Brand Equity as a Signaling Phenomenon

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This article develops an information economics perspective on the value (or equity) ascribed to brands by consumers Unlike research based on cognitive psychology, the proposed signaling perspective explicitly considers the imperfect and asymmetrical information structure of the market It motivates the role of credibility (determined endogenously by the dynamic interactions between firms and consumers) as the primary determinant of consumer-based brand equity. Thus, when consumers are uncertain about product attributes, firms may use brands to inform consumers about product positions and to ensure that their product claims are credible Thus, brands may signal product positions credibly Brands as market signals improve consumer perceptions about brand attribute levels and increase confidence in brands' claims The reduced uncertainty lowers information costs and the risk perceived by consumers, thus increasing consumers' expected utility

   This chain of relations that drives consumer-based brand equity is presented as a structural model and tested empirically in the linear structural relations framework using survey data on jeans and juice. The results are consistent with the proposed relations embodied in the signaling perspective on brand equity.

So the battle over brands will go on Do not be fooled into thinking it is really about baked beans, soap powder or notebook computers It is all about information And it will continue for as long as buyers need and want that information ("Don't get left on the shelf," 1994, p. 12)

Over the past few years, brand equity has received considerable attention in marketing research (e.g., Leuthesser, 1988; Shocker, Srivastava, & Ruekert, 1994). In a general sense, brand equity is defined as the added value a brand gives a product (Farquhar, 1989). This added value can be viewed and analyzed from the perspective of either the consumer or the firm (Shocker & Weitz, 1988). The value of a brand to consumers is generally referred to as *consumer-based brand equity* (Keller, 1993).

Brand equity research in marketing, as exemplified by Aaker's (1991) conceptualization and Keller's (1993) framework, focuses on consumers' brand associations. Aaker suggested that brand associations, brand awareness, perceived quality, brand loyalty, and other proprietary brand assets (e.g., patents) underlie brand equity. Keller also emphasized brand awareness and associations as key underpinnings of consumer-based brand equity. This view of brand equity is rooted in cognitive psychology and focuses on consumer cognitive processes. However, it does not explicitly recognize the informational aspects of the marketplace, as determined by the dynamic interaction between firms and consumers.

Brand equity also may be viewed from another perspective that is based on signaling theory from information economics. This research stream has examined a large variety of market signals: education signals in job markets (Spence, 1974); and quality signals such as price (Stiglitz, 1989), advertising (Nelson, 1974), and advertising and price (Kihlstrom & Riordan, 1984; Milgrom & Roberts, 1986). In marketing, signaling theory has been adopted to study firms' signaling to consumers as well as firm-to-firm signaling. Most of the studies involving firms' signaling to consumers have examined marketing mix elements such as advertising (e.g., Kirmani, 1990), warranties (e.g., Boulding & Kirmani, 1993), or retailer choice (e.g., Davis, 1991) as quality signals. Although consumer researchers also have studied the impact of brand name on quality perceptions (e.g., Chu & Chu, 1994; Dawar & Parker, 1994), brand equity has not been analyzed from a signaling perspective.

Unlike the cognitive psychology view, the information economics perspective on brand equity explicitly considers the imperfect and asymmetrical informational structure of the market. It stresses the role of credibility (determined endogenously by the dynamic interactions between firms and consumers) as the main determinant of consumer-based brand equity More specifically, this article suggests that the content, clarity, and credibility of a brand as a signal of the product's position may increase perceived quality and decrease information costs and the risk perceived by consumers. These effects, in turn, increase consumer-expected utility. This increased expected utility, which is "the added value a brand gives a product" (Farquhar, 1989), is the value of a brand signal to a consumer. Thus, in this view, consumer-based brand equity is defined as the value of a brand signal to consumers.

This perspective on brand equity focuses on the impact on consumer utility of a brand's signal credibility, rather than on the mere clarity of the provided information. The impact is driven by the reduction of perceived risk and information acquisition costs, over and above that due to increased perceived quality. This emphasis on the informational aspects of the marketplace and signal credibility is the fundamental difference between the information economics approach that is adopted in this article and current cognitive psychological perspectives on brand equity. Although the two approaches are complementary rather than competing accounts of brand equity, the differences in perspective and focus lead to a number of contrasting implications.

First, this information economics framework suggests that consumer-based brand equity is not necessarily associated only with "high-quality" products. Rather, equity hinges on the credibility of the quality claims, irrespective of high- or medium-quality positioning. For example, equity ascribed to the Suntrips travel agency is not derived from the high perceived quality of its vacation packages. Rather, it is derived from the credible information that the Suntrips brand conveys to consumers about the characteristics of its vacation packages (i.e., budget family vacation to enjoy the sun and the sea).

Furthermore, in the information economics view, the reduction in perceived risk and information costs attributable to brands are antecedents of brand equity, whereas in the cognitive psychology view these reductions are the consequences of brand equity. Thus, in the psychological account, brand equity must exist before perceived risk and information costs are reduced; the information economics account holds that these reductions drive brand equity. Also, the signaling framework proposes that brand loyalty is a consequence of brand equity because increased expected utility (due to decreased information costs and perceived risk) motivates consumers to buy the same subset of brands repeatedly (given a match between tastes and product offerings). In contrast, brand loyalty is seen as a component of brand equity in the cognitive psychology framework (e.g., Aaker, 1991).

This article offers and empirically tests a conceptualization of brand equity that has its underpinnings in information economics in general (e.g., Stigler, 1961) and in signaling theory in particular (e.g., Stiglitz, 1987). The next section presents a discussion of the informational imperfections and asymmetries that surround product quality assessments. This discussion presents the basis for a signaling perspective on brand equity. A set of conceptual hypotheses is presented next, and the relations are represented in a structural model that is estimated using data for two product categories. The results are presented along with their implications for the signaling perspective of brand equity. The article concludes with a discussion of the value of integrating into future brand equity research an information theoretic analysis with approaches based on cognitive psychology.

IMPERFECT AND ASYMMETRIC INFORMATION
ABOUT PRODUCT QUALITY

Because firms know better than consumers the quality of the products they sell (asymmetric information) and consumers cannot readily evaluate the product quality of experience or credence products (imperfect information), a need arises for market mechanisms by which firms can credibly inform consumers about the quality of their products.

One stream of research in information economics has focused on how a brand's investments (Klein & Leffler, 1981) and its reputation for high quality (C. Shapiro, 1983, 1985) can ensure its commitment to high quality. The argument is that if firms "cheat" consumers by promising high quality but delivering low quality, they will lose return on their brand investments, their reputation for high quality, or both.

