MEASURING THE IMPACT OF MARKETING INSTRUMENTS AND RELATIONSHIP CHARACTERISTICS ON CUSTOMER SWITCHING COSTS

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ABSTRACT

Understanding switching costs at the individual level has become an important issue for marketing strategy. Although recent research has provided some evidence of the presence of switching costs in a wide variety of service industries, a market or a firm level approach has been taken. In addition, most studies take a static perspective and assume switching cost homogeneity across customers or even firms. This study provides a technique to measure switching costs at the customer level using longitudinal information in the mobile phone industry. A hierarchical Bayes model is used to estimate the magnitude of switching costs while accounting for customer heterogeneity, and a conceptual framework is proposed to study the impact of marketing instruments and relationship characteristics on heterogeneous customer switching costs. The results show that switching service providers significantly reduces customer utility and that switching costs are highly heterogeneous across customers. Both marketing instruments and relationship characteristics contribute to explaining the systematic differences found in switching costs across customers. Implications for decision makers are discussed.

KEY WORDS
Customer Switching Costs, Retention, Marketing Instruments, Relationship Characteristics, Mobile Phone Industry
1. Introduction

Switching costs have been increasingly studied in the academic marketing literature (Burnham et al., 2003). Theoretically, switching costs are considered an important driver of customer retention, leading to stable and long-lasting relationships (Dick and Basu, 1994; Ganesan, 1994). From an empirical point of view, switching costs have been shown to reinforce customer intentions to continue the relationship and to avoid customer switching behavior (Jones et al., 2000; Bansal et al., 2005). An increasing interest in customer switching costs is also apparent in marketing practice. Consider the following example: in recent years mobile phone companies have developed loyalty programs in which customers are rewarded for their longevity and volume of use. Customers get points by using the services, and these points can be exchanged for new handsets. Firms also offer special discounts that are only available for exclusive chat groups, or lower rates for calls originating and terminating in the same network (on-net calls). Switching to other service providers, therefore, becomes more costly, and customers get locked into the relationship.

The study of switching costs is of particular interest in the Information Economy for the following reasons. First, switching costs have been shown to be a key value driver in e-businesses, allowing firms to lock their customers into the relationship (Amit and Zott, 2001). Second, prior research has illustrated the significant role played by switching costs in avoiding customer switching behavior in these industries (Chen and Hitt, 2002). Third, the high fixed cost structure of customer acquisition in information-intensive businesses increases the harmful effects of switching behavior (Chen and Hitt, 2005). Long-term relationships need to be built in order to overcome the initial sunk costs. Fourth, switching costs are significantly present in these contexts. Shapiro and Varian (1999) emphasize that: “switching costs are the norm, not the exception, in the information economy” (p.111). Finally, researchers in this context highlight that the literature on customer switching costs is scarce, and particularly from an empirical point of view (Burnham et al. 2003). Areas in particular need of research are switching cost measurement and antecedents (Farrell and Klemperer, 2006).

Recently, various studies have quantitatively measured switching costs. Shy (2002) provides an absolute measure of switching costs using prices and market shares in the mobile phone and the financial services industries. Using transition probabilities, Kim, Kliger and Vale (2003) measure switching costs in the financial services market. These studies provide a monetary value for customer switching costs. However, switching costs are composed of a wide variety of categories: economic, setup, uncertainty, psychological costs (Guiltinan, 1989). A monetary value can only account for the economic category of switching costs, but not for the rest of the categories. Using the random utility framework, some studies provide a relative measure of switching costs in various information-intensive markets –online brokers, mobile phone and routers and switches– (Chen and Hitt, 2002; Chen and Forman, 2006; Grzybowski, 2007; Lee et al., 2006). A common characteristic of these studies is that a measure of switching costs per firm is obtained, making the intrinsic assumption that customer switching costs are homogeneous across customers of the same firm. Given the heterogeneous nature of customers and the increasing interest in managing relationships at the individual level (Rust et al., 2000), a measure of individual customer switching costs is needed.

In the marketing literature some papers have dealt with switching costs by identifying state dependence, “inertia” or loyalty of customers (Guadagni and Little, 1983; Heckman, 1991; Keane, 1997; Seetharaman et al., 1999; Abramson et al., 2000; Moshkin and Shachar, 2003; Seetharaman, 2004; Goldfarb, 2006). Most of this research assimilates the persistence in consumption (after controlling for customer taste heterogeneity) with switching costs. However, these estimates could also include other aspects not related to switching costs (customer preferences not observable to researchers, marketing strategies encouraging customers to stay, psychological factors). In particular, there has been no direct attempt to quantitatively measure switching costs as such (any disutility obtained when switching service providers) at the individual level so far.

Several studies have analyzed customer switching cost antecedents. Burnham et al., (2003) studied the impact of some relationship characteristics (breadth of use) and customer demographics on customer switching cost perceptions. Recent research has shown the significant role played by firms’ strategies in driving customer switching costs (Shapiro and Varian, 1999; Chen and Forman, 2006). In
particular, some examples have been provided to show that switching barriers can be built by specific firm strategies (loyalty programs, compatibility, cross-selling). Other studies have pointed out the noteworthy effect of regulatory policies on switching costs (Grzybowski, 2005). In the mobile phone industry, particularly, switching barriers have been significantly reduced as a consequence of the introduction of number portability (Kim, 2005; Lee et al., 2006). However, in spite of the growing interest in knowing the effects of marketing instruments on customer related constructs (Verhoef, 2003), no study to date has analyzed their impact on customer switching costs at the individual level. Moreover, some important relationship characteristics have not been considered yet (e.g. relationship duration, service usage). In particular, there is a lack of a comprehensive model for analyzing customer switching cost antecedents that simultaneously includes relationship characteristics and marketing instruments.

