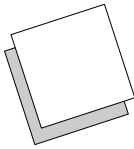


An executive summary for managers and executive readers can be found at the end of this article



Testing cross-cultural invariance of the brand equity creation process

Boonghee Yoo

Associate Professor of Marketing, Department of Marketing and International Business, Frank G. Zarb School of Business, Hofstra University, Hempstead, New York, USA

Naveen Donthu

Katherine S. Bernhardt Research Professor of Marketing, Department of Marketing, J. Mack Robinson College of Business, Georgia State University, Atlanta, Georgia, USA

Keywords *Brand equity, National cultures, Marketing, USA, Korea*

Abstract *The purpose of this study is to explore the cross-cultural generalizability of Yoo et al.'s brand equity creation process model. A two-step approach is introduced and used to test the factorial invariance of the model cross-culturally. The results reveal which marketing efforts and brand equity dimensions have invariant effects on brand equity across the US and Korean samples. Specifically, brand loyalty and perceived product quality do not have an invariant effect on brand equity, while brand awareness/associations have an equivalent effect. Price and store image show an equivalent, positive effect on perceived quality; distribution intensity has an equivalent, positive effect on both perceived quality and brand loyalty; and price deals have an equivalent, negative effect on both perceived quality and brand awareness/associations. But advertising has a quite different effect on brand equity. The between-group differences in the brand equity formation process are explained from a cultural perspective.*

Introduction

Brand equity is known to create customers' blind preference for a brand over its competing brands (Farguhar *et al.*, 1991; Simon and Sullivan, 1993) and increase the firm's value by affecting merger and acquisition decision making (Mahajan *et al.*, 1994), stock market responses (Lane and Jacobson, 1995), and the extendibility of a brand name (Rangaswamy *et al.*, 1993). But little research has investigated the antecedents of brand equity. Responding to Shocker *et al.*'s (1994, p. 157) call for a systems view of the brand equity creation process, Yoo *et al.* (2000) investigated the relationships between selected marketing mix elements and the creation of brand equity among US consumers. Their framework was an integration and expansion of previous brand equity literature.

Yoo *et al.*'s (2000) structural model of brand equity formation consists of three components: marketing mix elements selected from the traditional "4 P" marketing activity (i.e. price, store image, distribution intensity, advertising spending, and price deals), brand equity dimensions (i.e. perceived product quality, brand loyalty, and brand awareness/associations), and overall brand equity. According to the model, marketing managerial efforts can be classified into two types: brand-building activity and brand-harming activity. Specifically, frequent use of price promotions is an example of a brand-harming activity, whereas high ad spending, high price, distribution through retailers with positive store image, and high distribution

Brand equity



The research register for this journal is available at
<http://www.emeraldinsight.com/researchregisters>
The current issue and full text archive of this journal is available at
<http://www.emeraldinsight.com/1061-0421.htm>



Important implications

intensity are examples of brand-building activity. Brand-harming activity affects brand equity dimensions negatively, whereas brand-building activity affects brand equity dimensions positively. Next, each of the dimensions is positively related to overall brand equity. In summary, brand equity is created, maintained, and expanded by strengthening the dimensions of brand equity, which result from particular marketing activities.

Yoo *et al.*'s (2000) structural model of the brand equity creation process has important implications for marketing managers. Knowing how the certain marketing activities contribute to build or hurt brand equity will enable marketing managers to develop effective marketing plans. Managers need to promote brand-building activities and decrease or avoid brand-hurting activities. While the model of brand equity formation worked well as shown in its acceptable goodness-of-fit indices, one question that arises is "whose brand equity creation process was investigated?" Because the model was based on a particular market, that is, the US market, its generalizability across different markets needs to be validated. Recent emphasis in marketing is creating global brands that compete across countries and cultures. Thus, to ensure success in building strong brands (high brand-equity brands) in international markets, an understanding of the brand equity creation process in the target market is necessary. A relevant question to ask is whether there are any cultural differences in the brand equity formation process. A cross-cultural validation of the brand equity formation process is important to formulate a marketing strategy in international markets.

The main purpose of the present study is to explore the generalizability of Yoo *et al.*'s (2000) brand equity formation process and verify the model's factorial invariance in a culture that may be regarded as distinctively different from that of the USA. Korea has been popularly selected for cross-cultural validity study (e.g. Choi *et al.*, 1999) as she has developed the opposite Eastern culture, a different language, and a different history in comparison with most Western countries including the USA (Hofstede, 2001). In summary, the intent of the study is to test the extent to which the structural model of brand equity formation is invariant across US and Korean consumers.

Method

Sample and procedure

Cross-cultural comparability

As required for cross-cultural comparability, the Korean sample was drawn to match the type of Yoo *et al.*'s (2000) US sample, that was students ($n = 569$; mean age = 23.7 years) enrolled at a major state university in a metropolitan city. The US sample's ethnic origins were Caucasian (66 percent), African-US (23 percent), Hispanic (2 percent), Asian (6 percent), and of other ethnic origins (3 percent). The Korean sample ($n = 624$; mean age = 22.0 years) was drawn from two Korean universities, one in Seoul, the largest city in Korea, and the other in a moderately large city. The Korean sample of the present study was different from Yoo *et al.*'s (2000) US sample in certain aspects. For example, the Korean sample had more male students (69 percent) than the US sample (47 percent); less full-time or part-time working status (19 percent) of the US sample (50 percent). Also, the Korean sample's household size (4.2 members) was larger than the US one (3.2 members). However, such a difference may be a natural reflection of the college student populations of the USA and Korea.

The questionnaire was administered to multiple classes during regular class sessions. Participants were promised extra credits but participation was optional.

Instrumentation

Yoo *et al.*'s (2000) English version of the questionnaire was translated into Korean. Four bilinguals of Korean and English languages modified the Korean version independently until they reached consensus on its verbal equivalence with the English version. A total of 12 versions of the Korean questionnaire were produced for the same 12 brands used as stimuli in Yoo *et al.* (2000). The 12 brands were Adidas, Asics, LA Gear, Nike, Puma, and Reebok for athletic shoes; Agfa, Fuji, Kodak, and Konica for camera film; and Samsung and Sony for color television sets. The brands were selected in a way to enhance external validity of the findings across products. All of them were available in the Korean market. More importantly, a reasonable number of Korean participants reported that they had purchased the surveyed brands. For example, 26 percent (Puma) to 65 percent (Nike) of the participants purchased the athletic shoes, and 76 percent (Konica) to 94 (Kodak) percent of them purchased the camera film. Such a high purchase experience was comparable to the US sample.

Reliability coefficient

In the pretest of the Korean instrumentation in which the 202 Korean college students participated, the reliability coefficient of the constructs ranged from 0.60 (distribution intensity) to 0.95 (overall brand equity). The wording of some items were modified to eliminate ambiguity. In a main study ($n = 624$), each participant responded to one of the randomly assigned 12 versions only. The number of responses to each version ranged from 49 to 58. The reliability coefficients were satisfactory, ranging from 0.73 (distribution intensity) to 0.90 (overall brand equity).

A two-step approach to test the cross-cultural invariance of a structural model

Testing of the cross-cultural invariance of a structural model consists of two major phases:

- (1) measurement invariance test; and
- (2) structural invariance test.

For either phase, the null hypothesis is that the overall reality (i.e. data) supports the specified model (i.e. theory) across cultures. As a result, an insignificant test statistic, which in most cases is a chi-square fit statistic, is desired to confirm the model's cross-cultural invariance. This two-phase approach resembles Anderson and Gerbing's (1988) procedure of structural equation model estimation for a single sample, which also consists of two phases: measurement model and structural model. This study's two-phase procedure of testing cross-cultural invariance of a structural model embraces and expands Anderson and Gerbing's (1988) procedure by not only testing the unidimensionality of the constructs for independent cultures, but also establishing the invariance of the complete measurement model across cultures.

Invariance test procedures

Practically, we will test Yoo *et al.*'s (2000) brand equity formation model by following Byrne *et al.*'s (1989) partial invariance test procedures. First, a well-fitting baseline measurement model will be developed for each of the US sample and the Korean sample. Second, the invariance of the measurement model will be tested across the US and Korean samples. If the

model is not invariant, a partially invariant measurement model will be developed. Third, the invariance of the structural model will be tested across the US and Korean samples. If the model is not invariant, a partially invariant structural model will be developed to identify invariant as well as variant causal paths. As a result of these multi-step invariance-testing procedures, we will learn which marketing activities have the equivalent impact on brand equity across the US and Korean samples and which marketing activities do not.

