Global Sourcing, Multiple Country-of-Origin Facets, and Consumer Reactions

Zhan G. Li
UNIVERSITY OF SAN FRANCISCO
L. William Murray
UNIVERSITY OF SAN FRANCISCO
Don Scott
SOUTHERN CROSS UNIVERSITY, AUSTRALIA

Research on global sourcing has been dominated by issues related to production, management, finance, accounting, operations, and technology transfer. It has seldom examined how global sourcing decisions affect consumer behavior. Through an experimental design, this study investigated how global sourcing locations and related factors influence consumers' product evaluations in various quality dimensions. Our findings have interesting implications for global sourcing decisions and shed light on consumer behavior in the context of global sourcing and multiple country-of-origin facets (e.g., country-of-design, country-of-assembly, country-of-corporation).

Background

Global sourcing involves the coordinated efforts by multinational corporations (MNCs) to procure such resources as technology, materials, parts, and/or finished products on a worldwide basis to serve various markets (Kotabe, 1992; Monczka and Trent, 1991). In today's globalized competition, global sourcing plays a critical role for the success of MNCs because it influences market and technology access, costs, quality, delivery performance, customer services, and concept-to-market product cycle time (Arnold, 1989; Hefler, 1981). It has been predicted that firms in industrial countries will be importing, on average, nearly 40% of the parts they use in domestic manufacturing by the end of the decade (Kupfer, 1990).

Despite increasing research attention on the phenomenon of global sourcing, the question of how it may affect consumer behavior has seldom been investigated. In an attempt to address this issue, we examine the effects of global sourcing locations and related factors on consumers' evaluations of product quality. In the following, we first elaborate the research background and rationales for our study. Then, we formulate the hypotheses empirically tested in this study. Next, we describe the methodology employed to test the hypotheses. Last, we present our findings and discuss the implications of our research.

Address correspondence to Dr. Z. G. Li, University of San Francisco, McLaren School of Business, 2130 Fulton St., San Francisco, CA 94117-1080, USA.
concept posits that consumers are the ultimate force determining the success or failure of MNCs’ products in the marketplace and that MNCs’ ultimate aim is to satisfy the needs and wants of consumers at a profit. However, although the extant literature on global sourcing has greatly advanced our knowledge about the subject, it has seldom taken into account the perspective of consumers. Instead, its focus has been dominated by issues related to production, management, finance, accounting, operations, and technology transfer (Cordell, 1992; Witt and Rao, 1992).

A good starting point to take into account consumers’ perspective is to investigate how decisions regarding various sourcing locations would affect consumers’ product perceptions and attitudes. This is so because sourcing locations, as indicated earlier, represent important decisions in global sourcing and the country-of-origin (COO) research has demonstrated that “Made in” labels affect consumers’ product evaluations and purchases.

Early COO studies were largely demonstrational in nature and concerned with documenting the existence of COO effects (Gaedeke, 1983; Nagashima, 1970; Retierson, 1966). However, these studies suggested several methodological problems (Bilkey and Nes, 1982). Chief among these problems is the use of the single-cue approach, which provides respondents with only COO information and thus makes the demand effects likely occur. After Bilkey and Nes’s review, COO studies employing multiple information cues flourished. Many researchers focused their attention on the relative influence of COO information versus other product cues (e.g., brand name, price, store) as well as the moderating impact of these other cues on COO effects (Elliott and Cameron, 1994; Eroglu and Machleit, 1989; Han and Terpstra, 1988; Johansson, Douglas, and Nonaka, 1985; Tse and Gorn, 1993; Wall, Liefeld, and Heslop, 1991).

Although the extant research has significantly advanced our understanding about COO effects, it has one major limitation: operationalizing the COO construct as the “Made in” label, reported COO studies have seldom taken into account the fact that global sourcing, involved with multiple sourcing locations/countries, has transformed COO into a multifaceted construct (Nebenzahl, Jaffe, and Lampert, 1997; Oezsomer and Cavusgil, 1991; Samiei, 1994). That is, the COO construct may now manifest itself through multiple facets such as “COO of design (COD)” (e.g., Designed in Japan), “COO of assembly (COA)” (e.g., Assembled in Mexico), and “COO of the corporation (COC)” (e.g., IBM known as a U.S. firm) as well as “COO of parts and components (e.g., Parts Supplied from China).” For example, a Sony television may now be designed in Japan, have parts and components supplied from China, and be assembled in Malaysia. Pontiac LaMans is designed in Europe, manufactured in South Korea, and sold in the U.S. as a GM car.

Recently, a few studies have been conducted to address the phenomenon of multiple COO facets explicitly. For example, Chao (1993) showed that COD and price level significantly affect the design and overall quality perceptions of U.S. consumers about color televisions; whereas, COA influences the overall product evaluations only. Using Canadian respondents, Ahmed and d’Astous (1995) found that, although COD and COA affect the product evaluations of both household buyers and industrial purchasers, industrial purchasers tend to place more importance on COD than do household buyers. They also observed that COD and COA effects are attenuated when other product information concerning brand name, price, and warranty is available. Tse and Lee (1993), based on U.S. samples, observed that COO effects weaken as the COO construct is decomposed into multiple COO facets and that COA and component COO affect various quality evaluations of stereo sound systems. They further discovered that a well-known brand name can override negative COA effects and that product experience can reduce the effects of component COO. Cordell (1992) and Witt and Rao (1992) have also indicated that global sourcing research has not considered consumers’ perspectives. But, operationalizing the COO construct as the “Made in” label, their studies did not take into account the multifaceted nature of the COO construct.

