Brands as Signals: A Cross-Country Validation Study

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Abstract

This paper tests how well the information-economics view of brand equity explains consumer brand choice in countries that represent different cultural dimensions. Empirical analysis use survey and experimental data on orange juice and personal computer collected from subjects in Brazil, Germany, India, Japan, Spain, Turkey, and the United States. The results obtained provide strong empirical evidence across countries for the role of brands as signals of product positions. Additionally, the positive effect of brand credibility on choice is larger in the case of consumers that rate high on either uncertainty avoidance or collectivism. Credible brands provide more value to collectivist consumers because of being perceived as of higher quality (i.e. reinforcing group identity), while they do so to high uncertainty avoidance consumers because of lowering perceived risk and information costs.

Introduction

A brand (understood to be "a name, term, sign, symbol or design, or a combination of them which is intended to identify the goods and services of one seller or a group of sellers and to differentiate them from those of competitors", Kotler 1997, pp. 443) can potentially play many roles in consumer decision-making and choice behavior. Underlying many of the brand effects is consumer uncertainty about product attributes and/or benefits. This uncertainty arises from the imperfect and asymmetric information state that characterizes most product markets (i.e., firms are more informed about their own products than consumers).

The many roles brands play in consumer decision-making may materialize through multiple mechanisms such as psychological (e.g., associative network memory), sociological (e.g., brand communities) and economic processes (e.g., brands as signals under uncertainty) (Keller 2002). Earlier work on brands as signals under uncertainty (e.g., Erdem and Swait 1998; Wernerfelt, 1988) focused on the influence of imperfect and asymmetric information on consumer choice processes. Specifically, Erdem and Swait (1998) suggested that the clarity and credibility of brands as signals of product positions increase perceived quality, decrease consumer perceived risk and information costs, and hence increase consumer expected utility. They also discussed the antecedents to credibility and clarity. In this framework, the key characteristic of a brand signal is its credibility. Brand credibility (the credibility of a brand as a signal) is defined as the believability of the product position information contained in a brand, which depends on the willingness and ability of firms to deliver what is promised.

Most previous work utilizing information economics frameworks to explain brand credibility and brand equity focused on the United States only. The validity of existing frameworks in predicting consumer behavior in regard to brands as signals and outcomes outside

of the US is not clear. With the growing trend in the globalization of marketing activities, as well as the importance of brands in accomplishing many of these activities, there is a pressing need to explicitly address whether existing frameworks are compatible with consumer behavior outside of the US, and if not, to delimit their scope of application. Despite this practical impetus and growing theoretical interest, relatively little work examines the use of signals or extrinsic cues to judge quality across countries and/or cultures.

The purpose of this paper is two-fold. First, the paper tests how well the information economics view of brand equity explains consumer brand choice and brand equity formation in different countries. Specifically, this paper assesses the applicability of the framework proposed by Erdem and Swait (1998)[i] across countries representing different cultural dimensions. Second, we aim to highlight some differences across countries. More specifically, we attempt to explore differences in the way brands as signals operate across countries and link any such differences to consumers' cultural orientation. We believe that three of Hofstede's (1980) cultural dimensions (individual-collectivism, uncertainty avoidance and power distance) may particularly affect the way consumers use and think about brands as signals.

We conducted our analysis using survey and experimental data on orange juice and personal computers. Data on consumer brand perceptions, choices and cultural dimensions were collected from subjects in Brazil, Germany, India, Japan, Spain, Turkey, and the United States. We chose these countries to represent a wide range of Hofstede's (1980) cultural dimensions. All subjects were undergraduates in business schools (except for about half of the Brazilian sample, who were undergraduate engineering students) that participated in exchange for course credit. The results obtained provide strong empirical evidence for brands as signals of product positions, in general, and for Erdem and Swait (1998) framework, in particular, across countries that vary

along the cultural dimensions mentioned above. However, some interesting differences emerge in terms of both total credibility effects on choice, as well as the mechanisms through which brand credibility effects on utility operate.

The rest of the paper is organized as follows. The next section covers the relevant literature review and discusses the conceptual framework. We then develop a number of hypotheses to be tested and describe the empirical approach and the data collection. The last section outlines the implications of our findings and discusses future research avenues.

Literature Review and Conceptual Framework

Brands under Uncertainty

The effect of uncertainty about brand attributes (more generally, a brand's position in the attribute space) on consumer choice has been the focal point of economics approaches to brand effects. Uncertainty affects consumer perceived brand attributes, the variance of their attribute beliefs, as well as their information costs. The literature both in economics and marketing has focused on quality uncertainty, where quality is conceptualized and measured as a multi-dimensional construct (as a summary statistic of a brand's position in the space for attributes that are imperfectly observable). Aaker (1991) suggested that strong brands are associated with higher perceived quality, *ceteris paribus*, which refers to mean beliefs about quality. Uncertainty about quality also implies that there is variance of consumer beliefs of quality for a given consumer (if consumers knew quality exactly or thought they knew it exactly, this variance would be zero). This creates consumer perceived risk, while consumers tend to be risk-averse in most contexts. Risk aversion affects consumers' decision making in various ways (e.g., Rao and Bergen 1992; Shimp and Bearden 1982). Risk-averse consumers feel threatened by ambiguous and uncertain product assessments. In this context, the literature has suggested that brands can

reduce perceived risk by becoming credible and consistent symbols of product quality (Erdem and Swait 1998, Montgomery and Wernerfelt 1988).

When there is quality uncertainty, and especially in the presence of risk-aversion, consumers tend to search for more information regarding product quality before making a decision (Shimp and Bearden 1982; Money, Gilly and Graham 1998).[ii] However, such information may often not be available, not credible even if available, or even if available and credible, consumers may not be willing to bear large information costs, since utility decreases with increasing information costs. Consequently, consumers may resort to extrinsic cues, such as price, advertising or channel choice to infer product quality (Zeithaml 1988). For example, brand as a cue of quality could be particularly useful in countries (e.g., India) where the quality of the products may vary widely in a given product category (Maxwell 2001).

The signaling literature in economics focuses on which conditions make these cues into credible signals (i.e., manipulable attributes or activities of economic agents to convey information about their characteristics; see, e.g., Spence 1974). A firm can use various marketing mix elements to signal product quality: for example, charging a high price, offering a certain warranty or distributing via certain channels. Each of these actions may or may not be credible depending on market conditions, including competitive conditions and consumer behavior. However, what sets brands apart from the individual marketing mix elements as credible signals is that the former embody the cumulative effect of past marketing mix strategies and activities. This historical notion that credibility is based on the sum of past behaviors has been referred to as *reputation* in the information economics literature (see Herbig and Milewicz 1995).

Credibility is broadly defined as the believability of an entity's intentions at a particular time and is posited to have two main components: trustworthiness and expertise (Wernerfelt

1988; Rao and Ruekkert 1994). Thus, brand credibility is defined as the believability of the product information contained in a brand, which requires that consumers perceive that the brand have the ability (i.e., expertise) and willingness (i.e., trustworthiness) to continuously deliver what has been promised (in fact, brands can function as signals since – if and when they do not deliver what is promised – their brand equity will erode). The credibility of a brand has been shown to be higher for brands with higher marketing mix consistency over time and higher brand investments, *ceteris paribus* (Erdem and Swait 1998). Consistency refers to the degree of harmony and convergence among the marketing mix elements and the stability of marketing mix strategies and attribute levels over time. Brand investments, on the other hand, are resources that firms spend on brands to (1) assure consumers that brand promises will be kept and (2) demonstrate longer-term commitment to brands (Klein and Leffler 1981). Furthermore, it has also been shown that the clarity (i.e., lack of ambiguity) of the product information contained in a brand is an antecedent to brand credibility (Erdem and Swait 1998).

As also suggested by Aaker (1991), higher perceived (or expected) quality, lower information costs and lower risks associated with credible brands may increase consumer evaluations of brands. Indeed, Erdem and Swait (1998) have shown, using structural equation models, that expected utility increases with perceived quality, and decreases with perceived risk and information costs; these, in turn, are anteceded by brand credibility.

Brand Effects across Countries and Cultural Dimensions

Few previous papers studied the use of signals or extrinsic cues to judge quality across countries and/or cultures. Dawar and Parker (1994) found that there are few differences in the use of price to signify quality for a highly homogeneous segment of consumers across both Western countries and Japan. McGowan and Sternquist (1998) compared Japanese and US

consumers in terms of their price-quality schema, prestige sensitivity and value consciousness. Results suggested that price-inference behaviors may be market-universal. These studies, however, have focused on comparing consumer price-quality perceptions across developed markets. In inefficient markets, such as less-developed countries, consumers may believe in the price-quality relationship to a lesser extent because price information is less credible (Zhou, Su and Bao 2002). As a result, consumers in such markets may need to rely more on certain other signals to infer quality because other product information is less available or less reliable.

