

# **What is the True Value of a Lost Customer?**

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# What is the True Value of a Lost Customer?

## ABSTRACT

Customer profitability models have evolved into an important strategic tool for marketers in recent years. The authors show that conventional models may be inappropriate for markets involving new products or services because they fail to account for the social effects (e.g., word-of-mouth and imitation) that can influence future customer acquisitions. They develop a customer profitability model that captures these social effects and show how the value of a lost customer depends on (a) whether the customer *defects* to a competing firm or *disadopts* the technology altogether and (b) *when* the customer disadopts the technology -- distinctions often overlooked in customer retention models. An empirical application of the model to the online banking industry shows that the financial impact of disadoptions can be substantial. The results demonstrate that firms suffer financial losses not only when their own customers disadopt a new service or product, but also when their competitor's customers disadopt. By incorporating the effect of competitors' disadopters into the customer profitability model, the authors identify a heretofore unrecognized link between a firm's market share and customer profitability. In addition, the model enables the firm to quantify the value of a lost customer throughout the product lifecycle with the results demonstrating that the loss of an early adopter costs the firm much more than the loss of a later adopter. Results also suggest that managers must pay greater attention to post-purchase service strategies early in the product-market evolution to minimize the effect of disadoption on future customer acquisitions. An appealing aspect of the proposed approach is that it can be implemented using a spreadsheet, making it a practical tool that can help firm's manage their customer relationships more profitably.

## INTRODUCTION

Consider the following scenario. Joan has heard a lot about wireless web-enabled cell phones recently from friends and through magazine and television ads. After several weeks of deliberation, she decides to add the service to her existing mobile phone service to access the web and check email while away from home. After a few months, she starts to use it less and less until she eventually puts it aside and cancels her service subscription.

What is the financial impact on the seller of Joan's decision to disadopt web-enabled cell phone service? Conventional customer profitability models would attribute the lost profit to the value of Joan's *potential* product upgrades, service contracts, software, and accessories that she might purchase in the future. Yet, such an approach would significantly underestimate Joan's value to the firm. Had Joan continued to use the service, she would have influenced potential customers to switch from basic cell phone service to web-enabled service each time she used it public or wondered aloud how she ever managed to live without it. In other words, focusing only on the "direct effect" associated with the profits from Joan's future purchases overlooks the "indirect effect" that Joan's word-of-mouth, imitation, and other social effects have on future sales. As we show in this research, the profit impact of these "lost" social effects can be substantial.

In recent years, customer profitability models have evolved into an important strategic tool for managers in a variety of markets. If such models are to guide marketing strategy decisions, however, they must account more completely for the way that innovations affect the social interactions of current and potential customers.

Theoretically, these interactions represent an important link between the retention of current customers and the acquisition of future customers that has not been adequately explored by researchers. How can social effects such as word-of-mouth be incorporated into a customer profitability model to determine the value of a lost customer?

Unfortunately, extant research on customer relationships offers few insights into this question. Although considerable research has focused on direct purchases when assessing the value of a lost customer (c.f., Berger and Nasr 1998; Blattberg and Deighton 1996; Dwyer 1997; Rust, Zeithaml, and Lemon 2000), scholars have yet to develop a viable approach to assess indirect social effects. As we demonstrate in this article, focusing solely on direct purchases will understate the value of lost customers in markets where disadoption are common. Since anecdotal evidence suggests that increasing numbers of marketers rely on individual customer profitability models to guide marketing strategy (Brady 2000), failure to include these social effects could lead to misallocation of scarce marketing resources during the critical early stages of a new product market. Given the increasing technological content of many product and customer service applications, this appears to be a pressing management issue that should be addressed by academic research.

The purpose of this article is to develop a method for estimating the effect of disadoption on the value of a lost customer. We develop a model that demonstrates how the value of a lost customer depends on whether the customer *defects* to a competing firm or *disadopts* the product category altogether. An empirical application of the model to the online banking industry shows the importance of taking the value of lost customers into account. Specifically, we find that a lost customer can affect the firm through “self-

losses” related to disadoption by the firm’s customers and through “competitor-based losses” related to a slowdown in the overall category-level sales due to disadoption of competitors’ products. We also find that the value of a lost customer changes throughout the product life cycle, with the loss of early adopters of a technology costing the firm much more than the loss of a later adopter. Finally, we show a link between firm market share and individual customer profitability.

This research is relevant to a wide variety of markets because firms increasingly rely on new technologies and services to manage the customer experience. Even “mature” markets such as banking now rely heavily on technologies such as ATM machines, online account management, and automated loan processing to manage transactions and many customer service functions that were previously personalized. The research suggests new reasons for firms to attend to post-purchase customer service strategies early in the evolution of the product-market to minimize the likelihood of disadoption. An appealing aspect of the model is that it can be implemented with a spreadsheet, making it a practical tool for firms attempting to manage their customer relationships more profitably.

The paper is organized as follows. We begin by discussing the conceptual background for the model. We then develop the model for valuing the effect of disadoption on the value of a lost customer. This is followed by the empirical application and results. Finally, implications for marketing theory and practice, and directions for future research are discussed.

## CONCEPTUAL BACKGROUND

### *Consumer Resistance to New Products*

Disadoption is related to the phenomenon of consumer resistance to new products or services. The uncertainty, rapid product development, and complexity associated with technological innovations can create significant challenges for consumers (Glazer 1991; Heide and Weiss 1995; Moriarty and Kosnik 1989). One such challenge stems from the consumer's lack of sufficient knowledge about the product category to make informed purchases (von Hippel 1986). This lack of knowledge often leads to increased search costs and can place inordinate demands on the consumer's cognitive processing capabilities (Heide and Weiss 1995). The learning challenges can induce consumers to resist adopting new products; a phenomenon often attributed to "technophobia" (Reed 2000; Sheth 1981). Technophobia can induce the consumer to avoid adopting a new product or service by postponing the purchase decision or even launching an attack against the new technology (Ram and Sheth 1989). Generally, more discontinuous technologies result in higher levels of consumer resistance (Ram 1991; Ram and Sheth 1989).

Marketers have strong financial incentives to overcome consumer resistance to new products. By resisting adoption of new technologies consumers slow the diffusion process and decelerate expected cash flows of the firm (Srivastava, Shervani, and Fahey 1998). New technologies can also reduce the firm's cost-to-serve by automating previously personalized service encounters such as transaction processing and customer service. For example, the American Bankers Association estimates that banks save approximately \$0.80 for every personalized transaction that is converted to an ATM

machine. By resisting new technologies consumers prevent firms from capturing such cost savings.