Because examining the effects of multiple COO facets on consumer behavior can simultaneously address some of the research deficiencies elaborated above, in both the global sourcing research and the COO research, our study attempts to contribute to this emerging stream of research in several ways. First, in addition to COD and COA, we also included COC in this study. COC refers to the country with which a firm is associated, and typically, it is an MNC’s home country. In the era of global sourcing, researchers have argued for the distinction of COC versus other sourcing-induced COO facets (e.g., COA, COD) and have called for the investigation of COC effects (Nebenzahl, Jaffe, and Lampert, 1997; Oezsomer and Cavusgil, 1991; Samiei, 1994). Previous studies have not examined COC effects probably because COC is assumed to be inherent in brands or corporation names (e.g., Ahmed and d’Astous, 1995; Tse and Lee, 1993). For example, Honda and Sony are automatically considered to be Japanese brands, and IBM and Kodak are to be U.S. corporations. However, such an assumption is valid only if the focal brand or MNC is well known and closely identified with a particular country. For the majority of MNCs, neither their brands nor their corporations have achieved a high level of public awareness. Research focusing on well-known brands or corporations is beneficial only for global market leaders; it has limited implications for the majority of MNCs.

Our study purposefully examines COC effects related to unknown brands and corporations. Second, although the few recent studies on COO facets have recognized the multiple dimensionality of the COO construct, they, like most previous COO studies (e.g., Bannister and Saunders, 1978; Cattin, Jolibert, and Lohnes, 1982; Erickson, Johansson, and Chao, 1984), have not consistently dimensionalized the notion of product quality. For example, Chao (1993) examined the effects of COO facets on two product

Previous COO studies focusing on the “Made in” label also suggest that COO effects are product dimension-specific (Erickson, Johansson, and Chao, 1984; Han and Terpstra, 1988). That is, the existence and magnitude of COO effects vary across such product dimensions as serviceability, workmanship, and economy. Then, it follows that various sourcing locations may influence different product quality aspects. For example, COA may simply affect consumers’ product evaluations on functional aspects (e.g., performance and reliability); whereas COD may spread its influence over product image, aesthetics, and other aspects. Therefore, to understand the effects of various sourcing locations thoroughly, we must identify product quality dimensions comprehensively as well.

To operationalize the dimensions of product quality consistently and comprehensively, we adopted Garvin’s (1984) typology of eight product quality dimensions in this study: performance, serviceability, reliability, durability, conformance, features, aesthetics, and image (elaborated below). Garvin’s typology has been accepted by marketing scholars in describing product quality dimensions (Kotler, 1997; Zeithaml, 1988). His typology has not only included many quality dimensions examined by COO researchers (e.g., performance, reliability, durability) but also identified several quality aspects that COO researchers have either overlooked or understudied (e.g., features, aesthetics, image, serviceability, conformance). The identification of these overlooked or understudied quality dimensions may allow us to understand more comprehensively the effects of global sourcing decisions and COO facets on consumers’ product evaluations (Li and Dant, 1998).

Third, because most COO studies have aimed at U.S. or European consumers (e.g., Chao, 1993; Etenson, 1993; Niss, 1996; Papadopoulos, Heslop, and Beracs, 1990; Tse and Lee, 1993), our knowledge about the effects of sourcing locations on consumers living in other parts of the world has been limited (Li, Fu, and Murray, 1998). This is regrettable because the U.S. and European markets have become increasingly saturated and MNCs have consequently expanded into other country markets. Given its European heritage, strong business ties with the U.S., and geographical proximity to the growing Asian economy, Australia occupies a unique position in world trade. Furthermore, the privatization and deregulation activities by the current probusiness government seem to have achieved initial results in stimulating the economic recovery of Australia from its 1992 recession (Aubin, 1996). Thus, we collected data in Australia and examined how various COO facets affect Australian consumers’ product evaluations.

Fourth, researchers have recently studied how price levels and brand names combine with sourcing locations in affecting consumer behavior (Ahmed and d’Astous, 1995; Chao, 1993; Tse and Lee, 1993). This is consistent with the traditional interest of the COO literature in the interaction effects between COO cues and such other marketing variables as brand name and price (Erickson, Johansson, and Chao, 1984; Han and Terpstra, 1988; Johansson, Douglas, and Nonaka, 1985; Wall, Liefield, and Heslop, 1991). However, empirical evidence on the impact of warranty, another influential marketing variable, in the context of global sourcing and COO effects has been scarce (Ahmed and d’Astous, 1995; Etenson, 1993; Thorrelli, Lim, and Ye, 1989). As more products enter into the mature stage of product life cycle, services become increasingly important in attracting and retaining customers. Because warranty is such a crucial part of product services, it deserves more serious research attention. More importantly, warranty represents a vital means for unknown MNCs and brands, which our study focuses on, to survive and succeed in today’s highly competitive marketplace. Our study attempted to address warranty effects as well.

**Theories and Hypotheses**

In search for an inclusive framework of product quality dimensions, Garvin (1984) reviewed several research disciplines, including philosophy, economics, marketing, and operations management. He proposed eight dimensions to capture inclusively the construct domain of product quality. Performance refers to the superiority or excellence of primary operating characteristics of a product (e.g., the quality of the picture and sound for televisions); serviceability indicates the extent to which a product can be easily and adequately repaired and serviced. Reliability is defined as the extent to which a product is not likely to fail or break down, and durability is concerned with the physical life of a product. Aesthetics refers to the look, feel, taste, smell, style, and/or fashion of a product, and conformance is concerned with the extent to which a product’s design and operating characteristics meet predetermined technical standards. Features is defined as the availability and excellence of “bells and whistles” related to a product (e.g., on-screen time clock and channel display features for televisions). Image indicates the extent to which a product conveys an upscale or sophisticated image.

Because product evaluation may be functionally and/or symbolically oriented (Ahmed and d’Astous, 1995; Leclerc, Schmitt, and Dube, 1994), Garvin’s eight dimensions can be categorized into “functional” dimensions (performance, serviceability, reliability, durability, conformance, and features) and “symbolic” dimensions (aesthetics and image). The distinction of functional versus symbolic quality dimensions may shed new insights on how global sourcing locations and COO
facets influence consumers’ product evaluations. Based on Garvin’s eight quality dimensions, we next develop hypotheses regarding the effects of COO facets on functional and symbolic evaluations of a product.

