JACQUELYN S. THOMAS, ROBERT C. BLATTBERG, and EDWARD J. FOX*

For both academics and practitioners, the dominant focus of customer relationship management has been customer retention. The authors assert that customer winback should also be an important part of a customer relationship management strategy. Customer winback focuses on the reinitiation and management of relationships with customers who have lapsed or defected from a firm. In some cases, firms engage in extensive efforts to reacquire lapsed customers or defectors, and a common tactic is lowering the price to reacquire a customer. This investigation goes beyond the reacquisition pricing strategy and also examines the optimal pricing strategy when the customer has decided to reinitiate the relationship. By simultaneously modeling reacquisition and duration of the second tenure with the firm, the authors determine that the optimal pricing strategy for their application involves a low reacquisition price and higher prices when customers have been reacquired. In addition to pricing strategy, they also discuss the implications of their findings for targeting lapsed customers for reacquisition.

Recapturing Lost Customers

Loyalty and retention have been the dominant themes among scholars interested in customer relationship management (CRM). Books and articles have been written and businesses have been developed around the central theme of the management and maintenance of customer relationships (see, e.g., Reichheld 1996). Although progress has been made in the management of customer relationships, there are still high defection rates. Table 1, which we have adapted from the work of Griffin and Lowenstein (2001), shows customer defection rates across various industries.

Table 1
ANNUAL CUSTOMER DEFECTION RATES

Industry	*Defection Rate*
Internet service providers	22%
U.S. long distance (telephone)	30%
German mobile telephone market	25%
Clothing catalogs	25%
Residential tree and lawn care	32%
Newspaper subscriptions	66%

Adapted from Griffin and Lowenstein (2001).

Although all aspects of CRM need to be assessed and strategies and tactics developed, an area that has been largely neglected in the marketing literature is customer "winback" strategies. *Customer winback* is the process of firms' revitalizing relationships with customers who have defected. The importance and impact of customer winback as a key element in a firm's CRM strategy cannot be underestimated. Research has shown that a firm has a 60% to 70% chance of successfully repeat-selling to an "active" customer, a 20% to 40% chance of successfully repeat-selling to a lost customer, and only a 5% to 20% chance of successfully closing the sale on a brand new customer (Griffin and Lowenstein 2001). These statistics suggest that a key opportunity for firms to increase or maintain a customer base is the mining and evaluation of the firm's database of defected customers. Stauss and Friege (1999) make this argument even more convincing in a case study in which they find that the net return on investment from a new customer obtained from an external list is 23% compared with a 214% return on investment from the reinstatement of a customer who has defected.

A critical element in the process of firms' recapturing of lost customers is the assessment of customer profitability. Customer lifetime value (LTV) is a central profitability metric in analysis of customer relationships; it is typically defined as the net present value (NPV) of the customer's profitability throughout the customer–firm relationship (Dwyer 1989). However, when it comes to the recapturing of lost customers, the second lifetime value (SLTV) of the customer (Stauss and Friege 1999) is the metric of interest. This metric focuses only on the NPV generated after a customer has been reacquired. Specifically, Stauss and Friege

*Jacquelyn S. Thomas is an associate professor, Integrated Marketing Communications Department, Medill School of Journalism (e-mail: jakki@northwestern.edu), and Robert C. Blattberg is the Polk Bros. Professor of Retailing, J.L. Kellogg Graduate School of Management (e-mail: r-blattberg@kellogg.northwestern.edu), Northwestern University. Edward J. Fox is W.R. Howell Director of the JCPenney Center for Retail Excellence and Assistant Professor of Marketing, Edwin Cox School of Business, Southern Methodist University (e-mail: efox@mail.cox.smu.edu).

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(1999) define SLTV as the future value of a recaptured customer. They assert that when it comes to development and implementation of a customer recapture program, expectations about the potential future value of a recaptured customer should be the guiding factor. Logically, the SLTV should guide the decisions with respect to which customers should be recaptured and how much should be spent to reacquire them.

Some firms engage in extensive efforts to recapture defected customers or to reactivate lapsed customers. For example, during the long-distance telephone wars, one segment of customers frequently switched providers. Some customers switched to benefit from the introductory offer of a competing provider, whereas others simply wanted to solicit a better offer from the original provider (Marple and Zimmerman 1999). To recapture lost customers, telecommunications firms engaged in aggressive "come-back" campaigns. When the original provider approached customers to come back, they typically presented them with offers that were better than the original offer. Thus, the consumer usually benefited. However, reacquisition costs (e.g., reactivation fees, telemarketing efforts, come-back cash incentives) often caused the SLTV for the reacquired customers to be negative, thereby representing a net loss to the provider firms. This example illustrates the importance of SLTV to the strategy and tactics of customer reacquisition.

The focus of our article is on determining how firms should price customers when reacquiring them and how they should price them when they have been reacquired. In practice, the favored approach is to offer restarts lower prices for the same product. To stimulate purchase activity, Amazon.com offers lapsed customers discounts on their next purchases. Similarly, HoneyBaked, the ham company, offers a $10 gift certificate to reactivate customers (Schmid 1998), and Self Care, a health care products marketer, offers discounts of up to 25% to customers who have not ordered from the company in 18 to 24 months (Kiley 1996). Determining the optimal price for recapturing a customer is only part of the challenge in firms' customer winback strategy. An equally important decision is how to price when the customer has been reacquired.

The objective of this research is to assess optimal pricing strategies for the recapture of lost customers and the management of the SLTV of the recaptured customer (i.e., a restart customer). Specifically, we examine the relationship between the price used to recapture the customer and the subsequent price when the customer has been reacquired.

Prior research has shown that the acquisition of a customer affects the future relationship that a firm has with that customer (Thomas 2001). In this context, we examine how the reacquisition of a customer correlates and influences the reinstated customer–firm relationship. A key consideration in this analysis is the influence of the customer's relationship with the firm before reactivation. Using observable characteristics about the prior relationship (e.g., tenure, pricing, duration of lapse), we also draw conclusions about which lapsed customers are the most profitable targets for reacquisition.

We explore these questions in the context of services such as newspapers and magazine subscriptions and organizational memberships (e.g., health clubs). A common characteristic of these services is that the quantity purchased is typically one unit of the service. Thus, demand is typically determined by the duration of the customer–firm relationship. This context also offers the additional benefit that relationship durations and lapses are clearly identified. Although these relationships tend to involve contracts, the service we analyze allows customers to defect at any time without a penalty. This service also may change its prices over time. Thus, the context of our research offers the benefit of explicitly identifying relationship duration, but it is not limited by the pricing and duration constraints that often characterize contracted services.

In the next section, we review the relevant literature on pricing and CRM. In subsequent sections, we present a theory of restart customer behavior, detail the modeling framework used to test our theory, describe the data and variables used to estimate the model, present the empirical results, and examine the financial implications of our analysis. Finally, we conclude with a general discussion of our analysis and our study's limitations.

SLTV AND WINBACK LITERATURE REVIEW

On the surface, research on dynamic pricing seems an appropriate foundation on which to base our research. However, this research domain provides limited insight into the use of pricing to reacquire and retain lapsed customers. Traditional pricing research does not focus on the long-term relationship between the customer and the firm. This is evidenced by the fact that demand models typically used in pricing research do not monitor the churn or retention behavior of individual customers (for a review, see Mahajan, Mueller, and Bass 1993). Kalyanam (1996) shows that different ways of specifying demand can lead to different profit-maximizing prices.