The economic benefits derived from new technologies have led to a proliferation of self-service technologies like telephone based response systems, online response systems, and interactive kiosks that enable consumers to produce a service independently of employee involvement (Meuter, Ostrom, Roundtree, and Bitner 2000). Not surprisingly, consumers often experience considerable pressure from firms to adopt these new service technologies. The banking industry has been particularly aggressive in pursuing self-service technologies by increasing the cost of using personalized service relative to automated technologies like ATM's and electronic banking (Stoneman 1997). Not surprisingly, technology resistant consumers forced to try a new technology often become deeply frustrated and resist future use (Meuter et al. 2000).

Consumers can also experience strong social pressure to try a new technology through media attention that portrays those who resist technological innovations as stodgy and out of touch with the new economy. This can create a "bandwagon" effect in which individuals are pressured to try innovative technologies before they fully understand the benefits they might receive (Abrahamson and Rosenkopf 1993). These consumers often disadopt the innovation after the initial trial period. For example, the number of home computers has increased steadily over the last decade although recent evidence suggests that home computer usage has gone down. Similarly, many more people actually subscribe to Internet access than actually use it (Reed 1999).

### ***Defection versus Disadoption***

In the years since Reichheld and Sasser (1990) first demonstrated the effect of customer retention on firm profits, researchers have made substantial progress in understanding the mechanics of customer defection. Recent studies have provided insights into defection processes (Keaveney 1995), consumer profiles of switchers (Ganesh, Arnold, and Reynolds 2000; Rust and Zahorik 1993), the role of satisfaction (Oliver 1997), and ways to prevent defections (Jones, Mothersbaugh, and Beatty 2000). Although some of the claims about the link between customer retention and profitability have been challenged recently (Dowling and Uncles 1997; Reinartz and Kumar 2000), there is a general consensus that preventing customer defections is a sound business strategy (Anderson and Vittal 2000; Zeithaml 2000).

It is important to distinguish between the effects of defection and disadoption on firm profitability. Customer defection refers to a situation in which a customer leaves one firm in order to purchase from another. When a customer defects, the firm loses the direct sales that the customer would have made had it remained loyal to the firm. In contrast, disadoption occurs when a customer rejects an innovation and ceases purchasing from the product category altogether. One of the differentiating characteristics of disadoption and defection is that there are *two* ways that disadoption can affect long-term profitability. When a customer disadopts, the firm not only loses the *direct* effect of customer purchases, it also loses the *indirect* effect of word-of-mouth, imitation, and other social effects that influence future customer acquisitions of the category. Indirect social effects are integral to the diffusion process in many markets because they help potential consumers reduce the perceived risk of adoption. As prior research has

demonstrated, the contribution of these indirect social effects to the rate of category growth can be substantial (Rogers 1995).

The issue of post-adoption behavior, and specifically disadoption, has received considerable attention in the technology management literature regarding the implementation of information technology within organizations (Meyers, Sivakumar, and Nakata 1999). Several studies have found that the usage of new technologies such as material requirement planning systems (Cooper and Zmud 1990), computer-aided design systems (Liker, Fleischer, and Arnsdorf 1992) and object-oriented software (Fichman and Kemerer 1993) are often much lower than the number of reported adoptions. In a broader context, Rogers (1995) has observed the need for additional research on the antecedents and consequences of disadoption in order to more fully understand the social processes driving diffusion.

The growing body of research on disadoption suggests that it may be a substantial problem for marketers, especially in markets using new technologies to manage the customer experience. It is notable, therefore, that the problem of understanding the impact of disadoption on customer profitability has not been addressed in scholarly research. One reason for this lack of research may be that most empirical studies dealing with lost customers have focused on mature markets such as insurance, credit cards, and catalog sales where customer data is readily available. Historically, disadoption has been less of a concern for these markets because of the relative lack of technological innovation. This may no longer be the case as firms in these mature industries reengineer their customer service functions using Internet and wireless technologies. Another reason for the lack of research is that incorporating indirect social effects like word-of-mouth

into customer valuation models has been considered an intractable problem to date (Rust, Zahorik, and Keiningham 1995; Zeithaml 2000). Yet the increasingly prominent role of technology in most product markets has increased the need for managerial tools that can account for the profit impact of disadoption on customer profitability. In the following section we demonstrate how this can be accomplished.

### **A MODEL FOR DETERMINING THE EFFECT OF DISADOPTION ON THE VALUE OF A LOST CUSTOMER**

Assessing the value of a lost customer requires that we distinguish between defectors and disadopters. If the relative proportion of lost customers in a market that are disadopters is  $\alpha$ , then the value an average lost customer is:

$$[1] \quad \text{VLC} = \alpha \text{VLC}_{\text{disadopter}} + (1 - \alpha) \text{VLC}_{\text{defectors}}$$

In some markets (typically low technology markets) the value of  $\alpha$  will approach 0 and the value of a lost customer can be measured with conventional customer lifetime value models for defectors (c.f., Berger and Nasr 1998; Dwyer 1997; Rust, Zeithaml, and Lemon 2000). However, situations where disadoptions are common, such as for technology intensive products,  $\alpha > 0$  and therefore we must estimate  $\text{VLC}_{\text{disadopter}}$  in order to calculate the value of an average lost customer. This study focuses on estimating  $\text{VLC}_{\text{disadopter}}$ . However, the relative importance of disadoptions in shaping the total value of lost customers depends on the value of  $\alpha$  for a specific market<sup>1</sup>.

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<sup>1</sup> The value of  $\alpha$  could be readily estimated using defector analysis techniques as suggested by Reichheld (1996).

### *Estimating Future Sales with a New Product Growth Model*

A model to estimate the financial impact of disadoptions on lost customer value must capture the sales effect of slower customer acquisitions caused by the reduced level of word-of-mouth and other social effects. We use a new product growth model to capture these lost social effects and to describe the typical evolution for a product-market (Bass 1969; Mahajan, Muller, and Bass 1990). The model, which follows Roger's diffusion of innovation theory, assumes that two forms of communication influence adopters: mass media (e.g., advertising) and social influence (e.g., word-of-mouth). One appeal of the model is that it is flexible enough to accommodate a wide variety of market-specific situations such as different marketing mixes and consumer purchase. Moreover, the basic model has been shown to have a good fit for a large number of products and patterns (see Mahajan, Muller, and Wind 2000 for a recent review and for an in-depth examination of the underlying assumptions of the model).

