CHANNEL POWER IN MULTI-CHANNEL ENVIRONMENTS

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Abstract	In the literature, little attention has been paid to instances where companies add an Internet channel to their direct channel portfolio. However, actively managing multiple sales channels requires knowing the customers' channel preferences and the resulting channel power. Two key components of channel power are (i) the existing customers' intrinsic loyalty to a channel, and (ii) the channel's ability to attract new customers. We apply the Colombo and Morrison (1989) model to analyze the channel loyalty and conquesting power of two direct channels operated by a given firm. In addition, we analyze the evolution over time in each channel's power, and test for differences in channel power among different product categories offered by the firm, and among different customer segments.	
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ABSTRACT

In the literature, little attention has been paid to instances where companies add an Internet channel to their direct channel portfolio. However, actively managing multiple sales channels requires knowing the customers' channel preferences and the resulting channel power. Two key components of channel power are (i) the existing customers' intrinsic loyalty to a channel, and (ii) the channel's ability to attract new customers. We apply the Colombo and Morrison (1989) model to analyze the channel loyalty and conquesting power of two direct channels operated by a given firm. In addition, we analyze the evolution over time in each channel's power, and test for differences in channel power among different product categories offered by the firm, and among different customer segments.

INTRODUCTION

Internet usage continues to grow in both the United States and all Western-European countries. This evolution is partly customer-driven, as customers' increased familiarity with the medium results in a growing level of e-business activity (see Sultan, Urban, Shankar, & Bart (2002), Jain Palvia & Vemuri (1999)). However, it is also due to the fact that more companies establish a web presence, with an increasing number of them also using their website as a medium to *sell* their products. Recent estimates indicate that over 50% of all US businesses already sell their products over the Internet (The Washington Post (2001)). As a consequence, more and more companies become multi-channel operators, confirming Frazier's (1999) observation that "the use of multiple channels is now becoming the rule rather than the exception" (p. 232). Still, most empirical channel research continues to have a single-channel focus. In a recent literature review on four leading marketing journals (*International Journal of Research in Marketing*, *Journal of Marketing*, *Journal of Marketing Research,* and *Marketing Science*), Geyskens, Gielens, & Dekimpe (2002) identified only one empirical study by Lehmann & Weinberg (2000) that looked at the performance implications of expanding one's channel portfolio, which led them to affirm Frazier's call for more *empirical* research on multiple-channel portfolios.

This call was answered in a number of recent studies. Geyskens et al. (2002) used event-study methodology to evaluate the stock-market reaction when newspapers add a (free) Internet-version to their portfolio. Deleersnyder, Geyskens, Gielens, & Dekimpe (2002) investigated the long-run cannibalization effects of such an Internet-channel addition on newspapers' sales and advertising revenues, and Biyalogorsky & Naik (2003) examined whether Tower Records' addition of an Internet sales channel cannibalized their traditional stores' sales. What these studies have in common is that they all considered the performance

implications of a company's newly established direct (on-line) channel on its traditional, brick-and-mortar, channels.

However, it is not clear to what extent the insights obtained from the above studies on Internet cannibalization still apply when the Internet channel is added to the channel portfolio of a company already selling its products through other direct channels that are also characterized by a minimum of personal interaction. An example is the Otto Combined Group (comprising the Otto Group, the North American Spiegel Group and various joint ventures) that was already specialized in catalog sales when it added www.shopping24.de (in 1997) and www.otto-office.com (in 2001) to its channel portfolio. In doing so, the company offered its customers an on-line-shopping mall and a website selling over 10,000 paper, office-supply and furniture items. Otto Combined Group's management presumes that e-commerce will make up to 20% of the Group's sales within the next 10 years (see Otto Combined Group (2002), p.19). Geyskens et al. (2002) speculated that such an channel addition is "less likely to attract new category demand and more likely to cause channel shift or cannibalization" (p. 106, see also Ward & Morganosky (2000)). Still, Otto Combined Group's management is confident that the complementary nature of its different direct channels will create positive synergy effects.

