

Factors Affecting Customer Loyalty in the Taiwanese Imported Lumber Market

Jun-yen Lee
Tse-Wen Hsieh

Abstract

Establishing long-term relationships with Taiwanese lumber buyers generates profits and lowers costs. Marketing efforts, trust, and brand equity may be factors that strengthen relationships in this market. In this study, we assessed the relationships among these constructs using the structural equation model and data collected from a questionnaire sent to Taiwanese lumber importers. Path parameters are found to be statistically significant except for the link between brand equity and trust. Some factors must exist between these two constructs, and further exploration may be necessary in the future. The mediating effects of brand equity and trust are discovered between marketing efforts and customer loyalty. It suggests that lumber suppliers should focus marketing efforts on brand equity and customer trust in order to create customer loyalty.

Taiwan consumes approximately 400 million m³ of wood annually. More than 95 percent is imported from North America, Africa, Central America, and Southern Asia. Fierce competition between overseas suppliers occurs within the Taiwanese imported lumber market. Lower prices, shortened delivery times, and quality products in terms of wood-defect ratio are not enough to retain Taiwanese lumber importers. Marketing efforts shed light on, but may not necessarily lead to, customer loyalty within this business. Some studies show that marketing efforts lead to brand equity and trust (Aaker 1991, Biel 1993, Yoo et al. 2000, Kim and Hyun 2011) instead of customer loyalty. Other studies demonstrate that brand equity and trust antecede customer loyalty (Aaker 1991, Chaudhuri and Holbrook 2001, Taylor et al. 2004, Gounaris 2005, Jambulingam et al. 2009). In the context of the Taiwanese imported lumber market, importers may sense the foreign lumber suppliers' marketing efforts; however, their effects on customer loyalty are still inadequate. Some factors must exist that mediate between marketing efforts and customer loyalty in this market. From prior studies, we can infer that trust and brand equity are mediating factors between marketing efforts and customer loyalty in the Taiwanese imported lumber market, and therefore they are worth investigating. In this article we use the structural equation model to examine the importance of the links between marketing efforts, trust, and brand equity. We then consider the mediating effect of trust and brand equity on customer loyalty in the Taiwanese imported lumber market.

The Proposed Research Model and Hypotheses Development

Companies usually apply marketing efforts such as good product quality, physical product attributes, distribution services, and support services (Yoo et al. 2000, Bendixen et al. 2004, Van Riel et al. 2005) to achieve their objectives within competitive markets. Those efforts may add value to their products or enhance their brand image, eventually attracting potential customers. Brand equity represents value-added assets or brand assets, which can attract customers to a product (Aaker 1991, Keller 2008). Prior studies have shown that marketing efforts lead to brand equity (Bendixen et al. 2004, Van Riel et al. 2005, Kim and Hyun 2011) in the long run. Baldauf et al. (2009) prove the existence of marketing efforts on brand equity from the viewpoint of a retailer. Kim and Hyun (2011) indicate that marketing efforts positively affect brand equity within the Korean information technology software sector. Taiwanese importers choose lumber suppliers based on their brand image and reputation. Lumber suppliers' efforts to improve product quality, physical product attributes, distribution

The authors are, respectively, Professor and Research Assistant, National Chiayi Univ., Chia-Yi, 600, Taiwan (leejy@mail.ncyu.edu.tw [corresponding author], kingkevin1225@hotmail.com). This paper was received for publication in May 2011. Article no. 11-00058.

©Forest Products Society 2011.
Forest Prod. J. 61(6):489-493.

services, and support services may increase brand image and reputation (i.e., brand equity). This leads to the first research hypothesis.

H₁: Marketing efforts significantly affect brand equity

Trust shows the willingness of a customer to believe in a supplier's reliability and integrity, and it shows where the customer's confidence lies (Moorman et al. 1993, Morgan and Hunt 1994). Marketing efforts result in better product service and quality (Abratt 1986, Michell et al. 2001) and contribute to customer trust (Meldrum and Milman 1991). Lumber suppliers who consistently provide quality lumber and services build Taiwanese lumber importers' belief in suppliers' reliability and integrity. It is plausible that marketing efforts lead to customer trust in the Taiwanese imported lumber market; therefore, the second research hypothesis is stated as follows.

