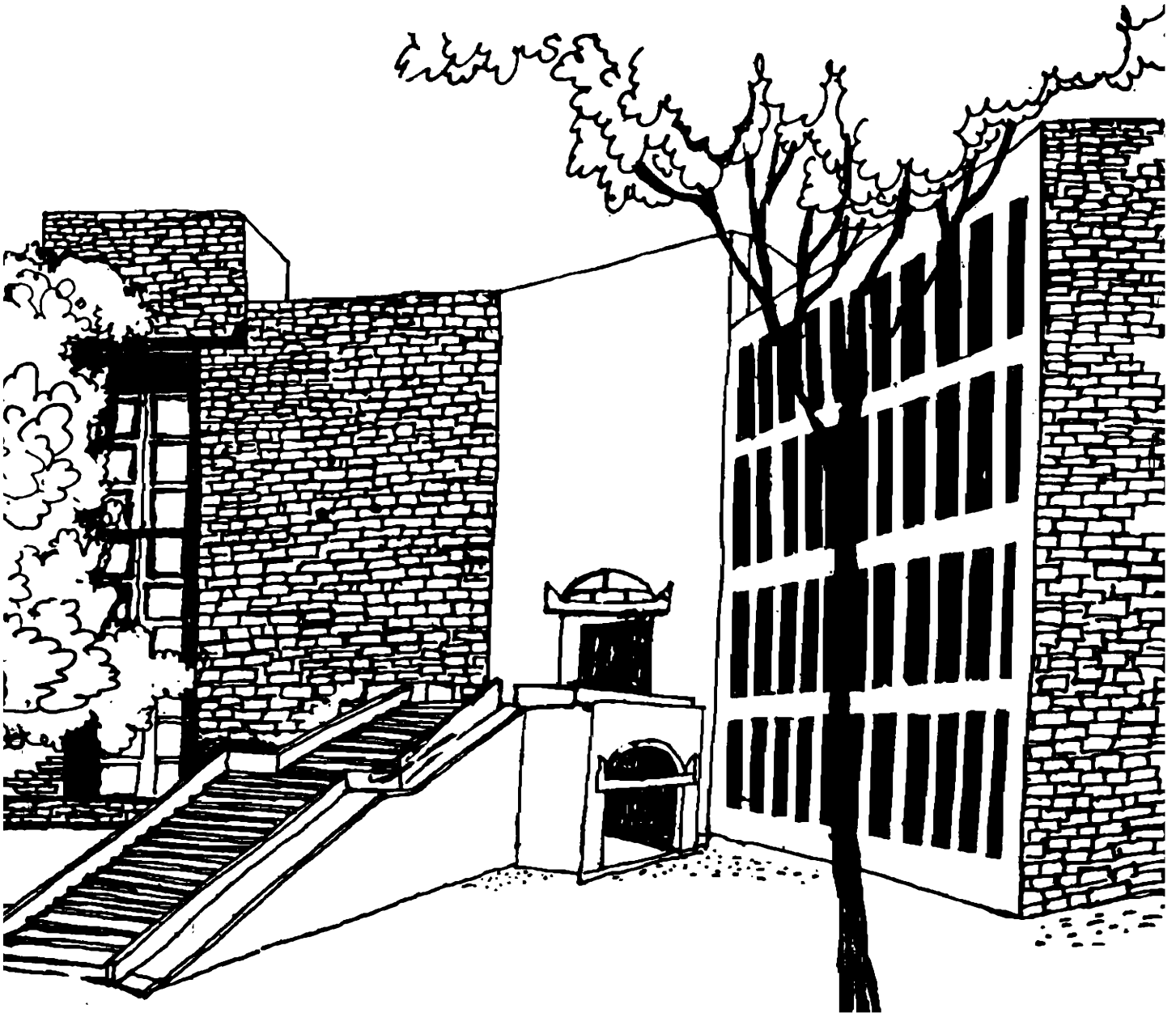# Working Paper

AN EMPIRICAL INVESTIGATION INTO THE EFFECTS OF COUNTRY OF ORIGIN ON CONSUMER PRODUCT PREFERENCE IN INDIA

By

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An Empirical Investigation Into The Effects of Country of Origin on Consumer Product Preference in India

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Abstract

With increasing cross-border trade and globalization of markets, country of origin effect is assuming importance in the domain of cross-national consumer behavior. 'Country of origin' effect refers to consumers' general perceptions of quality for products having brand names associated with a particular country.

