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Regaining drifting mobile communication customers: Predicting the odds of success of winback efforts with competing risks regression

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ABSTRACT

Mobile network operators (MNOs) make considerable efforts to reduce customer defection (= churn) by trying to motivate customers who announced to cancel their contract at the next legally possible date to withdraw their notification and to sign another postpaid contract or at least to accept a prepaid offer in case that they are unwilling to completely revoke their cancellation. Nevertheless, empirical evidence on factors significantly associated with the odds of success of an MNO's reactive winback attempt is scarce. As a consequence, this study explores the capability of socio-demographic, contract and service usage characteristics of MNO subscribers as well as their stated primary reason for contract termination to predict the likelihood of a fully successful winback at the individual customer level. In a sample of 305,466 postpaid residential customers of the German subsidiary of a multinational MNO, competing risks regression analysis suggests that younger customers with above average service usage levels who were already in a tariff plan bundling mobile voice and Internet access services, yet had received a subsidized device from their current provider in the past, had not originally signed their contract in the firm's own outlets and stated they cancelled their contract as a precautionary move or due to tariff level/structure reasons exhibit the highest prospects of full restoration. Moreover, the analysis reveals that the covariates studied and the competing risks regression technique achieve a satisfactory performance in predicting the outcome of the MNO's customer winback efforts. Results are discussed in terms of basic entry points of MNOs for improving both their reactive winback as well as their new customer acquisition strategies.

1. Introduction

The worldwide demand for mobile communication services (MCS) such as voice telephony, text messaging and mobile Internet (MI) access has been growing rapidly since the early 1990s. At that time, competition between various mobile network operators (MNOs) started to replace the former monopoly system prevailing in this sector for decades in most countries. Nevertheless, in the recent past developed markets for MCS are increasingly characterized by penetration rates stagnating at high levels. For instance, in the European Union the number of SIM cards per 100 inhabitants already amounted to 132 in 2013 (European Commission, 2014). Furthermore, the markets experience a shift in the usage of established highly profitable voice and text messaging services toward MI-based surrogates provided by applications such as Skype or WhatsApp (e.g., Dialog Consult & VATM, 2014; Ofcom, 2014). As a result, most MNOs at least in Europe face a decline in average revenue per user (ARPU) while at the same time being forced to invest in their infrastructure in order to cope with soaring MI data traffic (Cisco Systems, 2014, p. 5). In addition, an operator's room for maneuver to compensate for higher network costs by raising end-user prices is limited since "commoditization" (Nguyen & Pupillo, 2012, p. 319) of MCS, pressure from competitors amplified through the portability of mobile phone numbers, flexible service plans and market-wide technology standardization make it easy for customers to switch between MCS suppliers (Keramati et al., 2014).

As a result, customer acquisition in developed markets for MCS mainly corresponds to "poaching" (Fudenberg & Tirole, 2000, p. 634) among the subscribers of competitors. Successful customer acquisition requires substantial investment in customer data collection and analysis capabilities, as well as in designing and executing marketing campaigns. Such campaigns frequently entail substantial initial cash outlays (e.g., reduced prices during a "welcome period", subsidized handset). Consequently, MNO

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practitioners and scholars alike frequently emphasize that the acquisition of new subscribers costs about ten times more than retaining existing customers (e.g., Keramati & Ardabili, 2011; Kim, Jun, & Lee, 2014). Consequently, MNOs make considerable efforts to reduce subscriber defection.

In academia, quite a number of researchers have sought to identify variables contributing significantly to the discrimination of churning MNO subscribers from their staying counterparts (e.g., Ahn, Han, & Lee, 2006; Benedek, Lublóy, & Vastag, 2014; Keramati & Ardabili, 2011; Kim, Lee, & Johnson, 2013; Rehman & Ali, 2014; Seo, Ranganathan, & Babad, 2008). MNOs exploit findings of this kind of studies to improve their customer retention management programs. Such programs include *preventive* measures to identify the most likely churners in advance and then develop offers, which address their unmet expectations (Lee, Lee, Cho, Im, & Kim, 2011). The offers are typically presented during a "churn avoidance call" (e.g., Boenigk, 2011).

