

Revenue Premium as an Outcome Measure of Brand Equity

The authors propose that the revenue premium a brand generates compared with that of a private label product is a simple, objective, and managerially useful product-market measure of brand equity. The authors provide the conceptual basis for the measure, compute it for brands in several packaged goods categories, and test its validity. The empirical analysis shows that the measure is reliable and reflects real changes in brand health over time. It correlates well with other equity measures, and the measure's association with a brand's advertising and promotion activity, price sensitivity, and perceived category risk is consistent with theory.

The concept of brand equity has been widely discussed in the marketing literature; much of the research stems from a Marketing Science Institute (MSI) conference on the topic (Leuthesser 1988). Researchers such as Aaker (1991), Aaker and Keller (1990), Broniarczyk and Alba (1994), Farquhar (1989, 1990), Feldwick (1996), Keller (1993), Loken and Roedder-John (1993), and Park, Milberg, and Lawson (1991) have written extensively about the concept of brand equity and about how to build, manage, and extend it. At the same time, advertising and market research executives have emphasized the importance of brand equity (Baldinger 1990, 1992; Blackston 1992, 1995); companies have paid increasing attention to brands, often creating the position of brand equity manager; and consulting practices have been established to evaluate and track brand equity (e.g., Interbrand, Total Research Corporation, Millward Brown).

The steadily growing literature contains several often-divergent viewpoints on the dimensions of brand equity, the factors that influence it, the perspectives from which it should be studied, and the ways to measure it. However, there is agreement among researchers on the general definition of the concept. *Brand equity* is defined as the marketing effects or outcomes that accrue to a product with its brand name compared with those that would accrue if the same product did not have the brand name (Aaker 1991; Dubin 1998; Farquhar 1989; Keller 2003; Leuthesser 1988). The specific effects may be either consumer-level constructs,

such as attitudes, awareness, image, and knowledge, or firm-level outcomes, such as price, market share, revenue, and cash flow. As Leuthesser (1988) summarizes, Al Shocker and Bart Weitz define brand equity from the consumer perspective as a utility, loyalty, or differentiated clear image not explained by product attributes and from the firm perspective as the incremental cash flow resulting from the product with the brand name compared with that which would result without the brand name.

Despite all the attention paid to brand equity, the existence of a generally accepted definition, and both brand equity's and marketing metrics' positions as priority MSI topics for the past ten years, remarkably few academic researchers have addressed brand equity measurement *per se*. This may partly be due to disagreement about whether equity should be measured from the consumer or the firm perspective; although, the two perspectives are linked because firm-level outcomes, such as incremental volume, revenue, price commanded, cash flow, and profit, are the aggregated consequence of consumer-level effects, such as positive image, attitude, knowledge, and loyalty.

The purpose of this article is to propose and validate revenue premium as a measure of brand equity. We describe the measure and compute it for various brands across several packaged goods categories. We validate the measure by examining its correlation with other commonly available measures, its behavior over time and across product categories, and its association with price elasticity and marketing activities, such as advertising and promotion. The following section provides the conceptual background for our work by reviewing the purposes for which managers use brand equity measures, desirable characteristics of the ideal measure, and existing measures of brand equity. Subsequently, we present our measure and its theoretical basis, advantages, and limitations; we present an empirical validation of the measure; and we conclude with implications for researchers and managers.

Conceptual Background

Why Measure Brand Equity?

The academics and practitioners who gathered at an MSI (1999) workshop on brand equity metrics summarized the

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following broad purposes for measuring brand equity: (1) to guide marketing strategy and tactical decisions, (2) to assess the extendibility of a brand, (3) to evaluate the effectiveness of marketing decisions, (4) to track the brand's health compared with that of competitors and over time, and (5) to assign a financial value to the brand in balance sheets and financial transactions. They also developed the following list of desiderata for the ideal measure. It should be

1. grounded in theory;
2. complete, that is, encompassing all facets of brand equity, yet distinct from other concepts;
3. diagnostic, that is, able to flag downturns or improvements in the brand's value and provide insights into the reasons for the change;
4. able to capture future potential in terms of future revenue stream and brand extendibility;
5. objective, so that different people computing the measure would obtain the same value;
6. based on readily available data, so that the measure can be monitored on a regular basis for multiple brands in multiple product categories;
7. a single number, to enable easy tracking and communication;
8. intuitive and credible to senior management;
9. robust, reliable, and stable over time, yet able to reflect real changes in brand health; and
10. validated against other equity measures and constructs that are theoretically associated with brand equity.

Recognizing that no single measure is likely to satisfy all these criteria, the workshop attendees recommended that the usefulness of a measure should be evaluated against the primary purposes it is to be used for and that efforts should be made to build a database for use in validating existing and new measures of brand equity.

Existing Measures of Brand Equity

Keller and Lehmann (2001) divide existing measures of brand equity into three categories. The first category, which they call "customer mind-set," focuses on assessing the consumer-based sources of brand equity. The second and third categories, which they call "product market" and "financial market," focus on the outcomes or net benefit that a firm derives from the equity of its brands.

Customer mind-set. Customer mind-set measures assess the awareness, attitudes, associations, attachments, and loyalties that customers have toward a brand and have been the focus of much academic research (e.g., Aaker 1991, 1996; Ambler and Barwise 1998; Keller 1993, 2003) and industry offerings (e.g., Millward Brown's Brand Z, Research International's Equity Engine, Young & Rubicam's Brand Asset Valuator). These measures are rich in that they assess several sources of brand equity, have good diagnostic ability, and can be used as input to predict a brand's potential. Thus, they are well suited for the first three purposes of brand equity measurement listed previously. However, because the measures are typically based on consumer surveys, they are not easy to compute and do not provide a single, simple, objective measure of brand performance. Furthermore, because they do not culminate in a dollar value for the brand, they are not appealing for financial valuation pur-

poses. Even marketers argue that it is not enough to assess brand image, attitudes, and so on; the dollar-value connection to the bottom line is imperative (Kiley 1998; Schultz 1997).

Product-market outcomes. The logic underlying product-market measures is that the benefit of brand equity should ultimately be reflected in the brand's performance in the marketplace. The most commonly mentioned such measure is price premium, that is, the ability of a brand to charge a higher price than an unbranded equivalent charges (Aaker 1991, 1996; Agarwal and Rao 1996; Sethuraman 2000; Sethuraman and Cole 1997). Price premium is measured either by asking consumers how much more they would be willing to pay for a brand than for a private label or an unbranded product or by conducting conjoint studies in which brand name is an attribute. Other product-market outcome measures include market share, relative price (Chaudhuri and Holbrook 2001), share of category requirements (Aaker 1996), market share adjusted by a "durability" factor (Moran 1994), the constant term in demand models (Srinivasan 1979), the residual in a hedonic regression (Hjorth-Andersen 1984), or an economic theory-based measure of the difference between the brand's profit and the profit it would earn without the brand name (Dubin 1998).

The advantages of such measures are that they are more "complete" than any single customer mind-set measure because they reflect a culmination of the various mechanisms by which the brand name adds value and that they can be given a dollar value, which is appealing to senior management and is critical for financial valuation. Many such measures are also rooted in the conceptual definition of brand equity because they quantify the incremental benefit due to the brand name.

The disadvantages are that some of the measures rely on customer judgments of what they would buy in hypothetical situations rather than actual purchase data and are subject to several biases, such as context effects (Simonson and Tversky 1992). Other measures, such as conjoint-based measures, require fairly complicated statistical modeling, which makes them time consuming and impractical to monitor on a regular basis, or are sensitive to model specification (Steenkamp and Wittink 1994). In addition, some product-market measures can result in an incomplete and therefore misleading estimate of brand equity. For example, a brand might have high market share, but if that share simply has been "bought" by severe price cuts, market share will overestimate brand equity. Other brands might not command a price premium, but that does not mean they do not have equity. Indeed, in today's value-conscious consumer market, there are many examples of strong, value-priced brands (e.g., Southwest Airlines, Wal-Mart, Suave). Finally, because of their focus on outcomes rather than sources of brand equity, all product-market measures have limited diagnostic ability: They are diagnostic to the extent that they can flag when a brand is in trouble or when it is strong, but they cannot explain the reasons for either situation. Thus, they are more suited for the last three purposes of brand equity measures that we listed previously.

