

Characterising the deal-proneness of consumers by analysis of price sensitivity and brand loyalty: an analysis in the retail environment

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This study characterises the ‘deal-proneness’ of consumers by analysis of the consumer-level characteristics of price sensitivity and brand loyalty. The study first develops a multinomial logistic (MNL) latent class model suitable for use with universal product code (UPC) point-of-sale (hypermarket) scanner data. The model is then used to assess the deal-proneness of consumers with respect to monetary promotions (price reductions) and non-monetary promotions (store flyers). The results show that almost 47% of consumers can be considered deal-prone, in that both kinds of sales promotions have a significant effect on their choice behaviour. The findings provide important insights for retail management in seeking to optimise the results obtained from promotional budgets.

Keywords: deal-proneness; sales promotions; price reductions; store flyers; latent class approach; retail promotional budget

Introduction

The effectiveness of sales promotions is an issue of concern to the marketing managers of fast-moving consumer goods (FMCG), because firms are spending large sums on these activities (Raghubir, Inman, and Grande 2004).

Although a large body of literature has examined consumer response to sales promotions (Ailawadi, Neslin, and Gedenk 2001; Raghubir, Inman, and Grande 2004), important issues remain to be studied. Chandon, Wansink, and Laurent (2000) have contended that the study of sales promotions should be expanded, differentiating between the effects of monetary and non-monetary sales promotions. As Lichtenstein, Burton, and Netemeyer (1997, 286) observed: ‘There is a rationale to believe that deal-prone segments of consumers may exist based on a price–non-price promotion criterion.’ However, since most of the past sales promotion research has focused on monetary promotions, the differential role of sales promotion entailed in non-monetary promotions (e.g. feature advertising) to assist brand-related effects was unfortunately ignored (Palazón and Delgado 2005). In this respect, relatively little research has focused on responses to non-price promotions, e.g. store flyers (Miranda and Kónya 2007).

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Although some studies have examined the impact of feature advertising (in general) on consumer behaviour, and although a few have examined store flyers (either specifically or as part of a wider study of promotional tools), there has been little or no analysis of this subject in terms of brand loyalty and/or price sensitivity. To the best of our knowledge, only Papatla and Krishnamurthi (1996) and Gedenk and Neslin (1999) analysed to some extent the effects of feature advertising on loyalty. However, neither the works of Papatla and Krishnamurthi nor Gedenk and Neslin found a significant effect of featuring on loyalty or purchase event feedback. These results suggest that more research is needed to understand the true relationship between brand loyalty and flyer proneness.

In addition, although important synergistic benefits have been demonstrated from the simultaneous use of promotions based on purchase price and promotions not based on purchase price (Bemmaor and Mouchoux 1991; Lemon and Nowlis 2002), there is only limited past research (e.g. Bemmaour and Mouchoux 1991; Gupta 1988; Papatla and Krishnamurthi 1996; Van Heerde, Leeflang, and Wittink 2004) examining the synergistic effect from the simultaneous use of price reductions and flyers. It is apparent that more research is needed on this issue, in order to understand the synergistic effect of the simultaneous use of both promotional tools. As Neslin (2002, 65) pointed out: 'One area that merits more attention is the role of synergies between forms of promotion.'

The main purpose of the present paper is to shed more light on this issue by profiling and segmenting consumers who are more prone to respond to retail promotional tools (both price reductions and store flyers). This segmentation is based on the price sensitivity of consumers and their brand loyalty (including their preferences for national brands as opposed to store brands). In pursuing the objective of clarifying some of the conflicting findings in this research stream, a multinomial logit (MNL) latent class approach with panel data is utilised.

This paper contributes to the sales promotion literature in many ways:

- characterising and assessing the deal-proneness of consumers with respect to monetary (price reductions) and non-monetary (store flyers) promotions;
- finding a segment with a positive and significant effect for a brand's presence in store flyers and consumer's brand loyalty. Thus, our paper confirms that there are two segments in which no relationship between flyer sensitivity and brand loyalty exists – as did Papatla and Krishnamurthi (1996) and Gedenk and Neslin (1999). However, in an original contribution, we obtain an additional group with a relationship between brand loyalty and 'flyer proneness';
- establishing the profile of a deal-prone consumer using a multinomial logistic latent class model. This approach has been widely used in marketing (e.g. Kamakura and Russell 1989); however, to the best of our knowledge, it has not been applied for the concept of deal-proneness. Thus, the modelling approach used in the study constitutes an important methodological contribution of this paper; and
- extending previous promotional literature to the European FMCG context. In this respect, most of the previous works analysing deal-proneness are based on the USA context; however, promotional reality is different in Europe.¹ As Carpenter and Moore (2008, 121) observed in their recent work focused on US consumers' perception of non-price retail promotions: 'Generalizations of the findings of this study to markets outside the USA are limited due to differences

in consumers and forms of retail promotion within various markets.' Thus, it is necessary (and interesting) to analyse deal-proneness in the European context, since it will help to confirm or deny previous promotional findings – frequently based on the USA context.

The remainder of the paper is arranged as follows. The following section presents a literature review of relevant studies and the proposed hypotheses for the study. The modelling approach used in the study is then described. The empirical study, its findings, and a statement of the results of testing of the proposed hypotheses are then presented. After that, the profile of the deal-prone consumers is presented. The paper concludes with the conclusions and managerial implications.

Literature review and hypotheses

Within the marketing mix, sales promotion has one of the strongest impacts on short-term consumption behaviour (Laroche et al. 2003). Previous research has shown that sales promotion can encourage behavioural responses such as brand-switching, stockpiling, purchase acceleration, product trial and spending larger amounts.

According to data from IRI (2006), the promotional technique that is most commonly employed by large hypermarkets and supermarkets is price-cutting, followed by store flyers. The inclusion of particular brands in store flyers has become a significant component of promotional budgets for both retailers and manufacturers (Bjerre 2003). Indeed, retailers often spend a third to half of their marketing budgets on promotions advertised through store flyers (IRI 2006).

Deal-proneness

The construct of deal-proneness – first used by Webster (1965) – has been defined as 'a general proneness to respond to promotions because they are in deal form' (Lichtenstein, Netemeyer, and Burton 1990, 55). This construct offers a traditional approach to analyse the promotion-related behaviour of individuals (Henderson 1994; Lichtenstein, Netemeyer, and Burton 1995; Montgomery 1971). Important in this definition is that deal-proneness is the psychological propensity to buy, not the actual purchase of, goods on promotion (DelVecchio 2005). Thus, deal-prone consumers value the transaction utility rather than, or in addition to, the acquisition utility associated with buying on deal (Ramaswamy and Srinivasan 1998; DelVecchio 2005).

Some studies reveal that deal-proneness is a generalised construct – that is, an individual who modifies his/her purchase behaviour in certain promotions is likely to do the same in any other promotion (Price, Feick, and Guskey-Federouch 1988). The assumption inherent in this perspective is that there is some underlying characteristic that leads consumers to be prone (or not prone) to deals in general. This view suggests that consumers favourably predisposed to one type of deal are, on average, more likely to be favourably predisposed to other deal types. Thus, this perspective also implies that there is sufficient similarity across types of promotions to justify targeting a single deal-prone segment of consumers that would be more likely than others to respond to promotions of all types (Lichtenstein, Burton, and Netemeyer 1997).

However, recent research has examined the ‘domain specificity’ of the deal-proneness construct and concluded that such a concept is best conceptualised at a deal-type specific level (e.g. coupon proneness, rebate proneness, flyer proneness) as opposed to being conceptualised at a general level (Lichtenstein, Burton, and Netemeyer 1997). Blattberg and Neslin (1990) contend that consumer behaviours may be related to differing response sensitivities across types of promotions, thus suggesting a need to distinguish among consumer responses to the type of deal. Consistent with this perspective, Henderson (1987) contends that an undifferentiated view of consumers with respect to promotional attitudes and responses seems naïve, and is inconsistent with empirical evidence that suggests that sensitivities to promotions differ across consumers and promotional types (e.g. Schneider and Currim 1991; Mayhew and Winer 1992; Ailawadi, Neslin, and Gedenk 2001).

