Leveraging Factors for Consumers' Car Purchase Decisions- A Study in an Emerging Economy

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Abstract

The Indian economy is growing at an unprecedented rate, with high disposable income, easy availability of finance, changes in urban lifestyle fostering car purchase decisions. Indian automobile industry is highly competitive and dynamic owning to major market players from U.S., Germany and Japan. The present study does not only attempt to find the factors behind purchase but at the same time also tries to find out the various other aspects of purchasing, the major dimension or attributes consumers' prefer to opt for while exhibiting decisions for car purchase. The data for the study has been collected from respondents through the use of structured questionnaires. The five different private car categories used in the study includes- Sedan, SUV, mini-cars, sports cars and prestige cars. Exploratory factor analysis with Multinomial Logit Model has been applied for data analysis. The implications of the research have also been discussed.

1. Introduction

India is the second most highly populated country in the world with unprecedented economic growth rate fostering demand in the automobile small car segment. India is a major market for leading auto giants. The various reasons swaying the growth of the Indian automobile market being high disposal income, increase in the need of mobility due to urbanization and leisure travel, lenient car financing options offered by the financial institutions, accessibility of service centers and spare – parts at vicinity and amendment in highway infrastructure.

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With manufacturers competing to capture one of the fastest growing car markets in the world, the Indian customer is being offered increasingly larger set of cars in various sizes and attributes to choose from. The rapid growth and change scenario, with its potential for affecting local environment and safety, as well as global fuel use and carbon emissions, underscore the need to study this growth and change phenomenon in the country. For the last couple of years, sales figures have shown a shift towards bigger cars (SIAM, 2007). However, the introduction of the affordable mini-car, the Nano by Tata Motors, and the designing of many more affordable small cars by car manufacturers opens up the possibility of a change in the present trend.

For most people, purchasing a car is the second most important decision, so the probability of having a post-purchase dissonance is quite high due to irreversibility of the decision or the high risk perception.

Consumer behavior is fairly complex as car purchase decision involves high level of social, psychological and financial involvement (Shende, 2014). Constant modifications in car models, in terms of features, capacity, styling, mileage etc. has become indispensable. Studying consumer behavior in a highly competitive market and also providing insights into their requirements in a constant dynamic environment is thus necessitated.

The small car market changed very rapidly pertaining to fierce competition, technological advancement, compelling the manufactures to understand consumer preferences on time and take immediate actions to respond to dynamic market.

The Indian consumersare very sensitive towards operating cost since the price of gasoline in India is a large fraction of per capita income. Perception of status in owning a specific personal vehicle, negative image of public and non-motorized modes all play their part in a vehicle choice.

Annually, the Indian automobile industry is growing at an average rate of 30% and marking itself as one of the fastest growing industries in India. According to the reports of Society of Indian Automobile Manufacturers [SIAM], annual car sales are estimated to reach 5 million vehicles by 2015 and more than 9 million by 2020. Automobile companies like Hyundai Motors, Nissan, Toyota, Volkswagen and Suzuki have expanded their manufacturing facilities owing to India's strong engineering base and expertise in the manufacturing of low-cost, fuel-efficient cars.

However growing inflation rate, rise in the rate of interest and other government policies are likely to hit the automobile sector hard and thus bring a temporary slowdown for the sector.

The objective of this paper is to identify the major driving factors behind the purchasing decision of cars in the Indian market using a model-based approach.

Table I – Car segments in India

Vehicle	Description	Example
A Passenger Cars	Number of seats including driver not exceeding 6	
A1 Mini	Maximum length 3400 mm	Maruti800, Nano
A2 Compact	Length 3401 – 4000 mm	GM Spark
A3 Midsize	Length 4000 – 4500 mm	Ford Ikon
A4 Executive	Length 4501 – 4700 mm	Honda Civic
A5 Premium	Length 4701 – 5000 mm	Honda Accord
A6 Luxury	Length 5001 mm & above	BMW 7 series
B Utility Vehicles (same as SUV in United States)	B1 Maximum mass 3.5 tonnes, number seats including driver not exceeding 9 B2 Maximum mass 5 tonnes, number seats including driver not exceeding 13	Toyota Fortuner
C Multi Purpose Vehicles	Van type; maximum mass not exceeding 3.5 tonnes	Maruti Omni

Source: Society of Indian Automobile Manufacturers 2009.

2.A Brief Literature Review

Several researches have been made with respect to the buying behavior of automobiles in India. The research conducted has not been made with respect to new cars but used cars as well.