Financial market outcomes. Financial market measures assess the value of a brand as a financial asset; such measures include purchase price at the time a brand is sold or

acquired (Mahajan, Rao, and Srivastava 1994) and discounted cash flow valuation of licensing fees and royalties. The Interbrand consultancy combines both product-market and financial market measures to adjust a brand's current profits for growth potential. Simon and Sullivan (1993) determine the residual market value after other sources of firm value are accounted for.

Although financial market measures have many of the same advantages and disadvantages as do customer mind-set measures and product-market outcomes, they differ in one key respect. In general, product-market outcomes quantify the current strength of a brand, whereas financial market outcomes also attempt to quantify future potential. However, this difference introduces a substantial element of subjectivity and/or instability into the measures. Future potential is assessed by means of subjective judgment (e.g., the multiples Interbrand applies) or stock market value, which is highly volatile (e.g., Snapple's sale price went from \$1.7 billion in 1994 to \$300 million in 1996, and then back to \$1 billion in 2000), and has less immediate relevance to marketing, because many things other than marketing activities influence it.

Summary. Researchers have used three major approaches to measure brand equity, and each approach has its own advantages and disadvantages. No single measure can possess all the characteristics that marketers desire in the ideal brand equity measure. Product-market measures offer an attractive middle ground between customer mind-set and financial market measures in terms of objectivity and relevance to marketing. However, our review reveals a need for a measure of this type that combines high external validity, strong conceptual grounding, completeness, and ease of calculation. In the next section, we propose the revenue premium measure as a way to satisfy this need.

The Revenue Premium Measure

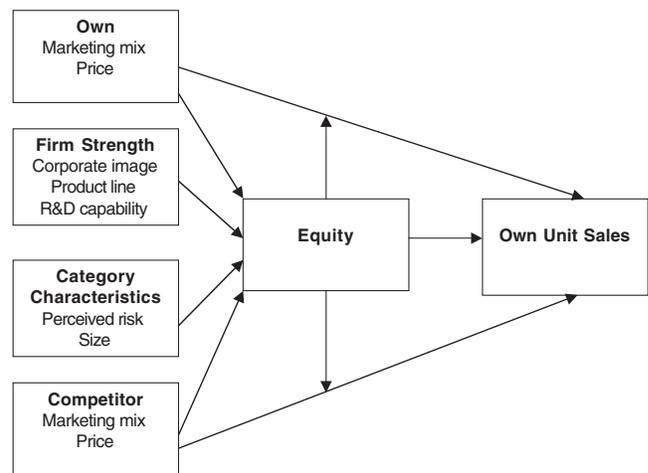
We define *revenue premium* as the difference in revenue (i.e., net price \times volume) between a branded good and a corresponding private label:

$$(1) \quad \text{Revenue premium}_b = (\text{volume}_b)(\text{price}_b) - (\text{volume}_{pl})(\text{price}_{pl}).$$

Theoretical Basis

Figure 1 shows the role of equity in determining a brand's sales volume. Sales are influenced by the marketing mix of both the brand and its competitors. Equity influences sales directly by means of consumer choice and indirectly by enhancing the effectiveness of the brand's marketing efforts and insulating the brand from competitive activity (Keller 2003). In turn, equity is created by the marketing mix of both the brand and its competitors and by the firm's previously existing strength from its corporate image, product line, research and development (R&D), and other capabilities. For example, Sony's equity arises from its superior products and marketing programs, company reputation, and expertise; this equity makes consumers pay more attention to Sony advertising, enables better trade support, and

FIGURE 1
Role of Customer-Based Equity in Determining Unit Sales



reduces Sony's vulnerability to competitors' product improvements and price cuts. Exogenous category characteristics, such as market size and perceived risk, also influence the level of equity that brands can achieve. The incremental value that consumers are likely to give to a well-respected branded product compared with an equivalent unbranded one is greater if the perceived risk in buying or consuming the category is high (Batra and Sinha 2000; Erdem and Swait 1998; Sethuraman and Cole 1997). In equation form, Figure 1 can be represented as follows:

$$(2) \quad S_j = f_j(M_j, P_j, M_k, P_k, M_j E_j, P_j E_j, M_k E_j, P_k E_j, E_j), \text{ and}$$

$$(3) \quad E_j = g_j(M_j, P_j, F_j, C_j, M_k, P_k),$$

where

- S = unit sales,
- M = marketing mix,
- P = price,
- E = equity,
- F = preexisting firm strength,
- C = category characteristics, and
- j and k = indexes of brands j and k.

In the competitive marketplace defined by the sales and equity functions in Equations 2 and 3, brands j and k decide on their marketing mix and price to maximize profits.¹ This yields an equilibrium set of marketing-mix, price, and brand equities (M_j^* , P_j^* , M_k^* , P_k^* , E_j^* , E_k^*), resulting in the following equilibrium revenue for brand j:

$$(4) \quad R_j^* = S_j^* P_j^* = f_j(M_j^*, P_j^*, M_k^*, P_k^*, M_j^* E_j^*, P_j^* E_j^*, M_k^* E_j^*, P_k^* E_j^*, E_j^*) P_j^*.$$

¹For exposition purposes, we portray two competing brands, but there could be several.

If brand j did not have a brand name, the resulting equilibrium would be $M_j^{**}, P_j^{**}, M_k^{**}, P_k^{**}, E_j^{**} = 0, E_k^{**}$.² This would yield the following revenue for brand j :

$$(5) \quad R_j^{**} = S_j^{**}P_j^{**} = f_j(M_j^{**}, P_j^{**}, M_k^{**}, P_k^{**})P_j^{**}.$$

Therefore, the outcome of the brand's equity is its revenue premium, $R_j^* - R_j^{**}$, that is, the revenue it achieves in the market less the revenue it would achieve if it had no brand name.

This theoretical development provides two major insights. First, the revenue outcome is achieved in competitive equilibrium, where brands adjust their marketing mix and prices to maximize profits. Therefore, revenue premium does not need to control for the marketing activities of either the brand or its competitors: The marketing mix, and equity itself, is part of equilibrium and is manifest in the revenue the brand achieves. This is the reason outcome measures generally do not control for marketing activities in quantifying the value of a brand. Keller (2003, p. 492) critiques as static measures that hold everything else constant and attempt to isolate only preferences for the product itself and highlights the importance of including differential response to marketing activities.³

Second, an exact calculation of equity requires structural estimates of the demand and equity functions for each brand, which in general are not available. Equations 2 and 3 could be combined to yield one "reduced form" equation, but even in the simplest case in which both equations are linear, the reduced form would still have interactions and quadratic terms. If the demand and equity functions were available, equilibrium marketing mix, prices, and revenue could be calculated by first using the equity function for brand j and then setting it equal to zero. The difference in equilibrium revenue is the revenue premium measure of equity. However, this process is difficult to implement in practice because it requires knowledge of the demand and equity functions, and it still may not yield closed-form equilibriums.