A third group of researchers has suggested a ‘middle’ position between these two perspectives. For example, Schneider and Currim (1991) dichotomise deal-prone consumers into ‘active’ and ‘passive’ deal types. They view active deal-prone consumers as more likely to engage in the relatively intensive search required to respond to promotions like coupons or feature sales (e.g. store flyers). In contrast, passive deal-prone consumers are more likely to respond to promotions such as in-store displays, where there is minimal searching limited to the in-store environment. Ailawadi, Neslin, and Gedenk (2001) establish a similar differentiation between proneness to out-of-store promotions and proneness to in-store promotions. For these authors, the former promotions are those which take place out of the shops and demand some effort from the consumer – they would be related to the active proneness proposed by Schneider and Currim (1991). On the other hand, in-store promotions are those which are developed inside the point of sales and discovered by the consumer when shopping. These types of promotions require a reduced effort from the buyer, and are related to passive proneness.

Another manner in which sales promotions can be classified is by price- and non-price-oriented sales promotions (Shimp 1990). Coupons, sales, rebates and cents-off promotions, for example, result in lower purchase prices, while other deals (e.g. contests/sweepstakes, free gift with purchase, displays, feature advertising) do not offer a lower purchase price. According to Chandon, Wansink, and Laurent (2000), price and non-price sales promotions may involve different levels of benefits to consumers – mainly, the utilitarian and hedonic values. Their study fails to examine types of non-price promotions across different incentive dimensions which provide consumers with a mixture of both utilitarian and hedonic benefits. In this respect, sales promotions provide utilitarian benefits including savings, quality and convenience, as well as hedonic benefits such as value expression, exploration and entertainment. In particular, Chandon, Wansink, and Laurent (2000) pointed out that price promotions provide more congruent benefit to utilitarian products, whereas non-price promotions are more compatible for hedonic purchase. To differentiate between both types of promotions is very interesting from both a theoretical and a managerial point of view, since consumers who are more price-conscious should be differentially sensitive to price-oriented sales promotions (Blattberg and Neslin 1990; Lichtenstein, Netemeyer, and Burton 1990). Hence, there is a rationale to believe that deal-prone segments of consumers may exist based on a price–non-price promotion criterion (Lichtenstein, Burton, and Netemeyer 1997). In the present research, we differentiate between price (price reductions) and non-price promotions (store flyers).

Recent works (e.g. Pechtl 2004) also distinguish between overt and intrinsic deal-proneness. The former is based on those indicators used to measure how sensitively a consumer responds to promotions – e.g. purchase time, brand choice, purchase quantity, category consumption, store choice or search behaviour. It refers to consumers' overt behaviour towards promotions (Dickson and Sawyer 1990). Previous research has shown that sales promotion can encourage behavioural responses such as brand-switching, stockpiling, purchase acceleration, product trial and spending larger amounts. The introduction of scanners in self-service outlets, along with the general adoption of barcodes identifying each specific product item (EAN code), has allowed retailers to easily measure how sensitively a consumer responds to promotions. In this respect, the quantity, precision and cost of these data bring numerous advantages. One of the main benefits of the data gathered by scanners in retail stores is the fact that they can be used to analyse the effects of their own management variables (e.g. purchase price and sales promotions) on consumer choice behaviour. Using this information, it seems plausible to characterise consumers' overt deal-proneness.

In addition to previous studies focused on overt deal-proneness, another body of literature on deal-proneness has considered more intrinsic aspects of this concept. For example, Hackleman and Duker (1980) emphasised the inability of deal-prone consumers to resist a bargain, and Henderson (1994) noted the commitment of deal-prone individuals to a promotion (e.g. coupons). Lichtenstein, Netemeyer, and Burton (1990) specified deal-proneness using the concept of transaction utility and favoured a psychological interpretation of this construct.

Intrinsic deal-proneness is based on emotional, motivational and affective aspects of promotions in buying behaviour (e.g. Chandon, Wansink, and Laurent 2000; Laroche et al. 2001). Traditionally, academic researchers have paid attention to measure overt consumer behaviours (e.g. Shi, Cheung, and Prendergast 2005), but they have not investigated psychological variables which may underlie deal-responsive behaviour. However, it is necessary to measure both dimensions of the deal-proneness concept, otherwise consumers could be incorrectly classified as deal or non-deal-prone. For example, a consumer might have the desire to use coupons, but fails to find coupons for his favourite brand. This would lead to him being incorrectly classified as non-coupon-prone. However, this consumer really can be classified as coupon-prone from an intrinsic perspective, and as non-coupon-prone according to his/her overt behaviour.

Nevertheless, in many situations, an overlap between intrinsic and overt deal-proneness is possible. Thus, many authors (e.g. Shimp and Kavas 1984; Lichtenstein, Netemeyer, and Burton 1990) claimed that there is a degree of overlap between intrinsic and overt deal-proneness. In the context of Everyday Low Prices (EDLP) and High Low Prices (HILO) price promotion strategies,² Pechtl (2004) confirmed the existence of an overlap between intrinsic and overt deal-proneness, especially for the HILO-prone consumers. For this author, the monetary proportion of price-reduced products in the basket can be considered an indicator of overt deal-proneness towards the HILO price promotion strategy. At the same time, HILO-prone consumers feel enjoyment when bargain hunting, and are willing to invest time and effort in planning their shopping trips in search of special offers; EDLP-prone consumers are unwilling to check whether a current price is lower than last/next week, and feel afraid when prices for an article constantly vary.

In the same way, Schneider and Currim (1991) also claimed an overlap between active and passive deal-proneness. According to these authors, the actively

deal-prone household may behave as though it were passively deal-prone on some occasions – that is, the shopper may not set aside time to look for a promotion before the store trip. Yet the shopper will react to a promotion if a brand is displayed/featured. Overlap between active and passive deal-proneness could also occur if shopping duties are shared by members of the same household (for example, one shopper may be actively deal-prone, the other passively deal-prone).

The present paper is focused on characterising the overt deal-proneness of consumers by analysis of price sensitivity and brand loyalty. In order to do so, we will employ a logit brand choice model applied to scanner panel data. This type of model provides a natural – and parsimonious – modelling approach to assess whether or not promotions induce brand choice (Guadagni and Little 1983) and, therefore, to characterise overt deal-proneness.

Characterisation of deal-prone consumers

The response of consumers to sales promotions is one of the main research streams in marketing. Blattberg and Neslin (1990) have argued that it is essential to identify and understand the behaviour of consumers who are more sensitive to promotional activities. In this respect, from the marketing management perspective, knowing the profile of deal-prone consumers will enable us to design better promotional campaigns (Bawa and Shoemaker 1987; Laroche et al. 2003).

The first studies which attempted to characterise the deal-prone consumer fundamentally based this characterisation on socio-demographic variables. Thus, in an early study, Webster (1965) claimed to identify the deal-prone consumer on the basis of his/her demographic, socio-economic or purchasing characteristics for being able to distinguish this type of consumer from others in the market. However, empirical studies yield a blurred demographic portrait of deal-prone consumers (Blattberg and Neslin 1990; Ainslie and Rossi 1998; Kim, Srinivasan, and Wilcox 1999). In this respect, as Blattberg et al. (1978) demonstrated, demographics correlate only indirectly, if at all, with deal-proneness, because shopping patterns exert a direct influence on overt deal-proneness (Krishna, Currim, and Shoemaker 1991; Ailawadi, Neslin, and Gedenk 2001). More recently, Pechtl (2004) found that the deal-prone segments differ slightly in their demographic structure, although these differences – e.g. in age or gender – seem too small to design a marketing strategy based on such demographic features. Kwon and Kwon (2007) found a positive effect of education and income on the use of coupons and rebates; also gender difference was significant in deal-proneness for the use of coupons, but was not for the use of rebates. Carpenter and Moore (2008) found no evidence of a relationship between gender or income and likelihood of participation in non-price retail promotions.

There are various reasons for the inconsistency of demographic and behavioural results across studies (Blattberg and Neslin 1990, 73): 'The studies use different measures, methods and study different types of promotions.' In spite of contradictory results of demographic variables in characterising deal-proneness, demographic profiles of psychological traits are of general interest in marketing, because such profiles ease direct marketing activities with these segments.

