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То

Sir,

Please find an article titled *"Perception of Brand, Price, Features and Product Quality"*, an empirical study on *Refrigerator Brands*. The author is working as Professor & HoD, JBS@JCET, Ottapalam, Palakkad; he can be contacted at ashokanchankarachan@gmail.com

Thanks & Regards,

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# **ABSTRACT**

# "Perception of Brand, Price, Features and Product Quality", an empirical study of Refrigerator Brands

Refrigerators have been manufactured in India since 1950s. Till the 1980s, players like Godrej, Kelvinator, ALLWYN and Voltas controlled almost 90 % of the market. Earlier the white goods sector was categorized as luxury goods industry and was subject to oppressive taxation and licensing. The situation changed after the liberalization of the Indian economy in the early 1990s. The government removed all restrictions, and now there is no restriction on foreign investment, and licenses are no longer required. Post-liberalization, a number of foreign companies entered the market and many domestic players also diversified into refrigerators. BPL and Videocon, who already had presence in the consumer electronics market, leveraged their strengths to enter the durable sector.

In India, refrigerators have the highest aspirational value of all consumer durables, with the exception of televisions. This accounts for the high growth rate of the refrigerator market. The refrigerator market has been growing at the rate of about 15 % per year, while the consumer durables industry as a whole has grown at almost 8 %.

The size of the refrigerator market is estimated to be 3.5-4 million units approximately, valued at Rs 50 billion. The domestic penetration rate of refrigerators is about 9 %. The penetration of refrigerators is considerably higher in urban area, which account for 75 % of the demand, with rural areas constituting other 25 %. The demand is also higher in the northern and western parts of the country than in the east. The south also has high demand as the warmer weather of the south requires a refrigerator running throughout the year.

This study was conducted in the city of Coimbatore with a sample size of 540. The study investigates the impact of Brand, Price and Features on Product Quality. The much debated price-quality relationship is also studied. Various tools like one-way ANOVA and Tukey's HSD etc. are also used to analyze data.

#### Key Words: Refrigerators, Perception, Brand, Price, Features, Perceived Quality

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#### **INTRODUCTION:**

Refrigerators have been manufactured in India since 1950s. Till the 1980s, players like Godrej, Kelvinator, ALLWYN and Voltas controlled almost 90 % of the market. Earlier the white goods sector was categorized as luxury goods industry and was subject to oppressive taxation and licensing. The situation changed after the liberalization of the Indian economy in the early 1990s. The government removed all restrictions, and now there is no restriction on foreign investment, and licenses are no longer required. Post-liberalization, a number of foreign companies entered the market and many domestic players also diversified into refrigerators. BPL and Videocon, who already had presence in the consumer electronics market, leveraged their strengths to enter the durable sector.

In India, refrigerators have the highest aspirational value of all consumer durables, with the exception of televisions. This accounts for the high growth rate of the refrigerator market. The refrigerator market has been growing at the rate of about 15 % per year, while the consumer durables industry as a whole has grown at almost 8 %.

The size of the refrigerator market is estimated to be 3.5-4 million units approximately, valued at Rs 50 billion. The domestic penetration rate of refrigerators is about 9 %. The penetration of refrigerators is considerably higher in urban area, which account for 75 % of the demand, with rural areas constituting other 25 %. The demand is also higher in the northern and western parts of the country than in the east. The south also has high demand as the warmer weather of the south requires a refrigerator running throughout the year.

#### **LITERATURE REVIEW:**

#### Price & Perceived Quality

Several studies have investigated the role and influence of price upon perceived quality of a product. It has been pointed out that the price cue may play a significant role in quality assessment process due to the following reasons: (1) the information about price is generally available (Monroe, 1971); (2) the buyer cannot be sure about the continued availability of other possible criteria to assess the quality of a product; (3) the price is usually the least ambiguous stimulus; and (4) the price is frequently a concrete and measurable variable for the shopper (Shapiro, 1968). But the results of empirical studies are not so obvious. One of the reasons for such findings is that various aspects of price such as an absolute threshold of pries (acceptable range of prices), differential threshold and reference price have not been paid prior attention. This section

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attempts to make a critical review of these issues and determine their implications for quality management.