Studies attempted to depict the perception and satisfaction levels of consumers with respect purchase of cars by forming a relationship between the factors that influenced the purchase and the factors that set the level of satisfaction(Subhadra et. al,2012). Driving comfort, availability of spare parts and pricingwere analyzed as one of the most significant influencersof consumers' choice behavior. Consumer demographics like age and qualification didn't seem to influence their choice behavior with respect to car purchase(Subhadra et. al,2012).

However, other researches had emphasized on demographics like family income, gender to be significant predictors of car purchase behavior (Shimpi, 2012). Peers and friends are significant influencers in the purchase decision making of small and mid-sized cars (Clement et.al, 2009*). In a study conducted to analyze consumer attitudes towards cars manufactured by European, American or Japanese manufacturers, country-of-origin effect, brand name, distributors' reputation emerged as significant predictors apart from pricing of passenger cars. Studies found that the general preference was towards mini and compact cars whereas SUVS were also popular among Indian consumers. Sedans and luxury cars were found out to be exclusive and luxury purchases (Srivastava and Tiwari, Shende, 2014).

However the cost and utility conscious consumers were more inclined towards compact and mini cars. Consumers who in general are disinclined towards public transportation system and two wheelers opted for sedan cars more than others. Consumer choice of a particular vehicle of a particular size segment reflects the need in the household and also a preference of the attributes of the specific make and model in the size segment(Banerjee et. al, 2010). Celebrity endorsements by car manufacturers, flexible payment mechanism and effective service delivery packages by dealers and marketing of cars' safety often leverages car purchase decision (Sharma and Patterson, 1999; K. Vidyavathi, 2005). Mid-sized car-buyers are keen about the space, luxury and comfort (Kotwal, 2009). In a study conducted to assess the influencing factors for consumer brand preference for SUV's and MUV's, product reliability, monetary factor, trendy appeal, frequency of non-price promotions offered, trust-worthiness and brand association were identified as the major predictors (Prasanna, 2013).

However the present study differs from the above studies as the sample market here is a representative market of Eastern India. The market due to its nature offers a unique scope of study. At the same time the present study does not only attempt to find the factors behind purchase but at the same time also tries to find out the various other aspects of purchasing such as brand switching.

3. Research Methodology

The survey was conducted from January 2014 to April 2014 in West Bengal, India. A total of 100 individuals were surveyed of which 76 individuals were those who already owned a car and 24 individuals who did not own a car.

West Bengal has seen a huge spurt in road density which has resulted in a rise of vehicle ownership also. Also the number of registered motor vehicles in West Bengal is on the higher side among other states.

Data was collected through Face-to-face interviews with the vehicle buyer in their homes or sometimes in their workplaces, with the help of a structured questionnaire. An average interview took 15 minutes. The interviews included questions on the vehicle purchasedecision in the recent future, other vehicles owned etc. Respondents' attitudes and perceptions were measured on a five-point likert scale.

4. Analysis

4.1. Sample Characteristics

From the Table 1 it is observed that most of the respondents are aged between 20 to 40 years of age. Also it is observed that the major occupation of the interviewed respondents is service that is they are employed salaried persons. At the same time it observed that the income level is mostly between 400000-1200000 INR, which indicates the predominance of the middle class income level in the sample market. Most of the individuals already own a car(76%). Among these individuals Maruti, Tata, and Mahindra and Mahindra are the highest preferred brands showing the preference of consumers towards Indian companies in the automobile market.

4.2. Factor Analysis

The appropriateness of factor analysis can be measured using Barlett's test of sphericity and Kaiser-Meyer-Olkin (Table 2). The KMO analysis value of 0.686, being greater than 0.60, is considered acceptable for conducting factor analysis (ULCA, 2011). A significant (<0.05) Barlett's test of sphericity suggests that the resulting matrix is not an identity matrix. Both tests being feasible allow further analysis.

Table 3 shows that the results of communalities being higher than 0.50, indicates the significance of each variable. Table 4 shows the total variance explained being 70.51% by the four factors. A rotated component matrix shows that the variables had high factor weights for the four identified factors (Table 5).

Based on the content definition of factors' principle and factor weights the following seven factors were identified and re-defined as 'Pricing regime and after sales'; 'Brand equity of company'; 'Technical aspects' and 'Effect of Promotional activities'.

In the second phase factor analysis was reused for the variables related to car preference on the set of 12 statements that were administered to respondents. Three factors were deduced explaining 76.96% of the variance with communalities and factor loadings above the threshold value of 0.50. The three factors were thus renamed as 'Car Dimensions'; 'Car Reputation' and 'Car technical specifications'.

