Are Private Label Users Attractive Targets For Retailer Coupons?

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Abstract

Brand-nonspecific retailer coupons that entitle customers to assortment-wide discounts appeal in similar ways to national brand (NB) and private label (PL) users. The latter may be considered an attractive target group because they express high levels of deal proneness. However, it is unclear how assortment-wide retailer coupons affect customers' purchase behavior. In particular, nothing is known about how PL users behave during coupon promotions. The authors deal with these issues by conducting a large-scale field experiment (N=28,000). They find that assortment-wide coupons increase both segments' (PL vs. NB users) profitability but that the route to increased profitability is different for the two groups. In the group of PL users, segment-level profitability is mainly driven by additional customers who would not have made a purchase in the absence of the promotion. On the contrary, in the segment of NB users, individual profitability increases because customers trade up to more expensive brands and/or products. Based on the differences in response behavior, the authors derive segment-specific managerial recommendations and emphasize that different promotional aims should be associated with PL and NB users.

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1. **Introduction**

During the last decade, the importance of retailer coupons has increased considerably. In the UK and Germany, retailers' share of coupon distribution has overtaken that of manufacturers (Deutsche Post, 2007; Valassis, 2008). The reason for this is that retailer coupons enjoy great popularity within loyalty programs. Retailers increasingly use mail-order coupons to give their loyalty program members an incentive to visit their stores and increase their expenditures (Lewis, 2004). The Coupon Council of the Promotion Marketing Association (2007) reports that by 2004, nearly half of US retailers offered some form of a bonus coupon program.

Retailers often use brand-nonspecific coupons that offer assortment-wide discounts. These coupons mention the retail brand and offer a percentage discount or fixed savings on some or all items, thus entitling consumers to choose the items to be promoted. Examples include promotions such as "10% off one item of your choice," "10% off your next purchase," and "$5 off your next grocery purchase above $50". Such coupons promise increases in store traffic and customer profitability because they reduce the price of the whole assortment and because it is likely that customers use this income effect to switch to more valuable and/or higher-margin items. However, these types of coupons also introduce the risk that customers will either choose lower-margin items or not change their choice behavior at all; in either case, the coupon will decrease customer profitability. Therefore, retailers are interested in the careful identification of profitable target groups.

Brand-nonspecific, assortment-wide coupons do not promote a specific brand; this feature distinguishes them from manufacturer coupons, which promote national brands. Due to their assortment-wide validity, these coupons appeal in similar ways to the segments of national brand (NB) and private label (PL) users. The latter could be an attractive target for

retailer coupons because their profile resembles that of coupon-prone consumers (Schindler, 1989; Swaminathan & Bawa, 2005), making it likely that they will be particularly responsive to coupons. Additionally, PL users buy high-margin PLs and are thus regarded as profitable targets. On the other hand, they typically have tight budget constraints (Ailawadi, Neslin, & Gedenk, 2001; Richardson, Jain, & Dick, 1996), which may hamper incremental expenditures. Also, PL users are marked by the intention to shop smart (Garretson, Fisher, & Burton, 2002), so they may switch to NBs during promotions, thus potentially causing a loss of contribution margin. Hence, it is unclear whether PL users are attractive targets for retailer coupons.

The couponing literature focuses mainly on manufacturer coupons (e.g., Bawa & Shoemaker, 1987; Dhar, Morrison, & Raju, 1996; Krishna & Zhang, 1999), with the effect that knowledge regarding assortment-wide retailer coupons is limited. Similarly, because the literature only discusses the concepts of PL and coupon use separately, nothing is known about how PL users behave during price promotions in general and coupon promotions in particular. It is the intention of this study to explore the effectiveness and profitability of brand-nonspecific, assortment-wide retailer coupons. Of particular interest is how these coupons affect customers' purchase behavior at varying discount levels and whether PL and NB users differ in their promotional responses. These issues are addressed via a large-scale field experiment (N=28,000) conducted in cooperation with a retail chain that runs about 100 department stores. During the experiment, mail-order coupons offering percentage-off assortment-wide discounts were sent to PL- and NB-prone customers enrolled in the retailer's loyalty program. Six treatment groups were selected per segment (PL vs. NB users) and addressed with face values between five and ten percent. A key difference between this and previous studies on manufacturer coupons is that this study focuses on store-wide outcome measures per customer (e.g., the probability of making a purchase, average basket size, total

customer profits) rather than on measures related to a specific brand. This focus enables us to analyze whether assortment-wide coupons fulfill their strategic aims, i.e., whether they generate store traffic and induce positive basket size, up-trading, and profitability effects and derive recommendations concerning coupon design, strategy, and target selection.

An important insight from the field experiment is that retailer coupons increase the overall profitability of both customer segments under study. However, the route to increased profitability is very different for the two segments because PL and NB users differ significantly in their reactions to coupon promotions. In the segment of PL users, segment-level profitability is mainly driven by additional purchases made by customers who would not have visited the store in the absence of the coupon promotion. On the contrary, in the segment of NB users, individual margins increase because customers tend to switch to more expensive items. Furthermore, we find that the PL segment responds more negatively to face value reductions than does the NB segment.

This article is organized as follows. In the next section, a profitability model is presented and hypotheses regarding the behavioral effects of retailer coupons are derived. The hypotheses are subsequently tested based on the field experiment outlined above. The paper closes with managerial implications and directions for further research.

2. Behavioral effects of retailer coupons

2.1 Incremental coupon profitability

A coupon creates positive incremental profits when customers generate higher profits during the promotion than under regular conditions. Therefore, incremental profit per

responding customer (i.e., where $Q_{ig}^{c} > 0$) is equal to the profit generated during the coupon promotion minus the baseline profits that would have been achieved in the absence of the promotion and minus the cost of the mailing:

$$\mathrm{E}\left[\Delta\pi_{ig} \mid v, Q_{ig}^{c} > 0\right] = \mathrm{E}\left[Q_{ig}^{c} \mid v, Q_{ig}^{c} > 0\right] \cdot \mathrm{E}\left[\overline{m}_{ig}^{c} \mid v, Q_{ig}^{c} > 0\right] - MC - \mathrm{E}\left[Q_{ig}^{b} \mid Q_{ig}^{b} > 0\right] \cdot \mathrm{E}\left[\overline{m}_{ig}^{b} \mid Q_{ig}^{b} > 0\right] \quad (1a)$$

with

$$Q_{ig}^{c}(\mathrm{v}) = Q_{ig}^{r}(v) + Q_{ig}^{s}(\mathrm{v}) \quad (1b)$$

$$\overline{m}_{ig}^{c} = \frac{\sum_{r=1}^{Q_{ig}^{r}} \left(p_r(v) - w_r - v \cdot p_r(v)\right) + \sum_{s=1}^{Q_{ig}^{s}} \left(p_s(v) - w_s\right)}{Q_{ig}^{r}(v) + Q_{ig}^{s}(v)} \quad (1c)$$

$$\overline{m}_{ig}^{b} = \frac{\sum_{b=1}^{Q_{ig}^{b}} \left(p_b - w_b\right)}{Q_{ig}^{b}} \quad (1d)$$

where:

