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## **Consumer Perceptions and Behaviour towards Branded Commodities**

### **Abstract**

This study investigates consumers' perceived differentiation of branded commodities. Using data from three countries, across four commodity categories, the study examines consumers' brand / attribute associations, brand commitment, and loyalty-related brand performance measures that are benchmarked against the output from the well-established NBD-Dirichlet model. The brand perceptions and brand performance data provide convergent evidence of systematic variations with market share (or brand penetration), rather than idiosyncratic brand differentiation related to the characteristics or equity of individual commodity brands. Overall, the results show that even commodity brands follow the well-established Dirichlet-type empirical patterns. The implication is that communication and other marketing-mix activities should aim to constantly remind consumers of the brand, maintaining the market shares, rather than setting unrealistic targets for increasing loyalty or accentuating brand differentiation.

**Keywords:** branded commodities; NBD-Dirichlet model; consumer perceptions; brand associations/attributes; brand loyalty; duplication of purchase

## **Consumer Perceptions and Behaviour towards Branded Commodities**

### **Introduction**

Commodities such as milk, petrol, or water “*typically are characterized by the lack of perceived differentiation by customers between competing offerings*” (de Chernatony & McDonald, 2003: 12). In other words, a commodity is a product that is the same as other products of the same type from other producers or manufacturers. Lack of differentiation means that commodities are purchased primarily on price and availability (e.g., Mainardes, Júnior, & Andrade, 2019; Metcalf, 1982; Pennington & Ball, 2009). Consequently, customer loyalty in commodity markets is suggested to be typically low or non-existent (Metcalf, 1982).

By contrast, the essence of a brand is the differentiation (functional and/or symbolic) that the brand name confers to the product, so that “*the branded article has more value for consumers than the ‘bare’ product*” (Riezebos, 2003: 18). Differentiation means that consumers purchase brands based on “*relevant and unique added values which match their needs more closely*” (de Chernatony & McDonald, 2003: 25). Indeed, researchers have claimed that customer loyalty can be achieved only when consumers perceive significant differences between competing brands (Dick & Basu, 1994; Keller, 1993).

Two perspectives emerge from the above discussion. The first is that for brands to exist, consumers must perceive differences between competing offerings in a product category. The second perspective suggests that establishing and promoting differentiation are keys to building and sustaining a brand. Both perspectives rest on the premise that consumers’ unique mental associations with brands and consumer perceptions of relevant and unique added values generate brand loyalty.

Consistent with the two perspectives, branding researchers note that commodities can be transformed into branded commodities by creating differentiation via elements such as

packaging, marketing communication or the country of origin of the product (de Chernatony & McDonald, 2003; Ryan, 2008; Stanton & Herbst, 2005). For instance, bottled water brands invest substantial resources in creating differentiation based on the source of the water, the taste, bottle shapes and sizes, promotional contests, social responsibility activities, or catchy slogans, such as *'live young'* (Evian), *'the water from organic land'* (Highland Spring), *'a drop of pure Britain'* (Buxton), or *'untouched by man'* (Fiji).

Despite the above, except for a study by Morrison and Eastburn (2006), there is scarcity of research on whether consumers perceive differences between competing commodity brands, and little is known about consumer loyalty to commodity brands. Insights on the above would provide much needed empirical evidence to branding scholars on the importance of perceived differentiation for branded commodities.

Our study, therefore, investigates consumer perceptions of brand differentiation, and loyalty-related patterns of brand performance in branded commodities markets. Specifically, we aim to address the following research questions: (i) do consumers perceive differences among brands and associate unique attributes to different brands in branded commodities markets? (ii) to what extent do any differences in consumers' brand perceptions or any differences in brand/attribute associations relate to brand usage in branded commodities markets? (iii) do consumers display attachment or commitment to specific brands in branded commodities markets? and (iv) what are the patterns of loyalty-related brand performance measures such as Share of Category Requirements, Purchase Frequency, and Exclusive Buying for commodity brands?

Our study presents much needed empirical evidence on how consumers perceive and buy branded commodities. The findings have important implications for branding theory development, providing empirically generalisable results benchmarked by the well-known Dirichlet theoretical framework developed by Goodhardt and colleagues (Goodhardt et al.,

1984; Ehrenberg et al., 2004). The results offer insights for the manufacturers of commodities who invest large sums on branding, and for the managers who strive to create differentiated commodity brands.

## **Background Literature**

Given the scarcity of research concerning branded commodities, the general branding literature provides the background for this study. The review of branding literature reveals two distinct streams, attributing different importance to the role of perceived brand differentiation as the basis for consumer purchase. Each research stream results in several possible implications for branded commodities, as discussed below.

Scholars suggest that differentiation plays a crucial role in transforming commodities into brands (de Chernatony & McDonald, 2003; Stanton & Herbst, 2005). Differentiation is also a basis for consumer choice between competing offerings (e.g., de Chernatony & McDonald, 2003; Keller & Swaminathan, 2020; MacMillan & McGrath, 1997; Riezebos, 2003), wherein consumers choose brands which provide *“relevant and unique added values which match their needs more closely”* (de Chernatony & McDonald, 2003, p. 25) and towards which consumers feel some kind of attachment or relationship (Aaker, Benet-Martinez, & Garolera, 2001; Fournier, 1998; Keller, 1993). The notion that consumers perceive differences between competing brands and form unique mental associations with each brand is the premise of Keller’s conceptualisation of Customer Based Brand Equity: *“Customer-based brand equity occurs when the consumer is familiar with the brand and holds some favorable, strong, and unique brand associations in memory”* (1993, p. 2). The above perspective holds that strong, favourable, and unique associations towards a brand ultimately translate into a consumer’s loyalty, attachment, identification, and engagement with that brand.

The implication of the seminal work by Keller (1993) and other branding researchers (e.g., Buil, Martínez, & de Chernatony, 2013; Çifci et al., 2016; de Chernatony & McDonald, 2003; Stocchi & Fuller, 2017; Stocchi et al., 2020; Yoo & Donthu, 2001) is that competing brands in commodity-type markets (as in other markets) should differ significantly in how consumers perceive them. After all, perceived differentiation is what distinguishes a brand from a commodity. Therefore, it follows that, for branded commodities to exist, there should be evidence of perceived consumer differentiation between competing offerings.

Consequently, commodity brands should differ not only in how consumers perceive them, but also in how loyal consumers are towards them. Indeed, perceptions of quality and self-image congruence between the consumer and the branded offer are important moderators of the relationship between brand equity and consumers' willingness to pay, in Morrison and Eastburn's (2006) study of branded beef. However, a key limitation of the study by Morrison and Eastburn and in general, of the above-mentioned literature is that they mostly lack benchmarks against which to assess competitive brands' performance. We address this limitation here, by benchmarking our results by the well-established Dirichlet theoretical framework developed by Goodhardt and colleagues (Goodhardt et al., 1984; Ehrenberg et al., 2004).