Effects of COO Facets

Information-processing theory posits that consumers use product cues to form beliefs and evaluations about a product, which in turn influence their purchase behaviors. Product cues can be intrinsic parts of a product (e.g., taste, smell, performance) or extrinsic to physical products (e.g., brand name, price, COO). Although intrinsic cues would provide consumers with the most reliable basis to judge product quality, they are not always as easily obtained or available as are extrinsic cues. Thus, consumers frequently rely on extrinsic cues when forming product impressions (Cox, 1962; Olson and Jacoby, 1972).

Consistent with information-processing theory, the majority of COO studies have observed significant COO effects on consumers’ product perceptions and purchases (Bilkey and Nes, 1982; Oszomer and Cavusgil, 1991). Recent results indicate that, like the “Made in” label, COO facets also influence consumers’ product evaluations (Ahmed and d’Astous, 1995; Chao, 1993; Tse and Lee, 1993). Given past findings, we should expect significant effects of sourcing locations in this study. However, in the contexts of Garvin’s typology and multiple COO facets, more interesting questions arise. Are various COO facets equally influential in affecting consumers’ product evaluations? If not, which COO facet is more important? How does each sourcing location decision/COO facet affect the functional and symbolic evaluations of a product?

Previous studies have shown that COO effects tend to be product dimension-specific (Han and Terpstra, 1988). Thus, different COO facets may be associated with or affect distinct sets of product quality attributes (Tse and Lee, 1993). Presumably, each product dimension or attribute does not have equal weight in forming consumers’ evaluations of product quality. Therefore, some COO facets may carry more weight in affecting consumers’ evaluations of products than do others.

Information-processing theory also suggests that the more information content an information cue possesses about a product, the higher predictive value it has, and the more likely it will be used as a predictor of product quality (Cox, 1962; Heimbach, Johansson, and MacLachlean, 1989). Thus, consumers are likely to pay more attention to the most “informative” COO facet in judging a product. Intuitively, COC seems to be a powerful and comprehensive COO cue for a product: it may indicate the COO of the product, suggest the levels of sophistication in product design and in manufacturing processes, and convey a sense of cultural tradition associated with a product. However, when presented together with COD and COA, COC may lose much of its information content because the COOs for product design and assembly are explicitly indicated by COD and COA, respectively. The sense of cultural heritage conveyed by COC may be further shared with or diluted by COD and COA. Thus, we expect that COC will have minimal impact on functional and symbolic quality evaluations of a product.

Compared with COD, COA, as an information cue, only conveys information about the last step of a product’s production process—the country designation in which the product is assembled. Because labor skills and industrial capabilities vary across countries, COA may affect consumers’ evaluations of a product’s manufacturing quality, conformance to prespecified engineering standards, and potential defects. Therefore, COA may influence consumers’ evaluations of a product’s functional quality dimensions (e.g., performance, reliability, conformance). COA may also affect the “prestige” image of a product, depending upon the “advance” status of the assembly country location. Given MNCs’ current widespread practices of assembling products in low-cost countries, however, consumers may perceive COA to be a less effective criterion to discriminate MNCs and their products. Thus, the effects of COA on a product’s “image” may be diminishing. Additionally, COA may not indicate anything to consumers about the style, fashion, or other aesthetic aspects of the product because these product aspects are normally determined by the product design process, not by the assembly process.

On the other hand, COD may hint at the level of technological sophistication for the whole production process, including the assembly step as well as for the parts and components. It may also provide consumers with clues about the technical sophistication, innovativeness, possible features, and craftsmanship in the design of a product. It may further convey the cultural heritage imbedded in the product as well as the style, fashion, or other aesthetic information about the product. Consequently, we believe that COD conveys more critical information about a product than does COA and that COD will affect both functional and symbolic quality evaluations of a product.

Based on above elaboration, we formed the following related hypotheses.

H1a: When COD and COA are present, COC has minimal impact on functional and symbolic quality evaluations of a product.

H1b: COA has stronger impact on the evaluations of a product’s functional qualities than on its symbolic qualities.

H1c: COD influences both functional and symbolic quality evaluations of a product.

H1d: Compared with COA and COC, COD is most influential in affecting the evaluations of a product’s functional and symbolic qualities.

Effects of Warranty

Warranty assures consumers that redress is possible if a product does not perform as expected. Thus, warranty can posi-
tively influence consumers’ evaluations of a product by assuring the quality and value of the product (Feldman, 1976), enhancing consumers’ self-confidence in product purchases (Armstrong, Kendall, and Russ, 1975), reducing consumers’ perception of risk (Bearden and Shimp, 1982; Perry and Perry, 1976), and increasing satisfaction through dissonance reduction (Darden and Rao, 1977). To consumers, warranty may also signal a manufacturer’s confidence in the quality of a product. Hence, warranty is expected to affect product quality evaluations positively.

Furthermore, we believe that the positive effects of warranty are stronger on the functional quality evaluations of a product than on its symbolic ones. Warranty is primarily concerned with functional performance of a product. It spells out what the manufacturer will do to ensure minimal performance standards for a product. In contrast, warranty typically does not explicitly address issues about the style, fashion, or image aspects of a product. However, it most likely allows consumers to return the merchandise for whatever reason. So, redress is also possible for consumers if a product fails to meet their aesthetic or image standards. Nonetheless, the assurance of warranty for the symbolic quality of a product is less explicit and direct than for the functional aspects of the product.