A second stream of work examines marketing mix elements as signals of quality. Spence (1974) defined signals as manipulable attributes or activities that convey information about the characteristics of economic agents (e.g., firms, consumers, job applicants). Thus, marketing mix elements such as packaging, advertising, and warranties not only provide direct product information but also convey indirect information on product attributes about which consumers are imperfectly informed. Therefore, mix elements may serve effectively as signals.

For example, advertising may serve as a quality signal (Kihlstrom & Riordan, 1984; Milgrom & Roberts, 1986) if consumers perceive high advertising costs as demonstrating a firm's commitment to its brand. The reasoning would be that fly-by-night producers, for example, are much less likely to be able to afford expensive endorsers and spend a lot of money on advertising. Indeed, Kirmani (1990) found that consumers use perceived advertising expenditures of firms as cues to infer quality when product quality information is missing. Similarly, a high price may function as a quality signal by guiding inferences about demand- or supply-related quality information. More specifically, a high price may reflect either a high demand for superior quality or the high production costs associated with high quality (e.g., Spence, 1974; Tirole, 1990).

Warranties also may signal manufacturers' confidence in the quality of their products if consumers expect lower quality producers not to have longer, more comprehensive warranties (Boulding & Kirmani, 1993; Grossman, 1981; Lutz, 1989). Finally, as Wernerfelt (1988) showed analytically, multiproduct firms can take advantage of their reputation for quality by using the brand name of an established product for a new experience good. Thus, in Wernerfelt's model, *umbrella branding*, in which the same brand name is used for a number of products, serves as a signal of the new product's quality.

However, quality signals are credible only if sellers do not find it profitable to "cheat" by conveying false market signals (e.g., by charging higher prices for lower quality). Sellers might refrain from cheating in the interest of repeat sales or due to

the presence of informed consumers (Farell, 1980). For example, only high-quality firms may sustain a high price because signaling high quality but offering low quality is unlikely to pay in the long run. When sellers do not find it profitable to cheat by conveying false market signals, and low- and high-quality sellers must use different strategies for profitability, then buyers can differentiate among sellers by observing their signals.

However, in markets where sellers find it profitable to cheat, and where there are no incentives for low- and high-quality sellers to choose different strategies, buyers are unable to differentiate by signals. For example, the high costs associated with producing high-quality products may outweigh the positive effect of high quality on repeat sales (Tirole, 1990), and both low- and high-quality sellers may choose to advertise heavily. Consequently, consumers cannot differentiate sellers using the advertising signal. Hence, the signal is not credible.

Other signals may not be credible because they are subject to adverse selection or moral hazard problems (Philips, 1988). For example, a full warranty offered by a contact lens firm may disproportionately attract consumers who know that they will likely lose them (adverse selection) or it might make consumers less careful about their lenses (consumer moral hazard). In general, the limitations of individual marketing mix elements as credible signals provide the motivation for examining the role that brands may play in markets with asymmetric and imperfect information.

CONSUMER-BASED BRAND EQUITY: A SIGNALING PERSPECTIVE

The Brand as a Signal

Marketing mix strategies both affect and are affected by the degree and nature of the informational imperfections and asymmetries in a market. For example, holding other things constant, high consumer uncertainty about quality in a product category may encourage firms to offer warranties. However, the existence of credible warranties, in turn, influences the degree of imperfect and asymmetric information and feeds back into these informational aspects of the marketplace (see Figure 1).

These informational aspects of the marketplace may encourage firms to use brands as signals. Traditionally, a *brand* is defined as "a name, term, sign, symbol, or design, or combination of them which is intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of competitors" (Kotler, 1997, p. 443). A *brand signal* is composed of a firm's past and present marketing mix strategies and activities associated with that brand. In other words, a brand becomes a signal because it embodies (or symbolizes) a firm's
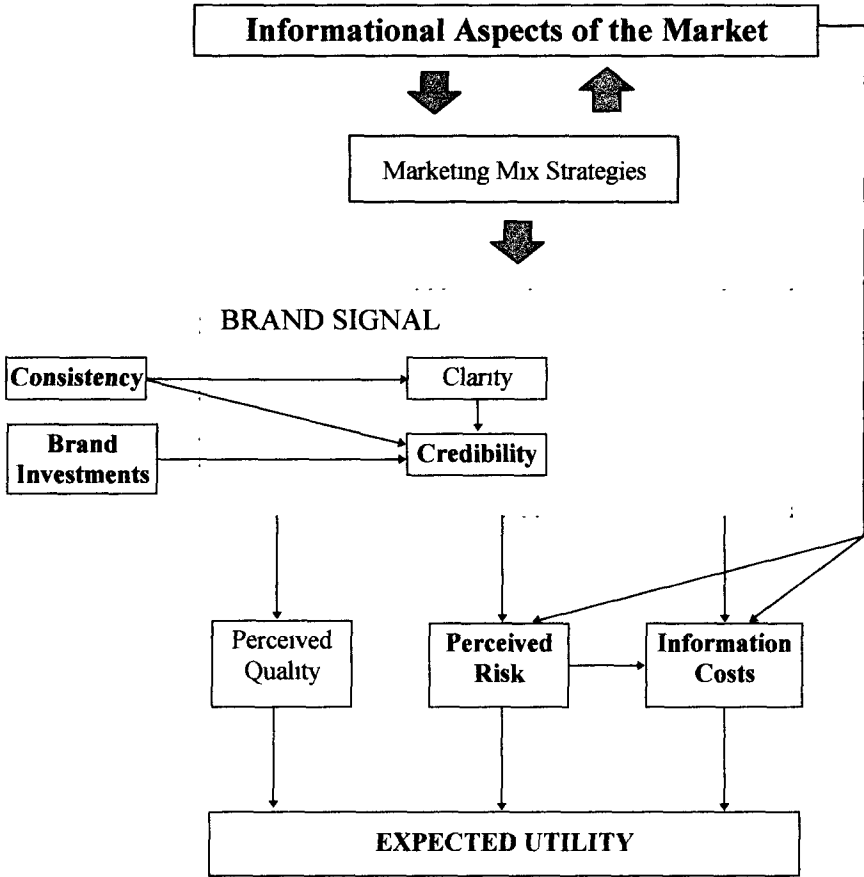
FIGURE 1   Proposed conceptual framework for brand equity

past and present marketing strategies. Thus, with asymmetric and imperfect information, brands may serve as credible market signals.

