

Measurement of Consumer Buying Preferences towards Cars using Conjoint Analysis: A Comparative Study of Urban and Rural Consumers

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Consumer choices concerning the selection, consumption and disposal of products and services are often difficult and are important to the consumer, to marketers, and to policy makers. An attempt has been made to measure the consumer buying preferences towards cars and both urban and rural segments are compared. The data of 477 respondents was collected from Punjab region. The conjoint analysis using regression has been used to analyze the data. It has been found that Hyundai brand is the most preferred brand now a days and people in both urban and rural region prefer to buy LPG segment than petrol and diesel. It has also been found that as disposable income in Punjab region is high so people prefer to buy cars ranging above 8 lacs. Both urban and rural area gave more weightage to first attribute i.e. brand but the least important attribute in rural area is fuel variant where as price range in urban area.

Marketing deals with identifying and meeting human and social needs. Marketing is an organizational function and a set of processes for creating, communicating, and delivering value to customers and for managing customer relationships in ways that benefit the organization and its stakeholders (Kotler and Keller 2007). More and more companies are now resorting to the scientific approach to marketing where strategies and decisions are based on extensive market research and information on consumer behavior; their needs, purchasing power and money related aspects that influence buying decisions (Anand 2006).

Behavior of consumer is influenced by cultural forces, social factors like family, reference groups etc. and perceptions (Sternthal et.al 1982). Consumption is a key to understand why consumer buys products (Blackwell, Miniard and Engel, 2007). Consumer choices concerning the selection, consumption and disposal of products and services are often difficult and are important to the consumer, to marketers, and to policy makers. As a result, the study of consumer decision processes has been a focal interest in consumer behavior for over 30 years. The shopping habits of rural population can be summarized as preference for small and medium package, personal acquaintance

with the neighborhood retailer, role of opinion leaders for durables etc. (Dogra & Ghuman 2008).

Rural marketing is the process of developing, pricing, promoting, distributing rural-specific goods and services leading to exchange between urban and rural market, which satisfies consumer demand and also achieves organizational objectives (Iyer, 2008). India, being largely an agricultural and rural oriented economy, need for assessing the potential for rural business and studying buying behaviour in rural market is imperative. A thorough understanding of the rural market has become an important aspect of marketing in the Indian marketing environment today. This attraction towards the rural market is primarily due to the colossal size and varied demand of rural areas. The demand in rural market is growing in India at such a rapid pace that it is going to overtake the demand in urban market. So it can be claimed that rural markets are growing faster than urban markets (Adesara, 2004).

The story of the car is one of the most important chapters in the history of transport. Millions of people use their cars to help them earn a living or to travel for pleasure. The origin of the car can be traced to Europe (Rani 2008). India's first motor car on the streets was seen in 1898 (Goyal and Aggarwal 2008).

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In today's scenario, people in rural and semi urban areas are trying to elevate their life style and people in metropolitan cities are completely disappointed with the public transport system. This has lead to the exponential growth in sales of passenger car segment in the domestic market (Kaushik and Kaushik, 2008).

The major manufacturers of cars in India are Maruti Suzuki, Hyundai Motors India Ltd., Honda Siel Cars India Ltd., Toyota, Hindustan Motors, General Motors India Pvt. Ltd. etc. (<http://www.automobileindia.com/automobile-industry/>).

Review of Literature

Goyal and Aggarwal (2008) attempted to find the relative importance of various factors that attract the customers while selecting a particular car in its segment. For the said purpose, the questionnaire was developed and respondents were selected by convenience sampling method. Total of 277 respondents were selected from Ludhiana city which comprised of 67 respondents from luxury cars and 117 from small cars. Various techniques like Factor Analysis, Mean, Standard Deviation and Bi-Variate Correlation had been used. The study revealed that in case of purchase of luxury cars, the factors like horse power, model, luggage capacity, accessories and loan facility emerged as most significant factors, in case of medium cars, after sales service, availability of spare parts, model, shape and engine capacity were important and in case of small cars, the factors like accessories, engine capacity, after sales service and price were main considerations. So it was recommended that the car manufacturers had to properly understand the relative importance of various attributes for the different segments of cars.

