Using Polarisation to Reveal Systematic Deviations in Dirichlet Loyalty Estimation

Fang Li, Cullen Habel, Cam Rungie

Fader and Schmittlein (1993) established that the larger brands in a product category often have excess loyalty relative to the benchmark provided by the Dirichlet Model. This paper extends the analysis to loyalty measures they did not consider and to the phenomenon known as double jeopardy. The implications for management are discussed. This data for this paper comes from a University Research Institute archive, comprising 450 brands in 24 consumer product categories including detergents, chocolate bars, shampoos, biscuits, soft drink to fuel. Two approaches – simple loyalty deviations and a regression of brands' polarisations with their market shares – converged on the same finding. High share brands frequently enjoy loyalty above that predicted by the Dirichlet but this deviation pattern is not confined to the high levels of market share. The smallest brands were also shown to have *lower* than expected loyalty measures. This implies that rather than simply a pattern of excess loyalty for high share brands, the Dirichlet may have a systematically shallower slope in its portrayal of double jeopardy than commonly occurs in real life.

Keywords: Dirichlet, double jeopardy, polarisation, excess loyalty, brand loyalty

Introduction

The Dirichlet Model (Goodhardt, Ehrenberg & Chatfield 1984) is robust and parsimonious. It has been observed to fit repeated purchases in many and varied markets and is an important generalisation for marketing. The model describes the empirical patterns of buyer behaviour in markets and estimates a range of brand performance measures (BPM) such as penetration, purchase frequency and share of category requirements for the brands within a product category. The model has been widely used as a benchmark to evaluate whether a brand is performing in a manner consistent with its market share. Analysis is usually made by comparing the brands' *theoretical* BPMs estimated from the model with their *observed* BPMs (Fader & Schmittlein 1993, Bass & Wind 1995, Uncles, Ehrenberg & Hammond 1995, Bhattacharya 1997, Ehrenberg, Uncles & Goodhardt 2004).

There is excess loyalty for a brand if its observed loyalty related BPMs are higher than the theoreticals; in contrast, there is less (than expected) loyalty if the observed BPMs are lower than the theoreticals. As an empirical generalisation, it is found that there are mainly three kinds of loyalty deviations when fitting the Dirichlet Model. These are (1) excess loyalty for high-share brands or reinforcing brands (Fader & Schmittlein, 1993), (2) excess loyalty for small brands or niche brands (Kahn, Kalwani & Morrison 1988, Bhattacharya 1997, Jarvis & Goodman 2005), and (3) lower than expected loyalty for small brands or change-of-pace brands (Fader & Schmittlein 1993, Bhattacharya 1997, Ehrenberg, Uncles & Goodhardt 2004, Jarvis & Goodman 2005).

Goodhardt, Ehrenberg and Chatfield (1984) acknowledged that *purchase frequencies for some market leaders are occasionally under-estimated by the Dirichlet model.* Fader and

Schmittlein (1993) provided strong evidence of excess behavioural loyalty for leading brands both in Japan and in the USA.

In this paper we continue to investigate the degree to which excess loyalty occurs using 24 new product categories and two new approaches and extend the interpretation of the phenomenon to include the slope of a double jeopardy line. Our first empirical analysis provides a count of the direction of loyalty deviations for the largest (and smallest) brands in each category while empirical analysis two regresses the polarisation statistic (φ_j) for the brands in a category against their market shares. Finally we discuss the marketing implications.

