Measuring National Brands' Equity over Store Brands and Exploring its Antecedents

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ABSTRACT

In this paper, we provide an approach to measuring the overall brand equity of national brands based on customers' reservation price differential and perceived quality differential between national brand and store brand. Our approach draws upon a utility framework and develops an econometric model for measuring national brands' equity over store brand and decomposing it into Quality Equity and Non-Quality Equity.. We then employ the approach and estimate brand equity using data on 20 product categories from 132 consumers and explore some demographic and category antecedents.

Our research offers several useful insights. First, it suggests that brand equity is a dominant component of consumers' willingness to pay a premium for national brands than for store brands. In fact, nearly 80% of the premium that consumers would pay for national brands over store brands can be attributed to brand equity. Second, a significant portion (over 80%) of national brand equity comes from non-quality equity or brand image. Finally, our study identifies several category and consumer characteristics such as advertising, purchase price, income, and age that are significant antecedents of brand equity. The managerial implications of these findings for both national brand manufacturers and retailers are discussed.

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Brand equity is conceptualized as the value accrued to a firm that is attributable to the brand name (Faquahar 1989). Research over the last 20 years has shown that brand equity is a very important, perhaps dominant, component of the value of a firm (Simon and Sullivan 1993; Kerin and Sethuraman 1998)

Brand equity is a particularly important consideration in the context of national brand vs. store brand competition from both strategic and methodological perspectives. From a strategic standpoint, private labels or store brands have become a major force to reckon with in grocery products. Private labels account for about one-fifth of total volume sales in the United States, one-fourth in Canada, and an even greater proportion in Europe (Dunne and Narasimhan 1999, Erdem, Zhao and Valenzuela 2002). The Private Label Manufacturers Association (PLMA) website reports that store brand sales in grocery products in the United States have grown from $34 billion in 1994 to $50 billion in 1998, outpacing national brand growth. Private labels are the #1 market share brands in 77 out of 250 supermarket products (Quelch and Harding 1996). To counter the private label growth, national brand managers have attempted to slash the prices of their brands, resulting in a significant erosion of their profits. Practitioners and researchers suggest that developing and sustaining brand image and brand equity would be a more viable and profitable approach in the long term (Hoch 1996, Sethuraman and Cole 1997). Thus, measuring brand equity of national brands when they compete with a store brand and exploring its antecedents would be useful from a strategic perspective for national brand manufacturers, and for retailers who sell both the national brands and their own private labels.

Measurement of brand equity in the context of national brand vs. store brand competition is also useful from a methodological standpoint. For measuring the value of a brand that is attributable to its brand name, the financial value of the brand is compared with a brand with no brand-name value. Such comparison brands can be hypothetical (e.g., in the Interbrands approach – Kerin and Sethuraman 1998), or real. Many researchers (e.g., Ailawadi, Lehmann, and Neslin 2002, Park and Srinivasan 1994) have used, or suggested the use of, private labels as the comparison brand because they are generally low-priced, unadvertised brands. Thus, measuring brand equity in the context of national brand vs. store brand competition provides an estimate of the overall value (equity) of national brands.

In this paper, we provide an approach to measuring the overall brand equity of national brands based on customers' reservation price differential and quality differential between national brand and store brand.   We define national brand equity as the price premium that consumers would be willing to pay for national brands over a store brand (i.e., reservation price differential) when both brands have the same "true" quality, i.e., when there is no objective quality differential between national and store brands.

The notion that brand equity manifests in the form of a price premium that consumers would pay for a reputed brand compared to an identical, but less reputed, brand is well known (Agarwal and Rao 1996).   This notion is best exemplified by Chrysler's former chairman Lee Iacoca's observation that the same car coming out of the same assembly line seems to command a higher price when it is branded as a Japanese car (Mitsubishi Eclipse) than when it is branded as a U.S. make (Eagle Talon).

There are two reasons why consumers would pay a premium for the reputed brand. First, consumers would perceive the reputed brand to be superior in quality even though their objective quality may be the same. We call this premium as *Quality Equity*. Specifically in our context, Quality Equity is defined as the price premium that consumers would pay for national brands as a result of their perceiving the quality differential between national brand and store brand to be greater than the true (objective) quality differential between the two brands.

On the other hand, consumers may pay a premium for the reputed brand even if they perceive the quality of the brands to be the same. We call this premium as *Non-Quality Equity*. Specifically, Non-Quality Equity is defined as the premium that consumers would pay for national brands even when they perceive no quality differential between national brands and store brands.

Our approach draws upon a utility framework and develops an econometric model that enables us to measure national brand equity and decompose the same into Quality Equity and Non-Quality Equity. This decomposition enables us to identify the source of the brand equity – whether the equity arises from quality perception (Quality Equity) or non-quality considerations (Non-Quality Equity), often labeled as brand image. The econometric model also permits us to explore consumer and category antecedents of brand equity – for what types of consumers and in what types of product categories are we likely to see higher national brand equity.

The econometric model is estimated using consumer survey data on 20 grocery product categories. The analysis yields several interesting results. First, we find that brand equity represents a significant component of the size of the price premium that consumers would pay for national brands over a store brand. In fact, of the average 37% premium that consumers stated they

would pay for the national brand, about 80% of that premium (or nearly 30%) can be attributed to brand equity. Furthermore, a significant component of the brand equity is due to non-quality consideration (Non-Quality Equity) or brand image. In particular, of the 30% total brand equity, about 26% (85% of total equity) is due to non-quality equity. It is also interesting to note from our findings that brand equity exists to a significant extent even in the so-called "commodity" products such as bleach and flour.

Our study also identifies several category and consumer characteristics that are significant antecedents of brand equity. We find that brand equity tends to be higher in heavily advertised, hedonistic, high-priced product categories. Brand equity also tends to be higher among females and younger consumers. The effect of income on brand equity is particularly insightful. Both low-income and high-income consumers seem to exhibit high levels of brand equity. It is the middle-income consumers who have the least brand equity. These results have potential managerial implications for both national brand manufacturers and retailers.

The paper is organized as follows. First, we provide a brief review of the brand equity measurement literature and discuss how our paper relates to this literature. Second, we draw upon a general utility framework and provide our operationalization of national brands' equity over store brands. Third, we develop an econometric model for estimating brand equity across multiple consumers and multiple product categories. Fourth, we describe the data used for estimating brand equity. Fifth, we estimate the econometric models and report the results. Sixth, we discuss the results and their implications. Finally, we conclude by discussing the limitations and directions for future research.

BRIEF REVIEW OF BRAND EQUITY MEASUREMENT LITERATURE

Approaches for measuring brand equity or brand value continues to be of interest to both

marketing academics and practitioners alike. Though there seems to be at least some agreement

at the conceptual level about the meaning of brand equity as the value endowed by the brand to

the firm, measuring brand equity has been a more difficult and challenging task. The extant

literature reveals two distinctive and seemingly independent perspectives. One approach is to

measure brand equity from the perspective of the firm/market, with interest centered on assessing

the value derived from strong branding (see Simon and Sullivan 1993, for example). The second

prominent approach is to adopt a consumer-based perspective (e.g., Park and Srinivasan 1994).