#### Brand Name & Perceived Quality

The brand name cue or its image had a significant main effect on perceived quality when it was one of the cues provided to a consumer either in isolation or in combination with some other cue. Such results may be attributable to several reasons, among them are: (1) the brand name cue is easy to judge as the price cue (Shapiro, 1973), (2) the familiar brands have high predictive and confidence values; (3) the well advertised brands generally have high predictive and confidence values; and (4) the "brand name cue is a symbolic index to an informational chunk that consists of data about several attributes of a product, among them, perhaps, are price, size, shape, manufacturer, and performance factors" (Olson, 1976, p 40). Those subjects who use band name cue to access an informational chunk, the separate exposure to the specific price cues adds no extra information beyond that already known, and, therefore, a significant price effect is unlikely (Olson, 1976) and brand image will have a significant effect. It is concluded, therefore that the brand name or its image will have a significant effect were a brand possess an image either because a consumer is extremely familiar with it or because it is widely advertised.

#### Features & Perceived Quality

Attributes that signal quality have been dichotomized into intrinsic and extrinsic cues (Olson 1977; Olson and Jacoby 1972). Intrinsic cues involve the physical composition of the product. In beverages, intrinsic cues would include such attributes as flavor, colour, texture, and degree of sweetness. Intrinsic attributes cannot be changed without altering the nature of the product itself and are consumed as the product is consumed.(Olson 1977; Olson and Jacoby 1972). Extrinsic cues are product-related but not part of the physical product itself. They are by definition, outside the product Price, Brand Name, and level of advertising are examples of extrinsic cues to quality.

The intrinsic-extrinsic dichotomy of quality cues is useful for discussing quality but is not without conceptual difficulties. Other methods of classification scheme include (1) tangible/intangible, (2) distal/proximal (Brunswick 1956), and (3) direct/inferential. However, each of these dichotomies has the same "fuzzy set" problems that are inherent in the intrinsic/extrinsic dichotomy. Notably, with each scheme, some cues (particularly packaging) would be difficult to classify. Because the intrinsic/extrinsic dichotomy has a literature

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underpinning it, because it is widely used and recognized, and because it has clear managerial implications, it was retained in this study.

# **OBJECTIVES:**

- 1. To classify Refrigerators the basis of Brand Names
- 2. To conduct Tukey's HSD to find out the homogeneous Brand Names
- 3. To classify Refrigerators the basis of Price
- 4. To conduct Tukey's HSD to identify homogeneous Price Ranges
- 5. To classify Refrigerators the basis of Features
- 6. To conduct Tukey's HSD to find out homogeneous Features
- 7. To classify refrigerators the basis of Perceived Quality
- 8. Classification of Brands in terms of quality by Tukey's HSD.

# **Classification of Refrigerators on the Basis of Brand Name:**

The respondents were asked to rate the Brand Name of 11 brands on a five point Likert Scale. At a glance **Table 1** makes it clear that 'Whirlpool' and 'LG' were rated high where as 'Sanyo' and 'Akai' were rated as low. The average scores obtained are LG (4.04), Godrej (3.67), BPL (3.12), Samsung (3.60), Akai (2.70), Videocon (3.52), Whirlpool (4.18), Sanyo (2.70), Electrolux (3.01), Daewoo (2.74) and Haier (2.83). Table 1 summarizes the mean and standard deviations obtained for the 11 brands chosen for study.

# Table 1

# **Brand Favorability – Refrigerator**

	Ν	Minimum	Maximum	Mean	Std. Deviation
Akai	540	1.00	5.00	2.6944	.94818
Sanyo	540	1.00	5.00	2.7019	.96025
Daewoo	540	1.00	5.00	2.7426	.97959
Haier	540	1.00	5.00	2.8333	.99255
Electrolux	540	1.00	5.00	3.0130	.99060
BPL	540	1.00	5.00	3.1222	.89519
Videocon	540	1.00	5.00	3.5185	.88569
Samsung	540	1.00	5.00	3.5926	.87043
Godrej	540	1.00	5.00	3.6648	.84880
LG	540	1.00	5.00	4.0463	.80794
Whirlpool	540	1.00	5.00	4.1759	.92209
Valid N (listwise)	540				

# **Descriptive Statistics**

# **One-Way ANOVA to classify brands**

The purpose of this test was to classify the brands into "Low" and "High" in terms of Brand Favorability. Then these brands were used in the main questionnaires as "Low" and "High" for the purpose of brand manipulation.