Behavioural loyalty

The concept of loyalty has a long history in marketing and has been linked to strategy (Cunningham 1956, Baldinger, Blair & Echambadi 2002, Uncles, Dowling & Hammond 2003). *"Brand loyalty is customers 'preference' to buy a particular brand in a category"* (Giddens & Hofmann 2002, p1). It happens because customers perceive that particular brand is better than other brands: it may offer good quality for its price; or it may have the features which will satisfy consumer's needs. At first, consumers will buy the brand, and after that, if they are satisfied with that brand, they will buy more often and then it becomes a habit. Loyal customers like the brand, buy the brand more, say good things about the brand to other people and are less susceptible to the offers of competing brands. Furthermore, there is an argument that retaining existing customers may cost less than attracting new customers (Krishnamurthi & Raj 1991, Ryals & Knox 2001). Loyalty programs are intended to alter normal repeat purchase patterns and move a brand into a loyalty position beyond what is "normal" for a brand of their size (Sharp & Sharp 1997, Uncles, Dowling & Hammond 2003).

Marketing research identifies three main conceptualisations of loyalty: (1) behavioural loyalty, (2) attitudinal loyalty, (3) differentiation loyalty (Uncles, Dowling & Hammond 2003). Behavioural loyalty is when shoppers demonstrate a repeated bias towards buying the given brand in preference to its competition. Attitudinal loyalty is the desire or intention to behave loyally towards the brand. Finally, differentiation loyalty (or tenure loyalty) is when customers stay with the brand for a long time (Uncles, Dowling & Hammond 2003).
It is often argued that a complete definition of customer loyalty must include attitudinal components as shown in figure 1.

In contrast, other researchers have found attitudes to be fickle and lacking in reliability (Castleberry, Barnard, Barwise, Ehrenberg & Dall'olmo Riley 1994, Sharp, Rundle-Thiele & Dawes 1997). Also, according to Bhattacharya:

> *"Perhaps because of the relative ease of collecting behavioural data, the majority of all brand loyalty measures are behavioural (Jacoby and Chestnut 1978). And these measures are based on a fairly intuitive notion— if a consumer repeatedly buys a particular brand, she appears to be rather loyal to that brand. In other words, brand loyalty is inferred from repeat purchase behaviour"*
>
> (Bhattacharya 1997, p423).

Thus, in this paper excess loyalty is calculated and analysed on the behavioural basis only. This is also the tradition in discussing the empirical generalization of excess loyalty.

Figure 1: Two components of loyalty to a brand

		Repeat Buying	
		High	**Low**
Attitude	**High**	True loyalty	Latent loyalty
	Low	Spurious loyalty	No loyalty

Source: (Dick and Basu 1994)

Brand performance measures

Jacoby and Chestnut (1978) classified loyalty measures in five groups:

> *"the proportion of purchases devoted to a given brand; those concerned with the sequence in which brands are purchased; those that reflect probability of purchase; those that synthesize or combine several behavioural criteria, and a number of miscellaneous measures"*
> (Jacoby and Chestnut 1978, Jarvis, Rungie & Lockshin 2007, p491).

The first group – "the proportion of purchases" is accounted for by the "brand performance measures" (BPMs) which are calculated from actual purchase data. The bulk of the BPMs relate to purchases over a fixed period of time such as a month or a year (Ehrenberg, Uncles & Goodhardt 2004, Rungie & Goodhardt 2004).

The three BPMs that are of interest in this paper are defined below:

Market share: for a brand, it is its sales as a proportion of total sales of the category. It is calculated as the period total purchases for the brand divided by the period total purchases for the category.

Penetration: the proportion of shoppers who buy the brand/category at least once in the given period. The penetration is the number of buyers divided by the number of shoppers.

Purchase frequency: the average number of times a buyer of the brand buys that brand in the given period. It is the period total purchases divided by the number of buyers.

The Dirichlet Model

The Dirichlet is a stochastic model which is most often used to estimate the range of BPMs for brands in a product category (Goodhardt, Ehrenberg & Chatfield 1984, Ehrenberg, Uncles & Goodhardt 2004) in a normative application.

