

Customer Migration: An Empirical Investigation Across Multiple Channels

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**CUSTOMER MIGRATION: AN EMPIRICAL INVESTIGATION ACROSS
MULTIPLE CHANNELS**

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Abstract

Recent industry studies suggest that customers routinely use multiple channels of the same retailer to make their purchases. However, most studies about the drivers of customer profitability only focus on customer behavior in a single channel. This research investigates customer channel migration and the outcome of channel migration on the drivers of customer profitability. We find that all single-channel buyers and all multi-channel buyers are not alike. In addition, we discuss how forecasts of customer migration patterns can impact channel equity, channel expansion decisions, and promotion and product strategies.

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Introduction

Proponents of customer relationship management routinely discuss a variety of customer behaviors including customer acquisition and reacquisition (e.g., Thomas 2001, Thomas, Blattberg, and Fox 2004), customer retention (e.g., Bolton 1998, Bolton and Lemon 1999, Reinartz and Kumar 2000, Berger and Nasr-Bechwati 2001), cross-buying (e.g., Verhoef, Franses, and Hoekstra 2001, Kamakura, Wedel, de Rosa, and Mazzon 2003), purchase frequency (e.g., Anderson and Weitz 1992; Kalwani and Narayandas 1995; Venkatesan and Kumar 2004), and share of wallet allocations (e.g., Anderson and Narus 2003; Verhoef 2003). These are all important customer behaviors because they tend to be indicative of the strength of the customer-firm relationship and are drivers of the customer's long term profitability to the firm (e.g., Reinartz and Kumar 2003, Reinartz, Thomas, and Kumar 2004).

While the existing literature has made great strides in terms of understanding customer behavior and linking it to long-term customer profitability, it tends to only examine the drivers of customer profitability within a single channel (e.g., brick-and-mortar or catalog or internet). However today, many firms operate in multiple retail channels and as a result, customers routinely use multiple channels of the same retailer to make purchases (Cleary 2000, Forster 2004). For example, an industry report indicated that 56% of the respondents declared that they used more than one channel of the same retailer to purchase items during the 2002 holiday shopping season (DoubleClick.net 2003). Because of these trends, it is important to test whether customers who buy in multiple channels of a retailer *uniformly* exhibit the same behavior with respect to the drivers of customer profitability. Additionally, with the growth of multi-channel buying, it is critical for firms to understand *customer channel migration* and its

outcomes. We assert that customer channel migration is important in customer relationship management because customers who buy from distinct channel combinations may be different with respect to key drivers of customer profitability.

Therefore, the focus of this research is on customer channel migration. We define *customer channel migration as a dynamic process in which a current customer repeatedly makes choices to frequent one of a retailers channel options* (e.g., brick-and-mortar, catalog, internet). This research demonstrates how existing statistical techniques can be used to assess and predict a buyer's channel migration in a multi-channel retail environment. In addition, we investigate whether there are significant differences in 1) the known length of the active relationship with the firm; 2) the purchase frequency; 3) the amount of cross-buying; and, 4) the total order dollars across customers who choose to purchase from the various combinations of channels that a retailer offers.

In our discussion of channel migration, we introduce a new metric: *channel equity*. Like its 'sister' term, customer equity, we define *channel equity as the net present value of the current and future profits generated through a distribution channel*. There are two parts to channel equity—a variable component and a fixed component. The variable part of that equity is derived from all interactions from all customers that patronize a retail channel. These interactions may generate revenues and or costs. This definition of the variable component of channel equity is consistent with Langford and Cosenza's (2000) assertion that successful multi-channel marketing needs to focus on managing the *customer* contact points rather than the channel. In contrast, the fixed component is composed of the expenses that the firm incurs as a result of operating the channel. Thus, this part of the equity focuses on the channel specific issues (e.g., fixed channel operating costs). Both contribute to the overall profitability of the channel.

While the term channel equity may not be broadly used by all multi-channel retailers, the concept is clearly understood. For example, computer manufacturer Gateway clearly understood this concept and took it into consideration when it recently decided to close its store outlets but continue operating its internet and catalog outlets (Freeman 2004).

Building on the concept of channel equity, this research describes how insights into customer channel migration patterns can greatly affect the forecasting and management of channel equity. In addition, we describe how patterns of channel migration might affect the firm's decisions regarding channel expansion as well as communication and product offerings across channels.

In summary, the key contributions of this research are: 1) that it investigates an important customer behavior--*channel migration*; 2) it tests how the key drivers of customer profitability vary when channel migration occurs; and, 3) it describes how management decisions can be affected by a deeper understanding of customer channel migration.

Understanding Customers' Channel Migration

At the most basic level channel migration can be simplified to a channel choice decision for a repeat purchase. Given this conceptualization, there are considerations that arise in the channel migration discussion that are unique to the phenomenon and others that are analogous to the issues discussed around the basic channel choice problem¹.

Traditional channel choice research has shown that the choice of a particular channel to frequent varies widely by customer. Some suggest pricing as leading to the choice among channels (e.g., Brynjolfsson and Smith 2000). At the advent of the internet economy, many

¹ In this research we make the distinction between channel choice and store choice. The store choice problem can be between different retailers. Our discussion of channel choice refers to the decision to frequent one of the distribution channels offered by the same retailer.

firms used price as a mechanism to encourage consumers to buy from the lower cost channel (Cotlier 2001). For example, the retailer might offer the same item in a brick-and-mortar store and on the internet. However, the item would be priced cheaper on the internet. Today this practice has become less common as consumers have come to expect the same price regardless of where they shop (Del Franco and Chiger 2002). In general, understanding and managing customer migration between channels is significantly more challenging as firms move towards having *integrated channels*, i.e., the same price, product, and sometimes promotion offering across all of its channels of distribution (Anonymous 2001).

