Consumer-based brand equity: improving the measurement – empirical evidence

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Abstract

Purpose – The present research aims to improve the measurement of consumer-based brand equity. Current measurement of consumer-based brand equity suffers from limitations, including: a lack of distinction between the dimensions brand awareness and brand associations, the use of non-discriminant indicators in the measurement scales and of student samples.

Design/methodology/approach – Based on the recommendations of extant research, the scale constructed to measure consumer-based brand equity in this study included brand personality measures. Brand associations were measured using a different set of items. Unlike many of the previous studies that had used student samples, the present study used a sample of actual consumers from an Australian state capital city. Confirmatory factor analysis employing structural equations modelling was used to measure consumer-based brand equity in two product categories and across six brands.

Findings – Results support the hypothesised four-dimension model of consumer-based brand equity across two product categories and six brands. Brand awareness and brand associations were found to be two distinct dimensions of brand equity as conceptualised in the marketing literature. The present study contributes to the understanding of consumer-based brand equity measurement by examining the dimensionality of this construct.

Originality/value – The principal contribution of the present research is that it provides empirical evidence of the multidimensionality of consumer-based brand equity, supporting Aaker's and Keller's conceptualisation of brand equity. The present research also enriched consumer-based brand equity measurement by incorporating the brand personality measures, as recommended by previous researchers. While earlier studies were conducted using US and Korean samples, the present study also used a sample of Australian consumers.

Keywords Consumers, Brand equity, Brand awareness, Brand identity, Quality, Brand loyalty

Paper type Research paper

An executive summary for managers and executive readers can be found at the end of this article.

Introduction and background

Building brand equity is considered an important part of brand building (Keller, 1998). Brand equity is supposed to bring several advantages to a firm. For example, high brand equity levels are known to lead to higher consumer preferences and purchase intentions (Cobb-Walgren *et al.*, 1995). Firms with high brand equity are also known to have high stock returns (Aaker and Jacobson, 1994).

Developing further insights into the measurement of consumer-based brand equity is important in the face of the prominence of branding. Branding is a powerful means of differentiation. Differentiation is one of the key competitive positioning strategies suggested by Porter (1990). The strategic impact of branding is duly recognised in the marketing literature (see Aaker, 1991, 1992; de Chernatony and McDonald, 1998; Kapferer, 1994; Keller, 1999). Brands might develop sustainable competitive advantage for firms (Aaker, 1989). That is, if consumers perceive a particular brand favourably, then the firm may have a competitive advantage. Hence, it becomes vital for brand managers to have access to valid and reliable consumer-based brand equity instruments.

Further, brand management is considered useful in fully exploiting the assets of an organisation and in generating additional value from the investments already made into brands. The high costs associated with the launching of new brands and the high failure rates of new products (Crawford, 1993; Ourusoff, 1992) as well as increasing costs of advertising and distribution (Aaker, 1991) are some of the reasons for the growing interest in brand management. Brand building is considered the best way of doing business because of the constant changes in the marketing environment (Aaker, 1996a, b; King, 1991; Lannon, 1993). Successful brand building could strengthen a producer's competitive position to withstand the increasing power of retailers (Park and Srinivasan, 1994). Brand building can also bring advantages such as defending against competitors and building market share (Adams, 1995). Hence, a better understanding of brand

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equity measurement is essential for an enriched practice of brand management.

Despite the availability of numerous definitions for brand equity in the literature, there is little consensus on what exactly brand equity means (Park and Srinivasan, 1994). Nor there is a general agreement among researchers, at the conceptual level about what brand equity comprises. The broad meaning attached to the term "brand equity" is similar to the definition provided by Farquhar (1989) as the value endowed by the brand to the product. Most researchers provided definitions that are similar to Farquhar's definition (e.g. Aaker, 1991; Keller, 1993; Leuthesser, 1988; Srinivasan, 1979; Srivastava and Shocker, 1991; Yoo and Donthu, 2001).

The definitions of brand equity can be broadly classified into two categories. Some definitions are based on the financial-perspective and stress the value of a brand to the firm (e.g. Brasco, 1988; Mahajan *et al.*, 1990; Shocker and Weitz, 1988; Simon and Sullivan, 1993). Other definitions are based on the consumer-perspective, which define brand equity as the value of a brand to the consumer (e.g. Aaker, 1991; Kamakura and Russell, 1993; Keller, 1993; Kim and Lehmann, 1990; Rangaswamy *et al.*, 1993).

When reflecting a consumer or marketing perspective, brand equity is referred to as consumer-based brand equity. Mackay et al. (1997, p. 1153) stated:

> [t]he marketing approach (often referred to as consumer based brand equity) refers to the added value of the brand to the consumer. Subscribers to this approach tend to focus on the value created by marketing activities as perceived by customers.

Several researchers (e.g. Cobb-Walgren *et al.*, 1995; Sinha and Pappu, 1998; Yoo and Donthu, 2001, 2002; Yoo *et al.*, 2000; Washburn and Plank, 2002) have conceptualised brand equity similarly to Aaker (1991) and Keller (1993) and used the term consumer-based brand equity to refer to brand equity.

Although Aaker (1991) and Keller (1993) conceptualised brand equity differently, both defined brand equity from a consumer perspective based on consumers' memory-based brand associations. Keller (1993, p. 8) referred to brand equity as customer-based brand equity and defined it as "the differential effect of brand knowledge on consumer response to the marketing of a brand". (According to Keller, customer-based brand equity consisted of two dimensions – brand knowledge and brand image. Aaker (1991, p. 15) provided the most comprehensive definition of brand equity available in the literature, defining brand equity as: "a set of brand assets and liabilities linked to a brand, its name and symbol, that add to or subtract from the value provided by a product or service to a firm and/or to that firm's customers". In effect, Aaker conceptualised brand equity as a set of assets (or liabilities). Brand awareness, brand associations, perceived quality, brand loyalty and other proprietary assets were the five assets of brand equity he proposed. These assets (or liabilities) are proposed as "dimensions" in the present study. From the consumer perspective, brand awareness, brand associations, perceived quality and brand loyalty are the four most important dimensions.

Researchers (e.g. Crimmins, 1992; Farquhar, 1989) have argued in favour of a consumer-based measurement of brand equity. "[t]here is value to the investor, the manufacturer and the retailer only if there is value for the consumer" (Cobb-Walgren *et al.*, 1995, p. 26). Several brand equity measurement methods have been suggested based on the marketing or consumer perspective, both by researchers (e.g. Aaker, 1996c; Green and Srinivasan, 1978, 1990; Kamakura and Russell, 1989, 1993; Srinivasan, 1979; Swait *et al.*, 1993) and marketing practitioners or consulting firms (see Winters (1991) for a list of the methods).

Many of these measurement approaches, however, were of somewhat limited use for managers since brand equity is not broken into components that can be related to factors such as favourable customer perceptions (Sinha *et al.*, 2000; Sinha and Pappu, 1998). Overcoming this problem, some researchers (e.g. Park and Srinivasan, 1994) divided brand equity into attributes-based and non-attributes-based components, while other researchers (e.g. Cobb-Walgren *et al.*, 1995; Sinha and Pappu, 1998; Yoo and Donthu, 2001, 2002; Yoo *et al.*, 2000), proposed a brand equity measurement method, by subdividing brand equity into different dimensions (e.g. brand awareness, brand associations, perceived quality and brand loyalty).