In contrast, the CRM literature focuses on the individual customer and emphasizes LTV, which is a relatively new area and has been the subject of little empirical research, particularly research that addresses customer reacquisition and SLTV. For example, the research that is most similar to ours in that it explicitly addresses customer winback is that of Stauss and Friege (1999). They explore a concept that they term "regain management," which they define as the process of winning back customers who either give notice to terminate or have already ended the relationship. Stauss and Friege present a conceptual framework for customer winback that entails regain analysis (i.e., determining which customers have defected and why), regain actions (i.e., engaging in dialogue with the customer to determine the appropriate regain offer), and regain controls (i.e., the profit/loss analysis of the regain actions).

Our research addresses the three areas of Stauss and Friege's (1999) framework in a more rigorous context. Unlike Stauss and Friege, we perform a statistical analysis of defected and restart customers to determine drivers of reacquisition, we model both the reacquisition and the retention of a lapsed customers, and we focus explicitly on pricing as a means to recapture customers. Although our data do not enable us to determine why the lapse occurred, prior research has shown that unfavorable price perceptions have a direct effect on a customer's intention to switch providers (Keaveny 1995).

Building on the framework introduced by Stauss and Friege (1999), Griffin and Lowenstein (2001) introduce a general outline for winning back lost customers. Citing best practices from industry, they highlight the importance of highly trained winback teams and customer information systems. However, counter to the mantra of "zero defections," they assert that not all customers should be won back. According to Griffin and Lowenstein, firms should calculate SLTV, segment customers on the basis of SLTV, and evaluate customers in those segments to determine why they defected. Assessments of SLTV and rationale for defection guide the targeting and offers made in the regain process. Using case analyses, Griffin and Lowenstein find that the duration of a customer's lapse and the way that customer was acquired affect SLTV estimates. Our research incorporates and extends their insights into the domain of pricing strategies for customer winback.

Unlike the research we have mentioned, the majority of other CRM research does not address customer winback directly. However, a few researchers have addressed pricing issues related to CRM. Bolton and Lemon (1999) show that customers' use of two continuously provided services partly depends on prices. Bolton, Kannan, and Bramlett (2000) find that a price gain (i.e., a decrease in price) has a significant impact on repatronage, but a price loss (i.e., a price increase) does not. This finding is consistent with that of Krishnamurthi, Mazumdar, and Raj (1992), who show that for customers who switch often among consumer packaged-goods brands, price gains have a larger impact on brand choice than do price losses.

Another common theme in the CRM literature is the degree of price sensitivity among loyal customers. Previous researchers have asserted that loyal customers are willing to pay higher prices (Reichheld and Sasser 1990). Reinartz and Kumar (2000) test this assertion empirically. Using a median split, they segment customers into long- versus short-life customers and then examine the mean price paid by the two segments. They determine that long-life customers actually pay a lower mean price than do short-life customers.[1] Although Reinartz and Kumar never actually estimate price sensitivity, they draw inferences about the price sensitivity of customers who have longer relationships with the firm compared with that of customers whose tenures are shorter. Our research is distinct in that we model customer reacquisition and duration as a function of price. Thus, we actually estimate price sensitivity. In addition, our focus is not on long- versus short-life customers but on the pricing strategy for restart customers who may have either long or short prior relationships with the firm.

TOWARD A THEORY OF RESTART CUSTOMER BEHAVIOR

There are two basic issues that we address in our theory about restart customer behavior: (1) the nature and influence of the prior relationship on customer reacquisition and the subsequent relationship that evolves and (2) the responsiveness of restart customers to price. These two issues are particularly relevant. The first is critical for targeting; that is, which lapsed customers should the firm target for reacquisition? The second issue is critical for making offer decisions; that is, what are the optimal reacquisition and follow-up (after reacquisition) prices?

Targeting Decision

A popular approach for making targeting decisions in direct marketing firms is recency, frequency, and monetary value analysis. Although weaknesses in this approach have been identified, a widely held belief among direct marketers is that customers who have bought most recently and more often and have the highest monetary value are more likely to respond favorably to subsequent offers (Hughes 1996). This belief is consistent with other research findings. For example, Schmittlein and Peterson (1994) find that in a brokerage context, customers who make fewer transactions (i.e., purchase less frequently) are most likely to terminate their relationship with the firm. Boulding, Kalra, and Staelin (1999) find that, more generally, consumers' prior experience with a service affects their subsequent attitudes and assessments of that service.

Bolton, Kannan, and Bramlett (2000) find that experience with a product, measured by the number of prior transactions, is positively associated with a higher likelihood of repatronage. It is noteworthy that this result holds regardless of whether repatronage is measured either in terms of the decision to stay or to terminate the relationship or in terms of how much to use the service. They explain this finding by relating a customer's prior experience to repatronage intentions and to the customer's desire to maintain the status quo. Specifically, they assert that prior experience drives customer expectations and intentions. They argue that intentions are strongly related to the actual decision because customers strive to maintain the status quo; however, they also find that a customer's level of satisfaction can moderate this result.

Although the preceding articles are unique, the consistent theme in the results is that previous experience affects customer behavior. For lapsed or defected customers, experience can be measured by their prior tenure (which we refer to as Tenure 1 or first tenure) with the firm. Consistent with prior research, we assert the following:

> H_1: For restart customers, the length of their first tenure with a firm is positively related to (a) the reacquisition probability and (b) their subsequent tenure in a reinitiated relationship.

Although the normative beliefs of direct marketers about which customers to target for repurchasing may hold in many cases, in the context of this research, it is important to acknowledge that the relationship was terminated. The finality of this termination is not known at the time when the firm evaluates potential reacquisition candidates. This raises the question, How does the amount of time elapsed since the last purchase (or the length of the lapse) affect the chances of reacquisition and the nature of the relationship that may ensue?

Prior research has asserted that with the passage of time, customers adapt to the new level of service provided by the switched-to firm (Ganesh, Arnold, and Reynolds 2000). In addition, customers who have switched to a new firm after

[1]An inquiry with Reinartz and Kumar revealed that this result held even when they accounted for basic differences in product categories.

having experienced another firm's service exhibit higher levels of loyalty and repeat patronage to the switched-to firm than do patrons of the firm who had never experienced another provider (Ganesh, Arnold, and Reynolds 2000). Logically, the longer the time since the last purchase, the more likely a lapsed customer is to have engaged a new service or simply to have developed new behaviors. On the basis of this reasoning, we believe that the prior research suggests the following hypothesis:

H_2: The greater the time since last purchase, the lower is the likelihood of customer recapture.

Note that this hypothesis is still well founded even if the customer has not switched to a new provider, because it is consistent with status quo bias, that is, an exaggerated preference for the current state or inaction (Samuelson and Zeckhauser 1988).

To gain insight into the relationship between lapse duration and the duration of the reinitiated relationship (which we refer to as Tenure 2 or second tenure), we reference the theory of cognitive dissonance (Festinger 1957). A key premise of dissonance theory is that dissonance, or lack of fit between two elements (e.g., attitudes and behaviors, behavioral decisions and commitments), gives rise to pressures to eliminate or reduce the dissonance. This can be conceptualized as a drive to obtain consistency.

For any lapsed customer, the decision to reinitiate a relationship with the firm creates dissonance relative to the customer's prior state (i.e., inactivity) with the firm. Dissonance can vary in magnitude and is moderated by the importance or intensity with which attitudes are held (Eagly and Chaiken 1993; Festinger 1957). Applying this idea to our research, we argue that longer lapses may represent more extreme attitudes. Therefore, the decision to reinitiate a relationship after a long lapse results in a greater amount of dissonance relative to the decision to reinitiate a relationship after a shorter lapse. Cohen (1960) asserts that the greater the amount of dissonance, the stronger are the attempts to reduce it. This implies that customers who have had longer lapses make stronger attempts to reduce the dissonance between their prior behavior (i.e., the lapse) and their decision to reengage in a relationship with the firm.