> *"The Dirichlet model postulates that each consumer has a certain propensity—a probability in the model—to buy a given brand. This probability is assumed to be steady for the time being but differing across heterogeneous consumers. The model is defined for steady state and unpartitioned markets where market shares are stationary and there is no clustering of particular brands"*
>
> (Ehrenberg, Uncles & Goodhardt 2004, p1308)

In recent years many empirical studies using the model have been reported (Uncles, Ehrenberg & Hammond 1995, Driesener 2005) and its use in marketing has been discussed relative to benchmarking (Ehrenberg, Uncles & Goodhardt 2004), new products (Stern & Ehrenberg 2003), price promotions and effects of advertising (McDowell & Dick 2001). It has implications for managers for understanding consumer behaviour, brand performance and the effects of the marketing mix. The Dirichlet reflects a range of patterns in the product category: 1) market share and penetration of each brand differs greatly, but the loyalty related measure, such as purchase frequency, are usually much alike for different brands, 2) a brand typically has many light buyers and few solely loyal buyers; 3) there is a double jeopardy relationship between penetration and purchase frequency - larger brands have far more buyers and they buy the brand a little more often (Uncles, Ehrenberg & Hammond 1995, Ehrenberg, Uncles & Goodhardt 2004).

Loyalty Deviations

The concept of excess loyalty is derived from applications of the Dirichlet model where the model estimates (theoreticals) of the loyalty BPMs are compared to the observed values. When the observed loyalty BPM is higher than their corresponding Dirichlet estimates, there is said to be excess loyalty (Fader & Schmittlein 1993, Bhattacharya 1997, Ehrenberg, Uncles & Goodhardt 2004). There are three kinds of loyalty deviations from the Dirichlet Model: high-share, niche, and change-of-pace brands.

High-share brands

Since the early 1970s it had been known that – for some market leaders – annual purchase frequencies are a unit or so higher than predicted (Ehrenberg, Uncles & Goodhardt 2004).

Also, Fader and Schmittlein (1993) found that high-share brands have significantly greater behavioural loyalty than the levels that would be expected on the basis of Dirichlet Model, both in U.S. and Japan. They reported that the most common cause of excess loyalty seems to be consumer segmentation and structured submarkets, but a specific source may be distribution patterns that differentially favour large-share brands.

Niche brands

Small segments of consumers exist whose needs differ from those of the general users of the product class, thus providing opportunities for niche brand. Niche brand focus only a small group of customers who buy them very often. Thus, the market share for niche brands tends to be low and the purchase frequency tends to be high related to their market share (Kahn, Kalwani & Morrison 1988, Bhattacharya 1997, Jarvis & Goodman 2005).

Change-of-pace brands

The tendency for some customers to seek variety offers opportunities for change-of-pace brands. A change-of-pace brand has a small market share, its customers buy it very infrequently but it has more customers - i.e., the purchase frequency is less than would be expected from the Dirichlet model given the brand's market share but the penetration is more (Kahn, Kalwani & Morrison 1988, Bhattacharya 1997, Jarvis & Goodman 2005).

Is it common for high share brands to have excess loyalty?

The relationship between brands' size and brands' loyalty in a category has been known as double jeopardy (DJ) phenomenon and has been investigated for various markets (Ehrenberg, Goodhardt & Barwise 1990, Ehrenberg & Goodhardt 2002, Allsopp & Jarvis 2003). The double jeopardy (DJ) line has been conceived as a plot of penetration vs. purchase frequency for the brands in a category and is generally considered to be a relatively straight line with a shallow slope (Allsopp & Jarvis 2003).

A series of Dirichlet estimates for penetration and purchase frequency can be thought of as a theoretical double jeopardy line (Habel & Rungie 2005). Previous research found that there was excess loyalty for high share brands when fitting the Dirichlet model. If there is excess loyalty for high share brands, it might show a systematic flaw in this Dirichlet DJ line. Excess loyalty for high share brands, combined with a high incidence of change-of-pace brands would indicate that the Dirichlet theoretical DJ line predicts a shallower slope than commonly occurs. In this paper we want to investigate the degree to which excess loyalty occurs within new sets of data. Is it common for high share brands to have excess loyalty?