$\Delta\pi$	:	incremental profit,
Q	:	purchase quantity,
v	:	coupon face value in percentage,
$\overline{m}$	:	average contribution margin,
MC	:	fixed cost per mailing,
p	:	retail price,
w	:	wholesale price,
i	:	index of customers,
g	:	index of customer segments, g=1 for NB users, g=2 for PL users,
c	:	indicates purchases during a coupon promotion,
r	:	indicates purchases with coupon redemption,
s	:	indicates purchases during promotion period without coupon redemption,
b	:	indicates baseline purchases (during regular non-promotion periods).

Incremental profits per individual customer build the basis for the overall segment-level (NB vs. PL users) profitability of the coupon promotion. This measure also includes the coupons' effects on customers' purchase probability and is given as follows:

$$E\left[\Delta\pi_g \mid v\right] = \Pr(Q_{ig}^c > 0 \mid v) \cdot N_g \cdot \left(E\left[Q_{ig}^c \mid v, Q_{ig}^c > 0\right] \cdot E\left[\overline{m}_{ig}^c \mid v, Q_{ig}^c > 0\right] - MC\right) \quad (2)$$

$$- \Pr(Q_{ig}^b > 0 \mid v) \cdot N_g \cdot \left(E\left[Q_{ig}^b \mid Q_{ig}^b > 0\right] \cdot E\left[\overline{m}_{ig}^b \mid Q_{ig}^b > 0\right]\right)$$

where *N* symbolizes the number of targeted customers (i.e., the number of direct mailings). It is important to note that customers do not redeem coupons with every purchase during the promotion and that a coupon may positively affect customers' purchase behavior even if it is not redeemed. This may be explained by a coupon's advertising value and its positive effect on (retail) brand awareness (e.g., Leone & Srinivasan, 1996). Moreover, coupons might be valid only for a limited number of items. If a customer's purchase quantity exceeds this limit, he will generate some purchases with and some without coupon redemption. Accordingly, the purchase quantity Q_{ig}^c and the average contribution margin $\overline{m}_{ig}^c$ during coupon promotions are based on purchases with and without coupon redemption (Equations 1b and 1c). The contribution of a purchase with redemption is ceteris paribus lower because the discount is directly subtracted from the retail price and thus reduces the margin. All decision variables included in Equations (1a) to (2) vary with the coupon's face value. This is based on prior research, which shows a strong effect of face value on redemption probabilities and incremental sales (Bawa & Shoemaker, 1987; Bawa, Srinivasan, & Srivastava, 1997).

The equations above highlight how customers' purchase decisions translate into profitability and that three major factors determine a coupon's influence on customer- and segment-specific profitability. First, the coupon may affect quantity decisions. Positive basket size effects appear when customers buy more items during promotions than under regular (baseline) conditions. Second, the coupon may affect brand and/or product category choice and consequently the average margin per item. It is possible that coupons induce up-trading effects, meaning that they cause customers to switch to higher-priced brands and/or product categories. Up-trading can have positive and negative effects on profit margins depending on

the products bought previously. For instance, if the coupon induces the substitution of PLs for second- or third-tier NBs, it might decrease customer profitability because margins are typically highest for PLs and premium NBs. A third factor apparent in Equation (2) is the incremental purchase probability. If the coupon increases the likelihood that customers make a purchase, it causes a traffic effect, which ceteris paribus leads to positive incremental profits generated by additional customers who would not have visited the store in the absence of the promotion.

2.2 Hypothesis development

Purchase probability. Previous research concerning retailer coupons is sparse; only three studies deal with coupons in service environments. Chapman (1986) and Taylor (2001) focus on restaurant coupons, while Heilman, Nakamoto, and Rao (2002) address unexpected in-store coupons at a grocery store. Chapman (1986) estimates a sales response model and shows that coupons increase the sales revenues generated by the households living in the restaurant's trading area. However, because he reports aggregated figures, it remains unclear whether incremental sales stem from an increased number of households visiting the restaurant or from higher expenditures per visit. Taylor (2001) concentrates on redemption behavior and observes a redemption probability of 12.5 percent (N=984). This value is much higher than those obtained in manufacturer coupon settings, where average redemption probabilities typically fall below three percent (Bawa, 1996; Swaminathan & Bawa, 2005). Because assortment-wide retailer coupons—issued, for example, by grocery or department stores—appeal to a broader audience than do restaurant coupons, we expect to observe even higher purchase and redemption probabilities in this study. This is also in line with

experiences reported by marketing managers of retailers such as Tesco (Humby, Hunt, & Phillips, 2007). Therefore, we hypothesize the following:

H1. Assortment-wide retailer coupons increase customers' probability of making a purchase at the store.

Purchase quantity. Heilman, Nakamoto, and Rao (2002) reveal that unexpected in-store coupons increase basket sizes. This result opposes those of prior research on manufacturer coupons, indicating that consumers do not buy more items from the promoted brands (Krishna & Shoemaker, 1992). Although Heilman, Nakamoto, and Rao (2002) attribute their finding to the unexpected nature of the in-store coupon studied, a similar effect is expected for this study. The rationale is that assortment-wide retailer coupons only name the retail brand rather than naming a product brand and thus are likely to improve retail brand awareness and store evaluations. It is assumed that improvements in store perception cause consumers to shift purchases from other outlets to the store providing the coupon. This effect should be highest for stores issuing coupons via direct mail or as freestanding inserts because these coupons allow prior anticipation. This expectation is in line with Schneider and Currim (1991), who find that coupon- and feature-prone consumers increase their purchase quantity during promotions. This leads to the following hypothesis:

H2. Assortment-wide retailer coupons cause customers to buy more items.

Contribution margin. It is difficult to state an expectation regarding how the behavioral effects of a coupon promotion will translate into an average contribution margin. The reason is that coupons can be expected to affect customers' brand and product category choices. We expect that assortment-wide coupons will cause trade-up and asymmetric switching effects, which are well documented in the marketing literature (Allenby & Rossi, 1991; Blattberg & Wisniewski, 1989). Asymmetric switching is the reason that promotions for high-quality

brands attract more consumers than do those for low-quality brands. Substitution and income effects can explain this phenomenon. In the case of high-quality brands, the income and substitution effects of price reductions work in the same direction; in the case of low-quality brands, these factors work in opposite directions. Because assortment-wide coupons lower the price of the entire assortment, they cause a considerable income effect that should trigger comprehensive up-trading effects. Accordingly, we expect customers to seize the opportunity and choose brands and/or product categories with higher retail prices and switch away from PLs:

H3. Assortment-wide retailer coupons cause customers to buy more expensive brands and/or products.