Within the consumer-based methods for assessing brand equity, the indirect approach focuses on

the potential sources of brand equity, such as awareness, perceptions and preference, without

really considering the added value of a brand. For example, Landor associates uses share of

mind and esteem, DDB Needham Worldwide uses a composite of awareness, perception and

liking as indicators of brand equity (Winters 1991).

A more direct consumer-based approach to measuring brand equity involves measuring

the added value of a brand name as it manifests in the market in terms of price and market share

premium or incremental revenues and profits. Such methods include measurement of brand

equity as:

Components effect -- brand equity is the difference between a consumer's overall brand

preference and his/her multi attribute preference based on objectively measured attribute levels,

expressed in dollar-metrics or incremental market share attributable to the brand name (Park and Srinivasan 1994).

Brand–specific effect – brand equity is the component of brand preference not explained by objectively measured attributes, that is, the difference between actual choice behavior and that implied by utilities computed from attribute part-worth utilities, but with no brand name (Park and Srinivasan 1994).

Residual of regression - brand equity is the utility intrinsic to a brand that cannot be captured by objective characteristics and its short-term price (Kamakura and Russell 1993).

Equalization price – brand equity is the dollar value of brand in a market in which some degree of differentiation exists as compared to its value in a market characterized by no brand differentiation (Swait et al. 1993).

Our approach to brand equity measurement embraces the components effect and brand-specific effect methods and is similar in spirit to that of Park and Srinivasan (1994). A detailed comparison between the Park and Srinivasan (1994) model and our model is presented later in the section titled, "Comparison with Park and Srinivasan Model," after we describe our measurement approach. We now present our framework for measuring brand equity and discuss its operationalization.

FRAMEWORK AND OPRATIONALIZATION OF BRAND EQUITY

We define national brand equity as the price premium that consumers would be willing to pay for national brands over a store brand when both brands have the same "true" quality, i.e., when there is no objective quality differential between national and store brands. This price premium can

arise from two sources -- Quality Equity and Non-Quality Equity. Quality Equity is defined as the price premium that consumers would pay for national brands as a result of their perceiving the quality differential between national brand and store brand to be greater than the true (objective) quality differential between the two brands. Non-Quality Equity is defined as the price premium that consumers would pay for national brands even when they perceive no quality differential between the two brands. In this section, we develop our conceptualization and operationalization of brand equity by drawing upon a consumer utility framework.

We start with the conventional utility model involving price and quality and define the utility (U_{in}) for national brand (n) for consumer (i), as in Blattberg and Wisniewski (1989), as:

(1) $\quad U_{in} = \beta_i Q_{in} - P_n$, where

Q_{in} is the perceived quality of national brand by consumer i and P_n is the price of national brand. Coefficient β_i is consumer i's desire for quality or quality sensitivity, relative to price sensitivity taken as 1.

Equation (1) suggests that the non-price utility arises exclusively from perceived quality of the national brand. However, literature on brand loyalty/equity suggests that brand strength or equity can arise from factors other than quality. In particular, Aaker (1991, p. 17) states that brand equity or consumer's utility for a brand may arise from brand image and brand associations, not necessarily related to perceived quality. This brand image may be developed through proper execution of the marketing mix elements, especially positioning and advertising (Simon and Sullivan 1993). We believe this non-quality utility is a particularly important consideration in the context of national brand vs. store brand competition since national brands

are considered the "image" brands while store brands are considered the "no-frills" price brands.

To incorporate the non-quality strength, we introduce an intercept term (α_{in}) in the utility

equation as follows:

(2) $\qquad U_{in} = \alpha_{in} + \beta_i Q_{in} - P_n$

The intercept can have several interpretations. From an economic utility standpoint, it

can be thought of as "intrinsic" utility or preference for the brand. From a marketing standpoint,

an intercept term has been used to capture consumer-level brand loyalty or equity (e.g., Jedidi,

Mela and Gupta 1999, Kamakura and Russell 1993). At an aggregate level, the term has been

used to represent national brand strength (e.g., Raju, Sethuraman and Dhar 1995).

Let Q_n^o represent the national brand's "true" or objective quality level. Often an

individual's subjective perception of quality (Q_{in}) may be different from actual quality (Q_n^o),

such perceptual bias arising from the national brand's image or brand equity. To incorporate this

aspect, we add and subtract $\beta_i Q_n^o$ to the RHS of Equation (2) to obtain,

(3) $\qquad U_{in} = \alpha_{in} + \beta_i (Q_{in} - Q_n^o) + \beta_i Q_n^o - P_n$

Since our measure of national brand equity is relative to the store brand (private label), we write

the utility of the store brand (s) for consumer i analogous to Equation (3) as

(4) $\qquad U_{is} = \alpha_{is} + \beta_i (Q_{is} - Q_s^o) + \beta_i Q_s^o - P_s$

Subtracting Equation (4) from (3), we get

(5) $\qquad U_{in} - U_{is} = (\alpha_{in} - \alpha_{is}) + \beta_i [(Q_{in} - Q_{is}) - (Q_n^o - Q_s^o)] + \beta_i (Q_n^o - Q_s^o) - (P_n - P_s)$

A consumer will purchase a national (store) brand if and only if $U_{in} - U_{is} > 0$ (<0); s/he will be indifferent if the term is 0. Setting $U_{in} - U_{is} = 0$ and rearranging, we get

(6) $\qquad (P_n - P_s)_i^r = \beta_i (Q_n^o - Q_s^o) + (\alpha_{in} - \alpha_{is}) + \beta_i [(Q_{in} - Q_{is}) - (Q_n^o - Q_s^o)]$

The term on the left hand side of Equation (6) $[(P_n - P_s)_i^r]$ is the (maximum) price that consumers are willing to pay for national brands over store brands, also called reservation price differential (RPD). Consumers are willing to pay a premium partly because the true (objective) quality of the national brand (Q_n^o) is greater than the objective quality of store brand (Q_s^o). The dollar-metric utility or premium attributable to this aspect is given by $\beta_i (Q_n^o - Q_s^o)$. Any price premium that a consumer is willing to pay for the national brand over and above this utility is deemed as brand equity (E_{in}). Thus, national brand equity

(7) $\qquad E_{in} = (P_n - P_s)_i^r - \beta_i (Q_n^o - Q_s^o) = (\alpha_{in} - \alpha_{is}) + \beta_i [(Q_{in} - Q_{is}) - (Q_n^o - Q_s^o)]$

The second expression on the right hand side $\beta_i [(Q_{in} - Q_{is}) - (Q_n^o - Q_s^o)]$ is the price premium consumers will pay for the national brand because their perceived quality differential between the national brand and the store brand $(Q_{in} - Q_{is})$ is greater than the objective quality differential $(Q_n^o - Q_s^o)$. We call this term, Quality Equity (QE_{in}). The first term on the right hand side $(\alpha_{in} - \alpha_{is})$ is the premium consumers will pay even after accounting for the perceptual quality bias; therefore we call the term, Non-Quality Equity (NQE_{in}). Thus,

(8) Total national brand equity (E_{in}) = Quality Equity (QE_{in})+ Non-Quality Equity (NQE_{in}).