The objective of this paper is to understand the effect of country of origin on consumers in India in their preference for products. The paper looks at two distinct effects of country of origin - foreign brands made in their respective countries and foreign brands made in India. This study is in the context of a typical developing country like India on the throes of economic liberalization.

Methodologically, this research involved multiple-cue study, i.e., product descriptions offered to respondents involved not only country of origin but other cues as well. The research design involved a two-stage procedure, and ordinal data was fed into conjoint analysis to determine the effect of country of origin.

The findings show that country of origin effect on consumer product evaluation in India is product-specific. The effect was found to be stronger for television than for wrist watch or car. Also, between the three countries, Japan is preferred for television, while Indian products are preferred for car and wrist watch.

Possible reasons have been explored along with implications for researchers, marketing practitioners, and public policy makers in developing countries.

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An Empirical Investigation Into the Effects of Country of Origin on Consumer Product Preference in India

Avinandan Mukherjee[1]

Introduction

With the globalization of markets since the 80's, the question of how prominently the country of origin of a product influences buyers' evaluations has assumed special significance. Hence, the impact of product-country images on consumer decisions is emerging as an important subfield of consumer behavior.

In this paper, *country-of-origin effect* refers to consumers' general perceptions of quality for products having brand name associated with a particular country. Therefore, the term would include both a foreign brand made in the home country of the company and a foreign brand made in the host country, where the country-of-origin measurement is being done. For example, a country of origin study made in India can encompass Indian consumers' general perceptions of quality for a Japanese brand of electronic product made in Japan as well as the same brand of product made in a manufacturing facility owned by the Japanese company in India.

Product preference can be understood through information processing and learning theories. In purchase decisions, consumers are thought to rely on two categories of cues : intrinsic (physical product attributes) and extrinsic (non-physical product attributes). These cues help consumers to facilitate learning and simplify the purchase decision task. Country-of-origin is an extrinsic cue (Hong and Wyer, 1989). Country of origin can also be interpreted as the impact of source effect on consumer preference.

The purpose of this paper is to empirically investigate the effect of country-of-origin on product preference of consumers in India. The paper looks at two distinct effects of country of origin - foreign brands made in their respective countries and foreign brands made in India.

Literature Review

Research Streams

Since the mid-1960s, several studies have been reported on country of origin effects. In general, researchers have found that consumers <u>have</u> significantly different country images or general perceptions about products made in different countries.

Some broad research streams emerge from the myriad of literature surveyed. One research stream is concerned with explaining country-of-origin effects in terms of the demographic and psychographic characteristics of the consumer. Country of origin effect has been found to depend on demographic characteristics, like race (Schooler, 1971), age (Schooler, 1971 ; Dornoff, Tankersley and White, 1974), gender (Schooler, 1971 ; Dornoff, Tankersley and White, 1974), education (Schooler, 1971 ; Wall and Heslop, 1986), nationality (Gaedeke, 1973 ; Wall and Heslop, 1986), patriotism (Nagashima, 1970), expertise (Maheswaran, 1994) and familiarity with country's product (Min Han, 1989).

The second research stream looks at country of origin effects as product-specific. Some of the findings of this class of research are : durables are associated with higher country of origin biases in consumer evaluation than non-durables (Hugstad and Durr, 1986). Also, high-tech products are more susceptible to country of origin effect than low-tech products (Witt and Rao, 1992).

The third research stream has investigated the use of marketing strategies as countervailing influences on country-of-origin bias. These studies have shown that negative biases can be moderated by labeling (Schooler and Sunoo, 1969; Schooler, 1971), communications (Reierson, 1967; Ettenson, Wagner and Gaeth, 1988), pricing (Krishnakumar, 1974), branding (Han and Terpstra, 1988), and distribution (Chao, 1989).