To reduce or resolve the dissonance that occurs after a decision, a person attempts to engage in postdecision processing that reinforces the new decision that has been made (Festinger 1957, 1964). In the case of reacquired customers, the current decision is the choice to reengage in a relationship with the firm. In this context, the second tenure can be evidence of the reacquired customer's degree of reinforcement processing. Thus, because customers with longer lapses make stronger attempts to reinforce the reacquisition decision, they will have longer subsequent relationships than customers with shorter lapses.

H_3: Longer lapse durations are positively associated with longer second tenures.

Offer Decision

The most basic question about the price offer decision is, How will restart consumers respond to price? General laws of supply and demand assert that higher prices lead to lower demand (e.g., Einhorn 1994). This general principle can be directly applied to the reacquisition price offer.

H_4: The reacquisition rate is higher if the price offered is lower.

Consistent with economic theory, Reinartz and Kumar (2000) show that long-life customers pay lower mean prices than do short-life customers; theirs was one of the first CRM articles to demonstrate this unique result. However, it is worth acknowledging that this conclusion is not based on a statistical estimate of price sensitivity but on a median split of customers based on relationship duration.

We use caution in applying traditional economic theory to the price response of reacquired customers, because economics typically focuses on price responsiveness in discrete transactions. In contrast, CRM considers the long-term effects of price on customer relationships. Because of the long-term perspective, responsiveness to price may be more complex. For example, Bolton and Lemon (1999) use the concept of payment equity (i.e., the customer's perception of fairness with respect to the exchange of payment for service usage) to discuss consumers' use of services. Their research shows that consumers seek to maintain payment equity in a service relationship and adjust usage levels in response to price changes. Specifically, Bolton and Lemon find that service usage levels may increase as price increases in order to maintain equity in the relationship. However, the implied positive relationship between price and usage contradicts both the long history in economics of the negative effect of price on demand and the compelling empirical evidence across many disciplines. Thus, on the basis of weight of evidence, we hypothesize the following:

H_5: The second tenure is longer if the retention prices are lower.

Although we derive H_5 from the history of pricing research, we believe that it is important to test this hypothesis and either to reinforce the similarity between CRM and a transaction-oriented business perspective or to highlight the unique perspective of CRM.

To understand further how price affects reacquisition and repatronage, we revisit the issue of prior experience. Boulding, Kalra, and Staelin (1999) show that customers give different weights to prior experience and current experience. They find that as customers gain confidence or experience with a product, they weight their prior assessment of a given service more heavily than they do new information about the service. Thus, it might be expected that when restart customers assess their reinitiated relationship with the firm, they reflect on their prior relationship with the firm and give significant consideration to that assessment. This behavior is consistent with the existence of reference prices in consumer decision making.

The reference price literature enables us to generalize that consumers use prior prices in the formation of reference prices and that reference prices have a significant impact on demand (Kalyanaram and Winer 1995). The specific combination of prior prices and process by which internal reference prices are formed remains an open issue (for a review, see Kalyanaram and Winer 1995). For customer winback, the logical reference point is the customer's prior relation-

ship with the firm. Consistent with these arguments and with H_4, we propose the following:

> H_6: The difference between the reacquisition price offering and the last price paid before lapse (i.e., reacquisition price minus last price in prior relationship) negatively affects the probability of reacquisition.

It is notable that this hypothesis allows for the price difference to be either positive or negative.

Further drawing on reference price literature, we assert that differences between the new price and prior prices can influence how restart customers assess their experience. This assertion is supported by arguments that customers' assessments of value, which directly affect relationship continuity, are based on differences relative to a reference point (e.g., Bolton 1998; Thaler 1985). More specifically, Varki and Colgate (2001) show that price perceptions significantly affect customer retention. Consistent with the cited research, we assert the following hypothesis:

> H_7: The difference between the current price offering and the last price paid before lapse (i.e., current price minus last price in prior relationship) negatively affects the duration of the second tenure.

H_6 and H_7 can have significant implications for the offer and targeting decisions. If supported, these hypotheses suggest that the price paid in the prior relationship anchors customers' perceptions and guides their subsequent behavior in the reinitiated relationship. This implies that firms should target customers for reacquisition and make the offer based on prices paid before the lapse.

The assertion that customers respond to differences in price raises the question of whether their response is the same for gains (e.g., price decreases) as it is for losses (e.g., price increases). Consistent with prospect theory (Einhorn and Hogarth 1981; Kahneman and Tversky 1979; Thaler 1985), another finding of the reference price literature is that customers respond more to losses than gains (Kalyanaram and Winer 1995). However, CRM researchers have observed a different effect with respect to price. Bolton and Lemon (1999) find that gains in price (i.e., decreases) have a larger impact on usage amount than do losses in price (i.e., increases). Similarly, Bolton, Kannan, and Bramlett (2000) find that gains in price have a larger effect than do losses on both the decision to stay in a relationship and the usage level. Given the solid support for both sides of the issue, we refrain from making predictions about the impact of gains versus losses with respect to prices, and we defer to the empirical results.

MODEL DEVELOPMENT

Modeling Customer Relationships

The growing CRM literature includes several modeling approaches (for a review, see Jain and Singh 2002). Some of these articles model SLTV within the broader context of LTV. This implicitly assumes that the firm can regain lapsed customers ("always a share") instead of customers being "lost for good." The most commonly used models are discrete Markov chains, so called because (1) time periods are discrete and (2) the probability of entering a particular state in the subsequent period depends only on the current state. Dwyer (1989) outlines alternative discrete Markov models for customer migration, assuming an always-a-share scenario, and for customer retention, assuming a lost-for-good scenario. When the initial share of the customer is zero (i.e., customers are identified before having developed a relationship with the firm), the models can be interpreted as incorporating customer acquisition.

Pfeifer and Carraway (2000) and Rust, Zeithaml, and Lemon (2000) generalize Dwyer's (1989) approach by incorporating both migration and retention. Of particular interest, Rust, Lemon, and Zeithaml (2001) allow for the investigation of other decision variables, such as price, by modeling transition probabilities as a function of covariates.

Using alternative approaches such as selection models or decision calculus, researchers have explicitly modeled both acquisition and retention simultaneously (Berger and Nasr-Bechwati 2001; Blattberg and Deighton 1996; Thomas 2001). Such approaches are drawing increasing interest from researchers in the modeling of customer relationships.

Another CRM literature stream assumes that customers' probability of purchasing again (given that they do not explicitly terminate their relationships with the firm) depends not only on their current state but also on their purchase history. Schmittlein, Morrison, and Columbo (1987) and Schmittlein and Peterson (1994) use a stochastic modeling framework, the Pareto/NBD, for this purpose. Reinartz and Kumar (2000) dichotomize the continuous probability predictions of the Pareto/NBD model and, using individual customer cost information, are able to estimate LTV. The Pareto/NPD allows for continuous rather than discrete time, but it does not explicitly model price or other decision variables as covariates.

Given this history, we focus on five important characteristics of our investigation in making our modeling choices. First, we focus exclusively on the second lifetime (we term this "single spell," in line with the statistics literature). Although we may lose some generality by not adapting an always-a-share model, our focused approach is necessary to address the four remaining characteristics, thereby enabling us to provide managerially useful insights about the second lifetime. Second, because our hypotheses relate to the effects of price, we model price explicitly using covariates. Third, because many of our hypotheses relate to second tenure duration and because the data set we analyze lacks consistent decision intervals, we select a continuous-time specification. Fourth, our hypotheses for customer reacquisition and duration differ, which requires us to model the two as distinct processes. Fifth, the data set includes many customers whose relationship with the firm exceeds the period we observe, so we must allow for censoring.