To take “all aspects of error into account” (Jöreskog and Sörbom, 1993, p. 121) and because of no existence of best index (Marsh *et al.*, 1996, p. 315), we considered both absolute and incremental fit indices (Bollen, 1989) to evaluate the overall model fit. Throughout the tests, we used the LISREL 8 maximum likelihood method (Jöreskog and Sörbom, 1993).

Results

Baseline measurement models

Alternative models

As reported in Table I, the fit of the nine-factor measurement model based on Yoo *et al.*'s (2000, p. 211) correlation matrix of the 34 measures was marginally acceptable for the US sample ($\chi^2_{491} = 2,225.10$, CFI = 0.89, TLI = 0.88, and RMSEA = 0.077). The model fit based on the Korean data was a little less acceptable ($\chi^2_{491} = 2,557.12$, CFI = 0.87, TLI = 0.85, and RMSEA = 0.085). To have a more reasonable baseline model, the model was modified to a series of alternative models in a somewhat exploratory manner. See Table II for the correlations of US and Korean data.

In particular, modification indices (MIs) were used to improve the model. A modification index estimates the decrease of χ^2 that could be obtained when freeing its corresponding fixed parameter (Jöreskog and Sörbom, 1993). But freeing a parameter simply to improve the poor fit without theoretical supports has been heavily criticized (Cliff, 1983). Therefore, we avoided eliminating restrictions between factor loadings and between measurement errors across subscales because in this study we did not extend further theoretical investigations for measures. But, guided by modification indices, we relaxed highly correlated measurement errors within subscales one at a time and computed the χ^2 change for each.

An examination of MIs showed that for Yoo *et al.*'s (2000) US data the error correlation between two measures (AWAS4 and AWAS5) of the brand awareness/associations factor had the largest MI. With the error ($\theta_{AWAS4,AWAS5}$) relaxed, the model was substantively improved ($\Delta\chi^2 = 96.57$, $\Delta d.f. = 1$). After successively freeing five more errors with the next largest MIs within the subscales, the model had a better fit ($\chi^2 = 1,929.33$, CFI = 0.91, TLI = 0.90, and RMSEA = 0.069). For the Korean data, the largest MI among the error correlations within the subscales was 121.99 between two measures (OBE3 and OBE4) of the brand equity factor. After 11 largest-MI error correlations were freed one at a time, the model had a better fit ($\chi^2_{480} = 2,050.27$, CFI = 0.90, TLI = 0.89, and RMSEA = 0.071).

Baseline models

Model 7 for the US sample and Model 12 for the Korean sample in Table I were selected as the baseline models for the measurement invariance test. The model for each culture could have been improved further by relaxing more error correlations, but to minimize capitalization on chances, no other error correlation was relaxed. The goodness of fit was somewhat sacrificed to maintain interpretability and Yoo *et al.*'s (2000) initial assumptions on the measures. Thus, the finalized baseline models were reasonably optimal as indicated in fit indices. From the Hu and Bentler (1999) two-index

Competing models	χ^2	d.f.	$\Delta\chi^2$	Δ d.f.	CFI	TLI	GFI	SRMR	RMSEA	χ^2 /d.f.
<i>The US sample</i>										
0. Null model	16,893.41	561	–	–	–	–	–	–	–	–
1. Basic nine-factor model with $\theta_i\theta_j = 0$	2,225.10	491	–	–	0.89	0.88	0.82	0.069	0.077	4.53
2. θ_{AWAS4} , θ_{AWAS5} free	2,128.53	490	96.57	1	0.90	0.89	0.83	0.069	0.075	4.34
3. θ_{IM1} , θ_{IM2} free in addition	2,063.75	489	64.78	1	0.90	0.89	0.83	0.068	0.072	4.22
4. θ_{QL1} , θ_{QL4} free in addition	2,019.97	488	43.78	1	0.91	0.89	0.84	0.067	0.070	4.14
5. θ_{AWAS5} , θ_{AWAS6} free in addition	1,982.99	487	36.98	1	0.91	0.89	0.84	0.067	0.070	4.07
6. θ_{PR1} , θ_{PR3} free in addition	1,955.70	486	27.29	1	0.91	0.90	0.84	0.065	0.069	4.02
7. θ_{QL1} , θ_{QL5} free in addition	1,929.33	485	26.37	1	0.91	0.90	0.84	0.064	0.069	3.98
<i>The Korean sample</i>										
0. Null model	16,528.08	561	–	–	–	–	–	–	–	–
1. Basic nine-factor model with $\theta_i\theta_j = 0$	2,557.12	491	–	–	0.87	0.85	0.80	0.060	0.085	5.21
2. θ_{OBEB3} , θ_{OBE4} free	2,435.13	490	121.99	1	0.88	0.86	0.81	0.060	0.082	4.97
3. θ_{AWAS1} , θ_{AWAS2} free in addition	2,359.57	489	75.56	1	0.88	0.87	0.81	0.059	0.080	4.83
4. θ_{QL4} , θ_{QL6} free in addition	2,293.16	488	66.41	1	0.89	0.87	0.82	0.059	0.078	4.70
5. θ_{QL5} , θ_{QL6} free in addition	2,255.44	487	37.72	1	0.89	0.87	0.82	0.058	0.077	4.63
6. θ_{AWAS3} , θ_{AWAS5} free in addition	2,217.99	486	37.45	1	0.89	0.87	0.83	0.058	0.076	4.56
7. θ_{QL2} , θ_{QL3} free in addition	2,188.09	485	29.90	1	0.89	0.83	0.83	0.057	0.075	4.51
8. θ_{QL4} , θ_{QL5} free in addition	2,157.54	484	30.55	1	0.90	0.88	0.83	0.057	0.074	4.46
9. θ_{AWAS1} , θ_{AWAS5} free in addition	2,132.30	483	25.24	1	0.90	0.88	0.84	0.057	0.073	4.41
10. θ_{AD1} , θ_{AD3} free in addition	2,109.24	482	23.06	1	0.90	0.88	0.84	0.057	0.072	4.38
11. θ_{PR1} , θ_{PR3} free in addition	2,075.85	481	33.39	1	0.90	0.88	0.84	0.057	0.071	4.32
12. θ_{AWAS3} , θ_{AWAS6} free in addition	2,050.27	480	25.28	1	0.90	0.89	0.84	0.057	0.071	4.27

Notes: CFI = the comparative fit index, TLI = the Tucker and Lewis (1973) nonnormed index (TLI), GFI = the goodness-of-fit index, SRMR = the standardized root mean square residual, and RMSEA = the root mean square error of approximation