This paper is concerned with the second research stream, which looks at product-specific effects of country of origin on consumer product evaluation. Most researchers have conceptualized country of origin only as consumers' general perceptions of quality for products made in home country of the product (Bilkey and Nes, 1982). The other way to conceptualize the construct, namely, consumers' general perceptions of quality for foreign brands manufactured in the host country, has been largely overlooked. This paper has conceptualized the construct of country of origin in both ways, i.e., consumers' general perceptions of quality for foreign brands made in home country of the product, as well as manufactured in the host country. Also, since multiple-cue measures are much more robust and realistic, this research involves multiple-cue study. Thus, each product in this study has been described in terms of four independent factors (serving as cues), one of which is country of origin. Further, this paper has considered durables as the object of study. Finally, research on country of origin has mostly been carried out in developed country contexts. Such research results may not be of much use to managers of multinational firms in India and managers of Indian companies trying to protect their turf from multinational invasion. The current paper addresses this research gap.

Objectives of the Research

The objective of this research is to understand the effect of country of origin on consumers in India in their preference for products. It examines whether the effect differs for foreign brands made in their respective countries vis-a-vis foreign brands made in India. The paper also examines the implications of this research for theory and practice.

Scope of research

This research has been restricted in scope to :

1)   three products : television, car and wrist watch
2)   three countries : Japan, Korea and India
3)   period of study spanning from late 1994 to the first half of 1995. This was the time when the fruits of economic liberalization set in motion in India since 1991 started coming to the fore, with multinational companies making a beeline for entry into the Indian market and Indian companies organizing themselves to defend their market share.

Methodology

This study involved a two-stage procedure. In the first stage, a pilot study was conducted to select three products and two foreign countries. In the second stage, consumer subjects reacted to product combinations by ranking nine different descriptions of each product according to his/her preference. The subjects were asked to rank order nine descriptions of each of the three products from the combination that they were most likely to buy, to the combination that they were least likely to buy. After the rank ordering of each product, respondents were given an intermission to help desensitize them from any possible carry-over effects to the next product evaluation. Half of the total number of respondents were told that the foreign brands were manufactured in their respective country and imported into India, and the remaining half were told that the foreign brands were manufactured by the foreign companies in India. The respondents were only told about products from these three countries, and no brand names were mentioned. Although within each country of origin, different brand names do have different images, this aspect was kept out of the purview of the study. The

assumption, therefore, was that the brand selected in this study from a particular country is a representative brand of that country.

Sample of respondents

The research study was conducted on a sample size of sixty respondents. The sample was composed of:

1)   30 second year post-graduate management students.
2)   30 heads of household in the Vastrapur area of Ahmedabad.

All these respondents selected for the study satisfied the following criteria:

1)   annual household income exceeding Rs. 1.5 lakhs.
2)   ownership of car, television and wrist watch.
3)   familiarity with brand names of the above products from Japan and South Korea.

Convenience sampling was used because of constraints on time and resources.

Choice of products

The criteria used to select the three products were :

1)   respondents should be familiar with the products
2)   the products should be perceived to be significantly different in terms of producing country technological knowhow.
3)   there should have been liberalization in the concerned industries leading to import of foreign brands in India
4)   the product should have been used in previous country-of-origin studies.

The three products chosen on these criteria are : television, wrist watch, and car.

Choice of countries

The choice of countries for analysis was guided by logical considerations, like:

1)   firms from these countries should have already entered or are entering the Indian market for the above products.
2)   these countries are equally familiar to consumers as producers of above products.

South Korea was chosen as a foreign country of origin, because it is a newly-industrialized country producing and exporting a wide variety of consumer durables to India. The recent launch of Korean brands like Daewoo, Goldstar, Hyundai, Samsung, etc. in the Indian durables market has increased consumer awareness on Korean products. Japan was selected as the second foreign country, because it is well-known as a manufacturer of durables, particularly electronics and automobiles. Japanese companies like Sony and Aiwa (in television), Seiko, Citizen and Casio (in wrist watches), and Honda and Mitsubishi (in cars) have already entered the Indian market. India was also selected as a country-of-origin, because the purpose of the paper is to find out whether Indian consumers show any preference for foreign-made products compared to Indian-made products, due to country-of-origin effects.

Design of experiment

For each of the three products, four relevant factors were selected based on an exploratory consumer study. For each factor, three levels were determined.