In contrast with the above literature, a substantial stream of empirical research shows that brand differentiation hardly matters in consumer choice: any differences in image ratings between brands correlate with the market shares of the brands (or the number of brand users), irrespective of a specific characteristic, or the brand (e.g., Barwise & Ehrenberg, 1985; Ehrenberg, Uncles, & Goodhardt, 2004; Ehrenberg, Goodhardt, & Barwise, 1990; Romaniuk et al., 2007). Sharp and Dawes (2001) also note that consumer perceptions do not reflect differentiation in brand characteristics. Supporting this lack of brand differentiation is the empirical evidence showing that the customer profiles of competing brands are very similar in

terms of demographics or other consumer segmentation criteria (e.g., Anesbury, Winchester, & Kennedy, 2017; Hammond, Ehrenberg, & Goodhardt, 1996; Kennedy & Ehrenberg, 2001; Romaniuk & Nenycz-Thiel, 2013; Uncles et al., 2012).

Consistent with the lack of brand differentiation and consumer segmentation is the evidence that only a few consumers buy exclusively one brand within a product category, that is, they are sole or 100% loyal brand buyers. Typically, only about 10% of the buyers of a brand in a year are its sole buyers (Ehrenberg, 1988). Most consumers tend to buy more than one brand over a period (Ehrenberg et al., 2004; Sharp, 2016; Uncles et al., 1994).

Furthermore, brands share customers with other brands in line with their relative penetration, so that the proportion of buyers of brand X who also buy brand Y depends only on the penetration of Y, and not on buying of brand X as such. The relationship between brand penetration (or market share) and cross-purchase behaviour is known as the Duplication of Purchase Law (Ehrenberg, 1988; Ehrenberg et al., 2004).

In summary, two distinctive positions regarding the role of brands and consumer perceptions of brand differentiation emerge from the branding literature, with rival implications for branded commodities. Following the view that differentiation plays a crucial role in transforming commodities into brands (de Chernatony & McDonald, 2003; Stanton & Herbst, 2005), we might expect that perceived non product related consumer differentiation between competing brands should be especially important for commodities for which the product offering is, by its nature, difficult to differentiate. If the above applies, then consumer perceptions towards branded commodities should provide evidence of unique brand associations. We should also find evidence of consumer's loyalty, attachment, identification, and engagement with commodity brands.

On the other hand, when extended to branded commodities, evidence by Barwise and Ehrenberg (1985) on brand perceptions suggests that competing brands should not differ

significantly in *how* consumers perceive them, but in the *number of people* for whom the brand is ‘salient’, i.e. are positive about the brand (Ehrenberg, Barnard and Scrivens, 1997). The number of consumers who are positive about the brand they buy should conform to the Double Jeopardy (DJ) phenomenon (McPhee, 1963): smaller brands (brands with fewer users, or lower penetration) enjoy fewer ‘likes’ amongst their users than larger brands amongst theirs (Ehrenberg et al., 2004; Singh, Ehrenberg, & Goodhardt, 2008). Hence differences in brand perceptions should reflect the size of the brand itself (or the number of its users), rather than brand differentiation.

As in other markets, exclusive purchase loyalty should be low, and commodity brands should share customers with other brands in line with their relative market shares or penetration (the already mentioned Duplication of Purchase Law; Ehrenberg, 1988; Singh et al., 2012a). Furthermore, patterns of loyalty-related performance measures for commodity brands, such as Share of Category Requirements, Purchase Frequency, and Exclusive Buying should conform with the predictions of the Dirichlet theoretical framework developed by Goodhardt and colleagues (e.g., Ehrenberg et al., 2004; Goodhardt et al., 1984), which assumes that brands compete as undifferentiated choice options of varying popularity.

We investigate the empirical evidence for branded commodities and address the following research questions related to consumer perceptions, brand commitment and loyalty-related brand performance measures:

- (i) do consumers perceive differences among commodity brands and associate unique attributes to different brands?
- (ii) to what extent do any differences in consumers’ brand perceptions or any differences in brand/attribute associations relate to brand usage in branded commodities markets?
- (iii) do consumers display attachment or commitment to specific commodity brands?



- (iv) what are the patterns of loyalty-related brand performance measures such as Share of Category Requirements, Purchase Frequency, and Exclusive Buying for commodity brands?

Overall, these research questions examine whether perceived brand differentiation is as evident for branded commodities, as Keller and Swaminathan (2020) and de Chernatony and McDonald (2003) suggest it should be, or whether perceptual and loyalty-related brand performance measures follow known patterns of buying associated with the brands' market shares or penetrations, as put forth by Goodhardt and colleagues in their over five decades of substantial and consistent empirical evidence.

## **Method**

### *Selection of commodity markets*

Our study focuses on four commodity categories across three countries: packaged rice and bottled water in Thailand, petrol in Germany, and packaged bread in the UK. We selected the above categories for several reasons. First, these commodities have a long history of branding, and have several well-established brands that receive considerable marketing support from their manufacturers, such as Danone and Nestlé for bottled water<sup>1</sup>. Second, these commodities are frequently bought, and most consumers are familiar with the alternative offerings, which was useful for data collection as the respondents were able to relate to the brands without any difficulty. Finally, in line with other commodities, while there is objective price-based differentiation (often linked to the provenance, e.g., bottled water) between brands in these four commodities, there is little identifiable physical difference at the product level between competing offerings in each category.

### *The Data and Measures*

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<sup>1</sup> <https://www.danone.com/brands/waters.html>  
<https://www.nestle-waters.com/get-to-know-us/through-our-waters/all-brands>

Our research questions require the analyses of both perceptual and behavioural brand performance measures, which we benchmark with the Dirichlet theoretical framework developed by Goodhardt and colleagues (Goodhardt et al., 1984; Ehrenberg et al., 2004).

The parallel examination of consumers' brand perceptions and loyalty-related brand performance measures is a noteworthy aspect of this research since previous studies have relied on the analysis of either consumer perceptions or purchase behaviour. The parallel examination of consumers' brand perceptions and loyalty-related brand performance measures provides solid evidence of whether or not brand differentiation manifests itself in either, or both, consumer perceptions and brand loyalty.