H₂: Marketing efforts significantly affect trust

Brand image and reputation of lumber suppliers usually capture the Taiwanese lumber importers' attention and may further lead to buyers' belief in suppliers' reliability and integrity. In other words, if suppliers consistently maintain their brand equity, then trust develops. This leads to our third research hypothesis for the Taiwanese imported lumber market.

H₃: Brand equity significantly affects trust

Buyers tend to heavily rely on prior purchasing experiences to make the next purchase. Suppliers showing reliability and integrity earn the Taiwanese lumber importers' trust. Trust is central and critical in the development (Dwyer et al. 1987, Dertouzos et al. 1989, Morgan and Hunt 1994) and as a cornerstone (Spekman 1988) of long-term relationships with customers. Other prior research depicts trust as an antecedent to loyalty (Hart and Johnson 1999, Chaudhuri and Holbrook 2001, Taylor et al. 2004, Gounaris 2005). Following this evidence, we hypothesize trust as an antecedent to customer loyalty in the Taiwanese imported lumber market. It forms the basis for the next hypothesis.

H₄: Trust significantly affects customer loyalty

Taiwanese lumber importers repeatedly purchase lumber from lumber suppliers with good brand image and reputation. Prior studies show that buyers tend to pay more and display repeat purchase behavior as brand equity increases (Aaker 1991, Keller 2008). Furthermore, Taylor et al. (2004) state that brand equity appears to be one of the most important factors influencing loyalty. Therefore, brand equity is often viewed as a source, dimension, or indicator of loyalty and creates the basis for the fifth and final hypothesis.

H₅: Brand equity significantly affects customer loyalty

The research models are based upon the above hypotheses (Fig. 1). The relationships among marketing efforts, brand equity, trust, and customer loyalty are evaluated simultaneously via analysis of covariance. The model uses

maximum likelihood (ML) estimation via analysis of moment structure (AMOS) to measure the path parameters.

Methods

Data collection

Postal questionnaires, sent to 259 Taiwanese lumber importers compiled from the Taipei World Trade Center (2009), composed the data used in the structural equation modeling analysis. Within 2 weeks, 64 responded. In spite of a follow-up letter sent to nonrespondents, only 25 more questionnaires were returned. The value of the χ^2 test, obtained by comparing the ratings of early and late respondents for nonresponse bias on, for instance, the question in the questionnaire on consistent lumber quality, was found to be insignificant ($P = 0.18$) and suggests that this survey did not have a nonresponse bias. Eighty-nine respondents are eligible for analysis after eliminating blank or incomplete surveys. The response rate is 34.36 percent. The questionnaire was composed of three parts: (1) an introduction explaining the objectives of the questionnaire; (2) multi-item questions for each construct, i.e., marketing efforts, brand equity, trust, and customer loyalty; and (3) multiple-choice questions for respondents to provide basic information.

Variable development and validation

Interviews with marketing and purchasing personnel, review of relevant literature, and previous measures were used to build the multi-item scales for each construct. The multi-item scales of marketing efforts, trust, brand, and customer loyalty are based upon the works of Yoo et al. (2000) and Van Riel et al. (2005); Sako (1992) and Miyamoto and Rexha (2004); Aaker (1991), Keller (1993, 2008), and Van Riel et al. (2005); and Baldinger and Rubinson (1996) and Chaudhuri and Holbrook (2001), respectively. Each construct and its variables (items) are measured on 7-point Likert-style scales, with anchors of 1 = strongly disagree and 7 = strongly agree. Taiwanese tend to choose the midpoint answers, i.e. "Normal," in measure scales. To prevent this bias, the authors introduced "partly agree" and "partly disagree" options in our 7-point scales.

Cronbach's α value and confirmatory factor analysis was used to assess the reliability and validity of each construct, respectively. A Cronbach's α value greater than 0.7 (this cutoff is recommended for theory testing research by Nunnally and Bernstein 1994) indicates a highly reliable construct. Confirmatory factor analysis detects unidimensionality of each construct. If values of $\chi^2/\text{degree of freedom}$ (χ^2/df), goodness-of-fit index (GFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) exceed their recommended levels, then constructs are valid (Jöreskog and Sörbom 1993). The recommended level for χ^2/df should be as small as 3, GFI and CFI should be greater than 0.8, and RMSEA should be less than 0.05. Finally, 22 variables were retained for four constructs: 10 for marketing efforts, 4 for customer equity, 3 for trust, and 5 for customer loyalty (Table 1).