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The four factors selected for each product and the three levels selected for each factor are given in Table 1 in the Appendix. This gave rise to a 3 * 3 * 3 * 3 factorial design, leading to 81 alternative combinations. Since it is impractical to present all 81 combinations to respondents for their evaluation, a fractional factorial design was required. Therefore, an orthogonal array was constructed, which reduced the 81 combinations to 9 combinations to be rank ordered by the respondents. In the orthogonal array, the test combinations are selected so that the independent contributions of all the four factors are balanced. In this way, each factor's weight is kept separate and is not confused with those of other factors. The orthogonal array used here is shown in Table 2 in the Appendix. The ranked data was fed into conjoint analysis. The purpose of using conjoint analysis was to calculate the relative importance of the various attributes including country of origin for each product, and also to find out the relative impact of each country of origin on consumer evaluation. Instead of self-stated attribute importance ratings through questions like : "How important to you is to know what country the brand is from ?", these ratings were derived through conjoint analysis, making the study task more realistic.

While most of the factors selected were objective in nature, there were some subjective factors like design for wrist watch and car. The levels chosen for design of wrist watch were 'highly aesthetic', 'moderately aesthetic' and 'not aesthetic', while design for car was categorized into three levels of 'excellent', 'average' and 'poor'. These subjective levels were operationalized based on pre-tests where respondents were asked what they understood by 'highly aesthetic', 'moderately aesthetic', and 'not aesthetic' design in case of wrist watch. In the actual survey, the levels were defined on these lines to the respondents for the sake of clarity. The nine attribute-level combinations for each product generated through fractional factorial design and administered to respondents for rank ordering are given in the Annexure - 1.

Findings

The research findings are summarized for each of the three products in the following tables :

Wrist Watch						
Factor and Level	Conjoint Part-Worths (Factor-level Weights)			Factor Importance Weights (in percent)		
	Over-all	Foreign Brands made abroad	Foreign Brands made in India	Over-all	Foreign Brands made abroad	Foreign Brands made in India
Water Resistance 1. 3 metres 2. 10metres 3.30metres	0.00 0.35 -0.85	0.00 0.76 -0.46	0.00 -0.06 -1.24	13.17	10.79	19.34
Price 1. Rs. 1,000 2. Rs.2,000 3. Rs.5,000	0.00 -1.38 -0.87	0.00 -2.29 -1.14	0.00 -0.47 -0.60	21.34	32.70	9.33
Design 1. Highly aesthetic 2. Moderate aesthetic 3. Not aesthetic	0.00 3.37 1.23	0.00 2.87 0.70	0.00 3.88 1.76	52.24	40.95	60.28
Country of Origin 1. India 2. Japan 3. Korea	0.00 -0.64 -0.86	0.00 -0.58 -1.09	0.00 -0.71 -0.62	13.25	15.56	11.05

Car						
Factor and Level	Conjoint Part-Worths (Factor-level Weights)			Factor Importance Weights (in percent)		
	Over-all	Foreign Brands made abroad	Foreign Brands made in India	Over-all	Foreign Brands made abroad	Foreign Brands made in India
List price 1. Rs. 5 lakhs 2. Rs. 3 lakhs 3. Rs. 2 lakhs	0.00 0.92 -0.11	0.00 0.95 -0.05	0.00 1.08 0.01	14.95	15.01	15.18
Country of Origin 1. Japan 2. Korea 3. India	0.00 0.09 1.02	0.00 0.02 1.42	0.00 1.24 1.81	16.58	21.10	25.51
Fuel economy 1. 30 mpg or better 2. 24-27 mpg 3. 20 mpg or less	0.00 -1.37 -0.82	0.00 -0.95 -0.80	0.00 -0.80 -0.74	22.16	15.60	11.27
Design 1. Excellent design 2. Average design 3. Poor design	0.00 -2.86 -1.03	0.00 -2.50 -1.50	0.00 -3.41 -1.90	46.31	45.40	48.04