One of the reasons that previous research focuses on perceptions or on purchase behaviour in isolation is that the simultaneous collection of perceptual and purchase behaviour data is not common practice. For example, consumer scanner panels typically record data only on brand purchases, quantities bought, price paid and stores, but do not collect consumer perceptions towards the brands they buy (i.e., why they buy a brand), mainly because of concerns that capturing consumer perceptions may influence their behaviour. Due to the non-availability of single source perceptual and behavioural scanner data, we created a survey questionnaire to investigate both buying behaviour and perceptions concerning brands in the chosen four commodity categories.

A common criticism is the inaccuracy of self-reported data for purchase behaviour in survey research (Oppenheim, 1992). In recent years, however, the Juster scale has become a popular method to capture purchase likelihood (e.g., Singh et al., 2012a; Uncles & Lee, 2006; Wright et al., 2002) and is used in this study as proxy to scanner panel data (see Appendix A). The brand performance measures (brand penetration, average purchase frequency, 100%-loyal buyers, and Share of Category Requirements), necessary for the Dirichlet model, are usually acquired through panel data (Wright, Sharp, & Sharp, 2002). As suggested by Wright et al. (2002), the Juster scale can be employed as an inexpensive alternative for panel data. Uncles

and Lee (2006, p. 20) note that the Juster scale captures purchase probabilities with accuracy and can be used to “*develop the estimators for the market shares required as inputs in the Dirichlet model of purchase incidence and brand choice*”.

As a purchase probability scale that combines individual purchase probabilities to estimate demand (Juster, 1966), the scale asks respondents to estimate their chances of engaging in a certain type of future behaviour (Wright et al., 2002), such as the probability of purchasing particular brands in a specified period of time: “How many times are you likely to purchase/use <brand A> in the next <period of time>?”. Respondents are asked to choose from an eleven-point scale, where 0 denotes “no chance, almost no chance (1 in 100)” and 10 denotes “certain, almost practically certain (99 in 100)” (Wright et al., 2002). The time period asked varied according to the product category (see note in Appendix A).

The Juster scale derived response is rescaled into purchase probabilities, which is used to derive brand penetration ( $b_j$ ), category penetrations ( $B$ ), brand average purchase frequency ( $w_j$ ), category purchase frequency ( $W$ ) and market share ( $ms_j$ ) (Uncles and Lee, 2006). The latter is used as input to calculate other brand performance measures (100%-loyal buyers and Share of Category Requirements) and report Dirichlet predictions. We present the calculations for brand penetration (i.e., the percentage of consumers who have bought the brand at least once in the period), category penetration, brand average purchase frequency and category purchase frequency below.

Equation 1: Brand penetration ( $b_j$ ), is the average score of the individual purchase probabilities ( $p_{ij}$ ) for each brand ( $j$ ) expressed as a percentage:

$$b_j = \left( \sum_i p_{ij} / n \right) \times 100$$

Equation 2: category penetration ( $B$ ) is estimated as one (1) minus the probability of not buying any brands in the chosen period. This must be calculated for each individual, then the mean of these values is taken. Category penetration is also expressed as a percentage:

$$B = \left( \sum_i \left( 1 - \prod_j (1 - p_{ij}) \right) / n \right) \times 100$$

Equation 3: brand average purchase frequency ( $w_j$ ), is determined by dividing the total brand volume by the total number of buyers of the brand, where  $v_{ij}$  is the most likely number of purchases of a brand:

$$w_j = \sum_i p_{ij} v_{ij} / nb_j$$

Equation 4: category purchase frequency, is determined by the sum of the individual brand volumes divided by the expected number of buyers of the category:

$$W = \sum_i \sum_j p_{ij} v_{ij} / nB$$

The market share of each brand is calculated using the following formula:

$$ms_j = (b_j w_j / BW) \times 100$$

Our survey questionnaire consisted of three parts. The first part incorporated brand purchase behaviour measures using the Juster scale. The second part included brand / attribute associations measures and the third part had brand commitment measures. Brand / attribute associations and brand commitment measures addressed different aspects of consumer perceptions.

For the second part of the questionnaire, we examined category specific attributes and created a list of seven attributes for each category (see Tables 1 & 2), which may be indicative of brand differentiation. We asked which traits, from the list of seven category specific attributes such as healthy, high quality, traditional, or conveniently located (for petrol), respondents associated with each of the top four brands (based on market share in the respective country) in the packaged rice, bottled water, petrol or bread product category. Market research practitioners as well as academic researchers regularly use attributes and free-choice pick-any measure of brand / attribute associations to determine consumer perceptions of brands relating to specific characteristics (e.g., Barwise & Ehrenberg, 1985;

Driesener & Romaniuk, 2006; Romaniuk & Sharp, 2000). For example, 45% of the respondents may choose to associate a brand with the attribute *high quality*, 16% may do so for *traditional*, etc. Tables 1 and 2 report the attributes and brands.

For understanding commitment, we use eight customer commitment measures (e.g., *Always my first choice*; *Would recommend*, *Strong affection*, etc. in Tables 3 & 4) commonly used in commercial branding research (e.g., Mintel's reports on bottled water). These customer commitment measures are indicative of the broader aspects of consumer perceptions, relating to attitudinal loyalty, or the attachment of consumers to each brand and are a signal of the *resonance* of each brand for consumers (Keller, 1993).

Trained local interviewers administered self-completion questionnaires either online or face-to-face (using a tablet device), to a convenience-based sample of 18year + respondents in major cities of each country. The interviewers collected 150 valid responses for packaged rice in Thailand (16% male, 84% female), 150 for bottled water also in Thailand (31% male, 69% female), 153 for petrol in Germany (45% male, 55% female) and 137 responses for packaged bread category in the UK (36% male, 64% female).

#### *Analysis and benchmarks*

In the analysis of purchase behaviour data, the NBD-Dirichlet model provides benchmarks for brand performance measures such as *penetration*, *purchase frequency*, *100% loyal buyers* and *share of category requirements* for each brand. The NBD-Dirichlet (Dirichlet for short) is a statistical model that describes and predicts the patterns of buyer behaviour (e.g., Barwise, 1995; Danaher, Wilson, & Davis, 2003; Ehrenberg et al., 2004; Goodhardt, Ehrenberg, & Chatfield, 1984; Stern & Hammond, 2004). The model is robust, and its predictions hold across more than 50 different product categories, ranging from fast moving consumer goods to prescription drugs. The standard approach for estimating the Dirichlet parameters is through employing specialist software (Kearns, 2010, used in this

study). There are also practical approximations, especially for the Duplication of Purchase Law (e.g., see Colombo, Ehrenberg, & Sabavala, 2000; Ehrenberg et al., 1990), that substantiate whether the results hold.