Results and Discussion

All factor loadings on the latent variables (constructs) are significant. The path parameters among constructs are also significant at the 0.05 level in the proposed model except for H₃, indicating that brand equity's effect on trust is

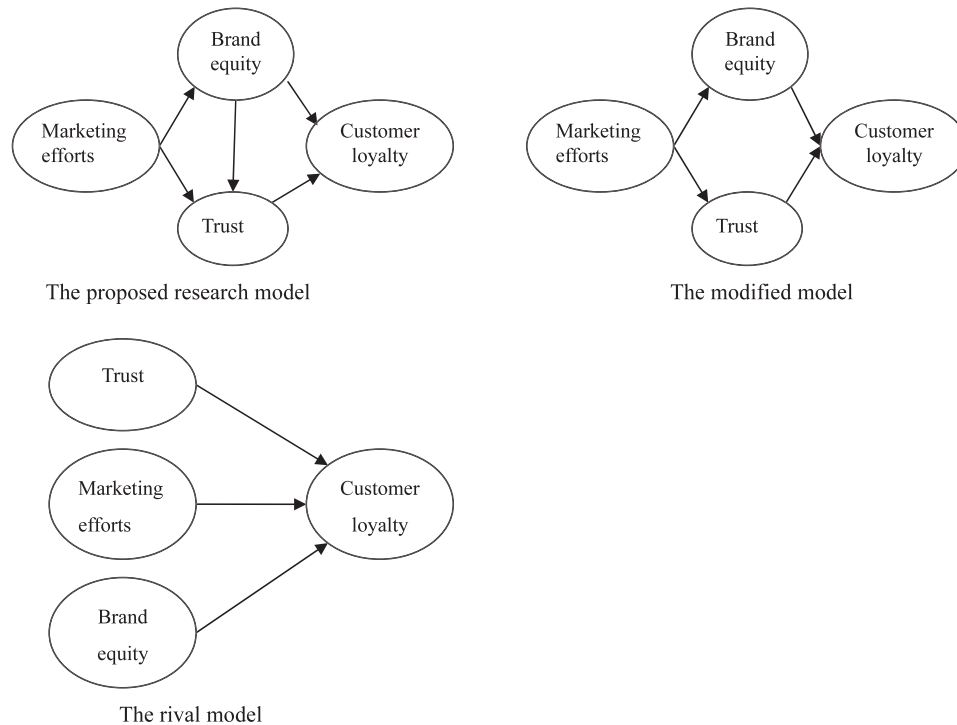


Figure 1.—The research models.

Table 1.—Reliability and validity of constructs.^a

Construct and its variables	Standardized path parameters	Mean (SD)
Marketing efforts (Cronbach's $\alpha = 0.903$)		
Supplier's lumber quality is high	0.86	4.4 (1.53)
Supplier's lumber quality is consistent	0.86	4.2 (1.63)
Supplier sends invoice by fax	0.75	5.6 (1.27)
Supplier sends invoice by e-mail	0.82	5.1 (1.61)
Supplier's lumber helps reduce production costs	0.74	4.6 (1.52)
Buyer has profits for resell	0.62	5.0 (1.14)
Buyer reduces systematic management costs	0.77	4.7 (1.42)
Supplier provides lumber supply information	0.72	5.1 (1.11)
Supplier provides clear trading documents	0.70	5.2 (1.38)
Supplier sends supplemental documents quickly	0.73	4.9 (1.35)
Fit measure $\chi^2/df = 0.877$, GFI = 0.941, CFI = 1.000, RMSEA = 0.000		
Brand equity (Cronbach's $\alpha = 0.890$)		
Supplier has a good reputation	0.84	5.4 (0.98)
Supplier is financially stable	0.87	5.3 (1.04)
Supplier is a leading edge company	0.87	5.2 (1.11)
Supplier is well known in market	0.78	5.2 (1.07)
Fit measure $\chi^2/df = 0.043$, GFI = 1.000, CFI = 1.000, RMSEA = 0.000		
Trust (Cronbach's $\alpha = 0.749$)		
Supplier helps us without any agreements	0.80	4.0 (1.40)
Supplier would like to sacrifice for us	0.73	4.0 (1.40)
Supplier treats us fairly	0.82	4.3 (1.43)
Fit measure $\chi^2/df = 0.157$, GFI = 0.999, CFI = 1.000, RMSEA = 0.000		
Customer loyalty (Cronbach's $\alpha = 0.892$)		
Buyer's first choice supplier	0.93	5.2 (1.08)
Buyer is committed to this supplier	0.91	5.1 (1.11)
Buyer intends to use supplier even if lumber price is lower elsewhere	0.60	4.7 (1.39)
Buyer continuously trades with supplier	0.87	5.3 (1.11)
Buyer intends to do business again with supplier	0.83	5.2 (1.11)
Fit measure $\chi^2/df = 0.742$, GFI = 0.987, CFI = 1.000, RMSEA = 0.000		