We now present an econometric model for estimating the brand equity components and exploring their category and consumer antecedents.

ECONOMETRIC MODEL

Equation (7) represents the conceptual model for measuring brand equity. In order to empirically assess the value of brand equity and its components using Equation (7), we need measures or estimates of the following at the individual consumer level: reservation price differential [RPD = $(P_n - P_s)_i^r$], perceived quality differential (PQD = $Q_{in} - Q_{is}$), quality sensitivity (β_i), and non quality equity (NQE = $\alpha_{in} - \alpha_{is}$). We also need a measure of objective quality differential (OQD = $Q_n^o - Q_s^o$).

Reservation price differential and perceived quality differential can be obtained through a consumer survey. Objective quality differential may be obtained through expert ratings or from *Consumer Reports*. However, quality sensitivity (β_i) and non quality equity ($\alpha_{in} - \alpha_{is}$) would be difficult to obtain by asking a direct question to the consumer and therefore they have to be estimated. To estimate these parameters, we rewrite Equation (7), after canceling the terms containing objective quality differential, setting α_{is} to zero without loss of generality, and suppressing the national brand subscript as:

(9) $RPD_i = \alpha_i + \beta_i PQD_i$

Note from Equation (9) that for each consumer observation (i), we need to estimate two parameters (α and β), which is not econometrically feasible. The econometric model is developed by taking a multiple-consumer, multiple-category perspective. From Equation (9), the

premium consumer i is willing to pay for national brand over store brand in product category j

can be written as:

$$(10) \quad RPD_{ij} = \alpha_{ij} + \beta_{ij} PQD_{ij}$$

Equation (10) cannot be estimated since two parameters (α_{ij}, β_{ij}) are to be measured for

each i, j observation. So, we focus on three submodels of interest to our research – (i) Aggregate

Model, (ii) Category Model, and (iii) Antecedents Model.

Aggregate Model

The purpose of this model is to obtain an approximate aggregate estimate of total brand

equity (aggregated across brands and categories) and the portions of the total equity that can be

attributed to quality equity and non-quality equity. Therefore, in this model, the intrinsic utility

and quality sensitivity parameters are assumed to be equal across consumers and categories, i.e.,

$\alpha_{ij} = \alpha$ and $\beta_{ij} = \beta$ for all i,j. Equation (10) reduces to

$$(11) \quad RPD_{ij} = \alpha + \beta PQD_{ij}$$

Given observations RPD_{ij} and PQD_{ij}, Equation (11) can be estimated as,

$$(12) \quad RPD_{ij} = \alpha + \beta PQD_{ij} + \varepsilon_{ij} ,$$

where ε_{ij} is the error. One simple approach is to estimate Equation (12) using OLS. However,

because PQD may vary based on consumer and category factors and RPD also depends on

consumer and category factors, some of which may be embedded in the error term, there is likely

to be a correlation between PQD and the error term, thus violating OLS assumptions.

To overcome this problem, we also estimate Equation (11) by using two stage least squares. First we estimate the following equation:

(13) $PQD_{ij} = f(z_{ij})$,

where z_{ij}s are instrumental variables expected to be correlated with PQD but not with the error term in Equation (12). We obtain estimate of PQD [est(PQD)] and use the estimate instead of PQD in Equation (12) to obtain coefficient estimates of α and β.

Estimate $\hat{\alpha}$ is an aggregate measure of non-quality national brand equity (NQE) over store brands, aggregated across consumers and categories. Estimate $\hat{\beta}(\overline{PQD} - \overline{OQD})$ is the aggregate measure of quality equity (QE) over store brands, aggregated across consumers and categories. $(\overline{PQD} - \overline{OQD})$ is the difference between perceived quality differential and objective quality differential (PQD_{ij} - OQD_j) averaged over all i, j observations.

Category Model

The purpose of this model is to assess the extent of brand equity for individual product categories. In this model, the intrinsic utility and quality sensitivity parameters are assumed to be equal across consumers within a category (i.e., $\alpha_{ij} = \alpha_j$; $\beta_{ij} = \beta_j$ for all i). Equation (12) can be written as:

(14) $RPD_{ij} = \sum_{j} \alpha_j PRODUCT_j + \sum_{j} \beta_j PRODUCT_j \cdot PQD_{ij} + Error.$

Estimate $\hat{\alpha}_j$ is the average NonQuality Equity (NQE) for j'th product category and estimate $\hat{\beta}_j(\overline{PQD}_j - OQD_j)$ is the Quality Equity for category j, where $\overline{PQD}_j$ is the perceived

quality differential of product category j, averaged across all consumers. OQD_j is the objective

quality differential for product j. Note that because the design matrix in Equation (14) can be

partitioned, the parameters can be obtained by estimating a regression model for each individual

category.

Again, to overcome the potential problem of correlation between PQD and the error term

in Equation (14), we also use the same instrumental variable procedure described above under

Aggregate Model.

Antecedents Model

The purpose of this model is to explore some consumer and category antecedents of

brand equity. In this model, we assume that non-quality equity (α_{ij}), quality sensitivity (β_{ij}) and

Perceived Quality Differential (PQD_{ij}) are all determined by product category variables (PV) –

such as edibility, purchase frequency -- and consumer variables (CV) – such as income and age.

In other words,

(15) $\alpha_{ij} = f_1$ (PV, CV); $\beta_{ij} = f_2$ (PV, CV); and $PQD_{ij} = f_3$ (PV, CV).

In addition, $OQD_j = f_4$ (PV) and therefore we can write PQD_{ij} - $OQD_j = f_5$ (PV, CV),

where $f_1 - f_5$ are different functional forms – in our estimation we use only functional forms that

are linear in product and consumer variables. Incorporating these functional forms in Equation

(11), we estimate the following two equations

(16) $PQD_{ij} = f_3$ (PV, CV)

(17) $RPD_{ij} = f_1$ (PV, CV) $+ f_2$ (PV, CV) * est(PQD_{ij})

where est(PQD$_{ij}$) is obtained from Equation (16). In addition, to obtain the antecedents of perceptual quality bias, we estimate the following equation using OLS:

(18) PQD$_{ij}$ - OQD$_j$ = f_5 (PV, CV)

Comparison with Park and Srinivasan Model

Park and Srinivasan (1994) – hereafter also referred to as PS -- utilize an individual-level multi-attribute consumer utility framework to measure brand equity. In particular, their brand equity measurement equation (Equation 3, p. 274) can be expressed as

(19) $E_{i\ell} = [U_{i\ell} - U(\text{sub})_{i\ell}] + [U(\text{sub})_{i\ell} - U(o)_{i\ell}]$, where

$U_{i\ell}$ is consumer i's actual utility for brand ℓ and $U(\text{sub})_{i\ell}$ is the utility based on subjectively perceived attribute levels – the notations we have used are a little different from theirs and have been chosen to minimize potential confusion.