According to the widely used discrete version of the basic Bass model, sales at any given point in the diffusion process,  $n(t)$  are given by:

$$[2] \quad n(t) = \left( p + q \cdot \frac{N(t)}{m} \right) \cdot (m - N(t))$$

where  $m$  is the market potential,  $N(t)$  is the cumulative number of adopters up to time  $t$  and the coefficients  $p$  and  $q$  represent the effects of external influence (e.g., advertising or mass media) and internal influence (e.g., word-of-mouth or imitation) respectively.

Estimation of the model parameters for specific cases is a straightforward exercise that can use analogies from similar product categories or non-linear least squares regression

when there are enough data points (see Mahajan, Muller, and Wind 2000; Parker 1994; Srinivasan and Mason 1986 for an in-depth treatment of parameter estimation).

### ***Estimating the Profit Impact of a Lost Customer***

There are two possible sources of direct profit from customers. The first stems from the contribution margin generated from the initial purchase, while the other is derived from periodic profits generated by ongoing services or user charges. If the product is one for which there is little or no relationship with the selling firm after the sale, then the profit derived from the customer stems from the initial sale only (e.g., a real estate purchase). If the product is a service for which there are only periodic usage charges (e.g., Internet access), then only the periodic profits matter. A product can also have both as in the case when a cellular service provider profits from the initial equipment purchase and the monthly usage fees. These distinct sources of profit can all be handled by our approach in this article.

We address the problem of estimating the profit impact of a lost customer by calculating changes in the expected profitability of the firm before and after the customer has disadopted using sales estimates from the new product growth model. It is important to note that consumers “disadopt” at the category level. However, individual firm profitability is determined by its *share* of the product category. Thus, we use market share to estimate a firm’s share of the benefits derived from new customers (and loss of customers).

Consider the case in which firm  $i$  derives profits from the initial purchase ( $L_i$ ) and periodic profits ( $K_i$ ) for its product. If the firm has market share ( $S_i$ ) and the product's life started at  $t_0$ , then the expected profit of the firm over the  $j$  periods beginning at  $t_1$  is:

$$[3] \pi_i [t_1, t_1 + j] = S_i \cdot \sum_{t=t_1}^{t_1+j} \frac{N_1(t) \cdot K_i + n_1(t) \cdot L_i}{(1+d)^{t-t_1}}$$

From an application perspective, it is important to note that  $N_I(t)$  and  $n_I(t)$  are measured at the category level as in [2] and that equation 3 can be estimated with a spreadsheet by using the data used to estimate  $n_1(t)$  from equation 1.

Now consider the consequences for firm profitability of a customer that disadopts at time  $t_1$ . First, the seller loses the direct effect of that customer's periodic profits ( $K_i$ ) from  $t_1$  until the end of the time horizon under consideration ( $t_1 + j$ ). A second consequence is that the growth rate of the category slows since there is one less person to influence future customers through word-of-mouth or imitation. Thus, the profit given the disadoption at time  $t_1$  is:

$$[4] \pi_{i(\text{disadoption})} [t_1, t_1 + j] = S_i \cdot \sum_{t=t_1}^{t_1+j} \frac{N_2(t) \cdot K_i + n_2(t) \cdot L_i}{(1+d)^{t-t_1}}$$

Where  $N_2(t)$  at time  $t=t_1$  equals  $(N_I(t) - 1)$  in the case of a single disadopter. The direct sales effect of disadoption is captured by reducing cumulative sales by one, which then affects periodic profits. The indirect sales effect of disadoption is captured by the fact that, in this case, the new sales in each period,  $n_2(t)$ , are determined by the cumulative sales,  $N_2(t)$ . Thus, the value of a disadopter is given by the difference between equation 3 and 4.

Note that the profit impact of the indirect effect is due to the deceleration of the diffusion process. We illustrate this effect with an example in which a firm loses 1000

customers in the third year as a result of new product rejection (see Figure 1). The figure illustrates how the loss slows the adoption of the product and postpones the peak of the sales curve by nearly two years. This deceleration of future sales creates two problems for the firm. First, it decelerates the rate of customer acquisitions thereby reducing the value of the new technology to the firm (Srivastava, Shervani, and Fahey 1998). It also increases the probability that some competing technology will be introduced that will prevent the complete diffusion of the new product or service.

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Insert Figure 1 Here

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### ***Extending the Model***

An appealing aspect of the model is that it can be adapted to accommodate market-specific conditions by relaxing the basic assumptions. For example, we suggested using the basic Bass model to describe the relationship between  $n(t)$  and  $N(t)$  in [3] and [4]. However, any other product growth model, including the many extensions to the Bass model that include marketing mix and other variables can be used. Yet, given the ability of the basic Bass model to capture diffusion process without decision variables (see Bass, Jain, and Krishnan 2000 for a discussion of this issue) and possible estimation problems using many parameters with limited data, we believe that the basic Bass model is sufficient in many cases.

Another assumption that can easily be relaxed is the use of a firm's market share to determine the firm specific effects of category-level growth (or contraction). This is a reasonable assumption for relatively stable markets in which the relative market shares of competitors do not change substantially over a limited time period. However, in more

dynamic markets it is possible to model  $S_i$  in [3] and [4] as a function of time to reflect the actual share of losing and gaining customers. Similarly, other model parameters such as the profit from initial purchase  $L_i$  and profit from per period purchase  $K_i$  can also be modeled as a function of time if appropriate.

The theoretical model suggests that a lost customer may have a significant profit impact on the firm. However, it is important to examine the specific ways in which the firm “loses” due to the loss of a customer. To understand the specific impact of a lost customer, we now turn to an empirical application of the model.

### **EMPIRICAL APPLICATION**

We demonstrate the model developed in the previous section by applying it to the online banking market (often called “PC banking” or “Internet banking”). With the advent of the Internet, online banking was expected to have a substantial impact on the lives of consumers. Proponents touted that it would enable consumers to conduct financial transactions at home 24 hours a day while avoiding long lines for personal tellers (Rose 2000). In addition to consumer appeal, the technology appealed to banks because it enabled them to offer more services while reducing costs. These savings could be substantial, with some industry analysts placing the variable cost of personal service as much as a hundred times the cost of online service (Orr 1999).