^a df = degrees of freedom; GFI = goodness-of-fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

insignificant and not supported by the data (Table 2). This implies that brand image and reputation may attract and capture first-time lumber buyers, but it is far from building customer trust. Roberts and Merrilees (2007) also state that branding has a minor role in building trust between suppliers and customers. In general, brand equity is used to differentiate from and gain advantages over competitors' products (Aaker 1991, Yoo et al. 2000); however, it does not guarantee trustworthiness. Repeat satisfaction in lumber purchases may be crucial in building belief in suppliers' reliability and integrity. In fact, satisfaction from past purchasing experiences increases buyers' belief in suppliers' trustworthiness (Ganesan 1994). Therefore, there is little doubt that some other constructs must exist to mediate between brand equity and trust.

By removing the path between brand equity and trust, we improve the GFI (Table 2) from 0.831 in the proposed model to 0.848 (now referred to as the modified model). Also, the χ^2/df value (1.447) for the modified model is marginally lower than that of the proposed research model (1.455). It appears that the modified model is more parsimonious than the proposed research model. The removal uses trimming techniques suggested by James et al. (1982) and adopted by Stimpert and Duhaime (1997) and Mavondo and Rodrigo (2001). The modified model eliminates the nonsignificant hypothesized relationship, i.e., the path of brand equity \rightarrow trust. All other highly significant standardized path parameters remain and support the overall structure of the modified model.

One can also develop a rival model for comparison in order to ascertain whether the research model is robust (Bollen and Long 1993). This study develops a rival model

similar to that of Morgan and Hunt (1994) and Gounaris (2005). In the rival model, marketing efforts, brand equity, and trust directly affect customer loyalty (Fig. 1). The significant level of path estimators and goodness-of-fit indices decide which model is the better fit, and it will further examine the mediating effects of brand equity and trust on customer loyalty. In other words, by comparing the direct and indirect path effects in these models, one can explore the mediating effects of brand equity and trust.

The resulting parameters and fit indices between the modified and rival models are shown in Table 2. Examining the goodness-of-fit indices, the modified model appears to be more robust when compared with the rival model. This indicates that the direct path effects of marketing efforts, brand equity, and trust on customer loyalty (rival model) are less than mediating effects of brand equity and trust between marketing efforts and customer loyalty (modified model). Furthermore, the modified model's total path effect is 0.57, which is greater than the rival model's effect of 0.38 (Table 3). Consequently, the mediating effects of brand equity and trust between marketing efforts and customer loyalty exist and are significant.

In Taiwan, lumber importers often appear to be rational and calculative. Purchase decisions tend to be based more on suppliers' reliability and products with strong brand images and reputations. The modified model suggests that loyalty of Taiwanese lumber importers is affected directly by the establishment of brand equity and trust and indirectly through marketing efforts. Marketing efforts may include providing good product quality, physical product attributes, distribution services, and support services, but attention should be on establishing brand equity and building trust to

Table 2.—Standardized path parameters and fit indices for the proposed research model, the modified model, and the rival model.^a

	Proposed research model	Modified model	Rival model
Path			
H ₁ : Marketing efforts \rightarrow brand equity	0.63***	0.64***	NA
H ₂ : Marketing efforts \rightarrow trust	0.52**	0.62***	NA
H ₃ : Brand equity \rightarrow trust	0.13	NA	NA
H ₄ : Trust \rightarrow customer loyalty	0.24*	0.25**	0.18
H ₅ : Brand equity \rightarrow customer loyalty	0.64***	0.64***	0.60***
Marketing efforts \rightarrow customer loyalty	NA	NA	0.38***
Goodness-of-fit test			
χ^2/df	1.455	1.447	1.877
GFI	0.831	0.848	0.799
CFI	0.932	0.945	0.891
RMSEA	0.072	0.071	0.100

^a *** = $P < 0.001$; ** = $P < 0.01$; * = $P < 0.05$; NA = not applicable; df = degrees of freedom; GFI = goodness-of-fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Table 3.—The path effects of marketing efforts, trust, and brand equity on customer loyalty.