Equation (7) in our model expresses brand equity as:

(20) $E_{in} = (\alpha_{in} - \alpha_{is}) + \beta_i[(Q_{in} - Q_{is}) - (Q_n^O - Q_s^O)]$

While the PS formulation is more general, our model focuses exclusively on the store brand as the comparison brand. For ease of comparison, we set store brand values, $\alpha_{in} = Q_{is} = Q_s^O = 0$, and rewrite Equation (20) as:

(21) $E_{in} = \alpha_{in} + \beta_i Q_{in} - \beta_i Q_n^O$.

In the PS model (Equation 19), $U_{i\ell}$ - $U(\text{sub})_{i\ell}$ is the utility not accounted for by attributes – PS call the term nonattribute-based equity. This term is analogous to non-quality equity (α_{in}) in our model (Equation 21). Note from our Equation (2) that

$\alpha_{in} = U_{in} - \beta_i Q_{in} - P_n$, which is the utility for national brand not accounted for by perceived quality (and price).

The second term in the RHS of Equation (19) $[U(\text{sub})_{i\ell} - U(o)_{i\ell}]$ is the utility due to subjectively perceived attribute level exceeding the objective levels. PS call the term attribute-based equity. This term is analogous to $\beta_i Q_{in}$ - $\beta_i Q_n^o$ in our Equation (21), where $\beta_i Q_{in}$ is the utility due to subjectively perceived quality level and $\beta_i Q_n^o$ is the utility due to objective quality level. We call this term quality equity (in relation to store brand).

Both the PS model and our model are based on an individual-level multi-attribute utility framework, estimate brand equity as the premium consumers would pay for brand name, and decompose the total brand equity into its components. However, there are significant differences both in the methodology used and in the goals of the article.

PS analyze a single product category in a multi-attribute framework and use conjoint analysis to estimate preferences. Their focus is on measuring brand equity for each individual consumer within a product category, when brands compete with each other. Our model uses only quality as the composite attribute and employs an econometric approach for estimating preferences and brand equity. Our focus is more on measuring aggregate brand equity across consumers and product categories in an effort to provide more generalizable results in the specific context of competition between national brands and store brands. The multiple-consumer, multiple-product approach enables us to explore some category and consumer antecedents of brand equity.

Next, we describe the data used for estimating brand equity.

DATA

For computing brand equity and exploring its antecedents through estimation of Equations (11) - (18), we need data on (i) perceived quality differential, (ii) reservation price differential, (iii) consumer variables that are potential antecedents of brand equity, (iv) antecedent category variables, and (v) objective quality differential. We collected data on items (i) – (iv) through a consumer survey. Survey-based methods are often used in understanding brand choice and price sensitivities (e.g., Bucklin and Srinivasan 1991; Dillon and Gupta 1996). Self-explicated approaches to customer preference structure measurement have also been found to have high robustness and predictive validity (Park and Srinivasan 1994). Later, we test the external validity of our survey measures.

A sample of 350 randomly selected households from a medium-sized metropolitan area received the survey. Respondents received $10 for completing the questionnaire. The respondents were asked to provide their perception of quality differential, premium willing to pay, and other measures for 20 selected grocery products listed in Table 1. The product categories were judgmentally selected to cover a wide range of commonly purchased food and non-food grocery products. 132 usable questionnaires were obtained for our analysis. Data on item (v) – objective quality differential – was collected through a survey of 25 retail experts. We now describe the measures.

Perceived Quality Differential (PQD)

We measure perceived quality differential between national brand and store brand as follows: In each selected product category, we ask the consumer to focus on the national brand that they are most familiar with and a private label or store brand in the retail store that they frequently shop. Because our econometric model is based on observations across multiple consumers (i) and multiple product categories (j), we construct measures of perceived quality differential that are comparable across consumers and product categories.

We state to the consumers that the quality of national brand is 100 and ask them to rate the quality of the store brand on a scale between 0 and 200 with intervals of 10 (0 being much worse than national brand, 100 being equal to national brand, and 200 being much better than national brand). If X is the quality of the store brand perceived by the consumers, quality differential is computed as $QD = 100 - X$. The quality differential measure can range from -100 to $+100$. Since we are interested in consumers' opinions/perceptions rather than actual knowledge, respondents are encouraged to answer the comparison questions even if they have not bought a national or a store brand, but have an opinion about it. They were asked to omit a product category if they do not purchase the product or do not have an opinion.

Reservation Price Differential (RPD)

The reservation price differential is measured in a similar manner. We state that the normal purchase price of the national brand in a product category is 100. We ask respondents to indicate on a scale ranging from 0 to 200 (with intervals of 10), the maximum price they will pay to purchase the store brand – for example, a score of 90 would mean they are willing to pay a 10%

premium for the national brand (100-90). If Y is the price they say they would be willing to pay for the store brand, then the premium consumers are willing to pay for the national brand is computed as PREMIUM = 100 - Y. Thus the premium, expressed as a percentage of national brand price, can range from -100% to +100%.

Consumer Variables (CV)

What types of consumers are likely to have higher (national) brand equity in the context of national brand – store brand competition? To gain some insight into this issue, we investigate the relationship between brand equity and some selected demographic variables. While there is no formal theoretical work that can guide us in selecting the demographic variables, several studies have attempted to identify the demographic characteristics of store-brand prone consumers. Sethuraman (2002) reviewed past literature and identified 20 studies that investigated the demographic characteristics of private label consumers. Five demographic variables were considered by at least 2 of the 20 studies. They are: gender, age, income, education, and family size. We also use these five demographic variables in the present study. The variables are measured as follows:

Gender: Male; Female
Age: "Young" (18-40 years); "Middle" (41-60 years); "Old" (> 60 Years)
(Because there were only 4 consumers in the 18-22 group, they were combined with 23-40 year olds.)
Annual household Income: Low (< $25,000); Middle ($25,000-$50,0000); High (> 50,000$)
Education: High-School (or below); College
Family size: Number of persons living in the household (single-1, couple-2, family >2)

Product Variables (PV)

With respect to category characteristics that may influence national brand equity, there are fewer studies to guide us in selecting the variables. Sethuraman (2002) identifies five studies that link category characteristics to private label share. The main category variables investigated by these studies that can potentially influence brand equity are category purchase price, purchase frequency, and hedonism. In addition, Ailawadi, Lehmann, and Neslin (2002) and Simon and Sullivan (1993) suggest that advertising may influence brand equity. Based on these literature, we selected four variables – purchase price, purchase frequency, hedonism and advertising. In addition, we explored whether product edibility affects brand equity. These variables were measured as follows:

Edibility: Product edibility is noted easily from the nature of the product category.