Table I. Sequential development of baseline models

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34		
1. QLI1	1.	0.59	0.64	0.59	0.52	0.29	0.17	0.17	0.13	0.12	0.12	0.15	0.23	0.26	0.08	0.25	0.30	0.24	0.21	0.30	0.26	0.27	0.52	0.56	0.42	0.15	0.14	0.07	0.26	0.21	0.19	-0.05	-0.06	-0.06		
2. QLI2	0.83	1.	0.77	0.64	0.55	0.28	0.33	0.30	0.32	0.08	0.12	0.22	0.28	0.16	0.09	0.37	0.39	0.32	0.28	0.08	0.10	0.05	0.38	0.37	0.29	0.17	0.17	0.10	0.16	0.15	0.12	-0.06	-0.03	0.00		
3. QLI3	0.70	0.78	1.	0.67	0.57	0.31	0.33	0.31	0.29	0.12	0.12	0.24	0.27	0.22	0.11	0.42	0.43	0.29	0.26	0.08	0.14	0.06	0.43	0.38	0.32	0.20	0.23	0.16	0.22	0.19	0.18	-0.09	-0.09	-0.05		
4. QLI4	0.70	0.81	0.70	1.	0.41	0.46	0.38	0.37	0.35	0.22	0.20	0.27	0.28	0.34	0.20	0.42	0.48	0.33	0.33	0.10	0.13	0.09	0.44	0.41	0.35	0.24	0.22	0.17	0.25	0.19	0.28	0.03	-0.06	-0.06		
5. QLI5	0.69	0.75	0.71	0.78	1.	0.02	0.20	0.19	0.19	-0.02	0.02	0.13	0.14	0.04	-0.04	0.26	0.27	0.29	0.26	0.18	0.07	0.17	0.24	0.35	0.24	0.09	0.06	0.04	0.04	0.03	0.04	0.03	0.04	0.04		
6. QLI6	0.55	0.51	0.50	0.52	0.50	1.	0.15	0.10	0.07	0.21	0.15	0.13	0.16	0.23	0.29	0.13	0.14	0.09	0.06	0.10	0.23	0.07	0.29	0.19	0.25	0.02	-0.01	0.05	0.08	0.11	-0.13	-0.29	-0.21			
7. LO1	0.49	0.44	0.32	0.36	0.43	0.29	1.	0.79	0.78	0.20	0.24	0.36	0.38	0.17	0.13	0.55	0.58	0.52	0.48	-0.20	-0.16	-0.24	0.10	0.06	-0.05	0.30	0.33	0.15	0.22	0.21	0.28	-0.03	-0.01	-0.01		
8. LO2	0.53	0.51	0.37	0.42	0.49	0.32	0.79	1.	0.75	0.18	0.16	0.32	0.35	0.14	0.14	0.52	0.55	0.50	0.44	-0.17	-0.18	-0.17	0.11	0.11	0.00	0.29	0.33	0.09	0.19	0.17	0.22	-0.05	-0.01	-0.05		
9. LO3	0.34	0.29	0.18	0.22	0.31	0.14	0.72	0.76	1.	0.09	0.12	0.30	0.29	0.07	0.10	0.58	0.61	0.58	0.54	-0.10	-0.13	-0.12	0.08	0.09	0.00	0.34	0.39	0.15	0.14	0.21	0.21	-0.01	0.05	0.04		
10. AWAS1	0.46	0.35	0.37	0.40	0.40	0.37	0.27	0.31	0.15	1.	0.80	0.66	0.61	0.69	0.47	0.20	0.21	0.11	0.10	0.14	0.13	0.11	0.14	0.11	0.12	0.00	-0.01	0.05	0.16	0.06	0.20	-0.05	-0.15	-0.17		
11. AWAS2	0.47	0.42	0.50	0.49	0.44	0.43	0.24	0.24	0.10	0.84	0.85	1.	0.68	0.59	0.43	0.34	0.35	0.28	0.26	0.00	0.00	0.02	0.22	0.15	0.16	0.10	0.07	0.07	0.10	0.13	0.17	-0.02	-0.06	-0.08		
12. AWAS3	0.50	0.42	0.45	0.46	0.45	0.38	0.41	0.41	0.28	0.71	0.71	0.68	1.	0.69	0.53	0.34	0.36	0.27	0.27	0.02	0.01	0.04	0.23	0.18	0.10	-0.02	0.04	0.02	0.14	0.05	0.16	-0.01	-0.03	-0.06		
13. AWAS4	0.49	0.40	0.43	0.47	0.43	0.38	0.34	0.36	0.23	0.76	0.77	0.72	0.79	1.	0.58	0.23	0.24	0.15	0.16	0.11	0.06	0.06	0.23	0.17	0.22	-0.05	-0.04	0.07	0.15	0.04	0.22	-0.03	-0.10	-0.11		
14. AWAS5	0.36	0.33	0.35	0.41	0.35	0.43	0.19	0.19	0.03	0.59	0.60	0.57	0.54	0.65	1.	0.17	0.20	0.12	0.16	-0.01	0.04	-0.01	0.14	0.04	0.03	-0.07	-0.07	-0.05	0.00	-0.04	0.07	-0.03	-0.12	-0.13		
15. AWAS6	0.40	0.35	0.26	0.27	0.34	0.22	0.34	0.22	0.54	0.56	0.51	0.23	0.26	0.22	0.26	0.23	0.12	1.	0.85	0.73	0.70	0.04	-0.01	-0.02	0.21	0.19	0.14	0.26	0.28	0.12	0.17	0.18	0.20	-0.03	-0.05	-0.10
16. OBE1	0.47	0.40	0.29	0.35	0.41	0.32	0.60	0.68	0.58	0.28	0.28	0.27	0.32	0.32	0.20	0.75	1.	0.81	0.77	0.01	-0.04	-0.03	0.22	0.21	0.12	0.29	0.34	0.13	0.19	0.20	0.24	-0.07	-0.08	-0.07		
17. OBE2	0.46	0.42	0.34	0.38	0.42	0.30	0.58	0.67	0.60	0.28	0.28	0.29	0.31	0.29	0.16	0.71	0.89	1.	0.82	0.02	-0.02	0.01	0.17	0.16	0.09	0.30	0.29	0.12	0.16	0.16	0.23	-0.01	-0.01	-0.03		
18. OBE3	0.43	0.37	0.28	0.30	0.40	0.29	0.49	0.56	0.51	0.26	0.27	0.26	0.31	0.29	0.16	0.70	0.79	0.81	1.	0.04	-0.01	0.00	0.10	0.10	0.09	0.27	0.26	0.12	0.16	0.18	0.24	-0.03	-0.03	-0.03		
19. OBE4	0.36	0.27	0.26	0.29	0.29	0.29	0.15	0.19	0.06	0.16	0.19	0.20	0.21	0.18	0.17	0.14	0.14	0.10	0.11	1.	0.67	0.86	0.29	0.33	0.36	-0.10	-0.05	-0.07	0.22	0.15	0.02	-0.11	-0.15	-0.08		
20. PR1	0.36	0.31	0.30	0.33	0.33	0.38	0.12	0.17	-0.01	0.24	0.26	0.29	0.25	0.24	0.28	0.09	0.12	0.12	0.05	0.69	1	0.56	0.28	0.25	0.29	-0.10	-0.09	-0.04	0.16	0.19	0.02	-0.16	-0.29	-0.10		
21. PR2	0.25	0.24	0.21	0.24	0.26	0.22	0.13	0.19	0.02	0.10	0.12	0.16	0.17	0.12	0.14	0.12	0.14	0.12	0.11	0.81	0.61	1.	0.23	0.34	0.32	-0.06	0.02	-0.09	0.19	0.19	0.05	-0.09	-0.11	-0.04		
22. PR3	0.42	0.35	0.34	0.36	0.37	0.24	0.12	0.11	0.06	0.33	0.34	0.33	0.30	0.30	0.37	0.25	0.14	0.18	0.17	0.20	0.20	0.22	0.20	1.	0.77	0.55	0.07	0.06	-0.06	0.17	0.09	0.12	-0.01	-0.09	-0.04	
23. IM1	0.39	0.31	0.29	0.32	0.33	0.24	0.09	0.10	0.01	0.26	0.25	0.27	0.22	0.28	0.18	0.10	0.16	0.15	0.17	0.15	0.22	0.16	0.77	1.	0.60	0.11	0.12	-0.04	0.20	0.17	0.13	0.01	0.01	0.04		
24. IM2	0.32	0.32	0.38	0.39	0.33	0.32	0.06	0.03	-0.07	0.43	0.42	0.50	0.38	0.39	0.38	0.09	0.11	0.12	0.13	0.10	0.18	0.10	0.57	0.47	1.	0.00	0.05	0.04	0.19	0.15	0.07	-0.08	-0.12	-0.07		
25. IM3	0.40	0.39	0.27	0.35	0.39	0.25	0.46	0.53	0.39	0.14	0.17	0.15	0.25	0.21	0.14	0.34	0.43	0.43	0.37	0.14	0.19	0.18	0.11	0.10	0.09	1.	0.82	0.39	0.39	0.46	0.47	0.15	0.14	0.16		
26. DI1	0.34	0.34	0.25	0.33	0.33	0.18	0.41	0.49	0.41	0.09	0.13	0.12	0.26	0.19	0.08	0.38	0.43	0.41	0.40	0.11	0.12	0.13	0.14	0.08	0.89	1.	0.41	0.39	0.48	0.42	0.04	0.09	0.17	0.17	0.17	
27. DI2	0.36	0.34	0.29	0.28	0.31	0.16	0.27	0.33	0.23	0.23	0.25	0.27	0.24	0.29	0.34	0.20	0.26	0.30	0.24	0.14	0.12	0.16	0.17	0.12	0.20	0.53	0.51	1.	0.29	0.33	0.35	0.12	0.09	0.17		
28. DI3	0.49	0.48	0.35	0.38	0.39	0.36	0.43	0.47	0.34	0.31	0.34	0.35	0.40	0.44	0.26	0.34	0.41	0.37	0.34	0.31	0.31	0.33	0.24	0.22	0.17	0.48	0.47	0.47	1.	0.72	0.82	0.11	0.05	0.10		
29. AD1	0.32	0.37	0.24	0.30	0.32	0.18	0.30	0.37	0.27	0.06	0.10	0.07	0.22	0.21	0.09	0.30	0.30	0.29	0.30	0.32	0.28	0.33	0.16	0.16	0.06	0.38	0.42	0.26	0.56	1.	0.68	0.07	0.06	0.14		
30. AD2	0.43	0.46	0.35	0.41	0.40	0.36	0.45	0.48	0.36	0.25	0.30	0.29	0.38	0.37	0.25	0.33	0.37	0.32	0.32	0.31	0.31	0.24	0.21	0.17	0.47	0.46	0.40	0.83	0.63	1.	0.11	0.03	0.07	0.14		
31. AD3	0.14	0.14	0.06	0.12	0.15	-0.03	0.19	0.22	0.15	0.06	0.09	0.09	0.14	0.14	-0.03	0.14	0.19	0.22	0.15	-0.23	-0.19	-0.16	0.07	0.03	0.03	0.25	0.25	0.23	0.23	0.09	0.31	1.	0.83	0.66		
32. DLI1	-0.01	-0.05	-0.11	-0.13	-0.06	-0.17	0.15	0.15	0.14	-0.15	-0.10	-0.13	-0.02	-0.04	-0.20	0.12	0.12	0.16	0.08	-0.13	-0.13	-0.05	-0.01	0.03	-0.13	0.19	0.22	0.18	0.15	0.12	0.21	0.55	1.	0.73		
33. DLI2	-0.05	-0.14	-0.23	-0.22	-0.15	-0.23	0.05	0.06	0.10	-0.14	-0.13	-0.20	-0.10	-0.09	-0.24	0.07	0.05	0.06	0.05	-0.10	-0.16	-0.11	-0.05	0.00	-0.14	0.11	0.14	0.14	0.07	0.06	0.08	0.39	0.69	1.		
34. DLI3																																				