Cobb-Walgren *et al.* (1995) were the pioneering researchers to measure consumer-based brand equity based on the conceptualisation of Aaker (1991) and Keller (1993). These researchers treated consumer-based brand equity as a set of four dimensions, namely brand awareness, brand associations, perceived quality and brand loyalty. Sinha *et al.* (2000) and Sinha and Pappu (1998) measured consumer-based brand equity in a similar fashion but used Bayesian methods. Yoo *et al.* (2000) used confirmatory factor analytic methods to measure consumer-based brand equity. However, Yoo *et al.* treated consumer-based brand equity as a three-dimensional construct, combining brand awareness and brand associations into one dimension.

Yoo and Donthu (2001) were also the first to develop a multidimensional scale for consumer-based brand equity and test its psychometric properties. These researchers observed only three dimensions for consumer-based brand equity, similar to Yoo *et al.* (2000). Yoo and Donthu's (2001) consumer-based brand equity scale was later validated by Washburn and Plank (2002).

However, both Yoo and Donthu (2001) and Washburn and Plank (2002) have acknowledged the scope to improve the measurement of consumer-based brand equity. For example, Washburn and Plank have highlighted the need to refine the dimensionality of consumer-based brand equity. They also advocated that researchers focus on the distinction between the dimensions of brand awareness and brand associations. While these two dimensions are conceptually different (e.g. Aaker, 1991), some empirical evidence (e.g. Yoo and Donthu, 2001, 2002; Yoo *et al.*, 2000; Washburn and Plank, 2002) suggests that they should be combined into one. There is also empirical evidence to say that these are distinctive dimensions of brand equity (e.g. Sinha *et al.*, 2000; Sinha and Pappu, 1998). Hence, it is important to examine further the dimensionality of consumer-based brand equity construct.

Further, Washburn and Plank urged researchers to re-evaluate the items included in Yoo and Donthu's (2001, p. 60) consumer-based brand equity scale to "suggest more discriminating indicators". For example, brand personality is considered a sub-dimension of brand associations and is supposed to contribute to brand equity (Aaker, 1996b). However, Yoo and Donthu's (2001) scale does not include brand personality measures. In fact, Yoo and Donthu advocated the inclusion of brand personality measures into

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consumer-based brand equity, as a future research direction. Thus, there is scope to enrich the measurement of consumer-based brand equity.

Another area for improvement in the previous research on consumer-based brand equity measurement is the usage of student samples. Both Yoo and Donthu (2001) and Washburn and Plank (2002) used student samples to validate the consumer-based brand equity scale. The present research aims to improve the measurement of consumer-based brand equity, by including more discriminating indicators in the scale, and by using a sample of actual (non-student) consumers. The objective of the present research is also to empirically examine the dimensionality of the consumer-based brand equity construct.

This paper is organised as follows. The next section delineates the conceptual domain of consumer-based brand equity. The following section details the methodology adopted, followed by a discussion of the results. Implications for theory and managers are provided towards the end of the paper. The final section presents the limitations of the present research as well as future research directions.

Conceptual domain of consumer-based brand equity

The present research conceptualises brand equity in accordance with Aaker (1991) and Keller (1993) based on consumer perceptions. The following sections provide a description of the four dimensions of consumer-based brand equity examined in our study:

1 *Brand awareness.* This refers to the strength of a brand's presence in consumers' minds. Brand awareness is an important component of brand equity (Aaker, 1991; Keller, 1993). Aaker mentioned several levels of brand awareness, ranging from mere recognition of the brand to dominance, which refers to the condition where the brand involved is the only brand recalled by a consumer. Rossiter and Percy (1987) defined brand awareness as the consumers' ability to identify or recognise the brand, whereas Keller conceptualised brand awareness as consisting of both brand recognition and brand recall. According to Keller, brand recall refers to consumers' ability to retrieve the brand from memory, for example, when the product category or the needs fulfilled by the category are mentioned. Keller (1993, p. 3) argued that "brand recognition may be more important to the extent that product decisions are made in the store". Hence, in the present study, brand awareness is conceptualised as consisting of both brand recognition and brand recall.

2 *Brand associations*. These are another important component of brand equity (Aaker, 1991; Keller, 1993). Brand associations are believed to contain "the meaning of the brand for consumers" (Keller, 1993, p. 3). While a brand may derive associations from a range of sources, brand personality and organisational associations are the two most important types of brand associations, which influence the brand's equity (Aaker, 1991, 1996b). Brand personality is a key component of brand equity, and is defined in terms of the various traits or characteristics that brands can assume from the perception of consumers (Aaker, 1991; Keller, 1993). In the present study brand personality is defined as "the set of human characteristics associated with a brand" (Aaker, 1997, p. 347). The concept of brand personality is well established in the marketing literature (Batra *et al.*, 1993; Biel, 1993; Phau and Lau, 2000). Aaker (1991) argued that a brand association has a level of strength, and that the link to a brand (from the association) will be stronger when it is based on many experiences or exposures to communications, and when a network of other links supports it. Further, Aaker (1991) suggested that brand associations could provide value to the consumer by providing a reason for consumers to buy the brand, and by creating positive attitudes/feelings among consumers.

3 *Perceived quality.* This is another important dimension of brand equity (Aaker, 1991). Perceived quality is not the actual quality of the product but the consumer's subjective evaluation of the product (Zeithaml, 1988, p. 3). Similar to brand associations, perceived quality also provides value to consumers by providing them with a reason to buy and by differentiating the brand from competing brands.

4 *Brand loyalty.* This is a major component of brand equity. Aaker (1991, p. 39) defined brand loyalty as: "the attachment that a customer has to a brand". Oliver (1997, p. 392) defined brand loyalty as: "a deeply held commitment to rebuy or repatronise a preferred product or service consistently in the future, despite situational influences and marketing efforts having potential to cause switching behavior". Oliver's definition emphasises the behavioural dimension of brand loyalty, whereas Rossiter and Percy (1987) argued that brand loyalty is often characterised by a favourable attitude towards a brand and repeated purchases of the same brand over time. Brand loyalty is also conceptualised based on an attitudinal perspective. For example, Chaudhuri and Holbrook (2001, p. 82) argued that "attitudinal brand loyalty includes a degree of dispositional commitment in terms of some unique value associated with the brand". From an attitudinal perspective, brand loyalty was defined as "the tendency to be loyal to a focal brand, which is demonstrated by the intention to buy the brand as a primary choice" (Yoo and Donthu, 2001, p. 3). While the definitions of brand loyalty based on the behavioural perspective emphasised the consumer's actual loyalty to the brand as reflected in purchase choices, the definitions based on an attitudinal perspective accentuated consumer intentions to be loyal to the brand. As previously mentioned, we conceptualised brand equity on the basis of consumer perceptions not on the basis of their behaviour. Hence, we conceptualise brand loyalty also based on an attitudinal perspective and consumer perceptions.

We propose associative relationships among the four consumer-based brand equity dimensions of brand awareness, brand associations, perceived quality and brand loyalty. It is envisaged that consumers' perception of quality will be associated with their brand loyalty. The more brand-loyal a consumer is, the more he/she is likely to perceive the brand as offering superior quality and vice versa. Similarly, the more favourable associations consumers have towards a brand, the more their loyalty and vice versa. Consumers who hold favourable associations towards a brand are also likely to develop favourable perceptions of quality and vice versa. Brand awareness in the present study has been defined as

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consumer's ability to recall that the brand is a member of the product category. Consumers' brand awareness is likely to be high when they have strong associations for the brand and when they perceive the quality of the brand to be high and vice versa. Similarly, consumers' perception of quality of a brand is likely to be high when they have strong association with the brand and vice versa.