Method

This research was undertaken using a multiple sets of data approach (MSOD), rather than a single set of data, producing more generalisable results with greater predictive capacity

(Ehrenberg, Goodhardt & Barwise 1990). The sample of 24 product categories come from two sources, and two different forms of empirical analysis are used.

The first data contribution comes from a meta-analysis of the literature and commercial sources of Dirichlet-Type studies (Allsopp 2003). These data covered multiple categories and ranged from soft drink to fuel, from US markets to Australia, UK and New Zealand markets. Allsopp's (2003) data tables were generally in the format closely aligned with the methods for a Dirichlet analysis, i.e. they included brand performance measures such as market share, absolute penetration, category penetration and other loyalty measures.

The last four categories were collected in France during 1998 and 1999 by market research company MarketingScan. It was combination of (1) a questionnaire survey to record demographic and other variables and (2) scanner data on all purchases from all seven supermarket stores in the city of Angers. The data records for each of 3500 household over a year their store choice and purchases for detergents, chocolate bars, shampoos and biscuits.
The measures used in evaluating deviations from the Dirichlet Model vary in the literature. Fader and Schmittlein (1993) used repeat purchase probability and share of category requirements (SCR) as loyalty measures and market share as the size measure. They found that loyalty deviation varied positively and significantly with a brand's market share, using a univariate linear regression method. Similarly Bhattacharya (1997) used SCR as the loyalty measure and included a number of independent variables in addition to the market share of the brand.

In this analysis different measures of brand size and brand loyalty are used, in two different empirical analyses. In empirical analysis one, we simply conducted a count of the direction in loyalty deviations for the two largest and the two smallest brands (Habel, Rungie & Li 2005) using purchase frequency as the loyalty measure and penetration as size measure. In empirical analysis two we consider the relationship between market share and a relatively underutilised loyalty measure – the index of polarisation (Sabavala & Morrison 1977).

Results

Empirical Analysis One: Purchase frequency versus penetration

The Dirichlet reflects the way that penetration varies substantially between brands in a product category. The variation of penetration within product categories positively correlates to the variation in a brands' market share. Additionally, the average purchase frequencies hardly vary between brands within the same category with some small market share effect. The notion that big brands have higher penetration and slightly higher purchase frequencies is known as the double jeopardy phenomenon (Ehrenberg, Goodhardt & Barwise, 1990, Uncles, Ehrenberg & Hammond 1995, Ehrenberg & Goodhardt 2002).

The observed penetration and purchase frequency (PFo) for individual brands and the category is calculated firstly using the definitions found earlier in this paper. Theoretical purchase frequency (PFt) is then calculated using Zane Kearns' Dirichlet software (Kearns, 2009). For a particular brand, if its PFo > PFt, then we say this brand has excess loyalty and

if its PFo < PFt, this brand has less than expected loyalty. Table 1 shows the result of such an analysis, where a positive deviation for a brand indicates excess loyalty, with a negative deviation indicating less than expected loyalty.

Table 1: Determining the deviations in the instant coffee category

Brand		Market Share	Purchase Rate		Deviation
		(%)	(O)	(T)	(O-T)
Maxwell House	(Largest)	18	3.6	3.2	**0.4**
Sanka	(Second Largest)	15	3.3	3.0	**0.3**
Tasters Choice		13	2.8	2.9	0.1
High Point		12	2.6	2.9	-0.3
Other		13	3.0	2.9	0.1
Folgers		10	2.7	2.8	-0.1
Nescafe		8	2.9	2.7	0.2
Brim	(Second smallest)	4	2.0	2.6	**-0.6**
Maxim	(Smallest)	3	2.6	2.5	**0.1**

Table 2 shows the findings of empirical analysis one, and has tabulated the deviations for 24 product categories. When we consider only the largest brands and the smallest brands out of the whole 24 categories, 21 market leaders and 4 smallest brands enjoy a higher purchase frequency than the Dirichlet would predict. When the analysis is extended to include the two largest brands and the two smallest brands, 41 large brands and 8 small brands have a higher purchase frequency than the Dirichlet estimate. There appears to be a pattern of positive deviations for large brands, and negative deviations for small brands. The exceptions to this general pattern are highlighted in bold in Table 2, and appear to be in the minority.