Notes: The left off-diagonal matrix represents the US data (n = 569) and the right off-diagonal matrix represents the Korean data (n = 624). QL = perceived quality factor; LO = brand loyalty factor; AWAS brand awareness/associations factor; OBE = overall brand equity factor; PR = price factor; IM = store image factor; DI = distribution intensity factor; AD = advertising spending factor; and DL = price deals factor

Table II. Correlations of the US and Korean data

presentation strategy viewpoint, the model achieved a relatively good fit when SRMR (US sample: 0.064; Korean sample: 0.057) and RMSEA (US sample: 0.069; Korean sample: 0.071) were jointly considered.

In addition, as reported in Table III, the scale composite reliability and the average variance extracted for each construct were quite reasonable (Fornell and Larcker, 1981). The composite reliability (ρ_c), that is, internal consistency reliability measures as an evidence of convergent validity, ranged from 0.74 to 0.93 for the US sample and from 0.82 to 0.93 for the Korean sample. The average variance extracted for each construct ranged from 0.50 to 0.78 for the US sample and from 0.52 to 0.78 for the Korean sample, exceeding the acceptable level of 0.50.

Measurement invariance

Testing for measurement invariance across the US and Korean samples

In this study, measurement invariance is limited to metric invariance (i.e. invariance of factor loadings), which indicates that members in different groups interpret and respond to measures in an identical manner (Meredith, 1993; Steenkamp and Baumgartner, 1998). When testing measurement invariance, the off-diagonal error correlations, which had been relaxed during the baseline model development, remained unconstrained. The fully-unconstrained model, in which the 34 factor loadings were relaxed to be different across the US and Korean samples, yielded a reasonable fit to the data ($\chi^2_{965} = 3,979.60$, CFI = 0.91, TLI = 0.89, GFI = 0.84, SRMR = 0.057, and RMSEA = 0.070). In particular, the test of closeness of RMSEA to 0.05 was insignificant ($p = 1.00$). To check whether the factor loadings were invariant across cultures, the unconstrained model was compared with the fully constrained model in which the factor loadings were specified to be the same across the US and Korean samples ($\chi^2_{999} = 4,208.11$). As reported in Table IV, the full metric invariance of the measurement model was rejected due to the significantly large chi-square difference ($\Delta\chi^2_{34} = 228.51$, $p < 0.0001$).

The failure of the full metric invariance led us to test the invariance of each of the factor loadings independently, which would detect the sources of metric inequivalence (see Byrne *et al.*, 1989). For each test, one factor loading was fixed to be invariant across the US and Korean samples and other factor loadings to be variant. Then, the chi-square difference between the measurement model with one factor loading invariant and the fully unconstrained model with all factor loadings variant tested the tenability of the hypothesis of the invariance of the focal factor loading. When the QL1 loading on perceived quality factor (i.e. $\lambda_{QL1, QL}$) was constrained to be the same across cultures, the chi-square difference between the one-factor loading constrained model and the unconstrained model was significant ($\Delta\chi^2_1 = 8.38$, $p < 0.01$), rejecting the invariance of the factor loading. For each of the remaining factor loadings, the same procedure was performed, and the invariance of the particular factor loading was estimated. As shown in Table IV, 14 factor loadings were inconsistent across cultures, whereas 20 factor loadings were equal.

A new model

All measures of brand loyalty, price, and distribution intensity were invariant for the US and Korean samples; some measures of perceived quality, brand awareness/associations, brand equity, advertising spending, and price deals were invariant; no measure of store image factor was invariant. The results of partial measurement invariance tests demonstrated which factors were specifically invariant and which factors were somewhat invariant. A new partial invariance measurement model, in which the 20 invariant measures

Perceived quality (US sample: reliability = 0.93 and VE = 0.70; Korean sample: Reliability = 0.86 and VE = 0.52)

- QL1 X is of high quality
- QL2 The likely quality of X is extremely high
- QL3 The likelihood that X would be functional is very high
- QL4 The likelihood that X is reliable is very high
- QL5 X must be of very good quality
- QL6 X appears to be of very poor quality (r)

Brand loyalty (US sample: reliability = 0.90 and VE = 0.75; Korean sample: reliability = 0.91 and VE = 0.78)

- LO1 I consider myself to be loyal to X
- LO2 X would be my first choice
- LO3 I will not buy other brands if X is available at the store

Brand associations with brand awareness (US sample: reliability = 0.93 and VE = 0.71; Korean sample: Reliability = 0.91 and VE = 0.63)

- ASAW1 I know what X looks like
- ASAW2 I can recognize X among other competing brands
- ASAW3 I am aware of X
- ASAW4 Some characteristics of X come to my mind quickly
- ASAW5 I can quickly recall the symbol or logo of X
- ASAW6 I have difficulty in imagining X in my mind (r)

Overall brand equity (OBE) (US sample: reliability = 0.93 and VE = 0.78; Korean sample: reliability = 0.93 and VE = 0.76)

- OBE1 It makes sense to buy X instead of any other brand, even if they are the same
- OBE2 Even if another brand has same features as X, I would prefer to buy X
- OBE3 If there is another brand as good as X, I prefer to buy X
- OBE4 If another brand is not different from X in any way, it seems smarter to purchase X

Price (US sample: reliability = 0.83 and VE = 0.63; Korean sample: reliability = 0.82 and VE = 0.61)

- PR1 The price of X is high
- PR2 The price of X is low (r)
- PR3 X is expensive

Store image (US sample: reliability = 0.74 and VE = 0.50; Korean sample: reliability = 0.85 and VE = 0.66)

- IM1 The stores where I can buy X carry products of high quality
- IM2 The stores where I can buy X would be of high quality
- IM3 The stores where I can buy X have well-known brands

Distribution intensity (US sample: reliability = 0.87 and VE = 0.70; Korean sample: reliability = 0.82 and VE = 0.62)

- DI1 More stores sell X, as compared to its competing brands
- DI2 The number of the stores that deal with X is more than that of its competing brands
- DI3 X is distributed through as many stores as possible

Advertising spending (US sample: reliability = 0.87 and VE = 0.70; Korean sample: reliability = 0.86 and VE = 0.68)

- AD1 X is intensively advertised
- AD2 The ad campaigns for X seem very expensive, compared to campaigns for competing brands
- AD3 The ad campaigns for X are seen frequently

Price deals (US sample: reliability = 0.80 and VE = 0.58; Korean sample: reliability = 0.90 and VE = 0.75)

- DL1 Price deals for X are frequently offered
- DL2 Too many times price deals for X are presented
- DL3 Price deals for X are emphasized more than seems reasonable