Television						
Factor and Level	Conjoint Part-Worths (Factor-level Weights)			Factor Importance Weights (in percent)		
	Overall	Foreign Brands made abroad	Foreign Brands made in India	Over-all	Foreign Brands made abroad	Foreign Brands made in India
Width of screen 1. 14 inch 2. 21 inch 3. 29 inch	0.00 0.69 -0.56	0.00 1.07 -0.33	0.00 0.82 -0.26	16.76	23.76	14.62
Country of Origin 1. India 2. Korea 3. Japan	0.00 0.80 0.87	0.00 0.41 0.59	0.00 -0.34 -0.09	21.08	13.12	6.13
Price 1. High 2. Medium 3. Low	0.00 -0.11 0.31	0.00 -0.22 0.22	0.00 -0.16 0.69	7.57	4.95	12.25
Picture and Sound Quality 1. Sharp/ stereo 2. Sharp/ mono or weak/stereo 3. Weak/ mono	0.00 2.24 1.32	0.00 2.61 1.36	0.00 3.77 1.83	54.59	58.17	67.00

The results of this research show that country of origin effect on consumer product preference in India is product-specific. This conforms to the findings in literature, where country of origin bias has been found to be based on the product and the product-class. Literature seems to be replete with findings which suggest that consumers prefer domestically produced products, since imported products are perceived to be of inferior quality. While such findings are logical in advanced economies, the results of this research suggest that the situation is quite opposite in India. No significant and consistent differences have been observed between the cases of foreign brand made abroad and foreign brands made in India.

The results of conjoint analysis indicate that the country of origin variable, although relatively less important than some other factors (picture and sound quality for television ; design and fuel economy for cars ; and design and price for wrist watch), is clearly significant. These results confirm similar findings in recent multivariate research by Han & Terpstra (1988), Johansson, Douglas & Nonaka (1985), and Lee, Kim & Miller (1992). An analysis of the research results for each product points to interesting differences.

Television

For television, country of origin effect on product evaluation is highly significant. Responses reveal that consumers consider picture and sound quality as the most important factor, followed by country of origin. The importance of country of origin as an factor, however, is higher in the case of foreign brands made abroad compared to the case of foreign brands made in India. Within the country of origin, a comparison of the three countries reveals that the sample as a whole has considered Japan as the best, followed by Korea, and then India. In the case of foreign brands made abroad, the trend is the same, i.e., Japan is rated highest, followed by Korea, and finally India. However, the results of the case of foreign brands made in India shows a reversal of trends. India comes first in this case, followed by Japan and finally Korea.

Car

The importance of country of origin in consumer product evaluation for cars is lower than for televisions. However, the effect is still significant. Consumers consider design as the most important factor for a car. For the overall sample, country of origin emerged as the third factor in terms of importance after design and fuel economy. The relative position of country of origin vis-a-vis other factors, however, changed for the two sub-samples. For the sub-sample who were told that the foreign brands were manufactured in India, country of origin emerged as a more important attribute compared to the sub-sample who were told that the foreign brands were manufactured in their respective countries. However, for both the cases, country of origin emerged as the second most important variable, next only to design. If we look at the perceptions on each of the three countries, India has emerged as the best in all the three cases. India is followed by Korea, which is followed by Japan.

Wrist watch

Research on wrist watch revealed that the importance of country of origin is quite low, albeit not insignificant. Respondents considered design to be the most important factor for purchase decision. Country of origin was found to be third in importance, well below design and price, and marginally above water resistance. No significant difference was observed in the importance of country of origin for the two sub-samples, i.e., for the case of foreign brands made abroad and the case of foreign brands made in India. A comparison of the average utilities of the three countries points to a strong positive image of India, followed by Japan and Korea in that order.

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Implications

This research has implications both for Indian firms and foreign firms operating in India. The results obtained point to the need for marketing practitioners in Indian companies to better prepare for meeting the competitive challenges of global companies invading India. Since the average Indian consumer considers country-of-origin as one of the factors in purchase decision, Indian firms need to gear themselves up to face competition from foreign players. The industry association and the government can also play a role in this process. They should establish minimum quality requirements and provide incentives to firms who meet the standards while penalizing those who do not. Indian brands can also gain competitive advantage over their foreign counterparts by stressing on maintaining distribution equity, improving service and spare parts availability, giving wide choices to the customer, and thus retaining the brand loyalty. Several Indian companies are doing well in selected foreign markets even in the face of stiff international competition. BPL, Videocon and Onida have made successful foray into exports. Indian cars, like Maruti and Ambassador, are exported. Titan is the first Indian international company, with substantial brand equity abroad. A strategy that Indian companies can adopt is to highlight their international successes through their communication campaigns, so that the negative stereotyping of Indian products can be dispelled. Indian companies can also get into collaborations with foreign companies, so that they are deemed to be technologically at par wih some of the foreign entrants in the Indian market.