A firm can control and "manipulate" its marketing mix strategies and activities associated with its brand. Moreover, these strategies and activities convey information to consumers. For example, brands convey information about product attributes and signal a product's position in attribute space. This information may relate not only to physical (ingredients) and functional ("Lysol cleans and disinfects") attributes, but also to purely perceptual, symbolic attributes (popularity, femininity). Thus, the content of a brand signal (i.e., information conveyed by the marketing mix strategies and activities associated with that brand) depends on the

specific properties of the brand's mix elements (e.g., high-quality information contained in a high price), as well as brand-specific marketing messages sent over time to consumers (e.g., "Nothing cleans better than Tide").

A signal is also characterized by its clarity and credibility. The *clarity* of a brand signal refers to the absence of ambiguity in the information conveyed by the brand's past and present marketing mix strategies and associated activities. One factor that influences the clarity of a brand signal is its *consistency*—that is, the degree to which each mix component or decision reflects the intended whole. Consistency may pertain to two or more elements of the marketing mix (e.g., expensive retailers and exquisite packaging for higher end brands) or to the components of each marketing element (e.g., copy and theme in the advertising submix), as well as to the conformity of mix elements to the objectives to be achieved (B. Shapiro, 1985). Consistency also has a temporal dimension in that marketing messages can be consistent over time. Thus, Procter & Gamble's "Choosy mothers choose Jif" slogan and theme have not changed over several years and provide consistent information about the brand's position. Similarly, the British retailer Harvey Nichols has maintained its style over time (Ind, 1993). Consistency also refers to the stability (low variation) of brand attributes over time (e.g., "Mercedes–Benz always produces high-quality cars").

The credibility of a brand signal is perhaps its most important characteristic. Signaling theory suggests that signal credibility determines whether a market signal conveys information effectively (Tirole, 1990). When a market is characterized by imperfect and asymmetric information, it is important for a firm to convey credible information to consumers. In other words, the information about a brand's position that is communicated to the consumer by a firm should be perceived as truthful and dependable. The firm must be able and willing to deliver what is promised. Thus, credibility underlies consumer confidence in a firm's product claims. For example, consumers may be more inclined to believe that IBM will provide the promised level of customer support, whereas an equivalent claim by Leading Edge may be less credible.

Firms spend resources on their brands to assure that promises are delivered. In addition, firms also make brand investments to demonstrate commitment to their brands (Klein & Leffler, 1981). Investments in a brand logo, sponsorships, or a powerful advertising slogan (e.g., the "Friendly Skies" of United Airlines) are essentially sunk costs that cannot be recouped. Thus, when it fails to fulfill product claims, a brand compromises the expected returns on these brand investments as well as its reputation for delivering on its promises. Brands that damage their credibility then cannot command the premium associated with their reputation and brand investments.

To sum up, brand investments underlie the credibility of a brand signal by motivating firms to be truthful in their product claims and to deliver the promised product (see Figure 1). Credibility of a brand signal also depends on the consistency

of its marketing mix strategies, because consistency influences consumers' perceptions of firms' willingness and ability to offer the promised products.[1] Finally, the clarity of a brand signal should also affect signal credibility because consumers may believe that firms that are willing and able to offer the promised products would send clear signals.

The importance of credibility stems from the fact that imperfect and asymmetric information creates consumer uncertainty about product attributes. Consumer uncertainty may exist even after active information gathering (for experience attributes) or after consumption (for long-term experience or credence attributes). This leads to consumer *perceived risk* because "any action of a consumer will produce consequences which he cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant" (Robertson, Zielinski, & Ward, 1984, p. 184).

Many types of perceived risk have been identified in consumer behavior research. These include functional, financial, physical, psychological, and social risk. A consumer may perceive a risk of getting a product that is of lower quality than what is promised by the firm. For example, some batteries do not last as long as claimed (i.e., the performance dimension of quality), and some contact lenses tear more easily than one would expect from the durability that is claimed. Perceived risk also may arise because of a possible mismatch between product characteristics and consumer needs and tastes. An outdoors-oriented individual may find an entertainment-oriented vacation package undesirable even though its features are attractive for someone who is entertainment oriented.

Consumers incur costs when gathering and processing information to reduce uncertainty and perceived risk (Shugan, 1980). *Information-gathering costs* include expenditure of time, money, psychological costs, and the like. Similarly, *information-processing costs* (e.g., thinking costs) include time and psychological costs. The level of perceived risk and information costs accrued depends on the informa-

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[1]There are two reasons why brands may be more credible than underlying individual mix elements (e g , advertising and price) in signaling product positions First, brands represent an "information chunk" (Jacoby, Szybillo, & Busato-Schach, 1977) and convey more information than do individual mix elements Second, brands may be more credible in signaling product attributes than individual mix elements because they reflect higher sunk costs Furthermore, brands are less susceptible to adverse selection and moral hazard. For example, warranty signals are not easy to use in differentiation strategies A high-quality seller cannot always differentiate itself by offering a full warranty, because consumers may misuse the product (consumer moral hazard) or the warranty may attract a disproportionate number of consumers who misuse the product (adverse selection) Hence, consumer-based brand equity may be higher in product categories where other signals are limited by moral hazard or adverse selection concerns Research shows that consumers rely more on brands (e g , vs price) as an information source (Brucks & Zeithaml, 1991) and that quality perceptions are influenced more by brand than by price (Chu & Chu, 1994) These results support the idea that brands can credibly inform consumers about product positions

tional structure of the market. The level of information costs also will depend on perceived risk, in that when all else seems equal, high perceived risk may motivate consumers to gather and process a large amount of information.

The specific levels of perceived risk and information costs also influence consumers' *expected utility. Multiattribute utility theory* (Lancaster, 1966) suggests that consumer (expected) utility depends on a brand's perceived physical/functional/symbolic attributes and consumer tastes. (Note that the weights attached to different attributes, or marginal utilities associated with these attributes, represent consumer tastes.) Furthermore, Meyer and Sathi (1985) and Roberts and Urban (1988) showed that in the presence of attribute uncertainty, perceived risk may reduce expected utility. Utility theory tenets (e.g., Anand, 1993) suggest that perceived risk decreases utility if consumers are risk-averse. There is some empirical evidence that consumers are risk-averse in product markets—that is, that uncertainty about product attributes decreases utility (e.g., Erdem & Keane, 1996; Meyer & Sathi; Roberts & Urban) and that umbrella brands can play a risk-reducing role in these contexts (Montgomery & Wernerfelt, 1992). As such, expected utility should depend on both the perceived risk and information costs borne by consumers.