Although there is a growing trend toward using longitudinal data on actual customer behavior in marketing research (panel data), this is less prominent in switching cost research. Prior studies have used cross-sectional, stated preference information to study switching costs and customer behavior (Burnham et al., 2003; Lam et al., 2004). The use of such data leads to biases in the estimations due to conceptual and methodological issues. Customer switching costs are dynamic in nature, they evolve over time (Hess and Ricart, 2003); cross-sectional data, however, only provide information at one specific point in time. Therefore, to analyze switching costs properly and to deal with their dynamic nature, longitudinal information is needed. Moreover, the use of stated preference information allows biases to be introduced into the analysis because respondents are given hypothetical settings where actual action is not required (Lee et al., 2006). Therefore, actual customer behavior data are best suited to study customer switching costs. In addition, prior research using firm strategies to explain switching costs only considers single firm information. Competitors’ strategies are also expected to have an influence on customer switching costs, so a proper analysis should also consider competitive information. Our study aims to fill some of these gaps in the literature.

The research objectives are threefold. First, we aim to provide a technique to quantitatively measure customer switching costs at the individual level. Second, we address the existence and heterogeneity of customer switching cost in the mobile phone market using a hierarchical Bayes model that explicitly accounts for customer differences. Third, we examine customer switching cost antecedents by providing an empirically defensible conceptual model that includes relationship characteristics and marketing instruments (from both current firm and competitors). In order to do so, our study uses longitudinal data on actual customer behavior in the mobile phone industry, and longitudinal information on marketing instruments for the three competing firms offering mobile phone services in the Spanish market.

2. Switching Cost Measurement

Empirical research on customer switching costs is much smaller and more recent than the theory. Switching cost measurement has not received much attention in the literature so far mainly because of the lack of detailed information on individual behavior (Chen and Hitt, 2005). Aggregate data does not allow customer switching costs to be estimated since it is a customer-specific measure, and individual information is required. Recent research has provided a technique based on the random utility framework (McFadden, 1974) which allows marginal utility from switching providers to be estimated using individual information (Chen and Hitt, 2002). There has been wide acceptance of this methodology in the literature and some papers have already used it in order to estimate switching costs at the firm level, with the implicit assumption of switching cost homogeneity across customers of the same firm (Chen and Hitt, 2002; Kim, 2005; Grzybowski, 2007; Chen and Forman, 2006; Lee et al., 2006). However, customer switching costs are heterogeneous (Shachar and Emerson, 2000; Goldfarb, 2006), and a customer-specific measure of switching costs is needed. The availability of longitudinal

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1 Number portability allows customers to maintain their mobile phone number when switching service providers. The main motivation for the introduction of this policy is to minimize the inconveniences associated with the switching process.
information on actual customer behavior allows us to estimate individual level switching costs extending the technique provided by Chen and Hitt (2002).

According to the random utility framework (McFadden, 1974), consumers make choices in each period assuming a utility-maximizing behavior. Therefore, in each period \( t \), customer \( i \) faces a choice of \( J \) alternatives in her/his choice set. It is assumed that the selected option will be the one with the highest utility (Ben-Akiva and Lerman, 1985). The utility that the customer obtains from selecting firm \( j \) (out of \( J \)) is a function of the attributes associated with the alternative (systematic component, \( V \)) and of a random disturbance (random component, \( \varepsilon \)):

\[
U_{ijt} = V_{ijt} + \varepsilon_{ijt}
\]

In our empirical setting, the choices are mobile phone operators and the systematic component of utility includes aspects specific to the alternatives: prices (\( P_{jt} \)), firm size (\( T_{jt} \)) and a switching dummy variable (\( S_{jt} \)). There is wide support in the literature for the inclusion of these variables in the choice of mobile phone operators. Price is one of the most significant factors affecting customer choice decisions in this particular industry (Ofcom, 2002). The significant presence of network externalities in the market gives firm size an important role in choice decisions (Birke and Swann, 2006). Switching costs have been regarded as a determinant factor driving customer repurchase intentions and switching behavior (Grzybowski, 2007). The random disturbance \( \varepsilon_{ijt} \) captures the effect of customer specific tastes and unmeasured variables on customer utility. This leads to the following expression for the utility that customer \( i \) obtains at time \( t \) from firm \( j \),

\[
U_{ijt} = \beta_i^P P_{jt} + \beta_i^T T_{jt} + \beta_i^{SC} S_{jt} + \varepsilon_{ijt}
\]

The main concern of our analysis is the estimation of \( \beta_i^{SC} \), the customer-specific parameter accompanying the switching dummy variable (\( S_{jt} \)). If switching costs exist, current utilities will depend on earlier choices, making the nature of consumer behavior and switching costs dynamic (Kim, 2005).

The variable \( S_{jt} \) is constructed in the following way: it takes the value 0 if the customer chose firm \( j \) in the last period (\( t-1 \)), and 1 if the customer chose the firm \( n \neq j \). Therefore, parameter \( \beta_i^{SC} \) is defined as the marginal utility that customer \( i \) derives from switching service providers (Lee et al., 2006).

This methodology allows us to assess two important issues: (i) The existence of customer switching costs and (ii) their heterogeneity.