Kaushik and Kaushik (2008) investigated empirically customer's preference towards passenger car brands in South West Haryana region. He also considered pre purchase and post purchase behavior and factors influencing the brand preference of passenger cars. Judgmental sampling method was followed and

study was carried out in Bhiwani and Mahendragarh districts of Haryana in months of June-August 2007. Cross Tabulation and Multi Dimensional Scaling techniques were used. It was observed that Maruti 800, Alto and Wagon-R were favourite in that region and customers were more influenced by friends, relatives rather than dealers and sales persons. Brand name, fuel, efficiency and price were found to be primary determinant for buying cars in that region.

Rani (2008) studied the passenger car industry in India. Trends in car industry had been studied prior to liberalization and post liberalization. She pointed out that broad branding policy which gave new licenses to broad groups of automotive products started in 1985. After liberalization, the passenger car industry in the nineties was characterized by an increase in the number of brands available in the market which caused brands to compete on the basis of product features.

Lee and Cho (2009) tried to forecast demand for diesel passenger cars by considering consumer preference and government in South Korea. The model accommodated governmental policies and car attributes such as price and engine efficiency. Conjoint analysis was used to capture consumer preferences. The survey was done in September, 2003 by the specialized research company called "Dongseo Research". Sample of 492 adult residents of Seoul, Korea was taken and face to face interview was conducted. Interview was conducted in three different stages. Total of 216 alternative sets was made but it was reduced to 20 by means of orthogonal test in order to lessen the burden of respondents. 5 attributes were taken and further 15 levels ($2^3 \times 3^4 \times 3$) was chosen. The results implied that the consumers would prefer to purchase diesel passenger cars rather than gasoline cars because of the relative advantage in the operation cost. It was recommended that if car producers improve on the weak points of diesel cars such as comfort, noise, vibration levels etc, the diesel passenger cars would enjoy a substantial competitive edge over gasoline type cars.

Thakar et. al (2009) explored the basic parameters for development of new marketing strategy encompassing "Green Marketing" of automobiles among the consumers of the chosen region. Research was conducted to measure the awareness for the green automobiles. The sample of 80 randomly selected voluntary respondents was taken and it was conducted during the period of April to June 2006. Factor analysis and t-test statistics were used to analyze the data. It was found that middle aged segment, urban segment and four wheelers segments of the study exhibit more awareness as compared to younger people and people with rural background. It was also stated that green technologies in the automobile sector could not be allowed at the cost of an increased price tag of the green products. It was recommended that government should aim at encouraging the innovations and development of low cost technologies associated with the green automobiles.

Peter's et.al (2011) identified psychological factors that are effective in measuring change in behaviour and helps in promoting fuel efficient cars. Model was proposed which integrated psychological variables that explained the purchase of fuel efficient vehicles by private consumers. The data was collected from 302 Swiss respondents whose household have bought a new car since 2002. Structured equation modeling was used to confirm the factors. It was concluded that problem awareness, symbolic motives and response efficacy influence the respective behaviour indirectly via effecting the direct predictors. Results reflected the salience of the positively valued features of new technology and alternative fuels.

Need and Objective of the Study

A number of studies have been conducted on measurement of buying preferences covering urban segment (like Kaushik and Kaushik (2008), Lee and Cho (2009) etc.) but rural segment was ignored. Hence the thrust of present study is on a comparison between rural and urban consumers especially to understand the rural behaviour in a more comprehensive way.

India, being largely an agricultural and rural oriented economy, need for assessing the potential for rural business and studying buying behaviour in rural market is imperative. The rural market has become an important aspect of marketing in the Indian marketing environment today (Adesara, 2004). This analysis will be helpful for various car manufacturers and will help them to know about the buying preferences of both the segments. Marketer would be able to form different strategies for marketing their product and penetrating into the rural cadre. Hence, the main objective of the paper is to identify and compare the relative importance of different attributes of cars in urban and rural areas.