The surge of Internet users in the mid 1990’s created pressure for banks to move rapidly into the online banking market or risk losing customers to new “e-banks” and to traditional banks with online capabilities (Robinson 2000). In response to this competitive pressure, many banks introduced online banking prematurely with

inadequate technology that failed to meet consumer expectations. For many consumers, online banking turned out to be a frustrating affair that often caused as many problems as it solved (Rose 2000). Sites frequently offered limited services that required navigating a complex, and often confusing customer interface. Recent consumer surveys reveal that many of the initial users have disadopted online banking and are not inclined to try it again in the near future (Robinson 2000; Rubino 2000; Trotsky 1999). Not surprisingly, the active use of online banking even among PC owners in the end of the year 2000 was much lower than initial expectations (Johnson 2000; Robinson 2000; Rubino 2000). Banking managers have realized belatedly that improving the customer's experience with online banking will require substantial capital investments (Monahan 2000). Moreover, the return on those investments can only be estimated if the bank understands the value of customers, and more importantly, the value of disadopters.

### ***The Value of a Lost Online Banking Customer***

Calculating the value of a lost customer in the online banking industry requires estimations for the diffusion parameters  $p$ ,  $q$ , and  $m$ . We estimated these parameters based on data on the penetration of online banking obtained from various issues of the *Online Banking Report*, a leading industry trade publication. Household usage of online banking through the year 2000 is shown in Figure 2. This data was augmented with interviews from representatives of the American Bankers Association, the leading trade organization, and managers in the banking industry. Based on this data, we used non-linear least squares to obtain parameter estimates  $p = 0.008$ ,  $q = 0.61$  and  $m = 32.4$  million households.

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Insert Figure 2 Here

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Next, we estimated the cost differential for servicing an online transaction versus a personal transaction. In general there is no initial profit from online banking at the time of subscription and thus, the variable  $L$  in [3] and [4] will be 0. The periodic savings ( $K_i$ ) of online banking versus a personal teller were estimated at \$1.06 per transaction based on data provided by the American Bankers Association. Thus, a customer conducting one transaction per week would save the bank approximately \$55 per year<sup>2</sup>. For the purpose of the initial analysis, we assume a discount rate of 10%, a time horizon for the customer lifetime of 5 years as suggested by Berger and Nasr (1998), and a firm market share of 100%.

Based on these estimates, we plot the value of a lost customer in the online banking industry against the time period in which the customer disadopted in Figure 3. The direct purchase effect is the discounted value of the \$55 annual savings over five years, which is approximately \$208. The indirect social effect changes with time; it is large if the disadoption occurs early in the product life cycle and goes down exponentially in the latter stages of the life cycle. In the case of online banking, the indirect social effect is larger than the direct purchase effect until year four. In general, the difference between the total effect (which includes the social effect) and the direct effect helps to explain the

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<sup>2</sup> There may be other benefits to having online consumers beyond reduced service costs such as retention of higher value customers and, in the case of online banks, total customer profits the bank would lose if the customer goes offline. Given the lack of a published assessment of these other lost benefits, we utilized the more conservative estimation of service costs after consulting with banking executives. The estimation of savings per customer affects the magnitude of the financial results but not the patterns or conclusions drawn.

degree to which conventional CLV models have misstated the financial impact of lost customers.

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Insert Figure 3 Here

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The previous analysis examined the value of a lost customer when the firm held 100% market share. We now extend the analysis to understand how the value of a lost customer will change when the firm has a market share of less than 100%.

### ***The Effect of Competitors' Lost Customers***

In conventional models, market share has no effect on customer profitability. However, when the profitability model is extended to include social effects, the relationship between market share and customer profitability becomes apparent. As previously noted, the indirect effect of a disadoption is determined by the loss of social interactions of the customer that decelerate the growth rate of the product category. When a firm has less than 100% market share this deceleration can occur via the disadoption of the firm's customers as well as the disadoption of its competitor's customers.

Figure 4 shows the relationship between market share and the value of a lost customer for the online banking industry after the disadoption of 10 customers from the product category two years after the introduction of the new technology (Figure 4a) and 5 years after introduction (Figure 4b). We again assume that the savings per year for this bank is \$55. The figures demonstrate how there are actually *three* ways that disadoptions

can affect the firm when market share is less than 100%. The first two fall under the category of *self-loss* that occurs when the firm loses its own customers. Self-loss includes the direct purchase effect of its own customers who disadopted and the firm's share of the social effect of these customers. For example, if firm A's market share is 10 percent then firm A would lose one customer for every 10 disadopters, on average. This would equate to losses of \$208 due to the direct effect as well as 10% of the lost indirect effects from that one customer. The total self-loss amounts to about \$263 as shown in Figure 4a.

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Insert Figure 4 Here

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The third source of financial loss stems from the effects the indirect effects of Firm A's competitors' lost customers. When competitors customers disadopt, the lost indirect effects of these customers slow category-level sales affecting the future sales of all other firms in the market. In our example, 9 of the 10 lost customers were purchasing from Firm A's competitors. Ten percent of the lost social effects from these customers will affect Firm A's future sales amounting to a total competitor-based loss in value of \$494. In this case, the company loses more value from its competitors' disadoptions than from its own. Not surprisingly, the impact of competitors' disadoptions decreases as Firm A's market share increases until the self-loss exceeds competitor-based losses when Firm A's market share approaches 50%. Note that this result is different when the disadoption occurs later in the product lifecycle at  $t_1=5$  (see Figure 4b). Here the self-loss is \$223 and the competitor-based loss is \$132 when the firm holds 10% market share.

### ***Incorporating the Effect of Negative WOM***

In the previous section we examined the effect of disadoption on customer value accounting for lost *positive* social effects such as the customer spreading positive word-of-mouth. However, when consumers are highly dissatisfied they tend to spread negative WOM about the product (Anderson 1998; Mahajan, Muller and Kerin 1984) that will influence potential adopters not to purchase. We now extend the analysis to account for negative word-of-mouth.

Suppose that a disadopter spreads negative word-of-mouth about a product that convinces another would-be adopter to delay her adoption for a period of 5 years. Returning to the online banking example, we illustrate the detrimental effects of negative word-of-mouth on the value of a lost customer in Figure 5. As the figure shows, the direct effect of disadoption is \$208 as previously calculated. However, the indirect effects have increased to approximately \$1200 due to lost positive word-of-mouth and additional negative word-of-mouth. Moreover, if the disadopter's negative word-of-mouth were to affect 5 customers, then cost of a lost customer soars to nearly \$3,000. As Figure 5 demonstrates, the relationship between the time of disadoption and the value of a lost customer is magnified significantly due to negative WOM. As above, this effect is exacerbated if the negative WOM occurs early in the life of the product.