Past research has also attempted to link brand choice to a number of cultural dimensions (e.g., Trompennars and Hampden-Turner 1997, Cray and Mallory 1998; Voich 1995). Particularly, Hofstede's (1980, 1984) influential work on cross-cultural value systems identifies three aspects of cultures that can be related to brand choice: collectivism/individualism, uncertainty avoidance and power distance.[iii] Although Hofstede's research was conducted in organizational settings, the values he identifies have often been associated with consumer behavior. For example, Hofstede's values have been associated with consumer's tipping behavior (Lynn, Zinkhan and Harris 1993), country-of-origin effects on product evaluations (Gurhan-Canli and Maheswaran 2000), value-attitude relations (Gregory, Munch and Peterson 2002), persuasion effects (Aaker and Maheswaran 1997), consumer innovativeness (Steenkamp, Hofstede and Wedel 1999) and behavioral intention models (Lee and Green 1991).

The marketing literature has been particularly keen in examining the cultural dimensions of individualism and collectivism. The individualism-collectivism dimension relates brand usage to social motivations (Hofstede 1980). Cultures high in individualism tend to seek variety and hedonistic experiences, whereas cultures high in collectivism correlate more with conformity and group behavior. Roth (1995) found support for the hypotheses that collectivist cultures find

brands that reinforce group membership and affiliation more attractive, whereas individualistic cultures favor brands that reinforce their independence and provide individual gratification. Besides, collectivist societies value consensus and that makes them loyal to the dominant brand (Robinson 1996). Furthermore, research into the symbolic meaning of brands indicates that brand names are a much more important symbol of group identity in collectivistic societies (Johansson, Ronkainen and Czinkota 1994). Finally, previous literature found that the degree in which other people influence the consumer purchase decision is a factor that may affect brand attitudes across national cultures. Particularly, Nicholls et al. (1997) showed that a collectivist sub-culture (Hispanic consumers in the U.S.) tended to be more susceptible to social influence than an individualistic sub-culture (their Anglo counterparts). For example, collectivist consumers considered the influence of friends in the choice of favored brand very important.

In this research paper, given our focus on brands as signals, it is likely that the most relevant cultural mechanism is uncertainty avoidance. Uncertainty avoidance refers to "the extent to which people feel threatened by ambiguous situations and create beliefs and institutions that try to avoid these" (Hofstede and Bond 1984, p.418). This concept captures the cultural pattern of seeking stability, predictability, and low risk rather than change and new experiences (Hofstede 1984). As a consequence, consumers in cultures high in uncertainty avoidance tend to favor credible and consistent brands (Robinson 1996; Dawar and Parker 1994).

Another cultural dimension, power distance, describes the extent to which a culture fosters social inequality. Cultures high in power distance tend to emphasize prestige and wealth in shaping boundaries or vertical relationships between social and economic classes such as rich and poor, superiors and subordinates (Hofstede 1984, Inkeles 1960). If one relates the aspects of cultural power distance to consumer needs, then it appears that social brand images should be the

best fit for high power distance cultures. Past research confirms that consumers in high power distance cultures attach more importance to products' brand names than those in low power distance cultures (Bristow and Asquith 1999; Roth 1995; Robinson 1996). However, when power distance is high, consumers are also found to "distrust" authority (Hofstede 1980). More distrust of authority may diminish brand credibility effects, counterbalancing the stronger positive impact of the relationship between social status and brand names.

Applicability of Information Economics Perspective to Brand Effects across Countries and Cross-cultural Differences in the Use of Brands as Signals

Erdem and Swait 1998 have shown that brand credibility 1) increases perceived quality, 2) decreases perceived risk, and 3) decreases information costs; all three of which 4) increase consumer (expected) utility. We expect these main relationships to hold across countries but be moderated by cultural dimensions. Uncertainty avoidance is the cultural dimension that most clearly relates to brand effects as signals. Consumers from high uncertainty avoidance cultures are more likely risk averse and should have lower tolerance for ambiguity. This type of consumer tends to perceive more risk from product consumption and therefore adheres to historically tested patterns of behavior (Verhage, Yava and Green 1991). Therefore, as already indicated in the paper, consumers from high uncertainty avoidance cultures may use brands as signals more than consumers from low uncertainty avoidance cultures. Also, perceived risk may be a relatively more important source of the brand signaling effect in such cultures. Specifically, we would expect the impact of brand credibility through perceived risk on consumer utility to be higher in cultures with higher uncertainty avoidance (Douglas and Craig 1997). However, one would also expect that higher uncertainty avoidance would decrease sensitivity to information costs and increase willingness to collect information. Consequently, we expect

H1: Brand credibility's impact on consumer utility through perceived risk and information costs saved would be larger than through perceived quality under high uncertainty avoidance than under low uncertainty avoidance.

H2: Brand credibility's overall impact on consumer brand choice will increase with uncertainty avoidance.

The collectivist/individualist distinction is a more complex phenomenon in regard to its possible moderating effects on brand signals. Collectivist societies subordinate individual goals to the goals of a few large in-groups (Triandis and Gelfand 1998). In individualistic societies, the social fabric and group norms are much looser. Collectivism should result in more reliance on the brand choice of the group as a whole. Therefore, reliance on brands, epically in forming quality perceptions, may be more important in highly collectivist societies, *ceteris paribus,* since the positive impact of credibility on perceived quality and the impact of perceived quality on choice could become an element enhancing belonging to the group. However, culture conditions the way consumers search for product information (Dawar, Parker and Price 1996). Collectivist cultures tend to exhibit more information search than individualist cultures but rely more on interpersonal information exchange or word-of-mouth (Money, Gilly and Graham 1998), which reduces the impact of information costs. This may have two consequences: 1) dampening of the total credibility effects; 2) brand credibility effects operating more strongly through perceived quality than perceived risk and information costs.

We expect brand credibility's role in enhancing quality perceptions and hence belongingness to the group to dominate the dampening impact of reliance on interpersonal information exchange. We believe this will be the net effect because the importance of belonging to a group is very much the driver of behavior in collectivist societies. Consequently, we expect

H3: Brand credibility's impact on consumer utility through perceived quality will be more pronounced than its impact through perceived risk and information costs in high collectivism than in low collectivism.

H4: Brand credibility's overall impact on consumer brand choice will increase with collectivism.

In regard to power distance, cultures high on power distance tend to be hierarchic in their interpersonal relationships and decision-making, whereas those low on power distance tend to be egalitarian. Power distance influences active opinion leadership behaviors by making consumers distrust others (Dawar, Parker and Price 1996). Equally, power distance should make consumers distrust brands. In this sense, enhancements on brand credibility and clarity could have a relative lower effect on perceived quality, perceived risk and information costs saved. However, cultures high in power distance tend to emphasize the importance of prestige and wealth in vertical relationships between social classes (Hofstede 1980). If one relates this aspect of cultural power distance to consumer needs, then it appears that brand as signals of brand positions that relate to social status should be most important in high power distance cultures because people are highly motivated by status and affiliation norms (Roth 1995). In this case, brands as signals may have a larger effect on perceived quality, perceived risk and information costs saved compared to cultures with low power distance. Given the counter-acting factors determining the impact of power distance on brand credibility effects, power distance may be found not to have an effect on how brand credibility impacts choice or if one of the two major mechanisms (distrust versus importance of authority) dominates, it may decrease or increase total brand credibility effects. Consequently, we do not propose any hypotheses about the directionality of the moderating effects of power distance and leave the open empirical question to analyze further.

Empirical Investigation of Brand Signaling Across Cultures

As mentioned before, Erdem and Swait (1998) (henceforth, E&S) established the validity of brand signaling (specifically, via brand credibility) as the basis for positive brand effects on product evaluations, using a sample of United States university students. We have argued above that certain of the basic relationships postulated by E&S would be moderated across different cultures, particularly in terms of three important cross-cultural constructs: uncertainty avoidance (UA), collectivism/individualism (C/I) and power distance (PD).