H4. Assortment-wide retailer coupons cause customers to buy fewer private labels.

The effect predicted in hypothesis H3 leads ceteris paribus to an increase in average contribution margin, while the expected effect of H4 should lead to a decrease. Therefore, we refrain from postulating expectations concerning coupon-induced margin effects.

PL versus NB users. A positive relation between the tendency to use coupons and the tendency to buy PLs seems very likely because PL shoppers have been found to express high levels of general deal proneness. Garretson, Fisher, and Burton (2002) and Burton, Lichtenstein, Netemeyer, and Garretson (1998) find a positive correlation between PL and general deal proneness and show that a positive PL attitude is more strongly related to price-based than to non-price-based deal proneness. In addition, it is obvious that antecedents of coupon and PL use overlap widely, although the literature discusses these concepts separately. For instance, both segments are associated with the intention to be a smart shopper (Bagozzi, Baumgartner, & Yi, 1992; Burton et al., 1998; Garretson, Fisher, & Burton, 2002; Schindler, 1989). A common idea is that shopping competence and the

excitement of getting a bargain are major motivations to use both coupons and PLs. In addition, both segments are very price- and value-conscious and are less brand-loyal than others (Lichtenstein, Netemeyer, & Burton, 1990; Sinha & Batra, 1999; Swaminathan & Bawa, 2005). These similarities suggest that PL users are strongly attracted by retailer coupons. In particular, their high levels of price-consciousness and deal-orientation as well as their intention to shop smart suggest that they respond more intensely to retailer coupons than do NB users, that they are more likely to redeem coupons, and that they will seize the opportunity to buy more items or select more valuable items at a discount.

In addition, it is reasonable to expect PL and NB buyers to differ in their sensitivity to face value reductions (Guimond, Kim, & Laroche, 2001). The literature on coupon feature manipulation shows that incremental redemption and sales as well as deal expectations are positively influenced by higher face values (Bawa & Shoemaker, 1987; Bawa, Srinivasan, & Srivastava, 1997; Raghubir, 2004). This is plausible because higher face values imply larger income effects. Given that PL users display higher levels of price sensitivity, they are likely to respond favorably to retailer coupons even if low face values are issued. Therefore, they are expected to express lower levels of face value sensitivity than NB users. In summary, this leads to the following hypotheses:

H5a. The effects predicted in H1 to H4 are stronger for PL than for NB users.

H5b. Redemption probability is higher for PL than for NB users.

H5c. PL users react less sensitively to face value reductions than do NB users.

3. Field experiment

3.1 Background and customer segmentation

The hypotheses tests are based on a large-scale field experiment that was conducted in cooperation with a retailer operating around 100 department stores. The assortment encompasses fashion, books, housewares, perfume, jewelry, toys, food, and consumer electronics. The retailer's loyalty card was introduced in the late 1990s. For confidentiality reasons, we do not reveal the name of the retailer or its loyalty program. However, it is very similar to the 'Shop Your Way' program offered by Sears and Kmart: with every purchase, members earn reward points, which are stored on their account until they decide to redeem them. A quarterly statement mailing informs customers about their quantity of reward points. Additional membership benefits in the form of coupons are provided together with the statement mailing and with additional direct mailings that are regularly sent out throughout the year. The coupons typically offer assortment-wide discounts of ten percent.

The retailer provided the previous year's purchase records for randomly selected, active customers from its loyalty program database to provide a basis for treatment group selection. Customers were classified as active if they had visited the store at least three times or spent at least € 50 during the previous year. Customers with a shopping focus on food or consumer electronics were discarded because of limited PL assortment and coupon validity in these areas. The previous year's purchase records were used to classify customers into groups of PL and NB users and to select target groups for the field experiment.

Customer segmentation (PL vs. NB users) is based on individual PL volume shares but does not make use of a fixed (and arbitrary) classification threshold. Flexible PL share thresholds dependent on the purchase quantity during the previous year were used instead

because the explanatory power of PL share varies with the underlying number of items. Consider, for example, a customer who bought three items. If one of these items was a PL, the resulting PL share equals 33 percent and one could assume the customer to be PL-tending (median PL share at the retailer: 22 percent). However, whether this single choice was made randomly or is an expression of a general tendency is unclear because the total number of items is small. Because we intend to contrast the reactions of PL and NB users, it is very important to carefully identify customers whose purchases show a clear tendency toward either PLs or NBs. The flexible PL share thresholds are defined by confidence intervals calculated dependent on the number of items bought. For this calculation, PL choice is assumed to follow a binomial process wherein the number of trials is equivalent to the number of items bought and probability of success equals the average PL volume share. Customers are classified as either PL or NB users if their PL share differs significantly (α = .05) from the average PL share. This procedure results in average PL shares of 53.2 percent in the PL segment and 8.7 percent in the NB segment.

3.2 Experimental design

The classified segments were split into treatment groups that received four mail-order coupons entitling the customer to assortment-wide percentage-off price discounts. Experimental data were preferred to historical transaction data because the latter suffer from endogeneity arising from performance-based target selection. This means that the number and types of mailings previously received differ systematically in accordance with the customers' RFMR profiles (Reinartz & Kumar, 2000). Hence, an experiment was needed to ensure the comparability of treatments and treatment groups. A 2 (PL vs. NB users) x 7 (face value) between-subjects design was chosen for the experiment; it is illustrated in Figure 1.

-- Insert Figure 1 about here --

The experimental groups differ in their segment membership (PL vs. NB users) and in the face values they received; the face values varied between five and ten percent. In addition, a control group was selected for each segment. The control groups did not receive a mailing and hence, their data represent counterfactuals that would have been obtained in the absence of the promotion. Accordingly, they can be used as a proxy for the baseline outcomes in Equations (1a) and (2). Two thousand customers were selected for each cell, yielding a database of 28,000 customers.

The four coupons included in the mailing were identical in their layout and varied across the treatment groups only in their face value. The color scheme fit with the corporate logo and conveyed the retailer's corporate identity. The first line used a large font size to emphasize the face value of the coupon, using the words "X% off"; the second line of text stated, "valid on one item of your choice", and the third line showed the expiration date, which implied a promotion length of four weeks. Finally, the retailer logo appeared in the lower right corner.