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Insert Figure 5 Here

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## DISCUSSION

This research investigates the effect of disadoptions on the value of a lost customer. Although researchers have long recognized that word-of-mouth and other social effects are integral to determining customer value (Danaher and Rust 1996; Rust, Zahorik, and Keiningham 1995; Zeithaml 2000), our model is among the first to show how to quantify this value. We now discuss the theoretical and managerial contributions of this research.

### *Theoretical Contributions*

*Disadoption versus Defection.* Satisfied customers of innovative products play an essential role in promoting future sales in the product category through word-of-mouth and imitation (Mahajan, Muller and Wind 2000; Rogers 1995). When these customers defect to a competitor, the firm loses their future sales but retains the positive effect these customers bring to future category level sales. In contrast, a customer that disadopts an innovation hurts firm profitability in two ways: through the loss of direct sales and the deceleration of sales from potential adopters. We have demonstrated that the indirect loss can be substantial often exceeding the direct loss in some markets. In the case of online banking, the “indirect” value of a lost customer can be more than 150% of the value of lost direct purchases just accounting for lost positive social effects. Note that most of the effects presented here stem only from the lack of positive WOM and imitation. As we demonstrated, the indirect effect of negative WOM increases this loss substantially.

An important implication of our finding is that marketers must begin to differentiate between defection and disadoption. Considerable research has focused on understanding the antecedents to defection and the financial impact of defection on the

firm (c.f., Lemon, White and Winer 2001; Reichheld and Sasser 1990; Reinartz and Kumar 2000). In contrast, comparatively little research has focused on the antecedents of disadoption (Kleine, Kleine and Allen 1995; Redmond 1996; Rogers 1995; Unson 2000), and even less research has examined its financial impact on the firm. Although understanding and incorporating defection in customer profitability models is critical, the ubiquitous use of technology in new products and in service delivery applications suggests that failing to account for disadoption could lead to substantial errors in managerial decisions.

*Linking acquisition and retention.* Conventional profitability models developed in mature service industries are based on the assumption that customer retention and acquisition are independent processes. However, marketers increasingly recognize that customer acquisition and retention processes are interrelated and that failing to account for this relationship can lead to erroneous value assessments (Thomas 2001). The profitability model we have proposed captures one aspect of the relationship between acquisition and retention by demonstrating how the social interactions between retained customers and potential customers can affect firm profits. This finding is especially important in light of recent trends in which firms increasingly rely on technology as a foundation for new product and customer service strategies and individual customer profitability models to evaluate those strategies.

*Incorporating Competitive Effects into the Profitability Calculation.* This research also provides new insights into how customer profitability is affected by the actions of competitors. Even when a firm has excellent product quality and has invested appropriately in its retention efforts it can suffer substantial losses from the disadoptions

of competitor's customers. When a competitor's customers *defect*, it provides the firm with an opportunity to leverage its product and service quality to acquire a portion of the defectors. In contrast, when a competitor's customers *disadopt*, they leave the product category altogether and act as a decelerating force on future category sales. We have shown that the magnitude of this competitive effect is inversely related to the firm's market share. Thus, the customer profitability of smaller firms may be affected substantially by the product quality of larger firms. This is an important consideration in any market dominated by a few large firms such as banking, broadband, and telecommunications. Whereas previous research examining customer profitability focused on how competitors' offerings affect the switching probability of a firm's customers in mature markets (Rust, Zeithaml, and Lemon 2000), we have identified an additional mechanism by which competitive actions affect customer profitability via the acquisition of future customers.

*Change in CLV over the product lifecycle.* This research also informs our understanding of how customer value changes throughout the product lifecycle. Customers that are acquired at the earliest stages of a product lifecycle have a substantial effect on future customer acquisitions through their ability to influence potential adopters. In the online banking application, the value of a customer acquired in year 1 is 80% greater than the value of the same customer in year 4. The reason for this phenomenon relates to the number of users at each stage of the product life cycle. Initially, there is only a small pool of users available to affect future adopters through word-of-mouth and other social effects. Thus, a single disadoption can have a significant effect on the rate of future customer acquisitions. However, as more customers use the product, the

magnitude of the indirect effect of a lost customer diminishes because there are fewer potential adopters to be influenced.

There are two interesting theoretical implications of how our model enables marketers to assess customer profitability over time. First, it allows them to quantify the value of the various adopter categories such as innovators, early adopters, early majority, late majority, and laggards as proposed by Rogers (1995). It is commonly believed that earlier adopters are worth more to the firm because of their effect on later adopters. However, we have been unable to find any empirical documentation of this assertion. Since the value of a customer to a firm equals the profit the firm loses if the customer leaves, our approach can be utilized to examine the value of different adopter groups.

In Figure 6 we present the results of this calculation for the online banking industry. Using a Monte-Carlo simulation we determined average 5-year customer profitability for each of the adopter categories proposed by Rogers (1995). As the figure shows, earlier adopters are indeed worth considerably more than later adopters. The distinction between the categories is even stronger if we recall that the total value includes the \$208 direct value, which is the same for all categories. Thus, for online banking the social value of an innovator and an early adopter is larger than her direct value. The early majority lost customer has a social value that is about 30% of the direct value, and late majority and laggards have a relatively small social value compared with their direct purchase value.

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Insert Figure 6 Here

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The second implication is related to the change in an individual customer's value to the firm over time. Reichheld (1996) suggested that the average value of a customer typically goes up with time. Thus, loyal customers are worth more to the firm due to factors such as the ability of the firm to cross-sell, lower service costs with time, or lower price elasticity for loyal consumers (Reichheld and Sasser 1990; Reichheld and Neal 1996). While the magnitude of these effects has been questioned (Reinartz and Kumar 2000), the idea that a customer's profitability goes up with time remains a highly quoted finding. Our results raise additional questions about the validity of Reichheld's findings by showing that the value of long-term customers may actually go down with time when indirect social effects are included in the value assessment.