Average Price per Purchase. Respondents indicate the average price per purchase for each product category on a 5-point scale:

1= About $1 ($.50-$1.49); 2=About $2 ($1.50-$2.49); 3 = About $3 ($2.50-$3.49); 4 = About $4 ($3.50-$4.49); 5 = Over $4.50.

Purchase Frequency. Respondents indicate how often they purchase each product on a 5-point scale: 1 = at least once every two weeks; 2 = Once every 3-5 weeks (about once a month); once every 6-10 weeks (about once in two months); once every 10-14 weeks (about once in three months); 5 = less often than once every three months; DB = Never (Don't Buy).

Consumption Pleasure (Hedonism). Consumers indicate how much consumption pleasure they derive from the product category by responding to two phrases -- (i) the product is

"fun to have" and (ii) the product "gives me pleasure" on a three point scale: 1 = very true for me; 2 = somewhat true for me; and 3 = Not true for me. The correlation between the two items was .87. So. we computed the average of the two items to obtain an overall measure of consumption pleasure.

Advertising Expenditure. Following Hoch and Banerji (1993), Sethuraman (1992), Ailawadi, Lehmann and Neslin (2002), media advertising expenditures for the categories were obtained from Leading National Advertisers (LNA) class/brand summary (1999).

 Classification of Product Categories. We illustrate our procedure for classifying the product categories as high-priced, low-priced etc. using the purchase price measure as an example. Following Sethuraman and Cole (1997, p.41), the variation in purchase price across categories within a consumer is over 12 times the variation across consumers within a category. In other words, purchase price can be deemed more a category-specific characteristic.

Because there are only 20 product categories in the survey, we dichotomized the purchase price variable using the median cutoff. Those 10 categories in which the median purchase price was less than $3 ($1 or $2), were deemed low-priced categories. Those 10 categories in which the median purchase price was more than or equal to $3 were deemed as high-priced categories. The same procedure was used for the other three measures – purchase frequency, hedonism, and advertising. Table 1 gives the classification of categories used in the survey.

Objective Quality Differential (OQD)

We did not have any source (such as consumer report or experts) for collecting objective quality differential in this particular market. Therefore, we used the overall "objective" store

brand quality measures from Hoch and Banerji (1993) as surrogates. Hoch and Banerji asked 25 retail experts to rate the quality of the best private label in comparison to leading national brands in the product category on a scale: 1 = much worse; 5 = about the same. The experts' ratings were averaged to get mean private label quality. The quality differential between national brand and store brand can be obtained as 5 − observed mean score. The quality differential would range from 0 or no quality difference (5-5) to 4 or maximum quality difference (5-1). In our quality differential scale, no quality difference is zero and maximum quality difference is 100. To make the two scales comparable, we assumed that a quality difference of 1 in the Hoch and Banerji scale would represent 25 point quality differential in our scale. For instance, suppose the mean expert quality rating of private labels is 4.6. Then the quality difference in Hoch and Banerji scale is 0.4, which converted to our scale would be 10 (0.4*25).

DATA ANALYSIS

The sample of 132 respondents provided information for up to 20 product categories. Several consumers did not respond to some product categories because they do not buy them or did not have an opinion about store brands. Thus there are 2237 observations from 132 consumers across 20 product categories. The demographic characteristics of the sample are as follows:

Gender: Male (31%); Female (69%)

Age: 18-40 years (46%); 41-60 years (38%); over 60 years (16%)

Annual Income: Less than $25,000 (32%); $25,000-$50,000 (33%); over $50,000 (35%)

Education: High School (39%); College (61%)

Family size: Single (19%); Couple (41%); Family >2 (40%).

Distribution of Perceived Quality Differential and Reservation Price Differential

Figure 1 provides the distribution of perceived quality differential between national brand

and store brand. In less than 6% of the 2237 observations, consumers perceived the quality of

private labels to be higher than that of national brands. This finding is consistent with the general

notion that private labels are as good or inferior to national brands. In a substantial number of

observations (28%), consumers perceived the private labels to be equal in quality to that of the

national brands. This finding is also consistent with recent trends, which suggest that a large

number of consumers feel store brands usually perform as well as nationally advertised brands

(Research Alert 2000). The mean perceived quality differential is 22.8% and the median is 20%.

Figure 1
Distribution of Perceived Quality Differential and Reservation Price Differential
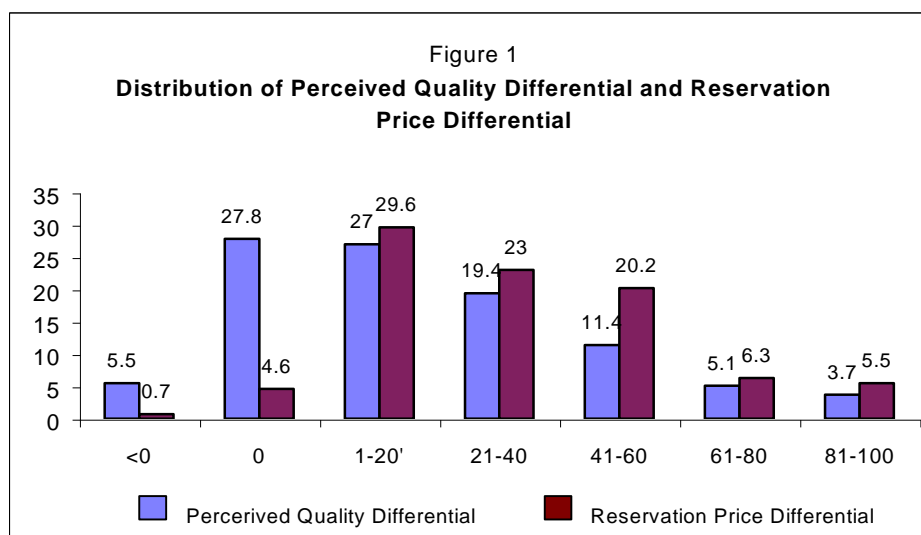
Figure 1 also gives the distribution of reservation price differential between national brands

and store brands. While in about 33% of the observations, consumers perceive the store brands to

be equal or higher in quality to national brands, in only 5% of the cases are they willing to pay the

same or higher price for the store brand. This finding is consistent with general belief that

consumers derive utility from national brands beyond what is explained by quality (Research Alert 2000, Sethuraman and Cole 1997). Our model enables us to quantify this aspect by separately estimating quality equity and non-quality equity. The mean RPD is 36.7% (median = 30%).