Existence of customer switching cost. There is ample evidence in the empirical literature for the presence of switching costs in a wide variety of markets. In addition, there is an extensive theoretical literature giving support to the disutility that switching providers causes to customers (see Farrell and Klemperer, 2006 for an extensive review). There are many barriers that consumers must overcome if they are to switch suppliers –contractual, setup, continuity and psychological commitment costs (Guiltinan, 1989)–. In the mobile phone industry the following are important switching barriers: obtaining and evaluating information about the alternatives, losing the benefits and privileges given by the former service provider, uncertainty associated with the unknown service supplier and breaking the bonds of identification with the former firm’s personnel or with the brand (Lee et al., 2006). In spite of the evidence provided by the literature, few studies have explicitly proved the existence of switching costs at the customer level by directly estimating their magnitude. Therefore, based on the above discussion, we postulate the following:

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2 In the mobile phone market, firms price discriminate according to the destination of the calls. If calls are made within the same network (on-net calls) prices are lower than when calls are made to competitors’ networks (off-net calls). As a consequence, customers value bigger firms more highly because, on average, they can obtain better conditions (the average cost is lower).

3 There exist two methodologies to identify switching costs, either directly or indirectly. The direct approach uses information on individual consumer behavior to estimate consumer preferences. The indirect approach, in contrast, analyzes switching costs using aggregate market data (Ofcom, 2003).
Proposition 1: There exist customer switching costs in the mobile phone market. The marginal utility derived from switching service providers is negative.

Switching cost heterogeneity. Customers are heterogeneous, and their differences are expected to influence the magnitude of the switching costs they bear when changing providers (Burnham et al., 2003). So far, marketing literature has stressed the important role played by individual-specific characteristics in explaining the differences in relationship duration (Reinartz and Kumar, 2003), perceived satisfaction levels (Mittal and Kamakura, 2001), repurchase intentions and switching behavior (Keaveney and Parthasarathy, 2001; Maicas et al., 2006). Some papers have already introduced the idea of customer switching cost heterogeneity, allowing the cost of switching to vary across individual characteristics (Shachar and Emerson, 2000; Goldfarb, 2006). Thus, we posit the following:

Proposition 2: Customer switching costs are heterogeneous in the mobile phone market. The marginal utility derived from switching service providers is different across customers.

3. Switching Cost Antecedents

In this section we provide a conceptual model of switching costs which identifies and analyzes how and why switching costs systematically differ across customers. This is a customer-specific analysis because it studies switching costs at the individual level; and it is a dynamic model because longitudinal information is employed. The conceptual framework is displayed in Figure 1. In this model, we consider three groups of variables which can potentially explain customer switching costs. First, relationship characteristics contain the variables that describe the development and progression of a relationship over time: length, depth and breadth (Verhoef et al., 2001). We introduce an additional characteristic related to the mobile phone market which is also expected to influence customer switching costs in this specific industry: type of contract. Second, we consider two marketing instruments in our model that potentially explain switching cost differences: price and advertising (brand and service advertising). In addition, some demographic characteristics are included in the model in order to control for observed heterogeneity. Below, we develop the research hypotheses that show the expected association between these groups of antecedents and switching costs.

Figure 1. Conceptual model: Switching cost antecedents.

3.1. Relationship Characteristics

The length of a relationship refers to its duration (Bolton et al., 2004). The early stages of a relationship are characterized by high uncertainty and low customer experience (Verhoef et al., 2002).
Specific investments are low and the interdependencies between the parties are not much developed (Dwyer et al., 1987). Psychological barriers have been reported to play an important role in switching decisions (Fornell, 1992; Bansal and Taylor, 1999), but their magnitude is low in these early stages due to the absence of familiarity and of intimate relationships (Burnham et al., 2003; Geyskens et al., 1999). Switching to a competitor, therefore, is easy for customers in these stages because of the low level of barriers they have to bear (Verhoef et al., 2002).

As the relationship progresses over time, however, trust between the parties develops (Gwinner et al., 1998, Gounaris and Venetis, 2002), customers gain experience in their relationships with the company (Verhoef et al., 2002), familiarity and interdependencies between the parties become higher (Dwyer et al., 1987), and psychological barriers increase (Burnham et al., 2003). Moreover, long-term customers are usually granted some benefits to enhance their loyalty and to lock them into the relationship (Bolton et al., 2000; Berry, 1995). Some are economic benefits in the form of loyalty programs, which give customers financial rewards like discount coupons, points redeemable for prizes or other economic advantages (Sharp and Sharp, 1997; Uncles et al., 2003). Continuing customers also receive social benefits in the form of communication, cooperation, friendship and rapport (Berry, 1995; Dwyer et al., 1987), which aim to increase social bonds and interdependencies between the parties (Chiu et al., 2005). All these benefits are lost if the customer leaves the company and are not readily available elsewhere (Berry, 1995).

Verhoef et al. (2002) provide some arguments supporting the idea that switching costs increase with relationship age. Shapiro and Varian (1999) offer some examples showing that customers become locked into the relationship as a consequence of the increasing nature of switching costs. Hess and Ricart (2003) also point out that switching costs depend on the time the relationship is maintained, switching costs being higher the longer the relationship is sustained. In a B2B context, Ongena and Smith (2001) report that relationship duration in the banking industry exhibits negative duration dependence in the later stages of the association: the likelihood of ending the relationship decreases with time. Hence, we hypothesize that:

**H1:** The length of the relationship positively influences customer switching costs.

The depth of a relationship is the frequency of service usage over time (Bolton et al., 2004). Higher levels of service usage provide customers with a better knowledge of the company and the processes needed to use the products and services satisfactorily (Alba and Hutchinson, 1987). Moreover, heavy users can develop non-transferable provider-specific skills due to the time and effort invested in the relationship (Keaveney and Parthasarathy, 2001; Williamson, 1975). In addition, as customers use the services more, they become familiar with the company and the interdependencies between the parties become stronger (Dwyer et al., 1987). Heavy users are also granted economic and social benefits which are not transferable across companies (Shapiro and Varian, 1999; Bolton et al., 2000). Taking everything into consideration, all these factors make the switching process more costly.