### ***Managerial Implications***

A beneficial aspect of our model is that it can be implemented on a spreadsheet with minimal difficulty. As a result, it represents a practical tool that can help firms manage their customer relationships more effectively in increasingly technology-driven markets. One insight derived from this research is that firms relying on conventional profitability models as a basis for allocating marketing resources may be under spending on customer retention. As an example, a recent survey among online banking managers reveals that while many appreciate the importance of retention, minimal resources are actually devoted to this goal (McAdam 2000). By under spending on retention, these marketers actually drive up their acquisition costs because the pool of potential adopters in a given year shrinks due to reduced social effects. As the pool of potential adopters

shrinks, the number of customers acquired for each acquisition dollar spent declines as well. Marketers would be well advised to invest substantially early-on in programs designed to facilitate consumers' use and acceptance of technological innovations that have been incorporated into the product or purchase experience, and to invest in post-purchase customer service and support.

*Allocation of Retention and Acquisition Spending Over Time.* Another insight for managers is how resource allocation between retention and acquisition activities should change over the product lifecycle. Conventional wisdom suggests that managers should initially focus on customer acquisition activities and only later focus on retention spending in order to keep those customers. Ironically, the value of retention is highest in the early stages of the product lifecycle when managers are most likely to focus on acquisition of the initial pool of customers. This overemphasis on acquisition in the early stages of a market was typical of many Internet companies in the late nineties. Now defunct companies like Pets.com and Homeruns.com spent lavishly on customer acquisition through the use of expensive television ads at a time when consumers were just becoming familiar with the potential uses of the Internet. However, many of the acquired customers found the online ordering and fulfillment capabilities of these firms to be inadequate and subsequently disadopted. Interestingly, the rate of new adoptions quickly declined as predicted by our model (Reichheld 2000). A more complete understanding of customer value provided by our model would have supported an alternative strategy that emphasized retention and post-purchase support at the earliest stages of the lifecycle.

*Extended ROI analysis.* Marketing managers are increasingly asked to justify marketing expenditures based on expected returns. This is especially true with information technology expenditures where senior management increasingly demands a clear forecast of how a new technology will benefit the firm (Anthes 2001). This trend is relevant for Customer Relationship Management (CRM) systems that are expected to be one of the largest markets for information products in the coming years (Trott 2001). This article demonstrates that assessments of the ROI on CRM systems (and service investments in general) should include an analysis of the social effects of customers. Failing to account for social effects may lead companies to underestimate the actual ROI on these investments.

*Managing the Competitive Environment.* This research raises some important issues for start-ups and other small firms attempting to compete on the basis of new technologies. By virtue of their low market share, these firms are vulnerable to the way their competitors manage customer-related technology. As we have demonstrated, overall growth of the market can slow substantially if a major competitor has inferior technology or service that causes many consumers to disadopt. This creates a conundrum for small competitors with superior offerings. Although the company's competitive advantage may stem from its superior technology, it could potentially benefit by helping competitors prevent disadoptions through shared technological enhancements of the service function. Although we would not recommend that small firms give away their technology, they could benefit by helping the industry overcome disadoptions by using trade associations to monitor customer problems and solutions and conduct informational advertising to educate consumers about using new technologies.

### ***Limitations and Future Research Directions***

This research addresses the phenomenon of disadoption and shows how social processes such as word-of-mouth can affect the customer profitability calculation. One limitation of the approach we have developed is that it does not account for social effects that occur in mature markets. Scholars have called for models that include word-of-mouth effects in the profitability calculation (Rust, Keiningham, and Zahorik 1995; Zeithaml 2000). Although our model partially addresses this call, additional research is needed in this important area. By incorporating word-of-mouth into the profitability calculation we will begin to provide marketing managers with additional metrics that can be used to guide decision-making.

We have based this research on the new product growth model first proposed by Bass (1969). The advantage of this model is that it is both flexible and robust. It has been shown to provide an accurate description of new product growth across a wide variety of industries (Mahajan, Muller, and Bass 1990). Yet, there might be other models that could be usefully employed. Additional research should also investigate alternative model specifications for the Bass model. For example, a useful extension would be to include marketing mix variables to provide a more tailored model for a particular market (see Bass, Jain, and Krishnan 2000).

Another issue relates to the ability to differentiate between the different factors that constitute a "social effect". A customer may affect others through direct WOM, imitation (even when the user is unaware of it) and network effects (where the utility of customers from the product is related to the existence of other users). The Bass model, and consequently our approach, captures all these effects together with a single parameter.

Thus, distinguishing between the different social effects may require different modeling approaches such as that proposed by Hogan, Lemon, and Libai (2001) for measuring the incremental value of positive word-of-mouth.

The research identifies a single mechanism linking customer retention and acquisition. However, there are undoubtedly other links between these important variables. This is an important area for future research because conventional models implicitly assume that the two processes are independent even when prior research has shown this is not the case (Thomas 2001). The disparity between the direct and indirect customer values demonstrated in the banking example reiterates the need to better understand the complex linkages between customer acquisition and retention.

Our work can be viewed in the context of social capital of individuals, a topic that has received great attention by organizational management and sociologists in recent years (e.g., Coleman 1990; Burt 1997). Students of organization and human behavior have focused on how a person's social structure and connectivity with others can create value for that individual. Future research could focus on understanding how this social capital affects the firm's marketing programs. There is a need for further research that can combine marketers' knowledge of consumer social and network-based behavior with advanced customer profitability models to examine the factors that affect social capital for different customers of the firm.

## **CONCLUSIONS**

In this paper, we have shown how the value of a lost customer depends on whether the customer *defects* to a competing firm or *disadopts* the technology altogether.

In the empirical application of the model, the results from the online banking industry show how the value of lost customers is affected by the stage of the product lifecycle, the firm's market share, and the rate at which competitors' customers disadopt. The approach is such that is easily applied by managers, providing a practical tool by which they can manage customer relationships in an innovation intensive market.

Although advances in the theory and practice of customer relationship management have been substantial in the last few years, the discipline is far from mature. To date, researchers have focused almost exclusively on mature, service industries to develop and test theories and analytical models because of data availability. This restrictive focus is detrimental to the advancement of the discipline because it leads to models that may not be valid in the technology-driven markets that are rapidly becoming the norm. As we have shown in this article, researchers in this area should be concerned that practitioners are applying inappropriate models in markets where disadoptions are common. This research represents one step toward expanding the conceptual domain of customer profitability models. It is our hope that it provides a useful foundation for additional inquiry.