Having obtained inconclusive results, psychographic and purchasing habit variables have been recommended to identify the deal-prone consumer (Grover and Srinivasan 1992; Martínez and Montaner 2006; Schneider and Currim 1991). In this respect, psychographically, we find a somewhat more consistent picture of the

deal-prone consumer as price-conscious (McCann 1974; Teel, Williams, and Bearden 1980; Rosen 1985; Burton, Lichtenstein, and Netemeyer 1999; Gijsbrechts, Campo, and Goossens 2003; Walters and Jamil 2003), involved with media (Montgomery 1971; Teel, Williams, and Bearden 1980; Rosen 1985), and involved with shopping (Teel, Williams, and Bearden 1980; Honea and Dahl 2005; Carpenter and Moore 2008). The relative success of psychographic variables suggests that the real reasons for deal-proneness lie more deeply than the cold statistics of demographics or buying patterns. Thus, some researchers have used economic benefits or purchase costs as a reference to characterise deal-prone consumers (Bawa and Shoemaker 1987). Economic or functional benefits are tied to the product's attributes; they provide the customer with functional information, and they refer to tangible or objective product-related aspects (Martínez and Montaner 2006). Among those functional benefits, we should highlight savings and quality (Chandon, Wansink, and Laurent 2000; Ailawadi, Neslin, and Gedenk 2001). Promotions provide a saving feeling and reduce the pain of paying. They may also grant access to higher-quality brands which could not be bought at their normal price.

Other authors have emphasised the hedonic benefits generated by the purchase of a promoted product (Shimp and Kavas 1984), both for price and non-price promotions. Hedonic benefits are tied to intangible attributes and they are experiential and affective. Some outstanding hedonic benefits of promotional actions are entertainment, exploration and expression. For example, for those consumers who enjoy shopping, some promotions may be amusing and increase this entertainment benefit provided by the product purchase. Thus, Ward and Hill (1991) explore consumer perceptions of games and sweepstakes, citing fun as one of the reasons for consumer participation in these types of promotions. Recently, Honea and Dahl (2005) develop the promotion affect scale to measure affective response to promotion.

Along the purchase decision process, the consumer weighs up both the benefits and the costs of a promotion. The importance of these benefits and costs for each consumer would differentiate deal-prone from non-deal-prone consumers (Martínez and Montaner 2006). Some authors have identified socio-demographic and psychographic traits of the consumer associated to each of these benefits and costs, and have related them to deal-proneness. In the following sections, we will emphasise two important consumer characteristics associated with both the economic benefits of promotions (price sensitivity) as well as to the costs of such promotions (brand loyalty).

Price sensitivity and deal-proneness

The characterisation of deal-prone consumers has traditionally been related to price sensitivity. Price sensitivity³ refers to the extent to which individuals perceive and respond to changes or differences in prices for products or services (Wakefield and Inman 2003). In most of the marketing literature, a direct relationship between price sensitivity and deal-proneness is assumed (Burton, Lichtenstein, and Netemeyer 1999; Walters and Jamil 2003; Martínez and Montaner 2006).

According to Gijsbrechts, Campo, and Goossens (2003), the greater the price-sensitivity of a consumer, the stronger the influence of sales promotions on that consumer's behaviour. In particular, they observed that consumers who are most price-sensitive have a greater propensity to consult store flyers before entering the store. Indeed, most shoppers read flyers only to be informed of price specials that the store has to offer (Miranda and Kónya 2007). In this respect, price deals featured on

store flyers aim to attract deal-prone customers (that is, customers who actively seek price specials). These are individuals who are continually informed about the prices of the brands that they normally purchase (Krishna, Currim, and Shoemaker 1991). This finding is in accordance with that of Chen, Monroe, and Lou (1998), who found that consumers who are more price-conscious are also more willing to make a greater effort to look for promotions.

In the context of retailers' price promotions strategies, Pechtl (2004) classified these consumers as HILO-prone consumers. These are consumers who feel enjoyment when bargain hunting and are willing to invest time and effort in planning their shopping trips in search of special offers. According to Zentes, Morschett, and Schramm-Klein (2007), HILO-prone consumers are more price-sensitive consumers since they wait for a sale and buy then. On the contrary, EDLP-prone consumers are unwilling to check whether a current price is lower than last/next week, and feel afraid when prices for an article constantly vary. Since these consumers prefer to buy at regular prices, we can say that they are less price-sensitive (Zentes, Morschett, and Schramm-Klein 2007), and they want to minimise shopping effort (Pechtl 2004). Therefore, it seems logical that HILO-prone consumers make greater use of sales promotions (Shoham, Kahle, and Rose 1995) – for instance, they are willing to consult the flyers before entering the store in order to know which brands are promoted.

Most research has concluded that the more price-conscious the consumer, the more positive will be his or her attitude toward sales promotions (Narasimhan 1984; Babakus, Tat, and Cunningham 1988; Tat and Bejou 1994), and they will respond well to promotional actions. Therefore, on the basis of the preceding discussion, the following hypotheses are proposed with respect to price sensitivity and sales promotions (both price and non-price promotions):

- H₁:** Price promotion proneness is positively and differentially related to price sensitivity.
- H₂:** Non-price promotion proneness is positively and differentially related to price sensitivity.

Brand loyalty and deal-proneness

It has often been postulated that deal-proneness is negatively related to brand loyalty (Dodson, Tybout, and Sternthal 1978; Blattberg and Neslin 1990; Lichtenstein, Burton, and Netemeyer 1997; Laroche et al. 2003; Lim, Currim, and Andrews 2005). Customers who are loyal to brands present a lower level of proneness to promotions, since they attach more importance to the product than to the price (Massy and Frank 1965; Wakefield and Barnes 1996), whereas non-loyal consumers are more prone to buy promoted products because they attach more importance to the price than to the product's attributes (Webster 1965; Bawa and Shoemaker 1987). Thus, brand-loyal consumers tend to be satisfied with the brands they buy, and need no incentives to purchase the same brand again (Wakefield and Barnes 1996).

Marketers have also been interested in the relationship between brand loyalty and price sensitivity for many years, and have examined whether loyalty reduces consumer price sensitivity. The typical finding from this research is that loyalty does reduce consumers' price sensitivity (Brown 1974; McCann 1974; Neslin, Henderson, and Quelch 1985; Wernefelt 1986, 1991; Krishnamurthi and Raj 1988, 1991).

To date, the results indicate that loyalty does indeed raise the price that consumers are willing to pay for a brand (Krishnamurthi and Papatla 2003). On the contrary, consumers who seek variety consider promotions as a salient attribute in their patronage choice and, as a result, do not intend to re-patronise frequently (Wakefield and Barnes 1996). Therefore, it is expected that consumers' price sensitivity is negatively related to brand loyalty (Kumar and Advani 2005).

Nevertheless, recent studies have weakened the traditional assumption that deal-proneness is strictly negatively related to brand loyalty. For example, Ailawadi, Neslin, and Gedenk (2001) found no significant relationship between brand loyalty and the use of in-store promotion. Focusing on reinforcement theory, Blattberg and Neslin (1990) postulated that brand loyalty would be highest for medium levels, but lowest for very low or very high levels of deal-proneness. McAlister (1986) proposed a taxonomy that included loyal deal-prone consumers as one particular segment in the market. Due to today's more promotion-intensive environment, a consumer may remain loyal to some brands by switching between the stores in which his/her favourite brand is currently being offered at a bargain price (Pechtl 2004). Nevertheless, we expect that customers who are satisfied with their purchases and experiences are more likely to spend money with that company in future, and are less likely to be sensitive to price promotions. Therefore:

H₃: Price promotion proneness is negatively and differentially related to brand loyalty.

Few empirical results have been generated regarding the specific relationship between brand loyalty and flyer proneness. To the best of our knowledge, only Papatla and Krishnamurthi (1996) and Gedenk and Neslin (1999) analysed to some extent the effects of feature advertising on loyalty. However, neither found a significant effect of featuring on loyalty or purchase event feedback. In the absence of more empirical research on this subject, and considering that the main objective of store flyers is to inform consumers about the promotions taking place in the store (Tellis 1998), we can speculate that price-sensitive shoppers will be more likely to be interested in information contained in store flyers. Indeed, most shoppers read flyers only to be informed of price specials that the store has to offer (Miranda and Kónya 2007). In contrast, consumers who are loyal to a brand are less likely to be interested in store flyers, because they will purchase their favourite brand anyway (Froloff-Brouche 1994). Therefore:

H₄: Non-price promotion proneness is negatively and differentially related to brand loyalty.

Modelling approach

In accordance with previous studies that have analysed consumers' choice behaviour (e.g. Chintagunta 2001), the present study employed a multinomial logit (MNL) model specifying heterogeneity.

There are three important reasons for the use of this model: (1) analytical tractability and ease of econometric estimation; (2) conceptual appeal (being grounded in economic theory); and (3) excellent empirical performance (Guadagni and Little 1983).