Research Methodology

In recent years, the internet has been used to conclude more and more sales contracts (Scholz 2008). There are product recommender systems for a lot of different types to help finding products which fits the preferences of consumers (Schaffer et al. 1999, Montaner et. al 2003). Major recommender systems can be divided into two categories, collaborative based and content based (Hung 2005, Ahn 2006). While collaborative based recommender systems suggest products which are bought by consumers with similar preferences, content based recommender systems try to find products based on syntactic properties of the products (Burke 2002, Wei et.al, 2007). Third category consists of those recommender systems which are using both approaches (Montaner et al 2003, Choi et.al 2006). Preference measurement is vital for all product recommender systems. The preferences will either be compared to those of other consumers or to product descriptions (Scholz 2008). Due to higher predictive validity, conjoint would be more suitable for product recommender systems (Scholz 2008). Forecasting consumer demand for a new product is becoming even more difficult as consumer preferences change rapidly and market environment becomes more complex (Lee and Cho 2009).

The present study is mainly based on primary data collected from 477 respondents from Punjab. The respondents can be further classified as 239 from urban and 238 from rural area. These respondents were interviewed through a pretested, well structured questionnaire which was administered personally. The survey was conducted during the period of January 2011 to June 2011. Convenience cum Judgment sampling method has been used keeping in view the socio economic characteristics. All respondents selected for the study are having cars or they are purchasing it in near future. The families residing in the posh and planned colonies were selected for the survey.

Conjoint Analysis – Inferring consumer preference towards a product and forecasting associate market potential involve dealing with much uncertainty and conjoint analysis is a contingent rating method that allow one to capture consumer preferences rather accurately by providing consumers' with similar choice situations (lee and cho 2009). Conjoint Analysis is a multivariate technique developed specifically to understand how respondents develop preferences for any type of object (products, services or ideas). (Hair et.al 2011). It is an attempt to convert ordinal scale into interval scale value or utility scale. (Nargundkar, 2010). Conjoint procedures attempt to assign values to the levels of each attribute, so that the resulting values or utilities attached to the stimuli match, as closely as possible, the input evaluations provided by the respondents. (Malhotra, 2010). The basic steps in conducting conjoint analysis are selection of preference models, selection of data collection method, construction of stimulus set and selection of measurement scale and estimation method (scholz 2008). A conjoint analysis cannot be conducted until the attributes for which preference values should be estimated are selected (scholz 2008). Three attributes that make up the preference for a certain car are taken.

The three important attributes identified for the cars are brand of car, fuel variant and price range. The levels of these attributes so taken are as follows:

Attributes	Levels
Brands (Brands with highest sales in 2010)	<ul style="list-style-type: none"> • Maruti • Hyundai • Tata
Fuel Variant	<ul style="list-style-type: none"> • Petrol • Diesel • LPG
Price Range	<ul style="list-style-type: none"> • Below 4 Lacs • 4-8 Lacs • Above 8 Lacs

The car description can be constructed by using 27 possible combinations of the attributes as follows; three dimensions with three levels each ($3 \times 3 \times 3 = 27$). Each combination is then written in the form of question.

The 27 combinations are presented in random order and the respondents are asked to rank them from least preferred to most preferred (North and Vos 2002). The ranking of various levels are determined. This method of data collection is called full profile method. The full profile method is recommended when the number of factor is 6 or fewer (hair et. Al). and in our study there are only 3 factors. The respondent is asked to rank order all stimuli or to provide a metric rating of each stimulus (Hauser and Rao 2002).

After the completion of data collection, it is assumed that the overall preference is an additive sum of the partworths of the features by a series of dummy variables and used monotonic regression to estimate contribution of each attribute/ level to overall preference (Hauser and Rao 2002). The coding of the attributes for this purpose known as 'effects coding' which is similar to coding of dummy variables (Nargundkar 2010). The coding of the attributes is done in the following manner-

Brand	Variable1 (Maruti)	Variable2 (Hyundai)
Maruti Suzuki	1	0
Hyundai	0	1
Tata	-1	-1

Fuel Variant	Variable3 (Petrol)	Variable4 (Diesel)
Petrol	1	0
Diesel	0	1
LPG	-1	-1

Price	Variable5 (Below 4 lacs)	Variable 6 (Above 8 lacs)
Below 4 Lacs	1	0
4-8 Lacs	0	1
Above 8 Lacs	-1	-1

The input data sheets are prepared separately for rural and urban consumers. Mean value of ranks given by respondents is taken and accordingly further ranking is done. The Conjoint analysis is done with the help of regression analysis and adjusted R square for rural data comes out to be 0.927 and 0.880 for urban data which is a pretty good figure. Normality assumption of data is also satisfied in both urban and rural series.