	Direct path effects			Indirect path effects		Total path effects ^a
	Marketing efforts \rightarrow customer loyalty	Trust \rightarrow customer loyalty	Brand equity \rightarrow customer loyalty	Marketing efforts \rightarrow trust	Marketing efforts \rightarrow brand equity	
Modified model	NA ^b	0.25	0.64	0.62	0.64	0.57
Rival model	0.38	0.18	0.60	NA	NA	0.38

^a Total path effect is equal to the sum of path effects of marketing efforts \rightarrow trust \rightarrow customer loyalty ($0.25 \times 0.62 = 0.16$) and marketing efforts \rightarrow brand equity \rightarrow customer loyalty ($0.64 \times 0.64 = 0.41$).

^b NA = not applicable.

create customer loyalty. Brand image, reputation, reliability, and integrity are the basic components of brand equity and trust that are necessary in establishing long-term relationships with Taiwanese lumber importers.

Furthermore, if the lumber suppliers are given limited resources and have to choose between establishment of brand equity or trust, they should focus on brand equity first. This is because the weight of the path parameter from marketing efforts through brand equity to customer loyalty ($0.64 \times 0.64 = 0.41$) is higher than that of marketing efforts through trust to customer loyalty ($0.62 \times 0.25 = 0.16$).

Conclusions

In this rapidly changing competitive environment, developing long-term relationships with lumber buyers creates an advantage. This study shows that marketing efforts can shed light on, and indirectly lead to, customer loyalty via brand equity and trust in the Taiwanese imported lumber market. Brand equity and trust mediate significantly between marketing efforts and customer loyalty; furthermore, brand equity exerts more influence on customer loyalty than trust. The path parameter of brand equity to trust is not significant. It appears that some other constructs, for example, customer's perceived value or satisfaction, may exist between brand equity and trust.

Generally, managers use marketing efforts (i.e., high and consistent quality of lumber, efficient communication, adequate lumber price, and easily trading services) to attract potential long-term customers. This study establishes that customer loyalty is achieved through the fulfillment of brand equity and customer trust for the Taiwanese imported lumber market. An understanding of these relationships is of importance for the lumber suppliers and will help to clearly develop strategies to create brand equity and trust. It would be wise to invest in marketing efforts building on what customers perceive as trust and brand equity and hence indirectly building customer loyalty. With our study results, we provide a basic tool with which Taiwanese lumber suppliers can judge their marketing strategies for establishing customer loyalty and their future potential.