The Indian consumer is not likely to continue to patronize Indian brands only for the sake of loyalty. They will not mind drifting towards foreign brands in case the Indian manufacturers fail to prove themselves superior. Therefore, the implication of the research results for Indian companies is that they need to develop strategies for combating the disadvantage they have due to negative country-of-origin image.

This research also has significant implications on the marketing strategies of multinational companies in India. The biggest strength of these companies is the favorable country of origin image they enjoy, at least in some product categories. However, these multinational companies entering India will have to dispel the apprehensions in the minds of Indian consumers regarding their suitability for Indian consumers. Multinational companies entering India need to undertake rigorous market research to be able to better understand the tastes and preferences of Indian consumers, which should help in strategic decision-making, like selecting a suitable segmentation basis, choosing the right target segment(s), developing a proper positioning strategy, and deciding on the marketing mix elements of product details, pricing, distribution, and promotion. For all these, it will be important for these companies to go beyond what happened in the past in India to examine what might lie in the future.

Discussions

As in the case of most empirical studies, the present study is not without its limitations. Country of origin effect is a vast field, incorporating various facets - consumer and industrial products, goods and services, trade and FDI. This article limits itself only to consumer products and does not consider industrial products. Also, this research covers durables, and therefore goods, and not services. However, this research does consider the effects of both trade and FDI, i.e., differences in country of origin effects for foreign brands manufactured in home country vis-a-vis foreign brands manufactured in host country. Each of the factors considered in the study has been conceptualized at three levels. However, in real-life situations, the levels for each attribute are not uniform and limited to three in number. As is typical in conjoint analysis, the relative importance of each factor is influenced by the orthogonal array design, which is based on the number of factors and the number of levels of each factor. An obvious limitation of this study is in the use of only three products and only three countries. Prior research has established that country-of-origin bias is specific to both products and countries. Another limitation is that the data for this study has been collected from a geographically limited environment. The findings may not be generalizable to other geographic areas. In view of these limitations, the findings of this study should be extrapolated to other products and countries only with

suitable caution. A further limitation of the research can be attributed to possible inaccuracy which may have crept in due to the difficulty faced by the respondents in considering four factors at one time, and ranking nine alternatives in order of preference.

Conclusions

This research confirms the findings in previous research that country of origin effect is product-specific.

The research results for television show that country of origin effect is considered to be very important in product evaluation by respondents. Also, Japan was considered to be the best, followed by Korea, with India coming a poor third. Some possible reasons for this may be discussed. First, the perceived technological differences between television sets produced by Japan, Korea amd India are high. Countries like Japan have already commercialized the high definition TV (HDTV) - a technology still not available with Indian manufacturers. Japan is well-known across the world for its leadership in electronics technology and miniaturization. Korea, one of the Asian tigers, is exactly following the Japanese way, and is fast becoming a technologically advanced country with special strength in electronic products, like TV. Second, several foreign brands have already entered the Indian market. As a result, Indian consumers have already been adequately exposed to foreign TVs. This might have helped them to decide on the relative strengths of products of various countries. Also, most of the foreign TV manufacturers have already set up their service centres in various Indian cities, thus allaying the apprehension of poor service facilities among Indian consumers. Such apprehensions, however, were found to be very strong in the case of car. Third, depth interviews with some of the respondents revealed that television is considered to be a status symbol in many households. A foreign TV in the drawing room significantly adds to the social prestige of the household.