Therefore, we take a pragmatic approach to approximate $R_j^* - R_j^{**}$. We take the brand's current revenue as R_j^* and the revenue of the private label in its category as R_j^{**} . Subtracting the latter from the former yields the revenue premium for brand j . Two key assumptions underlie this calculation. The first is that brands pursue rational equilibrium strategies so brand revenue approximates R_j^* . This assumption is most likely to hold over long periods, such as an annual time frame (Ailawadi, Kopalle, and Neslin 2002). Weekly demand may be subject to random shocks and out-of-equilibrium knee-jerk reactions to competitors' actions,

but over the long run, this "dust settles" (Dekimpe and Hanssens 1999), and the market is in equilibrium.⁴

The second assumption is that the private label mimics how the brand would perform if it had no brand name, so private label revenue approximates R_j^{**} . The generally low expenditures of private labels on brand-building activities, such as advertising and R&D, and their low prices provide face validity to this assumption, and other researchers who have used private labels as a benchmark to compute a brand's price or market share premium (Park and Srinivasan 1994; Sethuraman 2000) provide precedence. Still, there are some potential complications. First, we assume that the demand function facing the private label is identical to that which brand j would face if it had no equity. If this is not the case, private label revenue may not be a good surrogate for R_j^{**} . However, note that many, if not all, of the differences in demand parameters between national brands and private labels are likely due to brand equity, and our model accounts for these differences by means of the main and interaction effects of brand equity. Second, there will be an obvious zero-equity brand in some markets, most often it will be a private label, that provides a good surrogate for what the brand would achieve if it had no brand name and thus no equity. In other markets, a new entrant or a weak brand may need to be used as the benchmark. Third, private labels vary across retailers and markets. However, unlike measures such as price or market share premium, total revenue premium has the advantage that it can be computed as the sum of revenue premiums for individual retailers and/or markets (indexed by s):

$$(6) \quad E_b = R_b - R_{pl} = \sum_s R_{bs} - \sum_s R_{pls} \\ = \sum_s (R_{bs} - R_{pls}) = \sum_s E_{bs}.$$

Advantages of the Revenue Premium Measure

The external validity and objectivity of the measure are obvious because revenue premium is computed with actual market data, not responses to hypothetical scenarios or subjective judgments. Revenue premium is logical, intuitive, and linked to a key performance measure that marketers and the investment community care about: revenue. Revenue premium is easy to calculate because it does not require consumer surveys, estimates of demand elasticities, or assumptions about consumer choice. The data required for calculating revenue premium are readily available in existing internal and secondary data (e.g., annual reports, Information Resources Inc. and ACNielsen data). Therefore, it can easily be monitored for a large number of brands and categories.

Revenue premium is also more complete than some other outcome measures because it considers both volume

²We set the equity the brand would achieve if it did not have its brand name equal to zero, without loss of generality.

³Market size, which is not determined in equilibrium, could be controlled for by taking revenue premium as a percentage of category revenue. We present the absolute size of the revenue premium because it provides a dollar value of the brand. We believe it is important to control for market size when comparisons are made across categories, and we do so later in this article.

⁴Note that equilibrium does not mean stable or zero growth. It simply means that during the period of interest, firms maximize their profits while taking into account one another's actions, new entrants and exits in the market, and environmental influences such as growth in the category.

premium and price premium. Consider four possible cases, depicted in Figure 2, that depend on the price and unit sales of the brand relative to a private label. In each case, price is on the x-axis, and unit sales are on the y-axis. The B represents the branded product, and PL represents the private label equivalent. The area depicted by the plus sign represents a positive contribution to the brand's revenue premium, and the area depicted by the negative sign shows a negative contribution.

Case A represents the ideal situation: The brand is priced higher and sells more than the private label does. Its revenue premium is the shaded area depicted with a plus sign. In Case B, the brand sells at a higher price but has fewer unit sales than the private label does. Major brands in the cigarette and diaper markets have faced this situation in recent years as consumers switch to private label and discount brands and are no longer willing to pay high price premiums (Keller 2003, p. 106; Miller 1993). In such cases, revenue premium may be positive or negative, depending on the relative size of the positive premium due to higher price (depicted by "+" in Figure 2) and the negative premium due to lower sales (depicted by "-").⁵ In Case C, the branded good enjoys greater sales than the private label does (depicted by "+") but at a lower price (depicted by "-"). Again, total revenue premium may be positive or negative, depending on the size of the components. Although it is not common for strong brands to be priced below private labels, several low-priced brands do have strong equity in today's value-conscious market, as we noted previously. Finally,

⁵It is important to define the market appropriately because a strong niche or regional player may incorrectly appear to belong to Case B if its revenue premium is calculated in a broad market that it does not serve. We examine this issue in our empirical analyses.

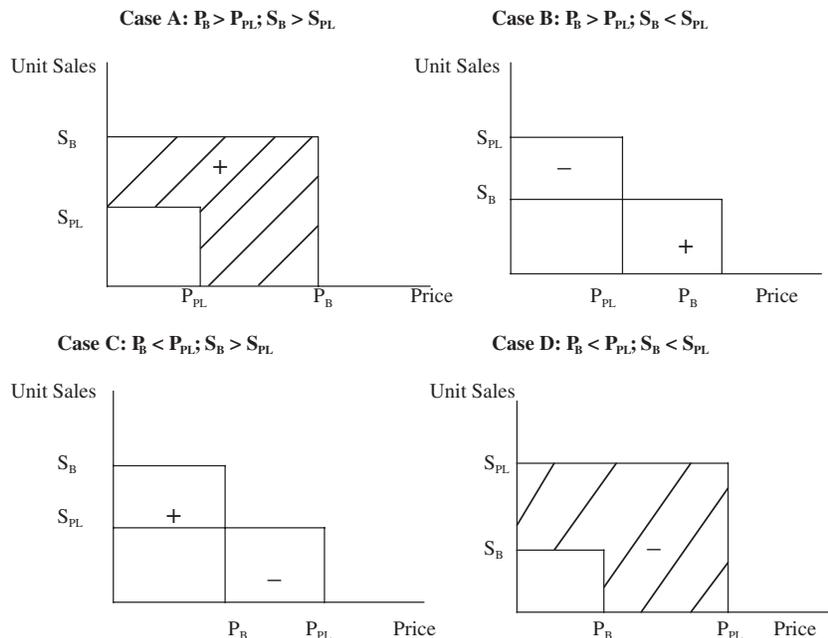
Case D is the opposite of Case A: The brand sells fewer units at a lower price than the private label does. Revenue premium is negative in this case, and prospects for a brand in this position are not encouraging.

The four cases illustrate the completeness of our measure compared with some other product-market measures. For example, in Case A, value-priced brands may be labeled as low equity by means of a price premium measure when their true strength is better reflected in revenue premium. In Case C, the market share measure would label brands as high equity, ignoring that the brand might have "bought" share by cutting prices. Behavioral brand loyalty, which is sometimes quantified as share of category requirements (i.e., the percentage of customers' total category purchases of the given brand), does not account for either the number of customers or the price they pay. Therefore, tracking revenue premium and determining in which of the four cases in Figure 2 their brand lies enables brand managers to flag a problem or an upturn in brand strength more readily than would one of these measures alone.

Limitations of the Revenue Premium Measure

As we noted previously, no single measure of brand equity is ideal on all fronts. First, as do all outcome measures, revenue premium has limited diagnostic ability: It does not provide insight into the customer-level sources of equity and thus the "quality" of this equity. Second, revenue premium does not explicitly consider a brand's extendibility and future potential, though it represents a reasonable floor on the overall long-term value of a brand (see Dubin 1998, p. 78). A multiple could be applied to a brand's revenue premium to reflect its future potential, but any forecasting attempts are necessarily subjective or complex. The subject

FIGURE 2
Revenue Premium Measure: Four Possibilities



tivity of such multiples is evident in the rule of thumb that accountants allegedly use to price a brand: four to six times the annual profit realized by products bearing the brand name (Keller 2003, p. 495). Third, our measure does not include costs. To adjust the revenue premium measure for variable costs, we define the following:

$$(7) \quad \text{Adjusted revenue premium}_b = (\text{volume}_b)(\text{price}_b - \text{variable cost}_b) - (\text{volume}_{pl})(\text{price}_{pl} - \text{variable cost}_{pl}).$$

Inclusion of variable costs has a negative impact on our measure in Cases A and C and a positive impact in Cases B and D. In this article, we use the gross revenue premium rather than the adjusted revenue premium measure partly because we do not have reliable data for variable costs. However, it could be argued that in some sense, gross revenue premium is a more appropriate measure because it reflects market demand rather than the firm's internal production costs.

Assessing the Validity of Brand Equity Measures

The validity of a brand equity measure can be assessed by examining whether it (1) is stable (reliable) over the short and medium runs and correlates (2) with other measures of brand equity; (3) in expected ways with the brand's marketing effort; (4) in expected ways with other variables, such as the characteristics of the product category; and (5) in expected ways with price sensitivity.