Given these requirements, we specify a hazard model. Bolton (1998) uses a hazard model in a CRM context to examine the relationship between customer satisfaction and customer duration. Hazard models are well established in statistics, can incorporate covariates, and are adaptable to all types of censoring. Furthermore, hazard models have been shown to be well suited for analysis of duration data and superior to other common methods, such as logistic and least squares regressions, in terms of stability, face validity, and predictive accuracy (Helsen and Schmittlein 1993). To distinguish our approach from the more common propor-

tional hazards model (Cox 1972), we refer to it as a "split hazard model" (it may also be termed a "censored duration model").

Model Specification

As we stated previously, we focus on a single spell that starts when the customer is reacquired by the firm and ends when the customer terminates the subsequent relationship. Our split hazard specification comprises separate reacquisition and duration components. The reacquisition component measures the probability of recapturing a lapsed customer, and the duration component predicts the length of the second tenure, given that the firm successfully recaptures the customer. This approach to linking acquisition and retention explicitly incorporates left censoring (Thomas 2001).

For customer i (i = 1, …, C), we specify the reacquisition component as a latent variable probit with observation equation

$$z_i = \begin{cases} 1 & \text{if } z_i^* \geq 0 \\ 0 & \text{otherwise} \end{cases}. \tag{1}$$

We model the latent dependent variable z_i^* with the linear model

$$z_i^* = \mathbf{w}_i'\gamma + \eta_i, \tag{2}$$

where $\mathbf{w}_i N\gamma$ is the deterministic component, η_i is the stochastic component, $\mathbf{w}_i$ is the customer's vector of predictors, and γ is the associated parameter vector. Probit specifications have been used previously to model customer acquisition (Hansotia and Wang 1997; Thomas 2001).

Modeling of the second tenure is somewhat complicated by the firm's propensity to change the offer price during the relationship. Although this occurs relatively infrequently (see the data description in the following section), we must nevertheless allow for price changes to affect the customer's probability of terminating the relationship. We note that Amemiya (1985, pp. 433–35) shows that a split hazard model of the form that we specify is simply a generalization of a single spell of a continuous Markov model. Recognizing this relationship, we adopt the continuous Markov process assumption that the probability of the customer terminating the relationship at any point in time is independent of the current duration (i.e., it is stationary). Using this assumption of stationarity, we partition the second tenure so that each period during which a given price is offered to the customer is a "subspell." Thus, each customer's second tenure consists of one or more subspells that differ only in the offer price. Moreover, the stationarity assumption implies that the duration of a subspell does not depend on the length of prior subspells.[2] To illustrate, consider a hypothetical customer who is reacquired by the firm at time t as a result of a reacquisition price offer, is offered a second price at time $t + \delta_1$, and then terminates the second tenure at time $t + \delta_1 + \delta_2$. This customer's duration consists of two subspells: one of length δ_1 (which is right censored) that is associated with the reacquisition price and one of length δ_2 that is associated with the second price. This approach enables us to capture parsimoniously the effect of price on second tenure duration.[3]

We model the duration component for customer i during subspell s_i ($s_i = 1, \ldots, S_i$) as a conditional regression with the following observation equation:

$$y_{is_i} = \begin{cases} y_{is_i}^* & \text{if } y_{is_i} < c_{is_i} \\ c_{is_i} & \text{otherwise} \end{cases}, \tag{3}$$

where $y_{is_i}^*$ is the latent duration of the relationship and c_{is_i} is the censoring value, or length of time that a given price was offered. If the customer terminates the relationship before the price changes, then $y_{is_i}^* = y_{is_i}$ (i.e., it is observed). Otherwise, the duration of the subspell is right censored. The observed duration may also be limited by the observation horizon, in which case it is also right censored. Note that the censoring value is known; it is a necessary condition to estimate this model (Amemiya 1985, p. 363). We specify the latent duration of subspell s_i of customer i as

$$\ln(y_{is_i}^*) = \mathbf{x}_{is_i}'\beta + \varepsilon_{is_i}, \tag{4}$$

where $\mathbf{x}_{is_i}'\beta$ is the deterministic component, ε_{is_i} is the stochastic component, $\mathbf{x}_{is_i}$ is the customer's vector of predictors during subspell s_i, and β is the associated parameter vector. The dependent variable is log-transformed to approximate more closely the normality assumption about the residuals.[4]

Given the likely relationship between the customer's acquisition and retention behavior (Thomas 2001), it is important that these components be linked. We explicitly model this linkage, along with customer heterogeneity, by specifying variance components. We specify errors of the reacquisition and duration components, respectively, as follows:

$$\eta_i = \iota_i + \psi_i, \text{ and} \tag{5}$$

$$\varepsilon_{is_i} = \alpha_i + \xi_{is_i}, \tag{6}$$

where $\psi_i \sim N(0,\sigma_\psi^2)$ and $\xi_{is_i} \sim N(0,\sigma_\xi^2)$.

For the reacquisition and duration components, respectively, ι_i and α_i represent customer-specific preferences, and ψ_i and ξ_{is_i} are random errors. As the subscripts of ι and α indicate, customer-specific preferences for reacquisition and duration are not fixed; they are distributed across households. In this way, we allow for heterogeneity across customers. Moreover, we allow the distributions of customer-specific preferences to be correlated so that $\theta_i \sim BVN(\bar{\theta},\Sigma_\theta)$, where

$$\theta_i = \begin{bmatrix} \iota_i \\ \alpha_i \end{bmatrix}, \bar{\theta} = \begin{bmatrix} \bar{\iota} \\ \bar{\alpha} \end{bmatrix}, \text{ and } \Sigma_\theta = \begin{bmatrix} \sigma_i^2 & \sigma_{\iota\alpha} \\ \sigma_{\iota\alpha} & \sigma_\alpha^2 \end{bmatrix}.$$

[2]We tested whether there were systematic differences between customers with a single subspell and customers with multiple subspells by estimating a more general specification of our model with a dummy variable that captured single versus multiple subspell customers as a predictor of duration. The CAIC and BIC for this specification are 1289 and 1282, respectively. For the specification without the dummy variable, CAIC and BIC are 1285 and 1279, respectively. We conclude that there is no evidence of systematic differences between the durations of customers with single and multiple subspells.

[3]We empirically validated the assumption of stationarity for our application. We estimated an alternative specification of our model that included a dummy variable for subspells beyond the first, and we found no difference in duration between the first (or only) subspell and subsequent subspells.

[4]Details of normality tests and alternative transformations are available from the authors.

In this way, we allow a customer's preference to reenter a relationship with the firm to be correlated with the customer's preference for the duration of that resumed relationship. Allowing for correlation between customer preferences for the discrete and continuous components of our split hazard specification is similar in spirit to a selection model, in which single stochastic error terms for the two components are correlated. In summary, the error variances of Equations 2 and 4 are

$$\text{Var}(\eta_i) = \sigma_\psi^2 + \sigma_\iota^2 + \sigma_{\iota\alpha}, \text{ and} \tag{7}$$

$$\text{Var}(\varepsilon_{is}) = \sigma_\xi^2 + \sigma_\alpha^2 + \sigma_{\iota\alpha}. \tag{8}$$

We follow Ainslie and Rossi (1998) in estimating our variance components specification in a Bayesian framework by using Markov chain Monte Carlo methods. The simulation-based methods of estimating posterior distributions of parameters in censored and missing data problems have only recently become available (Casella and George 1992; Gelfand and Smith 1990; for application to censored regressions, see Chib 1993). (A complete discussion of our estimation procedure is available as a technical report on request.)

DATA AND MODEL VARIABLES

Data

The data we used to estimate the model come from a newspaper subscription database and comprise 566 lapsed customers targeted for reacquisition (i.e., C = 566).[5] Of the customers, 416 were successfully reacquired. The reacquisition component of the data includes a single observation for each lapsed customer that consists of the reacquisition price offered, the result of that offer (i.e., successful or failed reacquisition), the number of periods elapsed since the customer's most recent purchase (each period as defined by the company is roughly one month), the price of the last purchase, and the length of the first tenure. Note that the firm made only one reacquisition offer per customer during our observation period (i.e., customers who did not respond did not receive multiple offers). Moreover, each customer in the data set lapsed only once, so none had received reacquisition offers from the firm at any time before our observation period. Thus, our application does not include sequential offers to lapsed customers, and we conjecture about their response to such a sequence of offers.