Estimation of Aggregate Model

The aggregate model (Equation 12) is first estimated using OLS with actual perceived quality differential (PQD). Then, we used the 2SLS procedure by using consumer variables (CV) and product variables (PV) as instrument for perceived quality differential (Equation 16). The following are the relevant values for the two methods:

Method	R^2	QE	NQE	BE=QE+NQE	RPD	BE/RPD(%)	NQE/BE(%)
OLS	0.18	4.6	27.2	31.8	36.7	85.0	85.5
2SLS	0.07	4.4	25.1	29.5	36.7	80.4	85.1

Both the OLS and the 2SLS methods give similar results. However, the R^2 for the 2SLS model with instrumented PQD is significantly lower. Two findings are interesting from the above table. First, brand equity accounts for over 80% of the premium consumers will pay for national brands over a store brand. Second, non-quality equity accounts for over 85% of the total brand equity.

Estimation of Category Model

The category model (Equation 14) was estimated using OLS and 2SLS. Again, while the key results were directionally similar, in as many as 14 product categories, the 2SLS produced low, non-significant R^2 values. Therefore we report only the OLS results in Table 2 for each of the 20 categories. Again, brand equity accounts for over 80% of the premium consumers would

pay for national brands over store brands and non-quality equity is the dominant equity component. Furthermore, brand equity exists even in product categories such as bleach and flour, which are generally considered commodity products.

Estimation of Antecedents Model

The antecedents model Equations (16) and (17) were estimated using 2SLS and Equation (18) using OLS. The product variables (PV) and consumer variables (CV) listed in the data section were used in the analysis. The results are presented in Table 3. Among category characteristics, advertising, hedonism, and purchase price appear to be significant influencers of brand equity. Among consumer variables, gender, age and income influence brand equity.

Assessing the Validity Of Key Measures

Perceived quality differential and reservation price differential form the core basis for measuring brand equity. In this section, we test the validity of our survey-based measures by comparing them with data from external sources.

Validity of Perceived Quality Differential (PQD) Measure. Table 4 provides the average perceived quality differential of the product categories in our survey. They are arranged in the ascending order of PQD. Categories such as bleach and flour, which are typically considered commodity products, have the lowest quality differential, while the more differentiated products such as shampoo and soft drink have the highest quality differential. Thus our measure of perceived quality differential appears to have some face validity.

The Pearson and Spearman correlations between perceived quality differential and objective quality differential are both 0.58. We find this correlation to be reasonably high given

that the data were collected from different markets using different measures at different time periods. One notable deviant is frozen vegetables. If we delete this category, the correlations increase to about 0.70, further enhancing the external validity of the PQD measure.

Validity of Reservation Price Differential (RPD) Measure. To assess the external validity of the RPD measure, we compared our survey data with that obtained from aggregate U.S. supermarket data for the same year. The supermarket data come from Infoscan Supermarket Review (1995) provided by Information Resources, Inc. For each product category, we computed the average actual price differential between national brand and store brand from the Infoscan Report (Table 4, Column 5). For this price differential, we computed the market share of private labels predicted in our survey (Column 7) and compared it with the actual all U.S. private label market share given in the Infoscan Supermarket Review (Column 6). The predicted market share in our survey is computed as the number of consumers whose reservation price differential is below the actual price differential (weighted by their purchase shares) divided by total number of consumers purchasing the category. The correlation between predicted and actual market share is very high (0.85). The Mean Absolute Percentage Deviation between the two market shares is 29.5%. These numbers indicate a strong relationship between actual market share and the share predicted from our measure, thus providing external validity to the survey-based RPD measure.

DISCUSSION OF RESULTS AND IMPLICATIONS

Strength of Brand Equity

Overall, consumers state that they would be willing to pay a premium of about 37% for national brands over store brands. Of this, about 30% (about 85% of 37) can be accounted for by brand equity. In other words, on aggregate, across all consumers in the sample, the name of the national brand should enable it to command a premium of about 30%. Thus brand equity is a very significant influencer of the premium consumers are willing to pay for national brands, and thus their purchase behavior. Brand equity is a significant force even in the so-called "commodity" products such as bleach and flour, where there is little scope for quality differentiation.

Decomposing brand equity into quality equity and non-quality equity, we find that non-quality equity accounts for over 80% of the brand equity. In particular, it is estimated that consumers on aggregate would pay nearly 26% premium for national brands even when they perceive no quality difference between national and store brands. The finding that brand equity, especially non-quality equity, plays an important role in the choice of national brand vs. store brand has also been validated in recent works by Applebaum, Gerstner and Naik (2002) and Steiner (2002). Our finding is also quite consistent with Park and Srinivasan's (1994) analysis of toothpaste and mouthwash categories where they find that brand equity is less driven by attribute-based equity and more by non-attribute based equity. In fact, in their study (Table 2), the proportion of total national brand equity (relative to store brands) accounted for by non-

attribute based component was 79.8% for Crest, 82.7% for Colgate, and 89.7% for Scope. These numbers are comparable to the average 85% found in our study.

Our finding of substantial non-quality equity represents good news for national brand managers because it allows them to command a reasonable premium even when retailers close the quality gap. National brand managers should maintain and increase this equity through repeat advertising. The importance of non-quality equity suggests that they should focus more on image-based emotional advertising than on quality or attribute-based advertising.

The findings have implications for retailers in setting the price differential between national and store brands. Consumers appear to be willing to pay a reasonable price premium for national brands even if their perceived quality differential is zero, because of non-quality equity. Retailers should recognize this characteristic and ensure that the actual price differential is above this "minimum" price differential -- just because retailers have closed the quality gap does not mean that they can close the price gap significantly.

Retailers wishing to increase private label share can also attempt to reduce non-quality equity. This may be accomplished by enhancing the image of store brands through better packaging, local advertising or greater shelf-space allocation (Corstjens and Lal 2000), or countering the image impact of national brands. A recent ad for Sprite says "Image is nothing, Thirst is Everything!" Similar campaigns or "Why Pay More" slogans may be some ways to counter the national brand image.

Category Antecedents of Brand Equity

The relationship between category characteristics and brand equity components are discussed below for each variable.

Edibility. In edible product categories, quality equity is slightly lower than in non-edible products because the perceptual quality bias is lower for edible products than for non-edible products. That is, consumers perceive the quality differential between national and store brands to be higher than what they actually are in non-edible goods than in edible goods. Part of the reason for this perception may be that in edible products consumers are actually able to taste the item and better assess the actual quality of store brand vis-à-vis national brand. However, in non-edible items, it may be difficult to judge the quality or performance and consumers resort to using brand name as a signal of quality.

Purchase Price. In categories where the average purchase price is high, consumers have higher non-quality equity. That is, greater imagery is present in high-priced categories than in low-priced categories. Consumers are also more quality sensitive in high-priced items, perhaps because of higher perceived monetary risk. In summary, brand equity is positively related to average purchase price.