Notes: X = A focal brand; VE = The variance extracted for a construct

Table III. Operational measures and scale reliability values

Competing models	χ^2	d.f.	$\Delta\chi^2$	Δ d.f.
The unconstrained model with factor loadings variant	3,979.60	965	–	–
The constrained model with all factor loadings invariant	4,208.11	999	228.51****	34
QL1 on PQ invariant	3,987.98	966	8.38**	1
QL2 on PQ invariant	3,986.27	966	6.67**	1
QL3 on PQ invariant	3,980.00	966	0.04	1
QL4 on PQ invariant	3,982.25	966	2.65	1
QL5 on PQ invariant	3,993.76	966	14.16***	1
QL6 on PQ invariant	3,994.02	966	14.42***	1
LO1 on LO invariant	3,981.20	966	1.60	1
LO2 on LO invariant	3,982.11	966	2.51	1
LO3 on LO invariant	3,980.87	966	1.27	1
AWAS1 on AWAS invariant	3,993.42	966	13.82***	1
AWAS2 on AWAS invariant	3,985.63	966	6.03*	1
AWAS3 on AWAS invariant	3,980.70	966	1.10	1
AWAS4 on AWAS invariant	3,980.80	966	1.20	1
AWAS5 on AWAS invariant	3,979.67	966	0.07	1
AWAS6 on AWAS invariant	3,979.61	966	0.01	1
OBE1 on OBE invariant	3,983.70	966	4.10*	1
OBE2 on OBE invariant	3,979.77	966	0.17	1
OBE3 on OBE invariant	3,984.90	966	5.30*	1
OBE4 on OBE invariant	3,981.00	966	1.40	1
PR1 on PR invariant	3,979.69	966	0.09	1
PR2 on PR invariant	3,980.14	966	0.54	1
PR3 on PR invariant	3,979.60	966	0.00	1
IM1 on IM invariant	3,987.31	966	7.71**	1
IM2 on IM invariant	4,000.21	966	20.61****	1
IM3 on IM invariant	3,985.87	966	6.27*	1
DI1 on DI invariant	3,981.23	966	1.63	1
DI2 on DI invariant	3,979.68	966	0.08	1
DI3 on DI invariant	3,983.40	966	3.80	1
AD1 on AD invariant	3,982.13	966	2.53	1
AD2 on AD invariant	3,997.16	966	17.56****	1
AD3 on AD invariant	3,989.90	966	10.30**	1
DL1 on DL invariant	4,005.33	966	25.73****	1
DL2 on DL invariant	3,979.80	966	0.20	1
DL3 on DL invariant	3,979.97	966	0.37	1
The constrained model with 20 factor loadings invariant	4,013.86	985	34.26*	20

Notes: QL = perceived quality factor; LO = brand loyalty factor; AWAS = brand awareness/associations factor; OBE = overall brand equity factor; PR = price factor; IM = store image factor; DI = distribution intensity factor; AD = advertising spending factor; and DL = price deals factor; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$

Table IV. Simultaneous tests of invariance for the measurement model

were held invariant and the remaining 13 noninvariant measures were held variant, was found to be much more consistent across the US and Korean samples ($\Delta\chi^2_{20} = 34.26$, $p = 0.024$) than the fully constrained model.

Cross-cultural comparisons

This partial invariance measurement model demonstrated the reasonable similarity of the constructs across cultures, as shown in the sufficient invariance of the factor loadings, which allows meaningful cross-cultural comparison of the structural parameters. Thus, the partial invariance measurement model was used in the following section to validate the consistency of Yoo *et al.*'s (2000) structural model using Korean data.

Equivalence of the focal path

Testing for structural invariance across the US and Korean samples

Using the partial invariance measurement model, the invariance of the 13 significant structural paths was tested across the US and Korean samples. The 13 paths, as confirmed in Yoo *et al.*'s (2000) study, consisted of three β paths connecting three endogenous factors (i.e. brand equity dimensions) to the last endogenous factor (i.e. overall brand equity) and ten γ paths selectively connecting five exogenous factors (i.e. marketing activities) to the three endogenous factors (i.e., brand equity dimensions). An unconstrained structural model, in which the 13 paths were set to be different across the US and Korean samples, was estimated. The model yielded a reasonable fit ($\chi^2_{1004} = 4,114.41$, CFI = 0.90, TLI = 0.89, GFI = 0.84, SRMR = 0.065, and RMSEA = 0.070).

To test the invariance of all the paths simultaneously, the unconstrained structural model was compared with the constrained model in which all causal paths were specified to be the same across the US and Korean samples. As shown in Table V, the chi-square difference was significant $(\Delta\chi^2)_{13} = 100.46$, $p < 0.0001$, leading to rejection of the hypothesis of an invariant pattern of causal paths. We therefore conducted a series of invariance tests of the paths independently. In each test, only one specific path was constrained to be equivalent across cultures and other paths were relaxed to vary. Then, the partial invariance structural model was compared with the unconstrained structural model to test the equivalence of the focal path. The first partial invariance model, in which the causal path from the price factor to the perceived quality factor (i.e. $\gamma_{QL, PR}$) was held invariant, demonstrated that the path was consistent across cultures as indicated in the chi-square difference $(\Delta\chi^2)_1 = 2.26$, $p > 0.05$. As summarized in Table V, the series of tests for path invariance revealed that seven of the 13 paths (i.e. one β path connecting the brand awareness/associations factor to the brand

Competing models	χ^2	d.f.	$\Delta\chi^2$	Δ d.f.
The unconstrained model with γ s and β s variant	4,114.41	1,004	–	–
The constrained model with all γ s and β s invariant	4,214.87	1,017	100.46****	13
$\gamma_{QL, PR}$ invariant	4,116.67	1,005	2.26	1
$\gamma_{QL, IM}$ invariant	4,117.77	1,005	3.36	1
$\gamma_{AWAS, IM}$ invariant	4,142.14	1,005	27.73****	1
$\gamma_{QL, DI}$ invariant	4,114.49	1,005	0.08	1
$\gamma_{LO, DI}$ invariant	4,115.43	1,005	1.02	1
$\gamma_{QL, AD}$ invariant	4,126.13	1,005	11.72***	1
$\gamma_{LO, AD}$ invariant	4,134.46	1,005	20.05****	1
$\gamma_{AWAS, AD}$ invariant	4,122.55	1,005	8.14**	1
$\gamma_{QL, DL}$ invariant	4,117.75	1,005	3.34	1
$\gamma_{AWAS, DL}$ invariant	4,116.16	1,005	1.75	1
$\beta_{OBE, QL}$ invariant	4,125.42	1,005	11.01***	1
$\beta_{OBE, LO}$ invariant	4,119.60	1,005	5.19*	1
$\beta_{OBE, AWAS}$ invariant	4,115.17	1,005	0.76	1
The constrained model with six γ s and one β invariant	4,126.15	1,011	11.74	7

Notes: QL = perceived quality factor; LO = brand loyalty factor; AWAS = brand awareness/associations factor; OBE = overall brand equity factor; PR = price factor; IM = store image factor; DI = distribution intensity factor; AD = advertising spending factor; and DL = price deals factor. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, and **** $p < 0.0001$

Table V. Simultaneous tests of invariance for the structural model

Significance of the estimates

equity factor and six γ paths) were invariant across cultures. Specifically, all the γ paths connecting the price, price deals, and distribution intensity factors to the brand equity dimensions were invariant, but no γ path connecting the advertising spending to the brand equity dimensions was invariant.

The partial invariance structural model was formed with the seven invariant causal paths constrained to be the same and the six noninvariant paths relaxed to vary across the US and Korean samples. As reported at the bottom of Table VI, the model insignificantly differed from the full unconstrained model ($\Delta\chi^2_7 = 11.74, p > 0.10$), indicating the wholesome cross-cultural equivalence of the seven causal paths. Table VI reports the LISREL completely standardized solutions of the factor loading and causal path parameters of the partial invariance structural model, and Figure 1 exhibits the invariant and noninvariant causal paths to the overall brand equity factor across the US and Korean samples.

The significance of an estimate is shown in its t -value. Both invariant and noninvariant factor-loading estimates were highly significant, as the minimum t -value was 9.64. All seven invariant causal paths were significant, as the minimum absolute t -value was 2.92. The two price deals factor paths were negative, while the remaining five paths were positive, as reported in Yoo *et al.*'s (2000) original study. All of the US six noninvariant causal paths were significant at the 0.05 level, whereas only four of the Korean sample's causal paths were significant. Specifically, the Korean sample's two insignificant paths were the advertising spending factor to both perceived quality (t -value of $\gamma_{QL, AD} = -0.17$) and brand loyalty (t -value of $\gamma_{LO, AD} = 0.63$) factors.