One way analysis of variance was conducted to group the various brands into homogeneous groups. (Tukey's HSD). Five groups were identified based on increasing order of brand favorability. Group-1 consists of (Sanyo, Akai, Daewoo, and Haier). Group- 2 (Haier and Electrolux), Group-3 (Electrolux and BPL), Group- 4 (Videocon, Samsung, and Godrej) and Group 5 (LG and Whirlpool). For the purpose of manipulation of brands, Whirlpool was selected as a "High" brand and "Sanyo" as Low.

#### Table 2

# Tukey's HSD - Brand Rating-Refrigerator Brand Rating

Tukey HSD <sup>4</sup>									
			Subset for alpha = .05						
Brand Factor	Ν	1	2	3	4	5			
Sanyo	540	2.7000							
Akai	540	2.7074							
Daewoo	540	2.7407							
Haier	540	2.8333	2.8333						
Electrolux	540		3.0056	3.0056					
BPL	540			3.1222					
Videocon	540				3.5222				
Samsung	540				3.5963				
Godrej	540				3.6630				
LG	540					4.0389			
Whirlpool	540					4.1759			

a. Uses Harmonic Mean Sample Size = 540.000.

# **Manipulation of Prices Levels:**

The following table gives the descriptive statistics about the price levels on a five point scale. Price level of <8500(1.80), 8500-10,000(2.14), 10,000-12,500(2.70), 12,500-15,000(2.86, 15,000-17,500 (3.36), 17,500-20,000(3.49), 20,000-25,000(3.98), 25,000-30,000 (4.13), 30,000-35,000(4.31), 35,000-40,000(4.69) and above 40,000 (4.76), were the scores obtained for the 11 price ranges. As expected these price ranges are rated on an ascending order and a low rating means a low price and a high rating means a high price.

# Table 3Price Rating-Refrigerator

Descriptives
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Price Rating

	Ν	Mean	Std. Deviation	Minimum	Maximum
Less than 8500	540	1.7981	.97938	1.00	5.00
8500-10,000	540	2.1352	1.10079	1.00	5.00
10,000-12,500	540	2.7019	.83410	1.00	5.00
12,500-15,000	540	2.8630	.92768	1.00	5.00
15,000-17,500	540	3.3556	.72298	1.00	5.00
17,500-20,000	540	3.4944	.74975	1.00	5.00
20,000-25,000	540	3.9870	.65735	1.00	5.00
25,000-30,000	540	4.1333	.68971	1.00	5.00
30,000-35,000	540	4.3148	.73412	1.00	5.00
35,000-40,000	540	4.6944	.79023	1.00	5.00
Above 40,000	540	4.7611	.79677	1.00	5.00

# **One-Way ANOVA to Classify Prices:**

The purpose of this analysis was to classify the price levels into 4 categories, Low, Medium High and Very High so that the price levels can be manipulated at four levels to study Perceived Quality, Perceived Value and Willingness to buy in the buyer's acceptable price range.

One way analysis of variance was conducted to group the various price levels into 7 homogeneous groups. (Turkey's HSD). Seven groups were identified based on increasing order of price levels. Group- 1 consists of Less than 8500; Group -2 (8500-10,000), Group-3 (10,000-12,500 &12,500-15,000). Group- 4 (15,000-17,500 & 17,500-20,000); Group- 5 (20,000-25,000 & 25,000-30,000). Group-6 (30,000-35,000); and Group- 7 above 40,000. Based on the above classification, the 4 price levels manipulated in the final study were Rs.45,000 (Very High), Rs.35,000(High), Rs.20,000 (Medium) and Rs.10,000 (Low).