Purchase Frequency. In more frequently purchased product categories, consumers tend to associate less imagery and hence non-quality equity is smaller. It is possible that greater frequency of purchase and use increases the familiarity of brands in the product category. This familiarity wears out the imagery associated with any particular brand. Consumers are slightly

more quality sensitive in frequently purchased product categories, but the parameter is not statistically significant.

Hedonism. As would be expected, in hedonistic products, which provide greater consumption pleasure, the non-quality equity is higher. That is, consumers are more image-conscious and would pay a higher premium for national brand items in hedonistic products such as soft drinks and cookies than for national brands in the more functional products such as bleach and flour. Interestingly, hedonism also translates into higher quality equity. Consumers perceive the national brand to be higher in quality in hedonistic products than in functional goods.

National Brand Advertising. Advertising influences all components of brand equity. Consumers have higher non-quality equity, are more quality sensitive, and perceive national brand quality to be higher in highly advertised categories compared to less-advertised categories. The belief that advertising influences brand equity is well-known (see for example Simon and Sullivan 1993). Our research shows that it influences brand equity through all three components.

Managerial Implications. The importance of advertising as a potential influencer of national brand equity reinforces the belief that advertising could be an effective marketing instrument for national brand manufacturers in countering the threat posed by the private labels. Consumers will also pay a higher premium for national brands in categories that provide high amounts of consumption pleasure because of their higher brand equity. Therefore, national brand managers can maintain a premium pricing strategy in product categories consumed for hedonistic reasons, other things equal. National brand managers might attempt to increase the hedonistic value of their brands through emotional advertising that shows consumers using the brand to meet

emotional needs, and advertising that emphasizes the benefits delivered instead of the features of the product. However, enhancing consumption pleasure may be easier in some products such as cookies but quite difficult in some intrinsically functional products such as toilet tissue or frozen vegetable. We also find that non-quality equity is higher in categories in which the average purchase price is higher and purchase frequency is lower; hence national brand manager can exploit the higher brand equity and charge a higher price, *other things equal*. Retailers wishing to increase private label sales, on the other hand, would need to set a higher price differential between national brand and store brand (lower store brand price) in hedonistic, higher-priced, less frequently purchased product categories.

Consumer Antecedents of Brand Equity

Gender. In our study, females tended to have higher non-quality equity and had higher perceptual bias favoring the national brand. It appears therefore that females are more image conscious and national brand prone than are males.

Age. Relative to older consumers (above 60 years in age), younger consumers (18-40 years) have higher non-quality equity, slightly higher quality sensitivity, and have higher perceived quality bias favoring the national brand. Particularly noteworthy is the big difference in non-quality equity (about 9%). That is, even when both young and old consumers perceive the quality of national brand and store brand quality to be the same, young consumers would pay 9% more for the national brand. This finding is fairly intuitive. Because of their age and greater desire for social acceptability, young consumers would be more image-conscious and favorably

disposed toward national brands. Middle age (40-60 years) consumers appear to be the most quality sensitive among all age groups.

Income. One would expect that, because of their reduced purchasing power, lower-income consumers would be less image-conscious and simply buy what works at the cheapest price. Interestingly, the middle-income consumers are the ones who are willing to pay the lowest premium for national brands because they are less image-conscious (have lower non-quality equity) than low- or high-income consumers. Overall, this finding is consistent with a 1991 Gallup survey, which noted that consumers most likely to buy store brands are the middle-income ($25,000-$45,000) consumers (Fitzell 1992, p. 149).

Fitzell (1992) and other private label promoters have bemoaned this "unfortunate" situation. Low-income consumers stand to benefit the most from private labels because the brands are lower-priced reasonable alternatives to national brands. Yet, these are the very people who are unwilling to buy store brands because they are attracted by the imagery of national brands and use it to reflect their status. As would be expected, high-income consumers have the highest quality sensitivity (most discerning consumers).

Education. Our analysis shows that consumers with college education believe that there is less quality differential between national brands and store brands than consumers with high school (or less) education. Perhaps educated consumers, because of their ability to process product information from package labels and other sources, are more likely to recognize that store brands are comparable in quality to national brands. Hence, consumers with higher education have lower national brand quality equity than less-educated consumers.

Managerial Implications. Findings related to consumer antecedents of brand equity have implications for segmentation and targeting. Those segments of consumers that have higher levels of national brand equity are natural segments for national brand manufacturers to target. Thus, other things equal, national brand manufacturers would be better off targeting young, educated, females with low or high income. Retailers on the other hand may be better off targeting the older, less-educated, middle-income males for their store brands. Because private labels are low-priced items appropriate for low-income consumers and because females are primary grocery shoppers in a majority of cases, and because younger consumers represent future growth potential, store brand managers can attempt to attract these consumers by reducing the imagery of national brands or by increasing the imagery associated with store brand (e.g., packaging, in-store advertising) and communicating such activities to these younger, lower-income and female consumers.

CONCLUSIONS

In this paper, we have developed a customer-based approach and described an econometric model for measuring national brands' equity over store brand and decomposing it into Quality Equity and Non-Quality Equity. Our approach is drawn from a utility framework and our brand equity estimation is based on data from 132 consumers on 20 product categories.

The key qualitative insight is that non-quality equity (measured as the price premium consumers would pay for the national brand over store brand even when they perceive the quality of these brands to be the same) plays a dominant role in why consumers would pay more for

national brands and thus in consumers' choice between national and store brands. We also identified several category and consumer antecedents of national brand equity and discussed the implications of our findings. As expected, non-quality equity or brand image is higher in highly-advertised and hedonistic products. Non-quality equity is also higher in higher-priced, less frequently purchased categories. National brand advertising also appears to play a role in enhancing quality equity through increased quality sensitivity and perceived quality. Females tend to have higher non-quality equity (imagery) than males and younger consumers have higher non-quality equity than older consumers. The results do not appear to be monotonic in the case of household income. Middle-income consumers are the least affected by national brand imagery (have the least non-quality equity) compared to low- and high-income consumers.

Limitations and Future Research Directions

Our methodology has several limitations. First, our measure of perceived quality differential and price premium are based on self-report. This approach is fairly well established research practice. A number of past research studies involving attribute tradeoffs or price sensitivities, including most conjoint analysis studies, use the self-report approach. Second, in measuring quality differential and price premium, we have used national brand as the anchor. Our reasoning for use of national brand anchor is as follows. Literature on reference prices and referent brand suggest that the referent brand is likely to be the most recently or most often purchased. Kalyanram and Winer (1995) find convincing empirical evidence that past prices are considered when consumers form reference prices. In about 50% of the cases, consumers purchased national brands exclusively and in the other 50% of the cases, they purchased national

brands and store brands. Therefore, national brand appeared to be a better candidate for being an anchor. Consistent with this argument, in our pretests consumers given store brand anchor said they were uncomfortable anchoring on a brand that they are not familiar with.