Semi-parametric latent class approach

As noted in the literature review, the present study postulates that the effect of a sales promotion on a consumer's likelihood of choosing a promoted brand is determined by the consumer segment to which the consumer belongs – in terms of the consumer's sensitivity to: (1) the regular price; and (2) brand loyalty. The proposed hypotheses were therefore tested in terms of the heterogeneity (segments) of the market.

The analysis used a semi-parametric approach (Chintagunta, Jain, and Vilcassim 1991; Kamakura and Russell 1989). This involves the assumption of: (1) a discrete joint distribution of the response parameters; (2) the existence of a set of S possible response profiles; and (3) a distribution $\{P(s)\}_{s \in S}$ of the probability. Each of these profiles implies the existence of a latent segment whose relative size is given by its probability. The probability that consumer i will choose brand j conditional on membership of segment s is calculated as follows:

$$P_{ij|s} = \frac{\exp(\alpha_{js} + \sum_{k \in K} \beta_{ks} X_{ijk})}{\sum_{s \in S} \exp(\alpha_{js} + \sum_{k \in K} \beta_{ks} X_{ijk})} \quad (1)$$

in which:

- k refers to the different explanatory variables used;
- α_{js} , β_{ks} represent the intrinsic preferences and the response parameters of the segments, respectively;
- and X_{ijk} refers to the value of each brand attribute.

A more detailed description of the semi-parametric approach is provided in Appendix 1.

Because the number of latent classes is unknown, the parameter estimation is conducted on the condition of a previous value of S , for which heuristics are used with different combinations in the number of segments. In the marketing literature, the 'Bayesian information criterion' (BIC) and the 'Consistent Akaike information criterion' (CAIC) are the most widely used criteria, because they are more parsimonious and lead to a reasonable number of segments. In addition, they have better asymptotic properties than the AIC (Hofstede, Steenkamp, and Wedel 1999). However, many authors (e.g. Andrews and Currim 2003b; Kamakura and Russell 1989) have suggested that the use of criteria such as BIC does not enable a determination to be made on whether the correct parameter values have been recovered; nor is it possible to assess the relative fits of various segmentation solutions. Bozdogan (1987) indicated that 'Akaike information criterion' (AIC) is asymptotically consistent and penalises overparameterization more stringently to pick only the simplest of the 'true' models. Andrews and Currim (2003a) suggested that BIC may be more appropriate in regression, conjoint and market response settings; in contrast, AIC may be more appropriate in multinomial logit and scanner data settings.

The real effectiveness of these various criteria is thus disputed. According to Andrews and Currim (2003a), the choice of appropriate criteria depends on the circumstances in which the analysis is conducted. Differences in the number of segments for each of the criteria can lead to biased estimations about a marketing variable's effect on consumer choice behaviour.

Application

Data

Data on a range of olive oil brands, using the universal product code (UPC), were collected by point-of-sale scanners in a hypermarket belonging to an international distribution group located in the south-east of Spain. Olive oil is an essential foodstuff in the dietary habits of Spaniards, and can be considered a FMCG. The study examined the sales of various brands of 0.4° acidity olive oil packaged in one-litre plastic bottles, which is the most common form of olive oil used by Spanish consumers. Table 1 summarises the characteristics of the data used in this analysis.

The study period lasted 53 weeks, which was divided into 2 sub-periods: (1) an initialization period (weeks 1 to 20), which was used to calculate an aggregation variable capturing the consumers’ behaviour over time (brand loyalty); and (2) a calibration period (weeks 21 to 53), which was used to estimate the model parameters. To avoid bias from infrequent consumers, the study considered only those individuals who made at least two purchases in each of the two sub-periods (Sivakumar and Raj 1997). The definitive scanner data set consisted of 389 individuals who made a total of 3241 purchases (an average of 8.33 purchase occasions/individual).

Table 2 gives some basic data about the 10 brands analysed.

Table 1. Database.

| | |
|------------------|--|
| Data | Scanner choice data |
| Product category | Olive oil (1-litre bottle) |
| Store | Hypermarket from an international distribution group |
| Period | 1 year |
| Choice set | 10 brands: 8 national brands: <i>Carbonell, Coosur, La Masía, La Española, Elosúa, Giralda, Ybarra</i> and <i>Mueloliva</i> 2 store brands: <i>Private label (PL)</i> and <i>Premium price brand (PPB)</i> |
| Consumers | Only those customers paying for their purchases with the store’s loyalty card |
| Size | 389 individuals making a total of 3241 purchases |

Table 2. Description of the brands.

| | Market share (%) | Average price (€) |
|--------------------------|------------------|-------------------|
| Carbonell (NB) | 26.67 | 2.69 |
| Private label (SB) | 22.38 | 2.04 |
| Coosur (NB) | 16.34 | 2.34 |
| La Masía (NB) | 11.87 | 2.42 |
| La Española (NB) | 9.83 | 2.4 |
| Elosúa (NB) | 4.01 | 2.35 |
| Giralda (NB) | 3.87 | 2.26 |
| Ybarra (NB) | 2.45 | 2.44 |
| Premium price brand (SB) | 2.17 | 2.09 |
| Mueloliva (NB) | .41 | 2.55 |

Note: NB = National brand, SB = Store brand.

Model variables

Let I be the number of consumers (households) and T_i be the number of purchase occasions for consumer i . In the model utilised here, consumer i ($= 1, 2, \dots, I$) can, on any purchase occasion t ($= 1, 2, \dots, T$), choose a single brand (or brand combination) j from a set of ($= 1, 2, \dots, J$) distinct brands in a product category. It is assumed that the utility derived by the consumer from the purchase of this item is a linear function of: (1) (regular) price; (2) brand presence on flyer; (3) percentage price reduction; and (4) a loyalty variable. In addition, since stores often use several promotional techniques simultaneously, an interactive effect has been included in order to analyse the synergistic effect of price reduction promotions and flyers. If so, the utilities U_{ijt} that consumer i would derive from purchasing brand combination j on purchase occasion t can be expressed as follows:

$$U_{ijt} = \alpha_j + \beta_1 \text{LogPrice}_{ij} + \beta_2 \text{Flyer}_{ij} + \beta_3 \text{Discount}_{ij} + \beta_4 \text{BL}_{ij} + \beta_5 \text{Discount}_{ij} \times \text{Flyer}_{ij} + \varepsilon_{ijt} \quad (2)$$

in which:

- α_j is a brand-specific constant;
- β_k ($k = 1, 2, 3, 4, 5$) are the response parameters; and
- ε_{ijt} is an error term.

Table 3 summarises the variables used in this study.

In assessing prices, regular price was chosen instead of purchase price, since the former has been found to be a reasonable base for modelling purchasing behaviour (Mayhew and Winer 1992). In addition, log prices were chosen for the present study, because such prices produce better fits than straight prices (Sivakumar and Raj 1997).

The variable of *brand promotion through a price reduction* – measured using the percentage price reduction – during a particular week was established by observing the price levels of the 10 selected brands and assuming that a significant decrease in the regular price of a brand for a limited period (1 to 2 weeks) represented a price reduction. Previous research has found that a discount of at least 15% is required to obtain a positive effect on consumer choice probability (Della Bitta and Monroe 1980). Considering the stability in the sale price of the olive oil brands, we feel that this percentage is more than adequate. Therefore, a brand j was considered to have a price reduction on a purchase occasion t if:

$$\text{Regular price}_{j,t-1} - \text{Regular price}_{j,t} \geq 15\% \text{ of Regular price}_{j,t-1} \quad (3)$$

Table 3. Variables.

| | |
|---------------|---|
| Regular price | Weekly regular price (€) per brand (logarithm) (LogPrice_{ij}) |
| Store flyer | Dummy variable equal to 1(0) if brand j is (not) featured in the store flyer in t (Flyer_{ij}) |
| Brand loyalty | Within-household i market share of each brand j during a 20-week initialisation period (BL_{ij}) |
| Discount | Percentage of price reduction of each brand j in t (Discount_{ij}) |

The use of one variable for the regular price and another for the amount of discount is an established methodology in the literature for dealing with this promotional variable (Guadagni and Little 1983; Blattberg and Wisniewski 1989).

The variable of *brand presence in store flyers* was analysed using a dummy variable, which took a value of one or zero if the brand in question was or was not present in the store's flyers in period *t*. Treating promotional variables as dichotomous variables in this way is a commonly used procedure in the marketing literature (Kannan and Yim 2001).