Observations for the duration component differ from reacquisition observations in two ways. First, some customers have multiple subspells. More specifically, of the 416 customers that were reacquired, 140 received multiple price offers during the observation period (an average of 2.19 price offers for customers who received multiple prices), for a total of 582 subspells. Recall that each subspell represents a different price offer from the firm during a given customer's second tenure. Thus:

$$N_1 = \sum_{i=1}^{C} S_i = 582. \tag{9}$$

The second difference is that the price in each observation is characteristic of that subspell and so may differ from the reacquisition price. Thus, although most reacquired customers paid a single price (the reacquisition price) throughout their relationship with the firm, more than one-third received multiple price offers.

All the customers examined in this analysis receive the newspaper seven days a week. When customers agree to receive the newspaper, they commit to a weekly price that remains fixed for a given period (roughly one month). We were unable to determine from the data whether a customer precommits to buy for several consecutive periods. Regardless, the firm does not engage in price discounting for purchase commitments of more than one period. Furthermore, unlike some other contractual selling agreements, subscriptions are nonbinding; therefore, customers can decide to continue or terminate the subscription at any point during a period. The average length of the second tenure is 177.4 days (see Table 2). Of the customers who reinitiated relationships with the firm, 66.8% terminated the relationship during the two-year observation horizon. The remaining customer durations are right censored. Descriptive statistics are provided in Table 2.

Model Variables

The first and most obvious variable included in the estimation is price, that is, the current price offered/paid in the reinitiated relationship (recall that customers are offered a single price for reacquisition but may be offered multiple

[5]We removed customers who lapsed or defected as a result of relocation or vacation from the data.

Table 2
DESCRIPTIVE STATISTICS

	Total Sample			*Successfully Reacquired Sample*		
	Mean	*Standard Deviation*	*Range*	*Mean*	*Standard Deviation*	*Range*
Reacquisition price offer	$2.22	$.44	$3.00–$1.75	$2.28	$.44	$3.00–$1.75
Average retention price offer[a]				$2.43	$.46	$3.00–$1.75
Last price paid in prior relationship	$2.32	$.47	$3.00–$1.75	$2.38	$.47	$3.00–$1.75
Reacquisition price difference	$.10	$.41	$1.15–($1.25)	$.10	$.48	$1.15–($1.25)
Average retention price decrease[a]				$.12	$.30	$1.15–$.00
Average retention price increase[a]				$.17	$.32	$1.25–$.00
Duration of lapse (in periods)	10.51	11.05	34–1	5.03	4.62	30–1
Prior tenure (in days)	179.75	279.97	684–1	229.00	282.05	684–7
Observed restart relationship tenure (in days)				177.42	217.92	684–2

[a]Because the price is time varying, we present the averages over the duration of the reinitiated relationship.

prices over the duration of the second tenure). The Tenure 1 variable measures the total duration of the customer's relationship with the firm before lapsing. Lapse duration measures the number of periods elapsed since the customer's last purchase.

A fourth variable measures the difference in price with respect to the last price paid before the relationship lapsed, which we suggest is a logical reference for the customer. We considered two alternative approaches to modeling price differences, and we specified the preferred approach on the basis of model selection tests. The first approach is to have a single variable, price difference, which is the difference between the last price in the prior relationship and the current price paid or offered (i.e., price difference = current price – reference price). A positive value for price difference means that the current offer price is higher than the last price observed by the customer. The second approach to modeling price differences enables us to assess asymmetric response to gains and losses by defining price decrease (i.e., a gain) and price increase (i.e., a loss) variables. Specifically, we define *price decrease* as the dollar amount of price decrease relative to the last price the customer was offered by the firm before the relationship lapsed; *price increase* is the dollar amount of the price increase relative to the last price the firm offered the customer. In interpreting the results, note that both variables are coded as positive values. The data show that 26.6% of the prices paid or offered in the restart relationship were decreases relative to the last price paid in the prior relationship, and 34.7% of the prices paid or offered were increases relative to the last price paid in the prior relationship.

RESULTS

Covariate Effects on the Reacquisition Probability

Consistent with H_{1a} and H_2, the reacquisition model shows that the probability of a firm reacquiring a customer is higher if the lapse duration is shorter and/or if the first tenure is longer. Consistent with economic theory and H_4, the results also show that customers are more likely to be reacquired if the reacquisition price is lower.

As we noted previously, we estimated alternative specifications, one with the price difference variable only and one which separated gains and losses. Comparing the corrected Akaike information criterion (CAIC) and the Bayesian information criterion (BIC) for the two specifications, we find that the model specification with price difference was preferred to the specification with separate price increase and price decrease variables.[6] Thus, we report parameter estimates from the former specification. The results support H_6: The likelihood of a customer being reacquired decreases with the difference between the reacquisition price and the last price offered in the prior relationship. This result implies that pricing in the prior relationship anchors response to the reacquisition offer. More generally, this supports the assertion that customers make decisions about reinitiating the relationship based on comparisons with the lapsed relationship. Table 3 reports posterior means of parameter estimates for the reacquisition model as well as posterior probabilities (in parentheses) that the parameter is less than or greater than zero, depending on the sign of the posterior mean.

Table 3
COVARIATE IMPACT

Variable	β *(Posterior Probability)*[a]	*Elasticity*
Impact on Customer Reacquisition		
Price	–.900	–.9000
	(.97)	
Lapse duration	–.686	–.6860
	(1)	
Tenure 1	.784	.7843
	(1)	
Price difference	–.526	–.0526
	(.91)	
Impact on Relationship Duration		
Price	1.194	1.1936
	(1)	
Lapse duration	–.047	–.0473
	(.78)	
Tenure 1	.454	.4539
	(1)	
Price decrease	1.556	.1802
	(1)	
Price increase	–.312	–.0523
	(.76)	

[a]β is less than or greater than zero.

In terms of relative impact, the elasticities indicate that the offer price has the largest effect on reacquisition likelihood. Tenure 1 and lapse duration also have a material influence on the reacquisition outcome. Notably, price difference has a much smaller effect. Thus, the absolute effect of price is much more important than the effect of price relative to the last price paid in the prior relationship. This is an important insight for managers because it suggests that reacquisition strategies that emphasize decreasing price relative to the prior relationship are not likely to be effective. A more fruitful approach to winning back lapsed customers is simply to offer a low price, regardless of the price that the customer was accustomed to paying before the lapse. This also implies that customers who previously paid low prices should not be enticed with significantly lower prices.

Covariate Effects on Length of the Second Tenure

Table 3 also reports posterior means for parameters (and associated posterior probabilities that parameters are less than or greater than zero) for the duration equation. As in the reacquisition decision, the duration elasticity of price has a higher magnitude than other predictors. However, there are several notable differences between the factors that affect reacquisition and the length of the second tenure. An important difference is the sign of the price effect. Consistent with Bolton and Lemon (1999) and contrary to economic theory, we find that higher retention prices lead to longer relationship durations. Comparing this to the other relevant CRM literature, we find that it is consistent with the assertion that loyal customers are willing to pay higher prices (Reichheld 1996) but contradicts Reinartz and Kumar's (2000) finding that long-life customers pay lower average prices than do short-life customers (in a catalog retailing context). However, Reinartz and Kumar (2000, p. 28) state, "we expect

[6]For the model specification with price decrease and price increase variables, CAIC and BIC are 1288 and 1281, respectively. For the specification with only price difference, CAIC and BIC are 1285 and 1279, respectively. Thus, the second specification represents a better balance of fit and parsimony.

these factors to have differential impacts in different industries."