Stability over Time

Brand equity is an enduring phenomenon because it is built with long-term effort and investment (Aaker 1991; Farquhar 1990). In general, therefore, brand equity should be fairly stable in the short and medium runs. However, conventional wisdom maintains that the equity of brands eroded in the 1990s as consumers became more price conscious and as private labels gained market share (Dunne and Narasimhan 1999). Thus, although a measure of brand equity should not change drastically from one year to the next, it should reflect overall market trends.

Correlation with Other Measures

In theory, various measures of brand equity reflect the same underlying construct. However, equity is a multidimensional construct (Aaker 1996), and each measure may tap somewhat different dimensions. A new measure should correlate well with other conceptually similar measures, but it should not correlate so highly as to be redundant.

Correlation with Marketing Activities

As Figure 1 shows, marketing activities influence brand equity. It is widely accepted that advertising increases equity (Aaker and Biel 1993; Kirmani and Zeithaml 1993; Mela, Gupta, and Lehmann 1997). In contrast, some researchers argue that promotions erode brand loyalty and equity (Jedidi, Mela, and Gupta 1999; Keller 2003, p. 310; Yoo, Donthu, and Lee 2000); others suggest that promotions do not have a negative effect on brand loyalty (Ehrenberg,

Hammond, and Goodhardt 1994; Gedenk and Neslin 2000) and even expand the brand franchise by increasing penetration (Ailawadi, Lehmann, and Neslin 2001). We validate the revenue premium measure by examining whether its correlation with these variables is in line with what is expected of a brand equity measure. Note that this is strictly a test of association, not causality. The causal relationship between marketing actions and brand equity, as Figure 1 indicates, occurs through a complex chain of simultaneous relationships that we do not model.

Correlation with Category Characteristics

As Figure 1 shows, a driver of variation in equity across categories is the level of risk that consumers perceive. Risk may be related to performance, financials, or social aspects (e.g., Dunn, Murphy, and Skelly 1986). Brands should have higher equity in categories with greater perceived risk. The perceived risk of using unbranded products is greater (1) if the average time between purchases is high or if consumers stockpile, because consumers then must endure their choice for a longer time; (2) if the category is consumed more for pleasure than for utility, because it is easier for consumers to compare functional attributes than hedonic ones; and (3) if there is a greater difference in quality between branded and unbranded products (Batra and Sinha 2000; Richardson, Jain, and Dick 1996; Sethuraman and Cole 1997). Thus, brand equity should be positively associated with length of purchase cycle, stockpileability, hedonic products, and quality differences between branded and unbranded products.

Correlation with Consumer Price Sensitivity

Brand equity makes consumers less sensitive to price increases and thus enables the brand to charge a premium price. In contrast, a high-equity brand should make significant sales gains when it cuts its price. Thus, a high-equity brand may have a weaker (less negative) "up" self-elasticity and a stronger (more negative) "down" self-elasticity (Keller 2003; Keller and Lehmann 2001; Sivakumar and Raj 1997).⁶

Data

We base our empirical investigation on two separate data sets for the consumer packaged goods industry, both of which cover the period from 1991 to 1996. The first data set includes weekly price, promotion, sales, and retail margin data for several product categories sold in 85 stores owned by Dominick's Finer Foods, a major grocery retailer in the Chicago market. We study the 17 categories in which Dominick's had a private label offering during the entire period of our study. We calculate revenue premium and all other product-market measures possible for each of the 111 brands in each year. We provide definitions of all the variables in Table 1.

⁶This is related to but distinct from the concept of tier-based asymmetric price competition (Blattberg and Wisniewski 1989). The latter considers the amount a high-tier brand takes from a low-tier brand compared with the amount a low-tier brand takes from a high-tier brand. In contrast, our analysis compares the up self-elasticity of a high-equity brand with its own down self-elasticity.

TABLE 1
Definitions of Variables Used in Empirical Analysis

Variable	Definition	Source
Variables in Local Data Set		
Price	Net selling price per unit volume	DD
Brand volume	Number of equivalent units of the brand sold	DD
Price premium charged	Brand's price – private label's price	DD
Percentage market share	(Brand's unit volume sold)/(category's unit volume sold)	DD
Market share premium	Brand's market share – private label's market share	DD
Volume premium	Brand's unit volume – private label's unit volume	DD
Revenue	Unit volume × price	DD
Revenue premium	(Brand's unit volume × brand's net price per unit volume) – (private label's unit volume × private label's net price per unit volume)	DD
Revenue premium over smallest-share brand	(Brand's unit volume × brand's net price per unit volume) – (smallest-share brand's unit volume × smallest-share brand's net price per unit volume)	DD
Revenue premium over lowest-price brand	(Brand's unit volume × brand's net price per unit volume) – (lowest-price brand's unit volume × lowest-price brand's net price per unit volume)	DD
Dubin's equity	(Brand's unit volume)(Brand's net price) $\left\{ 1 - \left[\frac{S_b(1 - S_b)(\epsilon_b - 1)}{(1 - \text{Share}_b)(\epsilon_{pl} - S_b)} \right] \right\}$	DD (for details, see the Appendix)
Additional Variables in National Data Set		
Category volume per 1000 households	Number of equivalent units of the category sold	<i>Fact Book</i>
Brand volume per 1000 households	Brand market share × category unit volume	<i>Fact Book</i>
SOR	Among households that bought the brand, the percentage of their total category purchases represented by the brand	<i>Fact Book</i>
SOR premium	(Brand's SOR) – (private label's SOR)	
Advertising	Total advertising expenditure (millions of dollars) across 10 media computed by monitoring advertisements in each medium/program and applying a relevant rate to each advertisement	LNA/Media Watch Ad \$ Summary
Promotion	Percentage of brand sales made on a promotion	<i>Fact Book</i>
Small-brand dummy	Equal to 1 if brand accounts for less than 5% of the sales of the top three brands in the category, equal to 0 otherwise	<i>Fact Book</i>
Medium-brand dummy	Equal to 1 if brand accounts for 5%–40% of the sales of the top three brands in the category, equal to 0 otherwise	<i>Fact Book</i>
Purchase cycle	Average number of days between consecutive purchases of the category	<i>Fact Book</i>
Hedonic category dummy	Equal to 1 if mean summed score from consumer mail-survey response (three-point scale) to two items (The product is fun to have; The product gives me pleasure) is greater than 2, equal to 0 otherwise	Sethuraman and Cole (1997); expert judgment
Stockpileability	Mean factor score from consumer survey response (five-point scale) to two items (It is easy to stock extra quantities of this product in my home; I like to stock up on this product when I can)	Narasimhan, Neslin, and Sen (1996)
Private label quality	Mean mail-survey response (five-point scale) by retail experts to: How does the quality of the best private label supplier compare to leading national brands in this category?	Hoch and Banerji (1993)

Notes: DD = Dominick's database, University of Chicago. Following Ailawadi, Lehmann, and Neslin (2001), we combined all items sold by a manufacturer in a given category in the brand. Therefore, we computed Procter & Gamble's revenue premium in the diaper market, Colgate's revenue premium in the toothpaste market, and so on.

The second data set includes the entire U.S. grocery channel and contains share, price, promotion, and advertising data for 102 brands in 23 product categories from 1991 to 1996. We compile annual data on share, sales, price, promotion, and category characteristics from Information Resources's *Marketing Fact Book*, which tracks purchases of a panel of thousands of randomly selected households in markets across the United States. The *Fact Book* provides nationwide grocery sales of each category on a per-

thousand-households basis and unit market shares of each brand, from which we compute unit sales of each brand per thousand households. We supplement *Fact Book* data with advertising expenditures from LNA/Media Watch, Narasimhan, Neslin, and Sen's (1996) measure of category stockpileability, Hoch and Banerji's (1993) data on private label quality, and a classification into hedonic versus utilitarian categories per Sethuraman and Cole's (1997) survey and the judgments of several experts. In each category, we

include two to four major brands, apart from private labels, and at least one small-share brand that existed during the entire study period, were sold nationally, and were not niche players. Definitions of the variables in this data set are also listed in Table 1.

The benefit of the local data set is that it covers a single market and uses the private label from a single retailer. Thus, it is free from issues of heterogeneity in private label quality across retailers and of differences in equity across markets, though the levels of brand equity may not be representative of the national market. In contrast, the national data set enables us to examine how much revenue premium packaged goods brands possess and how it has changed over time in the entire country. In obtaining this nationwide view, differences across retailers and markets are averaged out. Thus, the two data sets complement each other and together contribute much more to our empirical analysis than either one would by itself.