Brand penetration provides the benchmark for the analysis of both brand/attribute associations and customer commitment measures. Brand penetration is a common brand-size-related measure in survey data analysis (e.g., Castleberry et al., 1994; Dall’Olmo Riley et al., 1997) and quantifies the percentage of the sample claiming to have ever used each brand (Collins, 2002). The metric, therefore, gauges the relative size of the brand within a sample and is an appropriate proxy for market share.

### **Analysis of Consumer Perceptions: Brand / Attribute Associations and Brand Commitment in Commodity Markets**

We first analyse the brand perceptions data to answer our research questions one, two, and three. Accordingly, in this section we consider whether consumers perceive differences among brands of commodities within our four analysed categories and whether consumers associate unique attributes with different commodity brands. Further, we analyse whether consumers display attachment to specific brands, in line with the brands’ perceived differentiation. Our analysis employs brand penetration as a benchmark to examine the extent to which any differences in brand users’<sup>2</sup> brand/attribute associations or brand attachment relate to brand buying. We then analyse research question four pertaining to the patterns of behavioural loyalty for commodity brands.

#### *Consumer Perceptions: Attribute Associations*

Table 1 reports the brand/attribute associations for four packaged rice brands in Thailand, that is, the percentage of users of each brand associating the brand with each

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<sup>2</sup> Brand users are defined as the respondents who indicated purchase probabilities of seven (7) and higher for a brand in the Juster scale.

attribute. For instance, 42% of users of the Royal Umbrella brand associated it with the attribute *free from adulterants*, while 25% of Benjarong users associated it with *free from adulterants*. The brands are presented in order of their penetrations, that is, the average score of the individual purchase probabilities ( $p_{ij}$ ) for each brand ( $j$ ) expressed as a percentage (Equation 1 in the Methods section). The bottom row in Table 1 reports the brand penetrations.

The results in Table 1 show a systematic pattern namely the users of the commodity brands with lower penetrations report lower associations than the users of brands with higher penetration. For example, the packaged rice brand Benjarong, with the lowest penetration of 35%, achieves an average attribute association of 30% from its users, while Royal Umbrella, the largest rice brand with 42% penetration, achieves higher average of 49% attribute associations from its users. The average attribute associations and penetrations are consistent, with high correlations between brand penetration percentages and brand association percentages ( $r = .93$ , on average). We find the same pattern being generalised across bottled water, petrol and bread categories in Thailand, Germany and UK respectively, as shown in Table 2. There are only a couple of exceptions to the high correlations between brand penetration and brand / attribute associations in Table 2, i.e. the negative correlation for the attribute *Trendy* in the bottled water category and the small correlation for the attribute *Wholesome* in the bread. These exceptions likely reflect specific marketing activities for the smallest brands in the bottled water and bread categories i.e., the bottled water brand Namthip being available only in expensive restaurants in Thailand and the slogan for Allinson's whole meal bread being: 'wholesome, full flavour, champion wholemeal'.

**Table 1 here**

**Table 2 here**

Overall, the results in Tables 1 and 2 are consistent with the Double Jeopardy (DJ) phenomenon (McPhee, 1963): smaller brands (brands with fewer users, or lower penetration) also enjoy fewer brand/attribute associations amongst their users (Castleberry et al., 1994; Dall’Olmo Riley et al., 1997). The two noted deviations for the brands Namthip and Allinson are exceptional and are not indicative of either niche branding or a significant ‘added value’ for the two respective brands, which are the smallest of the four brands considered in the respective category.

These results are remarkable, in the context of our research questions one and two, showing that irrespective of the specific attribute, any difference in brand/attribute associations between brands reflects the size of the brand itself (or the number of its users), rather than perceived brand differentiation.

#### *Consumer Perceptions: Brand Commitment*

We addressed research question three with the analysis of how the users of commodity brands commit to their brands. Our analyses of the brand commitment measures in Table 3 reveal another systematic pattern, with the users of smaller brands showing a weaker commitment or affection towards these brands than the users of the brands with higher penetrations. For example, only 36% of the users of the smallest packaged rice brand Benjarong associate the brand with the commitment measure *Always my first choice* as compared with 65% of the users of the largest brand Royal Umbrella. Brand commitment among brand users also correlates strongly with the brand’s penetration. The average correlation between brand commitment and brand penetration in Table 3 is .62. The figure increases considerably to .74, when omitting the low correlation for the measure *I like it but buy other brands too*. The low correlation for the latter measure in Table 3 seems to be an idiosyncrasy in the data, as it does not generalise across the bottled water, petrol and bread categories in Thailand, Germany and UK respectively (see Table 4). Indeed, the brand



commitment percentages for the measure *I like it but buy other brands too* in Table 4 are higher than for the other brand commitment measures, suggesting *repertoire* or portfolio buying, whereby consumers switch their purchases between different brands (Ehrenberg et al., 2004). The patterns for all other brand commitment measures generalise across the four commodities, as shown in Tables 3 and 4, including the low percentages across all brands and products for the measures *The only brand I'll buy* and *Worth paying extra*. These results also confirm the lack of perceived brand differentiation.

**Table 3 here**

**Table 4 here**

## **Analysis of Purchase Behaviour and Market Performance Measures of Commodity**

### **Brands**

In this section we address our research question four and examine loyalty-related performance measures of commodity brands. Further, we report whether commodity brands in each of the four categories share customers with other brands in line with penetration, following the *Duplication of Purchase Law* (Ehrenberg et al., 2004), rather than showing exclusive loyalty. We employ the well-established NBD-Dirichlet model output as benchmarks for the brand performance measures.

#### *Brand Performance Measures*

Table 5 reports the results for a range of Observed (O) brand performance measures and the corresponding Theoretical (T) Dirichlet predictions for packaged rice category in Thailand. The brand performance measures in Table 5 are: market share, brand penetration, purchase frequencies, exclusive buyers (100%-loyal buyers) and Share of Category Requirements (SCR) (see SCR definition below). The brands in the table are presented in market share order.

## Table 5 here

### *Dirichlet model fit*

Overall, the Dirichlet theoretical predictions (T) in Table 5 are very close to the Observed measures (O), with correlations  $>.8$ . There are a few exceptions in terms of the model predictions. The packaged rice brand Mahboonkrong has an observed penetration of 37 as against the Dirichlet predicted 28, along with a slightly higher predicted purchase frequency. Similarly, for the 100% loyal buyers, the model predictions are higher than the observed figures, resulting in a relatively low correlation of .43. Such intermittent deviations from Dirichlet predictions are often either data exceptions, or are explained by niche effects, and are well-documented in the literature (e.g., Ehrenberg et al., 2004; Fader & Schmittlein, 1993; Goodhardt et al., 1984; Jarvis & Goodman, 2005; Li, Habel, & Rungie, 2009). Overall, the model predictions are close, suggesting its high predictive accuracy for the commodity brands.