Reinartz and Kumar (2003) report a significant positive relationship between the level of customer consumption and profitable relationship duration. Burnham et al. (2003) acknowledge the potential role played by product or service usage in the effects of customer switching costs. In an online context, Keaveney and Parthasarathy (2001) report a negative effect of service usage on customer switching behavior, showing that heavy users are less prone to switch service providers. In the same vein, Chen and Hitt (2002) show a positive influence of service usage on the probability of customers staying in the company. Together, these studies suggest a positive association between service usage and customer switching costs.

However, some researchers argue that an intensive service usage allows customers to evaluate options more rapidly and accurately and learn new product-related information (Alba and Hutchinson, 1987). This could have the opposite effect on customer switching costs. Heavy users are expected to be able to better evaluate and compare the available alternatives in the market. This leads to a low dependence of the customer on the supplier due to the knowledge gained about the service and its characteristics (Ganesan, 1994; Bendapudi and Berry, 1997). In addition, heavy users might also have greater incentives to find the service provider which best fits their needs and provides them more value.
MEASURING THE IMPACT OF MARKETING INSTRUMENTS AND RELATIONSHIP CHARACTERISTICS... (Chen and Hitt, 2002). Taking future benefits into account would reduce switching cost perceptions, leading to a high propensity to switch service providers (Kemplerer, 1995). In this sense, Johnson et al., (2004), in an online context, report that more active shoppers tend to search across more alternatives.

Based on the above discussion, we propose an inverse U-shaped association between the depth of the relationship and customer switching costs, where intermediate service consumption is associated with the highest level of switching costs.

**H2**: Relationship depth is related to customer switching costs in an inverse U-shaped manner. Intermediate service usage is associated with the highest switching costs.

The breadth of a relationship is reflected in the number of additional products or services purchased from a company over time (Blattberg, Getz and Thomas, 2001). Buying additional products or services from the firm provides customers with a better knowledge of the company and of the quality of the products and services it offers (McCracken, 1986). The switching process for customers who buy additional products or services is expected to be more complicated for the following reasons. First, the risk associated with the switching decision is higher because there are more products or services involved in the process (Burnham et al., 2003). Second, switching providers implies the need to compare alternative vendors on a greater number of attributes and characteristics (Shugan, 1980). Third, switchers also need to invest additional resources in learning the new features of the switched-to-provider’s products and services.

Following this reasoning, Reinartz and Kumar (2003) show a strong positive effect of cross-buying behavior on profitable relationship duration. Kamakura et al. (2003) argue that buying additional products or services from the vendor leads to higher switching costs. Similarly, Burnham et al., (2003) report a positive relationship between the breadth of product use and customer switching cost perceptions. Taking all this into consideration, we posit that:

**H3**: The breadth of the relationship positively influences customer switching costs.

The type of contract is the option under which mobile phone services are provided. There are two main types of contract offered by mobile phone service providers: prepaid and postpaid. There are some important differences between them that might influence customers’ switching costs (Doyle and Smith, 1998). First, under postpaid options, customers are required to stay in the relationship for a specified time period (between 12 and 18 months, depending on the company). Otherwise, customers have to compensate the firm. In contrast, under the prepaid option customers are free to switch providers whenever they want without any penalty. Second, there are significant differences in the tariffs charged to each type of contract, postpaid options being cheaper than prepaid ones. Third, loyalty programs implemented by mobile phone operators are only directed at postpaid customers; they can benefit from their advantages and obtain the rewards associated with them. Moreover, postpaid customers benefit from additional services: for instance, they obtain detailed information on their mobile phone usage and can control the amount of money they spend.

Differences between postpaid and prepaid options resemble differences between contractual and non-contractual settings. Postpaid subscription is viewed as a contractual setting because customers sign a contract and pay a fee for “membership”. In contrast, prepaid subscription is viewed as a non-contractual setting because it is not governed by a contract. The literature has shown that switching costs in contractual settings are higher than in non-contractual ones (Reinartz and Kumar, 2000). Based on the above discussion, we hypothesize that:

**H4**: Postpaid subscription positively influences customer switching costs.

### 3.2. Marketing Instruments

Firms can control, to a certain extent, the magnitude of customer switching costs using marketing instruments (Chen and Forman, 2006). In particular, *price* has been considered a key factor in the
management of customer switching costs (Klemperer, 1987). By acting on prices, firms can attract customers in the early stages of the lifecycle who will be locked into the relationship in later phases (Farrell and Klemperer, 2006). There is also ample evidence in the marketing literature showing the key role played by prices in customers’ decisions to switch service providers (Keaveney, 1995; Roos, 1999).