Empirical Analysis: Local Data Set

Change over Time

The correlation of revenue premium with its lagged value in the local sample is .96. This high correlation speaks to its stability from one year to the next. However, as we noted previously, the 1990s were a period of eroding brand equity. Table 2 provides a summary of trends in private label share and revenue premium for each category.

In general, the trends in Table 2 support conventional wisdom. From 1991 to 1996, the median percentage change in Dominick's private label share is 13.5%, and the median percentage change in revenue premium is -11%. For individual categories, we find that the private label share increased in all but 5 of the 17 categories and the median revenue premium decreased in 11 categories. Although the percentage change in revenue premium seems large in some cases, recall that the change is over six years. For example, the 77% increase in canned broth translates to a 12% annual increase.⁷

Correlation with Other Measures

Table 3 summarizes the correlation of revenue premium with other measures; there are several notable results. First, our measure correlates strongly with revenue, but the correlation is not perfect, showing that revenue premium captures something different from revenue. Second, our measure is much more simple to compute than Dubin's (1998) measure (see the Appendix), yet it correlates well with it (.82). Third, the correlation is also strong with revenue premiums for the smallest-share (.90) and lowest-price (.83) brands, which are useful in categories with no private label. Fourth, our measure correlates strongly with volume premium obtained (.79) but not with price premium charged. As we discuss

⁷The percentage change is also amplified when the base is small. For example, all but one of the natural cheese brands had negative revenue premium in 1991. By 1996, this brand's premium also had become negative. The change appears great (-2108%) because it is calculated from the small base in 1991 (\$68,300).

subsequently, this reinforces the need for a measure that combines both volume and price premiums.⁸

Volume Premium Versus Price Premium

We determine the breakdown of our sample in terms of the four cases depicted in Figure 2. Of the brands, in 1991 33% were Case A; 55%, Case B; 5%, Case C; and 7%, Case D. Thus, only one-third of the sample enjoy both a price and a volume premium over the private label, and more than one-half charge a price premium but are not strong enough to sell more than the private label does. The existence of this sizable latter group explains the lack of correlation between revenue premium and price premium charged.

Table 4 displays the price and volume premium components for the brands with the highest and lowest revenue premium in each category. It supports the distribution of the four cases, showing that the vast majority of brands charge a positive price premium but that many are unable to get a positive volume premium. For example, consider the lowest-revenue-premium brands in categories such as juice, broth, soup, and cheese, which belong to Case B. Consideration of only price premium charged paints a relatively rosy picture of the brands, but their revenue premium, as shown in Table 2, is mostly negative. They are subject to significant upside price elasticity and therefore do not have much equity. Consideration of changes over time also reveals that the three measures can differ significantly. For example, consider the American processed cheese and liquid fabric softener brands with the highest revenue premium. From 1991 to 1996, the former lost 35% of its price premium but gained 37% in volume premium; the latter's price premium rose by 71%, but its volume premium declined by 64%. Whether these brands gained equity overall during this period cannot be ascertained from these numbers. Table 2 shows that the overall impact was a 21% increase in the revenue premium of the cheese brand, reflecting an increase in equity, and a 23% decrease in the revenue premium of the fabric softener brand, reflecting a decrease in equity.

These patterns demonstrate that revenue premium provides a more complete single measure of equity than either volume premium obtained or price premium charged. Volume premium may be bought by means of lower price premiums, and revenue premium is needed to determine whether this is the case. Price premium may result in significant losses in volume premium; again, revenue premium is needed to determine this. That less than one-half the cases are unambiguous (revenue, price, and volume premiums are all positive or all negative) underscores the need to examine revenue premium as the overall descriptor of the brand's equity.

⁸Note that the price premium charged in the market is not the same as the price premium measure used in the literature. The latter is the premium that consumers report they are willing to pay for a brand over a private label; this is obtained from consumer survey data, which were not available to us. Sethuraman (2000) is the one researcher who provides data on a survey-based price premium measure. Although only six of Sethuraman's categories overlap with ours and he measures national brand equity at the category level rather than the brand level, the correlation with median revenue premium as a percentage of category revenue is .61.

TABLE 2
Local Data Set: Summary of Revenue Premium Measure

Product Category	Private Label Share		Median Revenue Premium 1991 (\$)	Median Percentage Change ^a	Highest-Revenue-Premium Brand		Lowest-Revenue-Premium Brand	
	1991 (%)	Percentage Change ^a			1991 (\$)	Percentage Change ^a	1991 (\$)	Percentage Change ^a
Food Products								
Bottled juice	18.3	14	-1,344,392	-57	1,824,308	-48	-1,698,933	-22
Canned broth	.5	852	515,501	77	688,630	26	342,372	128
Canned soup	3.4	50	1,263,653	-41	7,631,917	-10	-154,807	-41
Canned tuna	8.5	3	-239,926	68	1,820,494	-93	-434,458	72
Cheese, American	27.4	-46	-1,799,205	43	4,647,035	21	-2,211,581	43
Cheese, natural	43.3	15	-1,379,057	-62	68,330	-2108	-2,152,881	-62
Frozen juice	33.8	-1	-2,767,301	39	-787,483	83	-3,535,425	39
Ready-to-eat cereal	6.2	-18	1,329,812	8	13,074,037	8	-1,261,071	-24
Refrigerated juice	23.7	-11	-3,229,130	-3	3,481,530	88	-3,762,568	-4
Personal Care Products								
Toothbrushes	8.5	76	-4,275	-38	287,376	-38	-47,272	97
Toothpaste	1.7	32	409,002	12	1,556,056	-16	99,554	172
Paper Products								
Toilet tissue	4.5	49	-26,390	-9	4,908,696	-66	-405,530	11
Cleaning Products								
Dishwasher detergent	9.6	-19	185,233	32	1,161,689	-17	-142,423	-7
Dishwashing liquid	6.8	36	683,427	-55	2,121,942	-55	377,736	-54
Laundry detergent	1.3	61	638,577	-15	14,301,874	-15	186,084	63
Liquid fabric softener	5.7	191	10,103	-274	1,999,097	-23	-58,904	-348
Sheet fabric softener	14.8	76	-187,161	-60	1,022,546	-42	-251,012	-51
Overall sample	8.5	13.5	-51,786	-11	13,074,037	8	-3,762,568	-4

^aChange from 1991 to 1996 as a percentage of the 1991 absolute value.

Notes: Median values of private label share and percentage change in private label share are reported for the overall sample.

TABLE 3
Local Data Set: Correlation of Revenue Premium
with Other Measures
(Between 559 and 660 Observations)

Product-Market Measure	Correlation with Revenue Premium
Volume	.62
Volume premium	.79
Market share	.65
Market share premium	.73
Price premium charged	-.00
Revenue	.89
Private label revenue	-.36
Dubin's (1998) equity	.83
Revenue premium over smallest-share brand	.90
Revenue premium over lowest-price brand	.82
Revenue premium lagged one year	.96

Revenue Premium in Partitioned Markets

A significant issue in calculating revenue premium is the definition of the market. A market definition that is too broad may make a niche or regional player appear to be much weaker than it really is. In contrast, a market definition that is too narrow can make even a weak brand appear to be strong. For example, we define bottled, refrigerated, and frozen juice drinks as three separate categories in our data. If we aggregated these products into one category, juice, then Gatorade, which sells only bottled juice drinks and not the other products, would appear to be much weaker than it really is. As shown in Table 5, Gatorade's revenue premium was -\$161,537 in the bottled juice drinks category, but it would appear to be considerably worse at -\$7,601,469 if we inappropriately evaluated the brand in an aggregated juice category. If we define the market more narrowly as sports drinks, Gatorade's revenue premium is high. In contrast with Gatorade, Tropicana sells products in all three categories, though it is strongest in refrigerated juice and weakest in bottled juice drinks. In an aggregate juice category, Tropicana's strong showing in refrigerated juice would not be revealed; rather, it would be offset by the weaker showing in bottled and frozen juices.