### *Purchase Frequency*

The purchase frequency of the market leader Royal Umbrella is 1.5 with 22% market share whereas the smallest brand Mahboonkrong (with 12% market share) has a purchase frequency of 1. The purchase frequencies are slightly lower for smaller market share brands.

### *100%-loyal Buyers*

Most customers buy several different brands within a product category. There is a small group of customers who buy only one single brand in an analysis period. These are the 100%-loyal or the sole buyers of a brand. In Table 5, the percentage of customers who are 100%-loyal buyers of a packaged rice brand does not vary much from brand to brand, ranging between 9%-5%, in line with previous findings for brands in a variety of product categories (e.g., see Ehrenberg et al., 2004). The low incidence of sole buyers even for larger brands

such as Royal Umbrella indicates that consumers have a repertoire of brands that they choose from, in a period.

#### *Share of Category Requirements*

A relevant and frequently used management metric of brand loyalty is Share of Category Requirements (SCR). It measures the share of an average buyer's total product category requirements that are accounted for by a specific brand, over a period. In Table 5, the SCR is, as expected, higher for the high market share brand Royal Umbrella.

Overall, the average SCR figure of 33% indicates multi-brand buying, as the 'brand commitment' measures in Table 3 had suggested. Even for a high market share brand such as Royal Umbrella, more than half of the purchases in the category are for other brands. There is also a downward trend with market share, with SCR being lower for smaller brands. The above patterns are generalised across bottled water, petrol and bread categories in Thailand, Germany and UK respectively, as shown in Table 6.

#### **Table 6 here**

The analysis of the Duplication of Purchase results in the next section substantiates these findings and those for the 100% loyal buyer.

#### *Duplication of Purchase*

Since only some customers of a brand (5% to 9% in Table 5) will be 100%-loyal to it in an analysis-period, the customers of the focal brand are also buying other brands. The levels of such duplicate buying are commonly interpreted in terms of which brands are in stronger competition with each other. Buying X and then Y need not mean that the consumer is totally giving up brand X in favour of brand Y, but may have both X and Y in their ongoing brand repertoire. This phenomenon of 'divided loyalty' results in the phenomenon known as Brand Duplication of Purchase. A duplication table (Table 7) presents the percentages of purchasers of one brand who also purchase in the same period some or all other brands.

### **Table 7 here**

There are two main patterns of buying in the figures in Table 7. The first main pattern is along the columns in Table 7. The figures are mostly similar; 68% of buyers of Golden Phoenix also buy Royal Umbrella, on average 68% of buyers of other brands also buy Royal Umbrella. This is directly related to the respective popularity, or penetration, of these brands. For instance, Royal Umbrella and Golden Phoenix are market leading brands, both with 42% penetration, and this is reflected in the higher duplication figures for the two brands in the columns, both averaging at 68%.

The second main pattern is that the average duplication for each brand is closely predicted by multiplying the brand's penetration times a duplication coefficient. The duplication coefficient  $D$  is the ratio of average duplication and average penetration ( $D = 1.6$  in Table 7). The predicted duplication is therefore 1.6 times the penetration for each packaged rice brand (with a correlation of .99).

The  $D$  value is an estimate of consumers' propensities to switch to other brands.  $D$  values closer to 1 mean that buying of one brand is independent of buying of other brands, i.e., buyers of one type are no more or less likely to buy another type than the category buyers as a whole (Ehrenberg, 1988). When  $D$  equals 1, the duplication figure for each brand is equal to their penetrations. Generally, over a period of 52 weeks duplications for brands tend to be more than 1; most customers duplicate their purchases with other brands over such length of time (Ehrenberg & Goodhardt, 1974; Singh, Ehrenberg, & Goodhardt, 2004).

The above patterns are generalised across bottled water, petrol and bread categories in Thailand, Germany and UK respectively, as presented in Table 8. Tables 7 and 8 show that, for all four categories, there is a remarkably close fit between the average duplications and the predicted duplications across all the brands. Overall, the patterns show cross-purchasing across commodity brands, pointing to repertoire buying. However, there are differences in

the D values for rice and the other three categories, consistent with previous research showing that D values can be category specific (Singh, 2007). Moreover, differences in D values in Tables 7 and 8 are likely due to the short time length set for purchase probabilities (1 month for rice, petrol and bread, and 2 weeks for bottled water). Accordingly, the duplication figures and the D value in the bottled water category are the lowest, which could also be due to the high number of brands in a fragmented bottled water market.

#### **Table 8 here**

The patterns of brand purchase duplication in Tables 7 and 8 are also coherent with the brand commitment measures in Tables 3 and 4, including *The only brand I'll buy* and *I like it but buy other brands too* measures. By and large, brands share customers with other brands in line with their relative size and consumers are not highly committed to any one brand.

#### **Discussion**

Our research investigates and establishes patterns of brand perceptions and loyalty related brand performance in four commodity markets across three countries. Regarding the questions of whether consumers perceive brands in commodity markets as differentiated and whether consumers associate unique attributes to different brands, the analysis of the brand/attribute associations data provides convincing evidence that what varies between brands is size (brand penetration or market share), and not perceived differentiation of the brands' individual features. The high correlation between brand/attribute associations and brand penetrations emerging from the analysis of the data in Tables 1 and 2 contradicts the commonly held view (e.g., Keller, 1993) that strongly perceived points of difference between competing brands reflect their individual characteristics. Almost irrespective of the specific attribute, any difference in brand/attribute associations between brands reflects the size of the brand itself (or the number of its users), rather than perceived brand differentiation.

Consumers of competing brands of packaged rice and other commodity categories therefore do not associate unique attributes to different brands, but any differences in perceptions relate to their brand's usage. The results in Tables 1 and 2 are a manifestation of the Double Jeopardy (DJ) phenomenon (McPhee, 1963): smaller brands (brands with fewer users, or lower penetration) also enjoy fewer brand/attribute associations amongst their users (Ehrenberg et al., 2004; Singh, Ehrenberg, & Goodhardt, 2008).

Consistent with the lack of perceived differentiation in branded commodities is the evidence that consumers' commitment towards brands also strongly correlates with the brands' penetrations, rather than being a manifestation of consumer attachment to individual brands. Furthermore, the similarity in brand associations for *I like it, but buy other brands too* measure illustrates in a striking manner that consumers hold no strong attachment to any of the commodity brands they buy.