An obvious reason that has been used to explain channel choice is one of convenience (Forster 2004). A less obvious explanation is the *experiential value* that a channel may provide. Mathwick, Malhotra, and Rigdon (2001) assert that “retailers are redefining themselves as a source of memories, rather than goods.” Additionally they argue that a brick-and-mortar retailer can create a certain type of experience similar to an “interactive theater” in which advice and support can be offered to the consumer. In contrast, when consumers are seeking a more controlled experience and convenience, catalogs and the internet tend to be the channel of choice (Speigelman 2000).

A fourth factor that has been associated with channel choice is the product purchased. In the context of the store choice decision, prior research has asserted that some consumers contemplate the items that they want to buy and then based on those thoughts make a store choice decision (Kahn and McAlister 1997; Bell, Ho, and Tang 1998). Similar logic has been applied to the decision of which of a given retailer’s channels to use (Schoenbachler and Gordon 2002). Some customers may prefer to buy certain types of products in an actual store environment so that they can actually experience the products and assess their quality (Young

2001). This may be particularly true of higher priced items because the risk of making a bad decision is greater (Schoenbachler and Gordon 2002). If this is the case, then some products or product categories will have a higher probability of being purchased in one channel versus another.

While the list of explanations for channel choice could continue beyond these key factors, a unique aspect of this paper's choice decision is that it is a *repeat purchase* channel choice decision. This is an important distinction because the issues involved in the choice decision become more complex. In a basic channel choice problem, the goal is the current transaction – consumers choose the channel that best completes the desired transaction. Therefore it is rational that variables like price, convenience, channel experience, and product have been studied in these contexts. In contrast, for a repeat purchase, the consumer is also seeking to build on a relationship that has already been established. Given that the relationship has already been established, when making the channel choice decision it is logical to consider aspects of the existing relationship.

One aspect that has been studied in the broader marketing context is the customer's level of prior experience with the firm. Specifically, extant research has shown that when people assess a situation and make decisions, their prior experiences factor into their current assessment (Boulding, Kalra, and Staelin 1999). Thomas, Blattberg, and Fox (2004) demonstrate that the prior experiences of a lapsed customer, specifically prior price offers and the prior relationship tenure, affect their decision to reinitiate and continue a relationship with the firm. In a channels context, Shankar, Rangaswamy, and Pusateri (1998) demonstrate that a prior positive experience with a brand in the brick-and mortar channel can decrease price sensitivity online. Thus these

studies suggest that a factor to consider with regards to channel choice for a repeat purchase is the prior experience that the customer has had with the firm.

In the customer relationship management (CRM) context, experience can be conceptualized as the customer's stage in the customer lifecycle. A core belief among CRM advocates is that customers behave differently at different stages of the customer lifecycle (Blattberg, Getz, and Thomas 2001). Consistent with this line of thinking, it follows that the customer's channel choice and propensity to switch purchase channels will depend upon their stage in the customer lifecycle.

Based on these prior findings and the data that is available for this analysis, the key factors that we investigate with respect to channel migration are: 1) product type; 2) product price; and, 3) stage of the customer lifecycle.

Channel Migration Model

The framework we use to assess the repeat buying behavior of customers across and within channels is a Markov Chain Model. These models are not new to marketing. They have been widely applied in brand switching contexts (e.g., Kalwani and Morrison 1977), store choice contexts (e.g., Burnett 1973), but more recently they have been used to model customer relationships and their value (e.g., Pfeifer and Carraway 2000, Rust Zeithaml, and Lemon 2000, Rust, Lemon and Zeithaml 2004). Given the history and more recent applications of this analysis approach, there is precedence for extending its application to the channel migration context in order to address the important managerial issue of customer migration and channel equity.

At the foundation of the Markov Chain Model is the *t-step* transition matrix. A *t-step* transition matrix shows the probability that a customer will be in a given state, j , t periods from now given that he is currently in state k . In this research context, we interpret the *t-step* transition matrix to represent the conditional probability a customer will make a purchase from a given channel (e.g., the retail store) t periods from now, given that his current purchase is made in a specific channel (e.g., catalog). A transition matrix reports all combinations of states, therefore capturing both repeat buying from the same channel as well as repeat buying across channels.

Pfeifer and Carraway (2000) provide extensive details regarding how the transition matrices are computed for each period. The key assumption of this methodology is the Markov property: *the future state of the customer is only a function of his current state*. In essence, it does not matter what path a person took to arrive at a particular state in period t . It just matters that he started in a particular state and arrived at the specified state in t periods. As Pfeifer and Carraway point out, “the Markov property is a necessary condition for a stochastic system to be a Markov chain,” and it is a property of numerous past customer-firm relationship models (Berger and Nasr 1998, Dwyer 1989, Blattberg and Deighton 1996, Rust, Zeithaml and Lemon 2000, Rust, Lemon and Zeithaml 2004).

Transition Probabilities

To derive managerial inferences from the transition matrices, the conditional probabilities of the *1-step* transition matrix are determined. In this research, the choice probabilities are estimated using two binary Logit models. Logit models have been used to study store choice in the past (e.g., Fotheringham 1988; Bell and Latin 1998). For the first Logit (Model 1), the

dependent measure was *repeat buy in retail* given the previous purchase was in retail. Therefore only the data points where the customer's last prior purchase was in the retail channel (accounting for 67,476 purchased items in our data) were used to estimate this model. For the second Logit model (Model 2), the dependent measure was repeat buy from the catalog or internet (C/I) given that the previous purchase was C/I². Similarly, only the data points where the last prior purchase was in the catalog or internet channel (accounting for 4,350 purchased items in our data) were used to estimate this model. Given these dependent measures the interpretation of the channel choice model can be framed as purchase in store vs. remote purchase. Using these two models, we derived a *1-step* switching matrix as depicted in Figure 1.

