255	.0055147	-0.89	0.372	-.0157356	.0058847
D_NPS_CC	-.0654646	.0361337	-1.81	0.070	-.1362951	.0053659
Constant	.862662	.0593272	14.54	0.000	.7463667	.9789573

Source	SS	df	MS
Model	73.3501915	14	5.23929939
Residual	1160.73421	8705	.133341093

Total	1234.0844	8719 .141539672

Number of obs.:	8720
F(14, 8705):	39.29
Prob > F:	0.0000
R-squared:	0.0594
Adj R-squared:	0.0579
Root MSE:	.36516

Source: own construction

ANNEX 8: STUDY 3.: CHECKING FOR MULTICOLLINEARITY- VIF

Variables	VIF	1/VIF
logMFDIFF	1.04	0.963847
TENURE	2.69	0.371240
CONTRACT	2.61	0.383669
BEFORE_USAGE_MINUTES	1.06	0.939854
NPS_CC	3.93	0.254553
D_NPS_CC	4.33	0.231062
CC_CALLS	1.65	0.607051
D_CC_CALLS	1.65	0.607183
Mean VIF	2.37	

Source: own construction

ANNEX 9: STUDY 3.: CORRELATION MATRIX

The following abbreviations are used for Annex 9.:

1: CHURN

2: logMINDIFF

3: logMFDIFF

4: TENURE

5: CONTRACT

6: BEFORE_USAGE_MINUTES

7: CC_CALLS

8: D_CC_CALLS

9: NPS_CC

10: D_NPS_CC

	1	2	3	4	5	6	7	8	9	10
1	1.0000									
2	0.2871	1.0000								
3	0.0127	0.0791	1.0000							
4	-0.1165	-0.1388	0.0528	1.0000						
5	0.0934	0.1245	-0.1100	-0.7739	1.0000					
6	0.0166	0.1558	0.0162	-0.1885	0.1791	1.0000				
7	-0.1077	-0.1180	0.0000	0.0201	-0.0010	0.0201	1.0000			
8	0.1524	0.1454	0.0176	-0.1145	0.0583	0.0079	-0.5432	1.0000		
9	-0.0652	-0.0708	-0.0201	0.0448	-0.0310	0.0123	0.1909	-0.3643	1.0000	
10	0.0854	0.0990	0.0058	-0.0368	0.0201	-0.0245	-0.3757	0.4298	-0.8476	1.0000

Source: own construction

ANNEX 10: STUDY 3.: CONSTANT ONLY MODEL TO ESTIMATE R^2

	Coef.	Std. Err.	z	P>z
2nd Stage: Estimating usage differences during service elimination by non-churned customers				
logMINDIFF				
Constant	-.7957479	.0237301	-33.53	0.000
1st Stage regression: Estimating probabilities for churn during service elimination				
CHURN	.7544363	.0361682	20.86	0.000
Constant	.2562506	.0330284	7.76	0.000
athρ	.6577373	.0310228	21.20	0.000
lnσ	.5881527	.009946	59.13	0.000
ρ	.5768556	.0206996		
σ	1.800659	.0179094		
λ	1.03872	.0444405		
LR test of indep. eqns ($\rho = 0$)	chi2(1) =	199.93	0.0000	
Number of observations	10056			
Censored observations	1865			
Uncensored observations	8191			
Wald χ^2 (0)	-			
Log-likelihood	-20529.41			
Prob > χ^2	-			

Source: own construction

ANNEX 11: STUDY 3.: LAST VERSION OF THE BACKWARD MODEL

	Coef.	Std. Err.	z	P>z
2nd Stage: Estimating usage differences during service elimination by non-churned customers				
logMINDIFF				
CC_CALLS	-.0294168	.0065074	-4.52	0.000

logMFDIFF	.307161	.0402537	7.63	0.000
BEFORE_USAGE_MINUTES	.0000194	1.29e-06	14.97	0.000
Constant	-1.040883	.0487773	-21.34	0.000

1st Stage regression: Estimating probabilities for churn during service elimination

CHURN

TENURE	.0002014	.0000287	7.02	0.000
CC_CALLS	.1547871	.0265114	5.84	0.000
D_CC_CALLS	-.3172471	.0738769	-4.29	0.000
BEFORE_USAGE_MINUTES	7.37e-06	1.25e-06	5.88	0.000
D_NPS_CC	-.3972364	.129045	-3.08	0.002
Constant	.7798985	.1604691	4.86	0.000
$ath\rho$	.5002762	.0517898	9.66	0.000
$\ln\sigma$	.5159354	.0121219	42.56	0.000
ρ	.4623343	.0407196		
σ	1.675205	.0203067		
λ	.7745046	.0748382		

LR test of indep. eqns ($\rho = 0$)	chi2(1) =	46.10	0.0000	
Number of observations	7755			
Censored observations	1570			
Uncensored observations	6185			
Wald χ^2 (10)	331.06			
Log-likelihood	-15318.87			
Prob > χ^2	0.0000			

Source: own construction

PUBLICATIONS OF THE AUTHOR RELATED TO THE TOPIC OF THE DISSERTATION

Journal article:

In English:

1. Somosi Á., Kolos K. (2017): The role of economic and psychological costs in service elimination. *Budapest Management Review/Vezetéstudomány* 48 (5), 14-23.

2. Somosi Á., Kolos K. (2016): Does Service Elimination Make Customers Less Satisfied?. *Sefbis Journal* 10, 49-53.

In Hungarian:

3. Somosi Á. (2017): A lemorzsolódás és a fogyasztói magatartás vizsgálata szolgáltatás-kivezetés esetén Heckman-féle korrekciós eljárással (The analysis of churn and customer behavior in case of service elimination using Heckman sample selection). *Statisztikai Szemle* 95 (7), 744-764.

4. Somosi Á., Kolos K. (2017): A szolgáltatáskutatás tendenciái Magyarországon 1992-2016 között (Trends of service research in Hungary between 1992-2016). *Köz-Gazdaság* 12 (5), 111-125.

5. Somosi Á. (2016): Az ügyfél használati szokásainak hatása a lemorzsolódásra szolgáltatás- kivezetés esetén (The effect of customer usage behaviour on customer retention in case of service elimination).. *Gradus* 3 (2) eISSN 2064-8014, 208-213.

Participation at conferences with publication of the full paper submitted:

In English:

6. Somosi Á., Kolos K. (2015): Customer Reactions to Service Elimination. In: Erzsébet Hetesi, Zsófia Vas (szerk.), New Ideas in a Changing World of Business Managament and Marketing, Szeged, Magyarország, 2015.03.19-2015.03.20. Szeged: University of Szeged, Doctoral School of Economics, 2015, ISBN:978-963-306-312-5, pp. 24-34

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