Warranty can enhance the symbolic evaluations of a product because the positive impact of warranty on the functional quality of a product may also have “spill-over” effects on the symbolic aspects of the product. According to the cognitive consistency theories, people strive to maintain a consistent set of beliefs and attitudes, and inconsistency in one’s cognitive system tends to induce adverse psychological tension and discomfort (McGuire, 1972). Consequently, consumers are likely to develop and hold a set of beliefs and evaluations about a product’s symbolic quality that are largely consistent with their beliefs and evaluations about the product’s functional quality, and vice versa. Thus, the positive impact of warranty on a product’s functional quality should enhance the symbolic evaluations of the product. Nonetheless, because warranty is primarily concerned with functional aspects of a product and its effects on the symbolic evaluations of the product tend to be “spill-over” in nature, the positive impact of warranty on symbolic evaluations may not be strong as its effects on functional evaluations.

Based on above elaboration, we formed the following related hypotheses.

H2a: Warranty positively affects the evaluations of a product’s functional and symbolic qualities.

H2b: Warranty has stronger positive effects on the evaluations of a product’s functional qualities than on its symbolic qualities.

Warranty versus COO Facets

Our previous hypotheses posit that both COO information and warranty influence consumers’ quality evaluations of a product. If it is the case, an interesting question arises: in the context of global sourcing, which information cue, warranty or COO, is more influential? According to information-processing theory, the extent to which consumers use an information cue depends upon their confidence in using this cue as well as the predictive value (information content) of the cue (Cox, 1962; Olson and Jacoby, 1972). Cues perceived to have high predictive value are used to a greater extent when confidence in the use of the cues is also high. It follows that consumers with low confidence in certain cues will make less use of the cues regardless of their assessment of any particular cue’s predictive value (Heimbach, Johansson, and MacLachlan, 1989).

Although both COO information and warranty are expected to affect product quality judgements, we believe that consumers are likely to have higher confidence in using warranty to infer product quality than in using COO information when multiple COO facets are indicated. This is so because a product with multiple COO facets, a typical case of global sourcing, is associated with several different countries, and thus consumers may perceive the COO information about the product to be inconsistent or conflicting. These conflicting and inconsistent pieces of COO information may hamper the credibility of such information and reduce consumers’ confidence in using COO cues in inferring product quality (Weinberger, Allen, and Dillon, 1981; Kelley, 1987). On the other hand, for most products, whether a warranty is offered or not is clearly indicated. The warranty content is conveyed through only one, rather than multiple, source: the product warranty policy.

Based on the above discussion, the following hypothesis was formulated.

H3: Compared with COO facets, warranty is more influential in affecting the evaluations of a product’s functional and symbolic qualities.

Interaction Effects

Interaction effects occur because, in processing information, consumers integrate various cues and their respective implications to arrive at product evaluations (Thorelli, Lim, and Ye, 1989). Obviously, such an integration represents a complex and demanding cognitive task. When COO construct manifests itself through multiple facets, different COOs are associated with a product, and these COO cues tend to be inconsistent or conflicting. Sorting out these inconsistent COO facets and integrating their respective implications in a meaningful way, thus, become even more complex and challenging. The availability of additional product information cues (e.g., warranty) should further complicate the process of information integration. Because consumers have the tendency to simplify and reduce cognitive processing (Alba and Hutchinson, 1987; Johansson, 1989), we suspect that interaction/integration among various COO facets or between COO facets and such
other product information as warranty is unlikely to occur when these COO facets are inconsistent or conflicting in indicating the COO of a product.

The limited empirical evidence involving multiple COO facets seems to support the above reasoning. In his study involving price, COA, and COD, Chao (1993) found that the three-way interaction and all the two-way interactions were insignificant in affecting consumers’ evaluations about product design quality. In terms of consumers’ overall product evaluations, only the two-way interaction between price and COD was significant. Similarly, in their first experiment involving COA and component COO, Tse and Lee (1993) observed that the two-way interaction was inconsequential in affecting any of the six product evaluation criteria. In their second experiment involving COA, component COO, and brand name, Tse and Lee found that, after respondents tried a product, the two-way interaction between brand and COA was significant in affecting only one of the seven product evaluation criteria, and that the rest of the two-way and three-way interactions were insignificant. In the case of no product trial experience, on the other hand, only a few more interactions were significant, while most of (the two-way and three-way) interactions were not.

Given the above elaboration, we stated our fourth hypothesis as follows.

**H4**: COO facets do not interact among themselves or with warranty in affecting the evaluations of a product’s functional and symbolic qualities.

**Method**

**Design and Measures**

A $2 \times 2 \times 2 \times 2$ between-subject experiment was implemented. The four manipulated factors were: COC ("GIW, a U.S. Corporation" versus "GIW, a Taiwan Corporation"), COD ("Designed in Japan" versus "Designed in Taiwan"), COA ("Assembled in U.S." versus "Assembled in Mexico"), and warranty ("Full Warranty" versus "Limited Warranty"). To be comparable with the recent studies on multiple COO facets (Chao, 1993; Tse and Lee, 1993), a color television was used as the reference product. To examine the effects of COO facets in the content of unknown corporations and brands, a fictitious corporation, GIW, was created (Tse and Gorn, 1993). In a similar vein, a fictitious brand name, Universe, was created as well for the television. Both names, GIW and Universe, were kept unchanged across experimental cells. In the "limited warranty" situation, the manufacturer (GIW) agreed to replace defective products within 60 days after purchase and share half the expense, if repair is needed, for up to 6 months. In the "full warranty" case, the manufacturer agreed to provide a full refund or replace the defective products within 12 months after purchase and repair the product, free of charge, for up to 18 months.

A questionnaire was used to collect data from undergraduate and nonstudent samples versus nonstudent samples. In the case of no product trial experience, and Cavusgil, 1991). However, recent evidence indicates that the difference in student samples versus nonstudent samples does not affect the findings about COO effects on product evaluations and quality perceptions, although it may influence somewhat the results about COO effects on purchase intentions (Liefeld, 1993; Peterson and Jolibert, 1995). Because we focused on COO effects on product evaluations and quality perceptions, student samples were deemed acceptable.