--Insert Figure 1 about here--

To allow for unobserved heterogeneity in the transition probabilities, each of the Logit models was estimated using a latent class segmentation approach as described by Kamakura and Russell (1989). The results of this analysis reflect segment level differences in a customer's channel choice decision when repeat buying.

Data

The data for this analysis come from a major US retailer maintaining three distinct channels of distribution: 1) physical retail stores in over 25 major markets; 2) catalogs that cover their basic merchandise as well as sale items; and, 3) an online store that allows customers to develop "self-help" solutions and purchase the products best suited to their needs. Similar to the majority of retailers in the world, this retailer first distributed through its physical stores, later adding on a catalog channel and finally, an internet channel.

² Theoretically, probabilities for all of these repeat buying states can be computed. However in the data, which is described in the next section, the internet was only operational for approximately one year over the four year observation horizon. Over that time span we found extremely low incidence of switching involving the internet. Thus any estimates and the inferences from them will be less reliable. Therefore the internet and catalog channels were collapsed into one channel for this part of the analysis.

The data used in this analysis are longitudinal and track each individual customer's buying across all of the channel options. The data are arranged as a product file where each product that the customer purchases during his buying history comprises one line in the file. The data only include first time customers whose first purchase was after the third quarter of 1997 and whose transactions dated as early as September 1997 and extended through July 2001. It is important to note that the internet channel was not fully operational until late 2000. There were almost 37,000 orders observed in the database. Customers were primarily male (63%), higher income (63% had income levels over \$50,000) and middle-aged (57% were between the ages of 30-54). Table 1 provides details regarding the retailer's customers by channel. Interestingly, channel users were fairly uniform across channels, with the catalog channel being the most different among all three channels.

--Insert Table 1 about here--

Retail-only users comprised over 80% of the total with Catalog-only representing fewer than 2% of the population and Internet-only encompassing 3% of the orders. Dual channel users had over 14% of the orders and tri-channel users were just under 1%. Volume-wise, 77% of the products purchased were bought at the retail store, 18% were bought from the catalog, and 5% were bought on the internet.

Eleven different product groups are captured in the data. Each product that was bought was categorized by the retailer into one of the eleven groups. Basic details about the product groups are reported in Table 2. Broadly, the product groups include household matter such as kitchen and bath supplies, gifts, travel and office aids, as well as storage and convenience items. All products are offered in all three channels; pricing and promotions are also consistent across the channels. Given that more and more retailers have decided to promote the uniformity of their

channels to all customers, knowing how to manage customers in this “undifferentiated” world becomes critical for a large number of firms.

--Insert Table 2 about here--

Migration Model Variables

The independent measures used in the choice model are *product category*, *price of the product*, and *stage in the customer lifecycle*. *Product category* is operationalized as a binary variable indicating whether the product purchased came from one of the eleven basic product categories. The *price* of the product is the dollar amount that the customer paid for the item. Because neither the product offering nor the product prices vary across channels, it is important to clarify how these variables should be interpreted. Specifically, the product category and the price variables assess whether customers tend to choose one channel versus another based on the products that they intend to buy and their price expectations of those products (Desai and Talukdar 2003; Iyer and Pazgal 2003). A third independent measure used is the customer’s *stage in the customer lifecycle*. This is a time-varying measure that is operationalized as the number of distinct purchase occasions or orders previously experienced by the customer.

Empirical Findings

Model Selection

Prior to making any repeat buying inferences the appropriate model structure has to be determined. Specifically, we assess how many segments best describe those customers whose prior purchase was in retail (Model 1) and how many segments best describes those customers whose prior purchase was from the catalog or internet (Model 2). The model fit statistics are reported in Table 3. From the fit statistics, we determine that the customers whose prior

purchase was in the retail channel can be divided into two segments and customers whose prior purchase was from the catalog or internet can be divided into three segments. Based on this, the discussion that follows describes the customers as belonging to a segment numbered one through five.

--Insert Table 3 about here--

Prior Purchase in Retail (Model 1) Parameter Estimates

The parameter estimates and the standard errors for Model 1 are reported in Table 4. The parameter estimates of Model 1 reflect the probability that a customer whose prior purchase was in retail will repeat-buy in retail on his next purchase occasion. For Model 1, the results indicate that 61% of the customers fall into Segment 1 and 39% of the customers can be classified into Segment 2. Based on the sign of the intercept terms, customers in Segment 1 have a greater propensity to repeat-buy in retail than customers in Segment 2 ($\beta = 3.089$ for Segment 1 and $\beta = -0.151$ for Segment 2).

--Insert Table 4 about here--

Nearly all of the variables are significant across both segments of Model 1. However an important difference between the two segments is the influence of price. In Segment 1, customers tend to choose the catalog or internet channels for repeat buying for higher priced items ($\beta = -0.174$ for price). The reverse is true for Segment 2 customers ($\beta = 0.017$ for price).

In both segments the coefficient for the lifecycle variable is negative which implies that given that the prior purchase was in retail, the more purchase occasions that a person has had with the firm, the more likely the next purchase will be from the catalog or internet channels. This type of finding can be helpful as firms begin to assess channel loyalty and forecast channel equity. This is also not a surprising finding given that for many firms, their brick-and-mortar

channel is viewed as a channel to frequent if the buyer needs more “hands-on” guidance with respect to the purchase. A customer in the later stage of their lifecycle may not need as much “hands-on” support and therefore is more likely to repeat buy from a remote channel.

In terms of product categories we find that categories generally do influence a consumer’s channel choice and has a similar influence across the two segments. The exceptions are Categories 3 and 5 which do not affect channel choice for Segment 2 customers. Despite this, in general we find that relative to the base category, which is the most frequently bought category, there is a greater likelihood that a category will be purchased from the catalog or the internet than from the brick-and-mortar store.