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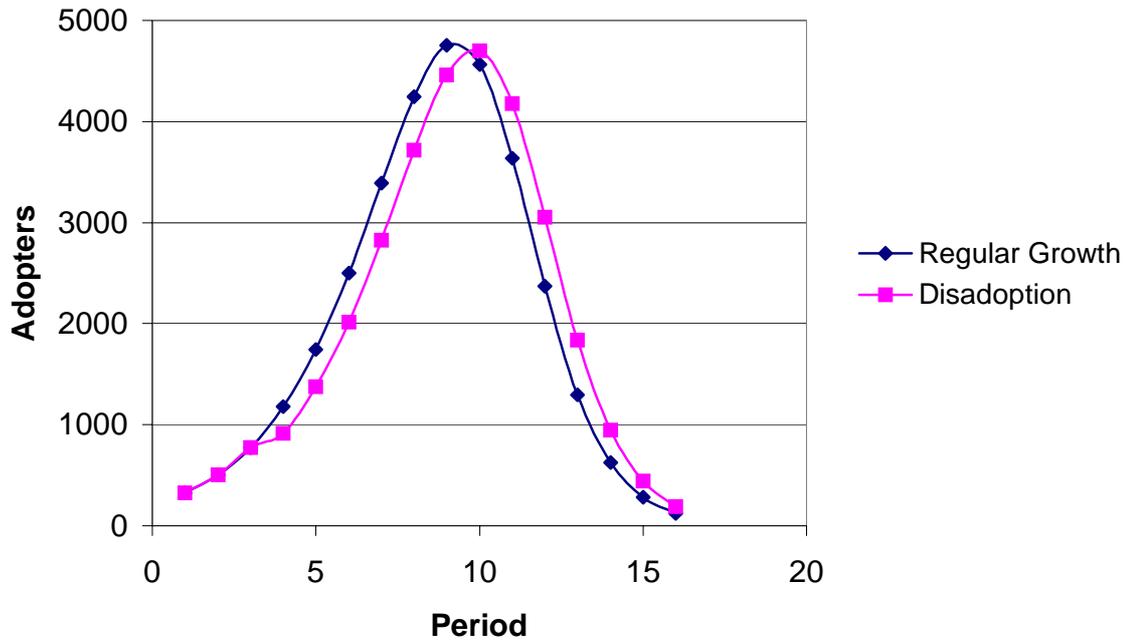
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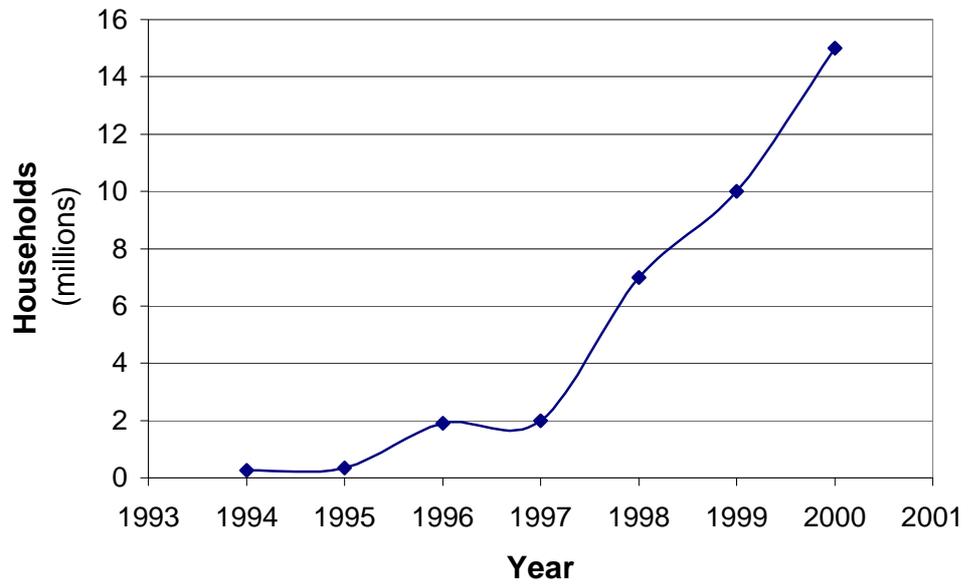
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**Figure 1**