The two largest brands' purchase frequency tends to be 0.4 higher than that predicted by the Dirichlet Model while two smallest brands' observed purchase frequency tends to be 0.7 less than the Dirichlet prediction. Excess loyalty occurs in well over 80% of cases when high share brands are considered and in well under 20% when the smallest brands are considered. We consider this to be compelling empirical evidence of excess loyalty for high share brands, and certainly meets a 95% confidence level using a simple nonparametric test of significance.

Empirical Analysis Two: Polarisation versus Market Share

The prior empirical analysis has provided raw evidence for the existence of excess loyalty to high share brands. It was achieved by direct comparison of observed and theoretical values for the largest and the smallest brands in a category. This method of analysis is intuitive – and provided valid results – but there is room for more rigorous analysis.

Using the mathematical structure of the Dirichlet, the polarisation statistic (φ) serves as a mechanism for quantifying the loyalty deviation for a brand in a category (Sabavala & Morrison 1977, Jarvis, Rungie, Goodman & Lockshin 2006). In this section we briefly review the nature of the statistic and test its relationship to market share.

Table 2: Excess loyalty patterns favour large brands

Category	N =	Purchase Frequency Deviations			
		Largest brand	Second largest brand	Smallest brand	Second smallest brand
1 instant coffee	9	0.4	0.3	**0.1**	-0.6
2 soft drink	16	1.3	**-0.3**	-1.3	-2.8
3 soft drink sectors	7	0.1	**-0.3**	-0.7	-1.1
4 confectionary	13	**-0.1**	0.3	-0.8	-1.2
5 toothpaste	15	0.4	0	**0.2**	**0.3**
6 snacks	11	0.4	0.9	-1.7	-0.8
7 department store	7	0.3	0.3	-0.1	-0.4
8 supermarket	9	0.1	0.5	-1.4	-1.5
9 Australian retail fuel outlet	7	0.1	0.5	-0.8	-0.1
10 Australian credit card	9	0.3	2.3	**3.7**	0
11 New Zealand credit card	8	0.1	0.2	-4.7	-3.6
12 New Zealand Retail Fuel	5	0.4	0.2	-0.8	-0.7
13 UK supermarket	12	0.5	0.2	-2.3	-1.8
14 breakfast Cereal	16	0.3	1.3	-2.3	-1.3
15 laundry detergent	14	0.3	0.2	**0.1**	0
16 denture	12	0	0.1	-0.3	**0.2**
17 Australian breakfast cereal	23	0.3	0.4	-0.3	-0.3
18 bread	9	0.5	**-0.2**	-0.8	-1.7
19 dessert	8	0	0.2	-0.3	-0.1
20 cake mix	21	0.2	0.1	-0.4	-0.4
21 detergent	22	0.8	0.3	-0.7	**0.2**
22 shampoo	21	0.1	0.2	0.7	-0.6
23 chocolate bar	23	0.7	1	-0.8	-0.7
24 biscuit	153	2.9	1	-1.4	**0.8**
Total	**450**	**10.4**	**9.7**	**-17.1**	**-18.2**
Average		**0.4**	**0.4**	**-0.7**	**-0.7**
Excess loyalty cases		**21**	**41**		
Proportion		**88%**	**85%**		
Less loyalty cases				**20**	**18**
Proportion				**83%**	**79%**

Dirichlet Parameters and Theoretical Brand Performance Measures

In order to understand the polarisation statistic we must first discuss the calculation of the Dirichlet theoretical brand performance measures. Each brand is said to have its own parameter - brand alpha (α). The sum of the brands' alphas is referred to as the S – or category switching parameter.