Moreover, increased channel shift among the different direct channels a company owns is not necessarily detrimental, and may be better labeled as channel *substitution*, which has a less negative connotation than channel cannibalization. Indeed, channel conflict is less likely to occur, as the redistribution of revenues or profits becomes an intra- rather than an inter-organizational issue, which is easier to solve through appropriate incentive schemes (see Coughlan, Anderson, Stern, & El-Ansary (2001), p. 257; Anderson, Lodish, & Weitz (1987)). In addition, it may become feasible for the company to exploit marginal cost and revenue effects of the various sales channels by actively stimulating the substitution of one channel

for another (see Anderson & Coughlan (2002), p. 223; Coughlan et al. (2001), p. 461). The Otto Combined Group, for example, is very confident that its costs will decline further if customers continue to migrate from paper-based mail orders to online ordering (see Otto Combined Group (2002)).

Actively managing multiple sales channels requires knowing the customers' channel preferences (see Reardon & McCorkle (2002); Schoenbachler & Gordon (2002)). Otherwise, unwanted effects like customer dissatisfaction and churn may occur when customers are too aggressively addressed to switch from their preferred channel to another one. A key component of customers' channel preference is their intrinsic loyalty to that channel. Not only is channel loyalty a main driver of the channel's long-term viability (see Krishnamurthi & Raj (1991)), it will also provide management with an indication on how easy it will be to make customers switch from its other direct channel(s) towards the by the company preferred (new) channel. Similarly, the channel loyalty of customers that have already made the transition will offer key information on the investments needed to prevent them from switching again.

However, channel loyalty is only one component of a channel's performance. Channel choice is often characterized by a substantial amount of dynamism (e.g., because competitors also introduce new channel options, because some incumbent channel attributes change, etc.) (see Lee, Zufryden, & Dreze (2003)). Moreover, some customers may not have a strong intrinsic preference for one specific channel, and occasionally (or even regularly) switch among different channel formats. Nevertheless, the ability of a given channel to keep a large fraction of its existing customers is not sufficient for long-run growth or viability, as this customer base will eventually get eroded (see Steenkamp & Dekimpe (1997)). Therefore, a second key characteristic for a channel's performance is its ability to attract these switching customers.

In this paper, we apply the well-known Colombo/Morrison model (see Colombo & Morrison (1989)) to decompose the observed switching behavior among a company's different direct channels into *(i)* customers' intrinsic loyalty to a particular channel and *(ii)* that channel's ability to attract potential switchers. Even though the Colombo/Morrison model has been used before to analyze the switching behavior among consumer durables (e.g., Bayus (1992); Colombo & Morrison (1989)) and various frequently purchased consumer goods (e.g., Bultez (1990a); Bultez (1990b); Dekimpe, Steenkamp, Mellens, & Abeele (1997); Steenkamp & Dekimpe (1997)), we are the first to extend its application area to a multi-channel context. Furthermore, we contribute to the current research in three more aspects.

We will examine the customers' channel preference by analyzing their channel loyalty and switching behavior. However, to determine how successful a new channel becomes, and to assess whether management is indeed able to steer channel choice into the desired direction, a one-shot analysis is not sufficient (see Steenkamp & Dekimpe (1997); Moore & Winer (1987)). Therefore, a second contribution of the paper will be to also consider whether channel preferences change over time.

Third, many companies sell multiple product categories. For example, Barnes&Noble sells books as well as electronic media, and the Otto Combined Group offers a wide assortment like clothing, furniture and electronics. However, not all product categories are equally suited to be sold over a particular channel (e.g., Inman, Shankar, & Ferraro (2002), Morrison & Roberts (1998); Liang & Huang (1998); Ward (2001)) and to build channel loyalty. Therefore, it is important for a company offering multiple product categories to know which categories are better suited to be sold over a particular channel and whether specific categories tend to be more affected by channel switching. Knowing the product-channel

association may help the company to improve its performance, since it allows to better tailor the assortment to the different channels.

Finally, some customer segments may be more easily induced to switch channels than others. Specifically, light users may be more likely to attribute their channel choice to external causes than to an internal cause such as their intrinsic preference for that channel (see Lim, Currim, & Andrews (2003) for a similar argumentation in the context of brand loyalty). It is important for targeting purposes to know whether there are indeed such differences between light and heavy users.