We collected comparable samples of respondents in seven different countries, specifically chosen to differ across these cultural constructs. To that respect, Sekaran (1983) identifies two primary ways to achieve sample comparability: Drawing nationally representative samples or selecting matched samples on the basis of some set of characteristics of interest. Due to budgetary constraints that prevented representative sampling, we matched samples by recruiting undergraduate business student respondents in all countries (in Brazil, due to recruitment difficulties, engineering undergraduates were employed for about half of that sample). While this is a potential limitation to the generalizability of our results, E&S model was first tested using undergraduate student samples, and, therefore, cross-cultural generalizability will be best established using samples with similar characteristics. We also expect that differences in age, socio-demographics, relative income, and so forth, to be small when we use undergraduate students' samples, making possible a clearer attribution of substantive theoretical differences between countries to cultural differences. Finally, the use of student samples constitutes a very conservative test of the impact of cultural constructs. University students is one of the most globally homogeneous segment of consumers and, thus, any cultural difference may be amplified if data is collected using a more inclusive group of respondents.

Cross-country comparisons are made in two ways: first, country-level structural equation models (SEMs) are estimated and compared; second, Mixed MNL choice models based on an experimental design are used to test the role of brand and cultural constructs in the choice process. Two product classes were selected for testing the robustness of brand signaling across cultures: orange juice is used to represent low-involvement/low-cost product categories, while personal computers are used for high-involvement/high-price categories.

The Structural Model

Figure 1 presents our SEM. With the exception of the Relative Price construct, this is basically the same model as implemented in E&S. Brand credibility (Cr) is postulated to increase Perceived Quality (PQ), to increase Information Costs Saved (ICS) and to decrease Perceived Risk (or conversely, increase its complement, Lower Perceived Risk – LPR); in turn, these latter constructs are expected to increase product Consideration and Purchase (C&P).

--- Insert Figure 1 about here. ---

In addition to E&S's brand constructs, the model includes a Relative Price (RP) construct. This was included for two reasons: firstly, E&S did not include price in any form in the SEM, and it was felt that its addition would be an interesting extension of their work to control for purely economic impacts on Consumption and Purchase (C&P); secondly, rather than price itself, since this would be country- and time-specific, we opted to use RP to capture the relative price positioning of the brands in each country. The RP positioning is likely to be a function of brand credibility because the firm is likely to be perceived by consumers to be charging a premium if their brand is strong and visible in the market; this leads to our expectation that the path from Cr to RP will be positive. The effect of RP on C&P, however, is expected to be negative: The greater the relative price of the brand, the less the brand should be

considered and the less attractive it should be.

The Measurement Model

A total of 19 items, shown in Table 1, were used to implement the measurement model that supports the SEM in Figure 1. We refer the reader to E&S for the items of all constructs except RP, which were specifically formulated for this study.

--- Insert Table 1 about here. ---

Convergent and discriminant validity was established using Anderson and Gerbing's (1988) procedures. For convergent validity, pooling data across countries and product categories to yield a sample of 882 respondents and 5292 brand evaluations, as required by their procedure, it is found that the construct coefficients in all item equations are statistically significant at the 95% level. This is reflected in Table 1 via the appreciable squared multiple correlation (SMC) levels for all items. In terms of discriminant validity, it is found that the hypothesis that the correlation between every pair of constructs is equal to one (i.e. there is no discrimination between the constructs in question) is rejected for all pairs of constructs in Figure 1 at the 95% or higher level. The smallest chi-squared statistic is 34.1 (1 degree of freedom), and occurs between Cr and ICS, for which the estimated correlation is 0.91 with a standard error of 0.014. Hence, we established both convergent and discriminant validity at the pooled level.

Cultural Constructs

The 13 items in Table 2 were used to characterize the four cultural constructs of interest: uncertainty avoidance (UA), collectivism/individualism (C/I) and power distance (PD) (Hofstede, 1980). We developed these items using the following procedure: we used Hofstede's (1980) original organizational values survey items and Triandis' (1995) horizontal and vertical individualism/collectivism items slightly modified to improve their applicability to a general

consumer context. Once cultural identity data by country was collected from our sample, we ran confirmatory factor analyses for each country to identify if any item did not load high enough (our cutting point was factor loadings larger than 0.50) on a single factor. There were minimal discrepancies in the factor structure by country. Final cultural construct specification excluded a total of 5 items from the original set (1 in the power distance construct, 2 in the uncertainty avoidance construct and 2 in the collectivism /individualism construct) that did not load high overall on the specific cultural construct. This procedure ensured reasonable levels of scale reliability both at the overall level as well as country by country (all Cronbach alphas > 0.60). Table 2 shows final factor loadings and reliability coefficients using data at the aggregate level.

--- Insert Table 2 about here. ---

From this point forth, whenever we refer to these constructs in terms of inclusion in a statistical model, it should be understood that we operationalized the cultural constructs as the simple average of the respective item responses for each individual respondent.

Data Collection Methodology

The survey administered to the respondents has several sections: (1) elicitation of the measurement model items (1 - 9 Strongly Disagree/Strongly Agree; Table 1) for three brands within each of two product classes; (2) elicitation of the degree of confidence (1 - 7 Very Low/Very High Confidence) in evaluating a new brand in each product class; (3) an association task linking (yes/no scale) product class to items describing familiarity, risks of purchasing, benefits offered, involvement levels, etc. (Erdem, Swait and Louviere 2002); (4) a brand/price experimental choice task for each product class, involving 17 choice sets each that elicited choice among 3 brands and a no choice alternative (the experimental design employed all brands present in every choice set with the same four levels of price applied to all brands – this is the

same design employed by Erdem, Swait and Louviere 2002); (5) elicitation of the cultural constructs (1 - 9 Strongly Disagree/Strongly Agree; Table 2); and (6) some simple demographics (age, gender, household income, citizenship status and number of times traveled abroad).

Originally developed and tested in US English, the final survey instrument was then translated and back-translated into Spanish, Portuguese, Japanese, Turkish and German for respondents in Spain, Brazil, Japan, Turkey and Germany to ensure comparability across countries (see the Appendix for a description of cross-country experimental controls). Respondents in the US and India were given the original US English survey, duly customized for local conditions (e.g. brands, prices). In the case of India, the survey was examined by our recruiter for understandability. These countries were selected to represent a wide range of uncertainty avoidance, power distance and individualism/collectivism dimensions (Hofstede 2003). Table 3 shows Hofstede's original country ratings by dimension for these countries.

--- Insert Table 3 about here. ---

In each country, three brands within each product class (orange juice and personal computers) were selected to represent different levels of market power and price/quality positioning.[iv] All brands selected were required to enjoy high levels of consumer brand recognition. We also made sure to always include at least one local brand and at least one regional or global brand. Thus, the brands used in the study could be local, regional, national or multinational/global, but to the extent possible they were selected to cover the spectrum of market share (lower, average, higher), thus introducing greater potential heterogeneity in the brand constructs of interest. Price levels used in the choice experiments were, of course, country- and product-specific and expressed in the local currency. Average price levels across stores were established using price audits by country with the cooperation of our recruiters.

The surveys were then programmed for execution on the Internet, which ensured method invariance. Recruiters at each institution of higher learning were given a list of identifiers and corresponding passwords (to enhance survey security), which they provided to their students for voluntary participation in the survey. These recruiters were generally instructors of undergraduate business courses, except in Brazil, where both business and engineering undergraduates were used due to recruitment difficulties. The respondents have similar demographic profiles: they are young (average age varies from 18 in India to 25 in Germany; 79% of all respondents are 22 or younger) and mainly middle-class. The gender split varies somewhat more than age: the male to female split is about even in the US and India, about 40% males/ 60% females in Germany, Spain and Turkey, and about 55% males/45% females in Brazil and Japan. Foreign exchange students were excluded from the sample. Students were given course credit for survey completion and were urged to complete the survey in one sitting (approximately 30 minutes); however, if the session was interrupted, respondents could subsequently resume the survey at the point of interruption.

Data collection occurred from October 2002 to April 2003, depending upon the country. This extended data collection period was necessary to obtain reasonable sample sizes for our statistical tests. Despite our best efforts, sample sizes by country vary significantly due to factors outside our control: Brazil (126 respondents), Germany (57), India (161), Japan (114), Spain (155), Turkey (126) and US (143).

Country-Specific Structural Equation Models

Table 4 presents the standardized SEM coefficients for each country and product class, as well as the averages of cultural constructs for each country. The Amos 5 software program was used to obtain model estimates (Byrne 2001). Overall, the models display a modest, though

certainly acceptable, level of goodness-of-fit (see Table 4 for details). All statistically significant coefficients in both product classes are in the expected direction, with a single exception: the LPR→ICS path, expected to have a positive coefficient, has a negative and statistically significant effect in Japan for PC's. Otherwise, it seems that the model structure from Figure 1 holds generally across the different countries.