Customer brand loyalty is the within-household market share of each brand during the 20-week initialisation period. Our measure for brand loyalty varies across households, but remains constant through the calibration period, and is designed to capture cross-sectional heterogeneity. This approach of incorporating the individual's brand loyalty has been adopted in previous studies that have analysed brand choice (e.g. Guadagni and Little 1983; Lattin and Bucklin 1989; Bucklin, Gupta, and Siddarth 1998; Tellis and Zufryden 1995; Han, Gupta, and Lehmann 2001).

Finally, regarding interaction effect, percentage price reduction variable was mean-centred before forming interaction to avoid multicollinearity (Aiken and West 1991).

Results

Consumer deal-proneness according to segments

To determine the optimal number of segments, the traditional heuristics – AIC and BIC – were employed. In addition, the following criteria were utilised – CAIC, the modified Akaike's information criterion (MAIC), and the HQ criterion (Hannan and Quinn 1979). Table 4 shows the results for these criteria.

The optimal solution differs, depending on the statistical criterion used. Thus, for the AIC, MAIC and HQ, the optimal solution is to have three market segments, whereas for BIC and CAIC, the optimal solution is to have only two.

As we indicated before (see 'Modelling approach' above), there is an absence of a clear solution for the problem of statistical criteria selection. Thus, since the optimal solution differs depending on the statistical criterion used – two optimal solutions are proposed (two and three segments) – we are going to estimate these two different models: (1) a model with a two-segment solution; and (2) a model with a three-segment solution. Then, analysing both the face validity of the results and its consistence (according to promotional and marketing literature), we will come to a decision on the optimal solution. The estimation of the two-segment model is provided in Appendix 2.

As we can observe from Appendix 2, the empirical results of the estimation of the two-segment model show that price has no significant effect on choice probability

Table 4. Comparison among different segments.

| # Segments | AIC | BIC | MAIC | CAIC | HQ |
|------------|----------|----------|----------|----------|----------|
| 1 | 3289.921 | 3324.489 | 3295.724 | 3324.491 | 3302.386 |
| 2 | 3028.154 | 3102.609 | 3034.404 | 3102.613 | 3055.003 |
| 3 | 3001.160 | 3112.844 | 3019.910 | 3112.850 | 3041.434 |
| 4 | 3004.929 | 3153.840 | 3029.929 | 3153.849 | 3058.628 |

among consumers belonging to segment 1. However, the well-known negative relationship (in the FMCG sector) between the price of a brand and a consumer's probability of choosing it (Bucklin and Gupta 1992; Bronnenberg, Dhar, and Dubé 2005) is assumed.

Regarding promotional variables, for consumers belonging to segment 1, both price discounts and flyers have a positive and significant effect on choice probability – we have to note that, in spite of the insignificant price coefficient, consumers belonging to this segment respond to discounts. On the contrary, for consumers belonging to segment 2, only store flyers have a positive and significant effect on choice probability; however, this effect is negative. This result is not in accordance with the positive effect of promotions on the consumer's choice behaviour, as documented in the marketing literature (Van Heerde and Bijmolt 2005). Indeed, some authors, such as Blattberg and Neslin (1990), have indicated that more than half of the sales of many categories of mass consumer goods were made in periods coinciding with some type of promotion. Particularly for feature advertising, literature recognises the positive effect of this promotional tool on the consumer's choice behaviour (e.g. Pieters, Wedel, and Zhang 2007; Song and Chintagunta 2007; Niraj, Padmanabhan, and Seetharaman 2008). Nevertheless, it is true that consumers show variations in flyer proneness. Thus, some of them are quite sceptical about the use of this promotional tool, and therefore are not sensitive to brand presence in store flyers (Schmidt and Bjerre 2003); but a negative effect of brand presence in store flyers on the consumer's choice behaviour had not been previously found. In addition, this result is not very consistent, since for these consumers (segment 2), price has a strong negative (and significant) effect.

On the other hand, interaction effect has no significant effect on choice probability for either segment 1 or segment 2.

Regarding loyalty, customers are loyal consumers in both segments. Even for consumers belonging to segment 1, brand loyalty is stronger than for those consumers belonging to segment 2 (both coefficients are significantly different – $p < .01$). The result is not logical, since segment 1 is deal-prone (both for discounts and flyers), whereas segment 2 is a non-deal-prone segment. The results show a positive relationship between deal-proneness and brand loyalty. However, it has often been postulated that deal-proneness is negatively related to brand loyalty (Dodson, Tybout, and Sternthal 1978; Blattberg and Neslin 1990; Lichtenstein, Burton, and Netemeyer 1997; Laroche et al. 2003; Lim, Currim, and Andrews 2005).

Finally, it is surprising to observe that for consumers belonging to segment 1, there is an insignificant preference for *Carbonell* (the market leader), although these consumers are very loyal, and they are not worried about the price of a brand. Even these consumers show a strong positive preference for *PL*, in spite of that insensitivity to price.

As a consequence of all the inconsistencies of the results extracted from the estimation of the two-segment model, we have decided to adopt the three-segment model. We characterise deal-proneness based on the existence of three groups of consumers of different sizes: 53.78% (segment 1), 37.12% (segment 2) and 9.1% (segment 3).

Table 5 shows the estimation for the brand choice model for the three obtained segments.

Sales promotions (both price reductions and store flyers) had a positive and significant effect in all segments except segment 1.

The segments were ranked according to: (1) the values provided in Table 5; (2) several *t*-tests between the parameters (the effect of price reductions, brand's presence in store flyers, interactive effect, and brand loyalty of each segment); and (3) differences in the elasticities between segment pairs.

Table 6 shows the *t*-test values for sales-promotion coefficients.

For price reduction coefficients, the *t*-test between segments 2 and 3 was significant (28.3375; $p < .01$). This demonstrates that the effect of price reduction on segment 2 consumers' choice probability (2.774) was stronger than the effect on segment 3 (.887). In the same way, several *t*-tests were developed for the store flyer variable. The results were similar to those obtained for the price reduction variable. The *t*-test between the effect of brand presence in store flyers for segments 2 and 3 was significant (11.494; $p < .01$). This demonstrates that the effect of brand presence in store flyers on segment 2 consumers' choice probability (2.964) was stronger than the effect on segment 3 (1.135).

Finally, as can be seen in Table 5, the parameter β_5 was positive and significant for both segment 2 (.486; $p < .01$) and segment 3 (.208; $p < .01$). In this respect, combining β_5 with β_2 and β_3 , synergies between store flyers and price reductions can be extracted. Thus, for both segment 2 and segment 3, the synergistic effect of price reduction promotions and flyers is apparent.

Table 5. Estimation of brand choice model for the three segments (segment size %).

| | Segment 1 (53.78) | Segment 2 (37.12) | Segment 3 (9.10) |
|--|-------------------|-------------------|------------------|
| Preferences towards each brand (σ) | | | |
| Carbonell (NB) | 3.921* (.284) | 1.595* (.173) | 2.475* (.365) |
| PL (SB) | .301 (1.182) | 6.322* (.396) | 1.921* (.094) |
| Coosur (NB) | .432* (.011) | 1.007 (1.211) | .865* (.018) |
| La Masía (NB) | 2.877* (.186) | 2.294* (.313) | 1.433* (.147) |
| La Española (NB) | 2.602* (.131) | 2.392* (.09) | 2.116* (.132) |
| Elosúa (NB) | 1.13** (.12) | .992 (1.127) | .372* (.003) |
| Giralda (NB) | 2.702* (.164) | .722 (.697) | .745 (.895) |
| Ybarra (NB) | 2.21* (.144) | .733* (.108) | .664* (.096) |
| PPB (SB) | .356 (.643) | 1.569* (.195) | .7412* (.007) |
| Parameters of the explanatory variables (σ) | | | |
| Regular price | -.963* (.004) | -4.321* (.116) | -1.743* (.226) |
| Discount | .485 (.433) | 2.774* (.395) | .887* (.11) |
| Store flyer | .712 (.609) | 2.964* (.951) | 1.135* (.117) |
| Brand loyalty | 7.216* (.183) | .997 (.875) | 1.467* (.107) |
| Discount \times Store flyer | .127 (.158) | .486* (.001) | .208* (.003) |

Notes: * $p < .01$, ** $p < .05$, *** $p < .1$.
 NB = National brand, SB = Store brand.