Method

The present research is part of larger study that investigated the relationships between consumer-based brand equity and country-of-origin effects (Pappu, 2003). The initial survey instrument was developed incorporating a pool of 19 items compiled from the literature. Three items were included for brand loyalty, five for perceived quality, eight for brand associations and three for brand awareness. These indirect measures of brand equity were empirically tested and used by several researchers (e.g. Agarwal and Rao, 1996; Cobb-Walgren *et al.*, 1995; MacKay, 2001; Sinha and Pappu, 1998; Washburn and Plank, 2002; Yoo and Donthu, 2001, 2002).

Aided and unaided recall were used as measures of brand awareness (Aaker, 1991). Organisational associations and brand personality provided measures of brand associations as suggested by Aaker (1996b). Liking, pride and trust were used to measure organisational associations (Aaker, 1996b). Based on Aaker (1997), five measures were also obtained for brand personality. Each of these measures was based on the five facets of brand personality developed by Aaker (1997), namely sincerity, excitement, competence, sophistication and ruggedness. Previous research recommended the inclusion of brand personality as a sub-dimension of brand equity (Yoo and Donthu, 2001). The set of items to used to measure brand associations was different from those used by earlier researchers who measured consumer-based brand equity (e.g. Washburn and Plank, 2002; Yoo and Donthu, 2001). Measures of perceived quality were obtained from Aaker (1991) and Yoo and Donthu (2001), while measures for brand loyalty were obtained from Yoo and Donthu (2001) and Yoo *et al.* (2000).

The study was conducted in two product categories: cars and televisions. We selected the product categories in such a way that most respondents were able to evaluate them. Many respondents had used products from these two categories, as our results indicated. The product categories selected were also different in terms of consumer involvement, price, and associated risk. Three brands were included in each product category. Toyota, Mitsubishi and Suzuki were the brands included for the product category cars, whereas Sony, Hitachi and Toshiba were the selected brand names for televisions. The brands were selected in such a way that they were all available to Australian consumers in each of the two product categories.

Unlike some of the previous studies in this area, the present research used a sample of actual (non-student) consumers. The data were collected via a mall-intercept survey of shopping mall consumers at an Australian state capital city, using systematic sampling. Trained research assistants were employed to administer the survey questionnaires. The survey yielded a total of 539 complete usable questionnaires.

Two different versions of the questionnaire were used, one for each product category. The questionnaire included questions on brand equity as well as demographics. Respondents were randomly assigned to one product category and were asked to rate a series of brand equity measures for all the three brands in the given product category. We measured brand awareness on a dichotomous scale (Yes/No), while a Likert-type scale of 1 to 11 was adopted for all other brand equity measures, using the anchors "strongly disagree" (1) and "strongly agree" (11).

Confirmatory factor analysis using structural equations modelling was used for testing the multidimensionality of the consumer-based brand equity construct. Confirmatory factor analysis is a relevant technique for the validation of scales for the measurement of constructs (Steenkamp and van Trijp, 1991).

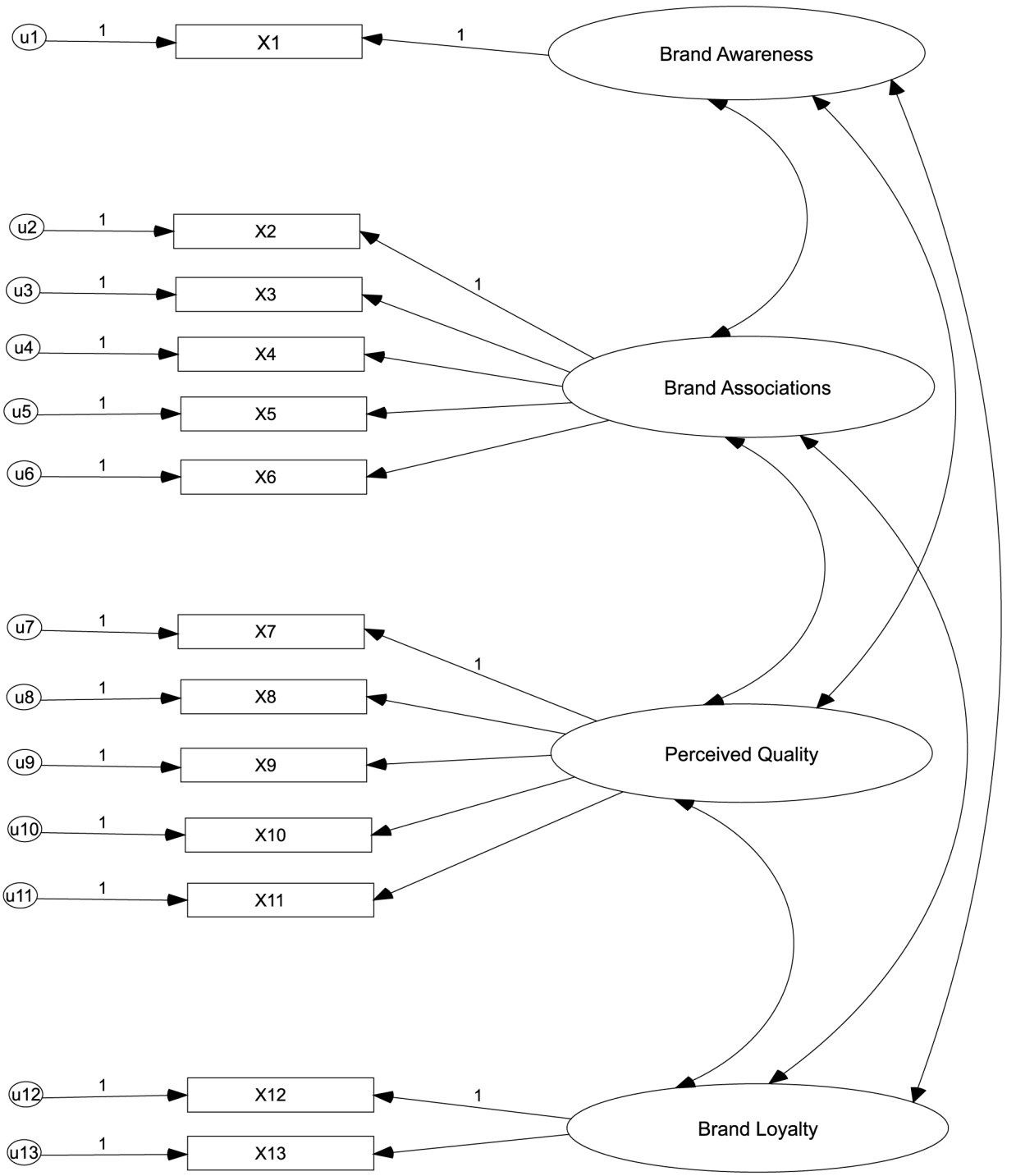
The 16 items obtained from the exploratory factor analysis of the original pool of 19 brand equity measures served as indicator variables in the confirmatory factor analysis. As shown in the path diagram (see Figure 1), five indicator variables were available for each of the constructs brand associations (X_2, X_3, X_4, X_5 and X_6) and perceived quality (X_7, X_8, X_9, X_{10} and X_{11}). Two indicator variables were the principal descriptors of the dimension brand loyalty (X_{12} and X_{13}). For one of the exogenous constructs, brand awareness, only one indicator variable (X_1) was available, which was constructed by summing three brand awareness measures. One loading per construct was set to the value of 1.0, to make each construct scale invariant. The variables with fixed loadings were X_1, X_2, X_7 and X_{12}.

All the variables, except X_1, were measured on a scale of 1 to 11. Each consumer-based brand equity dimension, except brand awareness, was operationalised as the average of the consumer's rating of the Likert-type items loading on it. Brand awareness was measured using three dichotomous variables (Yes/No), and was operationalised as the sum of consumer's ratings for these three dichotomous awareness measures. As the three brand awareness measures were categorical in nature, these variables were re-expressed as an item parcel as suggested by West *et al.* (1995, p. 70), to produce a distribution that more closely approximated normality. The construction of item parcels involves summing or taking the mean of several items, which measure the same construct. In the present case, the three items were summed to come up with the item parcel.