A clear and credible brand signal creates value to consumers by decreasing both information costs and the risk perceived by the consumer and thus increasing consumer-expected utility. Further, the credibility and clarity of the brand signal may increase perceived quality by creating favorable attribute perceptions. Indeed, cognitive psychological work on brand equity emphasizes how brands influence perceived quality (e.g., Aaker, 1991). Favorable attribute perceptions may stem from symbolic attributes that are purely perceptual, from positive discrepancies between perceived and objective attribute levels, or both (Park & Srinivasan, 1994).[2]

Obviously, the active information gathering/processing undertaken by consumers is influenced by the product category characteristics and other environmental and individual factors that may also influence the absolute amounts of perceived risk. Indeed, perceived risk itself may increase information costs by encouraging information search. However, when all else is equal, brands as credible signals may decrease consumer information-gathering and information-processing costs both directly (by providing less costly information) and indirectly (by reducing perceived risk).

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[2]These discrepancies may exist because brands as signals may affect the psychophysical transformation of objective attribute levels into perceived levels The signaling perspective emphasizes the market mechanisms underlying brand equity, consumer-perceived risk, and information costs Future research may focus on a detailed analysis of how favorable attribute perceptions are created and how credibility impacts perceived quality

Thus, the effects of a brand signal on consumer attribute perceptions, perceived risk, and information costs are expected to increase expected utility.[3] This increase can be conceptualized as the "added value" associated with brands (Farquhar, 1989, p. 24) or as "additional utility not measured by objective attributes" (Park & Srinivasan, 1994, p. 271). It is this increase in expected utility that underlies the value of a brand signal to consumers. Consequently, consumer-based brand equity can be defined as the value of a brand as a signal to consumers.[4]

EMPIRICAL ANALYSIS

Structural Model Specification

The following hypotheses summarize the theoretical perspective developed in the previous section:

H1: The credibility of a brand signal is increased by (a) the level of brand investments, (b) the level of consistency, and (c) the clarity of the brand signal.

H2: Consistency increases the clarity of a brand signal.

H3: Perceived risk is decreased by (a) the credibility and (b) the clarity of the brand signal.

H4: Information costs (information costs saved) are decreased (increased) by (a) the credibility and (b) the clarity of the brand signal.

H5. The perceived risk associated with a brand increases (decreases) information costs (information costs saved) associated with that brand.

H6: Perceived quality is increased by (a) the credibility and (b) the clarity of the brand signal.

H7: Consumer (expected) utility associated with a brand is decreased by the level of (a) the perceived risk and (b) the information costs associated with the brand.

These hypothesized structural relations for the latent endogenous constructs may be represented as

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[3] Note that credibility affects expected utility via perceived quality, information costs, and perceived risk

[4] Links among imperfect information, risk, utility, and choice are expected even if a product (brand) is only considered but not purchased Indeed, Hauser and Wernerfelt (1990) showed formally, and Roberts and Lattin (1991) tested empirically, that uncertainty and information costs influence which brands are added to or deleted from consideration sets

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \end{bmatrix} = \begin{bmatrix} 0 & \beta_{21} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \beta_{13} & \beta_{23} & 0 & 0 & 0 & 0 \\ \beta_{14} & \beta_{24} & 0 & 0 & 0 & 0 \\ \beta_{15} & \beta_{25} & 0 & \beta_{45} & 0 & 0 \\ 0 & 0 & \beta_{36} & \beta_{46} & \beta_{56} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \end{bmatrix} + \begin{bmatrix} \gamma_{11} & \gamma_{21} \\ 0 & \gamma_{22} \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} \xi_1 \\ \xi_2 \end{bmatrix} + \zeta \qquad (1a)$$

or more succinctly,

$$\eta = B\eta + \Gamma\xi + \zeta \qquad (1b)$$

where η is the (6×1) vector of endogenous constructs η_j, ξ is the (2×1) vector of exogenous constructs ξ_i, B and Γ are parameter vectors defined in (1a), and ζ is a conformable vector of error terms. Figure 2 depicts graphically the structural model to be estimated and indicates the paths suggested by theory as well as a number of correlations among the endogenous latent constructs.

The measurement equations relating manifest variables x to exogenous constructs and manifest variables y to endogenous constructs are specified as

$$x = \Lambda_x \xi + \delta \qquad (2)$$
$$y = \Lambda_y \eta + \varepsilon$$

where Λ_x and Λ_y are parameter matrices and δ and ε are error vectors. Table 1 specifies the manifest variables that make up the vectors x (7 items in total) and y (18 items in total), as well as the constructs that each is designed to measure. The wording of the items was first tested in a pilot survey involving 56 participants. Then a principal component analysis was used to make an initial assessment of construct and convergent/discriminant validity and to guide final wordsmithing to arrive at the items presented in Table 1

Pretesting affirmed the a priori expectation that certain items were associated with multiple underlying constructs (specifically, Items 9, 16, 10, 11, and 22 in Table 1). Although the use of items that measure multiple constructs is acceptable practice in the realm of structural equation modeling (see, e.g., Bollen, 1989), it may raise concerns about discriminant validity. As we demonstrate in the following, these concerns were not empirically salient in this model. We also address the issue of measurement item reliability.