We cannot prescribe the "right" way to define the market, but we recommend that a rigorous method be used when the market structure is not obvious (e.g., Kalwani and Morrison 1977; Urban, Johnson, and Hauser 1984). Moran (1994) recommends that the served market be defined quite narrowly on the basis of the segment in which the brand enjoys the greatest loyalty. However, this may be a slippery slope, because any brand can appear strong if its served market is defined narrowly enough. Ultimately, the breadth of the market definition should depend on the pattern of inter-brand competition and switching as well as the firm's aspirations for the brand.

In summary, the key findings from the local data set are that (1) revenue premium is highly correlated from year to year, suggesting stability; (2) its trend over the six-year

period is consistent with conventional wisdom about the eroding equity of brands; and (3) it correlates in expected ways with other measures of brand equity.

Empirical Analysis: National Data Set

Change in Measure over Time

The correlation of revenue premium with its lagged value is .98, showing that the measure is highly reliable even at the aggregated national level. Table 6 summarizes the median revenue premium in each category and median percentage changes over time.

The trends in our measure are again consistent with conventional wisdom about brand equity; there is an improved position of private labels and a decrease in revenue premium. The median percentage loss in revenue premium across all brands in our sample is 29% over the six-year period (translating to an approximate 6.6% decrease per year), and the median percentage gain in private label share is 69%. The change in private label share is positive for all but three categories, and median change in revenue premium is negative for all but four categories.

Two of the worst hit categories are cold/allergy/sinus tablets and liquids. In these categories, the median decreases in revenue premium are 235% and 275%, respectively, over the six-year period. To understand why such drastic changes occurred in these categories, consider that private labels increased their share by approximately 80% during the period. At the same time, direct-to-consumer advertising of prescription drugs increased significantly, and consumers became more aware of these alternatives. Furthermore, given the copay system of most health maintenance organizations, prescription drugs became more like over-the-counter products in terms of consumers' out-of-pocket costs. The result was that marginal over-the-counter brands, such as Alka-Seltzer, Chlor-Trimeton, and Drixoral, lost out to both private label and prescription drugs. Because these brands had little revenue premium to begin with, the percentage decrease was even greater.

Diapers are another category in which brands experienced substantial losses in revenue premium. In this category, private labels more than doubled their share from 1991 to 1996. At the same time, the category leaders Kimberly-Clark (Huggies brand) and Procter & Gamble (Luvs and Pampers brands) were locked in a price war and a struggle for share. As a result, they lost almost 70% and 90%, respectively, of their revenue premium during the six-year period. That the equity of these brands suffered is borne out by Total Research Corporation's EquiTrend study (Miller 1993, p. 8).

Correlation with Other Measures

Table 7 summarizes the correlations of revenue premium with other measures. With annual national data, there are not enough observations to estimate a demand function separately for each brand. As a result, we were unable to compute Dubin's (1998) measure of equity. All the other measures we computed for the local data set are included in Table 7. We also included a measure of behavioral brand loyalty, the brand's share of requirements (SOR), and the SOR premium over private labels.

TABLE 4
Local Data Set: Price and Volume Premiums

Product Category	Highest-Revenue-Premium Brand			Lowest-Revenue-Premium Brand		
	1991 Volume Premium (Units)	Percentage Change ^a	1991 Price Premium (\$/Unit)	1991 Volume Premium (Units)	Percentage Change ^a	1991 Price Premium (\$/Unit)
Food Products						
Bottled juice	15,664,952	-182	.019	-53,153,400	-21	.012
Canned broth	13,873,356	-1	.007	7,012,374	83	.006
Canned soup	129,112,598	-29	.012	-4,468,052	7	.06
Canned tuna	10,988,986	-95	.034	-3,826,213	77	1.725
Cheese, American	19,200,240	37	.051	-14,396,264	49	.085
Cheese, natural	-3,126,070	-205	.074	-10,873,124	-48	.041
Frozen juice	-15,249,504	60	.026	-38,392,210	39	.020
Ready-to-eat cereal	69,346,274	-4	.061	-10,812,402	6	-.002
Refrigerated juice	30,048,960	304	.015	-148,956,488	2	.085
Personal Care Products						
Toothbrushes	136,478	-76	.536	-32,998	-5	1.350
Toothpaste	4,383,046	-26	.090	108,649	244	.241
Paper Products						
Toilet tissue	13,767,254	-68	-.003	-889,896	-5	-.079
Cleaning Products						
Dishwasher detergent	19,782,890	-8	.017	-4,803,364	11	.164
Dishwashing liquid	28,863,102	-53	.020	4,734,086	-31	.015
Laundry detergent	190,379,659	-12	.033	4,079,715	54	.002
Liquid fabric softener	33,607,198	-64	.032	-4,335,198	-67	.419
Sheet fabric softener	14,931,282	-48	.015	-5,211,640	-68	-.011

^aThe change from 1991 to 1996 as a percentage of the 1991 absolute value.

TABLE 5
Revenue Premium in Partitioned Markets

Market	Revenue			Revenue Premium	
	Private Label	Gatorade	Tropicana	Gatorade	Tropicana
Bottled juice drinks	\$1,707,803	\$1,546,266	\$ 67,638	-\$ 161,537	-\$1,640,165
Frozen juice	3,671,137	0	2,883,654	-3,671,137	-787,483
Refrigerated juice	3,768,795	0	4,491,976	-3,768,795	723,182
All juice	9,147,735	1,546,266	7,443,268	-7,601,469	-1,704,466

The pattern of correlations in Table 7 is similar to that obtained for the local data set. We particularly note three results. First, the high correlations of revenue premium using private label as the benchmark with revenue premium using the smallest-share national brand (.92) or lowest-price national brand (.91) as benchmarks are reassuring. In addition to confirming the robustness of the measure, the correlations also alleviate concerns about the aggregation of multiple private labels in the national data set. Second, the correlations with SOR and SOR premium are .20 and .54, respectively. Neither SOR nor SOR premium reflects the number of consumers who buy the brand or the price they pay, so the measures are less complete than revenue premium. However, the correlation with SOR premium is stronger because it is more similar to the conceptual definition of brand equity in that it compares with a benchmark. Third, the correlation with price premium is almost zero, as it is in the local data set. Again, this reinforces the importance of including both volume and price premiums in equity measurement. Referring back to the four cases depicted in Figure 2, we find that in 1991, 54% of the brands were in Case A; 30% in Case B; 11% in Case C; and 5% in Case D. Therefore, even nationwide, a substantial number of national brands charge a price premium but are not strong enough to achieve a volume premium, which explains the lack of correlation between price premium and revenue premium.

Association with Marketing-Mix and Category Variables

Having established the stability, face validity, and convergent validity of revenue premium, we examine whether it is associated in expected ways with other variables by estimating the following regression:

$$(8) \quad \text{Revenue Premium}_{ijt} = \alpha + \beta_1 \text{Revenue Premium}_{ijt-1} + \beta_2 \text{SOV}_{ijt} + \beta_3 \text{SOP}_{ijt} + \beta_4 \text{PurCycle}_j + \beta_5 \text{Stockpile}_j + \beta_6 \text{Hedonic}_j + \beta_7 \text{PLQuality}_j + \beta_8 \text{Catrev}_{jt} + \epsilon_{ijt}.$$

In Equation 8, the revenue premium of brand *i* in category *j* in year *t* is a function of its revenue premium in the previous year, its share of total advertising (SOV) in category *j* in year *t*, its share of total promotion (SOP) in category *j* in year *t*, the average purchase cycle (PurCycle) and stockpileability (Stockpile) of category *j*, the hedonic nature of category *j*

(Hedonic), and the average quality of private labels compared with national brands (PLQual) in category *j*.⁹ Because we estimated the regression by pooling data across categories, we controlled for differences in market size across categories by including the revenue of category *j* in year *t* (Catrev) in the model.