The analysis of the loyalty related brand performance measures provides evidence consistent with the findings from the consumer perceptions data. Firstly, brand performance in commodity markets follows Dirichlet-type empirical patterns (Ehrenberg et al., 2004; Singh et al., 2008; Singh et al., 2012a) and confirms the long history of the Dirichlet approach in estimating that individual brands characteristics (e.g., those influenced by the marketing-mix variables such as advertising, packaging, positioning, promotions, etc.) do not affect the brands' purchase probabilities, other than as predicted through the brands' market share. This is a further instance of the Double Jeopardy (DJ) phenomenon (McPhee, 1963) which also emerges from the analysis of the perceptual data: fewer people buy smaller brands (lower penetration), like them less (lower brand/attribute associations in the earlier analysis) and they also buy them less often (e.g., Ehrenberg et al., 1990; Ehrenberg et al., 2004; Ehrenberg & Goodhardt, 2002).

The brand performance measures show that exclusive loyalty is generally very low for all brands, confirming the lack of commitment to individual brands and repertoire buying. Even for a big brand such Royal Umbrella in the packaged rice category, the Share of Category Requirements (SCR) is 48%, hence its customers allocate more than half of their rice purchases to other brands. Indeed, just over half (53%) of the respondents express commitment to the brand over a range of measures. For all brands there are similarly high levels of switching, in line with the individual brand's popularity, that is, Duplication of Purchase figures follow respective brand penetrations.

The above results are consistent with the stream of literature on brand purchase behaviour (e.g., Barwise & Ehrenberg, 1985; Sharp & Dawes, 2001; Romaniuk et al., 2007; Singh et al., 2012a; 2012b) about lack of differentiation amongst competing brands in the *regular* non-commodity type markets; buyers do not show any exclusive loyalty or commitment towards these brands. Our results are also consistent with recent studies on buying behaviour of fresh food and vegetables at category level (e.g., Anesbury et al., 2018, Anesbury et al., 2020). Consumer perceptions and brand performance evidence in our study confirm repertoire buying for brands in commodity markets, as was previously found for brands in other markets.

## **Conclusions**

The findings of our study have important implications for branding theory development, given the scant prior research on branded commodities. First, the empirically generalisable evidence from this study shows that consumers do not associate unique attributes to different commodity brands. Thus, for the commodity brands to exist successfully, it is not necessary for consumers to perceive differences between competing offerings. Second, all brand performance measures, either behavioural or perceptual, provide convergent evidence of systematic variations with market share (or brand penetration), rather

than idiosyncratic variations related to the characteristics, or strength, or equity of individual brands. Therefore, a brand's size is the main differentiating factor, not specific differences in the brands' characteristics.

Third, our study established that brand choice even in commodity markets follows Dirichlet patterns: there is no exclusive loyalty to any particular brand because of its characteristics, hence the buying of branded water is *as if* stochastic. Buyers are likely to buy a brand not because they are attached to its unique characteristics or added values, rather because of their ongoing propensities towards a repertoire of brands from which they choose to buy a particular brand, for a myriad of reasons, on a given purchase occasion. Both the consumer perceptions and behavioural data in this study support this conclusion.

### **Managerial Implications**

The findings in this study have important implications for marketers. Traditionally, the aim of branding has been to create a distinctive image in the minds of buyers. Researchers have also suggested that managers can transform commodities into brands by creating differentiation. Evidence in this study, however, suggests that consumer loyalties and perceptions reflect the brands' market shares and penetrations. Furthermore, customers show repertoire buying even in a branded commodity category.

Marketers can benefit from this knowledge, that the success of a brand depends upon the number of buyers, not the levels of attitudinal loyalties or creation of unique brand identities. Thus, instead of focusing on establishing and promoting differentiation as keys to building a brand, managers should aim to increase the brand's penetration with the help of better distribution and advertising that constantly reminds consumers about the brand's presence. In stationary and mature markets, the reminding function of advertising plays an important role in maintaining the market shares (Ehrenberg, Barnard, Kennedy, & Bloom, 2002; Sharp, 2016). This is more appropriate in commodity markets where clear brand



differentiation based on product-based physical attributes is difficult to achieve. Through consistent reminders, advertising can refresh memories for a commodity brand and make the brand easier to retrieve for its customers (e.g., Romaniuk, 2021). Marketers should, therefore, aim to publicise the commodity brand, reminding customers of what it is, when and where to buy it, or provide information about a new variant or an extension (e.g., Singh et al., 2008, Singh et al., 2012b).

### **Limitations and Further Research**

Our study has limitations that also provide fruitful avenues for future research. The general branding literature tends to focus on either consumer perceptions or purchase behaviour. In our study, the simultaneous examination of consumer perceptions and loyalty-related brand performance measures obtained from the Juster scale has provided a comprehensive depiction of how consumers perceive and buy commodity brands. However, we did not have access to actual purchase behaviour data to substantiate the results from brand performance measures obtained from the Juster scale. Further research should seek either single source brand perceptions and ‘real’ purchase behaviour data from a consumer panel or behavioural data from scanner panels, and consumer perceptions data from a commercial source. The use of multiple data sources is not uncommon in social science research, either because of concerns of bias in single source self-reports (e.g., Spector, Dwyer, & Jex, 1988) or when researchers seek to establish convergent validity with a multi-informant approach (e.g., Coie & Dodge, 1988).

Investigation across other branded commodities is warranted, to examine the extent to which the results in this study generalise. Market-partitioning is another area that can be further substantiated. We found differences in the duplication coefficients (D) across the commodities. Further research can generalise whether D value is commodity specific, and

how it changes over different time lengths. Finally, the impact of promotional activities on buying commodity brands can be examined to generalise findings from branding studies.