3.3 Data and structural equivalence

During the field experiment, the retailer recorded the purchases of the 28,000 selected customers and provided us with aggregated customer-specific purchase data. The dataset reveals whether the customers made a purchase and redeemed coupons. In addition, it reports customer-specific total revenues, profits, purchase quantities, average retail prices, average margins, and PL shares. The same outcome measures were also recorded during the two weeks following the experimental promotion period to cover the post-promotion period.

Because the dataset only contains aggregated customer data, it does not provide any information on brand- or department-specific purchases.

Because population differences in RFMR profiles and prior promotion participation might directly relate to the outcome measures (e.g., Reutterer, Mild, Natter, & Taudes, 2006), great importance was placed on the structural equivalence of the treatment and control groups to ensure internal validity. A selection algorithm optimized group membership until no significant differences between the experimental groups of each segment (PL vs. NB users) remained for a number of selection variables. The selection variables were obtained from previous years' purchase records and include purchase recency and frequency, monetary value (revenue, profit), relationship length, and prior promotion participation (number of mailings, response rate, redemption rate). The selection algorithm is illustrated in the Appendix. It was applied once for the PL users and once for the NB users to achieve structural equivalence between the experimental groups of each segment.

Comparisons of the previous year's customer data reveal that there are no significant differences between the segments of NB and PL users with regard to relationship length, recency of last purchase, and number of mailings received. This shows that the retailer did not previously target any of the segments in particular.

4. Empirical results

In the following, the behavioral effects of assortment-wide retailer coupons are analyzed using Analysis of Variance (ANOVA) procedures (continuous outcomes) and logistic regressions (dichotomous outcomes). We start with segment-specific mean comparisons to contrast the face-value-specific treatment groups to their structural equivalent control groups

and test H1 to H4. The reactions of PL and NB users (H5) are then contrasted using 2 (NB vs. PL users) x 6 (face value) analyses. The aim of this second step is to evaluate the interaction between segment membership and face value and to quantify segment-specific response parameters and coupon elasticities. The controls were excluded from this analysis because they did not even receive a direct mailing. Coupon elasticities reveal how intensely the outcome measures are affected by a one-percent face value variation and thus summarize the effects of face value variations in one measure. They are given by (Cooper & Nakanishi, 1984):

Dichotomous Outcomes	NB users:	$\varepsilon_x^{NB} = \beta_{v*NB}^{x} \cdot v\,(1 - x_{NB}^{v})$	(3a)
	PL users:	$\varepsilon_x^{PL} = \beta_{v*PL}^{x} \cdot v\,(1 - x_{PL}^{v})$	(3b)
Continuous Outcomes	NB users:	$\varepsilon_x^{NB} = \beta_{v*NB}^{x} \dfrac{v}{x_{NB}^{v}}$	(3c)
	PL users:	$\varepsilon_x^{PL} = \beta_{v*PL}^{x} \dfrac{v}{x_{PL}^{v}}$	(3d)

where *x* symbolizes the particular outcome measure (e.g., purchase probability, purchase quantity) and $x_{NB,PL}^{v}$ stands for the segment-specific mean of *x* in the treatment group associated with face value *v*. The segment-specific face value parameters $(\beta_{v*NB}^{x}, \beta_{v*PL}^{x})$ describe the relation between the particular outcome measure and the coupon face value. In the case of dichotomous outcomes, a logistic relation is modeled, while a linear relation is used for the continuous outcomes. In the following, we assume a face value of ten percent for the elasticity calculation because this is the value regularly used by the retailer under study.

Purchase probability. Purchase probability is measured as the fraction of the targeted customers who made a purchase. Table 1 reports the purchase probabilities observed in the treatment groups and contrasts them with the purchase probabilities of the corresponding,

segment-specific control group. To provide a better orientation, the percentage deviations from the control groups (incremental values) are also provided. The incremental purchase probability effects in Table 1 reveal that coupons with a face value of seven or more percent cause significant increases in purchase probability in both segments ($p < .05$). This finding supports H1, which states that assortment-wide retailer coupons increase the likelihood that customers will make a purchase. PL users are less likely to make a purchase during the experimental period than are NB users. This can be seen from the mean values in Table 1 and is also confirmed by the significant main effect ($p < .01$) of segment membership in Table 2. However, the data clearly indicate that the coupon causes users of PLs to catch up in terms of purchase probability. In the ten percent treatment groups, incremental purchase probability reaches 37.2 percent in the PL segment (Table 1). In the NB segment, this effect is less than a third of this size (10.9 percent). Accordingly, we find a significant ($p < .01$) interaction between face value and segment membership with respect to purchase probability (Table 2). Consequently, the segments differ considerably in their coupon elasticity with regard to purchase probability. Table 2 shows that this measure equals .49 at the ten percent level in the PL segment, indicating that a ten percent decrease in face value (i.e., a switch from ten to nine percent coupons) leads to a 4.9 percent decrease in purchase probability in this segment. This effect is exclusive to the PL shoppers; purchase probability stays fairly stable across face values in the NB segment, such that the associated face value response parameter turns out to be insignificant. This relation is graphically illustrated in the upper left panel of Figure 2, which contains observed and predicted mean values. This result lends support to H5a, which states that PL users' purchase behavior is more intensely influenced by assortment-wide retailer coupons than is that of NB users.

--Insert Table 1 about here--

Purchase quantity. Hypothesis H2 predicts a basket size effect and states that customers buy more items during coupon promotions than under non-promotion conditions. The results in Table 1 do not support this hypothesis; no significant difference between the treatment and control groups is apparent. The (nearly) flat lines in the second panel of Figure 2 and the insignificant face value response parameters in Table 2 emphasize the rigidity of the basket size.

--Insert Table 2 about here--

--Insert Figure 2 about here--

Average contribution margin. The figures in Table 1 reveal that the experimental coupons had a positive impact on individual contribution margins only in the segment of NB users. In the segment of PL users, negative incremental contribution margins are observed for most treatment groups. Although the effects are too small for the overall interaction between face value and segment membership to be significant, we find a significant positive relation ($p < .05$) between face value and contribution margin only in the NB segment (Table 2). If low face values are used, the positive margin effects diminish in the NB user segment (Table 1). The different margin effects in the two customer segments may be due to differences in redemption behavior or brand and product choice; these behavioral components are described next.