The remainder of the paper is organized as follows: Section 2 outlines the research methodology used to address our four research questions. Section 3 describes the data set, and empirical results are given in Section 4. Section 5 provides conclusions, limitations of the present study, and areas for future research.

METHOD

We use the model by Colombo & Morrison (1989) to examine the customers' channel loyalty and inter-channel switching behavior. The model is based on the assumption that there are two groups of customers:

- Customers who are intrinsically loyal and stay with the same sales channel, called *hard-core loyals,* and

- Customers who potentially switch from one channel to another on every purchase occasion. They choose between the available sales channels according to a zero-order process. We refer to those customers as *potential switchers*.

All potential switchers are assumed to have the same probability to use a specific sales channel, but this probability may differ across channels. The fraction of loyal customers and

the potential switchers' choice probability are linked to the elements of the observed switching matrix (which describes the channel transitions on subsequent purchase occasions), through:

$$p_{ii} = \alpha_i + (1 - \alpha_i) \cdot \pi_i \qquad i=1, 2, ..., I \qquad (1)$$

$$p_{ij} = (1 - \alpha_i) \cdot \pi_j \qquad i,j=1, 2, ..., I \qquad (2)$$

where

$p_{ii}, (p_{ij})$:   conditional probability that a customer who last used channel i will next use channel i (j) ($i,j = 1, 2, …, I$),

α_i: fraction of channel's i current customers who are completely loyal to that channel ($i = 1, 2, …, I$),

$\pi_i, (\pi_j)$:   fraction of potential switchers who will next use channel i (j), with $\sum_{i=1}^{I} \pi_i = 1$.

Equation (1) shows that not every repeat use of a particular channel comes from a customer intrinsically loyal to that channel. Indeed, also a zero-order buyer may end up making two (or more) consecutive purchases from the same channel. In contrast, every observed channel switch comes from the group of potential switchers. Even though α_i and π_i both vary between 0 and 1, there is no simple relation between the two, because they refer to a different base. The former is based on the fraction of the current users of a particular channel that is intrinsically loyal, while the latter refers to a fraction of the total number of switchers in the market.

To accommodate customers who did not use any channel within the considered time interval, a 'no purchase' option is introduced (see Chiang (1991) or Colombo & Morrison (1989) for a similar practice). The corresponding α_0 denotes what fraction of the potential customer population can be considered as *hard-core non-users*, while π_0 measures the probability that a potential switcher opts to not use any of the company's channels in a given period.

The estimation of the parameters is based on the following LogLikelihood function:

$$LL = \sum_{i=1}^{I} n_{ii} \cdot p_{ii} + \sum_{i=1}^{I}\sum_{\substack{j=1 \\ j \neq i}}^{J} n_{ij} \cdot p_{ij}$$

$$= \sum_{i=1}^{I} n_{ii} \cdot \left[\alpha_i + (1-\alpha_i) \cdot \pi_i \right] + \sum_{i=1}^{I}\sum_{\substack{j=1 \\ j \neq i}}^{J} n_{ij} \cdot \left[(1-\alpha_i) \cdot \pi_j \right] \qquad (3)$$

where

n_{ii}: observed number of customers who use channel i on two subsequent purchase occasions,

n_{ij}: observed number of customers who last used channel i and switch to channel j.

To take left-censoring of the data into account, a certain time interval of the observed time span is used for initialization purposes. Specifically, to determine whether the first order in a given time interval was a 'repeat use of a particular channel' or a 'channel switch', we compare the channel currently used to the channel used for the last order in this initialization period (see Steenkamp & Dekimpe (1997) for a similar practice).

DATA DESCRIPTION

Data are available on about all customers (1.5 million) of a large European home-shopping TV station. The company owns two direct channels: a call center and, as of spring 2000, an Internet channel.