Prior Purchase in Catalog or Internet (Model 2) Parameter Estimates

The parameter estimates and the standard errors for Model 2 are reported in Table 5. The parameter estimates of Model 2 reflect the probability that a customer whose prior purchase was in the catalog or internet channel will make his next purchase from the catalog or internet channels. The three-segment result indicates that 13% of the prior catalog or internet customers belong to Segment 3, 43 % belong to Segment 4, and 44% belong to Segment 5. Unlike the Model 1 results, fewer factors explain channel choice for customers whose prior purchase was from the catalog or internet. In fact, only the intercept ($\beta = -14.891$) is statistically significant for Segment 3 and it suggests that these customers are more likely to repeat buy from the brick-and-mortar channel than from the catalog or the internet. Because the other estimates are not statistically significant, we conclude that the channel choice decision for the 13% of the population whose prior purchase was from the catalog or internet can not be explained by the products that they buy, the price of those products, or their own stage in the customer lifecycle. Fortunately, for the majority of the prior internet or catalog customers (87%) this is not the case.

--Insert Table 5 about here--

Comparing the signs of the intercepts, we find that Segment 4 customers have a greater propensity to repeat-buy from the catalog or internet channels than Segment 5 customers ($\beta = 0.564$ for Segment 4 and $\beta = -8.5$ for Segment 5). Despite this difference, the channel choice decision for customers in Segments 4 and 5 are affected similarly with respect to their life cycle stage and the price of the products. Specifically, the results indicate that given a customer's prior purchase was in one of the remote channels, the further along a customer is in his lifecycle, the more likely he is to repeat-buy in the catalog or internet channels ($\beta = 0.123$ for Segment 4 and $\beta = 0.749$ for Segment 5). This result adds further support to our explanation regarding the outcome in Segments 1 and 2. Additionally, the higher the price of the item, the more likely the customer is to choose the catalog or internet channels ($\beta = 0.002$ for Segment 4 and $\beta = 0.359$ for Segment 5).

Product categories did not affect channel choice for Segment 5 customers. However, in Segment 4, relative to the base category, purchases from Categories 2 and 10 tend to drive customers to choose the retail channel over the catalog or internet channels ($\beta = -0.949$ for Category 3 and $\beta = -2.068$ for Category 19). Insights such as these are firm specific and can be used by the firm to manage product offerings and inventory across its channels.

1-Step Transition Matrix

Using the estimates from the models, the conditional probability of choosing to buy at time t in channel j given that the prior purchase was from channel q can be computed. The equation for computing the conditional probabilities is expressed in equation (1).

(1) $P(\text{channel choice} = j \text{ at time } t \mid \text{channel choice} = q \text{ at time } t - 1, \text{ customer is in segment } s) =$

$$\sum_{c=1}^C \left[P(\text{channel choice} = j \text{ at time } t \mid \text{channel choice} = q \text{ at time } t - 1, \text{ customer is in segment } s, \text{ product is in category } c) * \right. \\ \left. P(\text{product from category } c \text{ is purchased}) \right]$$

where

$price_c$ = the average price of an item purchased from category c

$category_c = 1$ if the product purchased is from category c

= 0 otherwise

C = total number of categories

α_s, β_s = the estimated parameters from segment s

As an example, the *1-step* transition matrix for customer Segments 1 and 4 is shown in Figure 2. This matrix assumes that customers are in the early stage of their lifecycles (i.e., 1 prior purchase occasion) and the price variable is set at the mean price for each product category. The first row in Figure 2 represents the probability of channel choice given that the current purchase is in the retail channel and the customer is in Segment 1. The second row in Figure 2 shows the probability of purchase given that the current purchase is in one of the remote channels and the customer is in Segment 4. The inference one can draw from these numbers is that if the customer's current purchase is in the retail channel, there is a higher probability (0.56) that his next purchase will be in the catalog or internet channels. Similarly, if the customer's current purchase is in one of the remote channels, there is a 0.61 probability that for the next purchase he will switch to the retail channel. On the surface this suggests that customers only have a moderate level of channel loyalty. However predictions beyond one future period are necessary in order to make this statement. This can be done with a t -step transition matrix which we discuss next.

--Insert Figure 2 about here--

Adding to this analysis, the third row in Figure 2 reports the marginal probability (i.e., unconditional probability) that in the next period, period (t+1), a customer will buy from either the retail channel or one of the remote channels. The general equation used to compute the segment specific marginal probabilities is expressed in equation (2).

$$(2) \quad P(\text{channel choice} = j \text{ at time } t \text{ and a customer is in segment } s) = \sum_{q=\text{all channel options}} \left[\begin{array}{l} P(\text{channel choice} = j \text{ at time } t \mid \text{channel choice} = q \text{ at time } t - 1, \text{ customer is in segment } s) * \\ P(\text{channel choice} = q \text{ at time } t - 1, \text{ and customer is in segment } s) \end{array} \right]$$

To compute the marginal probability from the conditional probability in our data we use the statistic in the data which is that 88% of the purchases at time t-1 (i.e., current purchases) are from the retail channel. Taking this into consideration, there is a higher probability (0.54) that in the next period a customer will buy from the catalog or internet versus the retail channel.

Forecasting Channel Migration

To develop long term customer management strategies in a multi-channel retail environment, firms can focus on the individual conditional probabilities in the *t-step* transition matrices. This approach is particularly useful when a firm knows details about an individual customer's current state – which channel they last purchased in. However if a firm is not knowledgeable about an individual customer, the marginal probabilities can be more helpful for deriving an aggregate level understanding of how customers migrate over time between the retail channel and the remote channels.