Average retail price. As described in hypothesis H3, we expect coupon availability to cause an up-trading effect. Accordingly, the respondents generate positive incremental retail prices per item (before discount), as tabulated in Table 1. Figure 2 illustrates that average retail prices increase with the face values of the coupons and that this effect is more pronounced in the segment of NB users. In the eight and ten percent face value groups, we find significant deviations from the structurally equivalent control group ($p < .05$) in the NB

segment. In the regular ten percent condition, NB users shop for items that are 26.7 percent more expensive than the items bought by the corresponding control group ($p < .01$). The average retail price of the items bought by the equivalent PL respondents exceeds the retail price of the items bought by the PL control group by only 11.1 percent ($p < .05$). Apparently, the coupons have a stronger effect on prices per item in the NB segment, which contradicts hypothesis H5a. In response to face value variations, we note a significant change in the price per item only in the NB segment (Table 2). The relation between retail price and face value appears insignificant in the PL segment and thus supports hypothesis H5c, which expects PL users to react less sensitively to face value reductions than NB users do.

Private label share. The observed up-trading effect has two possible sources: either customers switch to more valuable brands, or they use the coupon as an opportunity to buy more expensive products (i.e., to switch product categories). Our dataset does not contain information concerning the brand- and category-specific structure of the shopping baskets; rather, it provides the PL share per customer during the promotion period. Table 1 shows that PL shoppers who received a ten percent coupon buy on average 20.1 percent fewer PLs than their structurally equivalent control group ($p < .01$). Figure 2 and the significant interaction effect in Table 2 emphasize that PL users increasingly refrain from PL purchases when face values increase. This supports hypothesis H4 and the expectation that customers trade up to more valuable brands during coupon promotions (H3).

The results concerning retail prices and PL shares show that the up-trading effect observed in the NB user segment involves the substitution of second- and third-tier NBs for high-margin premium NBs. Users of PLs, on the other hand, substitute PLs for (inexpensive) NBs and show only a slight increase in average retail price per item. The size of the increase is similar to that of the coupons' face value and thus indicates that PL users do not increase

their total expenditure. Because second- and third-tier NBs have lower margins than PL brands, this trade-up effect negatively influences contribution margins.

Redemption probability. H5b postulates that PL users are more likely to redeem coupons when they make a purchase. In support of this expectation, we find a significant main effect ($p < .01$) of segment membership on redemption probability (Table 2), which is measured as the probability of redeeming a coupon given that the store was visited. The difference in redemption probability increases with decreasing face values, as illustrated by Figure 2. The associated interaction between face value and segment membership just misses significance ($p = .065$) but suggests that PL users respond less sensitively to face value reductions. The resulting segment-specific response parameters are significant and yield elasticities of 1.44 in the NB segment and 1.04 in the PL segment, respectively. This finding indicates that PL users are more likely to redeem coupons even if face values are low. The PL customers' lower redemption-related face value sensitivity suggests that the associated price savings are a more important purchase motivation for them than for NB shoppers.

Profitability. To evaluate the coupons' profitability effects, we apply equations (1a) and (2). The baselines were operationalized by the use of the control groups' means. Because we are contractually not allowed to reveal profitability figures, we only report incremental percentage deviations from the control groups in Figure 3. Incremental profits at the individual level are based on the sample of respondents; they show whether individual customer profitability changes. Overall segment-level results reveal whether the coupon was profitable for the retailer; they combine individual profitability and traffic effects.

--Insert Figure 3 about here--

The right part of Figure 3 shows that the coupon promotion appears profitable from the overall retailer perspective; both customer segments generate positive incremental overall profits. In the case of ten-percent coupons, the increase in profit compared to that of the control group equals 28.6 percent in the PL segment and 24 percent in the NB segment. However, the positive profitability effects predominantly stem from the strong traffic effects (i.e., the increase in purchase probability). This is particularly true for the targeted PL respondents, who generate less profit than the control respondents at the individual level (see left part of Figure 3). The overall result is positive because PL users are much more likely to make a purchase at the stores if they have a coupon. This highlights that the larger overall profitability effect is caused by purchases by additional customers who would not have made a purchase in the absence of the promotion. This is also emphasized by the face value elasticity with regard to overall profitability, which can be calculated as follows (e.g., Cooper & Nakanishi, 1984):

$$\varepsilon_{\pi}^{NB} = \varepsilon_{pp}^{NB} + \varepsilon_{Q}^{NB} + \varepsilon_{m}^{NB} = 0.08 + (-0.16) + 0.24 = 0.16 \quad (4a)$$

$$\varepsilon_{\pi}^{PL} = \varepsilon_{pp}^{PL} + \varepsilon_{Q}^{PL} + \varepsilon_{m}^{PL} = 0.49 + (-0.06) + (-0.01) = 0.42 \quad (4b)$$

where *pp* symbolizes purchase probability. Overall, face value variations affect NB segment profitability to a lesser extent than PL segment profitability. However, the values of the components reveal that different factors drive face value elasticity with regard to segment-level profitability in the two customer segments. In the PL user segment, purchase probability-related sensitivity plays the most important role. In the NB user segment, in contrast, margin-related sensitivity appears to be the most important driver of the overall elasticity measure.

Post-promotion period. The marketing literature shows that consumers may anticipate promotions in determining their shopping trip timing (e.g., Schneider & Currim, 1991; Van

Heerde, Leeflang, & Wittink, 2004) and that customer segments differ in their long-term response to promotions (Lim, Currim, & Andrews, 2005). If the customers included in this study bought earlier than planned in response to the experimental coupons, a post-promotion dip would appear that would have to be included in the segment-specific evaluation of the promotion. To research this aspect, we analyze basket sizes, average margins and purchase probabilities observed during the two weeks after the experiment. The post-promotion period is limited to two weeks to avoid overlaps with later promotions and to ensure that no coupons are available to the customers under study. We conducted one-way, seven-level ANOVAs to compare the treatment and control groups per segment and found no significant differences (average margin: p_{NB} = .93, p_{PL} = .60; number of items: p_{NB} = .24, p_{PL} = .79; purchase probability: p_{NB} = .84, p_{PL} = .90). We conclude that a post-promotion dip does not play a role in this study. This result is in line with Taylor (2001), who does not find a post-promotion dip in the case of restaurant coupons but instead observes increased visit probability among previous non-customers during the post-promotion period.

5. Summary and further research

5.1 Summary

The field experiment described in this paper reveals that assortment-wide retailer coupons increase the probability of making a purchase and thus cause considerable store traffic effects. Furthermore, they cause customers to trade up to more expensive items. This effect is largest for users of NBs who purchase items that are on average 26.7 percent more expensive than those purchased in non-promotion periods if a ten percent coupon is issued. PL users, on the other hand, substitute PLs with (inexpensive) NBs and show only a slight

increase in average retail price per item. The size of the increase is similar to that of the coupons' face value, indicating that PL customers have tighter budget constraints and are not willing to increase total expenditure beyond that made during non-promotion periods. Because second- and third-tier NBs have lower margins than PL brands, this trade-up effect hampers contribution margins and short-term profitability at the individual customer level. Accordingly, we find that coupon promotions increase individual per-item margins only in the NB user segment. With respect to basket sizes, we do not find significant effects of retailer coupons. Basket sizes appear to be rigid, which supports the suggestion of Heilman, Nakamoto, and Rao (2002) that quantity effects are exclusive to unexpected in-store coupons that cause both a psychological income effect and an elevated mood state at the time of the purchase decision.