--- Insert Table 4 about here. ---

That is not to say that the countries are homogenous in terms of the path coefficients. In the Juice category, for instance, the impact of brand Credibility on Consideration and Purchase is through the Perceived Quality construct in Brazil and Turkey. In Spain, however, the ICS and LPR constructs are also mediators in the impact of Cr on C&P, indicating that Spanish respondents displayed a more nuanced response to brand in the evaluation of product utility, considering the role of brand in risk reduction and information acquisition as enhancements to the utility of the brand. India, the US, and to a lesser extent, Germany, are more similar to Spain than to Brazil and Turkey in overall structure in the juice category. Note that the Relative Price (RP) construct is generally not statistically significant at the 95% significance level in this product category, with the sole exception of Spain. In the PC category, PQ is again the main mediator between Cr and C&P for Brazil, Germany and Turkey; the impact of Cr on C&P in India, Japan, Spain and the US additionally occurs through paths involving LPR and ICS.

The total impact of Cr on C&P, as estimated through the SEMs in Table 4, is remarkably consistent across countries: Brazil (0.806, 0.738 for juice and PC, respectively); Germany (0.815, 0.732); India (0.847, 0.831); Japan (0.773, 0.66); Spain (0.724, 0.712); Turkey (0.862, 0.880); US (0.803, 0.855). The smallest impact for juice is found in Spain, and for PCs in Japan; in both categories, Turkey displays the largest impact of Cr on C&P (and India is a close second in both

categories). As we've pointed out above, however, these effects and their magnitudes come about through different pathways in Figure 1.

To undertake a more systematic exploration of between-country differences in the path coefficients, we plotted the estimated coefficients as a function of cultural identity constructs. The averages of cultural constructs (see bottom of Table 4) suggest that Germany (M = 5.31) scores lowest on Uncertainty Avoidance, whereas Brazil (M = 6.72) and Spain (M = 6.57) score highest. Among the seven countries we studied, Spain (M = 5.18) and Brazil (M = 5.22) scored highest on collectivism, whereas India (M = 4.55) and US (M = 4.69) scored lowest. Power distance seems to be lowest in Germany (M = 3.88) and highest in Japan (M = 4.99). These ratings are consistent with Hofstede's original findings (see Table 3) except for India and Turkey, which seem to rate more moderately in our current data than in Hofstede's work. A possible reason for this divergence is that we collected these cultural values using university students, which are more likely to have an international mindset, and therefore ratings may tend to equalize those of reference countries in the Western world such as the U.S. and Europe.

Figure 2 shows three plots, depicting the coefficient estimates for the Cr→LPR→ICS→C&P paths as a function of Uncertainty Avoidance (UA) averages for each country. These paths are shown because they depict relatively clearly UA's moderating pattern: the higher the country on the UA scale, the stronger the first two paths become. This implies that as UA increases, brand credibility lowers risk perceptions more strongly and leads to more information cost savings. This impact on risk is mitigated in part by the decreased reliance on the brand to save on information costs in decision-making, as evidenced by the downward trend in the strength of the ICS→C&P path as a function of increased UA (since uncertainty avoidance decreases sensitivity to information costs). Furthermore, the PQ→C&P path strength does not

vary systematically with UA. These combined results suggest that the moderating role of UA in regard to the impact of Cr on C&P is more through the LPR and ICS paths than the PQ path. Thus, we find evidence for Hypothesis 1.

--- Insert Figure 2 about here. ---

Figure 3 shows two plots of the coefficient estimates for the Cr→PQ→C&P paths as a function of the Collectivism/Individualism (C/I) construct. These paths depict a different moderating pattern for C/I. Although Cr→PQ path coefficients do not change significantly, there is a clearly discernible positive trend in PQ→C&P path coefficients with increasing collectivism (Spain is an exception to this pattern). On the other hand, the sequence of paths Cr→LPR→ICS→C&P is also found to be a function of the C/I construct. The higher a country scores on the C/I scale (implying a more collectivist culture), the bigger the standardized coefficients for Cr→LPR and LPR→ICS, and the smaller the ICS→C&P path coefficient, with an almost null overall effect. These results suggest that in collectivist countries brand credibility seems to make its impact felt more directly through the perceived quality route than through the information acquisition route (perceived risk and information costs saved). This seems intuitive, since it is reasonable that in collectivist cultures sources of information such as word-of-mouth may be more easily available and more often used. Thus, we find evidence for Hypothesis 3.

--- Insert Figure 3 about here. ---

Notably, the last cultural construct under study (power distance) does not seem to explain any of the differences between path coefficients.

Evidence from the Choice Modeling Results

To analyze the overall impact of credibility on choice in various countries (while controlling for price effects) and to test Hypotheses 2 and 4, we also estimated brand choice

models. These final statistical results we present are based on Mixed MNL (McFadden and Train 2000) specifications, using the experimental choice data we mentioned earlier. These data resulted from eliciting 17 choices for each product class. Three brands in each country and product category were always presented, along with a No Choice alternative; each brand was associated with a 4-level price variable, which had the same range for all brands in the same country and product class. It will be noted that 17 choice sets are more than minimally necessary for identification of parameters but was done to maintain compatibility and comparability with prior studies (especially Erdem, Swait and Louviere 2002).

Our intent in this section is to examine whether the impact of credibility on preference differs in magnitude between countries, or more specifically, whether the impact of brand credibility on choice is moderated by the cultural constructs used in the previous two sections. To this end we calibrate two Mixed MNL models, one per product category, which allow for stochastic heterogeneity of brand and price effects at the country level. The utility function also includes the Brand Credibility (Cr) construct, as well as its interactions with uncertainty avoidance (UA), collectivism/individualism (C/I) and power distance (PD). Precisely, the utility functions are given by the following expression[v]:

$$U_{icn}=\alpha_{icn}+\beta_{icn}\cdot LN(p_{ic})+\delta\cdot Cr_{icn}+\gamma_1\cdot UA_{icn}\cdot Cr_{icn}+\gamma_2\cdot (C/I)_{icn}\cdot Cr_{icn}+ \gamma_3\cdot PD_{icn}\cdot Cr_{icn}+\varepsilon_{icn} \quad (1)$$

where i, c, n are respectively index brand, country and respondent; p_{ic} is a country-specific price for the good in question; ε_{icn} is the brand-country-person stochastic utility, which is assumed to be independent and identically Gumbel distributed across brands and respondents within country, but allowed to have different scale/variance by country (Swait and Louviere 1994); α, β, δ and γ are parameter vectors; and all other quantities have been previously defined. Note that the α and

β parameter vectors are subscripted by respondent, reflecting the fact that these coefficients will be allowed to have stochastic distributions (more details given with results in Table 5).

The coefficient vectors for the Cr and its cultural construct interactions were not given stochastic distributions, and are assumed comparable across countries. To support this specification, we established that the Cr construct has partial metric invariance across countries at the 95% confidence level using Steenkamp and Baumgartner's (1998) test; this result holds for both product categories. Construct Cr has six measurement items in total; we establish partial metric invariance with at most two items being country-specific. This test shows the construct is quite homogenous and robust across the countries tested (for orange juice, chisq=26.0, DF=18, p=0.10; for PC's, chisq=34.4, DF=23, p=0.06). This also implies that comparing credibility scores across country is empirically supported in our data, so making the γ and δ parameters in (1) to be equal across countries is consistent with empirical evidence.

The resulting product class models are presented in Table 5. First, it is important to point out that there is strong support for Erdem and Swait's (1998) contention that brand credibility increases product attractiveness/utility: across all countries, there is a positive and significant main effect impact of Cr in both product classes. This result is quite robust, since we allow for substantial country- and respondent-level differences via brands, prices and stochastic taste distributions at the country level. Note that due to scale differences (i.e. error variance differences) across product classes, it is not appropriate to directly compare juice and PC coefficients; only parameter ratios or elasticities should be compared. The coefficients of substantive interest to us are the interactions of Cr with cultural constructs (i.e. $\delta, \gamma_1, \ldots, \gamma_4$). In both product classes it is found that Power Distance has no substantive impact on the main effect of Cr on utility since γ_3 and γ_4 are not significantly different from zero at the 95% significance

level; this is in essential agreement with prior analyses reported above, but based on SEMs. Of greater interest is the consistent finding across both product classes that Uncertainty Avoidance (UA) increases the impact of brand credibility in both juice and PC's (coefficient γ_1 in both categories), as argued beforehand. The marginal impact of UA is relatively greater in PC's than in juice, as would seem reasonable, but it is statistically significant and increasing in both. Thus, we found evidence for Hypothesis 2 both in the PC and juice categories. Finally, increasing Collectivism/Individualism (C/I) also leads to the increased importance of Cr, but only in the juice category (see coefficients γ_2 in the table). A possible reason for this finding is that brands as symbols of collective behavior are more often embraced in high frequency/low involvement purchases where decision time pressure is high and the financial risk of making a wrong choice is low. Thus, we find evidence for Hypothesis 4 in the juice category only. It is interesting to note that the impact of C/I is significantly greater than that of UA in the juice category. It is difficult to discern the relative importance of these two cultural constructs across product classes since they are subject to different error term scales.