Table 6. Differences in sales-promotion coefficients between segment pairs (*t*-tests).

| Variables | Segment 1 ^a vs. Segment 2 | Segment 1 vs. Segment 3 | Segment 2 vs. Segment 3 |
|--------------------|---|----------------------------|----------------------------|
| Discount | — | — | 28.3375* |
| Store flyers | — | — | 11.494* |
| Interactive effect | — | — | 930.078* |

Notes: * $p < .01$. ^aFor both promotional variables, parameters for consumers belonging to segment 1 are not significant.

Regarding segment 2, the resulting coefficient ($2.774 + .486 = 3.26$) shows that the effect of price promotions on consumer choice behaviour is higher when the brand is also featured in store flyers. In the same way, the effect of the appearance of a particular brand on store flyers is higher when the brand is also promoted on price inside the store, as suggested by the combination of β_5 and β_2 ($.486 + 2.964 = 3.45$). From the above results, we can conclude the existence of synergies between these two promotional tools. The same holds for consumers belonging to segment 3.

On the other hand, as expected – since neither price reductions nor store flyers coefficients were significant – for segment 1, the interactive variable parameter was not significant.

In the same way, several *t*-tests were developed for the interactive variable. The results were similar to those obtained for both price reduction variable as well as store flyer variable. The *t*-test between the interactive effect of both promotional tools for segments 2 and 3 was significant (930.078; $p < .01$).

It was therefore established that:

- consumers belonging to segment 2 were the most deal-prone;
- consumers belonging to segment 1 were not deal-prone; and
- consumers belonging to segment 3 demonstrated an intermediate degree of deal-proneness.

Consumer price sensitivity

Table 5 shows that the regular-price parameter was negative and significant in all cases, thus confirming the well-known negative relationship (in the FMCG sector) between the price of a brand and a consumer's probability of choosing it (Simpson 2006).

To determine which of the segments was the most price conscious, the direct price elasticity for each segment was estimated (see Table 7). In the MNL latent class model, elasticity is expressed as follows:

$$e_{P_{j/s}}^{X_j} = \frac{\partial P_{j/s}}{\partial X_j} \frac{X_j}{P_{j/s}} \quad (4)$$

Table 7. Price elasticity for each segment.

| | Segment 1 | Segment 2 | Segment 3 |
|-------------|-----------|-----------|-----------|
| Carbonell | -.1662 | -.9808 | -.6247 |
| PL | -.1327 | -.7827 | -.4986 |
| Coosur | -.1649 | -.9734 | -.6200 |
| La Masía | -.1797 | -1.0604 | -.6754 |
| La Española | -.1823 | -1.0760 | -.6854 |
| Elosúa | -.1900 | -1.1216 | -.7144 |
| Giralda | -.1830 | -1.0802 | -.6880 |
| Ybarra | -.2006 | -1.1835 | -.7538 |
| PPB | -.1723 | -1.0166 | -.6475 |
| Mueloliva | -.2139 | -1.2627 | -.8042 |
| \bar{e} | -.1786 | -1.0538 | -.6712 |

where $P_{j|s}$ represents the probability that brand j is chosen conditional on membership of segment s , and X_j refers to the value of each brand attribute (in this paper X refers to regular price).

As Table 7 shows, segment 2 is the most price-sensitive ($\bar{\epsilon}_2 = -1.0538$), so a unitary change (e.g. a decrease) in the price of a brand will lead (for consumers belonging to segment 2) to a significant change (an increase) in the average probability of choosing it by 1.0538. The same holds for the other two segments. As Table 7 shows, segment 1 was the least price-sensitive ($\bar{\epsilon}_1 = -.1786$), whereas segment 3 was at an intermediate level ($\bar{\epsilon}_3 = -.6712$).

Table 8 shows the differences in the elasticities between segment pairs. These were significant for the three segments.

These results support both H_1 and H_2 , which proposed a positive relationship between price sensitivity and deal-proneness (both price promotion proneness and non-price promotion proneness). Thus, it is confirmed that consumers who are more sensitive to price are more prone to respond to sales promotions (Walters and Jamil 2003).

Consumer brand loyalty

To test H_3 and H_4 , a t -test was conducted between BL values for each one of the segments (Table 9).

BL coefficients for consumers belonging to segment 2 were not significant (see Table 5). For these consumers, previous choice experience had no influence on prospective choice behaviour. In contrast, for consumers belonging to segment 1 (7.216; $p < .01$) and segment 3 (1.467; $p < .01$), loyalty coefficients were positive and significant. In addition a t -test (Table 9) between them was significant (182.876; $p < .01$). It is thus apparent that loyalty behaviour for consumers belonging to segment 1 was more intense than for consumers belonging to segment 3.

From these results, it is possible to analyse the relationship between brand loyalty and deal-proneness for each segment. As Tables 5 and 6 show, price reductions had a stronger positive effect on choice behaviour in segment 2 (brand-switching consumers). Similarly, price reductions had a positive effect on choice behaviour in segment 3, albeit weaker than for segment 2. Segment 3 can thus be designated as

Table 8. Differences in elasticities between segment pairs (t -test).

| Segments | Own elasticities ^a differences (σ) |
|----------|--|
| 1 vs. 2 | .8752* (.1082) |
| 1 vs. 3 | .4926* (.0609) |
| 2 vs. 3 | .3826* (.0473) |

Notes: * $p < .000$. ^a $|\bar{\epsilon}|$.

Table 9. Differences in consumer loyalty coefficients between segment pairs (t -tests).

| | Segment 1 vs. Segment 2 ^a | Segment 1 vs. Segment 3 | Segment 2 vs. Segment 3 |
|---------|--------------------------------------|-------------------------|-------------------------|
| Loyalty | – | 182.876* | – |

Notes: * $p < .01$. ^aCoefficient for consumers belonging to segment 2 is not significant.

'medium-loyal' consumers. Finally, for segment 1, price reductions had no significant effect on choice probability. Therefore, H₃ is partially confirmed, since for segments 1 and 3, it is true that the greater a consumer's loyalty to a brand, the weaker that consumer's price promotion proneness. However, for consumers belonging to segment 2, previous choice experience has no influence on prospective choice behaviour.

These results are in accordance with the findings of such authors as Bawa and Shoemaker (1987) and Laroche et al. (2001), all of whom found that brand-loyal consumers are satisfied with the brands that they are accustomed to buying, and that sales promotions for brands that they are not accustomed to buying are therefore unlikely to change their choice.

The results regarding store flyers were similar to those obtained for price reduction promotions. H₄ is thus partially supported – for consumers belonging segments 1 and 3, the greater a consumer's loyalty to a brand, the weaker that consumer's non-price promotion proneness. However, it is true that also for consumers belonging segment 2, flyers have a positive and significant effect. This result is in accordance with Blattberg and Neslin (1990), who speculated that those consumers who are loyal to a brand would also respond to promotions in store flyers. Our results show that both loyal consumers and switching consumers are influenced by brand presence in store flyers. The former use store flyers to look for special deals with regard to their preferred brand, whereas the latter use store flyers to look for special deals for *any* brand.

These results are in accordance with the findings of Currim and Schneider (1991), who characterised consumers as: (1) 'passive deal-prone consumers' (who stockpile the preferred brand displayed); and (2) 'active deal-prone consumers' (who engage in brand-switching and increase their purchases of any brand that is featured).

Figure 1 shows the relationship between both consumers' deal-proneness and consumers' price sensitivity as well as between brand loyalty and consumer's deal-proneness.

Profiling deal-prone consumers

Using the results described above and the brand preferences shown in Table 5, profiles of the consumers' deal-proneness can be depicted as shown in Figure 2 and as described below.

- *Loyal consumers* (segment 1). This represented the largest segment (53.78%). These consumers were characterised by significant loyalty behaviour in their brand choice and the least degree of price-sensitivity ($\bar{\epsilon}_1 = -.1786$). Low price-sensitivity is characteristic of loyal behaviour (Mankila 2004). These consumers showed a marked preference for national top-price brands (e.g. Carbonell), and a lack of interest in the store brands (e.g. PL and PPB). In general, their preferences for the full range of national brands in the choice set were higher than for the other segments. This result is in accordance with the findings of Lin, Wu, and Wang (2000), who established that a stronger brand preference usually correlates with a high degree of brand loyalty. Our results suggest that these loyal consumers are probably not deal-prone as a consequence of both their loyalty behaviour and their low price-sensitivity.