In addition, the analysis shows that the segments differ in their reaction to face value variations. Contrary to expectations, PL shoppers more severely decrease purchase probability in response to face value reductions than do NB shoppers, so that the PL segment's profitability decreases significantly in the case of face value reductions. One reason for this may be that PL shoppers are used to purchasing less expensive items and buy more often on deal than do NB shoppers. This is relevant because this habit may reduce reference prices and increase deal expectations (Kalwani & Yim, 1992; Krishna, 1991). Consistent with our expectations, the opposite effect applies to average retail price per item and redemption probability. Average price paid and redemption probability show a smaller decrease among PL users than in the segment of NB users. This indicates that PL users are more deal-focused and that the associated savings are a more important motivation for them to respond to retailer coupons than for NB shoppers.

5.2 Implications

From an overall retailer perspective, assortment-wide coupon promotions appear profitable in both segments. Accordingly, the title question must be answered in the affirmative: PL users are attractive targets for retailer coupons. However, because PL and NB users react very differently to retailer coupons, the route to increased profitability is different for these segments. PL users are attractive targets because they show a high incremental purchase probability, which causes large segment-level profit increases through additional purchases made by customers who would not have visited the stores in the absence of the coupon promotion. However, the individual margins of PL users do not increase, mainly because these customers switch to inexpensive NBs during coupon promotions. In contrast, in the segment of NB users, we find a positive effect on individual margins mainly caused by a large up-trading effect. This suggests that coupons can be used to gain share of wallet in the NB-prone customer segment.

These differences emphasize that retailers need to carefully define their promotional aims and performance criteria; dependent on the particular aim, different customers may appear most attractive as coupon targets. Consequently, we stress the benefits of PL share as an additional selection criterion. This approach is new to most retailers; the cooperating retailer, for instance, previously used product category-related segmentation and grouped customers according to their shopping focus (e.g., apparel versus housewares customers). However, prior tests revealed no fundamental differences in these segments' coupon reactions; in particular, their face value sensitivity appeared very similar. Hence, PL share seems to be a better criterion for adjusting coupon design and strategy.

Furthermore, these differences between PL and NB users' responses suggest that different measures are appropriate for increasing coupon-induced profitability effects in the

two segments. PL users switch from PLs to inexpensive NBs during coupon promotions. An explanation for this is that the cooperating retailer offers only PLs of low-to-medium quality and thus gives PL users no option of continuing to buy PLs while up-trading. The addition of premium PLs to its assortment would increase the likelihood that the observed up-trading effect would translate into increased margins and customer profitability in the PL-prone segment. In the segment of NB users, retailers should try to strengthen profitability effects by focusing on those customers who currently buy second- and third-tier NBs with low margins.

Finally, retailers need to take into account that users of PLs and NBs react differently to face value variations. In particular, PL users respond more negatively to face value variations and should thus only be addressed with coupons that offer a discount high enough to meet their face value sensitivity. Hence, it is of particular importance in this segment to carefully research customers' deal expectations. If deal expectations are found to be very high, retailers should still try to fulfill them: for instance, by mixing coupons with high and low face values within one mailing. However, caution is required when setting and especially when increasing face values. Raghubir (1998) finds that high face values may reduce perceived deal value and purchase intentions because they are positively related to price expectations.

5.3 Limitations and directions for further research

We see three directions for further research. Firstly, this study is limited to percentage-off coupons. The price promotion literature shows that different price framings (e.g., percentage vs. absolute discounts) may have an impact on deal perceptions and purchase decisions (e.g., Krishna, Briesch, Lehmann, & Yuan, 2002). So far, it has not been researched whether these findings transfer from regular price promotions to coupons. It would be

interesting to see whether different framings would indicate different effects than those found in the experiment. Moreover, it would be important to analyze the effects of additional coupon requirements (e.g., minimum revenue per purchase). Such requirements could have a positive impact on basket sizes. Research in this area would extend our understanding of consumers' promotion behavior and yield valuable managerial recommendations.

Secondly, this field experiment is restricted to coupons with a maximum face value of ten percent. It is possible that the coupons appeared not to be worth the effort for all customers, such that only very price-conscious customers responded in the low face value groups. This could limit the study's generalizability because price-consciousness is associated with PL rather than NB users (Ailawadi, Neslin, & Gedenk, 2001). However, we are confident that this effect appears only to a negligible extent because the retailer typically uses ten and sometimes even only five percent coupons. As a result, its customers are used to the level of discount issued in the experiment. However, we stress the need for further comparisons of PL and NB users' reactions to promotions at varying discount levels.

Furthermore, it would be very interesting to examine how coupon promotions affect shopping basket structures and customer profitability in the long run. Due to limited data availability, it was not possible to research these effects in this study. However, knowledge regarding both aspects would help us to better judge the promotions' long-term impacts on customer profitability and their appropriateness as a customer management tool. This could be an important issue, for instance, for heavy PL users, keeping in mind that the recent literature indicates that medium PL users are marked by highest levels of loyalty and profitability (Ailawadi & Harlam, 2004; Ailawadi, Pauwels, & Steenkamp, 2008). Hence, the coupon-induced substitution of PLs for NBs could have positive long-term effects on the profitability and loyalty of very heavy PL users.

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Table 1

Observed cell means (treatment vs. control groups)