#### Table 4

Tukey HSD <sup>a</sup>										
l			Subset for alpha = .05							
Price Factor	N	1	2	3	4	5	6	7		
Less than 8500	540	1.7981			I					
8500-10,000	540		2.1352		, I	1	1	ł		
10,000-12,500	540			2.7019	, I	1	1 1	ł		
12,500-15,000	540			2.8630	, I	1	1	ł		
15,000-17,500	540				3.3556	1	1	ł		
17,500-20,000	540				3.4944	1	1	1		
20,000-25,000	540				, I	3.9870	1	1		
25,000-30,000	540				, I	4.1333	1	1		
30,000-35,000	540				, I	1	4.3148	1		
35,000-40,000	540				, I	1	1	4.6944		
Above 40,000	540				, I	1	1 1	4.7611		

Price Rating

a. Uses Harmonic Mean Sample Size = 540.000.

# **Manipulation of Features:**

The purpose of this analysis was to classify the features according to the quality perceived by the respondents. Altogether 18 features were presented to the subjects and they were asked to rate the quality on a five-point scale; **Table 5** gives the summary of the mean value and standard deviation for the various features. Single Door (4.05); Double Door (3.83); Triple Door (3.23); Frost Free (4.09); Automatic Defrosting (4.41); Cyclical Defrosting (3.65); Semi Automatic (3.18); Adjustable Shelves(4.01); Door Lock Facility (4.38); Separator for Fruits & Vegetables (3.64); Moisture Control (3.95); Freezer Lamps (3.91); Reversible Door Swing (3.14); Quick Freezing Compartment

(3.99); Deodorizer (3.47); Adjustable Egg Racks (3.75); Door Shelves (3.90); and Clean Back (4.44) were the mean scores obtained for the 19 features.

#### Table 5

#### **Rating of Features-Refrigerator**

# Descriptives

# **Features Rating**

	Ν	Mean	Std. Deviation	Minimum	Maximum
Single Door	540	4.0481	1.28697	1.00	5.00
Double Door	540	3.8333	.88797	1.00	5.00
Triple Door	540	3.2667	1.69119	1.00	5.00
Frost Free	540	4.0889	.96096	1.00	5.00
Automatic Defrosting	540	4.4130	1.00915	1.00	5.00
Cyclical Defrosting	540	3.6481	.84092	1.00	5.00
Semi Automatic	540	3.1833	.78110	1.00	5.00
Adjustable Shelves	540	4.0130	.71934	1.00	5.00
Door Lock Facility	540	4.3796	.96235	1.00	5.00
Separator for Fruits & Vegetables	540	3.6352	1.60075	1.00	5.00
Moisture Control	540	3.9519	.74199	1.00	5.00
Freezer Lamps	540	3.9130	.78590	1.00	5.00
Reversible Door Swing	540	3.1426	.84627	1.00	5.00
Quick Freezing Component	540	3.9926	.78715	1.00	5.00
Deodrizer	540	3.4722	.97709	1.00	5.00
Adjustable Egg Racks	537	3.7542	.88050	1.00	5.00
Door Shelves	537	3.9032	.79991	1.00	5.00
Clean Back	540	4.4389	.93478	1.00	5.00

# **One-Way ANOVA to Classify Features:**

As is shown in the following table, Tukey's HSD was done to classify the features into homogeneous subsets. Seven groups were found to be homogeneous on the basis of Mean and Standard Deviation. They are Group-1 (Reversible Door Swing, Semi Automatic, Triple Door); Group-2 (Triple Door, Deodorizer); Group-3 (Deodorizer, Separator for Fruits and Vegetables, Cyclical Defrosting); Group-4 (Cyclical Defrosting, Adjustable Egg Racks, Frost Free, Double Door); Group-5 (Adjustable Egg Racks, Double Door, Door Shelves, Freezer Lamps, Moisture Control); Group-6( Double Door, Door Shelves, Freezer Lamps, Single Door, Moisture Control, Quick Freezing Compartment, Adjustable Shelves, Single Door); Group-7 (Door Shelves, Freezer Lamps, Moisture Control, Quick Freezing Compartment, Adjustable Shelves, Single Door); and Group-8 (Door Lock Facility, Automatic Defrosting and Clean Back). Based on the classification, the intrinsic cue levels manipulated were; Automatic Defrost, Clean Back, Door Lock (High) and Semi Automatic, Reversible Door Swing & Triple Door (Low). Details are provided in Table 6.