Bolton and Lemon (1999) explain this effect in terms of payment equity. An alternative explanation is heterogeneity in reservation prices. However, our modeling approach allows for different reference prices across households. Because we replicate Bolton and Lemon's (1999) finding in the presence of heterogeneous reference prices, we can reject this alternative explanation. It is also possible in some contexts that price sensitivity decreases with use because of product familiarity, knowledge about how to use the product efficiently, or bias in favor of the status quo, which leads to repeat purchases. Both payment equity and decreased price sensitivity are plausible explanations in our application.

Although customers did not distinguish between price increases and price decreases in the reacquisition decision, they made this distinction after the relationship had been reinitiated, which is in support of H_7. This result further highlights the importance of the prior relationship price to the reinitiated relationship. Consistent with other CRM research (Bolton, Kannan, and Bramlett 2000; Bolton and Lemon 1999), the positive impact of gains (i.e., price decreases) on second tenure duration has a greater magnitude than does the negative impact of losses (i.e., price increases). Furthermore, we find that the effect of price decreases on the second tenure is statistically significant, but the effect of price increases is not. This asymmetric response to gains and losses points to a notable behavioral insight. Specifically, the results suggest that when price deviations (i.e., price increases or price decreases) are consistent with the customer's decision to reestablish a relationship, they have a noticeable effect. However, the customer is unaffected by deviations that do not support the decision to reestablish the relationship. This behavior is consistent with Festinger's (1957, 1964) assertion that people engage in postdecision processing that reinforces the decisions they have made.

Although Festinger's (1957, 1964) theory about postdecision processing can explain the effect of price comparisons, it does not explain our results about the effect of lapse duration on the second tenure. Specifically, the results do not support H_3, suggesting that there is no relationship between the length of the lapse and the customer's second tenure. It is possible that this null result is due to the relationship between lapse duration and the incorporation of customers' preference heterogeneity. If unmodeled individual characteristics, such as a propensity toward variety seeking or inertial behavior (Bawa 1990) in newspaper subscription, were correlated with the lengths of both the lapse and the second tenure, any relationship between the lapse and the second tenure would be obscured by the specification of preference heterogeneity.[7] In summary, although firms are less likely to reacquire customers who have had longer lapses, when they have been reacquired, the length of the second tenure appears to be unaffected.

Link Between Reacquisition and Length of the Second Tenure

Another issue in our investigation is the link between reacquisition and duration of the second tenure. Using a variance components approach, we allow for customer heterogeneity and correlation between customers' intrinsic preference to be reacquired and for their intrinsic preference to maintain the relationship after reacquisition. The estimates reveal that customers have a negative bias toward reacquisition (posterior mean of $\bar{\iota} = -1.592$, 95% posterior probability that $-2.789 \le \bar{\iota} \le -.094$), but when they have been reacquired, they are positively inclined to continue the relationship (posterior mean of $\bar{\alpha} = 1.743$, 95% posterior probability that $1.116 \le \bar{\alpha} \le 2.309$). This positive intercept parameter estimate for the duration model is consistent with our previous conjecture that a customer's price sensitivity may be lower in the reinitiated relationship.

The posterior mean of the correlation between the two preferences (estimated using $\sigma_{\iota\alpha}$) is –.09, which suggests that the likelihood of the customer being reacquired is inversely related to the likelihood of the customer remaining in the relationship. In other words, customers who may be more inclined to restart a relationship (i.e., customers who are easiest to win back) may not always be the best customers in terms of retention.

The descriptive data in Table 2 reveal some short first and second tenure observations. To assess the robustness of our results, we estimated our model with three reduced data sets: elimination of (1) all first tenures less than ten days, (2) all second tenures less than ten days, and (3) all first and second tenures less than ten days. Compared with our parameter estimates from using the full data set, we found no sign changes in any parameter estimate in the three reduced data sets. In addition, in none of the three reduced data sets did any parameter estimate that had been statistically significant at $\alpha = .05$ in the full data set become nonsignificant, and in only one case did a parameter that had not been significant become significant.[8] Thus, we suggest that our inferences are robust to the inclusion or exclusion of unusually short tenures.

FORECASTING SLTV

The asymmetric impact of price increases and decreases in conjunction with the current price effect suggests that pricing decisions for restart customers is complex. Specifically, the parameter estimates suggest that the last price in the prior relationship affects a customer's price sensitivity and behavior in both reacquisition and retention. In this section, we explore how the prior price affects the profitability of restart customers and the optimal pricing strategy of the firm.

Ultimately, a firm's targeting decision and offer decision should be based on the expected profitability of a reacquired customer. We used estimates from the reacquisition and duration models to predict the likelihood of a firm reacquiring and retaining a customer with certain characteristics. By assuming specific marketing costs, we determined the expected SLTV of a potentially reacquired customer.[9]

[7]We thank an anonymous reviewer for pointing out the possibility that our heterogeneity specification might mask this relationship.

[8]The price difference parameter for the reacquisition equation, which was significant at $\alpha = .10$ in the full data set, was significant at $\alpha = .05$ (actual p-value = .041) in the second reduced data set (i.e., eliminating all second tenures of less than ten days).

[9]It is important to note that we computed expected SLTV and not the NPV of the profits generated after a customer is reacquired. The difference is that the expected SLTV takes into account the reacquisition profit or loss and discounts the post-reacquisition LTV by the probability of reacquiring the customer.

Targeting Decision

We assumed that before reacquisition, the firm knew three characteristics of lapsed customers: (1) the duration of their lapse, (2) the length of their first tenure with the firm, and (3) the last price they paid. Logically, these are variables that the firm can use to distinguish customer reacquisition targets who are likely to be profitable from targets who are not. Fixing all other predictors at their median values except the three factors that are known before reacquisition, we predicted the expected SLTV for various customer types, as is shown in Table 4. The analysis shows that the expected SLTV of a customer whose profile reflects the tenth percentile (from the data) of each of the three factors is $.01. In theory, this is a profitable customer and one the firm should attempt to reacquire. However, this customer's expected profit is sensitive to reacquisition costs. If the reacquisition costs increase even slightly, the customer becomes unprofitable for the firm to pursue. Firms that target this type of customer must carefully manage their reacquisition investment. This is important because it suggests that customer winback should be a selective process and that not all lapsed customers should be pursued.

Table 4 also shows the expected SLTV of the average and modal customers of the firm. For the average and modal customers, we fixed all covariates at their averages and modes, respectively. The predictions reveal that, on average, the firm targets attractive prospects among its lapsed customers and implements a profitable reacquisition strategy.

Offer Decision

To assess how the offer decision affects expected SLTV, we provide highlights of a numerical simulation in Table 5. The values reported in Table 5 are the expected SLTVs of customers for different reacquisition prices and the average retention prices. In our numerical analysis, we fixed all variables that characterize the prior relationship at their median values and assumed that the costs are fixed over time.[10] This analysis addresses several important issues about pricing strategies for the reacquisition and retention of lapsed customers. When conducting this type of analysis, it is important to acknowledge that firms may not focus on price optimization but rather employ heuristics to set their prices. In this section, we assess optimal pricing strategies in terms of SLTV and evaluate heuristics that may be observed in practice.

Optimal pricing strategy. If the optimal strategy is explored within the range of prices that the firm typically offers ($1.75 to $3.00), the result is that the firm should offer a reacquisition price of $1.75 and then raise the retention price to $3.00. This strategy results in an acquisition likelihood of approximately .677. Note that this strategy does not maximize the length of the second tenure and thus does not maximize the firm's long-term market share. However, the increased margin from the retention price compensates for the reduced duration of the second tenure.