			Control Groups	Treatment Groups					
				5%	6%	7%	8%	9%	10%
Purchase Probability	NB users	Mean (%)	33.0	35.0	35.1	36.3 [a]	36.7 [a]	35.5	36.6 [a]
		Incremental (% vs. controls)	-	6.1	6.4	9.8	11.2	7.6	10.9
	PL users	Mean (%)	25.5	26.5	27.2	30.7 [a]	32.0 [a]	31.0 [a]	35.1 [a]
		Incremental (% vs. controls)	-	3.5	6.3	20.0	25.4	21.3	37.2
Purchase Quantity	NB users	Mean (# of items)	5.6 (5.72)	5.7 (6.72)	5.8 (6.76)	5.4 (6.14)	5.5 (6.77)	5.3 (5.60)	5.3 (6.00)
		Incremental (% vs. controls)	-	0.9	3.7	-4.0	-2.4	-5.2	-4.7
	PL users	Mean (# of items)	4.4 (6.17)	4.5 (4.46)	4.4 (4.55)	4.3 (4.86)	4.6 (8.67)	4.4 (4.24)	4.3 (4.51)
		Incremental (% vs. controls)	-	3.5	1.5	-2.9	5.4	0.6	-1.5
Price per Item	NB users	Mean (€)	15.0 (24.6)	15.5 (25.3)	15.3 (22.0)	16.2 (25.4)	17.8 [a] (23.3)	16.9 (23.4)	19.0 [a] (27.2)
		Incremental (% vs. controls)	-	3.2	2.0	8.2	18.8	12.8	26.7
	PL users	Mean (€)	15.6 (13.7)	16.6 (17.1)	16.2 (17.6)	17.2 (20.8)	17.2 (17.1)	16.8 (19.4)	17.4 (17.1)
		Incremental (% vs. controls)	-	6.2	3.7	10.2	10.3	7.1	11.1
PL Volume Share	NB users	Mean (%)	15.2 (28.1)	15.7 (29.2)	14.9 (27.8)	15.7 (28.6)	15.1 (28.9)	15.3 (28.7)	15.8 (28.8)
		Incremental (% vs. controls)	-	3.2	-2.5	3.3	-0.6	0.4	3.7
	PL users	Mean (%)	34.1 (38.4)	30.9 (36.2)	33.8 (37.5)	31.2 (38.4)	29.3 [a] (36.7)	29.9 (36.4)	27.3 [a] (35.9)
		Incremental (% vs. controls)	-	-9.6	-1.1	-8.4	-14.2	-12.5	-20.1
Margin per Item	NB users	Incremental (% vs. controls)	-	2.6	3.7	3.1	12.7	7.3	18.6 [a]
	PL users	Incremental (% vs. controls)	-	-5.4	-2.2	-3.5	0.8	-8.0	-3.5
		Purchase Probability: Observations (NB/PL)	2000/2000	2000/2000	2000/2000	2000/2000	2000/2000	2000/2000	2000/2000
		Other measures: Observations (NB/PL)	660/511	700/529	702/543	725/613	734/641	710/620	732/701

Note: Standard deviations in parentheses.

[a]Differs significantly from segment-specific (NB or PL) control group. Significance level: α = 5 percent.

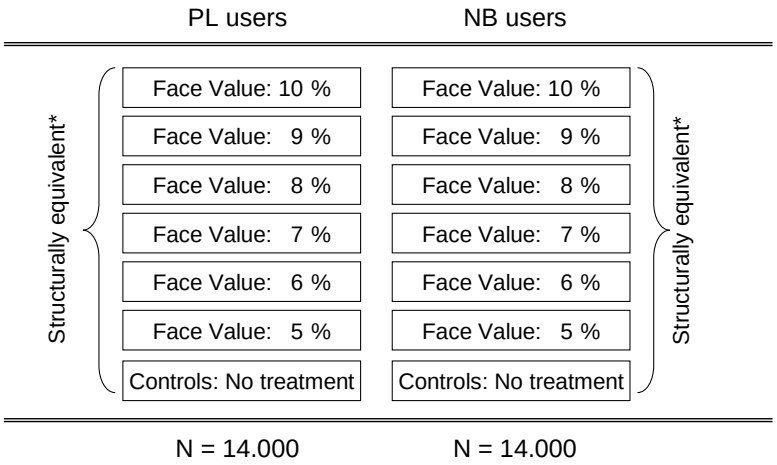
Table 2

ANOVA and logistic regression results

Measure	Source of Variation	Test-Statistic	d.f.	*p*-value		Parameter Estimate (*p*-value)	Elasticity at the 10% Face Value Level
Purchase Probability	Face Value (*v*)	42.169 [a]	1	.000			
	Segment [NB = 1]	34.042 [a]	1	.000	*v * NB*	.01 (.282)	.08
	Interaction (*v* * [NB = 1])	15.620 [a]	1	.000	*v * PL*	.08 (.000)	.49
Redemption Probability	Face Value (*v*)	66.062 [a]	1	.000			
	Segment [NB = 1]	8.791 [a]	1	.003	*v * NB*	.23 (.000)	1.44
	Interaction (*v* * [NB = 1])	3.407 [a]	1	.065	*v * PL*	.18 (.000)	1.04
Purchase Quantity	Face Value (*v*)	1.925 [b]	5	.165			
	Segment [NB = 1]	6.195 [b]	1	.013	*v * NB*	-.09 (.110)	-.16
	Interaction (*v* * [NB = 1])	.599 [b]	5	.439	*v * PL*	-.02 (.677)	-.06
Price per Item	Face Value (*v*)	8.558 [b]	5	.003			
	Segment [NB = 1]	3.409 [b]	1	.065	*v * NB*	.69 (.000)	.36
	Interaction (*v* * [NB = 1])	3.443 [b]	5	.064	*v * PL*	.16 (.468)	.09
PL Volume Share	Face Value (*v*)	4.380 [b]	5	.036			
	Segment [NB = 1]	43.579 [b]	1	.000	*v * NB*	.00 (.912)	.00
	Interaction (*v* * [NB = 1])	5.024 [b]	5	.025	*v * PL*	-.01 (.003)	-.33
Margin per Item	Face Value (*v*)	2.057 [b]	5	.152			
	Segment [NB = 1]	4.049 [b]	1	.044	*v * NB*	.16 (.026)	.24
	Interaction (*v* * [NB = 1])	2.518 [b]	5	.113	*v * PL*	-.01 (.917)	-.01

[a] Cell entries correspond to Wald test statistics.

[b] Cell entries correspond to F-test statistics.



*Structurally equivalent concerning recency of last purchase, purchase frequency, monetary value (revenue, profit), prior promotions (number of mailings, response rate, redemption rate), and length of relationship.