# Table .6

# **Tukey's HSD-Features-Refrigerator**

#### Features Rating

Tukey HSD <sup>a,b</sup>									
			Subset for alpha = .05						
Features Factor	N	1	2	3	4	5	6	7	8
Reversible Door Swing	540	3.1426							
Semi Automatic	540	3.1833							
Triple Door	540	3.2667	3.2667						
Deodrizer	540		3.4722	3.4722					
Separator for Fruits & Vegetables	540			3.6352	3.6352				
Cyclical Defrosting	540			3.6481	3.6481				
Adjustable Egg Racks	537				3.7542	3.7542			
Double Door	540				3.8333	3.8333	3.8333		
Door Shelves	537					3.9032	3.9032	3.9032	
Freezer Lamps	540					3.9130	3.9130	3.9130	
Moisture Control	540					3.9519	3.9519	3.9519	
Quick Freezing Component	540						3.9926	3.9926	
Adjustable Shelves	540						4.0130	4.0130	
Single Door	540							4.0481	
Frost Free	540							4.0889	
Door Lock Facility	540								4.3796
Automatic Defrosting	540								4.4130
Clean Back	540								4.4389
Sig.		.860	.078	.273	.111	.113	.239	.189	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 539.665.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guarantee

# **Quality Perception of Various Brands:**

The respondents were asked to rate the quality of various brands of refrigerators on a five point scale; Very Low, Low, Average, High and Very High. The purpose of the analysis was to classify the various brands on the basis of 'perceived quality' Table 7 summarizes the findings in terms of mean and standard deviation. LG (4.06), Godrej (3.85), BPL (3.16), Samsung (3.65), Daewoo (3.16), Videocon (3.48), Whirlpool (4.29), Akai (2.78), Electrolux (3.21), Sanyo (2.74) and Haier (2.92). The figures in brackets indicate the average ratings obtained for these brands on a five-point scale. It is also interesting to note that those brands which got a favorable rating in term of 'brand favorability' also got a similar rating in terms of perceived quality.

#### Table 7

# **Quality Perception of Brands- Refrigerator**

#### Descriptives

Quality Rati	ng				
	Ν	Mean	Std. Deviation	Minimum	Maximum
LG	540	4.0630	.88259	1.00	5.00
Godrej	540	3.8463	.85089	1.00	5.00
BPL	540	3.1611	.84952	1.00	5.00
Samsung	540	3.6481	.94285	1.00	5.00
Daewoo	540	3.1593	.99935	1.00	5.00
Videocon	540	3.4833	.92065	1.00	5.00
Whirlpool	540	4.2944	.89545	1.00	5.00
Akai	540	2.7815	.92604	1.00	5.00
Electrolux	540	3.2130	.96171	1.00	5.00
Sanyo	540	2.7426	1.00020	1.00	5.00
Haier	540	2.9222	1.08175	1.00	5.00

# **One-Way-ANOVA to classify Brands in terms of quality:**

ANOVA was done to classify the various brands in terms of perceived quality. Tukey's HSD identified six groups in terms of increasing order of quality. They are Group-1 (Sanyo, Akai, and Haier); Group-2 (Daewoo, BPL, and Electrolux); Group-3 (Videocon, Samsung); Group-4 (Godrej); Group-5 (LG); and Group-6 (Whirlpool). As expected, the quality perceptions of the various brands were different and the respondents were able to judge the quality of the product from its brand name alone. This is in supportive of the argument that 'Brand Effect' exists in the durable goods category.

# Table 8Tukey's HSD –Quality Perception-Refrigerator

Tukey HSD <sup>a</sup>							
				Subset for	alpha = .05		
Quality Factor	Ν	1	2	3	4	5	6
Sanyo	540	2.7426					
Akai	540	2.7815					
Haier	540	2.9222					
Daewoo	540		3.1593				
BPL	540		3.1611				
Electrolux	540		3.2130				
Videocon	540			3.4833			
Samsung	540			3.6481			
Godrej	540				3.8463		
LG	540					4.0630	
Whirlpool	540						4.2944

#### **Quality Rating**

a. Uses Harmonic Mean Sample Size = 540.000.

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