Firms can use prices to strengthen the relationships with their current customers by offering them better tariffs. They can also use prices as an incentive to switch by subsidizing competitors’ customers’ switching costs (Chen, 1997). For instance, prices can be reduced to attract competitors’ customers in order to compensate the disutility that the switching process generates for them. Therefore, customer switching costs will depend on the prices of both the current vendor and the competitors. It is expected that the higher the current firm’s prices, the lower the switching costs the customer will experience. This is because high prices charged by the current vendor reduce the cost of switching due to the potential monetary savings. In contrast, competitors’ prices will increase customer switching costs. The higher their prices, the higher the cost for the customer because switching providers will imply lower monetary savings. Following this reasoning, we expect that:

**H5a:** Current provider’s prices negatively influence customer switching costs.

**H5b:** Competitors’ prices positively influence customer switching costs.

Advertising has been considered to play an important role not only in the acquisition of new customers (Bolton et al., 2004), but also in the behavior of existing ones (Manchanda et al., 2006). Shum (2004), in the breakfast-cereals market, reports that advertising plays a major role in encouraging customers to switch service providers by reducing the magnitude of switching costs. Manchanda et al. (2006) show, in an online setting, that banner advertisement has a positive effect on repeat purchase probabilities. Prins and Verhoef (2007) report a significant effect of advertising on reducing the adoption timing of a new service among existing customers. Cramphorn (2006) acknowledges the significant impact of advertising on customer repurchase intentions. Yang, Bi and Zhou (2005) report a significant positive effect of advertising expenditures on customer loyalty.

When using this marketing instrument, firms can have two different objectives: to inform customers about service attributes and characteristics and/or to increase brand awareness. It is important, therefore, to distinguish between two types of advertising that can have different effects on customer switching costs: service advertising and brand advertising (Prins and Verhoef, 2007).

**Service advertising** focuses mainly on informing existing and potential customers about the advantages and benefits of the service (Prins and Verhoef, 2007). Again it is expected that switching costs will be influenced by the service advertising of both the current vendor and the competitors. On the one hand, it is reasonable to think of current vendor investments in service advertising as increasing customer switching costs because positive aspects and strengths of the service are highlighted. Thus, customers will be aware of the benefits and advantages that the service provides, and the relationship between the customer and the firm will be strengthened. On the other hand, the current vendor’s service advertising can also have the opposite effect. This is because this form of advertising provides customers with valuable information which can be used to better assess the different alternatives. The costs involved in searching for the information and in evaluating and comparing the alternatives will therefore be substantially reduced. This might make the switching process less costly. In support of this argument, Shum (2004) finds that advertising has a negative impact on the purchase probabilities of loyal customers. Therefore, there is no clear association between the current vendor’s service advertising and customer switching costs.

Competitors’ service advertising, on the other hand, is expected to reduce customer switching costs. Following the same reasoning as above, competitors will use service advertising to create awareness and knowledge of the services offered and to show their advantages and benefits.

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4 This is of particular relevance in the mobile phone market, where penetration rates are about 100% in most developed countries (in the Spanish market this rate has reached 113%). Therefore, marketing instruments are mainly directed toward customer retention, instead of customer acquisition.
Exposition to this advertising will make customers more informed about the services supplied by alternative vendors, reducing the costs involved in acquiring, evaluating and comparing the information. Moreover, highlighting the advantages and strengths of competitors’ services might induce switching. Shum (2004) reports a significant reduction in switching costs as a consequence of competitors’ advertising.

Following the previous reasoning, we do not posit any directional hypothesis on current firm service advertising. We test empirically for its effect on customer switching costs. Thus, we hypothesize that:

\( H6a: \) Current provider’s service advertising is related to customer switching costs.

\( H6b: \) Competitors’ service advertising negatively influences customer switching costs.

*Brand advertising*, on the other hand, aims to positively change brand feelings so as to impact purchase behavior (Cramphorn, 2006). Current firm brand advertising will therefore focus on increasing brand awareness, improving brand attitudes and creating a positive brand image (Keller, 1993). This is expected to reinforce customer-firm relationships, to increase the interdependencies between the parties and to strengthen the bonds of identification with the brand (Burnham et al., 2003). All this makes the process of switching more costly for customers.

Competitors’ brand advertising will also aim to create positive brand feelings. This is expected to increase customers’ awareness and knowledge of these brands and to reduce the uncertainty involved in the switching process. Switching costs will therefore be reduced.

\( H7a: \) Current provider’s brand advertising positively influences customer switching costs.

\( H7b: \) Competitors’ brand advertising negatively influences customer switching costs.

### 3.3. Customer demographics

In our model, we also include customer demographics, which capture observed customer heterogeneity. The main motivation to introduce these variables is for statistical and segmentation purposes. However, we do not posit any directional association between these variables and customer switching costs due to the absence of an appropriate theory.

### 4. Research Methodology

#### 4.1. Data description

Our empirical study is carried out in the mobile phone industry using data from three different sources. Information on relationship characteristics and customer demographics was provided by TNS Global. The database covers a four-year window (from 2001 to 2004) on a monthly basis (48 periods) and consists of a total number of observations of 287 individuals who switched service providers during the observation period. Information on prices and firm size (in number of subscribers) for the three companies that offer mobile phone services in the Spanish market (Telefónica, Vodafone and Orange) was provided by the Global Wireless Matrix database, and information on advertising expenses by Infoadex, a Spanish company that collects advertising data.

#### 4.2. Methodology

In order to estimate customer switching costs and to account for customer heterogeneity, a hierarchical Bayes model is proposed (Snijders and Bosker, 1999; Rossi and Allenby, 2003; Rossi, Allenby and McCulloch, 2005). The overall model to be estimated is specified in the following way. From the switching cost measurement discussion, the utility that customer \( i \) obtains from firm \( j \) in period \( t \) \( (U_{ijt}) \) is formulated as a function of service attributes,
where $X$ is a vector of service attributes (price, firm size and switching costs), $\beta$ is the parameter vector to be estimated and $\varepsilon$ is the disturbance term. This model is empirically implemented by estimating a mixed logit model (Train, 2003),\(^5\) which measures the impact of alternative-specific variables on the probability of choosing one of $J$ discrete outcomes.