These findings imply that, in the Korean market, advertising may not be as effective as in the US market to change either product quality perception or brand loyalty. Likewise, other noninvariant causal paths also exhibit the existence of cross-cultural differences in effectiveness of marketing efforts. Specifically, the effect of both store image and advertising on brand awareness/associations and the effect of brand loyalty on brand equity were stronger in the US sample than in the Korean sample. On the other hand, the effect of perceived quality on brand equity was stronger in the Korean sample than in the US sample.

Managerial implications

Discussion and managerial implications

In this section, we discuss the meanings and managerial implications of our statistical findings. Particularly, the partial invariance structural model provides managers with valuable insights about similarities and differences between the US market and the non-US market's process of brand equity creation. As Figure 1 exhibits:

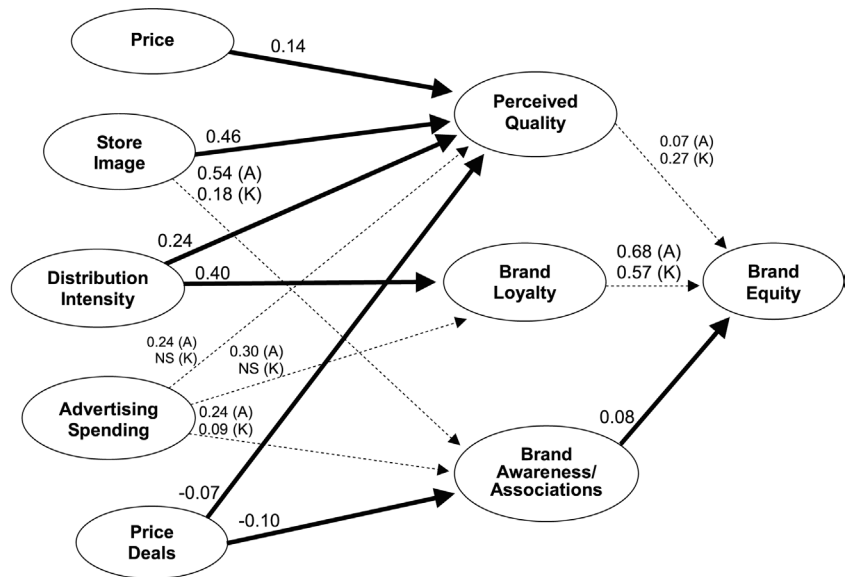
- the effect of price and distribution intensity was positive and equivalent in both markets;
- the effect of price deals on brand equity dimensions was negative and equivalent in both markets;
- the effect of store image on perceived quality was positive and equivalent in both markets, while the effect of store image on brand awareness/associations was positive in both markets but stronger in the US market;

Parameter	Accross-culture equivalencies		US sample		Korean sample	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
$\lambda_{QL1, QL}$			0.84	–	0.84	–
$\lambda_{QL2, QL}$			0.88	36.09	0.80	24.16
$\lambda_{QL3, QL}$	0.81	34.08				
$\lambda_{QL4, QL}$	0.85	33.80				
$\lambda_{QL5, QL}$			0.82	27.99	0.69	17.20
$\lambda_{QL6, QL}$			0.57	16.64	0.41	9.64
$\lambda_{LO1, LO}$	0.88	–				
$\lambda_{LO2, LO}$	0.90	42.95				
$\lambda_{LO3, LO}$	0.85	38.76				
$\lambda_{AWAS1, AWAS}$			0.84	–	0.84	–
$\lambda_{AWAS2, AWAS}$			0.89	40.46	0.87	35.61
$\lambda_{AWAS3, AWAS}$	0.89	41.92				
$\lambda_{AWAS4, AWAS}$	0.80	34.96				
$\lambda_{AWAS5, AWAS}$	0.83	37.97				
$\lambda_{IAWAS6, AWAS}$	0.65	25.07				
$\lambda_{OBE1, OBE}$			0.84	–	0.84	–
$\lambda_{OBE2, EQ}$	0.95	45.59				
$\lambda_{OBE3, EQ}$			0.94	36.62	0.82	31.82
$\lambda_{OBE4, EQ}$	0.82	35.54				
$\lambda_{PR1, PR}$	0.79	26.29				
$\lambda_{PR2, PR}$	0.85	28.06				
$\lambda_{PR3, PR}$	0.69	22.12				
$\lambda_{IM1, IM}$			0.71	16.66	0.85	25.21
$\lambda_{IM2, IM}$			0.59	13.22	0.90	27.27
$\lambda_{IM3, IM}$			0.80	18.82	0.66	17.95
$\lambda_{DI1, DI}$	0.93	40.27				
$\lambda_{DI2, DI}$	0.92	39.61				
$\lambda_{DI3, DI}$	0.51	18.12				
$\lambda_{AD1, AD}$	0.85	33.93				
$\lambda_{AD2, AD}$			0.64	17.53	0.91	25.27
$\lambda_{AD3, AD}$			0.91	30.12	0.80	25.31
$\lambda_{DL1, DL}$			0.59	14.82	0.85	27.90
$\lambda_{DL2, DL}$	0.95	39.79				
$\lambda_{DL3, DL}$	0.75	28.57				
$\gamma_{QL, PR}$	0.14	4.68				
$\gamma_{QL, IM}$	0.46	15.76				
$\gamma_{AWAS, IM}$			0.54	11.83	0.18	4.46
$\gamma_{QL, DI}$	0.24	7.61				
$\gamma_{LO, DI}$	0.40	11.75				
$\gamma_{QL, AD}$			0.24	5.37	–0.01	–0.17
$\gamma_{LO, AD}$			0.30	0.16	0.03	0.63
$\gamma_{AWAS, AD}$			0.24	5.63	0.09	1.98
$\gamma_{QL, DL}$	–0.07	–2.92				
$\gamma_{AWAS, DL}$	–0.10	–3.46				
$\beta_{OBE, QL}$			0.07	1.72	0.27	7.05
$\beta_{OBE, LO}$			0.68	16.19	0.57	15.22
$\beta_{OBE, AWAS}$	0.08	3.34				

Notes: QL = perceived quality factor; LO = brand loyalty factor; AWAS = brand awareness/associations factor; OBE = overall brand equity factor; PR = price factor; IM = store image factor; DI = distribution intensity factor; AD = advertising spending factor; and DL = price deals factor

Table VI. CFA maximum likelihood estimates (completely standardized solutions) and t-values

- the effect of advertising spending on brand equity dimensions was not equivalent in both markets, while it was substantively positive in the US market but insignificant except for the impact on brand awareness/associations in the Korean market;



Note: Solid arrows represent invariant paths and broken paths represent noninvariant paths. NS = not significant at 0.05 level. (A) = the American sample. (K) = the Korean sample

Figure 1. Invariant and non-invariant causal paths to brand equity across the US and Korean samples

- the impact of perceived quality and brand loyalty on brand equity was positive but not equivalent in both markets; and
- the effect of brand awareness/associations on brand equity was positive and equivalent in the two markets.

Several observations

Several observations can be made about the brand equity formation process in the two markets. First, the invariant causal paths from marketing efforts (particularly, price and store image) to product quality are consistent with Dawar and Parker's (1994) study of marketing universals, which are defined as "segment- and product-specific consumer behaviors that are invariant across cultures or countries" (p. 81). Based on 640 MBA students' samples from 38 Western industrialized countries and Japan, Dawar and Parker (1994) found that across countries consumers commonly use brand name, price, physical appearance, and retailer reputation as signals of product quality. The price-perceived quality relationship is well established through empirical research. Consumers believe that price connotes product quality because severe competition in the market enforces a natural ordering of competing products in terms of prices (Dodds *et al.*, 1991). According to congruity theory, consumers' inference that retailer reputation is highly associated with the quality of products is a means to reduce cognitive dissonance (Grewal *et al.*, 1998). Such an inference is not irrational because store reputation is built not only on physical atmosphere and services of the store, but also on actual quality of the products offered by the store (Zimmer and Golden, 1988). Category-based information processing theory also explains the relationship between retailer reputation and product quality (see Keaveney and Hunt, 1992). When store features or cues are provided, consumers first attempt to categorize a store into a group of similar stores that they previously experienced. Once they find a match, consumers then make inferences about the store, including the quality of the products the store carries, based on their experience with the similar stores, without analyzing each attribute of the store. Such positive relationships of product

Brand loyalty

quality perception to both price and store image were supported in the current study and found to be invariant in the US and the Korean markets.