Customers have two possibilities to purchase a product. First, they can watch TV shows featuring (a subset of) the company's products. The company alternates between a number of shows, which each focus on specific product categories such as cosmetics or jewelry. The shows are broadcasted 15 hours/day through a special channel owned by the company. In addition, the company leases airtime on an hourly basis from a variety of private TV stations. During the shows, the call center's phone number is displayed, where customers can place their order. No catalog is being distributed. As a consequence, only products that were recently covered in the TV shows are prominent in the potential customers' mind, and not

surprisingly most orders are placed very shortly after the product was featured in a show, which is in line with the findings by Tellis, Chandy, & Thainvanich (2000).

The Internet channel, which is comparable in conceptualization to www.amazon.com and a variety of other e-commerce websites, differs from the call center in a number of aspects. On the one hand, the Internet channel offers the company's complete assortment at all times. This allows for more cross-selling opportunities, and should result in a more evenly spread sales pattern over time. Moreover, when using the Internet channel, customers are no longer confronted with the waiting lines encountered when all call-center operators are busy serving other customers (Forsythe & Shi (2003)). Most importantly, the cost per order acceptance is substantially lower when customers are using the Internet channel. For that reason, the company's management has a strong preference to migrate customers from its call center to its Internet channel. Management feels such a channel substitution should be feasible, as both channels share a number of common features (see Ward (2001), Dholakia & Uusitalo (2002)): they both (*i*) tend to involve credit-card payment, (*ii*) present products via a screen, and (*iii*) do not offer customers the opportunity to physically examine and experience products prior to the purchase (see Forsythe & Shi (2003), p. 869). However, management currently has little prior knowledge on the preference structure of its customer base, and does not know whether both channels are comparable in terms of channel loyalty, nor whether both channels are equally effective in attracting potential channel switchers.

Data were available for 15 consecutive months from January 2001 until March 2002, of which we use three months for initialization purposes. As indicated in Table 1, the overall number of transactions is decreasing (-2.87%). However, the number of transactions conducted on the Internet channel is gradually increasing, in both absolute and relative terms.

INSERT TABLE 1

The company sells a huge range of products. Every year, about 10,000 new SKUs are introduced. The assortment consists both of products that are regulars (like particular cosmetic products) and a large number of products that are only sold temporarily, and which can be characterized as special offers (like particular pieces of jewelry). The most frequently-purchased product categories are housewares (53.2%), cosmetics (12.5%) and jewelry (10.3%). Those are also the categories that receive most airtime. Each of those categories has been argued in prior research to be quite suited to be sold over the Internet, which should facilitate the hoped-for channel migration (e.g., Vishwanath & Mulvin (2001); Machlis (1998); Takacs & Freiden (1998)).

Most of the products are (semi-)durables; as a consequence, consumption occurs over an extended period of time. The average (overall) interpurchase time in our dataset is 21 days. When focusing on purchases within specific product categories, the average interpurchase times become 73 days for cosmetics, 71 days for housewares to 40 days for jewelry.

For every order placed between January 2001 and March 2002, the following information was available: the customer's identification number, every SKU that was bought, its product category, the channel through which the order was placed, and the timing (day and hour) of the order. As indicated before, the first three months are used for initialization purposes. To account for the "no purchase" option when constructing the aggregate switching matrix across channels, we considered the number of German households. We focused on the number of German households as these constituted the vast majority of our company's customer base. A similar phenomenon was mentioned by Biyalogorsky & Naik (2003), where US customers still accounted for almost all Internet sales of Tower Records.

EMPIRICAL FINDINGS

Our results indicate that a substantial fraction (84.32%) of the call center's current customer base has an intrinsic preference for that channel, which suggests that the hoped-for channel migration may not be realized that easily (Table 2). Therefore, management may need to take a more pro-active role in promoting and stimulating channel migration, as opposed to its current practice of only mentioning the existence of its Internet channel.

INSERT TABLE 2

Moreover, of those customers who made their previous purchase through the Internet, a significantly smaller fraction ($p < 0.05$) seems to be loyal to that channel (66.42%). In addition, the Internet channel's ability to attract potential switchers is quite low (4.4%), and much smaller than the conquesting power of the call center (66.01%). One might argue that the superior performance of the latter channel is not surprising, as it represents the company's well-established incumbent channel (see Dholakia & Uusitalo (2002)), which has a considerably longer history than the more recent Internet channel.