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Data availability: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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**Table 1**  
**Consumer Perceptions of Packaged Rice: Thailand (n=150)**  
 % Brand Attribute Associations

<b>Brand Attribute</b>	<b>Royal Umbrella %</b>	<b>Golden Phoenix %</b>	<b>Mahboonkrong %</b>	<b>Benjarong %</b>	<b><u>Correlations:</u> Brand Attributes and Penetration</b>
<i>Healthy</i>	26	23	19	16	<b>0.96</b>
<i>Free from adulterants</i>	42	38	33	25	<b>0.95</b>
<i>Tasty</i>	59	58	49	33	<b>0.94</b>
<i>Fluffy</i>	55	49	43	30	<b>0.93</b>
<i>High Quality</i>	55	46	43	36	<b>0.87</b>
<i>Aromatic fragrance</i>	53	54	51	25	<b>0.80</b>
<i>Prestigious</i>	54	46	42	45	<b>0.66</b>
<b>Average attribute</b>	<b>49</b>	<b>45</b>	<b>40</b>	<b>30</b>	<b>0.93</b>
<b>Brand Penetration %</b>	<b>42</b>	<b>42</b>	<b>37</b>	<b>35</b>	

**Table 2**  
**Consumer Perceptions of Bottled Water (Thailand, n=150), Petrol (Germany, n=153), Bread (UK, n=137)**  
 [% Brand Attribute Associations]

Bottled Water (Thailand)						Petrol (Germany)						Bread (UK)					
<u>Brand Attributes</u>	Nestle Life Pure	Crystal	Singha	Namthip	<u>Corr.: Brand Attributes and Penetration</u>	<u>Brand Attributes</u>	Aral	Shell	Jet	bft	<u>Corr.: Brand Attributes and Penetration</u>	<u>Brand Attributes</u>	Hovis	Kingsmill	Warburtons	Allinson	<u>Corr.: Brand Attributes and Penetration</u>
Refreshing	65	60	50	47	<b>0.99</b>	Good service	86	84	59	46	<b>1.00</b>	Indulgent	40	38	34	23	<b>0.97</b>
Pure	54	47	43	34	<b>0.92</b>	Convenient location	91	87	72	68	<b>1.00</b>	Comforting	60	63	49	20	<b>0.96</b>
Healthy	43	25	24	17	<b>0.90</b>	Convenient hours	99	85	62	39	<b>0.98</b>	Traditional	34	35	26	11	<b>0.94</b>
High Quality	35	32	30	19	<b>0.80</b>	Fast	91	89	76	75	<b>0.98</b>	Authentic	16	13	17	6	<b>0.94</b>
Nice Taste	41	29	35	23	<b>0.67</b>	Product range	88	78	59	29	<b>0.96</b>	High quality	50	35	49	15	<b>0.93</b>
Prestigious	11	18	8	3	<b>0.65</b>	High quality	89	89	86	61	<b>0.81</b>	Delicious	27	15	26	17	<b>0.53</b>
Trendy	25	22	21	31	<b>-0.27</b>	Friendly staff	93	93	79	86	<b>0.78</b>	Wholesome	45	29	26	33	<b>0.17</b>
<b>Average</b>	<b>39</b>	<b>33</b>	<b>30</b>	<b>25</b>	<b>0.70</b>	<b>Average</b>	<b>91</b>	<b>86</b>	<b>70</b>	<b>58</b>	<b>0.93</b>	<b>Average</b>	<b>39</b>	<b>33</b>	<b>32</b>	<b>18</b>	<b>0.78</b>
<b>Penetration %</b>	<b>57</b>	<b>52</b>	<b>45</b>	<b>44</b>		<b>Penetration %</b>	<b>46</b>	<b>44</b>	<b>32</b>	<b>27</b>		<b>Penetration %</b>	<b>50</b>	<b>44</b>	<b>44</b>	<b>8</b>	

**Table 3**  
**Brand Commitment: Packaged Rice (Thailand, n=150)**

<b>Brand Commitment</b>	<b>Royal Umbrella</b>	<b>Golden Phoenix</b>	<b>Mahboonkrong</b>	<b>Benjarong</b>	<b>Correlations: Brand Commitment &amp; Penetration</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>
<i>The only brand I'll buy</i>	37	31	30	25	<b>0.84</b>
<i>Strong affection</i>	58	42	45	28	<b>0.75</b>
<i>Would recommend</i>	63	42	45	28	<b>0.74</b>
<i>Worth paying extra</i>	49	36	39	23	<b>0.74</b>
<i>Always my first choice</i>	65	49	55	36	<b>0.68</b>
<i>Likely to buy again</i>	55	41	45	33	<b>0.68</b>
<i>I like it but buy other brands too</i>	45	29	49	33	<b>-0.08</b>
<b>Average</b>	<b>53</b>	<b>39</b>	<b>44</b>	<b>29</b>	<b>0.62</b>
<b>Brand Penetration %</b>	<b>42</b>	<b>42</b>	<b>37</b>	<b>35</b>	

**Table 4**  
**Brand Commitment: Bottled Water (Thailand), Petrol (Germany), Bread (UK)**

Brand Commitment	Bottled Water (Thailand, n=150)					Petrol (Germany, n=153)					Bread (UK, n=137)				
	Nestle Pure Life	Crystal	Singha	Namthip	Corr.: Brand Commit. & Penetr.	Aral	Shell	Jet	bft	Corr.: Brand Commit. & Penetr.	Hovis	Kingsmill	Warburtons	Allinson	Corr.: Brand Commit. & Penetr.
	%	%	%	%		%	%	%	%		%	%	%	%	
<i>The only brand I'll buy</i>	25	18	21	7	<b>0.70</b>	18	20	12	14	<b>0.85</b>	28	24	20	9	<b>0.96</b>
<i>Strong affection</i>	31	22	24	10	<b>0.77</b>	34	26	19	12	<b>0.96</b>	28	24	20	7	<b>0.97</b>
<i>Would recommend</i>	27	20	25	13	<b>0.60</b>	48	48	33	25	<b>0.99</b>	42	37	35	18	<b>0.99</b>
<i>Worth paying extra</i>	21	11	17	7	<b>0.61</b>	25	18	3	2	<b>0.97</b>	24	19	22	11	<b>0.97</b>
<i>Always my first choice</i>	32	26	37	13	<b>0.35</b>	35	28	20	20	<b>0.93</b>	36	31	22	7	<b>0.93</b>
<i>Likely to buy again</i>	33	33	34	19	<b>0.55</b>	61	54	45	36	<b>0.98</b>	53	45	40	11	<b>0.99</b>
<i>I like it but buy other brands too</i>	41	33	34	23	<b>0.81</b>	61	59	49	39	<b>0.98</b>	53	39	36	17	<b>0.93</b>
<b>Average</b>	<b>30</b>	<b>23</b>	<b>27</b>	<b>13</b>	<b>0.63</b>	<b>40</b>	<b>36</b>	<b>26</b>	<b>21</b>	<b>0.95</b>	<b>38</b>	<b>31</b>	<b>28</b>	<b>11</b>	<b>0.96</b>
<b>Penetration %</b>	<b>57</b>	<b>52</b>	<b>45</b>	<b>44</b>		<b>46</b>	<b>44</b>	<b>32</b>	<b>27</b>		<b>50</b>	<b>44</b>	<b>44</b>	<b>8</b>	