Customer switching cost heterogeneity is introduced into the model by allowing coefficients ($\beta^{SC}$) to vary across customers,

$$\beta_i^{SC} = Z_i \alpha + \tau$$

where $Z$ is a vector containing customer-related variables (relationship characteristics and marketing instruments), $\alpha$ is the parameter vector measuring the impact of these variables on customer switching cost heterogeneity ($\beta^{SC}$), and $\tau$ is a normally distributed disturbance term. The main concern of our research is to estimate customer switching cost parameters ($\beta_i^{SC}$) while accounting for customer heterogeneity. Estimation is accomplished using Markov Chain Monte Carlo (MCMC) methods, which approximate the posterior distribution by sampling from the full conditional distribution.

### 4.3. Variable operationalization

For each month in our observation period, we observe the customers’ choice of mobile phone operator. In equation 1, utility is an unobserved latent variable that is manifested through customer choices (the alternative chosen is the one that maximizes customer utility). The dependent variable ($U_{ijt}$), therefore, is operationalized as a dummy variable that takes two possible values: 1 if customer $i$ chooses firm $j$ in period $t$, and zero otherwise. The choices are based on an evaluation of the service attributes over time: prices, firm size and switching costs. These variables are time-varying and are measured and updated each month. Price ($P_{jt}$) is operationalized as the Average Revenue Per User (ARPU) (Shy, 2002). We define firm size ($T_{jt}$) as the log of the firm’s subscribers in each time period. The switching dummy variables ($S_{jt}$) have already been defined.

In equation 2, the criterion variable is the customer-specific estimate of switching costs and, thus, only a single event associated with each customer exists. As switching costs arise in the period in which switching actually occurs, we take this period for each customer as the reference period for measuring the explanatory factors. Relationship characteristics are introduced in the following way. Relationship length ($LE_i$) is measured as the duration in months from the beginning of the relationship until the switching period. To measure relationship depth ($DE_i$), we compute the average mobile phone consumption per customer from the beginning of the observation period until the switching period. We define relationship breadth ($BR_i$) as a dummy variable taking the value one if the customer was subscribed to an additional service offered by the company in the period when switching takes place, and zero otherwise. Type of contract ($TC_i$) is operationalized as a dummy variable. It takes the value one if the customer had a post-paid subscription in the switching period, and zero otherwise.

Marketing instruments are introduced as follows. We define current firm price as the Average Revenue Per User (ARPU) in the period when switching takes place. Competitors’ prices, in contrast, are measured as the average ARPU of the two competing firms in that period. The variable introduced into the analysis ($PR_i$) is the difference between them (Current Firm Price – Average Competitors Prices). Advertising measurement follows the same rule. We use data on service and brand advertising expenditures by the current firm in the switching period to account for current firm advertising effects on switching costs. Average service and brand advertising expenditures by competing vendors in that

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\(^5\) Mixed logit is a highly flexible model that is able to approximate any random utility model. Advances in simulation techniques have made it possible to overcome some limitations of the standard logit allowing random taste variation, unrestricted substitution patterns and correlation in unobserved factors over time (Train, 2003).
period account for competitors’ advertising effects. We introduce the differences between current firm and competitors’ advertising expenses into the analysis in both categories (service advertising $SA_i$, and brand advertising $BA_i$). In addition, our research controls for some customer demographics. We define the variable age as the consumer’s age in years at the switching period ($Ag$), and we set the gender dummy variable to zero for male customers ($Ge$).

5. Empirical Findings

All computations and simulations for this study were done using the WinBUGS package (Spiegelhalter, et al., 2003). We ran 60,000 iterations, of which 50,000 were used for burn-in and the remainder for estimation purposes. Autocorrelation in the sample was reduced by thinning the iterations used for summary statistic purposes, taking only one in five of the iterations run by the program. One of the main concerns associated with the use of MCMC methods is whether or not the estimated parameters have converged. We applied both graphical and numerical techniques to test for convergence and the results showed that parameter convergence had been achieved.

5.1. Existence and heterogeneity of switching cost

The parameter estimates for the hierarchical model are reported in Table 3. Statistical significance is not a concern of Bayesian analyses, but we can construct an analog in order to assess parameter importance. The table reports the mean, the standard deviation, a Monte Carlo standard error and the mean divided by this error. Parameter significance depends on this quotient being higher than two (Rust and Verhoef, 2005), which is satisfied by all the parameters included in the model.