--- Insert Table 5 about here. ---

Discussion, Conclusions and Future Research

In this paper, we investigated the effects of brand credibility on consumer choice through perceived quality, perceived risk and information cost saved across seven countries in Asia, Europe and North and South America. These countries have been shown to vary across cultural dimensions such as uncertainty avoidance, collectivism and power distance (Hofstede 1980). We found strong support for the Erdem and Swait (1998) framework of brand effects on choice under consumer uncertainty. More specifically, brand credibility, the key construct in information economics based approaches to brand equity, has been shown to affect consumer

choice in all the countries we studied. Although the paths through which credibility operated differed somewhat across countries, the general framework of brand credibility effects was found to be empirically very robust across the countries studied.

To explore whether cultural constructs that have been linked to consumer choice behavior and brand effects in previous research moderated these effects, we investigated if uncertainty avoidance, collectivism and power distance explain any differences across the countries in regard to mechanisms through which brand credibility effects on consumer brand choice materialize. We expected that uncertainty avoidance and collectivism would increase total credibility impacts, which our results confirmed. Given counterbalancing considerations in the case of power distance, we deemed its net effect to be an empirical question; we did not find any moderating effects of this construct in either analysis undertaken (SEM and choice model). We should note that this does not mean that this construct does not influence brand credibility effects. It merely suggests that given that many factors are at play in confounding directions, these factors may cancel out and it may not be possible to observe any total net effect. Indeed, one necessary future research area is to more carefully map out these different factors by measuring and testing them separately; for example, with the inclusion of a new construct that denotes brand perceived prestige (Steenkamp, Batra and Alden 2003).

The results obtained through the choice models we estimated suggest uncertainty avoidance amplifies the net effect of credibility on choice. The effect has been found to be stronger in PC than in juice, which is to be expected since PC is a more complex, higher-involvement product category than juice. Collectivism was found to amplify the brand credibility effects as well, but only in juice. This might be due to the conspicuous consumption nature of juice, a more frequently purchased/low-ticket item for which a brand's value as a group identity

symbol would be more important than for PCs, for which functional features prevail.

The results obtained through the structural equation models suggested that as uncertainty avoidance increases, brand credibility lowers risk perceptions and increases information costs saved. However, it also decreases the reliance on the brand to save on information costs. The same pattern of influence is true as collectivist tendencies increase. We believe that uncertainty avoidance and collectivism decrease the impact of information costs on consumer choice due to the increased willingness of consumers to engage in active search (in case of uncertainty avoidance) and the ability to use other low costs information sources such as word-of-mouth (in the case of collectivism). On the other hand, increasing collectivism leads to a stronger path for the effect of perceived quality on brand consideration and purchase. This is consistent with the fact that collectivist consumers perceive and prefer credible brands as better quality because they reinforce their belongingness to the group. Overall, these findings suggest that collectivism moderates the impact of brand credibility on consumer utility (consideration and purchase) by increasing the effect of perceived quality while uncertainty avoidance makes the credibility impact operate mainly through the reduction of perceived risk and information costs.

These findings have important managerial implications. First of all, returns on a company's efforts to establish brand credibility depend on consumers' cultural values. Establishing a brand's credibility seems to be especially effective when consumers have more aversion to risky choices and, thus, look at brands as a way to choose "the sure thing"; and when consumers strongly need to reinforce their belonging to a group through the consumption of symbols that reflect such identity. Additionally, companies could take advantage of cultural differences in brand equity formation in many ways. For example, companies could work with product positionings that match cultural values; for example, emphasizing brand attributes that

invoke either risk reduction or social acceptance. Companies could also execute communication campaigns that reinforce a brand's ability to either reduce risk or generate group identification (e.g., showing brand consumption occasions in which such ability comes into play). These communication campaigns could also add elements representing a brand's trustworthiness (e.g., messages with ideas such as "you can always count on brand X" for countries high in uncertainty avoidance or "you will always be part of it" in countries high in collectivism). Finally, brand extensions could be thought of in categories where either risk or collective identity matters.

There many avenues of future research to pursue. Since the original body of empirical research in the US was based on student samples and since taking relatively homogenous samples across countries makes it easier to control for factors such as age, income and education, and other items that may lead to between-country differences, our study constitutes a conservative analysis of cultural differences. We may expect that in more heterogeneous consumer samples, the effects of cultural constructs would be amplified. Testing the model on more heterogeneous consumer samples, as well as with other product categories, will also enhance results' generalizability. Additionally, we may want to investigate the influence of cultural dimensions other than Hofstede's (1980), which have been criticized on the basis of their descriptive nature and organizational focus, in the validity and applicability of the model.

In this study, we focused on brand credibility and its antecedents. However, factors that underlie brand credibility (such as temporal consistency of brand positioning) and sub-dimensions of such factors may be moderated by cultural constructs as well. A better understanding of underlying dimensions of consistency, brand investment perceptions and the like have important branding and brand management implications in international markets. In fact, the success of globalization strategies depends upon assumptions about the communalities

in mechanisms whereby brands impact consumers, no matter what their cultural identity.

Table 1

Brand Constructs Measurement Model

Construct		Measurement Items[1,2]	SMC[3] Juice	SMC PC
Cr: Credibility	1.	This brand delivers what it promises.	0.51	0.56
	2.	This brand's product claims are believable.	0.41	0.46
	3.	Over time, my experiences with this brand have led me to expect it to keep its promises, no more and no less.	0.41	0.43
	4.	This brand is committed to delivering on its claims, no more and no less.	0.32	0.36
	5.	This brand has a name you can trust.	0.53	0.69
	6.	This brand has the ability to deliver what it promises.	0.54	0.58
PQ: Perceived Quality	7.	The quality of this brand is very high.	0.72	0.74
	8.	In terms of overall quality, I'd rate this brand as a …	0.70	0.73
ICS: Information Costs Saved	9.	Knowing what I'm going to get from this brand saves me time shopping around.	0.30	0.36
	10.	This brand gives me what I want, which saves me time & effort trying to do better.	0.79	0.75
LPR: Lower Perceived Risk	11.	I need lots more information about this brand before I'd buy it. (r)	0.39	0.45
	12.	To figure out what this brand is like, I'd have to try it several times. (r)	0.45	0.51
	13.	I never know how good this brand will be before I buy it. (r)	0.34	0.51
RP: Relative Price	14.	This brand is more expensive than the average brand in this category.	0.63	0.69
	15.	Compared to other brands, this brand is more expensive.	0.63	0.70
C&P: Consider & Purchase	16.	I would never buy this brand. (r)	0.30	0.37
	17.	I would seriously consider purchasing this brand.	0.49	0.53
	18.	How likely would you be to purchase this brand?	0.80	0.74
	19.	If you were to buy 9 [PRODUCT] at one time, how many of each brand would you buy to reflect your relative preference for each brand (assume these are the only brands available)?	0.39	0.33

Notes:

1. All items measured on 9-point strongly disagree/strongly agree scales, except items 8 (9-point low/high quality scale), 18 (9-point very unlikely/very likely scale) and 19 (allocation of 9 objects among brands to reflect preference).
2. (r) after an item indicates it was reversed for inclusion in the model.
3. SMC: squared multiple correlation, or percent of item variance explained by model. Based on the pooled sample across countries.