Third, we use a percentage premium measure so as to be consistent across all products and consumers and do not use absolute price premium (in dollars and cents). Fourth, we have considered national brand and private labels as single identities, though there are likely to be differences among national brands and among private labels. Fifth, we have used an econometric model that is linear in quality differential, while the true model may be non-linear.

Despite these limitations, as we have noted in the paper, several of our findings are consistent with expectations and prior research providing some face validity and nomological validity to our approach. Importantly, our key result that non-quality utility is a major driver of brand equity is consistent with Park and Srinivasan (1994) thereby providing some external validity. Therefore we believe our broad qualitative insights regarding national brand vs. store brand competition are robust. Future research can validate and refine these results using alternate methodologies (e.g., lab or field experiments) and in different markets.

Future research can also identify other potential antecedents of brand equity besides the demographic and category antecedents that we have analyzed. In addition, an important topic for future research is to identify the source of the non-quality equity. Is it reputation, loyalty, experience, or habit?

Table 1

Classification of Product Categories

Product	Edibility	Purchase Price	Purchase Frequency	Hedonism (Pleasure)	Advertising
Bleach	No	Low	Low	Low	Low
Flour	Yes	Low	Low	Low	Low
Frozen vegetables	Yes	Low	High	Low	Low
Analgesics	Yes	High	Low	Low	High
Jams/Jellies	Yes	Low	Low	High	Low
Fabric Softener	No	High	Low	Low	High
Aluminum Foil	No	Low	Low	Low	Low
Orange Juice	Yes	Low	High	High	High
Cheese	Yes	High	High	High	High
Cookies	Yes	High	High	High	High
Cake Mix	Yes	Low	Low	High	Low
Dish Liquid	No	Low	Low	Low	Low
Coffee (Ground)	Yes	High	High	High	High
Ketchup	Yes	Low	Low	Low	Low
Frozen Pizza	Yes	High	High	High	Low
Cereal	Yes	High	High	High	High
Dog Food	No	High	High	Low	High
Toilet Tissue	No	Low	High	Low	High
Soft Drink	Yes	High	High	High	High
Shampoo	No	High	Low	High	High

Table 2

Brand Equity by Product Category

Product	# obsns.	Quality Equity (QE)	Non-Quality Equity (NQE)	Total Brand Equity	% of premium accounted for by Brand Equity	% of equity accounted for by Non-Quality equity
Bleach	106	2.12	21.5	23.6	100	91.1
Flour	117	1.48	23.2	24.7	91.9	93.9
Frozen Vegetables	122	-2.81	26.7	23.9	79.4	--
Analgesics	119	3.89	26.9	30.8	93.8	87.3
Jams/Jellies	113	3.59	28.6	32.2	88.2	88.8
Fabric Softener	93	1.40	30.2	31.6	86.1	95.6
Aluminum Foil	127	4.00	24.9	28.9	86.8	86.2
Orange Juice	118	3.47	27	30.5	91.0	85.7
Cheese	127	7.01	21.2	28.2	87.8	75.2
Cookies	117	1.38	29.9	31.3	91.2	95.5
Cake Mix	102	1.07	27.6	28.7	90.3	96.2
Dish Liquid	125	1.07	29.1	30.2	81.6	96.4
Coffee (Ground)	92	7.55	26.5	34.1	90.4	77.7
Ketchup	118	8.24	23.9	32.1	90.2	74.5
Frozen Pizza	94	2.44	27.5	29.9	88.9	91.9
Cereal	122	7.10	30.9	38.0	95.9	81.3
Dog Food	33	9.73	28.7	38.4	84.4	74.7
Toilet Tissue	129	4.32	28.6	32.9	80.2	86.9
Soft Drink	121	4.90	31.4	36.8	82.7	85.3
Shampoo	123	5.94	32.9	38.8	89.4	84.8

Table 3

Regression Results – Antecedents of Brand Equity

Independent Variable	Level	Non-Quality Equity (NQE)	Quality Sensitivity	Perceived Quality Bias (PQD-OQD)
Edibility	Edible	-1.76 (2.07)	0.05 (.03)	-2.98 (1.55)*
Purchase price	High	4.01 (1.73)**	.07 (.04)*	2.91 (2.05)
Purchase frequency	High	-2.99 (1.51)*	.056 (.037)	-1.49 (1.77)
Hedonism	High	2.76 (1.53)*	.07 (.048)	3.10 (1.81)**
Advertising	High	4.06 (1.82)**	0.11 (.04)**	5.18 (2.18)**
Gender	Female	3.91 (1.31)**	-.05 (.034)	3.16 (1.53)**
Age	Young	9.1 (1.85)**	.05 (.05)	12.3 (2.24)**
	Middle age	4.16 (1.88)**	.25 (.05)**	8.95 (2.3)**
Income	Low	0.63 (1.71)	-.021 (.04)	2.97 (1.94)
	Middle	-6.42 (1.57)**	-.04 (.05)	1.46 (1.88)
Education	College	-1.54 (1.33)	.093 (.032)**	-6.95 (1.50)**
Family size	Single	1.59 (2.03)	-.08 (.05)**	-1.19 (2.13)
	Couple	2.36 (1.83)	-.02 (.04)	.94 (1.64)

**p < .05, *p < .10 two-tailed test

Table 4

Assessment of Validity

Product (1)	# obsns. (2)	Perceived Quality Differential from survey (3)	Objective Quality Differential from H&B (1993) (4)	Actual (%) Price Differential Supermarket review (5)	Actual (%) Market Share Supermarket review (6)	Predicted(%) Market Share from Survey (7)
Bleach	106	5.9	0	37.6	36.0	19.9
Flour	117	8.4	2.5	27.6	21.4	5.8
Frozen Vegetables	122	12.8	20	31.3	39.1	25.0
Analgesics	119	16.1	5	31.1	25.3	23.8
Jams/Jellies	113	16.7	7.5	26.4	27.0	18.9
Fabric Softener	93	17.5	12.5	34.3	22.8	10.8
Aluminum Foil	127	18.3	7.5	35	49.1	31.9
Orange Juice	118	18.7	7.5	30.5	30.2	21.0
Cheese	127	19.3	5	22.1	26.6	18.1
Cookies	117	22.1	17.5	39.9	16.4	16.0
Cake Mix	102	22.6	20	16.4	5.5	4.6
Dish Liquid	125	24.1	20	36.7	6.2	5.9
Coffee (Ground)	92	25.4	10	17.2	8.4	5.1
Ketchup	118	28.3	10	25.6	17.6	7.6
Frozen Pizza	94	28.4	20	32.1	7.5	8.0
Cereal	122	29.6	7.5	40.6	10.4	11.3
Dog Food	33	36.3	10	41.5	13.1	9.3
Toilet Tissue	129	34.5	22.5	27.0	13.5	7.9
Soft Drink	121	36.4	22.5	32.1	10.7	6.1
Shampoo	123	37.3	17.5	26.2	3.2	1.8

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