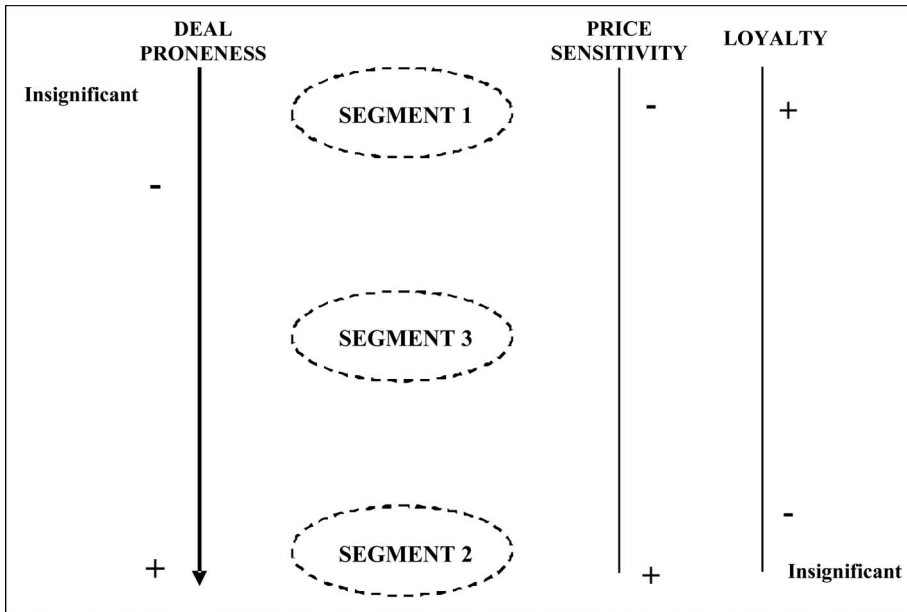


Figure 1. Price sensitivity, consumer loyalty and deal-proneness.

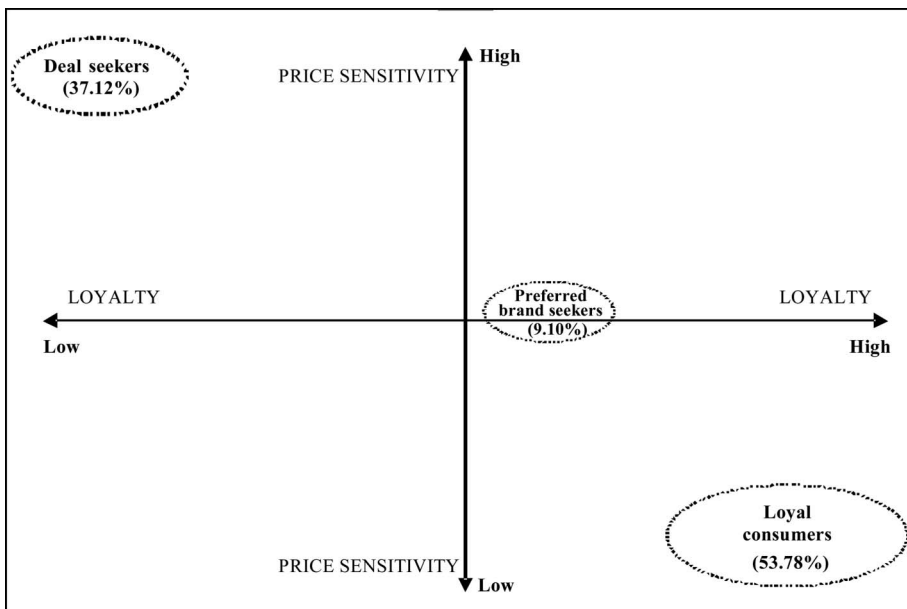


Figure 2. Segments of deal-proneness.

- *Deal-seekers* (segment 2). The consumers in this segment (37.12%) were highly price-sensitive ($\bar{\epsilon}_2 = -1.0538$), tending to seek the best prices according to the price-reduction promotions that appeared in flyers. It seems that there is a

relationship between the strongest consumer's deal-proneness and that consumer's insignificant brand loyalty behaviour; that is, because brand loyalty was not a significant aspect of the choice behaviour of this group of consumers, they were probably more likely to choose brands promoted in this way. The members of this group showed a strong (significant) preference for store brands (both PL and PPB). This result is in accordance with the findings of Dillon and Gupta (1996), who found that in the most price-sensitive consumer segments, private label brand was dominant.

- *Preferred-brands seekers* (segment 3). This represented the smallest segment (9.10%). This group consisted of consumers who demonstrated significant preference for brands that were most promoted (e.g. La Masia and La Española). These consumers could be influenced by promotions. This reinforces that, for many kind of deals, a brand is purchased because it is preferred not because of its promotion (Henderson 1994). In this respect, preferred-brands seekers consumers were loyal consumers to a brand until other brands (mainly national brands but also store brands) appeared in the store flyers. This result is in accordance with the findings of Ortmeier, Lattin, and Montgomery (1991), who found that many consumers who are sensitive to nearly every type of promotion are also loyal. In addition, the members of this group had a medium price sensitivity ($\bar{\epsilon}_3 = -.6712$).

Conclusions and managerial implications

The study has found that a significant proportion of consumers (almost 47% of those purchasing in a store) can be influenced by sales promotions. In general, these were price-conscious consumers who were consciously seeking the best deals in the store. These customers were more likely to choose brands that appeared in store flyers, and stores can thus use such flyers as a tool in loyalty-management programmes. In addition to their price-sensitivity, the deal-proneness of this segment of consumers was a consequence of their low level (and absence) of brand loyalty. These consumers often switched between brands, depending on which brand was being promoted at the time that they go to the store and make their choices.

On the other hand, a larger proportion of consumers (about 54%) were characterised by stronger brand loyalty and a lower level of deal-proneness. These consumers were less likely to seek information from store flyers before entering the store and making their choices. They were not especially interested in which brand was being promoted by price reductions, because they were always likely to buy their usual brands anyway. The findings for these consumers are consistent with the well-known inverse relationship between a consumer's deal-proneness and his or her brand loyalty (Mela et al. 1997).

Nevertheless, it is true (as our work suggests) that brand-loyal consumers also use promotions on brands they regularly buy. In this respect, the positive association (segment 3) between brand loyalty and use of deals suggests that a significant role of sales promotions is to induce loyal users to stock up on the brand. This result is in accordance with the findings of Bawa and Shoemaker (1987), who identified a group of consumers who are less brand loyalty but responsive to sales promotions (so-called 'activist' shoppers). Also, Henderson (1994) found that both loyal consumers and non-loyal consumers responded to certain promotional techniques. Our results, especially in the context of store flyers, suppose an original contribution to the sales

promotion literature; thus, only Papatla and Krishnamurthi (1996) and Gedenk and Neslin (1999) have previously analysed (at least to some degree) the relationship between feature advertising and loyalty; however, neither study found a significant effect of feature on loyalty.

This finding is somewhat at odds with the notion that the predominant effect of promotions is on brand switching (e.g. Gupta 1988). However, recent research (e.g. Ailawadi, Neslin, and Gedenk 2001; Erdem, Imai, and Keane 2003) has found that stockpiling and stockpiling-related consumption play a more important role than was previously thought, though switching does account for the majority of the promotion's effect (see Dillon and Gupta 1996).

The research also has methodological implications for researchers. The latent class models approach has been shown to be useful for characterising consumers in terms of their deal-proneness. In this respect, the present results are consistent with those of other researchers who have suggested that, although these methodological approaches only approximated the true nature of heterogeneity, the results are consistent with how managers think about their markets, and are therefore more appealing to managers (Wedel and Kamakura 2000).

From the perspective of retail management, an understanding of these two kinds of consumers (deal-prone consumers and brand-loyal consumers) is essential if firms are to make efficient use of their promotional budgets. Managers can increase the effectiveness of sales promotions by targeting each consumer segment with a different promotion programme (Lim, Currim, and Andrews 2005), since not all the consumers have the same response to sales promotions. When designing promotional campaigns, we should consider aspects such as consumers' price sensitivity and brand loyalty. The question is 'To what segment does a consumer belong?' In this respect, one of the main tools that firms can use to estimate the composition of each of these segments is the so-called 'loyalty card'. These cards provide time-series data on individual customers. These data complement the general information on brands provided by point-of-sale scanner data. In this respect – and taking into account the profile of each segment – estimating consumers' brands-share and crossing this information with data about the promotional activity of the retailer will lead them to easily determine to what segment a consumer belongs. The complementary information provided by loyalty cards can be used as a basis for loyalty programmes, sales promotion programmes, and advertising campaigns – all of which can be focused on consumer segments that are more prone to these marketing tools. According to Ziliani and Bellini (2004) and Ziliani (2006), individual demographic and behavioural customer information, such as that collected by loyalty cards, can be used in conjunction with point-of-sale scanner data to:

- overcome the limits of current sales-based methods;
- measure the degree of fulfilment of various promotional objectives (customer-specific, long-term, and assortment-wide); and
- create a knowledge repository which, if leveraged, can help to design better promotions.