Previous research has suggested that consumers’ familiarity with a product affects the effects of COO information and that consumers’ ethnocentrism influences the quality evaluations of domestic versus foreign products (Baughn and Yaprak, 1993; Nebenzahl, Jaffe, and Lampert, 1997; Sharma, Shimp, and Shin, 1995). To avoid the potential confounding effects of familiarity and ethnocentrism on our results and to concentrate on the effects of key COO facets, we: (1) chose a product very familiar to the largest number of consumers, as the reference product to minimize the variance in consumers’ product familiarity; and (2) did not use Australia, the home country, in the manipulation of any COO facets to eliminate the associations with domestic products. Our use of television as the reference product may further reduce the potential confounding effects of ethnocentrism because evidence exists to show that, although ethnocentrism or patriotism may influence the quality perceptions of many products (e.g., cars), their effects on the quality of television are almost nonexistent (Han, 1988).

Based upon the meaning of each of Garvin’s eight quality dimensions, multi-item scales were developed for these quality dimensions as well as for product overall quality (see Appendix). For example, a three-item scale was developed to measure the “serviceability” dimension, and it tapped the extent to which consumers perceive the television can be easily and adequately repaired and serviced, if necessary. Moreover a four-item scale was created to measure the “features” dimen-
sion, and this reflected the extent to which consumers believe that the television would have certain “bells and whistles.”

**Checks**

Preliminary analyses indicated that student major (business versus social science) did not affect respondents’ answers (F[9, 262] = 0.97, p < 0.50). Neither did gender (male versus female) (F[9, 264] = 1.09, p < 0.40). Therefore, business and social science majors as well as male and female respondents were pooled together in the subsequent analyses.

A set of statements were included in the questionnaire for manipulation checks. Analyses of responses on these statements revealed that respondents: (1) viewed full warranty more favorably (mean = 3.23) than limited warranty (mean = 2.01) (p < 0.001); (2) believed that product quality of U.S. companies (mean = 3.35) is better than that of Taiwanese ones (mean = 2.77) (p < 0.001); (3) perceived that Japan designs better products (mean = 3.89) than Taiwan (mean = 2.85) (p < 0.001); and (4) deemed that products assembled in U.S. have better quality (mean = 3.33) than those assembled in Mexico (mean = 2.70) (p < 0.001). Thus, the treatment manipulations were successful.

**Analyses and Results**

**Measure Validation**

Before employing confirmatory factor analysis to validate the scales, we examined item-to-total correlations to identify scale items that did not belong to the domain of the assigned construct (Li, 1998; Li and Dant, 1997). The results indicated a unsatisfactory level of internal consistency for the scale measuring the “aesthetics” dimension because of one item’s low item-to-total correlation. Therefore, this item was dropped (Appendix). No other items were eliminated during this measurement purification process. In other words, after the item-to-total correlation analysis, 24 of the original 25 scale items were retained as measures of nine constructs: the eight quality dimensions and the overall quality rating. Next, we assess the validity of our revised measures.

**Unidimensionality** requires that multiple items of a scale be loaded onto the same underlying pre-assigned construct. To assess the unidimensionality of our scales, we subjected the 24 retained scale items to the *a priori* nine-factor confirmatory analysis through Lisrel. The results indicated an acceptable fit between the measurement model and the data: $\chi^2 = 452.50$, df = 216; $p < 0.05$; GFI = 0.89; AGFI = 0.85; NFI = 0.89; RMR = 0.05. Because the retained items for each of the nine scales were loaded onto only their respective pre-assigned construct and not onto any other constructs in the measurement model, unidimensionality can be claimed for our revised scales (Anderson and Gerbing, 1988).

**Reliability** requires that a measure display an acceptable level of internal consistency and have few random errors. The reliability coefficients, reported in Table 1, presented the evidence of reliability for our scales.

**Convergent validity** requires that each item’s factor loading on its assigned construct be significant in a measurement model (Anderson and Gerbing, 1988). In the measurement model of our study, all $\lambda$s were positive and significant: the average $\lambda$ value was 0.74, and the minimum $t$-value for $\lambda$s was 6.32. Therefore, convergent validity can be claimed for our scales as well.

**Discriminant validity** refers to the extent to which the measure is, indeed, novel and not simply a reflection of some other variable. To investigate statistically the discriminant validity of our scales, we implemented Anderson and Gerbing’s (1988) $\chi^2$ difference test procedure: a constrained measurement model was first obtained by constraining the correlation parameters (i.e., $\rho$) between a pair of trait constructs in the measurement model to 1.0; then, the $\chi^2$ value associated with the unconstrained measurement model was compared with the $\chi^2$ value associated with the constrained measurement model. The test was repeated for one pair of constructs at a time and for all pairs of constructs. The results indicated that the unconstrained measurement model had a significantly lower $\chi^2$ than all the constrained measurement models ($p < 0.01$). For example, the highest correlation (0.82) occurred between reliability and overall quality rating (Table 1). The corresponding constrained measurement model had a $\chi^2$ value of 470.79 (df = 217), which was significantly larger than the $\chi^2$ value for

<table>
<thead>
<tr>
<th>Table 1. Construct Correlations and Reliability$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Performance (I)</td>
</tr>
<tr>
<td>Serviceability (II)</td>
</tr>
<tr>
<td>Reliability (III)</td>
</tr>
<tr>
<td>Durability (IV)</td>
</tr>
<tr>
<td>Aesthetics (V)</td>
</tr>
<tr>
<td>Conformance (VI)</td>
</tr>
<tr>
<td>Features (VII)</td>
</tr>
<tr>
<td>Image (VIII)</td>
</tr>
<tr>
<td>Overall quality (IX)</td>
</tr>
</tbody>
</table>

$^a$ The values in the parentheses are reliability coefficients. All construct correlations are based on Listel results and are significant at $\alpha = 0.05$. 
Table 2. MANOVA Results: Multivariate F-Values