The measure of Expected Utility (Item 28, Table 1) deserves comment. Respondents performed an allocation of 10 hypothetical purchases of the product in question among the given set of brands. The percentage of total purchases for a
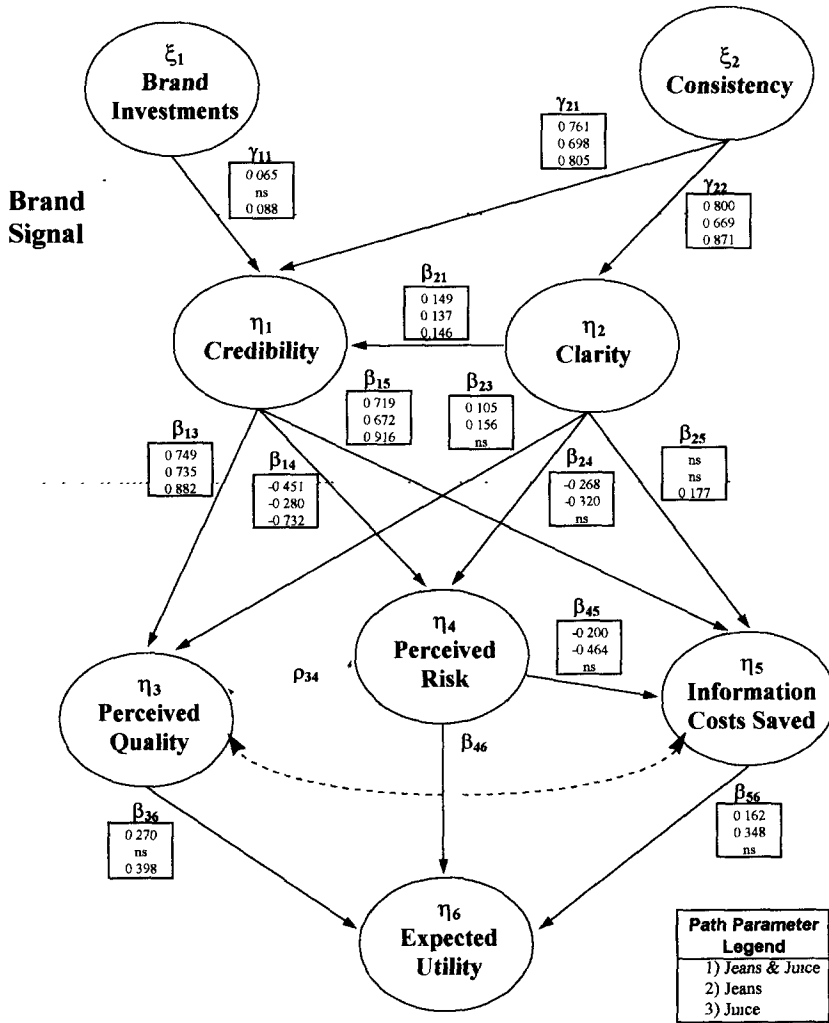
FIGURE 2   Structural model representation of brand equity framework

brand was used as its expected utility measure. Arguably, the allocation closely reflects the market behavior (choice) that is driven (at least in part) by brand equity. Ratings of intent or purchase likelihood for the brands would also serve as reasonable indicators of the Expected Utility construct, with the possible limitation

TABLE 1
Measurement Items for a Signaling Model of Brand Equity

Constructs	Item[a]	M[b]	SD[b]	Skewness[b]
Brand Investments	5 This brand spends lots of money on ads, commercials, promotions, event sponsorships, celebrity endorsements, etc	6 08	6 48	–0 40
Brand Investments	20 This brand has spent a lot on the community over the years	4 81	5 26	–0 03
Brand Investments/Credibility	9 This brand is at the forefront of using technology to deliver a better product	5 11	5 47	–0 18
Clarity	7 I know what this brand stands for	6 48	6 91	–0 81
Clarity	21 I have trouble figuring out what image this brand is trying to create.	3 85	4 57	0 53
Consistency	1 This brand's image in commercials and ads has been consistent for many years	6 24	6 55	–0 65
Consistency	3 The quality of this brand has been consistent for many years	6 69	6 93	–0 81
Consistency	4 This brand's ads, prices, specials, and products match its overall image	6 90	7 12	–0 81
Consistency	17 Everything is consistent about this brand fit, quality, price, ads, variety, specials, etc	6 37	6 66	–0 56
Credibility	2 This brand delivers what it promises	6 59	6 85	–0 77
Credibility	6 This brand's product claims are believable	6 34	6 62	–0 60
Credibility	14 You just can't believe what the ads say about this brand	4 17	4 76	0 36
Credibility	18 My experiences with this brand make me wary of their claims	3 79	4 46	0 53
Credibility	19 This brand has a name you can trust	6 49	6 84	–0 65

(Continued)

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TABLE 1 (*Continued*)

Constructs	Item[a]	M[b]	SD[b]	Skewness[b]
Credibility	23 This brand reminds of someone who's competent and knows what he/she is doing	6 02	6 38	-0.47
Credibility/Consistency/Clarity	16 This brand doesn't pretend to be something it isn't	5 98	6 40	-0 53
Expected Utility	28 If you were to buy 10 [new pairs of jeans], how many of each brand would you buy?	2 59	3 23	1.47
Information Costs Saved	13 I know what I'm going to get from this brand, which saves time shopping around	6.28	6 70	-0 61
Perceived Quality	8 The quality of this brand is very high	6 45	6 74	-0 61
Perceived Quality	24 In terms of overall quality, I'd rate this brand as a	6 41	6 73	-0 70
Perceived Risk	12 I never know how good this brand will be before I buy it	4 13	4 87	0 41
Perceived Risk	15 I know I can count on this brand being there in the future	6.62	6 99	-0 80
Perceived Risk/Information Costs Saved	10 I need lots more information about this brand before I'd buy it.	3 70	4 53	0 65
Perceived Risk/Information Costs Saved	11 I'd have to try it several times to figure out what this brand is like	4 04	4 82	0 43
Perceived Risk/Information Costs Saved	22 This brand gives me what I want, which saves me time and effort trying to do better	5 80	6 26	-0 34

[a]All items measured on 9-point agree/disagree scale except Items 24 (measured on 9-point scale with 1 = *low quality* and 9 = *high quality*) and 28 (likelihood to purchase item, measured as a constant sum allocation in a hypothetical 10-unit purchase, then transformed to a 9-point scale for analysis). [b]All statistics based on the full set of 890 brand-level observations

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that they may not capture whether a brand passes the preference threshold for choice in the marketplace.

Data Collection

The data were obtained via paper-and-pencil surveys from undergraduate students at a major U.S. university. Two product categories were selected: juice and jeans, both "relevant" categories for students. The main issue in this article is the degree to which brand attributes are imperfectly observable because the imperfect information that results creates perceived risk and the need for more information. Arguably, jeans have long-term experience attributes such as abrasion resistance (as do other frequently purchased products: toothpaste and cavity prevention). It also may be difficult to collect information about all the attributes associated with jeans. In contrast, juice has both short-term experience attributes (e.g., taste) and search attributes (e.g., calorie content). Thus, information about juice can be obtained by careful reading of product labels at relatively low information costs. Hence, a credible brand signal should help save more information costs for jeans relative to juices.

It is difficult to judge a priori how the impact of credibility on expected utility via perceived quality and perceived risk will differ between these two product categories. However, one might expect that perceived quality (relative to perceived risk and information costs) may have a greater effect on utility in juice versus jeans. This is because juice is typically associated with lower absolute levels of information costs and perceived risk. Hence, in the juice category, a credible brand signal may have a stronger impact on utility via the perceived quality rather than perceived risk or information costs.