**Table 5**  
**Brand Performance Measures: Packaged Rice (Thailand, n=150)**

	<b>Market share %</b>	<b>Penetration (b) %</b>		<b>Purchase frequency (w)</b>		<b>100%-loyal Buyers %</b>		<b>SCR %</b>	
		<b>O</b>	<b>T</b>	<b>O</b>	<b>T</b>	<b>O</b>	<b>T</b>	<b>O</b>	<b>T</b>
Royal Umbrella	22	42	<b>43</b>	1.5	<b>1.4</b>	8	<b>13</b>	48	<b>38</b>
Golden Phoenix	20	42	<b>40</b>	1.3	<b>1.4</b>	9	<b>13</b>	44	<b>36</b>
Benjarong	14	35	<b>31</b>	1.2	<b>1.3</b>	5	<b>11</b>	34	<b>33</b>
Mahboonkrong	12	37	<b>28</b>	1.0	<b>1.3</b>	8	<b>10</b>	30	<b>32</b>
<b>Average</b>	17	39	36	1.25	1.35	8	12	33	<b>33</b>
<b>Correlation</b>		<b>0.90</b>		<b>0.83</b>		<b>0.45</b>		<b>0.99</b>	

*SCR: Share of Category Requirements*

**Table 6**

**Brand Performance Measures: Bottled Water (Thailand, n=150), Petrol (Germany, n=153), Bread (UK, n=137)**

Bottle Water (Thailand)									Petrol (Germany)								Bread (UK)												
	Mkt. share	(b)		(w)		100% loyal		SCR			Mkt. share	(b)		(w)		100% loyal		SCR			Mkt. share	(b)		(w)		100% loyal		SCR	
		O	T	O	T	O	T	O	T			O	T	O	T	O	T	O	T			O	T	O	T	O	T	O	T
Nestle Pure Life	27	57	58	2.7	2.6	2.6	8	40	31	Aral	30	46	56	1.9	1.6	3	15	41	44	Hovis	28	50	52	2.1	2	1	14	50	40
Crystal	19	52	49	2.1	2.2	0	6	30	24	Shell	24	44	48	1.6	1.5	3	13	36	40	Kingsmill	23	44	46	2	1.9	0	12	42	36
Singha	21	45	52	2.7	2.3	6.6	7	39	26	Bft	13	27	30	1.4	1.3	3	9	18	34	Warburtons	22	44	45	1.9	1.8	2	12	39	36
Namthip	15	44	43	1.9	2	2.6	5	27	21	Jet	11	32	26	1	1.2	0	9	18	33	Allinson	2	9	5	0.6	1.4	1	7	5	24
Ave.	21	50	51	2.4	2.3	3	7	34	26	Ave.	20	37	40	1.5	1.4	2	12	28	38	Ave.	19	37	37	1.7	1.8	1	11	34	34
Corr.		0.76		0.86		0.31		0.89		Corr.		0.93		0.97		0.56		0.99		Corr.		1.00		0.98		0.00		1.00	

**Table 7**  
**Duplication of Purchase: Packaged Rice (Thailand, n=150)**

<b><u>Buyers of</u></b>	<b><u>Who also bought</u></b>			
	Royal Umbrella	Golden Phoenix	Mahboonkrong	Benjarong
Royal Umbrella		68	59	55
Golden Phoenix	68		56	56
Mahboonkrong	69	66		63
Benjarong	67	69	66	
<b>Average Duplication %</b>	<b>68</b>	<b>68</b>	<b>60</b>	<b>58</b>
Predicted Duplication %	69	69	61	57
<b>Penetration %</b>	<b>42</b>	<b>42</b>	<b>37</b>	<b>35</b>
<b>Coefficient D</b>	<b>1.6</b>			

Table 8

**Duplication of Purchase: Bottled Water (Thailand, n=150), Petrol (Germany, n=153), Bread (UK, n=137)**

	Bottled Water (Thailand)					Petrol (Germany)					Bread (UK)			
<b><u>Buyers of</u></b>	<b><u>Who also bought</u></b>				<b><u>Buyers of</u></b>	<b><u>Who also bought</u></b>				<b><u>Buyers of</u></b>	<b><u>Who also bought</u></b>			
	Nestle Pure Life	Crystal	Singha	Namthip		Aral	Shell	Jet	bft		Hovis	Kingsmill	Warburtons	Allinson
Nestle Pure Life		15	15	10	Aral		44	19	7	Hovis		44	40	2
Crystal	16		15	10	Shell	44		15	13	Kingsmill	52		50	4
Singha	13	12		9	Jet	38	28		31	Warburtons	53	51		4
Namthip	10	13	8		Bft	14	25	32		Allinson	25	50	50	
<b>Average Duplication %</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>10</b>	<b>Average Duplication %</b>	<b>32</b>	<b>32</b>	<b>22</b>	<b>17</b>	<b>Average Duplication %</b>	<b>43</b>	<b>48</b>	<b>47</b>	<b>3</b>
Predicted Duplication %	14	12	11	11	Predicted Duplication %	32	31	22	19	Predicted Duplication %	48	42	42	8
<b>Penetration %</b>	<b>57</b>	<b>52</b>	<b>45</b>	<b>44</b>	<b>Penetration %</b>	<b>46</b>	<b>44</b>	<b>32</b>	<b>27</b>	<b>Penetration %</b>	<b>50</b>	<b>44</b>	<b>44</b>	<b>8</b>
<b>Coefficient D</b>	<b>0.24</b>				<b>Coefficient D</b>	<b>0.70</b>				<b>Coefficient D</b>	<b>0.95</b>			



## APPENDIX A: JUSTER SCALE FOR CATEGORY PURCHASE:

What is the possibility that you personally will buy at least one loaf of branded bread\* during the next month (e.g., Hovis, Warburton, supermarket brand, etc.)? Using the scale below, please use the appropriate option:

---	---	10	- CERTAIN, PRACTICALLY CERTAIN (99 in 100)
---	---	9	- ALMOST SURE (9 in 10)
---	---	8	- VERY PROBABLE (8 in 10)
---	---	7	- PROBABLE (7 in 10)
---	---	6	- GOOD POSSIBILITY (6 in 10)
---	---	5	- FAIRLY GOOD POSSIBILITY (5 in 10)
---	---	4	- FAIR POSSIBILITY (4 in 10)
---	---	3	- SOME POSSIBILITY (3 in 10)
---	---	2	- SLIGHT POSSIBILITY (2 in 10)
---	---	1	- VERY SLIGHT POSSIBILITY (1 in 10)
---	---	0	- NO CHANCE, ALMOST NO CHANCE (1 in 100)

*Source: Wright, Sharp and Sharp (2002)*

\*Note: For branded bread, packaged branded rice and petrol: time period indicating purchase probability was forthcoming 1 month. For bottled water: time period was 1 fortnight.