<table>
<thead>
<tr>
<th>Factor</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>COC</td>
<td>0.61</td>
</tr>
<tr>
<td>COD</td>
<td>1.99*</td>
</tr>
<tr>
<td>COA</td>
<td>1.11</td>
</tr>
<tr>
<td>Warranty (W)</td>
<td>5.27**</td>
</tr>
<tr>
<td>COC × COD</td>
<td>1.47</td>
</tr>
<tr>
<td>COC × COA</td>
<td>0.76</td>
</tr>
<tr>
<td>COC × W</td>
<td>1.12</td>
</tr>
<tr>
<td>COD × COA</td>
<td>1.75</td>
</tr>
<tr>
<td>COD × W</td>
<td>0.94</td>
</tr>
<tr>
<td>COA × W</td>
<td>1.33</td>
</tr>
<tr>
<td>COC × COD × COA</td>
<td>0.82</td>
</tr>
<tr>
<td>COC × COD × W</td>
<td>0.47</td>
</tr>
<tr>
<td>COC × COA × W</td>
<td>1.80</td>
</tr>
<tr>
<td>COD × COA × W</td>
<td>1.67</td>
</tr>
<tr>
<td>COC × COD × COA × W</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Note: all F-values have (9,292) d.f.

As indicated in Table 2, the F-value for the overall impact of COC on the eight quality dimensions was insignificant. Predicting minimal impact for COC, H1a was thus confirmed. Claiming stronger COA effects on functional quality evaluations than on symbolic quality aspects of a product, H1b was not supported because the F-value for COA was insignificant. There are several possible reasons for this finding. One is that the widespread MNCs’ practices of assembling products in low cost countries may have reduced the value of COA as a criterion in discriminating and predicting the quality, functional or symbolic, of products.

Table 3. ANOVA Results: Means and Univariate F-Values

<table>
<thead>
<tr>
<th>Dimension</th>
<th>COD</th>
<th>Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Japan</td>
<td>Taiwan</td>
</tr>
<tr>
<td>Functional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>3.27 (.71)</td>
<td>3.12 (.80)</td>
</tr>
<tr>
<td>Serviceability</td>
<td>3.07 (.87)</td>
<td>3.01 (.86)</td>
</tr>
<tr>
<td>Reliability</td>
<td>2.85 (.68)</td>
<td>2.67 (.65)</td>
</tr>
<tr>
<td>Durability</td>
<td>2.97 (.74)</td>
<td>2.80 (.80)</td>
</tr>
<tr>
<td>Conformance</td>
<td>3.12 (.71)</td>
<td>3.06 (.69)</td>
</tr>
<tr>
<td>Features</td>
<td>3.22 (.65)</td>
<td>3.20 (.70)</td>
</tr>
<tr>
<td>Symbolic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aesthetics</td>
<td>3.26 (.78)</td>
<td>3.02 (.79)</td>
</tr>
<tr>
<td>Image</td>
<td>3.02 (.81)</td>
<td>2.92 (.88)</td>
</tr>
<tr>
<td>Overall quality</td>
<td>2.82 (.67)</td>
<td>2.77 (.81)</td>
</tr>
<tr>
<td># of Valid Respondents</td>
<td>155</td>
<td>161</td>
</tr>
</tbody>
</table>

Note: All F-values have d.f. (1,300). The values in the parentheses are standard deviations for the means.

*p < 0.05.
**p < 0.01.
see below) registered insignificant impact on this quality aspect. For such products as televisions “features” represents a “search” attribute, and consumers may readily find out a television’s features at the point of purchase. This may partially explain why COD (as well as warranty, see below) registered little impact on the “features” evaluations of televisions. Interestingly, COD did not affect the overall product quality and the serviceability dimension either.

Clearly, the multivariate F-value for COD was larger than those for COC and COA (Table 2), and, it was statistically significant, whereas those for COC and COA were not. Thus, predicting stronger influence for COD than for COC and COA, H1d was supported.

Warranty was found to affect overall product quality ratings as well as many functional and symbolic quality dimensions (Table 3). Specifically, televisions with full warranty were evaluated more favorably than those with limited warranty in terms of all Garvin’s quality dimension except conformance and features. Together with the multivariate F-value results (Table 2), these findings indicate that warranty significantly and positively affected consumers’ functional and symbolic quality evaluations of televisions; thus, H2a was supported. Furthermore, all the significant F-values for warranty were larger on performance, reliability, durability, and serviceability than those on aesthetics and image dimensions (Table 3). So, predicting stronger warranty effects on functional evaluations than on symbolic evaluations of a product, H2b was supported as well. Possible reasons for the insignificant effects of warranty on conformance and features were elaborated earlier.

As seen in Table 2, the multivariate F-value for warranty was more than twice as large as that for COD. Warranty also affected more functional and symbolic quality dimensions than did COD (Table 3). For each of the functional quality dimensions on which both COD and warranty registered significant effects, the F-value for warranty was larger than the F-value for COD. Although the F-value for COD was larger than that for warranty on the aesthetics dimension, warranty affected both symbolic quality dimensions, whereas COD did not influence the image quality dimension. Therefore, predicting stronger influence for warranty than for COO facets, H3 was well supported. Additionally, Table 2 indicates that none of the possible interaction effects was significant. Positing that COO facets do not interact among themselves or with warranty, H4 was also confirmed.

MANCOVA and a series of ANCOVAs were also run, in which warranty was treated as a covariate. The findings are essentially the same as in the MANOVA: (1) only COD \(F_{0.290} = 1.96, p < 0.01\) is significant, whereas COA \(F_{0.290} = 1.12, p < 0.35\) and COC \(F_{0.290} = 0.63, p < 0.80\) are still insignificant; (2) COD still affects reliability, durability, and aesthetics, but no longer influences the product “performance” dimension; and, (3) none of the two-way or three-way interactions among COD, COA, and COC are significant. Furthermore, as a covariate, warranty registers significant effects on the quality dimensions \(F_{0.290} = 5.40, p < 0.01\) and affects all Garvin’s dimensions except for “conformance” and “features.” These warranty effects are identical to those in MANOVA.