These parameters may be extracted from raw panel data by the use of maximum likelihood estimation (Rungie 2003) or from aggregated observed metrics using the method of mean and zeros (Kearns 2009). A brand's α and the category S parameter can also then be employed in a series of equations (Rungie & Goodhardt 2004) to derive theoretical estimates of brand performance measures for the brand.

The most basic of these equations is that of market share calculation for a brand, which is theoretically equal to the brand's α divided by the sum of all the brands' alphas (S). Therefore the market share of any brand (μ) is a simple function of its α and S, the relationship is $\mu = \alpha / S$. In a similar (but more involved) process the Dirichlet parameters may be employed to calculate the full range of metrics including penetration, average purchase frequency and repeat rate[1].

Polarisation as a measure of loyalty in a perfect Dirichlet Market

The polarisation parameter for a brand falls between zero and one. The higher the polarisation, the higher the loyalty in a category (Jarvis, Rungie & Lockshin 2007). In a perfect Dirichlet market (i.e. no loyalty deviations) there is a single value for polarisation that applies to each brand. This category polarisation value is a simple transformation of the Dirichlet S parameter:

Equation 1:
$$\varphi = \frac{1}{(1+S)}$$

(Fader & Schmittlein 1993)

The constant φ for all brands summarizes the loyalty in the category (Rungie & Laurent 2006, Jarvis, Rungie & Lockshin 2007).

Brand level polarisation as a measure of excess loyalty in a real market

It is possible for polarisation to be calculated at a brand level, when one considers the brand in question against the aggregate of all other brands. If there are six brand in a market, it is possible to calculate 6 polarisation parameters. In a perfect Dirichlet market, all six parameters would have an identical value, between 0 and 1, and identical to the category polarisation as shown in equation 1 above. Real markets are rarely perfect Dirichlet, however, and the brand level polarisation quantifies the amount to which the brand systematically deviates from perfect Dirichlet in terms of its loyalty metrics. The systematic deviation in

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[1] These calculations also require the Dirichlet K and A parameters, but discussion of these parameters is beyond the scope of this empirical analysis.

behavioural loyalty for a brand can therefore be captured by a brand specific measure of polarisation, referred to as φ_j for brand j.

When using panel data and maximum likelihood estimation, the calculation of polarisation φ_j for an individual brand j is given by first aggregating all other brands as if they are one and estimating the S parameter for this two brand case (S_j).[2] The polarisation for the brand is then:

Equation 3:
$$\varphi_j = \frac{1}{\left(1 + S_j\right)}$$

(Fader & Schmittlein 1993)

The value of this brand specific polarisation statistic may then be compared to the category figure as a benchmark for the expected loyalty deviation. Excess loyalty is said to occur for brand j if $\varphi_j > \varphi$ because the brand level polarisation is in excess of the underlying category figure. If the marginal S_j is used in the process of creating Dirichlet estimates for loyalty metrics, those marginal estimates will be higher than if calculated with the category level S. Importantly for this analysis, polarisation is the only measure of brand loyalty that is expected not to vary with the market share of the brand (Sabavala & Morrison 1977; Jarvis, Rungie, Goodman & Lockshin 2006). This means that a positive correlation between polarisations and market shares for brands in a category can be taken as evidence of an excess loyalty pattern favouring high share brands.

### *Brand level polarisation varies with market share*

In a similar manner to Fader and Schmittlein (1993), we use linear regression to produce the equation of market share and behavioural loyalty (in this case measured by polarisation) to see how these two variables are related. Under Dirichlet conditions, all brands in a product category have the same polarisation and the line would be horizontal (Jarvis, Rungie & Lockshin 2007).