Table 2

Cultural Constructs

Construct	Items[1,2]	Factor Loadings[3]
UA: Uncertainty Avoidance [alpha = 0.692]	1. Security is an important concern in my life.	0.772
	2. Life is so uncertain that one must continuously be on the alert so as not to be caught at a disadvantage.	0. 784
	3. It is important to consider dissenting views when making personal and social decisions.	0. 808
C/I: Collectivism/ Individualism [alpha = 0.735]	4. I like sharing little things with my neighbors.	0.537
	5. Being a unique individual is important to me. (r)	-0.804
	6. Decisions reached in groups are better than those reached by single individuals.	0.587
	7. I usually sacrifice my self-interest for the benefit of my group.	0.597
	8. I'd rather depend on myself than on others. (r)	-0.728
	9. It is important to me to be useful to others.	0.758
PD: Power Distance [alpha = 0.628]	10. One's boss is a person just like oneself. (r)	-0.633
	11. Bosses are always inaccessible and distant.	0.782
	12. The way to change a society is to make everyone equally powerful. (r)	-0.619
	13. Other people are a threat to one's power and cannot be trusted.	0.723

Notes:
1. All items measured on 9-point strongly disagree/strongly agree scales.
2. (r) after an item indicates it was reversed before use.
3. Loadings from principal components single factor analysis.

Table 3

Country Ratings by Cultural Dimension (Hofstede 2003)

Country	Power Distance	Individualism	Uncertainty Avoidance
Brazil	69	38	76
Germany	35	67	65
India	77	48	40
Japan	54	46	92
Spain	57	51	86
Turkey	66	37	85
US	40	91	46

Geert Hofstede analyzed a large data base of IBM employee's values scores collected between 1967 and 1973 covering more than 70 countries. In the editions of GH's work since 2001, scores are listed for 74 countries and regions, partly based on replications and extensions of the IBM study on different international populations. In order to collect these scores, Geert Hofstede used surveys designed for measuring culture-determined differences between matched samples of respondents from different countries and regions. It consists of 20 content questions and 6 demographic questions. The answers are grouped into cultural value scores. Value scores go from 0 to 100. Scores closer to 100 denote strongest agreement with a particular cultural value.

Table 4

SEM Estimation Results by Country

Personal Computers	Standardized Coefficients						
Path	Brazil	Germany	India	Japan	Spain	Turkey	US
Credibility ➔ Lower Perceived Risk	0.612***	0.314***	0.325***	0.057	0.559***	0.579***	0.347***
Credibility ➔ Perceived Quality	0.851***	0.885***	0.953***	0.798***	0.849***	0.973***	0.972***
Credibility ➔ Information Costs Saved	0.801***	0.564***	0.848***	0.69***	0.728***	0.703***	0.735***
Credibility ➔ Relative Price	0.538***	0.488***	0.768***	0.538***	0.815***	0.754***	0.455***
Lower Perceived Risk ➔ Information Costs Saved	0.034	0.053	-0.074	-0.127**	0.189***	0.1	0.014
Lower Perceived Risk ➔ Consider & Purchase	0.033	0.023	0.194***	0.102**	0.144***	0.01	0.01
Information Costs Saved ➔ Consider & Purchase	0.137	0.117	0.231***	0.242***	0.134	0.051	0.216***
Relative_Price ➔ Consider & Purchase	-0.18***	-0.109	0.004	-0.188***	-0.096	0.068	-0.043
Perceived Quality ➔ Consider & Purchase	0.825***	0.803***	0.603***	0.74***	0.704***	0.801***	0.732***
Juice							
Credibility ➔ Lower Perceived Risk	0.664***	0.276***	0.365***	0.014	0.375***	0.507***	0.382***
Credibility ➔ Perceived Quality	0.968***	0.879***	0.95***	0.937***	0.877***	0.972***	0.955***
Credibility ➔ Information Costs Saved	0.76***	0.775***	0.827***	0.67***	0.7***	0.805***	0.674***
Credibility ➔ Relative Price	0.644***	0.489***	0.416***	0.514***	0.454***	0.76***	0.604***
Lower Perceived Risk ➔ Information Costs Saved	-0.022	0.031	-0.076	-0.072	0.219***	-0.016	0.03
Lower Perceived Risk ➔ Consider & Purchase	0.004	-0.013	0.116***	-0.005	0.092	0.082	0.129***
Information Costs Saved ➔ Consider & Purchase	0.098	0.262***	0.178***	0.134	0.231***	0.09	0.105
Relative_Price ➔ Consider & Purchase	-0.082	0.059	0.017	-0.104	-0.124***	-0.083	-0.052
Perceived Quality ➔ Consider & Purchase	0.808***	0.664***	0.69***	0.786***	0.645***	0.836***	0.747***
# Respondents	126	57	161	114	155	126	143
# Brand Observations	378	171	483	342	465	378	429
Cultural Constructs (Averages)							
Uncertainty Avoidance	6.16	5.01	5.66	5.72	6.13	5.92	5.53
Collectivism	5.41	5.03	4.90	5.07	5.54	5.29	5.05
Power Distance	4.03	3.82	4.16	4.82	4.01	4.27	4.51

Note: ** p<0.05, *** p<0.01

ChiSq (DF)=11333.6 (2052), ChiSq/DF=5.52, GFI=0.83, CFI=0.83, RMR=0.470, RMSEA=0.029

Table 5

Mixed MNL Parameter Estimates

Utility Function[3]		Juice (asympt. t-stats)[1]	Personal Computers (asympt. t-stats)[2]
Brazil	Brand 1	-2.73 (-14.9) | 3.643 (6.96)	44.569 (12.66) | 0.201 (5.47)
	Brand 2	-0.571 (-2.78) | 0.789 (5.26)	44.223 (12.67) | 0.201 (---)
	Brand 3	-3.241 (-16.61) | 4.727 (6.42)	43.246 (12.67) | 1.718 (6.03)
	-LN(Price)	1.784 (27.03) | 0.371 (10.73)	—
	LN(Price)	—	-5.875 (-12.87) | 0.049 (5.15)
Germany	Brand 1	-36.172 (-1.23) | 1739.369 (0.56)	44.449 (57.78) | 4.6 (6.27)
	Brand 2	3.723 (0.63) | 234.583 (0.55)	46.086 (58.38) | 2.706 (5.66)
	Brand 3	-46.155 (-1.22) | 641.065 (0.55)	43.053 (57.02) | 4.853 (3.72)
	-LN(Price)	3.815 (4.23) | 0.996 (6.66)	—
	LN(Price)	—	-5.952 (-60.46) | 0.053 (2.41)
India	Brand 1	4.881 (13.28) | 1.155 (6.18)	29.546 (10.78) | 3.007 (5.03)
	Brand 2	6.106 (13.83) | 1.673 (9.06)	31.852 (10.78) | 0.391 (5.21)
	Brand 3	6.189 (13.61) | 0.117 (3.83)	31.211 (10.77) | 0.391 (---)
	-LN(Price)	1.188 (21.93) | 0.067 (15.27)	—
	LN(Price)	—	-3.586 (-11.21) | 0.09 (4.95)
Japan	Brand 1	1.188 (21.93) | 0.067 (15.27)	22.384 (12.85) | 0.122 (4.97)
	Brand 2	26.54 (17.74) | 0.067 (---)	22.036 (12.84) | 0.432 (5.52)
	Brand 3	26.066 (17.73) | 1.766 (8.42)	22.22 (12.87) | 0.234 (5.13)
	-LN(Price)	1.881 (36.1) | 0.004 (12.84)	—
	LN(Price)	—	-3.439 (-13.25) | 0.037 (5.82)
Spain	Brand 1	7.482 (14.47) | 0.356 (6.87)	8.605 (6.96) | 0.118 (2.42)
	Brand 2	6.863 (14.01) | 2.934 (7.17)	7.444 (6.27) | 2.125 (4.18)
	Brand 3	7.974 (15.12) | 0.356 (---)	8.736 (6.96) | 0.023 (1.01)
	-LN(Price)	0.886 (16.55) | 0.049 (11.03)	—
	LN(Price)	—	-1.198 (-7.85) | 0.056 (2.88)
Turkey	Brand 1	64.338 (31.79) | 0.204 (2.91)	22.577 (56.94) | 0.095 (3.74)
	Brand 2	65.109 (31.79) | 0.886 (11.48)	24.321 (54.12) | 0.095 (---)
	Brand 3	64.384 (31.6) | 0.114 (2.97)	24.499 (53.09) | 0.36 (6.67)
	-LN(Price)	1.484 (54.48) | 0.262 (8.36)	—
	LN(Price)	—	-2.581 (-37.19) | 1.398 (13.06)
US	Brand 1	-0.664 (-2.56) | 1.607 (5.84)	13.147 (10.79) | 0.467 (3.82)
	Brand 2	-1.188 (-5.47) | 1.055 (4.95)	13.374 (10.73) | 0.374 (4.82)
	Brand 3	-0.398 (-1.47) | 0.409 (3.86)	13.318 (10.65) | 0.149 (3.09)
	-LN(Price)	1.716 (23.2) | 0.529 (10.46)	—
	LN(Price)	—	-2.148 (-11.92) | 0.045 (4.26)
	Cred (δ)	0.438 (6.47)	0.448 (5.4)
Cred*Uncertainty Avoidance (γ_1)		0.009 (2.03)	0.025 (5.28)
Cred*Collectivism (γ_2)		0.064 (7.84)	0.000 (0.03)
Cred*Power Distance (γ_3)		-0.002 (-0.41)	-0.006 (-1.02)

(Cont.)