4.3. Model Development using Multinomial Logit Method

Using the factors that were derived using factor analysis and taking into consideration the socio demographic variables we have tried to develop a model that tries to explain this behavior of consumers related to specific car make. Here the Multinomial logit method has been applied to identify the model for each of the car categories with respect to the reference category of mini cars. Multinomial logit model has been applied as the different private car segments are assumed to be distinct and weighed independently in the eyes of consumers. The five different private car segments (Table 1) which a consumer aspires to purchase are distinct alternatives and not mere substitutes. Mini-cars were used as the reference category.The log-likelihood of the intercept measures the total sum of the squares (247.442) and the log-likelihood of the final model measures the sum of the squared errors (77.63) (Table 6). The small log-likelihood ratios thus suggest that the full model is a better fit than the intercept model. The sufficiently high Pseudo R^2 values signify good model fit (Table 7). The results show us the beta values for each of the car categories (Table 8).

5. Conclusion

Indian consumers are now mainly comprised of the middle class. Their preferences are changing from being only price conscious to checking about car technical specifications as well. Advertisements are too showing an effect on the Indian consumer as promotional offers are altering or effecting purchase decisions as well. Indian consumers are thinking similarly across age and occupation levels.

However when it comes to Income disparities the opinions and preference are changing.

This should be taken into consideration while segmentation of markets by various companies.Car technical specifications and technology is emerging as an important factor in deciding about the purchase and preference of cars. With the rise of Internet and increased literacy and awareness among consumers, consumers ready to go through the intricate details of the car related to its design,engine etc before taking any major decision. As observed in the multinomial logit analysis the mini car segment is the rising and most dominant section along with sedan segment. However the beta coefficients indicate that most of the car segments will be suffering or will post decreased sales if the factor levels were increased. This is because most of the beta coefficients are negative in nature. However most of the beta coefficients of SUVS are positive indicating a positive trend for SUVS. Thus it can be safely assumed and concluded that SUVs and Mini cars would be the dominant car segments in the future.

6. Implications

India is still dependent on the gulf countries for its fuel requirement. Uncertainty and dependability for fuel on other countries followed by currency fluctuations restricts the growth of Indian automobile industry. Manufacturers thus resort to alternative fuels to propel the future of car industry. The growing demand for hybrid cars in Europe can sway the choice of Indian consumers' towards similar brands in near future. Growth in disposable income and higher education will remain the main drivers of future advance car purchase decisions. Car manufacturers thus need to track the changing trends for alignment of product strategies. Reduction of tax burden on green vehicles or hybrid cars or safe drive vehicles can ensure availability of better quality cars on Indian roads. In the category of personal preferences, comfort factors, value for money, pricing regime and after sales, brand equity of company, car dimensions and technicalities should be given due consideration. Marketers might consider these aspects for designing cars, to attract consumers who are prone to decide models based on these criteria.

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Table 1: Sample Characteristics

Demographics		Frequency (%)
Age (in yrs)	20-30	45
	31-40	45
	41-50	6
	51 and above	4
Occupation	Student	24
	Self-employed	1
	Govt. employee	22
	Private employee	37
	Others	1
Annual Income (INR)	100000-400000	3
	400001-800000	43
	800001-1200000	42
	Above 1200000	12
Have own cars	Yes	76
	No	24
Brand of car owned	Maruti	32.9
	Hyundai	15.8
	Tata	21.1
	Chevrolet	5.30
	Mahindra & Mahindra	17.1
	Toyota	5.30
		2.60
Type of car consumer wants to buy	Sedan	35
	Sports	1
	SUV	21
	Mini-car	39
	Prestige Car	4

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.686
Bartlett's Test of Sphericity	Approx. Chi-Square	325.921
	df	55
	Sig.	.000

Table 3: Communalities

	Initial	Extraction
Purchase decision regarding price	1.000	.795
Purchase decision regarding financing	1.000	.671
Purchase decision regarding company's past record	1.000	.631
Purchase decision regarding brand	1.000	.688
Purchase decision regarding word of mouth	1.000	.686
Purchase decision regarding shape and size	1.000	.744
Purchase decision regarding technical aspects	1.000	.711
Purchase decision regarding after sales service	1.000	.731
Purchase decision regarding festival season/promotions	1.000	.699
Purchase decision regarding advertisements	1.000	.622
Purchase decision regarding other factors	1.000	.779

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.043	27.667	27.667	3.043	27.667	27.667	2.772	25.198	25.198
2	1.965	17.866	45.533	1.965	17.866	45.533	2.067	18.789	43.987
3	1.439	13.082	58.615	1.439	13.082	58.615	1.576	14.325	58.312
4	1.309	11.897	70.512	1.309	11.897	70.512	1.342	12.200	70.512
5	.739	6.722	77.234						
6	.589	5.351	82.585						
7	.517	4.700	87.285						
8	.462	4.204	91.489						
9	.420	3.821	95.310						
10	.303	2.755	98.065						
11	.213	1.935	100.000						

Extraction Method: Principal Component Analysis.