Table 3. Hierarchical Model Parameter Estimates.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Monte Carlo S.E.</th>
<th>Mean/MCSE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UTILITY MODEL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price $\beta_1[Avg]$</td>
<td>-0.0561</td>
<td>0.0201</td>
<td>0.0005</td>
<td>-98.77</td>
</tr>
<tr>
<td>Firm Size $\beta_2[Avg]$</td>
<td>0.5378</td>
<td>0.0712</td>
<td>0.0042</td>
<td>128.63</td>
</tr>
<tr>
<td>Switching Costs $\beta_3[Avg]$</td>
<td>-4.2425</td>
<td>0.6893</td>
<td>0.0053</td>
<td>-792.23</td>
</tr>
<tr>
<td><strong>SWITCHING COST ANTECEDENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length (Duration) $\alpha_1$</td>
<td>0.0737</td>
<td>0.0068</td>
<td>0.0002</td>
<td>312.51</td>
</tr>
<tr>
<td>Depth (Consumption) $\alpha_2$</td>
<td>0.0053</td>
<td>0.0036</td>
<td>0.0001</td>
<td>33.36</td>
</tr>
<tr>
<td>Depth $^2$ $\alpha_3$</td>
<td>-0.0006</td>
<td>0.0001</td>
<td>0.0000</td>
<td>-274.27</td>
</tr>
<tr>
<td>Breadth (Additional Service) $\alpha_4$</td>
<td>0.5578</td>
<td>0.1176</td>
<td>0.0047</td>
<td>117.43</td>
</tr>
<tr>
<td>Type of contract (1 = Postpaid; 0 = Prepaid) $\alpha_5$</td>
<td>0.0823</td>
<td>0.0908</td>
<td>0.0082</td>
<td>10.08</td>
</tr>
<tr>
<td><strong>Marketing Instruments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price (Current firm ARPU – Competitors ARPU) $\alpha_6$</td>
<td>-0.0122</td>
<td>0.0022</td>
<td>0.0010</td>
<td>-12.21</td>
</tr>
<tr>
<td>Service Advertising (Current firm investments – Competitors’ investments) $\alpha_7$</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
<td>160.71</td>
</tr>
<tr>
<td>Brand Advertising (Current firm investments – Competitors’ investments) $\alpha_8$</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
<td>69.63</td>
</tr>
<tr>
<td><strong>Customer Demographics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (1 = female; 0 = male) $\alpha_9$</td>
<td>0.1868</td>
<td>0.1375</td>
<td>0.0016</td>
<td>110.08</td>
</tr>
<tr>
<td>Age $\alpha_{10}$</td>
<td>0.0318</td>
<td>0.0034</td>
<td>0.0001</td>
<td>197.52</td>
</tr>
</tbody>
</table>
Switching cost parameters are our main concern in this analysis and the results reveal significant effects on customer utility. We find that marginal utility from switching service providers is negative for all customers in the sample ($\beta_3[Avg] = -4.24$). This result is largely consistent with the existence of customer switching cost in the mobile phone market posited in proposition 1. We also find that there are significant differences in switching costs across customers, as shown by the standard deviation ($\beta_3[Std] = 0.69$). Figure 2 shows the distribution of switching costs in the sample. As we can see from the figure, marginal utility from switching vendors is quite heterogeneous, ranging from 2.48 to 6.06 (in absolute values). These results are consistent with customer switching cost heterogeneity posited in proposition 2. Prices and firm size also contribute to explain customers’ choice decisions. On average, price negatively influences customer utility ($\beta_1[Avg] = -0.06$), while firm size has a positive impact on it ($\beta_2[Avg] = 0.54$).

![Figure 2. Switching Cost Distribution in the Sample (Switching costs in absolute values).](image)

5.2. Switching cost antecedents.

Two main groups of variables were introduced into the analysis to explain systematic switching cost differences: relationship characteristics and marketing instruments. To facilitate the discussion of the results, absolute switching cost values were taken. The results show that relationship characteristics have a significant role in explaining switching cost differences. Consistent with hypothesis 1, we find that the relationship duration is positively associated with customer switching costs ($\alpha_1 = 0.07$). We find support for hypothesis 2, in that there is a non-linear, inverse U-shaped relationship between mobile phone consumption and switching costs ($\alpha_2 = 0.005$; $\alpha_3 = -0.001$). Hypothesis 3 is also supported because cross-buying behavior positively influences the disutility derived from switching service providers ($\alpha_4 = 0.56$). The variable type of contract has the expected sign and postpaid subscription increases the magnitude of switching costs, consistent with hypothesis 4 ($\alpha_5 = 0.08$).

Marketing instruments play a significant role in explaining switching cost differences across customers. Consistent with hypotheses 5a and 5b, the difference between current and competitors’ prices negatively impacts on customer switching costs ($\alpha_6 = -0.01$). Current firm prices reduce customer switching costs while competitors’ prices increase them. The parameter accompanying the variable service advertising is very small and has a positive sign ($\alpha_7 = 0.00$), showing that the difference between current firm and competitors’ expenses in service advertising positively influences customer switching costs. We find support for hypotheses 7a and 7b, in that the difference between current firm and competitors’ expenses in brand advertising has a positive effect on customer switching costs ($\alpha_8 = 0.00$). Current firm brand advertising increases switching costs while competitors’ brand advertising reduces them. Again, parameter size is very small. Finally, demographics also play a role in the explanation of individual customer switching costs. The
estimation results show that female customers experience higher switching costs than males ($\alpha_9 = 0.19$) and that customer age is positively associated with customer switching costs ($\alpha_{10} = 0.03$).

6. Discussion and Implications

In this study we investigate the impact of relationship characteristics and marketing instruments on customer switching cost heterogeneity in the mobile phone market. In order to do so, we first provide a technique that allows marginal utility from switching providers to be measured. A conceptual framework is developed to assess the impact of relationship characteristics and marketing instruments on customer switching costs. Using a longitudinal design, we propose a hierarchical Bayes model to empirically measure switching costs and to analyze the sources of their heterogeneity across customers. We discuss the main findings and contributions below.

First, this paper provides an approach to measure individual switching costs based on the random utility framework. This technique has already been developed in the management literature but with a focus on firm or market level switching costs. Our study extends this technique to account for the dynamic nature of customer switching costs, allowing marginal utility from switching suppliers to be measured at the individual level. The increasing interest in managing individual customer-firm relationships (Rust et al., 2000) makes this an interesting extension for marketing academics and practitioners. To optimally manage the customer lifetime value (CLV) or the “customer asset”, individual measures of relational constructs are needed (Bolton et al., 2004). We contribute to the marketing literature by providing a technique to measure individual customer switching costs.