Table 5 (Cont.)

Utility Function[3]	Juice (asympt. t-stats)[1]	Personal Computers (asympt. t-stats)[2]
LN(Scale Function)		
Brazil	-0.193 (-3.12)	0.581 (7.31)
Germany	-1.498 (-1.68)	0 (---)
India	-0.125 (-2.49)	-0.115 (-1.3)
Japan	0.238 (4.45)	0.661 (8.7)
Spain	0.087 (1.66)	0.164 (1.71)
Turkey	0 (---)	0 (---)
US	0.862 (12.32)	0.813 (9.76)
Goodness-of-Fit		
Log Likelihood at 0	-20786.1	-20758.4
Log Likelihood at Conv.	-10339.1	-11985.0
Rho-Squared	0.5026	0.4226
Number of Subjects	882	881
Number of Choices	14994	14974

Notes:

1. Heterogeneity Specification: Independent normal distributions for brand effects, and independent log normal distributions for prices. For brand effects, presentation format is mean|variance of distributions, with t-stats in parentheses; for price effects, mean|variance of the normal distribution of the natural logarithm of taste coefficients is presented, with t-stats in parentheses. To use the latter coefficients in the utility function, note that the taste coefficients will multiply the *negative* of price. The log normal distribution was used for this category's price coefficients because the specification led to higher goodness-of-fit than the normal distribution.
2. Heterogeneity Specification: Independent Normal distributions for brand and price effects. Presentation format is mean|variance of distributions, with t-stats in parentheses.
3. Prices are given in currency of respective country.
4. One hundred Halton quasi-random numbers used for simulation estimator.