In general, the results summarized in Table 8 confirm our expectations. First, the coefficient of lagged revenue premium is .93, again confirming the stability of revenue premium from year to year. Second, a brand's share of category advertising has a significantly positive association with revenue premium. Third, category characteristics such as purchase cycle, hedonic nature of the category, and relative quality of private label are significantly associated with our measure, and their coefficients are of the expected sign. The only two variables that are not significant are the brand's share of category promotion and the stockpileability of the category. As we discussed previously, the lack of a significantly negative coefficient for share of category promotion is actually consistent with recent work that shows that promotion increases penetration and has little negative impact on SOR (Ailawadi, Lehmann, and Neslin 2001). As a result, the positive impact on unit sales offsets the decrease in price that comes with increased promotion. Thus, revenue premium's association with most of the brand and category characteristics examined is consistent with theory and prior research.

Impact on Price Elasticity

Finally, using a modified version of Ailawadi, Lehmann, and Neslin's (2001) market share response model, we tested whether high-revenue-premium brands exhibit asymmetric up and down price elasticities. Specifically, we estimated a first-differenced log-linear model on data pooled across brands and categories:

$$(9) \quad \text{Share}_{ict} = e^{\alpha} (\text{Price}_{ict}^{\beta_{1ic}}) (\text{Advt}_{ict}^{\beta_{2ic}}) (\text{Deal}_{ict}^{\beta_{3ic}}) (\text{Coup}_{ict}^{\beta_{4ic}}) (\overline{\text{Price}}_{ict}^{\beta_{5ic}}) (\overline{\text{Advt}}_{ict}^{\beta_{6ic}}) (\overline{\text{Deal}}_{ict}^{\beta_{7ic}}) (\overline{\text{Coup}}_{ict}^{\beta_{8ic}}) e^{\epsilon_{ict}},$$

where all the variables are transformed into first differences of logarithms, that is, logarithm of the value in year *t* less the

⁹We use share of advertising rather than dollar advertising because the latter may have a positive coefficient simply as a scaling artifact. Companies often use a target advertising-to-sales ratio as a budgeting rule, and therefore categories and brands that have high sales will also have greater dollar spending. For promotion, results are unchanged whether we use promotion or share of promotion.

TABLE 6
National Data Set: Summary of Revenue Premium Measure

Product Category	Private Label Share		Median Revenue Premium 1991 (\$/1000 HH)	Highest-Revenue-Premium Brand		Lowest-Revenue-Premium Brand	
	1991 (%)	Percentage Change ^a		1991 (\$/1000 HH)	Percentage Change ^a	1991 (\$/1000 HH)	Percentage Change ^a
Food Products							
Brownie mix	5.5	4	390	711	-7	71	-5
Frosting	3.6	76	483	788	6	152	32
Potato chips	5.8	-30	-422	3085	138	-1567	22
Shortening	14.5	31	637	1456	-30	-181	12
Health Care Products							
Cold/allergy/sinus liquids	23.3	79	-31	204	-135	-122	-80
Cold/allergy/sinus tablets	19.4	83	-134	34	-234	-313	-128
Cough syrup	15.4	89	233	367	-33	98	-156
Personal Care Products							
Bar soap	.2	508	1259	2829	-29	326	-18
Hair conditioner	1.9	-39	59	403	-8	11	160
Liquid soap	1.8	234	181	420	-17	80	11
Mouthwash	16.2	89	140	593	-10	-152	-142
Shampoo	2.7	35	56	1089	9	10	-493
Toothbrushes	10	31	203	239	-54	-42	55
Toothpaste	1.6	70	491	1845	-27	-29	-85
Paper Products							
Diapers	11.1	157	1500	5763	-88	-1030	-127
Paper towels	12.2	70	810	2372	-10	-1093	-69
Facial tissue	16.2	34	-382	2972	5	-975	-26
Toilet tissue	6.5	80	1877	4467	-35	-1205	-61
Cleaning Products							
Dishwashing liquid	4.1	52	1098	3063	-44	924	-57
Dishwasher detergent	6.2	37	627	1938	-29	573	-18
Dry bleach	2.7	-55	244	559	-38	-4	2845
Liquid laundry detergent	1.7	39	218	4516	-10	24	-44
Powdered laundry detergent	1.5	69	726	10,431	-41	-209	-55
Overall sample	5.5	69	225	10,431	-41	-1567	22

^aThe change from 1991 to 1996 as a percentage of the 1991 absolute value.

Notes: HH = households; median values of private label share and percentage change in private label share are reported for the overall sample.

TABLE 7
National Data Set: Correlation of Revenue Premium with Other Measures (Between 459 and 592 Observations)

Product-Market Measure	Correlation with Revenue Premium
Volume	.57
Volume premium	.75
Market share	.48
Market share premium	.53
Price premium	-.07
Revenue	.91
Private label revenue	-.02
Revenue premium over smallest-share brand	.92
Revenue premium over lowest-price brand	.91
SOR	.20
SOR premium	.54
Revenue premium lagged one year	.98

logarithm of the value in year $t - 1$. The independent variables are the brand's own price, advertising, dealing, and coupons and the share-weighted average price, advertising, dealing, and coupons of the competing brands. Following Ailawadi, Lehmann, and Neslin (2001), we accounted for brand and category differences in elasticities by including interactions of all the marketing-mix variables with two dummy variables for brand size ($Small_{ic}$ and Mid_{ic}) and four category characteristics (average category dealing, advertising, purchase cycle, and stockpileability). Thus, for $k = 2 \dots 8$:

$$(10) \quad \beta_{kic} = \beta_{k0} + \beta_{k1}Small_{ic} + \beta_{k2}Mid_{ic} + \beta_{k3}CatDeal_c + \beta_{k4}CatAdvtg_c + \beta_{k5}PurCycle_c + \beta_{k6}Stockpile_c,$$

where B_{kic} is the coefficient of the k th marketing-mix variable in Equation 9. For the self-price coefficient ($k = 1$), we also included an interaction with a dummy variable ($\beta_{17}PriceIncDum$) that is equal to one if there was a price increase from the previous year and equal to zero if there was not. We estimated this model separately for high- and low-revenue-premium brands.¹⁰

Rather than report the large number of coefficients in the regression model, we focus on the coefficient of the up price interaction (β_{17}). The first row of Table 9 reports the estimated coefficients of the interaction for low- and high-revenue-premium brands. Our expectation about the up versus down asymmetric effect is confirmed. The interaction term with the brand's own price is not statistically significant for low-revenue-premium brands, but it is positive and significant for high-revenue-premium brands. To illustrate what these interaction coefficients mean for the up and down self-price elasticities of high- and low-revenue-premium brands, we calculate the base (i.e., the down elasticity) for

¹⁰We define these using a median split of revenue premium as a percentage of the category's revenue in 1993. We use the percentage figure to control for the size of different categories so that we do not classify a brand as low simply because the category is small, and vice versa.

TABLE 8
Regression of Revenue Premium on Marketing-Mix and Category Variables (499 Observations)

Independent Variable	Regression Coefficient	
	Unstandardized	Standardized
Lagged revenue premium	.93* (90.37)	.96*
Share of category advertising	740.19* (2.20)	.02*
Share of category deals	407.28 (.44)	.01
Average purchase cycle	7.75* (4.65)	.11*
Stockpileability	62.34 (.76)	.01
Hedonic category dummy	166.59* (3.95)	.04*
Private label quality	-137.57** (-1.79)	-.03**
Category revenue	.02* (5.13)	.11*
Adjusted R ²	.97	
F-statistic (d.f. 1, d.f. 2)	1762 (8490)	

* $p < .05$.

** $p < .10$.

Notes: The t-statistics are in parentheses; d.f. = degrees of freedom.

TABLE 9
Up and Down Price Elasticities

Parameter/Elasticity	Revenue Premium	
	Low	High
Self-price increase dummy \times self-price coefficient (β_{17})	.274 (.69)	.564* (2.41)
Average down self-price elasticity	-1.195	-.747
Average up self-price elasticity	-.921	-.183

* $p < .05$.

Notes: The t-statistics are in parentheses.

each brand by plugging in its values for each of the independent variables in the model (we report the average down elasticity across all brands in the second row of Table 9). We then added the estimated coefficient of the up interaction term to determine the average up elasticity across all brands. Table 9 shows that low-revenue-premium brands have an average down price elasticity of -1.195 and an average up price elasticity that is not much different at $-.921$. In contrast, high-revenue-premium brands have an average down price elasticity of $-.747$ but an up price elasticity that is

much less negative at $-.183$. As we expected, high-revenue-premium brands gain share when they cut prices but lose relatively little when they increase price.