The use of a single indicator variable for any exogenous construct requires the researcher to specify the reliability of the construct (Hair *et al.*, 1998, p. 598). Both aided and unaided recalls were accepted as reliable measures of brand awareness (Aaker, 1991). Accordingly, we fixed the reliability of the brand awareness measure at 0.8, consistent with the reliability estimates of brand awareness from previous studies[1] (Sinha *et al.*, 2000; Sinha and Pappu, 1998).

The measurement model was estimated based on a covariance matrix based on advice from Cudeck (1989). The model was estimated using the maximum likelihood estimation method, the most commonly used approach in structural equation modelling (Chou and Bentler, 1995) which is known to perform reasonably well under a variety of less-than-optimal conditions such as small sample sizes or excessive kurtosis (Hoyle and Panter, 1995). The final parameter standard errors were estimated through bootstrapping based on 2,000 re-samples.

Figure 1 The confirmatory factor model



Note: u1 to u13 are unique or error variables

Results and discussion

The sample size employed was within the acceptable limits for confirmatory factor analysis, for both cars ($n = 254$) and televisions ($n = 285$). The ratio of respondents to observed variables was 19 for cars and 22 for televisions. The ratio of respondents to estimated parameters was 28 for cars and 31 for televisions[2].

This section summarises the results of the confirmatory factor analyses conducted to test the multidimensionality of

the construct consumer-based brand equity. Brand awareness, brand associations, perceived quality, and brand loyalty, the dimensions of consumer-based brand equity, were the four latent variables or exogenous constructs in the hypothesised model. The hypothesised loading structure for the model is shown in Figure 1.

A total of six separate confirmatory factor analyses were carried out: three were conducted within each product category, one for each brand. The results were first examined for offending estimates. No offending estimates (e.g. negative variances, non-significant error variances, correlations larger than 1 in magnitude and covariance or correlation matrices which were not positive definite) were present. The goodness-of-fit of the confirmatory factor models was then assessed. The hypothesised model was supported by values of various measures of fit as discussed below.

Evaluating the goodness-of-fit criteria

The Chi-square values for both cars and televisions were statistically significant at $p < 0.001$ level (see Table I). However, the Chi-square test becomes less reliable and has a great tendency to indicate significant differences when sample sizes are outside of the range from 100 to 200 (Hair *et al.*, 1998). Hence, other measures were also examined. The GFI values for both cars (Toyota 0.90; Mitsubishi 0.92; Suzuki 0.91) and televisions (Sony 0.89; Toshiba 0.89; Hitachi 0.90) were higher than or very near to the cut-off value of 0.9 (see Table I). The GFI values indicated an acceptable level of fit for each model. The RMSEA values were just within the acceptable range of 0.080 or less, for both cars (Toyota 0.078; Mitsubishi 0.068; Suzuki 0.072) and televisions (Sony 0.077; Toshiba 0.076; Hitachi 0.071). Thus, the RMSEA values also indicated an acceptable level of fit for each model. All the absolute fit measures indicated an acceptable level fit for the proposed model, in each of the six analyses.

The TLI values for both cars (Toyota 0.95; Mitsubishi 0.96; Suzuki 0.94) and televisions (Sony 0.94; Toshiba 0.93; Hitachi 0.94) indicated excellent fit and were well above the cut-off value of 0.9 (see Table I). Similarly, the IFI values were also much higher than the cut-off value of 0.9 for both cars (Toyota 0.96; Mitsubishi 0.97; Suzuki 0.96) and televisions (Sony 0.95; Toshiba 0.94; Hitachi 0.95). The CFI values for both cars (Toyota 0.96; Mitsubishi 0.97; Suzuki 0.96) and televisions (Sony 0.95; Toshiba 0.94; Hitachi 0.95) were well above the cut-off value of 0.9. Thus, all the incremental fit measures exceeded the heuristic critical value of 0.9 and further supported the acceptance of the proposed model.

The normed Chi-square values for both cars (3.34 for Toyota, 2.79 for Mitsubishi, 3.13 for Suzuki) and televisions (3.36 for Sony, 3.34 for Toshiba and 2.90 for Hitachi) were around 3.0 and were well below the upper cut-off value of 5.0 (see Table I). The parsimonious fit measure selected indicated an acceptable level of model parsimony. The normalised residuals were examined. None of the normalised residuals exceeded the value of $+2.58$.

Measurement model parameter estimates

After establishing that the hypothesised model fitted the data reasonably well, for all brands, we assessed the parameter estimates of the measurement model. Correlated factors were hypothesised in the model. The parameter estimates, along with their associated bootstrap standard errors are summarised in Table II, which show that all indicator variables loaded their hypothesised factors in a statistically significant ($p < 0.05$) manner. The respective matrices of construct correlations appear in Tables III and IV. In all cases, parameter estimates fell well outside the range of $+2$ bootstrap standard errors, indicating a significant non-zero estimate.

Reliability

As discussed earlier, the reliability for the exogenous construct brand awareness was fixed at 0.80 since the brand awareness construct had a single indicator[3]. Each of the three exogenous constructs (brand associations, perceived quality and brand loyalty) exceeded the suggested level of 0.70 for reliability, for both cars and televisions (see Tables III and IV). All three exogenous constructs exceeded the suggested level of 0.50 for variance extracted in the selected product categories of cars and televisions. The average variance extracted for each dimension was greater than the squared correlation between the dimension and any other dimension, indicating the discriminability of the dimensions. Thus, reliability and variance extracted estimates indicated that all the specified indicators were sufficient in their specification of the constructs.

Table I CFA results – goodness-of-fit measures (cars and televisions)

	Car brands ($n = 285$)			Television brands ($n = 254$)		
	Toyota	Mitsubishi	Suzuki	Sony	Toshiba	Hitachi
Measures of absolute fit						
Chi-square	200.84	167.93	187.91	201.83	200.32	174.07
Degrees of freedom	60	60	60	60	60	60
Significance level	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Goodness-of-fit index	0.897	0.915	0.909	0.892	0.892	0.906
Root mean square error of approximation	0.078	0.068	0.072	0.077	0.076	0.071
Incremental fit measures						
Tucker Lewis index	0.948	0.958	0.941	0.939	0.926	0.938
Incremental fit index	0.960	0.968	0.955	0.954	0.943	0.953
Comparative fit index	0.960	0.968	0.955	0.953	0.943	0.952
Parsimonious fit measures						
Normed Chi-square	3.347	2.799	3.132	3.364	3.339	2.901

Table II CFA results – standardised parameter estimates (cars and televisions)