Figure 1

The Structural Equation Model Relating Brand Credibility to Product Utility

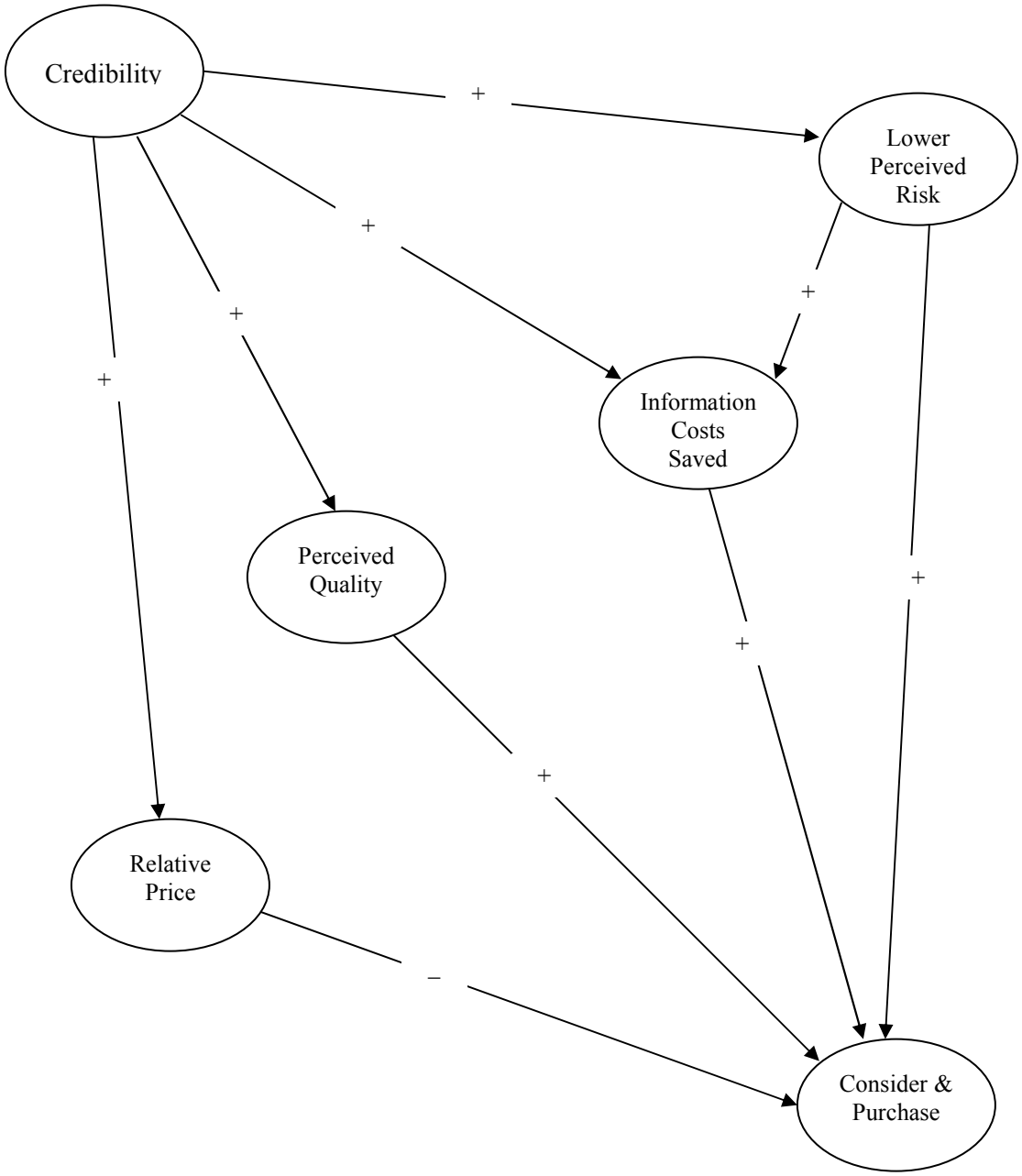


Figure 2

Plot of Cr→LPR→ICS→C&P SEM Coefficients as a Function of Uncertainty Avoidance

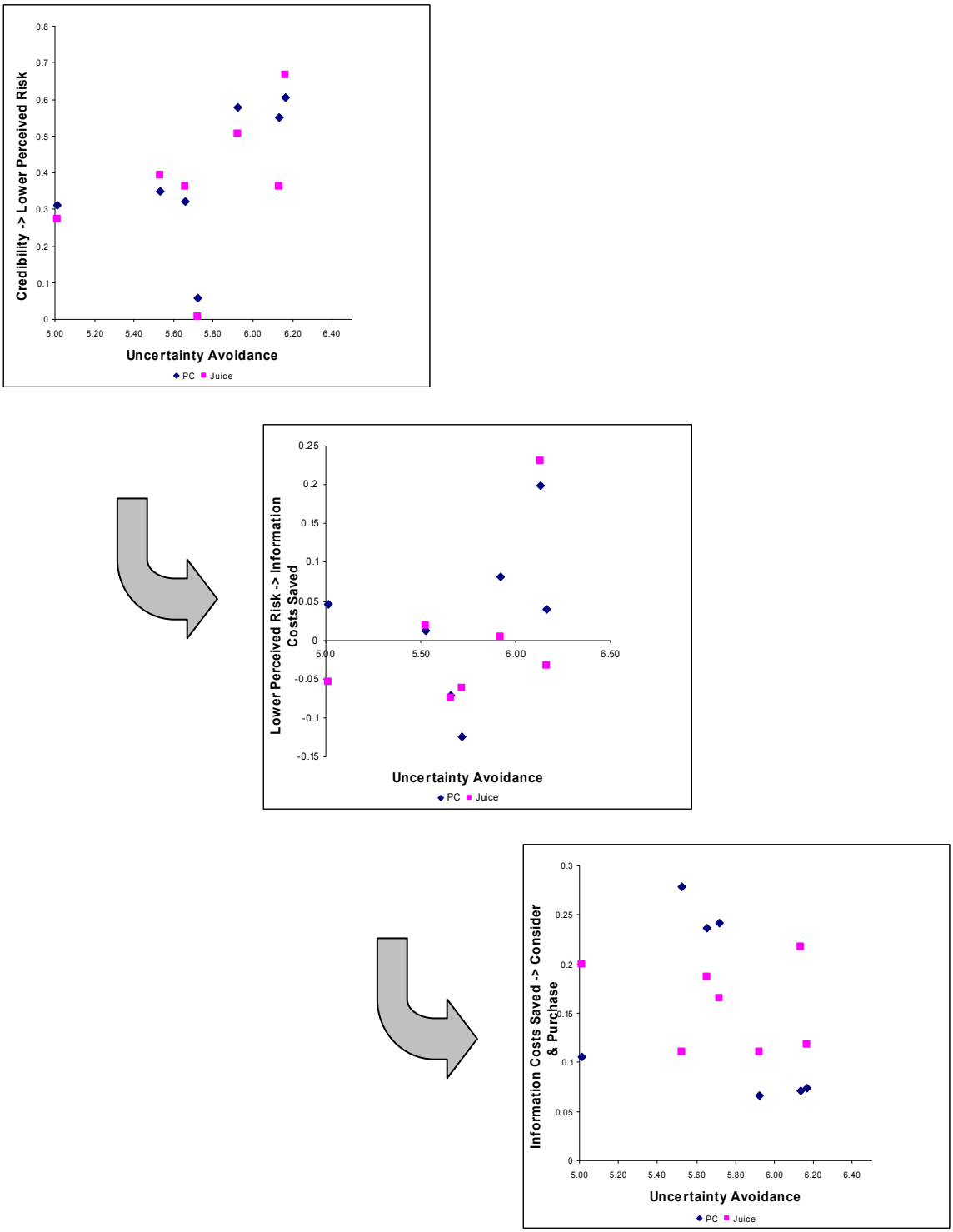
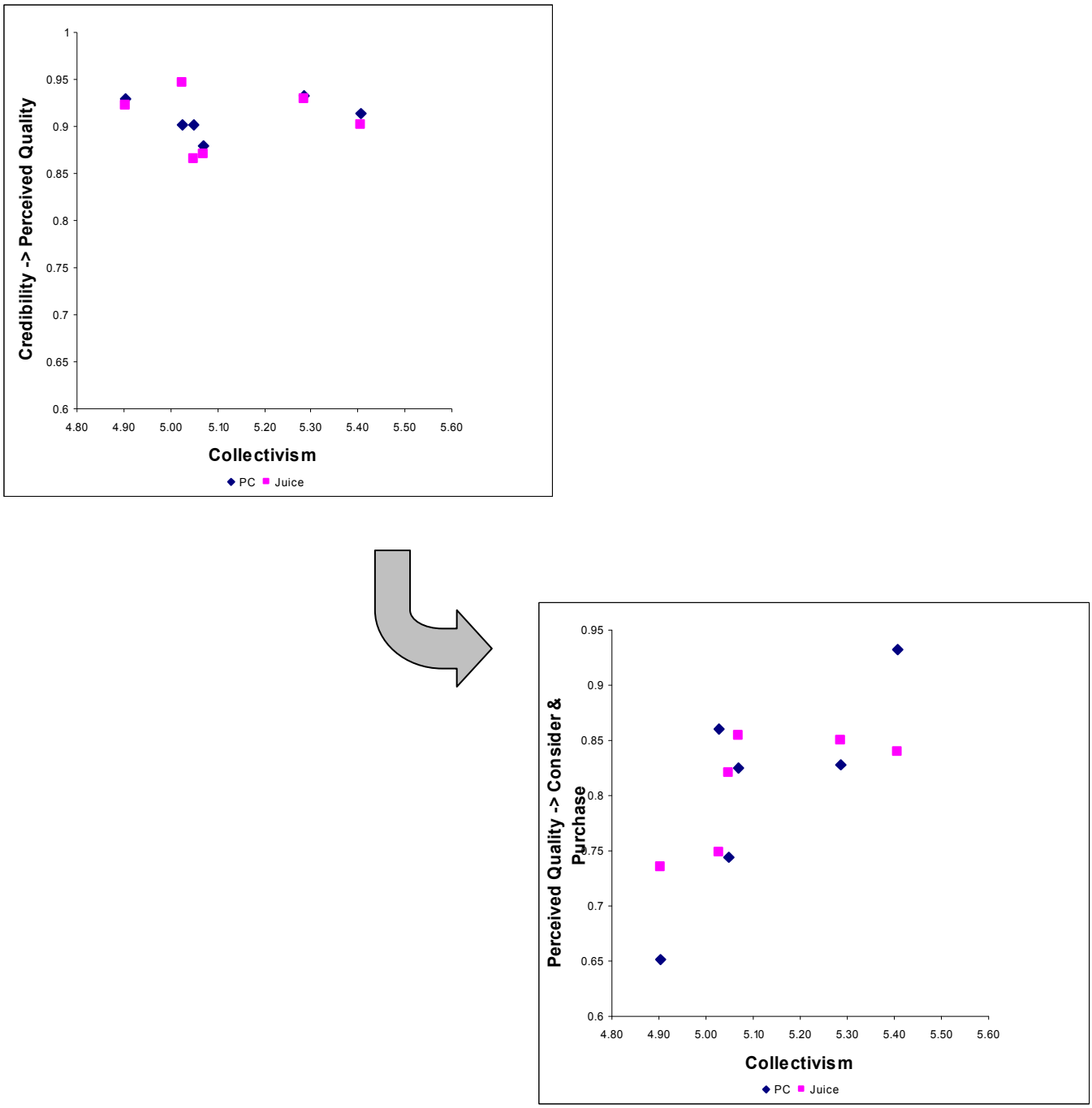


Figure 3

Plot of Cr→PQ→C&P SEM Coefficients as a Function of Collectivism (except Spain)



Appendix - Cross-country Experimental Controls

Functional Equivalence (Sekaran 1983)	To control for functional equivalence, our survey requested responses to similar problems in every culture. There was a comparable context or work-setting in every country.
Survey Instrumentalization (Steenkamp, Hofstede and Wedel 1999)	We used back-translation to control for vocabulary equivalence, idiomatic equivalence and grammatical and syntactical equivalence in our survey.
Conceptual equivalence (Adler 1983)	To control for conceptual equivalence, we pre-tested equivalence of the brands selected for the analysis and chose product categories purchased often, equally available and have the same function for consumers in each country of interest.
Construct equivalence (Steenkamp and Baumgartner 1998)	Though not presented in the paper due to space limitations, partial metric invariance was established using MULTIPLE GROUP SEMs for a subset of countries. This suggests cross-country comparability of path coefficients.
Response equivalence (Adler 1983)	We controlled for response equivalence by having uniform data collection procedures (Internet collection) and identical instructions.
Subject pool equivalence (Alden, Stennkamp and Batra 1991)	We controlled for the equivalence in educational background in three ways: First, the universities chosen were all top tier universities in their countries. Second, participants were all students in business or engineering. Third, sample characteristics were analyzed to verify the match in terms of age, sex and social class.
Currency equivalence (Roth et al. 1991)	We controlled for currency equivalence by using organic prices in each country, that is, current price averages across retail stores.

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[i] We should note that Erdem and Swait (1998) collected survey data on consumer self-reports in regard to consumer perceptions and purchase intentions, and estimated on these survey data a SEM model to assess the impact of brands as signals on expected utility, omitting price effects. In this paper, we collect via surveys both consumer self-reports in regard to consumer perceptions, as well as experimental data about their choices, then estimate both SEM models and brand choice models, the latter incorporating also price effects.

[ii] Specifically in cross-cultural contexts, consumers in cultures rating high in collectivism and uncertainty avoidance have been shown to use personal information sources more often that those rating low in these two cultural dimensions (Dawar, Parker and Price 1996).

[iii] Hofstede had a fourth dimension, "masculinity", and later added also "time orientation" as a fifth dimension. We chose not to focus on masculinity since the scale he developed combines two separate (although related) components: 1) attitudes towards gender roles and 2) attitudes towards quality of life. No straightforward expectations can be generated about how these might impact brand credibility effects. We pre-tested the impact of time orientation. However, there was not enough variation across countries on this dimension to further study it.

[iv] We also controlled for the fact that certain brands may communicate more individualistic values while others may communicate social values. Additionally, we believe such discrepancy is not as prevalent in the two product categories under study.

[v] We should note that an alternative utility specification would include the successors of credibility only (that is, perceived quality, perceived risk and information costs saved). Previous research has shown that credibility does not have a direct effect on utility and its effects are mediated through these three antecedents (Erdem and Swait, 2003). Therefore, there is no need to put credibility and the antecedents together in the utility function. We decided to put credibility rather than its antecedents in the utility to assess the total impact of brand credibility on choice and get a clearer and simpler picture of total credibility effects across countries.