However, since preventive measures do not avoid all contract terminations, most MNOs additionally call customers in the period after the receipt of a cancellation notice and before the date the cancellation becomes effective. This phone contact aims at figuring out reasons to quit and convincing the customer to withdraw the cancellation (e.g., Florl, 2000; Griffin & Lowenstein, 2001; Lopes, Brito, & Alves, 2013; Naß, 2012; Pick & Kannler, 2009; Rauchut, 2009; Richter, Yom-Tov, & Slonim, 2010; Schöler, 2011; Stauss & Friege, 1999; Thomas, Blattberg, & Fox, 2004; Tokman, Davis, & Lemon, 2007). Knowledge regarding success drivers of such *reactive revival* or *winback* measures supports MNOs in developing tailored winback policies. The targeted design of such policies requires that empirically derived weights of antecedents of the outcomes of winback attempts are used to predict for each subscriber who has announced to quit whether an attempt will lead to a cancellation of the termination or not. Winback measures can then be directed at subjects for whom the forecast indicates that they will respond positively to retention offers. This procedure helps to save considerable resources by reducing scattering losses. Empirical work that investigates winback success drivers for MNOs is scarce. In addition, findings concerning *proactive* customer retention measures are of limited usefulness for directing reactive customer winback steps because of differences in their initial context: Preventive measures try to strengthen the commitment of customers before it is dropping to a level which makes a subscriber quit. Winback activities, in contrast, face the challenge of convincing customers to actively withdraw a notification after their commitment is already low and after they have already invested time and cognitive effort to quit the contract.

Against this background, this work empirically examines various customer, contract and MCS usage characteristics as well as termination circumstances in order to identify factors with significant impacts on the odds of success of winback attempts. It uses data drawn from the customer management and billing systems of the German subsidiary of a large multinational MNO. The dataset covers 305,446 residential postpaid subscribers of MCS who announced to cancel their contract during the 11-month period from April 2012 to February 2013.

The remainder of this article is structured as follows. Section 2 lays the foundation of our empirical analysis by structuring earlier customer churn and winback studies based on their contribution toward explaining the contractual status of MCS customers. Building on this, our research question is developed. Section 3 describes the dataset and the statistical methods applied in the present study. Section 4 reports the empirical results. Conclusions of the results for management practice are discussed in Section 5, which also derives areas requiring further research from the limitations of our investigation.

2. Analytical framework, review of related work and research question

In many European countries and particularly in the German mobile communication market, it is common practice that postpaid subscriptions have a defined minimum initial contract duration (e.g., 24 months; see "contract period" in Fig. 1). At the end of the first and each subsequent period, the subscription is automatically extended on unchanged contractual terms. A subscriber may quit her subscription directly after signing it. However, the termination does not become effective until the end of the duration of the running contract is reached. In addition, to avoid an automatic extension covering another predefined period, the customer has to announce a termination a minimum number of months, weeks or days before the term of the running contract ends (see "latest date for termination announcement" in Fig. 1). Based on this structure of the contract periods of postpaid MNO subscribers, we suggest to distinguish three stages a customer passes through once she has signed a contract (see Fig. 1 and Naß, 2012, pp. 28, 36; Stauss & Friege, 1999, p. 352).

The first "proactive retention" phase is characterized by a valid MCS contract, which has not yet been terminated. In this phase, the supplier may proactively contact customers who were identified as churn candidates in order to understand and remedy their concerns. The key target of such proactive contacts is to prevent subscribers from actually announcing a termination. The identification of potential churners is a prerequisite for targeting proactive retention measures, which in turn helps in effectively reducing costly scattering losses in the first phase (e.g., Tamaddoni Jahromi, Stakhovych, & Ewing, 2014). Scholarly work focusing on the first phase can be segmented into two clusters.[2]

First, numerous studies develop and assess statistical techniques to estimate churn probabilities of subscribers. Table 1 lists 30 earlier predictive investigations focusing on the proactive retention phase. These *predictive* studies usually apply modeling techniques such as artificial neural networks, decision trees, and random forests in large samples of MNO subscribers. Their main objective is to improve the forecasting performance of the specified model that can afterwards be integrated into an MNO's decision support system to calculate individual churn propensities of the customer base. Second, a considerable number of *exploratory* investigations exist. They include a broad range of variables that could be associated with customer churn. Typically, they rely on standard statistical techniques such as discriminant analysis, which allow assessing variables with regard to their contribution to differentiating between churners and stayers. Both types of studies generally investigate variables that can be structured in the following three categories (Benedek et al., 2014): (1) subscriber attributes (e.g., age, gender), (2) contract characteristics (e.g., duration of the contract relationship, contract includes a subsidized device) and (3) variables which reflect a subscriber's service usage (e.g., ARPU, outgoing voice minutes, mobile Internet data volume).

Unfortunately, both strands of research leave room for improvement: Predictive method-driven investigations often use techniques, which are very complex. Therefore, it becomes hard or impossible to distill and report the strength and direction of

[2] Similar to empirical work on the uptake and use of MCS services, numerous churn-related publications are based on *intentions* as a proxy of *real behavior*, probably because the effort required to gather subjective intention data using online surveys is rather low. However, a substantial body of research shows that behavioral intentions correlate only very moderately with actual behaviors (e.g., Aydin & Özer, 2005; Blery et al., 2009; Pick & Eisend, 2014; Spiecker & Stauss, 2014; Van Vaerenbergh, Orsingher, Vermeir, & Larivière, 2014). Therefore, empirical investigations solely based on claimed churn intentions collected via surveys are excluded from the following literature review.