The brands utilized for the jeans category were Calvin Klein, Gap, Lee, Levi's, and Wrangler. The juice brands were Dole, Minute Maid, Sunkist, Tropicana, and Welch's. Respondents rated each brand on the manifest items that are listed in Table 1. We received 92 completed usable surveys for the jeans category and 86 for the juice category. This resulted in a total of 890 individual observations at the brand level (460 for jeans and 430 for juice).

The final three columns of Table 1 contain the mean, standard deviation, and skewness of the 25 measurement items used in the structural model (The sample statistics presented are for the two product categories together.) The standard deviations indicate that significant variability in the measurement items exists, which is needed for model identification.

Table 2 presents the predicted covariance (Panel 1) and correlation (Panel 2) matrices for the eight constructs in the model. The data show that the constructs are fairly well discriminated. In particular, the Perceived Risk and Information Costs Saved constructs exhibit a correlation of −.57. Given that the correlation would be

TABLE 2
Predicted Covariance and Correlation Matrices for Signaling Model of Brand Equity

Panel 1 Predicted Covariance Matrix

	Credibility	Perceived Quality	Perceived Risk	Expected Utility	Information Costs Saved	Clarity	Brand Investments	Consistency
Credibility	1 80							
Perceived Quality	1 44	2 16						
Perceived Risk	-1 04	-0 97	1 69					
Expected Utility	0 69	0 87	-0 53	1 40				
Information Costs Saved	1 57	1 51	-1 15	0 86	2 43			
Clarity	0 85	0 81	-0 82	0 41	0 91	1 64		
Brand Investments	0 07	0 05	-0 03	0 02	0 05	0 00	1 00	
Consistency	0 88	0 74	-0 61	0 36	0 82	0.80	0 00	1 00

Panel 2 Predicted Correlation Matrix

	Credibility	Perceived Quality	Perceived Risk	Expected Utility	Information Costs Saved	Clarity	Brand Investments	Consistency
Credibility	1 00							
Perceived Quality	73	1 00						
Perceived Risk	-60	-51	1 00					
Expected Utility	44	50	-35	1 00				
Information Costs Saved	75	66	-57	46	1 00			
Clarity	50	43	-49	27	45	1 00		
Brand Investments	05	03	-02	02	03	00	1 00	
Consistency	66	51	-47	31	52	62	00	1 00

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Panel 3 Selected Latent Score Regression Coefficients

Item	Perceived Risk	Information Costs Saved
10 I need lots more information about this brand before I'd buy it	0 069	-0 048
11 I'd have to try it several times to figure out what this brand is like	0 102[a]	-0 017
12 I never know how good this brand will be before I buy it	0 178[a]	-0 015
13 I know what I'm going to get from this brand, which saves time shopping around	-0 023	0 291[a]
15 I know I can count on this brand being there in the future	-0 295[a]	0 024
22 This brand gives me what I want, which saves me time and effort trying to do better	-0 009	0 258[a]

[a]Items that may correlate with both Perceived Risk and Information Costs Saved

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influenced by underlying structural relations and given the fact that the two constructs share some measures (see Table 1), this level of correlation appears acceptable. Note also that the selected latent score regression coefficients (Panel 3 of Table 2) show that Perceived Risk and Information Costs Saved were empirically determined by a different set of items (the former by Items 11, 12, and 15; and the latter by Items 13 and 22).

Results

Three structural equation models were estimated from this data. The first was a joint model for both product categories based on the uncorrected covariance matrix, in which intercepts, product class, and brand dummies were identified along with the B and Γ parameter matrices. In addition, two product-specific models (jeans and juice, respectively) were estimated, in which intercepts and brand dummies were included in addition to B and Γ. The analysis used PROC CALIS in SAS with Generalized Least Squares as the specific estimation method (due to its robustness to violations of multivariate normality) because the measures showed some skewness (Table 1).

The estimated models are reported in Table 3. Only the path parameters B and Γ (Figure 1 and two additional correlation parameters) are presented. The models estimated include Λ_x and Λ_y (i.e., the measurement equations parameters), intercepts, product class, and brand dummies, as well as manifest item variances from $VAR(\delta)$ and $VAR(\varepsilon)$. Intercepts, product class, and brand dummies included in the measurement equations are not reported here as they are not germane to the hypotheses tested. We can provide full estimation results on request. The pooled model has a goodness of fit indicator (GFI) of 0.85, with a Root Mean Square Residual of 0.45. The distribution of asymptotic standardized residuals is fairly symmetric, and 98% of the residuals are in the range $(-1, +1)$, suggesting that there are no serious problems with the basic model structure. In addition, the model predicts the manifest items x and y well: R^2_x ranges from 0.90 to 0.98, and R^2_y ranges from 0.83 to 0.99. Thus, the measurement items were reliable, particularly because several items depend on multiple latent constructs.[5] R^2s for the endogenous con-

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[5]For cases where there are shared items among constructs, and multiple constructs affect a single item, Bollen (1989, p 221) suggested R^2_x and R^2_y as better alternative measures of reliability than traditional measures Bollen also defined the validity of a measurement item for a given construct as the magnitude of the direct structural relation between the construct and the item (p 197) This definition, which directly handles the structural relations, is preferred over traditional measures of validity because (in contrast to traditional measures) it explicitly recognizes structural relations between underlying constructs and their measurement items. A detailed discussion of these issues is available in Bollen (pp 194–206)

TABLE 3
Structural Equation Model Estimation Results for Signaling Model of Brand Equity