For illustration purposes we constructed transition matrices for 6 periods into the future³. For each of these matrices we computed the conditional probabilities and the marginal probabilities of repeat buying in the future from a given channel. The 6-period trajectory of marginal probabilities is presented in Figure 3. For this data, this figure reveals that initially looking forward, there is a significantly higher probability that a customer will make its next repeat purchase from the catalog or internet channels rather than from the retail channel (57.3% chance for catalog or internet vs. 42.7% chance for retail). However two periods into the future this tendency reverses itself. It is more likely that in two periods, the repeat purchase will occur in the retail channel (a 52.4% chance). Over the 6-period horizon the probabilities level out to a point where the difference in the probability of buying from retail versus remote is negligible (50.7% for retail versus 49.3% for remote). Thus for these data, customers may periodically switch between channels, but ultimately there is an almost equal chance that a customer will buy from the retail or a remote channel. Again we reiterate that these channel choice dynamics are segment specific and driven largely by the fact that the overwhelming majority of current purchases are from the retail outlet.

The Outcome of Customer Channel Migration

Once the patterns of channel migration are understood, firms can assess how they relate to customer profitability. We test for differences in the drivers of customer profitability by channel usage with multivariate analysis of variance (MANOVA). The four dependent response measures used in the MANOVA are: 1) *length of relationship*, which is measured as the number of months between the customer's first purchase and the last known purchase; 2) *purchase frequency* which is measured as the total number of purchase occasions; 3) *level of cross-buying*

³ The transition matrices for periods 2-6 are available upon request from the authors.

which is measured as the total number of distinct product categories that the customer purchased in over all purchase occasions; and, 4) *order dollars*, which is measured as the total amount of money spent across all purchase occasions. A MANOVA was used as opposed to four separate ANOVAs because of the potential for high correlation (correlations range between 0.213 and 0.729) between the response variables. The correlation matrix is shown in Table 6.

--Insert Table 6 about here--

As a benchmark, a second MANOVA was estimated to investigate whether there is a basic difference in customers that buy from one channel versus a customer who buys from multiple channels of the same retailer.

The results reported in Table 7 indicate that both MANOVAs are statistically significant. The means and standard deviations for all of the response variables are in Table 8. It is important to point out that the significance of the second MANOVA supports the claim that the key drivers of customer profitability are distinct for multi-channel buyers versus single channel buyers. The question that then follows is, "Are all multi-channel buyers the same with respect to the drivers of customer profitability?" Based on the significance of the first MANOVA, the answer to this question is no. The specific differences between customers who buy from different channel combinations are addressed through the contrasts.

--Insert Table 7 about here--

--Insert Table 8 about here--

Planned Contrasts

Table 9 details the results of the contrasts.

Single Channel Users: The first three contrasts compare a person who is a single channel purchaser from channel A versus a single channel purchaser from channel B. When comparing a

retail-only (R) customer to a catalog-only (C) customer or a retail-only customer to an internet-only customer (I), across all of the response measures there are significant differences. Specifically, the retail-only customer is active longer, purchases more frequently, buys from more categories, and spends more than a catalog-only or an internet-only customer. However based on the results from the third contrast, there is no difference in any of the behavior measures between the catalog-only and the internet-only customer. Thus the results for the single channel user can be summarized as $R > C = I$.

--Insert Table 9 about here--

Two Channel Users: The next three contrasts compare customers who buy from only two channels. In general these data indicate that a customer who buys from two channels is not the same as another customer who buys from a different pairing of two channels. When it comes to length of the relationship the group differences are always significant. Specifically, when retail is paired with the catalog (R+C) or when retail is paired with the internet (R+I), the relationships tend to be longer than a catalog plus internet customer (C+I). This suggests that the retail channel may be a driver of longer-lasting relationships. Interestingly, retail plus catalog customers tend to have longer relationship durations than a retail plus internet customers. Thus in terms of *length of relationship* our results can be summarized as $R+C > R+I > C+I$.

With respect to purchase frequency a C+I customer tends to buy more frequently than a R+C customer or a R+I customer. There is no difference in purchase frequency between a R+C customer and a R+I customer. Thus, it appears as though a customer who only buys remotely tends to buy more often than a customer who buys via the brick-and-mortar retail stores. In terms of *purchase frequency* our results can be summarized as $C+I > R+C = R+I$.

The only significant difference in the level of cross-buying is observed in the data is between the R+C users and the R+I users. In this instance, the R+C user buys from fewer categories than the R+I users (i.e., $R+I > R+C$). Additionally, the results show that $R+I=C+I$. From this result, one might conclude that $C+I > R+C$. However, the statistical test (Contrast 5) suggests that this is not the case. Instead $C+I = R+C$. This is an interesting finding because it shows that the property of transitivity may not always hold when it comes to the drivers of customer profitability and distribution channels. This outcome provides additional evidence for why firms should perform thorough investigations about multi-channel buyers.

The data also suggest that two channel users are very distinct with respect to the total amount of money that they spend. R+C customers spend more than any other two channel users. Additionally, C+I customers spend more than R+I customers. Thus in terms of *dollar amount* spent the results can be summarized as $R+C > C+I > R+I$.

Three Channel Users versus Two Channel Users: In this analysis (captured in Contrasts 7-9) we find general support for the assumption that *'the more channels that a customer buys from, the better the customer.'* A three channel user (i.e., R+C+I) is active over a longer period of time, purchases more frequently, buys from more categories and generally spends more than any two channel user. The one exception that we found in this data is with respect to the R+C customer. The R+C customer spends significantly more than a R+C+I customer (i.e., $R+C > R+C+I$). While this result warrants further testing, it is surprising and possibly disturbing for firms who operate online. Specifically this result suggests that once a customer becomes a multi-channel user, adopting the internet as a purchase channel does not enhance a consumer's spending amount. This outcome could be indicative of cannibalization between the retailer's

channels. In general, this result is consistent with the belief that “many firms rushed to establish an online presence with or without any guidance as to its effectiveness as a channel for their particular business” (Schoenbachler and Gordon 2002).