Discussion

Implications for Global Sourcing

Global sourcing has increasingly become a common practice of MNCs. In making decisions regarding global sourcing, MNCs tend to be primarily concerned with cost, supply, and operational issues and pay little attention to the perspectives of consumers (Cordell, 1992; Witt and Rao, 1992). Our results suggest that it would be wise for MNCs to consider consumers’ perspectives in global sourcing decisions. Specifically, among the location decisions for global sourcing, MNCs should be very careful in selecting country designations for product design because COD seems to be the most important piece of COO information in influencing consumers’ evaluations of a product’s key functional and symbolic qualities. This implication is especially important for products whose “aesthetics” aspects play a critical role in consumers’ product evaluations and choices because COD exhibits the strongest impact on the “aesthetics” dimension of televisions in our study.

A poor COD decision may not be compensated by marketing variables, such as warranty, and by other sourcing location decisions, such as COA, because we found that COD is unlikely to interact with COA or warranty. Given the insignificant interaction effects between COD and COC, a MNC from a developed country, such as the United States, could not count on its favorable COC to counterbalance the detrimental effects of a poor COD decision. However, our findings also suggest that MNCs should not be too concerned about sourcing decisions for assembly locations because COA displays limited influence on consumers’ product evaluations, functional or symbolic. MNCs should feel relatively free to explore low cost assembly sites.

Our findings also suggest that MNCs may benefit from providing consumers with more detailed global sourcing information, such as COD, COA, COC, on product labels and packages, especially when a favorable COD is involved. More detailed global sourcing information seems to motivate consumers to simplify their processing of COO information by avoiding other COO facets and concentrating on the most informative COO facet, COD, in their judgments of products. This is especially relevant when MNCs pursue cost savings in production and assembly, and their products may, therefore, carry unfavorable COAs. Detailed COO information also seems to encourage consumers to downplay the importance of COO facets versus other product information (e.g., warranty). Perhaps, this is so because consumers feel less confident about using conflicting and inconsistent COO facets in evaluating products.

Our results also imply that MNCs from newly developed countries (NICs), such as Taiwan, can utilize global sourcing
to overcome or reduce the effects of unfavorable stereotypes consumers hold against their products. Operationalizing the COO construct in terms of the “Made in” label, previous studies have shed little light on the issue of which COO facet is more responsible for these unfavorable stereotypes. Our results indicate that these unfavorable stereotypes may not stem from the COC per se of an NIC company or its use of low cost assembly sites (COA). Rather, they may primarily originate from the country designation of its product design (COD). Thus, NIC companies may strategically outsource or locate product design functions in “prestigious” countries to overcome consumers’ unfavorable biases against their products. Providing detailed global sourcing information to consumers, as elaborated earlier, may be especially useful for NIC companies to combat the effects of these negative stereotypes. Moreover, because COCs per se do not seem to be a significant factor in affecting consumers’ quality perceptions toward products, NIC companies should not be deterred from exploring markets in developed countries because of their COCs. They may now have a better chance to make it in today’s global marketplaces with creative global sourcing decisions and product labeling as well as an attractive warranty.

**Theoretical Implications**

Our study attempted to address some of the research issues in both the global sourcing literature and the COO effects research. Therefore, the theoretical implications of our findings are related to these two research streams. Given the increasing practices of global sourcing by MNCs, researchers have strongly argued for the recognition of COA and COC as distinct constructs in COO research (Nebenzahl, Jaffe, and Lampert, 1995; Ozsomer and Cavusgil, 1991; Samiee, 1994). However, our findings reveal that, compared with design sourcing location (COD), the assembly sourcing location (COA) and the home country of a MNC (COC) are not very important in influencing consumers’ evaluations of product qualities (Table 2). Perhaps COD is more influential because COD conveys more information about the design and cultural heritage of a product as well as its technological sophistication.

Similarly, Chao (1993) discovered that COD, manipulated as a between-subject factor, affects both design quality and overall quality evaluations of a product, whereas COA has an impact only on overall quality ratings. One could argue that the significant COA effects on overall quality rating occur in Chao’s (1993) study because COA is manipulated as a within-subject factor; thus, demand artifacts may contribute to this finding. Tse and Lee (1993) have observed significant COA effects on consumers’ product quality judgments, but their study does not include COD as a factor. Focusing on the comparisons of COO effects on industrial purchasers versus consumers, Ahmed and d’Astous (1995) observed equal importance of COD and COA in affecting consumers’ product quality evaluations. Two possible explanations can be offered for their findings. One is that their study did not include COC. Exclusion of this additional COO facet could significantly simplify consumers’ evaluation processes and allow them to pay more attention to each COO information, including COA. The other reason is that they did not dimensionalize product quality and examined the effects of COO facets on overall perceived quality. This may allow COA effects, if any, to be concentrated, solidified, and thus captured by this sole quality aspect.

One of the prevailing assumptions in the COO literature is that, even if it is unknown, a firm from a “prestigious” country tends to be in an advantageous position versus a firm from an unfavorable country (Khanna, 1986). However, our results suggest that, for a unknown MNC, its COC (e.g., United States vs. Taiwan) is an unimportant factor in influencing consumers’ perceptions of product qualities when it is presented together with other prominent COO facets, such as COD and COA. COC conveys little about a product when the information about product design and assembly locations are clearly and explicitly expressed through COD and COA, respectively. COC may be influential only when no other COO information is provided to consumers.

Recent research has shown that COO effects weaken after the COO construct is decomposed from the “Made in” label into multiple facets (Tse and Lee, 1993). Our results seem to support such a finding because two facets, COA and COC, did not affect product evaluations, whereas, in terms of the multivariate F-values (Table 2), the only significant COO facet, COD, has smaller impact relative to marketing variables such as warranty. Our research suggests that, when COO construct is decomposed into multiple facets, COO effects weaken probably because these COO facets are often inconsistent and conflicting in indicating the COO of a product. Subsequently, the credibility of COO information may be hampered, and consumers may have less confidence in using COO cues to judge product qualities.