Parameter	Path	Expected Sign	Jeans and Juce Estimates	Jeans Estimates	Juce Estimates
γ_{11}	Brand Investments→Credibility	+	0 065 (1.76)	0 049 (0 90)	0.088 (2 10)
γ_{21}	Consistency→Credibility	+	0 761 (14 20)	0 695 (8 95)	0 805 (12 51)
γ_{22}	Consistency→Clarity	+	0.800 (12 75)	0 669 (18 95)	0 871 (10 66)
β_{13}	Credibility→Perceived Quality	+	0 749 (30 48)	0 735 (8 24)	0 882 (29 84)
β_{14}	Credibility→Perceived Risk	–	–0 451 (–13 30)	–0 280 (–5.35)	–0 732 (–19 20)
β_{15}	Credibility→Information Costs Saved	+	0 719 (15 37)	0 672 (10 68)	0 916 (12 45)
β_{21}	Clarity→Credibility	+	0 149 (3 21)	0 137 (1 92)	0 146 (2 71)
β_{23}	Clarity→Perceived Quality	+	0 105 (2 81)	0 156 (2 97)	0 023 (0 49)
β_{24}	Clarity→Perceived Risk	–	–0 268 (–5 16)	–0 320 (–4 14)	–0 090 (–1.52)
β_{25}	Clarity→Information Costs Saved	+	0 079 (1 45)	–0 003 (–0 04)	0 177 (2 71)
β_{36}	Perceived Quality→Expected Utility	+	0 270 (5 70)	0.098 (1.64)	0 398 (6 02)
β_{45}	Perceived Risk→Information Costs Saved	–	–0 200 (–2 98)	–0 464 (–4 56)	0 071 (0 87)
β_{46}	Perceived Risk→Expected Utility	–	–0 050 (–0 82)	0 063 (0 64)	0 004 (0 06)
β_{56}	Information Costs Saved→Expected Utility	+	0 162 (2 93)	0 348 (4 75)	0 010 (0 15)
ρ_{34}	Correlation ζ_3 and ζ_4	–	–.101 (–2 56)	–.127 (–2 36)	–.134 (–2 74)
ρ_{35}	Correlation ζ_3 and ζ_5	+	.214 (5 55)	.188 (3 41)	.102 (1 89)

(Continued)

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TABLE 3 (Continued)

Goodness-of-Fit Measures	Jeans and Juice	Jeans	Juice
GFI/Adjusted GFI/RMSR	0 85/0 65/0 45	0 80/0 66/0 62	0 71/0 51/0 54
R^2_x (range)	90–98	91–98	91–99
R^2_y (range)	83–99	84–99	86–99
$R^2_{\eta1}$ (Credibility)	44	40	47
$R^2_{\eta2}$ (Clarity)	39	35	43
$R^2_{\eta3}$ (Perceived Quality)	54	48	60
$R^2_{\eta4}$ (Perceived Risk)	41	29	54
$R^2_{\eta5}$ (Information Costs Saved)	59	60	64
$R^2_{\eta6}$ (Expected Utility)	29	26	29

Note GFI = goodness of fit indicator, RMSR = Root Mean Square Residual All parameters are nonstandardized However, because all manifest variables were measured on 9-point scales and have similar variances (see Table 1), these parameter values are close to the standardized values Asymptotic t-values are in parentheses

structs are also satisfactory (Table 3), with those for Credibility and Clarity being 0.44 and 0.39, respectively.

Table 3 shows that all parameters have the expected signs. In the pooled model, all but two path parameters are statistically significant at the 92% or higher confidence level. The two exceptions (Clarity→Information Costs Saved and Perceived Risk→Expected Utility) correspond to the relation paths postulated in H4(b) and H7(a). Thus, the pooled model results support all the remaining hypotheses. However, note that our results do not imply that Perceived Risk has no impact on Expected Utility. Rather, as theory predicts, increased Perceived Risk reduces Information Costs Saved, which in turn reduces Expected Utility (Figure 2). Hence, the premise of H7(a), that perceived risk decreases expected utility, still holds, although along an indirect path. Perhaps perceived risk does not have a direct impact on Expected Utility in these data because consumers are not very risk-averse in the two product categories studied. Overall, the pooled model results support the postulated structural relations and the central role of credibility in the proposed framework.

The pooled model results have a number of substantive implications. First, Consistency influences Credibility (the path coefficient is 0.761) to a larger extent than do Brand Investments (0.065) and Clarity (0.149). Credibility has a stronger effect on Perceived Quality (0.749) and Information Costs Saved (0.719) than on Perceived Risk (–0.451). Clarity affects Perceived Risk (–0.268) more strongly than does Perceived Quality (0.105). Although Perceived Quality influences Expected Utility (0.267) more than Information Costs Saved (0.162), the difference is not large. The strength of the direct path from Credibility and from Perceived Quality to Expected Utility suggests that the credibility of the brand signal has significant impact on quality perceptions and brand evaluations. Although this is implicit in cognitive psychology perspectives on brand equity, this relation deserves more empirical attention.

Comparative Results for Jeans and Juice

The product-specific models also provide good overall fits, as indicated by GFIs of 0.80 and 0.71 for jeans and juice, respectively. Prediction of manifest variables and latent endogenous constructs is generally comparable to that of the pooled model. The signs and significance levels of individual path variables are also generally comparable to those of the pooled models. Specific differences between the two individual models and their differences with the aggregate model are highlighted next.

First, in the juice category the impact of Credibility on Expected Utility is mediated mainly by Perceived Quality rather than by Perceived Risk and Information Costs Saved. This is evidenced by the insignificant effect of Information Costs

Saved and Perceived Risk on Expected Utility (the impact of Perceived Risk on Information Costs Saved is also statistically insignificant). In contrast, in the jeans category the impact of Credibility on Expected Utility is mediated by Information Costs Saved as opposed to Perceived Quality.

These results may be anticipated in the light of our previous discussion. Because most attributes of juices are search attributes or very short run experience attributes (e.g., taste), there is less imperfect and asymmetric information and less associated consumer uncertainty about juices than about jeans. Hence, perceived risk and potential information costs may be lower in juices than in jeans. Therefore, Credibility influences Expected Utility mainly through Perceived Quality. This is consistent with the signaling expectation that, all else being equal, consumer-based brand equity will be relatively higher for products with long-term experience or credence attributes. However, in theory, the value of a brand signal exists even for products with search and relatively short run experience attributes because credibility does influence perceived quality (consistent with our empirical results).

Second, note that Brand Investments have a statistically significant effect on Credibility for juices but not for jeans. Indeed, this is the only major difference between the pooled model and the jeans model results. One might speculate that consumer perceptions of a firm's brand investments depend on the firm's success in communicating its brand investments to consumers. Thus, one reason that Coca-Cola hires Elton John for broadcast commercials and then publicizes the money spent may be that it is an attempt to raise consumers' perceptions of Coca-Cola's brand investments. Whether Elton John likes Coca-Cola may be irrelevant to most consumers. However, the fact that he is associated with the brand and represents a significant investment may signal the company's commitment to the brand. A related implication of the results is that jeans manufacturers do not communicate well their brand investments to consumers.

IMPLICATIONS AND CONCLUSIONS

This article has developed a signaling perspective to explain the generation of brand equity and tested a set of related hypotheses. The framework asserts that marketing strategy in general, and brand management and consumer brand preference in particular, are affected by the informational aspects of the market. Thus, brands are seen as information sources for consumers. As signals of product positions, brands may credibly inform consumers about product attributes. In markets with imperfect and asymmetric information, the information conveyed by a brand will not create any value unless it is credible. Thus, credibility is the key element in the signaling perspective on brand equity formation and management. This contrasts with previous brand equity research in which brand associations and image played the central role in brand equity formation. Our empirical results are consistent with this information economics perspective on brand equity.