This raises the question whether the Internet channel's performance is at least improving over time, and if so, how this development relates to the performance evolution of the other channel. To that extent, we performed a split-half analysis, resulting in the loyalty and conquesting power estimates reported in Table 3. In both time periods, the loyalty and conquesting-power (i.e. its ability to attract potential switchers) estimates of the call center were significantly higher ($p < 0.05$) than the comparable estimates for the Internet channel.

INSERT TABLE 3

Interestingly, however, the customers' intrinsic preference decreases for both channels over time. This decrease supports the notion that customers increasingly tend to become multi-channel shoppers (e.g., Nicholson, Clarke, & Blakemore (2002), Schoenbachler & Gordon

(2002)). While the drop in the call center's loyalty may not be surprising - as the company hopes to see more channel migration towards the more profitable Internet channel -, it is quite disturbing that also the Internet channel fails to improve or even maintain its loyalty level (-6.52%). Even less comforting is the observation that also the call center's conquesting power decreases over time (-6.02%), and that this decrease is not compensated by a comparable increase in the Internet channel's ability to attract floating customers (-0.06%). Overall, this result suggests that the fraction of non-loyal customers that opts to use neither of the firm's channels (i.e. $\pi_0 = 1- \pi_1- \pi_2$) increases over time, from 52.8% to 58.9%. This observation, based on behavioral data, differs from the findings of Shankar, Smith, & Rangaswamy (2003), who found that the use of an on-line channel results in a higher *stated* customer loyalty.

As the company is faced with customer churn, the question becomes whether there are product categories that are better suited to be sold over the Internet channel, in order to result in higher channel (and subsequently firm) loyalty, and/or to prevent "floating" customers in these categories from migrating to the no-purchase option. We focus on the aforementioned three key product categories of the company's assortment. Even though it has been argued that each of those categories is particularly suited to be sold over the Internet (see Takacs & Freiden (1998), Vishwanath & Mulvin (2001)), prior studies used traditional brick-and-mortar stores as benchmark. Therefore, it is less clear to what extent the Internet has any further (dis)advantages over a TV-supported call center for some of those product categories. In line with the aforementioned more aggregate findings, we find that the call center's intrinsic loyalty is even, in every category, significantly ($p < 0.05$) higher than for the Internet (see Table 4).

INSERT TABLE 4

However, when we compare the channel loyalty estimates across the various categories, we note a significantly *(p < 0.05)* higher intrinsic preference for the Internet channel among buyers of cosmetics (75.98%), while the Internet channel also has a significantly ($p < 0.05$) higher conquesting power for this category (5.13%), which is in line with the findings of Kim (2002), and which is also consistent with the success of Estee Lauder's www.clinique.com (see Machlis (1998)).

According to Kim (2002), jewelry is getting more popular to be sold over the Internet (see Kim (2002), p. 596), which is confirmed in a subsequent split-half analysis on that category: the fraction of customers having an intrinsic preference for buying jewelry over the Internet increases significantly *(p < 0.05)* over time, i.e. from 43.84% to 56.96%.

Finally, we investigate whether heavy users are more loyal to a particular channel. In line with previous research (see Neslin, Henderson, & Quelch (1985), Lim et al. (2003)) we define heavy (light) users as those customers whose average monthly purchase quantity is above (below) the median monthly purchase quantity in the initialization period (in our case 3 months). Heavy users indeed have a greater intrinsic preference for both sales channels. Not surprisingly, also the fraction of churning customers that will migrate to the undesirable no-purchase option is significantly smaller among heavy users than among light users.

INSERT TABLE 5

IMPLICATIONS AND LIMITATIONS

Several implications arise from our analyses. First, we find that the incumbent channel is still, by far, the dominant channel in the company's channel portfolio. A more pro-active approach using, for example, some of the marketing tactics described in Ansari, Mela, & Neslin (2003) seems to be needed to enhance the migration to the less cost intensive Internet channel. This more proactive approach may be especially needed to convince the call center's heavy users

to migrate to the Internet, as they were found to have a considerably higher intrinsic preference for the more established channel.