	Cars						Televisions					
	Toyota		Mitsubishi	Suzuki			Sony		Toshiba		Hitachi	
Dimension measure	SRW	SE	SRW	SRW	SE	SRW	SE	SRW	SE	S.E	SRW	SE
Brand awareness												
X_1 Awareness[a]	0.89*	0.01	0.89*	0.01	0.89*	0.01	0.89*	0.01	0.89*	0.01	0.89*	0.01
Brand associations												
X_2 Up-market[a]	0.69*	0.04	0.73*	0.04	0.69*	0.04	0.75*	0.05	0.76*	0.04	0.73*	0.04
X_3 Tough	0.75*	0.03	0.75*	0.03	0.73*	0.04	0.70*	0.05	0.71*	0.05	0.67*	0.05
X_4 Like the company	0.83*	0.03	0.85*	0.03	0.83*	0.03	0.84*	0.03	0.74*	0.05	0.77*	0.05
X_5 Proud to buy	0.85*	0.03	0.82*	0.03	0.85*	0.03	0.80*	0.04	0.77*	0.04	0.79*	0.03
X_6 Trust the company	0.87*	0.03	0.87*	0.02	0.84*	0.03	0.88*	0.02	0.82*	0.04	0.81*	0.04
Perceived quality												
X_7 Good quality[a]	0.91*	0.02	0.92*	0.01	0.89*	0.02	0.88*	0.03	0.87*	0.03	0.85*	0.03
X_8 Consistent quality	0.92*	0.01	0.92*	0.01	0.89*	0.02	0.89*	0.03	0.84*	0.03	0.88*	0.02
X_9 Very durable	0.91*	0.02	0.89*	0.02	0.88*	0.02	0.93*	0.01	0.89*	0.03	0.90*	0.02
X_{10} Very reliable	0.93*	0.01	0.90*	0.02	0.86*	0.02	0.95*	0.01	0.91*	0.02	0.92*	0.01
X_{11} Excellent features	0.85*	0.02	0.84*	0.03	0.79*	0.03	0.85*	0.03	0.80*	0.03	0.76*	0.04
Brand loyalty												
X_{12} Feel loyal [a]	0.89*	0.03	0.88*	0.02	0.81*	0.04	0.71*	0.04	0.84*	0.03	0.83*	0.03
X_{13} First choice	0.89*	0.02	0.89*	0.02	0.84*	0.03	0.88*	0.03	0.88*	0.03	0.88*	0.03

Notes: [a] These loadings were fixed to the value of 1.0 during the estimation process; * Deemed significant at $p < 0.05$ due to estimate falling outside the interval 0 ± 2 bootstrap standard errors; SRW, standardised regression weights; SE, bootstrap standard errors

Table III CFA results – correlation matrix of latent constructs (cars)

	Cars											
	Toyota				Mitsubishi				Suzuki			
	BA	BAS	PQ	BL	BA	BAS	PQ	BL	BA	BAS	PQ	BL
BA	*(0.80)*				*(0.80)*				*(0.80)*			
BAS	0.35	*(0.90)*			0.20	*(0.90)*			0.14	*(0.89)*		
PQ	0.36	0.74	*(0.96)*		0.20	0.75	*(0.95)*		0.11	0.72	*(0.94)*	
BL	0.35	0.76	0.80	*(0.87)*	0.16	0.74	0.76	*(0.88)*	0.20	0.73	0.78	*(0.81)*

Notes: BA = Brand awareness; BAS = Brand associations; PQ = Perceived quality and BL = Brand loyalty. Figures in parentheses show the reliability values

Table IV CFA results – correlation matrix of latent constructs (televisions)

	Televisions											
	Sony				Toshiba				Hitachi			
	BA	BAS	PQ	BL	BA	BAS	PQ	BL	BA	BAS	PQ	BL
BA	*(0.80)*				*(0.80)*				*(0.80)*			
BAS	0.26	*(0.90)*			0.28	*(0.87)*			0.19	*(0.87)*		
PQ	0.25	0.74	*(0.96)*		0.28	0.72	*(0.94)*		0.18	0.70	*(0.94)*	
BL	0.38	0.74	0.79	*(0.78)*	0.31	0.79	0.70	*(0.84)*	0.13	0.80	0.70	*(0.84)*

Notes: BA = Brand awareness; BAS = Brand associations; PQ = Perceived quality and BL = Brand loyalty. Figures in parentheses show the reliability values

Discriminant validity

To test for discriminant validity, each pair of constructs was first analysed by standard confirmatory factor analytic procedures. For each pair of constructs, a second confirmatory factor model (non-discriminance model) was compared to the standard model. For example, to test for discriminant validity of the constructs "brand awareness" and "brand associations", two factor models were compared. In the standard model, the correlation between the constructs "brand awareness" and "brand associations" was not fixed. In the non-discriminance model, the correlation between the constructs brand awareness and brand associations was fixed at 1.0. The difference in Chi-square values of the two models ($\Delta; \chi^2 = 231.12 - 201.83 = 29.29$), at the difference degrees of freedom ($\Delta DF = 61 - 60 = 1$), if significant, indicates discriminant validity of the two constructs (Shemwell and Yavas, 1999). The discriminant validity of each pair of constructs for all the six brands was tested. The results are summarised in Table V, which indicated that the four constructs exhibited discriminant validity.

Factor comparison

The factors that emerged from each of the six brands were then compared. The comparison involved the comparison of the number of factors, complexity and configuration (Rummel, 1970). The factor comparison clearly indicated that the same set of factors have been revealed across the six brands. Complexity refers to the degree to which different variables loaded on to factors. Table II showed that similar variables are loading onto similar factors to a similar degree for all the six brands. Configuration refers to the pattern and magnitude of the loadings of the variables. Table II also showed that, similar variables were loading onto similar factors for all the six brands.

The root mean square coefficients (RMSC) values for all the six brands were nearer to zero, indicating that the factors revealed by all the brands were similar in both magnitude and direction[4]. The coefficient of congruence (CC) values for all the six brands were nearer to +1.0, indicating that the factors

Table V CFA results – test of discriminant validity (cars and televisions)

Brand equity dimensions	Non-discrimination χ^2	DF	Difference $\Delta\chi^2$	ΔDF	Prob
Cars					
Toyota (Standard model: $\chi^2 = 200.84$; DF = 60)					
BA and BAS	212.35	61	11.52	1	<0.01
BA and PQ	204.82	61	3.98	1	<0.01
BA and BL	212.75	61	11.91	1	<0.01
BAS and PQ	316.62	61	115.7	1	<0.01
BAS and BL	315.63	61	114.79	1	<0.01
PQ and BL	358.56	61	157.72	1	<0.01
Mitsubishi (Standard model: $\chi^2 = 67.9$; DF = 60)					
BA and BAS	200.67	61	32.74	1	<0.01
BA and PQ	191.16	61	23.23	1	<0.01
BA and BL	190.63	61	22.70	1	<0.01
BAS and PQ	301.41	61	133.48	1	<0.01
BAS and BL	296.07	61	128.14	1	<0.01
PQ and BL	294.93	61	127.00	1	<0.01
Suzuki (Standard model: $\chi^2 = 187.91$; DF = 60)					
BA and BAS	245.79	61	57.88	1	<0.01
BA and PQ	237.84	61	49.93	1	<0.01
BA and BL	226.42	61	38.51	1	<0.01
BAS and PQ	274.08	61	86.17	1	<0.01
BAS and BL	247.66	61	59.75	1	<0.01
PQ and BL	268.35	61	80.44	1	<0.01
Televisions					
Sony (Standard model: $\chi^2 = 201.83$; DF= 60)					
BA and BAS	231.12	61	29.29	1	<0.01
BA and PQ	229.25	61	27.42	1	<0.01
BA and BL	209.39	61	7.56	1	<0.01
BAS and PQ	303.37	61	101.54	1	<0.01
BAS and BL	288.64	61	86.81	1	<0.01
PQ and BL	294.36	61	92.53	1	<0.01
Toshiba (Standard model: $\chi^2 = 200.32$; DF = 60)					
BA and BAS	218.54	61	18.22	1	<0.01
BA and PQ	213.85	61	13.53	1	<0.01
BA and BL	208.68	61	8.36	1	<0.01
BAS and PQ	301.69	61	101.37	1	<0.01
BAS and BL	261.59	61	61.27	1	<0.01
PQ and BL	260.89	61	60.57	1	<0.01
Hitachi (Standard model: $\chi^2 = 174.07$; DF = 60)					
BA and BAS	207.75	61	33.68	1	<0.01
BA and PQ	207.17	61	33.10	1	<0.01
BA and BL	205.90	61	31.83	1	<0.01
BAS and PQ	205.56	61	31.49	1	<0.01
BAS and BL	223.55	61	49.48	1	<0.01
PQ and BL	222.21	61	48.14	1	<0.01

Notes: BA = Brand awareness, BAS = Brand associations, PQ = Perceived quality and BL = Brand loyalty

revealed by the six brands had nearly perfect similarity[5]. Thus, pattern similarity as well as magnitude similarity of the factors from the six brands was established.