**THE EFFECT OF DISADOPTIONS ON THE PRODUCT GROWTH CURVE**

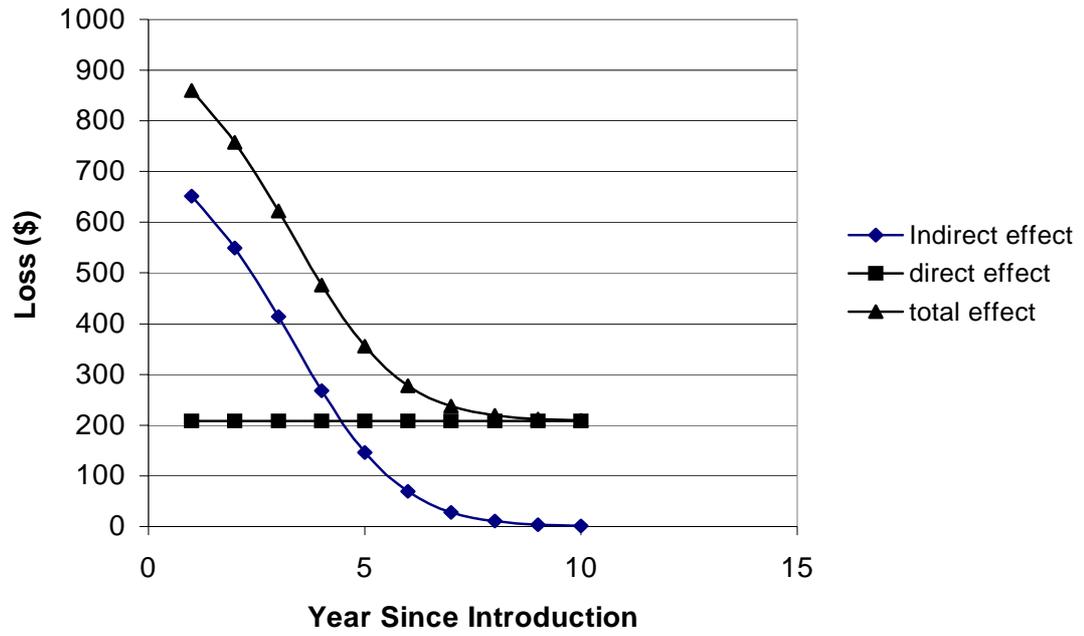


**Figure 2**  
**HOUSEHOLDS USING ONLINE BANKING**

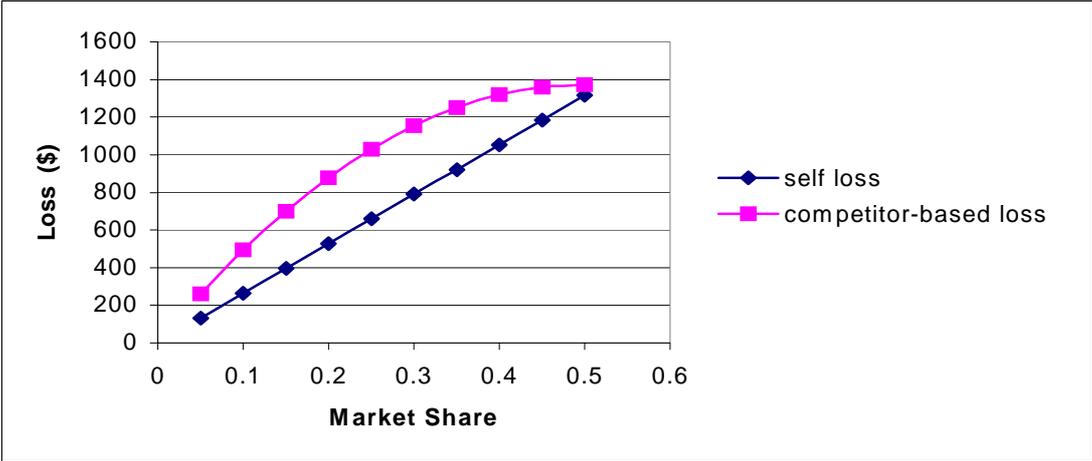


**Figure 3**

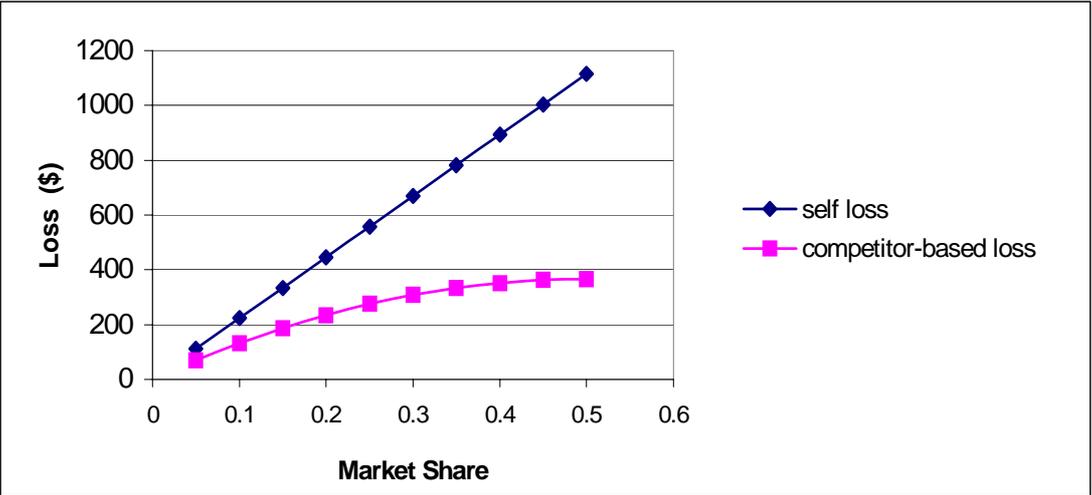
**VALUE OF ONE LOST CUSTOMER IN THE ONLINE BANKING INDUSTRY**



**Figure 4**  
**THE EFFECT OF MARKET SHARE ON LOSS**  
**DUE TO DISADOPTIONS FOR ONLINE BANKS**



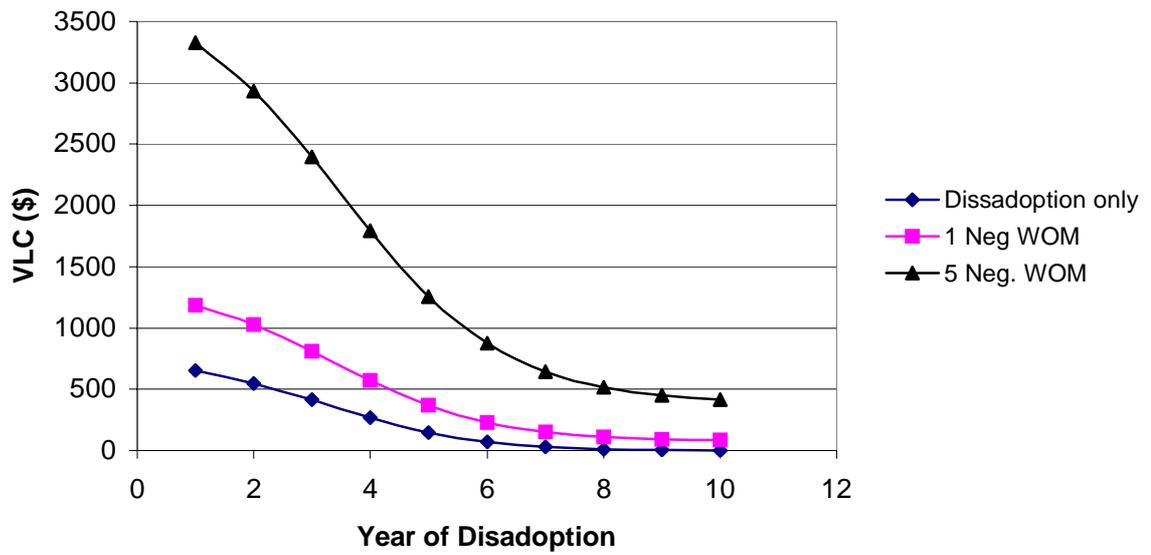
**Figure 4a: Disadoption at t=2**



**Figure 4b: Disadoption at t=5**

**Figure 5**

**THE EFFECT OF NEGATIVE WOM ON THE VALUE OF A LOST CUSTOMER FOR ONLINE BANKING**



**Figure 6**

**THE AVERAGE VALUE OF ADOPTER CATEGORIES FOR ONLINE BANKING**