Second, the most important brand equity dimension in both markets was brand loyalty, although the effect size of the factor was not statistically identical (US sample: $\beta_{\text{OBE, LO}} = 0.68$, t -value = 16.19; Korean sample: $\beta_{\text{OBE, LO}} = 0.57$, t -value = 15.22). In this study, brand loyalty was measured following Aaker's (1991, p. 39) definition of it as "a measure of the attachment that a customer has to a brand". This construct explains why loyal customers evaluate the focal brand with unreasonable favor and show prejudice against non-focal brands. As researchers found, loyal customers show more unconditional preference for the brand than non-loyal or switching customers (Grover and Srinivasan, 1992). Such strong attachment and loyal bondage cannot be either developed or destroyed in the short run but can be created through carefully designed long-term marketing investments. Now, this study finds that brand loyalty is a stronger determinant of brand equity than perceived quality or brand awareness/associations.

Third, price promotions consistently had a negative impact on brand equity dimensions in both US and Korean samples. Specifically, price promotions negatively affected both perceived quality ($\gamma_{\text{QL, DL}} = -0.07$, t -value = -2.92) and brand awareness/associations ($\gamma_{\text{QL, DL}} = -0.10$, t -value = -3.46). This confirms that price promotions erode brand equity over time and achieve only short-term financial gains by encouraging sales and brand switching (Gupta, 1988). In the long run, frequent price promotions convey a negative brand image, resulting from unstable quality and confusing price fluctuations (Winer, 1986). This negative effect of price promotions on brand equity formation was found to be consistent in both the US and Korean samples. Therefore, price promotions must be used with great caution cross-culturally.

Perceived quality

Fourth, perceived quality had a greater impact on brand equity in the Korean sample ($\beta_{\text{OBE, QL}} = 0.27$, t -value = 7.05) than in the US market ($\beta_{\text{OBE, QL}} = 0.07$, t -value = 1.72). Such a difference may be a result of the cultural differences between the countries. For example, according to Hofstede (2001), Korea is a society of strong uncertainty avoidance, and the USA is a society of weak uncertainty avoidance. In Hofstede's (2001) uncertainty avoidance index, Korea was ranked 16th out of the 53 nations surveyed and the USA was ranked 43rd. Defined as "the extent to which the members of a culture feel threatened by uncertain or unknown situations" (Hofstede 2001), uncertainty avoidance evaluates the way in which members of societies respond to the uncertainties and ambiguities embedded in everyday life. A society of weak uncertainty avoidance tends to accept uncertainty without much discomfort and takes risks easily. On the other hand, a society of strong uncertainty avoidance stresses the need to control the environment, events, and situations, requesting precise and explicit procedures. Such a cultural difference would result in different brand equity formation processes. Koreans have to physically sense the product's quality to give credit to the brand name.

Advertising

Fifth, advertising had greater impact on brand equity formation in the US sample, but in the Korean sample the impact of advertising spending was insignificant on product quality ($\gamma_{\text{QL, AD}} = -0.01$, t -value = -0.17) and brand loyalty ($\gamma_{\text{LO, AD}} = 0.03$, t -value = 0.63) and minimal on brand awareness/associations ($\gamma_{\text{AWAS, AD}} = 0.09$, t -value = 1.98). Although advertising plays a role in providing product information to reduce uncertainty, it seems less effective to persuade Korean consumers, who, living in a society of strong

uncertainty avoidance, prefer more concrete anxiety reduction mechanisms based on physical evidence rather than oral communication. In addition, another cultural difference between Koreans and Americans, for example, collectivism versus individualism, may provide some plausible explanation about why advertising has little effect in the Korean market but a strong effect in the US market. Individualism “pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family” (Hofstede 2001). Collectivism, as its opposite, “pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people’s lifetimes continue to protect them in exchange for unquestioning loyalty” (Hofstede 2001). In an individualist society, where self-concept and free will prevail, people develop a greater sense of autonomy and personal achievement as opposed to a sense of collectivism and importance of social and security needs. Also, people in an individualistic society see themselves as dominant or in control of their environment (Adler and Jelinek, 1986). Hui and Triandis (1986) conceptualized collectivism-individualism as sacrifice (subordination of personal to ingroup goals; ingroup regulation of behavior) versus hedonism (satisfying personal goals; behavior regulated by the individual). Thus, in an individualist (collectivist) society, people show more (less) independent and less (more) interdependent self. As a consequence, people in an individualist society (e.g. the USA) independently evaluate the advertising message, independently make a product purchase decision, and independently implement the decision, not relying too much on ingroup members’ opinions. In contrast, people in a collectivist society (e.g. Korea) interdependently interpret the advertising message and make an implicit or explicit joint product purchase decision conforming to ingroup members’ dominant opinions and behaviors, by which the impact of advertising is diluted. Therefore, advertising is a strong determinant of customer behavior in an individualistic society but a weak one in a collectivistic society. In summary, verbal persuasion (e.g. advertising) is an effective tool to create brand equity in the US market, whereas actual product performance (e.g. product quality and product demonstration) is an effective tool to build brand equity in the Korean market.

Cultural contexts moderate marketing efforts

Findings from this study suggest that cultural contexts significantly moderate marketing efforts and brand equity formation. As we discussed, Hofstede’s (2001) cultural dimensions of individualism and uncertainty avoidance seem to significantly affect the brand equity formation process in the international market, resulting in inconsistent impact of marketing activities on brand equity. Of course, because only two countries were compared in this study, it would be difficult to argue that the invariant causal paths will be held invariant even when data from a larger number of countries are collected and analyzed. But when more countries are studied, the role of culture will be more accurately identified, which will lead to more precise adjustments of marketing activity to build strong brands in particular international markets. Equating country and culture raises some problems because within-country heterogeneity may be as sizable as between-culture heterogeneity. When a country has cultural heterogeneity among her citizens, the true culture of the country cannot be characterized in a stereotyped fashion, due to wide variations. Then, individual differences in cultural orientation should be evaluated. While culture is an aggregate modal concept for a group of people, there is no basis on which to use strict geographic boundaries as the unit for aggregation. Therefore, measuring culture at the individual level may provide a meaningful tool for identifying cross-culturally similar groups

Strong brand equity

of people and for examining the relationships of cultural orientation to cross-cultural differences. Future research needs to investigate similarities and differences in the role of country-level culture and individual-level culture on brand equity formation process.

Conclusion

This study examined how to build strong brand equity across countries. Specifically, partial structural invariance tests revealed which marketing efforts and brand equity dimensions had invariant effects on brand equity formation across the US and Korean samples. According to the results, brand loyalty was the most important determinant of brand equity, although its effect was not the same across the Korean and US samples. The effect of perceived quality on brand equity was greater in the Korean sample than in the US sample, implying that relying on a product's quality elements would be most effective in the Korean market. Brand awareness/associations had an equivalent, positive effect on brand equity. In both markets, price and store image had an equivalent, positive effect on perceived quality; distribution had an equivalent, positive effect on both perceived quality and brand loyalty; and price deals had an equivalent, negative effect on both perceived quality and brand awareness/associations. But advertising had a quite different effect on brand equity. Advertising was a successful tool for building brand equity dimensions of perceived quality and brand loyalty in the US sample, but it failed to affect either perceived quality or brand loyalty in the Korean sample, although in both markets it had the equivalent, positive effect on brand awareness/associations.

References

- Aaker, D.A. (1991), *Managing Brand Equity*, The Free Press, New York, NY.
- Adler, N. and Jelinek, M. (1986), "Is 'organization culture' culture bound?", *Human Resource Management*, Vol. 25, Spring, pp. 73-90.
- Anderson, J.C. and Gerbing, D.W. (1988), "Structural modeling in practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-23.
- Bollen, K. (1989), *Structural Equations with Latent Variables*, John Wiley & Sons, New York, NY.
- Byrne, B.M., Shavelson, R.J. and Muthén, B. (1989), "Testing for the equivalence of factor covariance and mean structures: the issue of partial measurement invariance", *Psychological Bulletin*, Vol. 105 No. 3, pp. 456-66.
- Choi, I., Nisbett, R.E., and Norenzayan, A. (1999), "Causal attribution across cultures: variation and universality", *Psychological Bulletin*, Vol. 125 No. 1, pp. 47-63.
- Cliff, N. (1983), "Some cautions of causal modeling methods", *Multivariate Behavioral Research*, Vol. 18, pp. 115-26.
- Dawar, N. and Parker, P. (1994), "Marketing universals: consumers' use of brand name, price, physical appearance, and retailer reputation as signals of product quality", *Journal of Marketing*, Vol. 58, April, pp. 81-95.
- Dodds, W.B., Monroe, K.B. and Grewal, D. (1991), "Effects of price, brand, and store information on buyers' product evaluation", *Journal of Marketing Research*, Vol. 28, August, pp. 307-19.
- Farquhar, P.H., Han, J.Y. and Ijira, Y. (1991), *Recognizing and Measuring Brand Assets*, Working Paper Series, Report Number 91-119, Marketing Science Institute, Cambridge, MA.
- Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18, February, pp. 39-50.
- Grewal, D., Krishnan, T., Baker, J. and Borin, N. (1998), "The effect of store name, brand name and price discounts on consumers' evaluations and purchase intentions", *Journal of Retailing*, Vol. 74, Fall, pp. 331-52.