Conclusions and implications

The hypothesised four-factor model fitted the data well for all brands. All factor loadings were large and statistically significant. Anderson and Gerbing (1988) suggested that such statistically significant factor loadings indicate convergent validity. The overall model goodness-of-fit results and the measurement model supported the proposed four-factor model. The measures of absolute and incremental fit indicated that the model in each case was acceptable. The overall results of the confirmatory factor analysis confirmed that consumer-based brand equity was a four-dimensional construct. The six confirmatory factor analyses conducted across the brands provided consistent and comparable results.

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Despite considerable interest in the concept of consumer-based brand equity, there have been few attempts at its measurement and scale development. In addition, the available measurement scales suffer from some limitations including: the lack of distinction between the brand awareness and brand associations dimensions, the inclusion of non-discriminant indicators and usage of student samples. The present research addressed some of these limitations.

The study contributes to our understanding of consumer-based brand equity measurement by examining the dimensionality of this construct. The principal contribution of our findings is that they provide empirical evidence of the multidimensionality of consumer-based brand equity, supporting Aaker's (1991) and Keller's (1993) conceptualisation of brand equity.

The results of the present study established the multidimensionality of consumer-based brand equity, consistent with the conceptualisation of Aaker (1991). The four-dimensional construct found in this research was similar to Cobb-Walgren *et al.* (1995), but contrasted with the findings of other researchers. For example, Yoo and Donthu (2001, 2002) and Yoo *et al.* (2000) developed a consumer-based brand equity measure based on Aaker's (1991) and Keller's (1993) conceptualisation, but observed only three brand equity dimensions, combining the dimensions of brand awareness and brand associations into one. Washburn and Plank's (2002) study also provided results supporting this three-factor model. This warrants further investigation regarding the dimensionality of consumer-based brand equity.

The present research also enriched consumer-based brand equity measurement by incorporating the brand personality measures. Previous researchers (e.g. Yoo and Donthu, 2001) advocated including brand personality measures into the consumer-based brand equity scales.

Another improvement of the present study is the inclusion of a different set of measures (e.g. brand personality, organisational associations) for measuring brand associations. The measures of brand associations used by previous research (e.g. Yoo and Donthu, 2001) related to whether or not consumers associated with the brand. The present study measured various types of consumers' associations to the brand.

Moreover the present study relies on a sample of actual (non-student) consumers. While earlier studies were conducted using American (e.g. Yoo and Donthu, 2001, 2002; Yoo *et al.*, 2000; Washburn and Plank, 2002) and Korean (e.g. Yoo and Donthu, 2001, 2002) samples, the present study also used a sample of Australian consumers. Thus, this is one of the few studies testing Aaker's (1991) and Keller's (1993) framework of brand equity and measuring consumer-based brand equity in Australasia. Finally, the present study measured brand equity in a product category (e.g. cars), which was not used in previous studies on consumer-based brand equity measurement. Practitioners have advocated research in to the quantification of brand equity (Biel, 1993), and our research measured brand equity in a given product category for a given brand.

Limitations and future research directions

This study has several limitations that must be addressed in future research. First, the use of a single measure for brand awareness is limiting because confirmatory factor analysis requires a minimum of three indicator variables for each exogenous construct. Future researchers should aim to develop multiple measures for brand awareness.

Furthermore, confirmatory factor analysis would require indicator variables to be continuous scaled, whereas we used a dichotomous scale for measuring brand awareness. This might have biased the results. Hence, brand awareness should be measured on a continuous scale by future researchers.

Second, only items related to brand personality and organisational associations were used in the present study for measuring brand associations. Keller (1993) suggested three types of brand associations: attributes-based, benefits-based, and attitudes-based. Future researchers should incorporate items related to the above-mentioned types of associations in their measurement.

Finally, the use of a mall-intercept sample, albeit more cross sectional than student sample, limits our ability to fully generalise the findings to other samples. Future researchers endeavour to use probability samples in any further study of brand equity.

Notes

1 We adopted the approach recommended by Hayduk (1987) who suggested that when the covariance matrix is used as the input, the error variance of the unique variable associated with the single indicator variable should be fixed as per the formula:

$$\mathrm{EV}_x = (1 - r_{xx})^*(V_x)$$

where:

$\mathrm{EV}x$ = Error variance for single indicator variable$x$;
r_{xx} = Reliability of the single indicator variable;
V_x = Variance of the single indicator variable.

2 A ratio of minimum ten respondents per parameter was considered most appropriate (Hair *et al.*, 1998, p. 604) for structural equation modelling.

3 The reliability and the variance extracted were calculated as per the following formulae (Hair *et al.*, 1998, p. 624):

$$\text{Construct Reliability} = \frac{(\text{Sum of standardised loadings})^2}{(\text{Sum of standardised loadings})^2 + \text{Sum of indicator measurement error}}$$

$$\text{Variance Extracted} = \frac{\text{Sum of squared standardised loadings}}{\text{Sum of squared standardised loadings} + \text{Sum of indicator measurement error}}.$$

4 If the magnitude of RMSC is 0, the two factors being compared are similar in magnitude and direction. As RMSC departs from 0, the two factors being compared are less alike (Rummel, 1970, p. 461).

5 The value of CC varies between -1 and $+1$. A value of -1 indicates perfect negative similarity of the two factors being compared. A value of $+1$ indicates perfect similarity of the two factors being compared. A value of 0 indicates dissimilarity of the two factors being compared (Rummel, 1970, p. 461).

References

Aaker, D.A. (1989), "Managing assets and skills: the key to a sustainable competitive advantage", *California Management Review*, Vol. 31 No. 2, pp. 91-106.

Aaker, D.A. (1991), *Managing Brand Equity*, The Free Press, New York, NY.

Aaker, D.A. (1992), "Managing the most important asset: brand equity", *Planning Review*, Vol. 20 No. 5, pp. 56-8.

Aaker, D.A. (1996a), "The agency as brand architect: how today's agencies are restructuring to become better brand-builders", *American Advertising*, Vol. 12 No. 1, pp. 18-21.

Aaker, D.A. (1996b), *Building Strong Brands*, The Free Press, New York, NY.

Aaker, D.A. (1996c), "Measuring brand equity across products and markets", *California Management Review*, Vol. 38 No. 3, pp. 102-20.

Aaker, D.A. and Jacobson, R. (1994), "Study shows brand-building pays off for stockholders", *Advertising Age*, Vol. 65 No. 30, p. 18.

Aaker, J.L. (1997), "Dimensions of brand personality", *Journal of Marketing Research*, Vol. 36 No. 3, pp. 345-55.

Adams, J. (1995), "Brands at the crossroads", *American Advertising*, Vol. 11 No. 3, pp. 18-20.

Agarwal, M.K. and Rao, V.R. (1996), "An empirical comparison of consumer-based measures of brand equity", *Marketing Letters*, Vol. 7 No. 3, pp. 237-47.

Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-53.

Batra, R., Lehmann, D.R. and Singh, D. (1993), "The brand personality component of brand goodwill: some antecedents and consequences", in Aaker, D.A. and Biel, A.L. (Eds), *Brand Equity and Advertising: Advertising's Role in Building Strong Brands*, Lawrence Erlbaum Associates, London, pp. 83-96.