The results from all of the planned contrasts are summarized in Table 10. In general they suggest that all single channel buyers are not alike nor are all multi-channel buyers. Because of these differences it is even more important for a firm to understand how to anticipate and manage customer channel migration.

Managerial Implications

Channel Equity

As previously stated channel equity has both variable and fixed components. From a variable perspective, all of the revenues that the customer generates through a given channel and all of the costs that the customer generates as a result of using that channel are important in the measurement of channel equity. Knowledge about channel switching dynamics can be critical to forecasting the variable component of this metric because it can better inform a firm about where future revenues will likely come and costs will be incurred. This of course will lead to greater accuracy about the expected contribution of a particular channel to a firm’s overall profitability. In a market environment where companies are considering down-sizing and cutbacks, this type of insight could guide those decisions. Gateway’s choice to close its brick-and-mortar stores is an example of this kind of strategic decision.

In addition to the forecasting of channel equity, the management of channel equity can also be improved with insights about customer channel migration patterns. To see this, consider the issue of inventory management. Two critical components of operational expenses in retailing

are warehousing and shelf space. Warehousing costs affect all channels but can have a larger effect on a brick-and-mortar channel because the products need to be transported to numerous decentralized locations. Additionally, retail channels incur the expense of display or shelf space that the other two channels do not. With catalog and internet channels, a centralized warehouse is an option and “shelf space” is really more related to the number of pages in a catalog or on a website (both less expensive options to in-store display). Given these cost differences, any information that can guide a firm about where the customer is going to buy from can help to manage inventory and as a result the costs which affect channel equity.

Channel Expansion

A basic issue for supply chain managers is channel expansion. Under the topic of channel expansion are the questions of 1) *if* to expand and 2) *how* to expand. To address these questions, knowledge about customer migration is also beneficial.

The decision of whether to enter a new channel or not should be based on the degree to which customers will use the new channel and whether their usage behaviors are cost effective for the firm. Although the channel expansion is a new venture, a firm could benefit from industry level trends about customer migration patterns.

Once the firm decides to expand its channels, the decision of how to enter is one of “buying” versus “building” versus “borrowing.” Frequently managers choose the buy option when they want to quickly have better access to customers. An example of this could be seen with Sears Roebuck’s purchase of Lands’ End⁴. With the advent and growth of the internet, as well as the company’s desire to upgrade its garment business, Sears looked to Lands’ End highly

⁴ Sears had a long tradition in the catalog business. However, the company opted to close this aspect of their business in the early 90s.

lauded catalog and internet operations (Guy 2002). In buying the company, Sears was able to quickly tap into two channels that were highly complementary to its business. Thus in the case of Sears, knowledge of customer migration patterns provided insight about which channels may be attractive to buy into.

An alternative to buying a channel is building one. Building channels is the traditional method of accessing new customers or expanding services to current ones. One benefit of building a channel is that the firm has more control over how the channel is positioned to the customers relative to the other channels that it offers. Knowledge about customer migration patterns can aid in the positioning of a channel. For example, suppose that customers who are in the early stages of their lifecycle rarely use the internet channel. A firm could leverage this information and develop an internet site that is targeted mainly towards the needs of the more experienced customers.

Not all retailers have been successful in building their own alternative channels. For example, Dell Computer saw early disappointments (Wald 1994). Their disappointment came as they attempted to expand into the brick-and-mortar channel after its success in the catalog business. In hind sight, knowing the pattern of customer migration across channels, may have suggested to Dell that physical stores were not going to draw the traffic that their catalog and internet channels would generate.

Another example of a firm that was initially unsuccessful at building a channel is Wal-Mart (Tedeschi 2001). Wal-Mart faltered in its early attempts to build an internet channel. However, its insight about customers' channel switching behavior motivated the company to retrench in the late 90's and then re-emerge with a new online format a few months later.

In the case of Toys ‘R’ Us (and others since them), borrowing a channel has been their method of entering new markets. Specifically Toys ‘R’ Us decided to “borrow” Amazon’s expertise in the online channel as opposed to buying or continuing to build their own (Hof 2002). This strategy of establishing an alliance isn’t new conceptually, but it does offer a new way of thinking about how a retailer can reach new and current customers, particularly once customer channel migration patterns are known.

Communications and Product Offering

At a tactical level, knowledge about customer channel migration can also directly impact the communication and promotion efforts of a firm. In anticipation of future channel choices, a firm might position a specific message, or offer, in a specific channel. Taking this one step further, if a firm that has information about the sequence in which consumers adopt products (see for example Kamakura, Ramaswami, Srivastava 1991), it can even differentiate between the channels in which specific products are promoted and offered. This “tailored” communication and product strategy would assist in managing the cost component of the retailer’s channel equity.

Summary and Limitations

This analysis shows that understanding customer channel migration is critical for determining how multi-channel retailers should manage their business and their customers. The results of this research suggest that in terms of customer profitability drivers, a buyer from one combination of channels is not always more attractive to a firm than a buyer who buys from a different combination of channels. Thus, firms need to investigate their customers’ purchasing

patterns in order to uncover the important differences between customers' and their behavior in a multi-channel environment.

In multi-channel retailing, perhaps one of the biggest challenges for the retailer is the ability to measure and manage cross-channel influence (i.e., consumers who buy in one channel but are influenced by another). Shopping in one channel but buying in a different channel is an example of this phenomenon. This challenge is also a limitation of this research. This is a common problem with the transaction datasets that many firms collect. According to Doubleclick.net (2004), some businesses make their best estimate of this influence in lieu of accurate data. Despite this limitation, the types of managerial decisions that we discuss as being affected by customer migration information do not change.

A second limitation of this research is that customer migration is only modeled for existing customers. From a CRM perspective, how retail channels can be used to acquire customers is also important. Thus, future research should use data on prospects and successfully acquired customers and extend this analysis.