Note that whereas this strategy is theoretically "optimal," it is uncertain whether the anticipated customer response and associated profit will actually occur. The theoretically optimal reacquisition price is $.45 less than the last price in the prior relationship, and the optimal retention price is $.80 greater than the last price. Price changes of this magnitude rarely occurred in the data, in which the average reacquisition price was $.10 less than the last price paid before lapse, and if the retention price was increased, the average increase was $.17.

Pricing relative to costs. A class of heuristic approaches that the firm can use is cost based: pricing at cost ($1.00) or below cost (we used $.50) for reacquisition. At the extreme, the firm may price low enough so that the probability of reacquisition is nearly one. To generate a reacquisition probability that is virtually one, we fixed the covariates at their median levels and found that the model suggests a reacquisition price of $.30. As the firm lowers the reacquisition price through these three levels, respectively, the likelihood of reacquiring a customer increases from .890 to .985 to .998. Given that our estimation results reveal that the second tenure duration is negatively correlated with the likelihood of reacquiring a customer, the logic of considering these reacquisition pricing strategies might be questioned. However, it is important to acknowledge that duration and profits are not always strongly, or even positively, correlated (Reinartz and Kumar 2000). Our analysis shows that lowering the reacquisition price to $.30 and then increasing the price above the last price in the first tenure results in the highest SLTV. Table 6 highlights some of the calculations at a reacquisition price of $.30. Again, note that the second tenure duration and market share are not maximized with this pricing strategy. As with the pure optimization approach, we find that implementing a heuristic approach in which prices increase over time maximizes profits, even though second tenure duration is not maximized.

Pricing relative to the last price paid before lapse. Another class of heuristics that can guide pricing strategies for restart customers is pricing above, below, or equal to the last price paid before lapse. In our data, the median value of the last price paid before lapse is $2.20. Firms may be tempted to choose $2.20 as the reacquisition price, because the likelihood of reacquiring a customer is .56. Our analysis shows that reinstating a customer at the same price as the last price paid before lapse ($2.20) and maintaining this price is suboptimal from a profitability perspective. Profits can be improved if the firm follows one of two pricing strategies.

First, if the firm's tendency is to offer restart customers prices that are lower than the last price paid before lapse, the most profitable approach is to offer a low reacquisition price and a low retention price. If we limit the price decrease to be within two standard deviations of the mean price decrease, the most profitable offer is a reacquisition price and a retention price of $1.80. This price is two standard deviations below the mean of the last price before lapse. Region A in Table 5 shows some of the possible pricing combinations that are consistent with this strategy. At a fixed price of $1.80, for a prospective target, the reacquisition likelihood is .66 and the expected SLTV is $27.49.

[10]Relaxation of the time-invariant costs assumption is a trivial exercise because our demand functions are not a function of costs. If we had individual-level cost information, we could make demand a function of costs, and the results might vary.

Table 4
TARGETING CUSTOMER PROFILES

Profiles	*10th Percentile Value of All Observable Covariates*	*25th Percentile Value of All Observable Covariates*	*50th Percentile Value of All Observable Covariates*	*75th Percentile Value of All Observable Covariates*	*90th Percentile Value of All Observable Covariates*	*Average Reacquired Customer*	*Modal Reacquired Customer*
Reacquisition							
Reacquisition price	$ 2.22	$ 2.22	$ 2.22	$ 2.22	$2.22	$2.28	$1.75
Last price in prior relationship	$ 2.90	$ 2.75	$ 2.20	$ 1.75	$1.75	$2.38	$1.75
Lapse duration (periods)	35	17	6	2	1	5	1
Tenure 1 (days)	5	50	117	192	365	229	91
Probability of reacquisition	.001	.146	.553	.847	.968	.774	.869
Reacquisition costs	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$1.00	$1.00	$1.00
Expected reacquisition margin	$ .00	$ 1.15	$ 4.35	$ 6.67	$7.62	$.99	$.65
Retention							
Average retention price per period	$ 2.43	$ 2.43	$ 2.43	$ 2.43	$2.43	$2.43	$2.43
Price change	$ (.47)	$ (.32)	$ .23	$ .68	$.68	$.05	$.68
Predicted Tenure 2 (days)	38	103	127	155	213	178	113
Predicted Tenure 2 (periods)	1	3	4	5	7	6	4
Period retention costs	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$1.00	$1.00	$1.00
Expected retention margin given reacquisition	$11.07	$29.97	$36.96	$45.09	$61.83	$51.75	$32.89
Expected retention margin	$ .01	$ 4.38	$20.43	$38.19	$59.83	$40.08	$28.59
Expected Reacquisition Value	$ .01	$ 5.53	$24.79	$44.86	$67.45	$41.07	$29.24

Notes: For reacquisition and retention profiles, all numbers are per customer. With the exception of the characteristics that are observable before reacquisition, all covariates are fixed at their median values.

Table 5
EXPECTED SLTV

Reacquisition Price	*Average Retention Price*															
	$1.75	*$1.85*	*$1.95*	*$2.05*	*$2.15*	*$2.20*	*$2.25*	*$2.35*	*$2.45*	*$2.55*	*$2.65*	*$2.75*	*$2.85*	*$2.95*	*$3.05*	*$3.15*
$ .30	$35.81	$34.94	$33.84	$32.56	$31.15	$30.41	$31.53	$33.79	$36.04	$38.30	$40.55	$42.78	$44.99	$47.19	$49.35	$51.48
.50	36.15	35.29	34.21	32.94	31.55	30.81	31.92	34.15	36.38	38.61	40.82	43.03	45.22	47.38	49.51	51.62
1.00	34.44	33.67	32.69	31.55	30.28	29.62	30.62	32.63	34.65	36.66	38.67	40.66	42.64	44.59	46.52	48.42
		Region A														
1.75	28.21	27.62	26.88	26.01	25.05	24.54	25.31	26.84	28.37	29.90	31.42	32.94	34.44	35.92	37.39	38.83
1.85	27.31	26.74	26.03	25.20	24.28	23.79	24.52	25.99	27.46	28.92	30.39	31.84	33.28	34.70	36.11	37.49
1.95	26.41	25.87	25.18	24.39	23.51	23.04	23.74	25.15	26.55	27.96	29.36	30.75	32.13	33.49	34.84	36.17
2.05	25.53	25.01	24.35	23.59	22.75	22.30	22.97	24.32	25.66	27.01	28.35	29.68	31.00	32.31	33.60	34.87
2.15	24.66	24.16	23.53	22.80	22.00	21.57	22.21	23.50	24.79	26.08	27.36	28.63	29.90	31.15	32.38	33.60
2.20	24.23	23.74	23.13	22.42	21.63	21.21	21.84	23.10	24.36	25.62	26.87	28.12	29.36	30.58	31.79	32.98
							Region B									
2.25	23.81	23.33	22.73	22.03	21.26	20.85	21.47	22.70	23.93	25.16	26.39	27.61	28.82	30.02	31.20	32.36
2.35	22.98	22.52	21.95	21.28	20.54	20.15	20.74	21.92	23.10	24.28	25.45	26.61	27.77	28.91	30.04	31.16
2.45	22.17	21.73	21.18	20.55	19.84	19.47	20.03	21.16	22.28	23.41	24.53	25.65	26.75	27.85	28.93	29.99
2.55	21.38	20.97	20.44	19.83	19.16	18.80	19.34	20.41	21.49	22.57	23.64	24.71	25.76	26.81	27.84	28.86
2.65	20.62	20.22	19.72	19.14	18.49	18.15	18.67	19.69	20.73	21.75	22.78	23.80	24.81	25.81	26.80	27.77
2.75	19.88	19.50	19.02	18.47	17.85	17.52	18.01	19.00	19.98	20.97	21.95	22.92	23.89	24.84	25.78	26.71
2.85	19.17	18.81	18.35	17.81	17.23	16.91	17.38	18.32	19.27	20.21	21.14	22.07	23.00	23.91	24.81	25.70
2.95	18.48	18.13	17.69	17.19	16.62	16.33	16.77	17.67	18.57	19.47	20.37	21.25	22.14	23.01	23.87	24.72
3.05	17.81	17.48	17.06	16.58	16.04	15.76	16.18	17.04	17.90	18.76	19.62	20.47	21.31	22.14	22.97	23.78
3.15	17.17	16.86	16.46	15.99	15.48	15.20	15.61	16.44	17.26	18.08	18.90	19.71	20.51	21.31	22.10	22.87