The signaling perspective focuses on the market process by which credibility is created. It describes the factors that determine this process and may make brands (i.e., brand names) more effective as signals of product positions than individual mix elements such as advertising, price, or warranty. These factors are rooted in consumer behavior (e.g., if there were no consumer moral hazard, warranties could be more effective as signals) and firm behavior (e.g., if only high-quality or truthful firms could afford to advertise, advertising could signal quality credibly).

Compared to the cognitive psychological work on brand equity, the signaling perspective offers a different set and sequence of causal links among some concepts. For example, Aaker's (1991) conceptualization suggested that brand equity provides value to consumers by facilitating information processing and increasing confidence. Indeed, as we show, the signaling perspective reverses this causal link, suggesting that the value created by reduced information costs and perceived risk precedes and is what underlies consumer-based brand equity.

Furthermore, in the signaling framework, brand loyalty emerges as a consequence of brand equity rather than as its antecedent. More specifically, if consumers have a satisfactory usage experience with a product, they obtain positive purchase feedback. If the usage experience is consistent with the firm's product claims, the credibility of the brand signal increases. This raises consumer utility by lowering perceived risk and information costs and enhances the value of the brand signal. As a consequence, the likelihood of repeat purchase increases, leading to the formation of brand loyalty; in other words, consumers may buy a brand due to the additional expected utility (value) created by a brand signal. Then, given usage satisfaction, consumers may continue to buy that particular brand due to low perceived risks and information costs associated with the brand. In this scenario, brand loyalty stems in part from a close match between tastes and product offerings (i.e., usage satisfaction) and in part from lower perceived risks and information costs associated with credible and familiar brands. Thus, given that consumer tastes and product offerings match closely, brand loyalty may be a consequence (not an antecedent) of consumer-based brand equity.

In addition, although brands may credibly signal product attribute levels (including high quality), consumer-based brand equity is not necessarily associated with high-quality products. Rather, as illustrated with the Suntrips vacations example, consumer-based brand equity may be associated with the credibility of quality claims, irrespective of the quality level positioning. Thus, if Kmart positions itself to be a retail outlet offering good value and consistently delivers this value, then Kmart will command equity for delivering what it has promised (good value).

The signaling perspective also suggests that firms should communicate to consumers that they are committed to their brands. This may be accomplished by emphasizing the resources that the firm spends to establish and support its brand's credibility as an information source. In this view, advertising investments may be more important than promotional activities for brand equity generation because

advertising investments may reflect sunk selling costs more effectively and may contribute more to credibility than do promotions. Note that our empirical results, on the strength of the link from Brand Investments to Credibility, suggest that there is room for improvement in the quality of such communications.

Moreover, firms should avoid intentional and unintentional discrepancies between promised and actual product offerings. Otherwise, the credibility of their brands may erode. Quality standardization is an obvious and important way to avoid such discrepancies (e.g., the enormous expenditure of the resources by McDonald's in its quest for product and outlet consistency). The signaling perspective suggests that, in the long run, the consistency of current claims with consumer experience will feed back to the credibility of a firm's product claims, thus enhancing brand equity. More succinctly, managing brand equity requires managing the credibility of the firm's claims.

Consistency, a key marketing principle (Park & Zaltman, 1987), also emerges as a key to brand equity management. Specifically, maintaining brand equity requires consistency both within and across marketing mix (e.g., price and retail distribution decisions) and submix (e.g., advertising copy and theme) elements. Moreover, it is also important that both the individual brand claims and brand attribute levels should be consistent over time. This temporal consistency is likely to ensure the clarity of brand position information provided and to enhance its credibility.

FUTURE RESEARCH

This article raises a number of issues that deserve further research attention. First, there is a need to conduct a comprehensive multicategory analysis in order to identify the relative importance of various antecedents of brand equity in different product categories. Managerially relevant empirical generalizations can be drawn from such studies with respect to the relative importance of the information economics constructs (e.g., search vs. experience products).

Furthermore, the signaling perspective on consumer-based brand equity is consistent with the added value or residual value operationalizations of brand equity. In other words, consumer-brand equity is the utility not explained by objective attributes (Kamakura & Russell, 1993; Shocker & Weitz, 1988). A measurement-oriented model of brand equity that is based on the proposed signaling perspective would be a welcome addition to the literature.

Moreover, there is a need to develop the link between consumer-based brand equity and a firm-centered perspective on the construct. The perspective developed in this article implies that consumer-based brand equity precedes and underlies the firm-centered assessment of brand equity. Thus, consumer-based brand equity affects firms' market performance by enhancing the effectiveness of the marketing

mix strategies and by altering consumer purchase behavior. The signaling perspective suggests several paths along which consumer-based brand equity may influence response to the marketing mix.

As one example, advertising investments may increase consumers' confidence in advertising claims, thereby enhancing ad effectiveness. Indeed, Goldberg and Hartwick (1990) found that advertiser reputation had a positive effect on consumer attitudes toward ad claims. As another example, consumers may be willing to pay higher price premiums for strong brands because prices signal product positions more credibly given brand information (in contrast to the case when there is no brand information). Put differently, the credibility associated with the brand as a signal strengthens the price signal and increases consumer willingness to pay price premiums. In addition, consumer brand choice probabilities are higher because the brand signal raises expected utility.

Note also that consumer purchases and other responses to marketing activities provide feedback to firms. Indeed, firms that are responsive and sensitive to consumer reactions are more likely to send clear and credible signals to consumers. Thus, a good understanding of consumer-based brand equity should help increase competitive advantage and marketplace leverage, with corresponding effects on the firms' long-run profits. In this respect, brand equity to a firm can be defined as the returns associated with brand signaling. Indeed, C. Shapiro (1983) formally showed, and Weigelt and Camerer (1988) suggested, that firms may consider the reputation associated with a brand as a valuable asset that can generate future rents.

Finally, there is a need for research that integrates cognitive psychological and signaling perspectives on brand equity. The processes by which consumers form perceptions of the constructs that influence consumer-based brand equity deserve examination, including those processes by which consumers "decode" firms' signals. Such research can draw on a rich literature in cognitive psychology and information economics. The integration of these approaches in studying brand equity can lead to a better understanding of the dynamics governing the formation and management of brand equity.

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