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Investigating the post-complaint period by means of survival analysis

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Abstract

Firms increasingly view each contact with their customers as an opportunity that needs to be managed. The primary purpose of this article is to gain a better understanding of the customers' post-complaint period. Specific focus is placed on the impact of effective complaint handling on actual customer behavior throughout the time, whereas previous research has mainly focused on time-invariant or intentional measures. Survival analysis techniques are used to investigate the longitudinal behavior of complainants after their problem recovery. The proportionality assumption is tested for each explanatory variable under investigation. In addition, the impact for each variable is estimated by means of survival forests. Survival forests enable us to explore the evolution over time of the effects of the covariates under investigation. As such, the impact of each explanatory variable is allowed to change when the experiment evolves over time, in contrast to 'proportional' models that restrict these estimates to be stationary. Our research is performed in the context of a financial services provider and analyses the post-complaint periods of 2326 customers. Our findings indicate that (i) it is interesting to consider complainants since they represent a typical and rather active customer segment, (ii) furthermore, it is beneficiary to invest in complaint handling, since these investments are likely to influence customers' future behavior and (iii) survival forests are a helpful tool to investigate the impact of complaint handling on future customer behavior, since its components provide evidence of changing effects over time.
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1. Introduction

According to Keaveney (1995), the two major reasons why customers switch service providers are: (1) core service failures and (2) unfavorable service encounters with the company's personnel. When customers face a problem they may respond by exiting (=switching to another provider), loyalty (=staying with the supplier anticipating that 'things will get better') or voicing (=complaining to the firm or word-of-mouth to third-parties) (Levesque & McDougall, 1996; Tax, Brown, & Chandrashekaran, 1998). Unfortunately, it is only the tip of the iceberg that complains to the company (Stephens & Gwinner, 1998) since dissatisfied customers tend to remain passive when experiencing a problem (Bougie, Pieters, & Zeelenberg, 2003).

Customers who do not complain to the firm when dissatisfied are of special concern to management for several reasons. First, the company loses the opportunity to

rectify the problem (Fornell & Wernerfelt, 1988; Levesque & McDougall, 1996) and to restore the customer's satisfaction level (Smith, Bolton, & Wagner, 1999). Second, the firm's reputation can be damaged due to the negative word-of-mouth to friends, family or other people external to the customer's social circle, e.g. via newspapers (Bougie et al., 2003; Singh, 1988) which might result in the loss of prospects as well as current customers (Stephens & Gwinner, 1998). Third, the firm is deprived of valuable information about its products and services (Fornell & Wernerfelt, 1987) that is likely to improve the bottom-line performance and to prevent similar problems in the near future.

On the other hand, customers who complain and receive a proper response to their service failures are more likely to stay (e.g. Conlon & Murray, 1996), to buy new products (e.g. Maxham III & Netemeyer, 2003), to pay price premiums (e.g. Zeithaml, Berry, & Parasuraman, 1996), to engage in favorable word-of-mouth and to recommend the company's services to others (e.g. Maxham III, 2001; Maxham III & Netemeyer, 2002). Furthermore, they show higher share-of-wallet behavior (e.g. Bowman & Narayandas, 2001) as well as higher commitment and trust towards the company (e.g. Tax et al., 1998). Finally, they are less vulnerable

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to switch (e.g. Bougie et al., 2003) and less likely to spread negative word-of-mouth to friends (e.g. Blodgett, Granbois, & Walters, 1993), or third-parties, such as other customers (e.g. Zeithaml et al., 1996). In sum, there is overwhelming evidence from previous research that successful complaint handling results in favorable customer outcomes. Additionally, in their study Fornell and Wernerfelt (1988) state that the return on investment in complaint management is likely to reach a 400 percent level.

When considering the consumer complaint behavior (CCB) literature, Stephens and Gwinner (1998) argue that much of the research is dominated by studies trying to understand why customers complain. In their paper, they provide an exhaustive list of investigated antecedents, including individual characteristics, attitudes, situational factors, the cost of complaining, etc. It is only since the last decade that literature has caught up by investigating the consequences of complaint handling (cf. previous paragraph). However, current knowledge is limited in providing insights regarding behavioral intentions or self-reported actual behavior measures resulting from critical incident technique studies in which the respondents are requested to think about their latest service switch (e.g. Keaveney, 1995). As is well known, data on actual behavior are often unavailable. Generally, the only data available are the self-reported intentions of the individuals who completed a post-complaint questionnaire. Nevertheless, many authors argue that intentions are not always translated into subsequent behavior, since respondents typically do not have perfect information about changes that may occur in the future that may affect their behavior (Young, DeSarbo, & Morwitz, 1998).

Unlike previous research, we investigate the impact of complaint handling on customers' *actual* behavior instead of intended behavior (=perceptual information). As a consequence, our research setting implies the need to link complaint data with complainants' behavioral information that is stored in transactional databases.

In this study, we decided to investigate the complainants 'next-buy' decision. We believe that an effective purchase reflects actual retention behavior (Larivière & Van den Poel, 2004). In contrast to the studies that have investigated intended repeat purchasing behavior by questioning items such as 'In the near future, I intend to buy new products', we consider an actual product opening as a real and executed consequence of such an intention. The variable 'next-buy' expresses whether the customer has bought a new product during the observed period of analysis. The variable is operationalized as a time-varying dependent variable, in which the right-censoring situation is taken into account; that is, customers who have not bought a new product by the end of the observed period of analysis might do so in the future (that is, right-censoring).

Furthermore, we explicitly test whether the impact of complaint handling varies over time by means of survival forests, meaning that we allow for changes in the impact of complaint handling components on the customers' next-buy decision. In the context of complaints, it is plausible to assume that some effects, such as receiving compensation, fade out after a while. As such, we cannot use conventional 'proportional' models that assume stationary effects of the covariates throughout the observed window of observation.

In sum, we contribute to the existing CCB literature by presenting a framework of *actual* customer behavior in which we account for the right-censoring situation, and we explicitly test for the time-varying impact of explanatory variables by questioning the proportionality assumption.

The rest of this paper is organized as follows. In Section 2 we elucidate both the methodological underpinnings of the proportionality assumption and the survival forests technique. In Section 3, we present the data set and the explanatory variables under investigation. The study results and its implications are reported in Section 4. Section 5 concludes the paper and outlines some directions for further research.

2. Methodology

In this study we apply survival analysis techniques because our dependent variable is characterized by both a binary classification ('buy' or 'no buy') and a duration indicator for that purchasing (or censoring) event. First, we present the methodological underpinnings related to the proportionality assumption. Next, we elaborate on the survival forests technique that produces time-varying covariate estimates.

2.1. Testing the proportionality assumption

Survival analysis is a class of statistical methods modeling the occurrence and timing of events (in this case: the complainant's next-buy decision).

Survival data have the following form:

$$\{(c_n, t_n, x_n), \quad n = 1, …, N\} \tag{1}$$

where n represents the index to the 2326 (N) complainants under investigation in this study; c_n is the status (or binary classification) indicator which represents whether the complainant repurchased within the period of analysis; t_n is the duration indicator and represents the time to the event or the censoring time (that is, for the customers who did not experience the event of buying within the period of analysis); x_n is the vector of covariates for each customer n, and refers to the complaint handling and control explanatory variables in this study (cf. Section 3.2). The goal of survival analysis is to trace the effects of the covariates on the times to the event; or in this study: the impact of complaint handling on the duration to repurchase.

The field of survival analysis is dominated by the Cox proportional hazard model (Stare, Harrell, & Heinzl, 2001).