A migration to the less cost intensive Internet channel may well become a do-or-die issue for the company, as its customer base is gradually eroding. While the decline in both channels' loyalty supports the common observation that more customers become multi-channel shoppers, it is especially worrying that the call-center's diminished ability to attract "floating customers" is not compensated by a comparable increase in conquesting power for its Internet channel. This may require a rethinking of its Internet channel's design (which is beyond the scope of the current study), a more pro-active customer attraction/retention program, or a reconsideration of the assortment it is offering through its Internet channel. Indeed, even though all considered product categories (cosmetics, jewelry and housewares) have been argued to be well suited to be sold over the Internet, we found that especially customers buying cosmetics had a much higher intrinsic loyalty to the Internet channel, while that channel was also able to attract a higher fraction of the potential channel switchers among the cosmetics buyers. In addition, the channel loyalty among customers who used the Internet to buy jewelry was found to be rising over time, in contrast to the overall (i.e. across product categories) decrease in channel loyalty that was observed.

As with any empirical study, also the current research has a number of limitations, which offer useful areas for future research. First, no data were available on the extent of the firm's current marketing expenditures in general, and on its efforts to stimulate channel migration specifically. In addition, the behavior of hard core loyal customers and potential switchers was studied through a split-half analysis. If a longer time span had been available, a deterministic or stochastic trend regression as in Dekimpe et al. (1997) would have been feasible. Second, only one company was studied, and further research is needed to see whether, and in what conditions, our substantive findings such as which product categories

(customer segments) are more suited to be sold (approached) over the Internet, can be generalized to other firms that add an Internet channel to their direct channel portfolio. Third, we used the Colombo/Morrison model to study the preference structure of the company's customer base. Even though this is a simple, yet well-established, model, it is purely based on observed data. A more complete description would be obtained by considering both attitudinal and behavioral data.

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TABLE 1
Number of transactions

	Month 4-9	Month 10-15	Difference
Call center	3,744,129	3,619880	-3.32%
	(97.0%)	(96.5%)	(-0.5%)
Internet	116,924	130,535	+11.64%
	(3.0%)	(3.5%)	(+0.5%)
Total	3,861,053	3,750,415	-2.87%

TABLE 2
Fraction of hard core loyal customers and potential switchers

Fraction of hard core loyal customers*	
Call center	84.32%
Internet	66.42%

Fraction of potential switchers*	
… who will next use the call center	66.01%
… who will next use the Internet	4.40%

* Differences are significant ($p < 0.05$)

TABLE 3
Split-half analysis

	Fraction of hard core loyal customers**		Fraction of potential switchers**	
	Call center	Internet	… who will next use the call center	… who will next use the Internet
Months 4-9	79.91%	59.42%	44.45%	2.75%
Months 10-15	74.74%	52.90%	38.43%	2.69%
Difference	-5.17%*	-6.52% *	-6.02% *	-0.06% *

* Differences are significant ($p < 0.05$)
** Differences between call center and Internet users are significant ($p < 0.05$)

TABLE 4
Fraction of hard core loyal customers related to product categories

		Fraction of hard core loyal customers**		Fraction of potential switchers**	
		Call center	Internet	… who will next use the call center	… who will next use the Internet
Product category*	Housewares	98.13%	55.45%	82.25%	3.12%
	Cosmetics	78.78%	75.98%	69.71%	5.13%
	Jewelry	86.47%	54.65%	93.31%	1.65%

* Differences between product categories are significant ($p < 0.05$)
** Differences between call center and Internet users are significant ($p < 0.05$)

TABLE 5
Fraction of hard core loyal light and heavy users

		Fraction of hard core loyal customers**		Fraction of potential switchers**	
		Call center	Internet	… who will next use the call center	… who will next use the Internet
Customer segment*	Light user	69.97%	62.16%	55.77%	3.67%
	Heavy user	92.47%	72.73%	94.38%	5.62%

* Differences between customer segments are significant ($p < 0.05$)
** Differences between call center and Internet users are significant ($p < 0.05$)

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