The equation of simple linear regression is $y = a + bx$ where a is the intercept of the line and b is the slope of the line. This analysis is particularly interested in b, the slope of the line. Applied to this context, the regression equation we develop will take the form: $\varphi = a + \mu b$ where μ is market share. Excess loyalty to high-share brands can be implied when $b>0$ and the slope of the line is upward.

Figure 2 gives an example of such an analysis. This was for chocolate bars; one of the 24 categories we analysed. Each point on the scatterplot represents a brand, with its polarisation (φ_j) plotted against its market share. Thus the sloping line is the regression line of polarisation and market share for each brand while the horizontal line is the polarisation line of the whole category, reflecting the Dirichlet assumption that polarisation is constant for all brands in a category. The regression line slopes upwards indicating a tendency towards excess loyalty for the high-share brands in this category.

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[2] These individual brand polarisations can also be estimated from aggregated data using the Excel based software known as 'dirichlet.xls' (Kearns, 2009) which also provides marginal S parameters (S_j) for each brand j.

Figure 2: Polarisation and market share for the chocolate bars product category
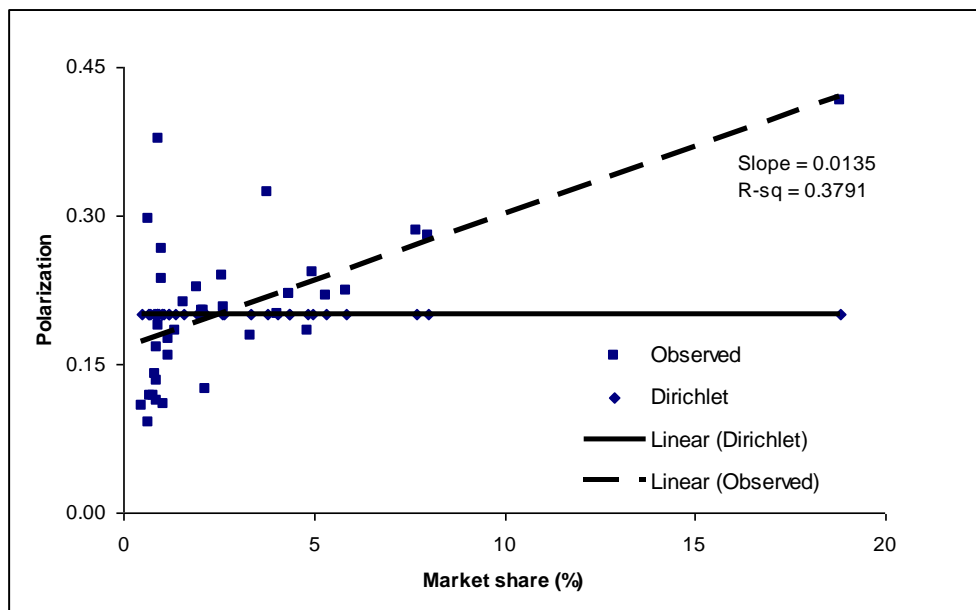
Note. There is a general (but weak) trend for polarisation to increase with market share

Whilst Figure 2 gives a specific case, the summary of results is given in Table 3; 23 of the 24 categories (96%) have a positive slope while only one of them has a negative slope. That means there are indications of excess loyalty for higher share brands in some 23 cases out of 24. Thirteen of the 24 categories have a statistically significant result and all categories with a significant result have a positive slope.

Simple linear regression gives a slope of the polarisation line, but some categories, when tested on their own, did not meet a statistical significance test at the 0.05 level. This is due to the low numbers of brands in each category. However, there is value in applying the principle of significant sameness:

> *"when faced with new data sets in an area where an empirically based*
> *prior model or relationship has already been reported, it is both simple and*
> *rewarding to see whether the new data follow the same pattern as all the*
> *previous data"*
>
> *Source: Bound & Ehrenberg (1989)*

In this meta analysis 23 out of 24 categories show a positive slope of the polarisation line. There is strong evidence of excess loyalty for high share brands.