The insignificant interactions we found in this study suggest that, although consumers may be aware of the cross-country and intertwined nature of global sourcing and manufacturing (Samiee, Shimp, and Snyder, 1990), they may not yet be accustomed to evaluate products with complex COO information and may not be able to integrate all the complicated information in a meaningful way. The fact that only one of the three COO facets, COD, displayed significant impact further implies that consumers confronted with complex COO information may simplify their cognitive tasks by relying on the most informative COO facet, COD, to infer product quality and avoiding processing other COO facets.

This study has also demonstrated that Garvin’s (1984) eight quality dimensions meet the major validity criteria (unidimensionality, reliability, convergent validity, discriminant validity). It has also established the direct relevancy of Garvin’s typology to research on the effects of COO facets. The adoption of Garvin’s typology allowed us to show that the effects of COO facets (e.g., COD) are product dimension-specific,
although they may not affect the overall quality evaluation. Hence, Garvin’s typology represents a promising framework for conceptualizing and operationalizing product quality dimensions for product quality research in general and for global sourcing and COO facets research in particular.

In contrast to other recent COO facets studies that have only investigated the effects of warranty on overall product quality (e.g., Ahmed and d’Astous, 1995), we adopted Garvin’s (1984) quality dimensions and further dichotomized them into functional versus symbolic dimensions. This sheds additional light on the issue of how warranty and COO facets may affect a product’s evaluations differently. For example, we found that, although design sourcing location (COD) affected a number of key functional quality dimensions of televisions, it registered the most influence on one of the product’s symbolic dimensions, aesthetics. Whereas warranty affected both symbolic quality aspects (aesthetics and image) of televisions, it exerted the most impact on the product’s key functional quality dimensions, such as serviceability, reliability, durability, and performance.

Nonetheless, as have many previous studies examining warranty effects on consumers in developed countries (Ahmed and d’Astous, 1995; Thorelli, Lim, and Ye, 1989), this study has observed that warranty positively affects product quality evaluations. However, examining data collected in Russia, Poland, and Hungary, Ettenson (1993) concluded that warranty has only a minimal impact for color televisions. One reason for such different findings is that warranty as a marketing tool may have not been frequently used by manufacturers in former communist countries, and thus consumers in these emerging markets may not be very familiar with warranty. As a result, they may feel less confident in using it to evaluate and choose a product. Therefore, the effects of warranty may be moderated by consumers’ familiarity with this particular marketing tool.

Limitations
Despite our interesting findings, the prudent reader should interpret our study with caution. Focusing on the effects of COO facets and warranty, our experiment did not examine how consumers’ familiarity with a product may affect our findings. Specifically, we investigated the effects of COO facets as well as warranty on televisions, a product very familiar to consumers. When consumers’ familiarity with a product is low, they are more likely to use COO information to make product quality judgements (Johansson, 1989). Consequently, the effects of COO facets on an unfamiliar product are likely to be stronger, and more COO facets may exhibit significant impact on consumers’ product evaluations. But, given our elaboration on H1a to H1d, we believe that COD would continue to be the most influential COO facet in consumers’ quality evaluations of an unfamiliar product, whereas COC would exert the least impact when it is presented together with COD, COA, and other COO facets. Of course, future research is needed to test our conjectures.

To focus on the effects of multiple COO facets, our experiment did not include price; and, as with recent studies on COO facets (Ahmed and d’Astous, 1995; Chao, 1993; Tse and Lee, 1993), we did not incorporate purchase intention as a dependent variable. Interestingly, within the context of multiple COO facets, Chao’s (1993) results suggest equal importance of price and COD in affecting consumers’ evaluations of products; whereas Ahmed and d’Astous (1995) found that price has a minimal impact on perceived quality for consumers. Moreover, both studies reported limited or no interaction effects between price and COO facets on product evaluations. Some evidence indicates the “Made in” label affects product evaluations but does not necessarily influence purchase intentions directly (e.g., Wall, Liefeld, and Heslop, 1991). It has been argued that such insignificant effects occur perhaps because beliefs/attitudes versus purchase intention are formed by separate cognitive processes (Thorelli, Lim, and Ye, 1989). Nonetheless, future research is needed to examine whether and how price, COO facets, and their interactions affect product purchase intentions.

Despite the mentioned limitations, we hope that, taken together with recent studies on COO facets, our research could enhance both the global sourcing research and the COO research and contribute to the emerging research interest in the multifacets of the COO construct.

References


---

**Appendix. Scale Items**

This TV set:

**Performance**

p1 would display high quality pictures.
p2 would deliver high quality sound.

**Serviceability**

s1 would easily get repaired, if necessary.
s2 would easily get warranty services, if necessary.
s3 would easily get replacement parts, if necessary.

**Reliability**

r1 would likely break down. (R)
r2 would need a comprehensive warranty. (R)
r3 would be very reliable.

**Durability**

d1 would last for a long time.
d2 would have enduring quality pictures.
d3 would be very durable.

**Aesthetics**

a1 would have cutting-edge design.
a2* would likely be out of style. (R)
a3 would have appealing appearance.

**Conformance**

c1 would have no defects.
c2 would conform to prespecified technical standards.

**Features**

f1 would have on-screen (time) clock.
f2 would have on-screen channel display feature.
f3 would have auto-color-control feature.
f4 would have child-lock capacity.

**Image**

i1 would be a nice gift item that I’ll feel proud to give.
i2 would be a nice display that I’ll feel proud to show friends.
i3 would likely be sold at up-scale stores.

**Overall Quality**

o1 would have excellent overall quality.
o2 would have superior quality in comparison with similar TVs.

---

Note: 1. The scales were anchored with 1 = strongly disagree to 5 = strongly agree.
2. * indicates the item deleted during the item-to-total correlation analysis.
3. (R) indicates the reversely coded items.