Fig. 1. Experimental Design

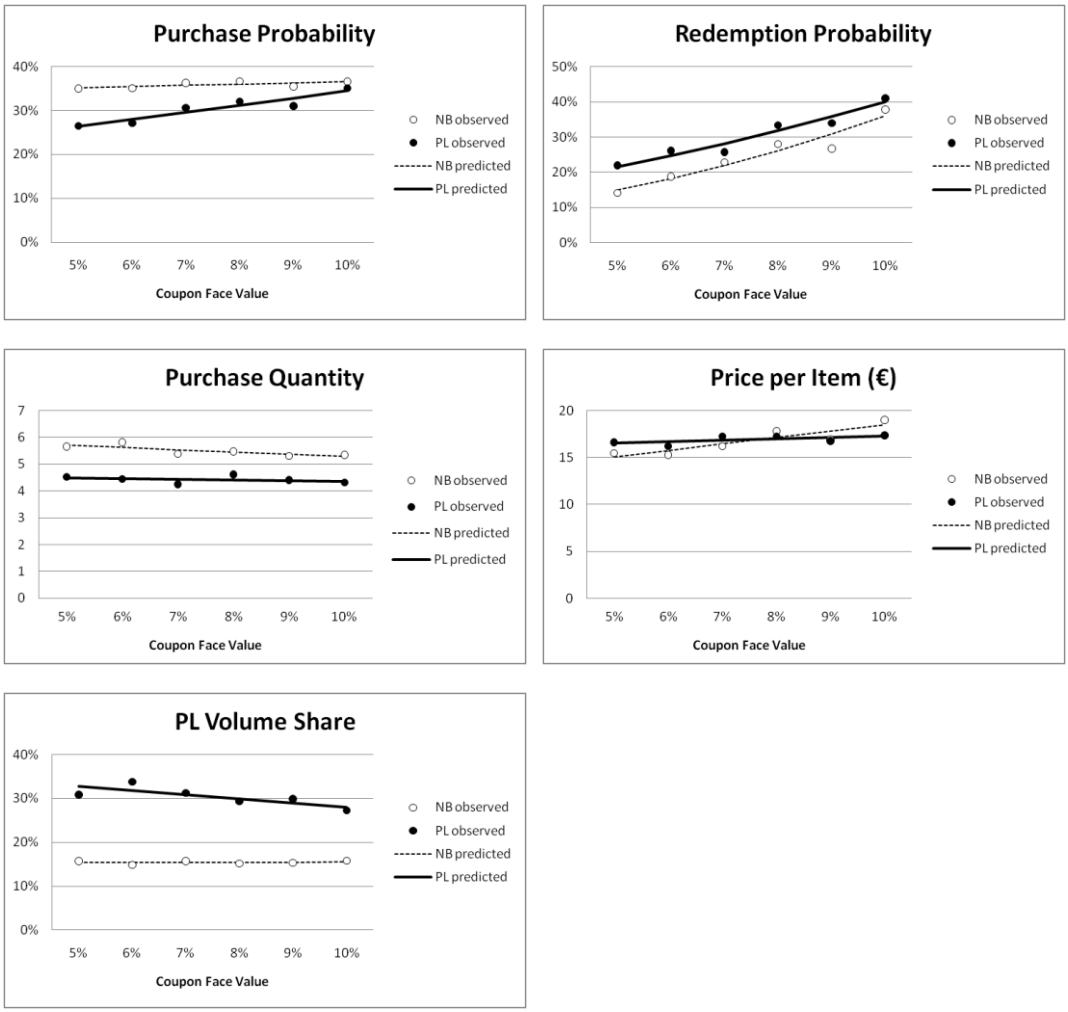


Fig. 2. Behavioral Effects

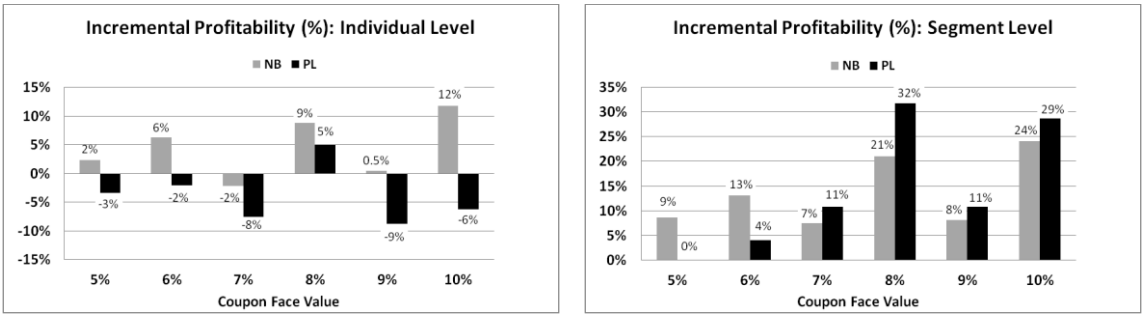
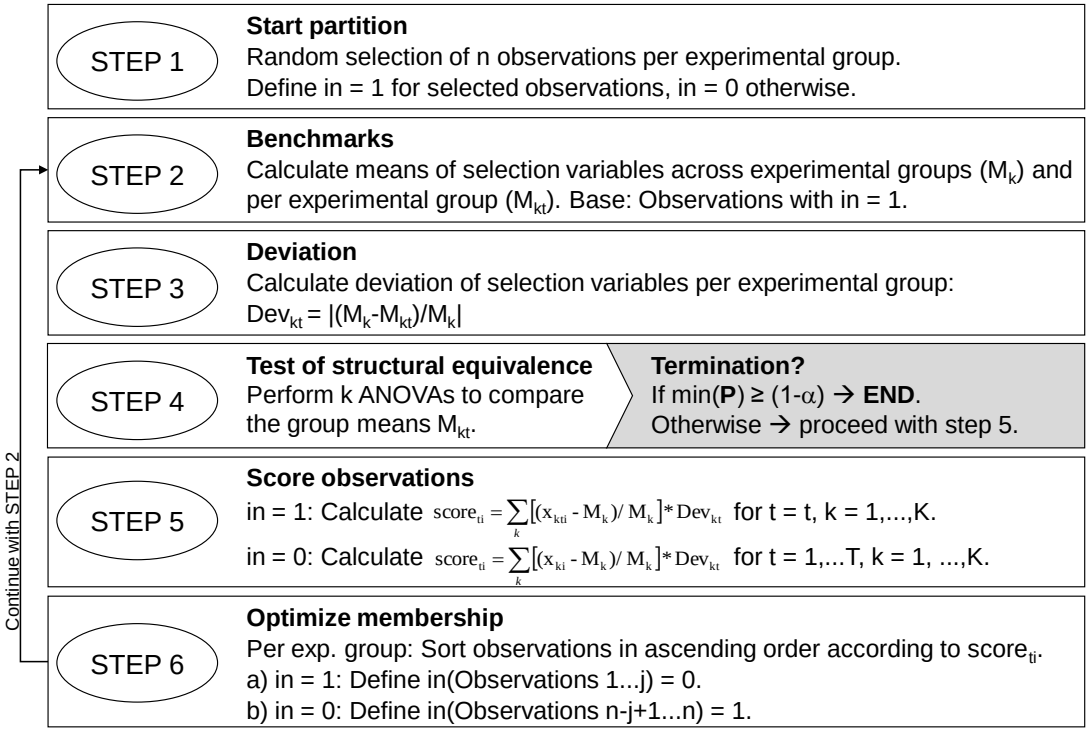


Fig. 3. Observed Profitability Effects



I : Index of observations, K : index of selection variables, j : number of replacements per iteration,
M : mean, T : index of experimental groups, x : value of selection variable, α : significance level.

Appendix: Selection Algorithm