The preference of Indian consumers for Indian cars over foreign cars can be explained from several perspectives. First, given the poor condition of roads in India, cars need to be robust. Some Indian brands like the Ambassador of Hindustan Motors are considered to be rugged enough to take on the rough Indian roads. The general perception is that foreign cars with their sleek and sophisticated looks are not so suitable for Indian road conditions. Ambassador also scores high on safety, sturdiness, and spaciousness. Second, though the sample had been screened and tested for ownership and knowledge about cars, it is possible that many had no exposure or experience regarding the kind of features offered by foreign cars. Third, availability of spare parts is also felt to be a problem as far as foreign cars are concerned. Finally, the popularity of Maruti in India is another possible reason of consumers opting for Indian cars. Maruti was considered to be an Indian brand in the survey. Car models like the Maruti 1000 and Maruti Esteem were perceived by many respondents to be as good as any foreign car. Hindustan Motor's Contessa, and Telco's Tata Sumo and Tata Sierra were considered by many respondents to be highly suitable for Indian conditions. The preference shown by the respondents for Korean cars over Japanese cars is an unexpected result. The Indian car market has recently witnessed the entry of the Korean conglomerate Daewoo with a luxury car called Cielo. No Japanese company has yet launched its car on Indian roads. So, greater exposure to Korean cars may have influenced the respondents. Exploratory discussions with some of the respondents revealed that another reason for this can be attributed to the advertisement campaign launched by Daewoo. The Ogilvy and Mather ad "Who's busy selling cars to Detroit ?" claims that Daewoo's cars are outselling several Japanese brands (like Nissan, Mazda, and Mitsubishi) in the USA. This may have resulted in Indian consumers feeling that Korean cars are better than many Japanese car brands.

For wrist watch, the importance attached to country of origin is low. Wrist watch is now-a-days considered to be a fashion accessory and not a lifetime investment. So, people look for good design and style in watches, and not necessarily which country the brand belongs to. Also, perceived technology differences between various countries for watches is decreasing. The technology for quartz watches has now become highly standardized and is available to manufacturers of many countries. Further, the range, design and reliability offered by Titan watches are considered by many to be of

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world standards. Titan offers a whole range of watches, priced from Rs. 1,000 to Rs. 1 lakh. Titan's watches are designed by international designers and are selling well in the Middle East, and now USA and UK. Also, the lackluster performance of the American brand Timex in India may be due to Indian consumers' feeling that there is hardly any perceptible benefit offered by foreign watch brands over Indian brands.

This research contributes towards empirically investigating the importance of country of origin effect in product evaluation and identifying the countries with positive image in the Indian context for specified products. Improved methodological approaches like multiple cues and conjoint analysis have been used. The paper distinguishes between two types of effects of country of origin - for foreign brands made in their respective countries vis-a-vis for foreign brands made in India.

Directions for Future Research

An interesting area of further research would be finding out whether country-of-origin biases are a function of source country considerations, such as its degree of economic development. Also, it might be interesting to explore whether country-of-origin effects depend on the consuming country considerations, like import experiences or familiarity and cultural affinity with source country. Also, identical research in the Indian context can be carried out on consumer non-durable products, industrial products, and services. Future research should be conducted to replicate the study using a different sample frame. The findings of this study should be confirmed by using different products from both the same and different product classes. Such confirmatory research would add valuable insight into the generalizability of these findings to other products. Future research efforts may also be directed towards understanding the effects of various moderating variables in the Indian context. Examples of such moderating variables are : product familiarity, demographic characteristics, consumer expertise, type of attribute information, etc. Future studies should also examine how consumers form country image, what types of exposure affect consumers' formation of country image, and how stable their country image is (i.e., to what extent they change their country image upon acquiring new product information).

There are two hypotheses on how country of origin affects product preference (C. Min Han, 1989) - 'halo effect' and 'summary construct'. According to halo effect hypothesis, consumers make inferences about product attributes from country image. Therefore, country image as a halo directly affects consumers' beliefs about product attributes and indirectly affects overall evaluation of products through those beliefs.

The halo effect may be shown as :
                    Country image ---> Beliefs ---> Brand Attitude

Summary construct hypothesis propounds that country image, just like brand image, can be viewed as a summary construct. Consumers construct country-specific information by generalizing product information over brands with the same country of origin to such an extent that the brands are perceived to have similar attributes. Therefore, according to this hypothesis, country image directly affects consumer attitude towards a brand from the country instead of affecting it indirectly through product attribute rating as in the case of the halo hypothesis.

The summary construct may be shown as :
                    Beliefs ---> Country Image ---> Brand Attitude

An interesting research question to pursue is which of these hypotheses holds good under what conditions. For example, the current research results appear to suggest that the halo hypothesis works for television, and the summary construct hypothesis holds good for car and wrist watch. Such issues may be probed in subsequent research.