Despite the limitations, this research addresses several important issues regarding customer channel migration and the outcome of channel migration on the drivers of customer profitability. To our knowledge this is one of very few papers that provides both descriptive insights about customer's channel migration and presents an analysis framework from which firms can gain critical insights about channel migration. The benefit for firms in applying this type of analysis to their customer database is that they can better manage their channel equity and make more strategic and prudent channel management decisions.

Table 1
Customer Demographics

Channel	Dates of Coverage	Gender (%Male/Female)	Age (Most Frequent Age Range)	Income (%>\$50,000)
Retail Stores	09/97 – 07/01	61 / 36	35 - 39	63%
Catalogs	09/97 – 07/01	68 / 29	35 - 39	65%
Internet	11/00 – 07/01	61 / 35	30 - 34	60%

Table 2
Product Category Characteristics

Product Category	Description	Mean Price (\$)	Standard Deviation	% of Items Purchased
Base	Closet and Storage	\$ 7.10	8.93	0.50
1	Kitchen and Food Storage	\$ 6.68	7.41	0.11
2	Boxes and Gift Supplies	\$ 2.19	2.95	0.11
3	Hooks and Shelving	\$ 10.86	19.39	0.09
4	Bath	\$ 9.28	8.28	0.02
5	Trash	\$ 12.89	23.19	0.02
6	Tower only	\$ 5.72	5.62	0.02
7	Office	\$ 10.01	16.85	0.05
8	Collections	\$ 7.68	7.43	0.03
9	Christmas	\$ 4.07	3.41	0.04
10	Travel	\$ 7.64	17.96	0.03
Weighted Average		\$ 6.98		

Table 3
Model Selection

Model Selection for Model 1

	LL	AIC
Segment 1	-29021.88	0.8606
Segment 2	-28173.22	0.8359
Segment 3	-28169.19	0.8362

Model Selection for Model 2

	LL	AIC
Segment 1	-2845.45	1.3142
Segment 2	-2767.73	1.2849
Segment 3	-2727.04	1.2727
Segment 4	-2725.31	1.2783

Table 4
Model 1 Estimation Results

REPEAT BUYING GIVEN PRIOR PURCHASE IN RETAIL				
	SEGMENT 1		SEGMENT 2	
	Retail v.s. Catalog/Internet β (SE)		Retail v.s. Catalog/Internet β (SE)	
Retail Intercept	3.09 (0.14)	***	(0.15) (0.04)	**
Lifecycle	(1.56) (0.66)	***	(0.28) (0.13)	***
Price	(0.17) (0.62)	***	0.02 (0.11)	***
Category 1	(1.72) (0.08)	***	(0.14) (0.03)	***
Category 2	(1.76) (0.08)	***	(0.97) (0.05)	***
Category 3	(0.70) (0.07)	***	(0.03) (0.04)	
Category 4	(3.00) (0.31)	***	(1.26) (0.07)	***
Category 5	(1.78) (0.07)	***	13.48 (21.46)	
Category 6	(1.78) (0.07)	***	(0.48) (0.07)	***
Category 7	(1.77) (0.07)	***	(0.50) (0.05)	***
Category 8	(1.78) (0.07)	***	(0.25) (0.05)	***
Category 9	(1.78) (0.06)	***	(1.25) (0.07)	***
Category 10	(1.79) (0.08)	***	(0.46) (0.06)	***
Segment Size	0.61		0.39	

***: p<.01

**: p<.05

Table 5
Model 2 Estimation Results

	REPEAT BUY GIVEN PRIOR PURCHASE IN CATALOG OR INTERNET					
	SEGMENT 3		SEGMENT 4		SEGMENT 5	
	Catalog / Internet vs.		Catalog / Internet vs.		Catalog / Internet vs.	
	Retail β (SE)		Retail β (SE)		Retail β (SE)	
C / I Intercept	-14.89 (6.86)	**	0.56 (0.19)	**	-8.50 (30.54)	**
Lifecycle	-3.12 (94.74)		0.12 (0.55)	**	0.75 (11.54)	***
Price	0.14 (17.56)		0.00 (0.26)	**	0.36 (5.49)	***
Category 1	-108.90 (167.14)		67.65 (135.95)		20.47 (29.26)	
Category 2	78.84 (342.10)		-0.95 (0.15)	***	46.95 (29.71)	
Category 3	0.06 (3.30)		-0.20 (0.16)		-18.90 (87.88)	
Category 4	-122.54 (266.43)		58.51 (85.93)		-5.23 (7.12)	
Category 5	226.10 (234.21)		-124.15 (164.84)		20.76 (29.50)	
Category 6	226.09 (234.21)		0.97 (0.15)		-12.09 (27.03)	
Category 7	226.20 (234.21)		0.01 (0.20)		-49.92 (97.81)	
Category 8	228.09 (254.21)		0.01 (0.23)		-30.79 (83.63)	
Category 9	219.08 (239.21)		56.38 (132.65)		30.52 (29.36)	
Category 10	222.09 (242.21)		-2.07 (0.23)	***	46.87 (29.71)	
Segment Size	0.13		0.43		0.44	

***: p<.01

**: p<.05

Table 6

Dependent Measure Correlations

	Partial Correlations			
Length of Activity	1	0.440	0.333	0.213
Purchase Frequency		1	0.729	0.492
Total Categories Purchased in			1	0.515
Total Order Dollars				1

Table 7

Differences in Customers' Purchase Patterns

Independent Variables	MANOVA Results		Measures of Customer Purchase Patterns (F-Value Significance)			
	Wilks' λ	F-Value	Purchase Frequency	Level of Cross-buying	Total Order Dollars	Length of Activity
MANOVA 1: Specific Type of Channel	0.85	173.62****	****	****	****	****
MANOVA 2: Use of Multiple Channels	0.89	719.07****	****	n.s.	****	****