Table 5: Rotated Component Matrix

	Component			
	1	2	3	4
Purchase decision regarding price	.857			
Purchase decision regarding financing	.786			
Purchase decision regarding company's past record		.776		
Purchase decision regarding brand		.780		
Purchase decision regarding word of mouth				.802
Purchase decision regarding shape and size			.853	
Purchase decision regarding technical aspects			.836	
Purchase decision regarding after sales service	.840			
Purchase decision regarding festival season/promotions	.803			
Purchase decision regarding advertisements				.735
Purchase decision regarding other factors		.876		

Table 6 Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	247.442			
Final	77.630	169.811	40	.000

Table 7: Pseudo R-Square

Cox and Snell	.817
Nagelkerke	.892
McFadden	.686

Parameter Estimates

	a	B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound	Upper Bound
sedan	Intercept	-10.479	3.753	7.798	1	.005			
	priceoffers	-.251	.536	.219	1	.640	.778	.272	2.225
	brandeq	-.407	.533	.581	1	.446	.666	.234	1.894
	techaspects	-1.470	.644	5.212	1	.022	.230	.065	.812
	promotion	.960	.639	2.262	1	.133	2.613	.747	9.136
	cardim	2.984	.962	9.626	1	.002	19.773	3.001	130.261
	carrep	2.347	.845	7.718	1	.005	10.459	1.996	54.795
	cartech	2.619	.856	9.371	1	.002	13.726	2.566	73.429
	age	.349	.765	.209	1	.648	1.418	.317	6.351
	occu	1.090	.558	3.809	1	.051	2.973	.995	8.879
	income	3.266	1.251	6.817	1	.009	26.206	2.257	304.222
sports	Intercept	-95.458	.000	.	1	.			
	priceoffers	4.814	.000	.	1	.	123.221	123.221	123.221
	brandeq	-3.356	.000	.	1	.	.035	.035	.035
	techaspects	-9.787	24569.366	.000	1	1.000	5.620E-005	.000	b
	promotion	-4.535	.000	.	1	.	.011	.011	.011
	cardim	14.036	20087.874	.000	1	.999	1246835.879	.000	b
	carrep	-4.966	.000	.	1	.	.007	.007	.007
	cartech	17.928	.000	.	1	.			
	age	-6.277	29797.089	.000	1	1.000	.002	.000	b
	occu	1.896	15814.933	.000	1	1.000	6.658	.000	b
	income	17.645	28366.105	.000	1	1.000		.000	b
suv	Intercept	-21.723	5.074	18.331	1	.000			
	priceoffers	.043	.667	.004	1	.948	1.044	.282	3.861
	brandeq	.234	.648	.130	1	.718	1.263	.355	4.496
	techaspects	-1.866	.721	6.690	1	.010	.155	.038	.636
	promotion	.996	.741	1.809	1	.179	2.708	.634	11.566
	cardim	2.549	1.015	6.310	1	.012	12.788	1.751	93.409
	carrep	2.486	.913	7.414	1	.006	12.009	2.007	71.878
	cartech	3.810	1.028	13.736	1	.000	45.151	6.020	338.614
	age	.578	.907	.405	1	.524	1.782	.301	10.553
	occu	1.258	.674	3.485	1	.062	3.519	.939	13.184
	income	6.476	1.551	17.444	1	.000	649.380	31.092	13562.599
prestige car	Intercept	-104.166	61142.115	.000	1	.999			
	priceoffers	-3.211	14668.089	.000	1	1.000	.040	.000	b
	brandeq	-9.519	.000	.	1	.	7.344E-005	7.344E-005	7.344E-005
	techaspects	-5.812	14017.789	.000	1	1.000	.003	.000	b
	promotion	-3.189	.000	.	1	.	.041	.041	.041
	cardim	10.410	14587.750	.000	1	.999	33175.843	.000	b
	carrep	12.905	23190.814	.000	1	1.000	402360.732	.000	b
	cartech	21.862	23091.388	.000	1	.999		.000	b
	age	9.731	17262.563	.000	1	1.000	16834.301	.000	b
	occu	2.503	22886.773	.000	1	1.000	12.215	.000	b
	income	10.715	35019.644	.000	1	1.000	45033.767	.000	b

The reference category is: mini car.

Table 9: Classification

Observed	Predicted					
	sedan	sports	suv	mini car	prestige car	Percent Correct
sedan	29	0	3	3	0	82.9%
sports	0	1	0	0	0	100.0%
suv	2	0	18	1	0	85.7%
mini car	4	0	0	35	0	89.7%
prestige car	0	0	0	0	4	100.0%
Overall Percentage	35.0%	1.0%	21.0%	39.0%	4.0%	87.0%