Biel, A.L. (1993), "Converting image into equity", in Aaker, D.A. and Biel, A.L. (Eds), *Brand Equity and Advertising: Advertising's Role in Building Strong Brands*, Lawrence Erlbaum Associates, London, pp. 67-81.

Brasco, T.C. (1988), "How brand names are valued for acquisition?", in Leuthesser, L. (Ed.), *Defining, Measuring and Managing Brand Equity: A Conference Summary Report*, No. 88-104, Marketing Science Institute, Cambridge, MA.

Chaudhuri, A. and Holbrook, M.B. (2001), "The chain of effects from brand trust and brand affect to brand performance: the role of brand loyalty", *Journal of Marketing*, Vol. 65 No. 2, pp. 81-93.

Chou, C. and Bentler, P.M. (1995), "Estimates and tests in structural equations modeling", in Hoyle, R.H. (Ed.), *Structural Equation Modeling: Concepts, Issues and Applications*, Sage, Thousand Oaks, CA, pp. 37-55.

Cobb-Walgren, C.J., Beal, C. and Donthu, N. (1995), "Brand equity, brand preferences, and purchase intent", *Journal of Advertising*, Vol. 24 No. 3, pp. 25-40.

Crawford, M. (1993), *New Products Management*, Irwin, Homewood, IL.

Crimmins, J.C. (1992), "Better measurement and management of brand value", *Journal of Advertising Research*, Vol. 32 No. 4, pp. 11-19.

Cudeck, R. (1989), "Analysis of correlation matrices using covariance structure models", *Psychological Bulletin*, Vol. 105 No. 2, pp. 317-27.

de Chernatony, L. and McDonald, M. (1998), *Creating Powerful Brands in Consumer, Service and Industrial Markets*, 2nd ed., Butterworth-Heinemann, Woburn, MA.

Farquhar, P.H. (1989), "Managing brand equity", *Marketing Research*, Vol. 1 No. 3, pp. 24-33.

Green, P.E. and Srinivasan, V. (1978), "Conjoint analysis in consumer research: issues and outlook", *Journal of Consumer Research*, Vol. 5 No. 2, pp. 103-23.

Green, P.E. and Srinivasan, V. (1990), "Conjoint analysis in marketing: new developments with implications for research and practice", *Journal of Marketing*, Vol. 54 No. 4, pp. 3-19.

Hair, J.F. Jr, Anderson, R.E., Tatham, R.L. and Black, W.C. (1998), *Multivariate Data Analysis*, 5th ed., Prentice-Hall, Upper Saddle River, NJ.

Hayduk, L.A. (1987), *Structural Equation Modeling with LISREL: Essentials and Advances*, Johns Hopkins University Press, Baltimore, MD.

Hoyle, R.H. and Panter, A. (1995), "Writing about structural equation models", *Structural Equation Modeling: Concepts, Issues, and Applications*, Sage, Thousand Oaks, CA, pp. 158-76.

Kamakura, W. and Russell, G.J. (1989), "A probabilistic choice model for market segmentation and elasticity structure", *Journal of Marketing Research*, Vol. 26 No. 4, pp. 379-90.

Kamakura, W. and Russell, G.J. (1993), "Measuring brand value with scanner data", *International Journal of Research in Marketing*, Vol. 10 No. 1, pp. 9-22.

Kapferer, J.N. (1994), *Strategic Brand Management: New Approaches to Creating and Evaluating Brand Equity*, The Free Press, New York, NY.

Keller, K.L. (1993), "Conceptualizing, measuring and managing customer-based brand equity", *Journal of Marketing*, Vol. 57 No. 1, pp. 1-22.

Keller, K.L. (1998), *Strategic Brand Management: Building Measuring and Managing Brand Equity*, Prentice-Hall, Upper Saddle River, NJ.

Keller, K.L. (1999), "Managing brands for the long run: brand reinforcement and revitalization strategies", *California Management Review*, Vol. 41 No. 3, pp. 102-4.

Kim, D.H. and Lehmann, D.R. (1990), "The role of brand equity in modelling the impact of advertising and promotion on sales", working paper, Department of Marketing, School of Management, State University of New York, Buffalo, NY.

King, S. (1991), "Brand-building in the 1990s", *Journal of Consumer Marketing*, Vol. 8 No. 4, pp. 43-52.

Lannon, J. (1993), "Branding essentials and the new environment", *Admap*, June, pp. 17-22.

Leuthesser, L. (Ed.) (1988), *Defining, Measuring and Managing Brand Equity: A Conference Summary*, Report No. 88-104, Marketing Science Institute, Cambridge, MA.

MacKay, M.M. (2001), "Evaluation of brand equity measures: further empirical evidence", *Journal of Product & Brand Management*, Vol. 10 No. 1, pp. 38-51.

MacKay, M.M., Romaniuk, J. and Sharp, B. (1997), "A typology of brand equity research", *Proceedings of the Australia New Zealand Marketing Educators Conference (ANZMAC), 1997*, Department of Marketing, Monash University, Melbourne, pp. 1146-57.

Mahajan, V., Rao, V.R. and Srivastava, R.K. (1990), "Development, testing, and validation of brand equity under conditions of acquisition and divestment", in Maltz, E. (Ed.), *Managing Brand Equity: A Conference Summary Report*, No. 91-110, Marketing Science Institute, Cambridge, MA, pp. 14-15.

Oliver, R.L. (1997), *A Behavioral Perspective on the Consumer*, McGraw-Hill, New York, NY.