- Grover, R. and Srinivasan, V. (1992), "Evaluating the multiple effects of retail promotions on brand-loyal and brand-switching segments", *Journal of Marketing Research*, Vol. 29, February, pp. 76-89.
- Gupta, S. (1988), "Impact of sales promotions on when, what, and how much to buy", *Journal of Marketing Research*, Vol. 25, November, pp. 342-55.
- Hofstede, G. (2001), *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, 2nd ed., Sage Publications, Thousand Oaks, CA.
- Hu, L. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in conventional criteria versus new alternatives", *Structural Equation Modeling*, Vol. 6, pp. 1-55.
- Hui, C.H. and Triandis, H.C. (1986), "Individualism-collectivism: a study of cross-cultural researchers", *Journal of Cross-Cultural Psychology*, Vol. 17, pp. 225-48.
- Jöreskog, K.G. and Sörbom, D. (1993), *LISREL 8.02*, Scientific Software International, Chicago, IL.
- Keaveney, S.M. and Hunt, K.A. (1992), "Conceptualization and operationalization of retail store image: a case of rival middle-level theories", *Journal of the Academy of Marketing Science*, Vol. 20, Spring, pp. 165-75.
- Lane, V. and Jacobson, R. (1995), "Stock market reactions to brand extension announcements: the effects of brand attitude and familiarity", *Journal of Marketing*, Vol. 59, January, pp. 63-77.
- Mahajan, V., Rao, V.R. and Srivastava, R.K. (1994), "An approach to assess the importance of brand equity in acquisition decisions", *Journal of Product Innovation Management*, Vol. 11, pp. 221-35.
- Marsh, H.W., Balla, J.R. and Hau, K.T. (1996), "An evaluation of incremental fit indices: a clarification of mathematical and empirical properties", in Marcoulides, G.A. and Schumacker, R.E. (Eds), *Advanced Structural Equation Modeling Techniques*, Lawrence Erlbaum Associates, Mahwah, NJ, pp. 315-54.
- Meredith, W. (1993), "Measurement invariance, factor analysis, and factorial invariance", *Psychometrika*, Vol. 58, pp. 525-43.
- Rangaswamy, A., Burke, R. and Oliva, T.A. (1993), "Brand equity and the extendibility of brand names", *International Journal of Research in Marketing*, Vol. 10, March, pp. 61-75.
- Shocker, A.D., Srivastava, R.K. and Ruekert, R.W. (1994), "Challenges and opportunities facing brand management: an introduction to the special issue", *Journal of Marketing Research*, Vol. 31, May, pp. 149-58.
- Simon, C.J. and Sullivan, M.W. (1993), "The measurement and determinants of brand equity: a financial approach", *Marketing Science*, Vol. 12, Winter, pp. 28-52.
- Steenkamp, J.E.M. and Baumgartner, H. (1998), "Assessing measurement invariance in cross-national consumer research", *Journal of Consumer Research*, Vol. 25, pp. 78-90.
- Tucker, L.R. and Lewis, C. (1973), "A reliability coefficient for maximum likelihood factor analysis", *Psychometrika*, Vol. 38 No. 1, pp. 1-10.
- Winer, R.S. (1986), "A reference price model of brand choice for frequently purchased products", *Journal of Consumer Research*, Vol. 13, September, pp. 250-6.
- 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, April, pp. 195-211.
- Zimmer, M.R. and Golden, L.L. (1988), "Impressions of retail stores: an analysis of consumer images", *Journal of Retailing*, Vol. 64 No. 3, pp. 265-93.



This 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

Executive summary and implications for managers and executives

Brands, advertising and culture

Since brand equity is created (or destroyed) by marketing activity, it is important for marketers to understand the process of brand equity creation. Yoo and Donthu refer to the concept of marketing activity being either “brand-harming” or “brand-building”. By making this distinction marketers are able to design a marketing mix that acts to increase the brand’s value. The work developing this concept was undertaken using research in the US market and identified marketing activities that were positive in their effect on brand equity. These positive activities include high levels of advertising spend, premium pricing, distribution intensity and distribution through retailers with a positive store image.

We cannot, however, assume that what goes for US markets applies in other markets and especially in those markets with very different cultures to the USA. Yoo and Donthu explore this issue through a cross-cultural study in the USA and South Korea.

How different is South Korea?

Researchers often focus on the continuum that runs from individualism to collectivism in looking at the differences between the USA and other markets. In understanding this difference we find that US consumers are more independent in their decision making and make less reference to peer or social expectations in making such decisions.

Korean society is more collectivist than that of the USA and, as Yoo and Donthu report, there is a considerable difference in terms consumers desire to avoid uncertainty in their purchase decisions. It is clear that individuals in the USA are more willing to take risks in decision making than Korean individuals.

Clearly there are significant cultural differences between the USA and Korea and, we can safely assume that these differences are reflected in behaviour. The question for this research is whether these differences are significant enough to make the process of brand equity creation also different.

Differences and similarities

What emerges here is that there are differences between the USA and South Korea in the process of brand equity creation but that these should not be considered in isolation from the considerable similarities. Most importantly, the negative aspects of marketing (principally the reliance on price promotions) are consistent. Wherever we go in the world (it would seem) the reliance on price-driven incentives will act to damage the brand.

On the positive side however there is greater inconsistency with a greater emphasis on perceptions of quality in Korea (seen as indicative of the greater degree of uncertainty avoidance in this culture) and a corresponding lesser emphasis on the impact of advertising where Korea’s more collectivist society is seen as the main influence.

These differences are important to marketers since they will influence the balance within the marketing mix used.

How important is advertising to the promotion of brand equity?

Received wisdom in marketing is that advertising represents the dominant tool available for the development of brand equity. Advertising, in most

cases, forms the heart of the brand development strategy since it provides the primary means of shaping the message and image we wish to get across about the brand. The question thrown up by findings here is whether marketing mix strategies in collectivist countries such as Korea need a radical rethink that moves the emphasis away from a reliance on advertising.

Equally – even though advertising remains significant in the USA – we should be asking questions about the balance between advertising and other elements of the marketing mix. It is likely that, as marketing channels become more complex and varied, there will need to be a re-emphasis on distribution and channel influence.

The breadth and quality of distribution has taken second place to advertising in the eyes of many marketers. Partly this reflects the fact that getting the right distribution and channel management is pretty prosaic next to the poetry of advertising. But also it draws on the separation of distribution strategies from the wider marketing effort. Indeed the link between FMCG sales and FMCG brand marketing only takes place at a very senior level in most organizations. If the right approach to channel management is important to brand equity creation then brand managers should know and understand the processes of improving strategies in this area.

As globalisation extends the importance of channel management will increase, especially since these strategies are central to the creation of brand equity in markets – such as South Korea – where advertising is less significant as a contribution to brand equity growth.

Development or culture

There is an assumption that so-called “cultural” factors are immutable – Korean culture dictates that certain approaches work. We should also challenge this assumption since the attitudinal and behavioural differences may relate as much to the degree to which the free market has developed in a place as it does to fundamental differences in culture. Factors such as income, levels of education and the functioning of markets free from state control or interference must also come into play and these are all elements that can and do change over time. It may prove to be the case that Korean consumers become more confident and independent as their wealth, education and income rises. And we should remember that there remain significant differences between working class Americans and middle-class Americans in terms of purchase behaviour and attitudes. What we term as fundamental cultural differences may in reality be mere reflections of a society with a larger working class.

(A précis of the article “Testing cross-cultural invariance of the brand equity creation process”. Supplied by Marketing Consultants for Emerald.)