Second, this is the first study that explicitly measures and quantifies switching costs at the individual level. A hierarchical Bayes model is proposed in order to empirically estimate the marginal utility derived from switching while accounting for customer heterogeneity. Two important results deserve attention. First, marginal utility from switching providers is negative. This result is largely consistent with prior theoretical work in support of the existence of switching cost (Farrel and Klemperer, 2006) and with previous empirical examples in a wide variety of markets (Shapiro and Varian, 1999; Goldfarb, 2006). However, our study is the first to prove the existence of switching costs (measured as the disutility from switching) at the individual level. Second, and contrary to prior research implicitly or explicitly assuming switching cost homogeneity, switching costs have been found to be highly heterogeneous across customers. Although this is not an unexpected finding, due to the heterogeneous nature of customers, no study in the marketing field had tested this assumption so far. Therefore, this result adds to previous marketing research that shows customer heterogeneity in relational constructs like profitable lifetime duration, satisfaction or cross-buying behavior (Reinartz and Kumar, 2003; Bolton, 1998; Verhoef et al., 2002).

Third, a conceptual model is proposed to understand the sources of the systematic differences in switching costs. Two main groups of variables were included: relationship characteristics and marketing instruments. Prior research has introduced some relationship characteristics in switching cost analyses (Burnham et al., 2003). Other studies have considered firms’ strategies in the explanation of switching cost differences across firms (Chen and Forman, 2006). However, no study to date had simultaneously considered these groups of variables when explaining individual customer switching costs.

The results show that relationship characteristics play a significant role in explaining switching cost heterogeneity. In particular, relationship duration increases the disutility from switching. This is an interesting finding and gives support to previous studies showing that switching service providers is easier in the early stages of the relationship (Ongena and Smith, 2001; Israel, 2005). However, as the relationship progresses over time, switching costs increase and switching providers becomes more difficult (Verhoef et al., 2002). We reasoned that relationship depth might have a non-linear association with switching costs. The results confirm this expectation, showing that relationship depth and switching costs are related in an inverse U-shaped manner. This finding is rather interesting as it shows that intermediate service consumption is associated with the highest switching costs. Low-consumption customers have not developed strong interdependences and ties with the firm yet. High-consumption customers, on the other hand, are able to better evaluate the alternatives and have higher
incentives to search for the best service provider. Intermediate consumption, therefore, is associated with the highest level of switching costs. Our results also show that relationship breadth is positively associated with consumer switching costs. This is also an interesting finding because increasing the number of products or services purchased from the provider leads to a higher disutility from switching. This result is in line with previous research showing a positive impact of cross-buying behavior on customer switching costs (Burnham et al., 2003). In addition, the type of contract also plays a role in explaining switching cost heterogeneity in this particular industry. Although it is not an unexpected finding, the results show that postpaid customers find switching service providers more costly than prepaid ones.

The results also reveal that marketing instruments significantly explain switching cost differences across customers. This is a rather interesting finding because it shows that firms can control the magnitude of switching costs their customers bear. This result adds to previous work that shows that firms are able to modify customer switching costs by using specific strategies (Chen and Forman, 2006; Shapiro and Varian, 1999). Another interesting finding is that not only current firm, but also competitors’ marketing instruments can modify the magnitude of customer switching costs. For instance, firms can use their strategies to lock their current customers into the relationship or to encourage competitors’ customers to switch providers. In particular, our study shows that, using prices and advertising, firms are able, to a certain extent, to modify the disutility derived from switching service providers. Current firm prices are negatively related and competitors’ prices positively related to customer switching costs. This is an interesting and expected finding as reducing current firm prices discourages customers from switching. In contrast, reducing competitors’ prices diminishes the magnitude of customer switching costs and encourages consumers to switch service providers. This result is in line with previous research showing that firms “pay customers to switch” (Chen, 1997). We find that advertising plays a minor role in the explanation of customer switching costs. However, the results show that increasing both service and brand advertising by the current firm increases customer switching costs. In contrast, competitors’ service and brand advertising reduces switching costs, making the switching process easier. This result is quite interesting as it shows that advertising (both service and brand advertising) plays a significant role in explaining the behavior of existing customers (and not only of the new ones) (Manchanda et al., 2006; Prins and Verhoef, 2007). We did not posit any directional association between current firm service advertising and switching costs as there were reasons for both associations (positive and negative) to hold. Although the size of the effect is quite small, the results show a positive relationship between current firm service advertising and switching costs. Clearly, more research is needed to clarify the association between the two variables.

Fourth, from a methodological perspective, our study shows the importance of using techniques which account for customer heterogeneity when studying individual-related constructs. Classical procedures do not fully capture customer heterogeneity. Moreover, with complex behavioral models (like the one specified in this study), maximization of the simulated likelihood function can be difficult and often fails to converge (Train, 2003). Hierarchical Bayes models overcome these problems because they allow the estimation of complex models accounting for heterogeneity across individuals and other sources of uncertainty (Rossi, Allenby and McCulloch, 2005). In addition, desirable estimator properties can be obtained under more relaxed conditions using this modeling approach. Our study extends the use of these models to the study of customer switching costs at the individual level.

Finally, competitive information is included in the analysis of customer switching costs. We show that not only current firm practices, but also competitors’ practices contribute to explaining switching cost heterogeneity. Not accounting for competitors’ strategies would have led to biases in the parameter estimates. This constitutes an interesting contribution to the marketing literature as most research dealing with marketing instruments and their effects on relational constructs only includes single firm information. This study is the first to analyze the effects of current firm and competitors’ marketing instruments on individual customer switching costs. Moreover, contrary to prior research, this study uses longitudinal information instead of cross-sectional data to analyze switching costs, which allows us to account for the dynamics of customer behavior. In addition, actual behavior is used to deal with this issue, avoiding methodological problems caused by stated preference data.
REFERENCES