Discussion

This paper has used two very different approaches to reinforce the case for excess loyalty to high share brands. Empirical analysis one showed that in 21 out of 24 cases, the Dirichlet under predicted the loyalty for the largest brands. When the two largest brands were

considered from each category, 41 of the 48 cases showed excess loyalty. Precisely the inverse was found when the smallest brands were considered; they tended to exhibit loyalty less than that predicted by the Dirichlet.

Table 3. Regression results: Polarisation vs. Market Share

Category	Slope	R-Sq	Sig
1 instant coffee	0.84	0.27	
2 softdrink	0.66	0.03	
3 softdrink sectors	0.30	0.20	
4 confectionary	0.27	0.16	
5 toothpaste	0.02	0	
6 snacks	0.46	0.15	
7 department store	0.63	0.51	
8 supermarket	0.68	0.22	***
9 Australian retail fuel outlet	0.55	0.62	**
10 Australian credit card	0.18	0.01	
11 New Zealand credit card	1.88	0.77	***
12 New Zealand Retail Fuel	0.30	0.37	
13 UK supermarket	1.87	0.49	**
14 breakfast Cereal	0.69	0.34	**
15 laundry detergent	0.45	0.35	**
16 denture	0.28	0.11	
17 Australian breakfast cereal	0.60	0.06	
18 bread	0.63	0.48	**
19 dessert	**-0.03**	0	
20 cake mix	2.19	0.39	***
21 detergent	0.54	0.08	
22 shampoo	1.50	0.23	**
23 chocolate bar	1.36	0.38	***
24 biscuit	2.54	0.20	***
Positive Slope			**23**
Proportion			**96%**
Significant Result			**11**
Proportion			**46%**

Note. The positive slope is often statistically significant and 23 of the 24 were positive.

Thus there appears to be a systematic error in estimation of loyalty by the Dirichlet. Rather than simply a deviation for high share brands only, there also appears to be a similar deviation for low share brands. This is further borne out by empirical analysis two. The polarisation statistics (φ) for the brands in a category repeatedly tended toward a positive slope with market share, where they would be invariant across brands in a perfect Dirichlet world. We have looked at new data through two different lenses to Fader and Schmittlein (1993) and replicated the result.

Managerial implications

The Dirichlet Model is one of the fundamental empirical generalisations in the marketing literature. As more and more academics and managers use this statistical model to analyse their markets, it is important to help them to understand the nature and limitations of this model.

Consumers of these brands tend to buy them more often and these large brands can enjoy even higher levels of loyalty than would be expected by the Dirichlet. We contend that this has added strength to the argument for excess loyalty to high share brands. It is quite common for high share brands to have a higher customer loyalty than small brands in real markets, even beyond that which would be predicted by the Dirichlet model.

This study has provided some methodologies to help product and brand managers make decisions. It is not surprising if a manager aims for a brand to have high loyalty. It reflects continuing satisfaction by consumers towards the brand. It is an indication that the brand delivers relevant benefits specific to the customer. In most markets consumers are bombarded with competing offers. Loyalty can only exist if there is some resistance to these offers. Loyalty generates deal resistance and lower price elasticities. These are all often desirable outcomes for the brand manager. However, this study shows that in the competition between brands it is the larger brands which have the advantage.

Certainly some smaller brands may achieve a niche position but it is the larger brands which have the advantage when it comes to loyalty.

The manager of the larger brand should aim to strengthen and exploit this loyalty. The manager of the smaller brand must be realistic. Some niche positioning can be possible but an effective strategy for building loyalty is to build market share.

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Fang Li is the Nielsen Media PhD candidate in the School of Marketing at the University of South Australia, Cam Rungie is Senior Lecturer in the School of Marketing at UniSA, and Cullen Habel is Lecturer in Marketing in The University of Adelaide Business School.