Conclusion

We have proposed revenue premium as a measure of brand equity, discussed its theoretical underpinnings, and validated the measure. Revenue premium is conceptually grounded in the fundamental definition of brand equity and theoretically grounded as the equilibrium outcome of a competitive marketplace. It is stable over time, yet reflects conventionally accepted industry trends, correlates reasonably with other product-market measures, and is more complete. Revenue premium's association with marketing actions and category characteristics is consistent with theory, as is its association with up and down price elasticities.

Implications for Managers

It is highly unlikely, if not impossible, for a single measure of brand equity to satisfy all the characteristics of the ideal measure. Still, the revenue premium measure has several strengths that make it attractive to managers. It is a single, objective number that is credible to senior management and the financial community, and it provides a useful guide to the value of a brand during mergers and acquisitions. Revenue premium is easy to calculate with readily available data and thus can be monitored on an ongoing basis for several brands in several product categories. At the same time, it is more complete than some other product-market outcome measures and thus provides a more accurate summary of brand health. Managers can also use the revenue premium measure to monitor the impact of marketing decisions on the long-term value of their brands.

The most challenging aspect of calculating revenue premium is the identification of the benchmark brand, that is, the product that mimics what the subject brand would achieve if it had no equity. We used private label as the surrogate, but some private labels arguably have brand equity, and in some categories private labels do not exist. That private label-based revenue premium correlates highly with lowest-price or lowest-share brand-based revenue premiums suggests that as long as the choice of the benchmark is sensible, the measure is robust. We recommend that managers identify a reasonable benchmark brand and use it consistently.

The most significant limitations of revenue premium for managers are that it does not provide insight into the consumer-based sources of brand equity or quantify a brand's future extendibility and potential. Customer mind-set measures are crucial for diagnosing the underlying reasons for changes in equity that may be signaled by revenue premium, and financial market measures are crucial for examining long-term potential, even if the assessment is subjective. All these measures are needed to provide a rich picture of current and future brand health. We recommend that managers regularly use revenue premium for tracking brand health over time compared with that of their competitors and periodically examine customer mind-set measures to guide marketing decisions and fully diagnose problems

flagged by revenue premium and its price and volume premium components. We also caution managers not to become complacent simply because their brands enjoy a large revenue premium. It is imperative to have a sense of both the consumer-based sources of the revenue premium and the future challenges and opportunities the brand faces.

Implications for Researchers

We believe the contribution of this article lies not only in proposing the revenue premium measure of brand equity but also in providing a framework within which the reliability and validity of various brand equity measures can be evaluated and in starting that validation process with the revenue premium measure. We hope that our work will encourage others to conduct such validation of the measures they develop. Although we validated our revenue premium measure against as many other measures of equity as we could calculate, we were limited by the availability of data. For example, we could not correlate our measure with customer mind-set or financial market measures. Although we recognize that measures used in industry are often based on proprietary data, we hope that researchers will share data with one another whenever possible to promote better measurement of this construct.

Our work also suggests some specific avenues for further research. First, revenue premium reflects the equilibrium realization of all the complex interrelationships among the brand name, its marketing decisions, and its competitors' marketing decisions. A worthwhile research project would be to estimate these structural relationships and understand the process by which firms develop high-equity brands. A second research need is an outcome measure of brand equity that is explicitly linked to the different consumer-based sources of brand equity. Park and Srinivasan (1994) take a step in this direction by decomposing equity into attribute-based and non-attribute-based components; however, more work is needed to combine some of the diagnosticity of customer mind-set measures with the financial valuation ability of market outcome measures. Third, a significant portion of the benefit of a brand name is its future potential. Current methods for valuing future potential depend on subjective multipliers or on the swings of the supposedly "efficient" stock market. It would be valuable to test validity of historical values against present values. For example, researchers could test the predictive validity of brand valuations done in the early 1990s using Interbrand or Simon and Sullivan's (1993) methodology by comparing them with the actual performance of those brands in recent years.

Further research should also quantify the long-term financial value of a brand. A relatively simple, objective approach for obtaining this from the current revenue premium is based on the premise that without further brand-building investment (e.g., advertising) in the brand, the brand's revenue premium will gradually decay to the level of a private label. Thus, researchers could estimate the carry-over or persistence and treat it as an annuity. For example, if the estimated carryover coefficient is $.9$ (i.e., 10% of the value decays each year) and the discount rate is 10%, the long-term value of a brand is $(1 + .1)/(1 + .1 - .9) = 5.5 \times$ the current revenue premium. Alternatively, researchers could assume that further brand-building expenditures will keep revenue premium constant, and they could treat the

current revenue premium less annual brand-building costs as an annuity. This does not account for the extendibility of the brand name to other products, but it is a reasonable starting point.

As technology and new distribution channels continue to intensify the competitive environment, the viability and health of the brand will continue to be prominent, even dominant, in the minds of managers. This argues for the importance and potential impact of more research of the type we suggest.

Appendix Dubin's (1998) Measure of Brand Equity

Dubin's measure is the incremental profits the branded version receives compared with those of an unbranded version. Using oligopoly economic theory and a series of simplifying assumptions, Dubin derives the following formula for brand equity:

$$(A1) \text{ Dubin's equity}_b = \text{volume}_b(\text{price}_b - \text{variable cost}_b)$$

$$\left\{ 1 - \left[\frac{S_b(1 - S_b)(\epsilon_b - 1)}{(1 - \text{share}_b)(\epsilon_{pl} - S_b)} \right] \right\},$$

where S_b is the volume of brand b divided by the sum of the volumes of brand b and the unbranded (i.e., private label) products in the market, and ϵ_b and ϵ_{pl} are the price elasticities of brand b and the private label product, respectively. The entire term in braces represents the proportion of the brand's margin that is due to the brand name.

To calculate Dubin's measure, we obtained the price elasticity of each brand (and the private label) in each category by using weekly data pooled across stores to estimate a demand function for each brand. The demand function specifies the logarithm of unit sales of brand i in store s in week t (Lnvol_{ist}) as a function of the logarithms of prices of

all n brands in the store in week t (Lnprice_{jst}); the percentage of items belonging to each of the n brands that are on promotion in store s in week t (Promo_{jst}); the percentage of items belonging to brand i that were on promotion in store s in week $t - 1$ (Promo_{ist-1}); 85 store dummy variables (Strdum_{ks}), where the k th dummy variable is 1 if $s = k$ and 0 otherwise; 9 dummy variables for special events during the year (e.g., Easter, Labor Day, Thanksgiving, Christmas) (Splevdum_{lt}), where the l th dummy variable is 1 if that event occurs in week t and 0 otherwise; and a trend variable (Trend_t) that takes values 1, 2, 3 ..., N for each week in the data:

$$(A2) \text{ Lnvol}_{ist} = a_i + \sum_{j=1}^n b_{ij} \text{Lnprice}_{jst} + \sum_{j=1}^n c_{ij} \text{Promo}_{jst} \\ + d_i \text{Promo}_{ist-1} + \sum_{k=1}^{85} e_{ik} \text{Strdum}_{ks} + \sum_{l=1}^9 f_{il} \text{Splevdum}_{lt} \\ + g_i \text{Trend}_t + \epsilon_{ist}.$$

The demand function controls for store-specific effects, special events and holidays during the year that may affect sales, any general trend in sales of the brand, and any lagged effects of the brand's promotion in the previous week, and it provides estimates of price and promotion (self and cross) elasticities for every brand in every category. We then used the self-price elasticities obtained for each brand to compute Dubin's measure of equity. Because we did not have information on variable costs, we computed the amount of the brand's revenue (not profit) that is due to the brand name:

$$(A3) \text{ Dubin's equity}_b = (\text{volume}_b)(\text{price}_b)$$

$$\left\{ 1 - \left[\frac{S_b(1 - S_b)(\epsilon_b - 1)}{(1 - \text{share}_b)(\epsilon_{pl} - S_b)} \right] \right\}.$$

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