S. No.	Factors	Levels
Table 1		
Wrist Watch		
1	Water Resistance	3 Metres 10 Metres 30 Metres
2	Price	Rs. 1,000 Rs. 2,000 Rs. 5,000
3	Design	Highly Aesthetic Moderately Aesthetic Not Aesthetic
4	Country of Origin	India Japan Korean
Car		
1	List Price	Rs. 5 Lakhs Rs. 3 Lakhs Rs. 2 Lakhs
2	Country of Origin	Japan Korea India
3	Fuel Economy	30 MPG or Better 24-27 MPG 20 MPG or Less
4	Design	Excellent Design Average Design Poor Design
Television		
1	Width of Screen	14 Inch 21 Inch 29 Inch
2	Country of Origin	India Korea Japan
3	Price	High Medium Low
4	Picture and Sound Quality	Sharp Contrast With Stereo Sharp Contrast With Mono /Weak Contrast With Stereo Weak Contrast With Mono

Table 2			
Orthogonal Array Used			
1	1	1	1
1	2	2	2
1	3	3	3
2	1	2	3
2	2	3	1
2	3	1	2
3	1	3	2
3	2	1	3
3	3	2	1

Questionnaire

For each of the products, please rank the following combinations in order of intention to purchase.

Car

1)   List Price Rs. 5 Lakhs, Japanese Brand, 30 MPG Or Better, Excellent Design
2)   List Price Rs. 5 Lakhs, Korean Brand, 24-27 MPG, Average Design
3)   List Price Rs. 5 Lakhs, Indian Brand, 20 MPG Or Less, Poor Design
4)   List Price Rs. 3 Lakhs, Japanese Brand, 24-27 MPG, Poor Design
5)   List Price Rs. 3 Lakhs, Korean Brand, 24-27 MPG, Excellent Design
6)   List Price Rs. 3 Lakhs, Indian Brand, 30 MPG Or Better, Average Design
7)   List Price Rs. 2 Lakhs, Japanese Brand, 20 MPG Or Less, Average Design
8)   List Price Rs. 2 Lakhs, Korean Brand, 30 MPG Or Better, Poor Design
9)   List Price Rs. 2 Lakhs, Indian Brand, 24-27 MPG, Excellent Design

Wrist Watch

1)   Water Resistance 3 M. Price Rs. 1,000, Not Aesthetic, Indian Brand
2)   Water Resistance 3 M, Price Rs. 2,000, Moderately Aesthetic, Japanese Brand
3)   Water Resistance 3 M, Price Rs. 5,000, Highly Aesthetic, Korean Brand
4)   Water Resistance 10 M, Price Rs. 1,000, Moderately Aesthetic, Korean Brand
5)   Water Resistance 10 M, Price Rs. 2,000, Highly Aesthetic, Indian Brand
6)   Water Resistance 10 M, Price Rs. 5,000, Not Aesthetic, Japanese Brand
7)   Water Resistance 30 M, Price Rs. 1,000, Highly Aesthetic, Japanese Brand
8)   Water Resistance 30 M, Price Rs. 2,000, Not Aesthetic, Korean Brand
9)   Water Resistance 30 M, Price Rs. 5,000, Moderately Aesthetic, Indian Brand

Television

1)   14 Inch Screen, Indian Brand, Price Rs. 10,000, Weak Contrast With Mono
2)   14 Inch Screen, Korean Brand, Price Rs. 15,000, Moderate Picture And Sound
3)   14 Inch Screen, Japanese Brand, Price Rs. 20,000, Sharp Contrast With Stereo
4)   21 Inch Screen, Indian Brand, Price Rs. 20,000, Sharp Contrast With Stereo
5)   21 Inch Screen, Korean Brand, Price Rs. 15,000, Weak Contrast With Mono
6)   21 Inch Screen, Japanese Brand, Price Rs. 15,000, Moderate Picture And Sound
7)   29 Inch Screen, Indian Brand, Price Rs. 30,000, Moderate Picture And Sound
8)   29 Inch Screen, Korean Brand, Price Rs. 30,000, Sharp Contrast With Stereo
9)   29 Inch Screen, Japanese Brand, Price Rs. 25,000, Weak Contrast With Mono

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