Another set of implications for managers relates to the synergies between promotional tools. In this respect, for deal-prone consumers, we find that, on one hand, the presence of brands in store flyers will conceivably increase the effect that

price promotions of these brands will have on these consumers, while, on the other hand, there will be a greater effect of brand presence in a store flyer if that brand is also promoted on price. This finding is in accordance with many authors such as Bemmar and Mouchoux (1991) and Lemon and Nowlis (2002), all of whom confirmed that using promotional advertising simultaneously with price cuts allows stores to significantly increase their sales.

Therefore, our conclusions suggest that marketing managers can obtain better results by optimising synergies among elements of the promotion and product mix.

Limitations and further research

As in similar studies using panel data, the analysis was conducted on only one product category. However, the characteristics of the product category that was analysed were such that it is likely that the results can be extrapolated with confidence to any type of mass-consumer product. In support of this contention, the present authors note that the leading brands of olive oil studied here were national brands, that the store's private label (PL) brand had a large market share, and that the distributor had a second premium-priced brand (PPB). Nevertheless, validation of these results by analysis of other product categories is recommended.

In addition, as in similar studies analysing consumers' brand choice behaviour, the analysis comprises only one store. Therefore, it is true that purchases by the buyers occurring outside the store may bias the results. However, in Spain, olive oil is frequently purchased in stores such as hypermarkets, supermarkets or discounters. In this respect, hypermarkets lead food sales rankings in Spain. Since the store used in this study is a hypermarket belonging to a leading international distribution group in both Spain and Europe, it is likely that the results can be extrapolated with confidence to other hypermarkets, and that they are representative of Spaniards' olive oil purchasing behaviour.

It would also be interesting to characterise the segments obtained here on the basis of relevant socio-demographic characteristics such as gender or age.

The authors also recommend that future research could analyse the effect of store flyers on other aspects of consumer behaviour apart from consumer choice (such as information search or evaluation of alternatives). This would assist in determining how retailers can improve the performance of this increasingly used promotional tool.

Notes

1. For example, while in the USA coupons are widely known and used (Schultz, Robinson, and Petrison 1998), in Europe the distribution and use of coupons is lower. Thus, in Spain, 67% of consumers admitted using coupons at least occasionally, but on average only 3.25 coupons per household were redeemed in 2003 (Martínez and Montaner 2006). However, the Spanish consumer received weekly flyers from different stores in their post boxes. On the contrary, in the USA, almost 90% of consumers reported using coupons, and an average of about 80 coupons per household were redeemed annually (Schultz, Robinson, and Petrison 1998).
2. In the high-low promotion strategy (HILO), temporary price discounts for selected items occur for some days, followed by weeks with normal prices. In the every-day-low-price (EDLP) strategy, the retailer promotes a basket of products with the argument to offer attractive low prices which will be constant for a longer period (Pechtl 2004).
3. Even though this concept is different from the price-consciousness concept (the latter refers to 'the exclusive focus on paying low prices' (Lichtenstein, Ridgway, and Netemeyer

1993) – that is, an attitudinal predisposition, whereas price-sensitivity is purely behavioural in its orientation), in this paper, both concepts will be used in the same sense, assuming that there is a direct relationship between a consumer's price-consciousness and his/her price-sensitivity, as many authors pointed out (Ailawadi, Neslin, and Gedenk 2001; Kim, Srinivasan, and Wilcox 1999).

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Appendix 1. Semi-parametric latent class approach

The semi-parametric latent class approach (Kamakura and Russell 1989) involves the existence of a set of S possible response profiles. Each segment s represents a response profile or family of parameters $(\{\alpha_{js}\}_{j \in J}, \{\beta_{ks}\}_{k \in K})$. This set of segments makes up the probability distribution, with a relative size λ defined by the probability $\{P(s)\}_{s \in S}$, according to a logistic formulation that provides probability values less than 1 ($0 \leq P_s \leq 1$), where $\sum_{s \in S} \lambda_s = 1$:

$$P_s = \frac{\exp \lambda_s}{\sum_{s'} \exp \lambda_{s'}} \tag{A.1}$$

Considering the case for the existence of a sequence of choices for each individual, H_i , the event probability of sequence H_i , conditional on the individual belonging to segment s , is given by:

$$P_i(H_i|s) = \prod_{t \in T} \prod_{j \in J} (P_{ij|s})^{d_{ijt}} \tag{A.2}$$

in which:

- d_{ijt} equals 1 if individual i chooses brand j at time t ; and
- d_{ijt} equals 0 if individual i does not choose brand j at time t .

The probability that consumer i has a choice history H_i (P_{Hi}) is calculated by a multinomial logistic structure:

$$\begin{aligned}
 P_{Hi} &= \sum_{s \in S} P_{H_i|s} P_s \tag{A.3} \\
 &= \int_{\{\alpha_{js}\}_{j \in J, s \in S}, \{\beta_{ks}\}_{k \in K, s \in S}} \int \left[\prod_{t \in T} \left\{ \prod_{j \in J} \left(P_{it} \left(j \mid \{\alpha_{js}\}_{j \in J, s \in S}, \{\beta_{ks}\}_{k \in K, s \in S} \right)^{d_{ijt}} \right) \right\} \right] \\
 &\quad d\mathfrak{S}(\{\alpha_{js}\}_{j \in J, s \in S}, \{\beta_{ks}\}_{k \in K, s \in S}) \tag{A.3}
 \end{aligned}$$

in which:

- d_{ijt} equals 1 if individual i chooses brand j at time t ; and
- d_{ijt} equals 0 if individual i does not choose brand j at time t .

$\mathfrak{S}(\{\alpha_{js}\}_{j \in J, s \in S}, \{\beta_{ks}\}_{k \in K, s \in S})$ represents the heterogeneity function. If this function is approximated by a finite set of points S , the previous expression becomes:

$$P_{H_i} = \sum_{s \in S} \left[\prod_{t \in T} \prod_{j \in J} \left(\frac{\exp(\alpha_{js} + \sum_{k \in K} \beta_{ks} X_{ijkt})}{\sum_{j' \in J} \exp(\alpha_{j's} + \sum_{k \in K} \beta_{ks} X_{ij'kt})} \right)^{d_{ijt}} \right] \frac{\exp(\lambda_s)}{\sum_{s' \in S} \exp(\lambda_{s'})} \quad (\text{A.4})$$

Each individual's probability of belonging to each segment is affected by the individual's choice history (using Bayes theorem), taking the segment for which the probability is highest:

$$P_{i|S|H_i} = \frac{P_{H_i|s} P_s}{\sum_{s' \in S} P_{H_i|s'} P_{s'}} \quad (\text{A.5})$$

Appendix 2. Estimation of the brand choice model for the two-segments

| | Segment 1 (29.07%) | Segment 2 (70.93%) |
|--|--------------------|--------------------|
| Preferences towards each brand (σ) | | |
| Carbonell (NB) | -8.347 (22.367) | 5.532* (.514) |
| PL (SB) | 5.086* (.426) | .269 (.628) |
| Coosur (NB) | 3.153* (.005) | 2.432* (.529) |
| La Masía (NB) | .54 (.956) | 1.836* (.518) |
| La Española (NB) | 1.548* (.214) | 2.614* (.517) |
| Elosúa (NB) | -.854 (1.024) | 1.597* (.528) |
| Giralda (NB) | -.754 (1.136) | -.432 (.677) |
| Ybarra (NB) | .483 (.577) | 1.973* (.522) |
| PPB (SB) | .119 (.785) | -1.226* (.621) |
| Parameters of the explanatory variables (σ) | | |
| Regular price | -1.987 (5.132) | -8.473* (.754) |
| Discount (%) | 1.468* (.225) | -.0263 (.0239) |
| Store flyer | 4.418* (.586) | -.386* (.0531) |
| Brand loyalty | 38.698* (4.403) | 3.163* (.0506) |
| Discount \times Store flyer | .221 (.301) | .331 (.430) |

Note: * $p < .01$. NB = National brand; SB = Store brand.