Ourusoff, A. (1992), "What's in a name?", *Financial World*, Vol. 161 No. 17, pp. 32-46.
Pappu, R. (2003), "Evaluation of a theoretical framework for explaining the interrelationships between country-of-origin effects and consumer-based brand equity", unpublished PhD thesis", New England Business School, University of New England, Armidale.
Park, C.S. and Srinivasan, V. (1994), "A survey-based method for measuring and understanding brand equity and its extendibility", *Journal of Marketing Research*, Vol. 31 No. 2, pp. 271-88.
Phau, I. and Lau, K.C. (2000), "Conceptualising brand personality: a review and research propositions", *Journal of Targeting, Measurement and Analysis for Marketing*, Vol. 9 No. 1, pp. 52-69.
Porter, M.E. (1990), *The Competitive Advantage of Nations*, Macmillan, London.
Rangaswamy, A., Burke, R. and Olive, T.A. (1993), "Brand equity and the extendibility of brand names", *International Journal of Research in Marketing*, Vol. 10 No. 1, pp. 61-75.
Rossiter, J.R. and Percy, L. (1987), *Advertising and Promotion Management*, McGraw-Hill, New York, NY.
Rummel, R.J. (1970), *Applied Factor Analysis*, North Western University Press, Evanston, IL.
Shemwell, D. and Yavas, U. (1999), "Measuring service quality in hospitals: scale development and managerial implications", *Journal of Marketing Theory and Practice*, Vol. 7 No. 3, pp. 65-75.
Shocker, A.D. and Weitz, B. (1988), "A perspective on brand equity principles and issues", in Leuthesser, L. (Ed.), *Defining, Measuring and Managing Brand Equity Report: A Conference Summary*, No. 88-104, Marketing Science Institute, Cambridge, MA, pp. 2-4.
Simon, C.J. and Sullivan, M.W. (1993), "The measurement and determinants of brand equity: a financial approach", *Marketing Science*, Vol. 12 No. 1, pp. 28-52.
Sinha, A. and Pappu, R. (1998), "Parcelling of the sub components of consumer-based brand equity using factorial survey: an empirical investigation in the New Zealand consumer electronics sector", *Proceedings, Australia New Zealand Marketing Academy Conference (ANZMAC), University of Otago, Dunedin, December*, pp. 2433-8.
Sinha, A., Leszeczyc, P.P. and Pappu, R. (2000), "Measuring customer based brand equity: a survey-based methodology using hierarchical Bayes model", in Gregory, G.T. and Murphy, P.E. (Eds), *Enhancing Knowledge Development in Marketing, Vol. 11, AMA Educators' Proceedings*, *American Marketing Association*, *Chicago, IL*, *August*, pp. 156-7.
Srinivasan, V. (1979), "Network models for estimating brand-specific effects in multi-attribute marketing models", *Management Science*, Vol. 25 No. 1, pp. 11-25.
Srivastava, R.K. and Shocker, A.D. (1991), *Brand Equity: A Perspective on Its Meaning and Measurement Report*, No. 91-124, *Working Paper Series*, Marketing Science Institute, Cambridge, MA.
Steenkamp, J.E.M. and van Trijp, H.C.M. (1991), "The use of LISREL in validating marketing constructs", *International Journal of Research in Marketing*, Vol. 8 No. 4, pp. 283-99.
Swait, J., Erdem, T., Louviere, J. and Dubelaar, C. (1993), "The equalization price: a measure of consumer-perceived brand equity", *International Journal of Research in Marketing*, Vol. 10 No. 1, pp. 23-45.
Washburn, J.H. and Plank, R.E. (2002), "Measuring brand equity: an evaluation of a consumer-based brand equity scale", *Journal of Marketing Theory and Practice*, Vol. 10 No. 1, pp. 46-62.
West, S.G., Finch, J.F. and Curran, P.J. (1995), "Structural equation models with non-normal variables", in Hoyle, R.H. (Ed.), *Structural Equation Modeling: Concepts, Issues and Applications*, Sage, Thousand Oaks, CA, pp. 56-75.
Winters, L.C. (1991), "Brand equity measures: some recent advances", *Marketing Research*, Vol. 3 No. 4, pp. 70-3.
Yoo, B. and Donthu, N. (2001), "Developing and validating a multidimensional consumer-based brand equity scale", *Journal of Business Research*, Vol. 52, pp. 1-14.
Yoo, B. and Donthu, N. (2002), "Testing cross-cultural invariance of the brand equity creation process", *Journal of Product & Brand Management*, Vol. 11 No. 6, pp. 380-98.
Yoo, B., Donthu, N. and Lee, S. (2000), "An examination of selected marketing mix elements and brand equity", *Journal of the Academy of Marketing Science*, Vol. 28 No. 2, pp. 195-211.
Zeithaml, V. (1988), "Consumer perceptions of price, quality, and value: a means-end model and synthesis of the evidence", *Journal of Marketing*, Vol. 52 No. 3, pp. 2-22.

Further reading

Johnson, A.R. and Wichern, D.W. (1998), *Applied Multivariate Statistical Analysis*, 4th ed., Prentice-Hall, Upper Saddle River, NJ.

Executive summary

This executive summary has been provided to allow managers and executives a rapid appreciation of the content of this article. Those with a particular interest in the topic covered may then read the article in toto *to take advantage of the more comprehensive description of the research undertaken and its results to get the full benefit of the material present.*

Measuring brand equity – from academic interest to practical tool

The idea that the brand adds value to our product or service is fundamental to marketing. There would be little point to the investment we make in the brand if this made no contribution to the value of the business. Despite this added value being so important marketers still dry up when faced with the task of measuring its extent. To a great extent we ask our colleagues to take this added value as given which, as we all know, can prove difficult for those charged with assessing the return on investment for the business.

The first significant attempts to measure "brand equity" – as the added value from a brand became known – came when brands became important in the valuation of a company. The willingness of acquiring organisations to pay a considerable premium for a brand led to a desire for more robust measures of a brand's value and therefore of "brand equity". Initially these valuations were driven by accounting requirements rather than by any demand for measurement that might improve marketing investment. The objective was to place a value on the brand rather than to improve return on investment in marketing.

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At this stage researchers and marketers began to challenge the accountancy-led approaches to brand valuation and brand equity. Central to this argument was the focus on the consumer with marketers arguing that brand equity was "consumer-based" rather than "business-based". And, if we were to improve marketing and to secure a better return on our investment in this activity, we needed a consumer-based measure of brand equity rather than one founded on seemingly arbitrary accounting assumptions.

Consumer-based brand equity – a measurement challenge

The first stage in moving towards a consumer-based approach lay in deconstructing the brand – rather than seeing it as a monolithic whole, we needed to break down the brand into the factors that determined brand equity in the mind of the consumer. This led to a set of dimensions – awareness, associations, perceived quality, and loyalty – that can be assessed through survey research.

However, this set of dimensions were not universally accepted – for some awareness and associations should be seen as one whereas other saw that individual dimensions were, in themselves, constructed from different variables. And, depending on the approach adopted, different results emerged suggesting that the goal of a reliable and robust means of assessing brand equity remained elusive. Here, Pappu *et al.* present some further improvements and refinements to the measurement of brand equity. First, they move from the use of student samples to "real" consumers selected by mall intercept and second, they recognise that the four dimensions are themselves multi-dimensional. For example "brand associations" encompass "brand personality" (the set of human attributes associated with a brand) and organisational associations.

Pappu *et al.* confirm the existing evidence supporting the multi-dimensional nature of brand equity, an important finding given the shift from student to "real" consumer sampling. In addition the authors show that the further deconstruction of brand equity adds to the robustness and validity of the research. Again this assists the marketer by extending the scope of variables that need measuring to be sure of a proper assessment of brand equity. The authors also raise some questions directing further investigation – the design of research samples, more assessment of the distinction between awareness and association and the further deconstruction of the brand equity concept.

Moving from academic to practical in measuring brand equity

Practical marketers, when considering brand equity, need to have a degree of confidence in the measurement methodology that has not been available to date. We have watched as academics mull over the complexities of brand equity and have applied many of the concepts and adopted some of the research methods.

However, we still lack a reliable tool that can be used in assessing whether our investment in the brand is contributing to sustaining and extending brand equity. Marketers need to know what effect a given set of actions (advertising, pricing strategies, sales promotions, etc.) have had on the brand in order to begin planning the next set of actions.

Pappu *et al.*, in presenting a refinement of the approach to measuring brand equity, start to break down the divide between the academic study of the brand and the practical task of managing a set of brands. The approach here is presented lucidly and in sufficient detail to allow its adaptation for practical purposes. Given the scope of consumer market research, brand managers should be able to extract robust brand equity assessments from the data collected via assessments of advertising. This is significant since it means that marketers do not have to commit significant extra resources to the measurement of brand equity but can gain insight from the analysis of existing data.

However, there remain limitations – typical practitioner research picks up associations, awareness and perceptions of quality but is less likely to encompass a robust measure of loyalty. We tend instead to rely on market share data and scanner data as the basis for loyalty assessments. This aggregated approach is not especially helpful in determining the loyalty element of brand equity – we know consumers are (or are not) loyal in global terms, but we do not know much about individual consumers. To improve our appreciation of brand equity we need to extend the usual research to encompass direct questions relating to loyalty.

The work done by academic researchers into brand equity has increased our understanding of the brand and the manner in which it works. For marketers this value will be further extended if we begin to look at how this understanding translates into information that can help in the design and implementation of brand strategies. Pappu *et al.* take us another step towards having a consistent and reliable measure that will provide the brand information we need for our planning.

(A précis of the article "Consumer-based brand equity: improving the measurement – empirical evidence". Supplied by Marketing Consultants for Emerald.)