*** $p < .01$.

**** $p < .0001$.

n.s. = non-significant

Table 8
Behavioral Descriptives by Channel Usage
MEAN (SD)

Channel Usage	Sample Size	% of Population	Length of Activity (months)	(SD)	Purchase Frequency (# of occasions)	(SD)	Level of Cross-buying (# of categories)	(SD)	Total \$ Spent over Relationship	(SD)
Retail (R)	14,409	80.34	5.12	(9.7)	2.25	(2.4)	3.29	(2.2)	\$6,463	(59,468)
Catalog (C)	306	1.71	0.21	(1.5)	1.08	(0.3)	1.48	(0.7)	\$6,290	(48,473)
Internet (I)	536	2.99	0.12	(0.6)	1.12	(0.4)	1.70	(1.0)	\$2,040	(19,009)
R + C	1,684	9.39	8.39	(12.2)	2.56	(3.1)	2.87	(2.3)	\$33,181	(175,199)
R + I	802	4.47	6.86	(11.5)	2.59	(2.6)	3.39	(2.4)	\$10,762	(59,531)
C + I	46	0.26	2.02	(2.9)	3.20	(1.6)	3.26	(1.5)	\$12,987	(20,701)
R + C + I	153	0.85	13.67	(13.9)	4.68	(3.4)	4.37	(2.6)	\$25,181	(62,910)

Table 9
Significance of Planned Contrasts

Channel Comparison	Length of Activity	Absolute Difference in Means	Purchase Frequency	Absolute Difference in Means	Level of Cross-buying	Absolute Difference in Means	Total Spent over Relationship	Absolute Difference in Means
1. R vs. C	***	4.91	***	1.17	***	1.82	***	173.07
2. R vs. I	***	5.00	***	1.13	***	1.59	***	4,423.70
3. C vs. I	n.s.	0.09	n.s.	-0.04	n.s.	-0.22	n.s.	4,250.63
4. R+C vs. R+I	***	1.53	n.s.	-0.03	***	-0.52	***	22,419.05
5. R+C vs. C+I	***	6.37	***	-0.64	n.s.	-0.39	***	20193.85
6. R+I vs. C+I	***	4.84	***	-.61	n.s.	0.13	***	-2,225.20
7. R+C+I vs. R+C	***	5.28	***	2.12	***	1.50	***	-8,000.38
8. R+C+I vs. R+I	***	6.81	***	2.09	***	0.98	***	14,418.68
9. R+C+I vs. C+I	***	11.65	***	1.48	***	1.11	***	12,193.48

*** $p < .01$.

n.s. = non-significant

Table 10

Cumulative Summary of Planned Contrast

	Length of Activity	Purchase Frequency	Level of Cross-Buying	Total \$ Spent over the Relationship
Single Channel Buyer	$R > C = I$	$R > C = I$	$R > C = I$	$R > C = I$
Two Channel Buyer	$R+C > R+I > C+I$	$C+I > R+C = R+I$	$R+I > R+C$ and $C+I = R+C$	$R+C > C+I > R+I$
Three Channel Buyer vs Two Channel Buyer	$R+C+I > \text{any } 2$	$R+C+I > \text{any } 2$	$R+C+I > \text{any } 2$	$R+C+I > \text{any } 2$ except $R+C > R+C+I$

FIGURE 1

1- Step Transition Matrix

Template

		Next Period Purchase Channel	
		Retail	Catalog / Internet
Current Purchase Channel	Retail	a	1-a
	Catalog / Internet	1-b	b

Figure 2

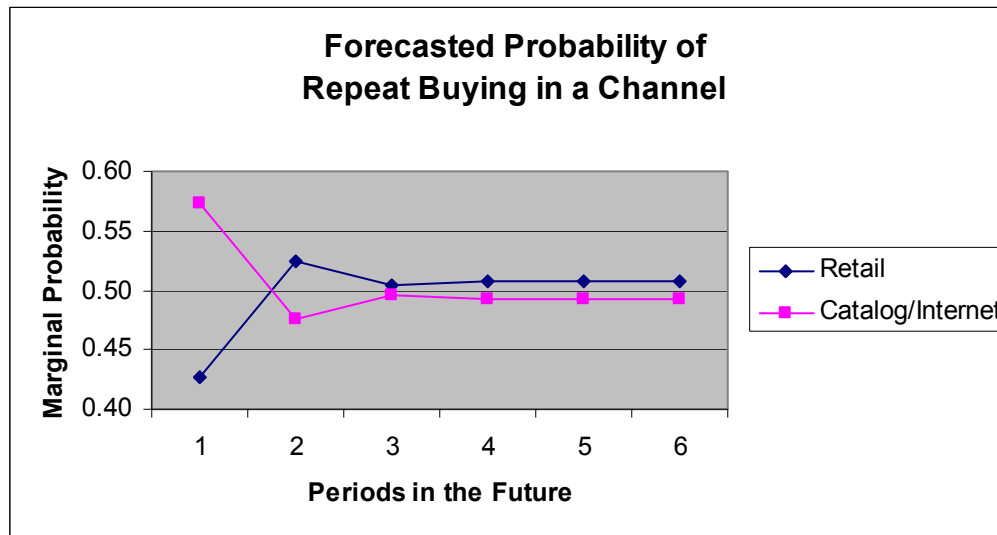
Estimated 1-Step transition Matrix*

		Next Period Channel	
		Retail	C/I
Current Channel	Retail	0.44	0.56
	C/I	0.61	0.39
Marginal		0.46	0.54

* This matrix assumes the following:

- A customer is in the early stage of his lifecycle
- Current retail customers are in Segment 1 and current C/I customers are in Segment 4
- Non-significant parameter estimates are assumed to equal zero.

Figure 3



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