Literature Cited

- Aaker, D. A. 1991. *Managing Brand Equity*. Free Press, New York.
- Abratt, R. 1986. Industrial buying in high tech markets. *Ind. Mark. Manag.* 15(4):293–298.
- Baldauf, A., K. S. Cravens, A. Diamantopoulos, and K. P. Zeugner-Roth. 2009. The impact of product-country image and marketing efforts on retailer-perceived brand equity: An empirical analysis. *J. Retailing* 85(4):437.
- Baldinger, A. L. and J. Rubinson. 1996. Brand loyalty: The link between attitude and behavior. *J. Advert. Res.* 36:22–34.
- Bendixen, M., K. A. Bukasa, and R. Abratt. 2004. Brand equity in the business-to-business market. *Ind. Mark. Manag.* 33(5):371–380.
- Biel, A. L. 1993. *Brand Equity and Advertising*. Lawrence Erlbaum Associates, Hillsdale, New Jersey.
- Bollen, K. A. and J. S. Long (Eds.). 1993. *Testing Structural Equation Models*. Sage, Newbury Park, California.
- Chaudhuri, A. and M. B. Holbrook. 2001. The chain of effects from brand trust and brand affect to brand performance: The role of brand loyalty. *J. Mark.* 65(2):81–93.
- Dertouzos, M. L., K. L. Richard, and M. S. Robert. 1989. *Made in America: Regaining the Productive Edge*. MIT Press, Cambridge, Massachusetts.
- Dwyer, F. R., H. S. Paul, and S. Oh. 1987. Developing buyer–seller relationships. *J. Mark.* 51:11–27.
- Ganesan, S. 1994. Determinants of long-term orientation in buyer–seller relationships. *J. Mark.* 58(2):1–19.
- Gounaris, S. P. 2005. Trust and commitment influences on customer retention: Insights from business-to-business services. *J. Bus. Res.* 58: 126–140.
- Hart, C. W. and M. D. Johnson. 1999. Growing the trust relationship. *Mark. Manag.* 8(1):8–19.
- Jambulingam, T., R. Kathuria, and J. R. Nevin. 2009. How fairness garners loyalty in the pharmaceutical supply chain: Role of trust in the wholesaler–pharmacy relationship. *Int. J. Pharm. Healthcare Mark.* 3(4):305–322.
- James, L. R., S. A. Mulaik, and J. M. Brett. 1982. *Causal Analysis: Assumption, Model, and Data*. Sage, Beverly Hills, California.
- Jöreskog, K. G. and D. Sörbom. 1993. *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*. Scientific Software International, Chicago.
- Keller, K. L. 1993. Conceptualizing, measuring, and managing customer-based brand equity. *J. Mark.* 57(1):1–22.
- Keller, K. L. 2008. *Strategic Brand Management: Building, Measuring, and Managing Brand Equity*. 3rd ed. Pearson Education International, Upper Saddle River, New Jersey.
- Kim, J. H. and Y. J. Hyun. 2011. A model to investigate the influence of marketing-mix efforts and corporate image on brand equity in the IT software sector. *Ind. Mark. Manag.* 40(3):424–438.
- Mavondo, F. T. and E. M. Rodrigo. 2001. The effect of relationship dimensions on interpersonal and interorganizational commitment in organizations conducting business between Australia and China. *J. Bus. Res.* 52:111–121.
- Meldrum, M. and A. F. Milman. 1991. Ten risk in marketing high technology products. *Ind. Mark. Manag.* 20:1–8.
- Michell, P., J. King, and J. Reast. 2001. Brand values related to industrial products. *Ind. Mark. Manag.* 30(5):415–425.
- Miyamoto, T. and N. Rexha. 2004. Determinants of facets of customer trust a marketing model of Japanese buyer–supplier relationship. *J. Bus. Res.* 57:312–319.
- Moorman, C., R. Deshpande, and G. Zaltman. 1993. Factors affecting trust in market research relationships. *J. Mark.* 57(1):81–101.
- Morgan, R. M. and S. D. Hunt. 1994. The commitment-trust theory of relationship marketing. *J. Mark.* 58(3):20–38.
- Nunnally, J. C. and I. Bernstein. 1994. *Psychometric Theory*. 3rd ed. McGraw-Hill, New York.
- Roberts, J. and B. Merrilees. 2007. Multiple roles of brands in business-to-business services. *J. Bus. Ind. Mark.* 22(6):410–417.
- Sako, M. 1992. *Price, Quality, and Trust: Inter-firm Relation in Britain and Japan*. Cambridge University Press, Cambridge, UK.
- Spekman, R. E. 1988. Strategic supplier selection: Understanding long-term relationships. *Bus. Horizons* 31:75–81.
- Stimpert, J. L. and I. M. Duhaim. 1997. Seeing the big picture: The influence of industry, diversification, and business strategy on performance. *Acad. Manag. J.* 40(3):560–583.
- Taipei World Trade Center. 2009. *Taiwan Importers*. Taipei World Trade Center, Taipei, Taiwan.
- Taylor, S. A., K. Celuch, and S. Goodwin. 2004. The importance of brand equity to customer loyalty. *J. Product Brand Manag.* 12(415): 217–227.
- Van Riel, A. C. R., C. P. De Mortanges, and S. Streukens. 2005. Marketing antecedents of industrial brand equity: An empirical investigation in specialty chemicals. *Ind. Mark. Manag.* 34:841–847.
- Yoo, B., N. Donthu, and S. Lee. 2000. An examination of selected marketing efforts element and brand equity. *J. Acad. Mark. Sci.* 28(2): 195–211.