Table 6
EXAMPLE OF SLTV CALCULATION

Profiles	*Variations in Retention Price*						
Reacquisition							
Reacquisition price	$ .30	$ .30	$ .30	$ .30	$ .30	$ .30	$ .30
Last price in prior relationship	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20	$ 2.20
Lapse duration (periods)	6	6	6	6	6	6	6
Tenure 1 (days)	117	117	117	117	117	117	117
Probability of reacquisition	.998	.998	.998	.998	.998	.998	.998
Reacquisition costs	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Expected reacquisition margin	$ .20	$ .20	$ .20	$ .20	$ .20	$ .20	$ .20
Retention							
Average retention price per period	$ 1.75	$ 2.00	$2.25	$ 2.50	$ 2.75	$ 3.00	$ 3.25
Absolute price change	$ (.45)	$ (.20)	$ .05	$ .30	$ .55	$ .80	$ 1.05
Predicted Tenure 2 (days)	178	142	118	123	128	131	134
Retention costs	$ 1.00	$ 1.00	$1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Expected retention margin given reacquisition	$35.68	$33.09	$31.39	$37.05	$42.66	$48.16	$53.48
Expected retention margin	$35.61	$33.02	$31.33	$36.97	$42.58	$48.07	$53.37
Expected Reacquisition Value	$35.81	$33.22	$31.53	$37.17	$42.78	$48.27	$53.57

There are two key factors that increase the expected SLTV with the low-price strategy. The first is the significantly higher reacquisition rate, relative to a price of $2.20. Table 7 shows how the reacquisition rates vary with the reacquisition prices. The second factor is the impact of the price decrease on length of the second tenure. Specifically, the length of Tenure 2 increases when the reacquisition price is less than $2.20. The increased duration compensates for the lower retention margin that is received when the retention price is less than $2.20.

Table 7
CUSTOMER REACQUISITION RATES

Reacquisition Price	*Reacquisition Probability*
$1.75	.677
1.80	.663
1.85	.649
1.90	.635
1.95	.622
2.00	.608
2.05	.595
2.10	.582
2.15	.570
2.20	.557
2.25	.545
2.30	.533
2.35	.521
2.40	.510
2.45	.498
2.50	.487
2.55	.476
2.60	.466
2.65	.455
2.70	.445
2.75	.435
2.80	.425
2.85	.416
2.90	.407
2.95	.398
3.00	.389

Notes: We calculated all probabilities at the median values of the prior tenure, lapse duration, and last prior price variables.

Second, to hedge against the risk and potential costs of a restart customer lapsing again, firms may opt to increase prices above their prior levels. Our analysis shows that the firm can moderately reduce the reacquisition rate (see Table 7) and still increase expected profits.[11] To increase profits by using this strategy, the firm must increase both the reacquisition and the retention prices above the last price before lapse. Region B of Table 5 shows some of the price combinations for which expected SLTV exceeds the SLTV obtainable when reacquisition and retention prices are both $2.20.

The key to a firm's successful implementation of a price increase strategy is managing the trade-off between a lower acquisition rate (due to higher reacquisition prices) and increased margins (due to higher retention prices). Because of this trade-off, there are limits on how high the firm can set the reacquisition price relative to the retention price and generate profits beyond those of a $2.20 fixed price. A reacquisition price that is greater than $2.20 and significantly higher than the retention price will result in an expected SLTV below the expected SLTV attainable at a fixed price of $2.20.

Summary of Numerical Simulation

From these results, it might be concluded that the key to managing customer winback most profitably is successful customer reacquisition. However, our targeting discussion has revealed that the firm may not want to price so as to reacquire all lapsed customers and instead may want to focus on customers with attractive profiles. Note that we performed our simulation analysis by assuming a moderately attractive profile (i.e., at the median value of the prior relationship characteristics). When attractive customers have been recaptured, their behavior is such that the firm can recoup the losses from reacquisition by charging higher prices. This approach maximizes margins but not long-term

[11]It is notable that when we computed expected profits for price increase strategies, the effect of price increase relative to prior price on relationship duration was small (the effect of price decrease was irrelevant).

market share. To maximize share, firms must be concerned with second tenure duration. A better strategy for maximizing share is to implement the heuristic of lowering prices relative to the last price before the lapse.

DISCUSSION AND LIMITATIONS

Early CRM advocates touted the benefits of having mature or long-life customers and consequently emphasized retention. However, a 100% retention rate is seldom feasible. Our analysis provides the additional insight that 100% retention (or other high retention rates) is not always desirable or profitable, particularly when it requires setting a low retention price. It is not worth it for firms to try to reestablish relationships with customers who are likely to lapse or to defect rapidly. Furthermore, our research suggests that lapsed customers who are more likely to be reacquired have a shorter second tenure with the firm after they have been reacquired.

For the relationships that are attractive to reestablish, firms need to employ profitable winback strategies that maximize customers' SLTV. Our analysis shows that reacquisition is the critical phase in the winback initiative. Firms' significant lowering of reacquisition prices to increase the likelihood of reacquisition is an optimal strategy. To maximize profits, firms should increase prices when the relationship has been reestablished. If market share is the metric of interest, the firm should focus on maximizing duration of the second tenure. To do this, our analysis shows that both reacquisition and retention prices should be low.

In addition, this research shows that lapsed consumers' response to price varies at different phases of the relationship. Throughout the relationship, the customer is sensitive to the absolute price. At the point of reacquisition, customers respond negatively to price. However, customers who are reacquired at higher prices have longer second tenures. Consistent with this outcome, our research shows that there is a negative correlation between a customer's preference for reacquisition and their intrinsic "retainability."

Customers also demonstrate a dynamic response to relative prices. At the time of reacquisition, customers respond to deviations in price relative to the last price paid before lapse. However, after the relationship is reestablished, customers respond in a way that reinforces their decision to reenter the relationship. In other words, price increases have no affect on second tenure duration, and price decreases relative to the prior price result in longer second tenures. This is an important insight for firms because it shows that the last price paid during the first tenure plays a role throughout the winback process.

Although this research highlights the importance of dynamic pricing and the customer's prior history with the firm to a winback strategy, there are some limitations and areas that need further exploration. In particular, individual-level remarketing efforts and marketing cost data might affect our conclusions. A paucity of cost data prevents us from exploring this; however, our findings apply to firms that have relatively standard costs across customers in their winback programs. A firm that sends fixed-value coupons to all lapsed customers, such as HoneyBaked (as we mentioned in the first section), is an example of this. Ideally, winback spending levels should vary on the basis of the customer's prior history and/or current response. In this context, demand becomes a function of marketing expenditures, and thus actual profit-maximizing pricing strategies may vary. Also related to individual-level remarketing efforts, it would be useful to address price endogeneity (Villas-Boas and Winer 1999), particularly for reacquisition pricing. Many firms make reacquisition offers conditional on customers' responses to prior offers; however, in our application, only a single reacquisition offer is made. Price endogeneity might be explored using a game theoretic analysis. In addition, given a data set in which the firm makes many price changes over time, dynamics of the baseline hazard could be studied. Such an investigation would improve our understanding of the dynamics of customer winback and foster insights into dynamic pricing strategies.

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