Table-5 Analysis for rural data-

Conjoint analysis using regression model is carried out which gave the following results.

Multiple R	0.971
R Square	0.943
Adjusted R Square	0.927
Standard Error	2.1636

Interpretation- All the above figures represent good model fit.

Table 6 – Utility of Variables

Variables	Beta Values / Utility
Variable 1	-7.741
Variable 2	6.481
Variable 3	-3.741
Variable 4	-2.630
Variable 5	-1.852
Variable 6	-0.407

Utility for third variable of each attribute is calculated by the principal that sum of utilities is equal to zero. (Nargundkar 2010). So accordingly value for those variables are calculated .

Table-7 Utility Table for Conjoint Analysis-

Attributes	Levels	Part Utility	Range of utility (Max-Min)
Brands	Maruti	-7.741	6.481-(-7.741) = 14.222
	Hyundai	6.481	
	Tata	1.260	
Fuel Variant	Petrol	-3.741	6.371-(-3.741) = 10.112
	Diesel	-2.630	
	LPG	6.371	
Price Range	Below 4 Lacs	-1.852	2.259- (-1.852) = 4.111
	4-8 Lacs	-0.407	
	Above 8 Lacs	2.259	

The table-7 clearly states that most important brand in rural area is Hyundai and least important is Maruti where as LPG is most desirable variant and price range is above 8 Lacs.

The most important combination is Hyundai brand, LPG variant and price range above 8 Lacs. Highest range is for brand and lowest is for fuel variant so it can be said that people take brand as most important attribute in rural areas and they give least importance to fuel variant.

Table-8 Analysis of Urban data-

Conjoint analysis using regression model is carried out which gave the following results.

Multiple R	0.953
R Square	0.908
Adjusted R Square	0.880
Standard Error	2.75076

Table-9 Utility of Variables

Variables	Beta Values/ Utility
Variable 1	-7.889
Variable 2	5.444
Variable 3	-3.333
Variable 4	-2.333
Variable 5	-2.667
Variable 6	-0.667

Table-10 Utility (Urban Area) for Conjoint Analysis-

Attributes	Levels	Part Utility	Range of utility (Max-Min)
Brands	Maruti	-7.889	5.444-(-7.889) = 13.333
	Hyundai	5.444	
	Tata	2.445	
Fuel Variant	Petrol	-3.333	5.666-(-3.333) = 8.999
	Diesel	-2.333	
	LPG	5.666	
Price Range	Below 4 Lacs	-2.667	3.334- (-2.667) = 6.001
	4-8 Lacs	-0.667	
	Above 8 Lacs	3.334	

The table 10 clearly states that most important brand in urban area is Hyundai and least important is Maruti where as LPG is most desirable variant and price range is above 8 Lacs.

The most important combination is Hyundai brand, LPG variant and price range above 8 Lacs. Highest range is for brand and lowest is for price so we can say that people take brand as most important attribute in urban areas and they give least importance to price range.

Discussion, Conclusion and Implications for Marketers

It can be clearly seen that the most important brand in both rural as well as urban area is Hyundai as this particular brand came out with the various innovative versions like i10, i20, Tucson, Verna etc. People in Punjab region prefer cars with low running cost so they mostly prefer LPG variant and they assign less importance to petrol which is quite expensive. Disposable income in Punjab region is somewhat high so people prefer price range of above 8 Lacs. If marketer wants to approach rural and urban Punjab, they have to come out with the new and latest segments of cars with LPG variant and there is no need to think more about price range as people assigned less weightage to price. Hyundai is very famous in Punjab but it should try to come

out with LPG so that desires of individuals can be satisfied. If we look at overall statistical range, it can be seen that in both urban and rural area, branding is the most important attribute but the least important attribute in rural area is fuel variant where as price range in urban area. It may be due to the fact that disposable income in rural area is somewhat less than urban area so rural people give more weightage to pricing where as urban people are more concerned about fuel variant than price range. Hence in order to increase customer base, companies have to come out with more innovative versions of cars and try to give LPG version in those cars.

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