Factors Affecting Green Brand Equity (GBE) of the Customers of Two and Three Wheelers: An Application of Logistic Regression

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Abstract

The production, marketing and use of vehicles affect our natural and green environment much worse than other industries due to the pollution caused by emission and effluent of vehicles. Chemical effluent and emission from the automobile sector are harmful to our environment and the living organisms on the earth. Therefore, automobile companies are more concentrated on bringing 'green effect' in their production and marketing functions with the aim of getting an image as 'green companies'. They declare that they are more socially responsible to the living organism in the green environment. They design, develop, produce and modify the structure of the vehicle by re-engineering their processes for reducing the detrimental impact on the natural and green environment. At the same time, these companies attract the prospective environmentally-conscious customers by claiming green effect in all these functions and try to satisfy the customers by launching environment-friendly vehicles in the market. Noticeably, how the various Green Marketing Practices (GMP) of these companies affect the purchasing behaviour of customers, and how they react and respond towards these practices are normally unknown to these companies. Similarly, the perception and response of the customers of automobile industries towards the GMP, the degree of satisfaction over these practices, how far the environmental effect of these vehicles affects their trust and loyalty, and finally, how far their trust and loyalty affect customers' Green Brand Equity (GBE) are normally not predictable. In this study, the authors analyse the impact of Green Satisfaction (GS), Green Trust (GT) and Green Loyalty (GL) on the GBE of the customers of two-wheelers and three-wheelers in Kerala.

Keywords: Brand Equity – Green Brand Equity – Logistic Regression

I. Introduction

'Green Marketing' is a holistic marketing concept wherein the production, marketing, consumption and disposal of products and services happen in a manner that is less detrimental to the environment, with growing awareness about the implications of global warming, non-biodegradable solid waste, harmful impact of pollutants, etc. Both marketers and consumers are becoming increasingly sensitive to the need for switching over to 'green products and services'. Green marketing is the process of developing products and services and promoting them to satisfy the customers who prefer products of good quality, performance and convenience at affordable cost, which at the same time do not have a detrimental impact on the environment. It includes a broad range of activities like product design and development, product modification, changing the production process, modified advertising, change in packaging, and change in the style of consumption and change in the attitude after consumption, etc., aimed at reducing the detrimental impact of products, their consumption and disposal, on the environment. Companies all over the world are striving to reduce the impact of products and services on the climate and other environmental parameters. Marketers are taking the cue and are going green. Green marketing is a vital constituent of the holistic marketing concept. It is particularly applicable to businesses that are directly dependent on the natural environment.

Many global players in diverse businesses are now successfully implementing green marketing practices (GMP). Today, many companies have accepted their responsibility not to harm the environment. So, products and production processes become cleaner, and more companies go green because they realize that they can reduce pollution and keep the natural environment greener at the same time. Green marketing is a creative opportunity to innovate in ways that make a difference and at the same time achieve business success by designing and modifying the products in a way totally suitable to nature. As business activities caused many of the environmental problems in the past and still do, there is increasing recognition that Green business is vital in the process of a more ecological, sustainable society. Companies, especially multinationals, play an essential role in the world economy, and they have also the resources and capacity to put ecological solutions into practice. Companies have a responsibility to drive the development towards greater sustainability and becoming greener, so that a company's aim is to create markets for more environment-friendly products and services and educate and influence customers to change their black behaviour into Green behaviour. At least two motives for companies to change to more environmentally appropriate strategies and practices are protecting the environment and creating a green market for the green customers. Companies can save money by reducing the amount of raw material and energy used in production. Becoming more eco-oriented and offering environmental-friendly products might result in increased market shares as well as an improved company's green orientation towards environment and thus, companies gaining first-mover advantages in greening should become more competitive. This first-mover advantage, however, is not sufficient

anymore as more companies orient themselves ecologically and customers can choose from a variety of eco-designed products. Thus, green marketing incorporates a broad range of activities, including product modification, changes in the production process, packaging and modifying advertising. Green Marketing means "all activities designed to generate and facilitate any exchange intended to satisfy human needs or wants, such that satisfying these needs and wants occurs with minimal detrimental input on the natural environment." Green marketing must satisfy two objectives: improved environmental quality and customer satisfaction.

The current rapid growth in the economy and the patterns of consumers' consumption and behaviour worldwide are the main causes of environmental deterioration. As the environment continues to worsen, it has become a persistent public concern in the developed countries and has recently awakened developing countries to the Green Movement. The obvious assumption of Green marketing is that potential consumers will see in the 'green' product an additional benefit and adjust their purchasing decisions accordingly. Moreover, the trend of the EU countries, and even of our own land, is to notice what they look like and what the product is worth. It remains to be seen to what extent consumers are willing to pay extra for a green product. In this respect, consumers are highly sensitive to the environmental impacts of products and to their health.

As customers are aware of the environmental protection, manufacturers are bound to design and produce their products more environmental consciousness in both design and manufacturing. It has been proved

that the green design should incorporate the voices from both customers and producers at the same time. Customer needs might be the driving force, while producers are asked to do so from cost, technical ability, and other aspects. It is important to know what kind of green products is acceptable by the marketplace, and it is also essential to understand if manufacturing this type of green products is possible from the angle of cost, material, marketability, and other aspects. Therefore, a consensus should be reached between customers and manufacturers since it might be unreasonable to make undesired products with unacceptable costs from customer viewpoints. The philosophy of green design should begin with the above consensus between customers and manufacturers.

II. Concepts Used

II. (A) Green Satisfaction (GS)

Green satisfaction means the satisfaction of the customers of vehicles which reduce the outflow of pollutants so that their health and the Green environment will not be badly affected. Green satisfaction is a customer-sensed consumption/use which fulfils some need, goal, desire about environmental or Green concerns and this fulfilment is pleasurable. It was the outcome of consumption that the performance met or exceeded the green needs of customers, the requirements of environmental regulations, and the sustainable expectation of society.

II. (B) Green Brand Image (GI)

A Green brand identity is defined by a specific set of brand attributes and benefits related to the reduced environmental impact of the brand and its perception as being environmentally sound. A well-implemented

Green brand identity should provide benefits to environmentally conscious consumers. The image of the vehicle companies due to the recognition of their name as the perfect one to produce vehicles with the latest technology for making them more eco-friendly and use them with low energy and waste is GI.

II. (C) Green Brand Trust (GT)

The trust of the customers towards a vehicle brand due to its Green features suitable to the Green environment gives satisfaction to the customers while these vehicles are in use. Green consumers' trust in eco-friendly products is treated as reliability and safety of the eco-friendly product, by which consumers may be persuaded from their own experience to consume eco-friendly products

II. (D) Green Brand Loyalty (GL)

Green customer loyalty is the urge of the customer to maintain a relation with an institute, which involves environmental or Green concerns. The customer is then committed to re-buy or re-patronize a preferred product consistently in the future. The loyalty of the customers due to their satisfaction over the Green features of the vehicles, forces them to purchase the same brand when they decide to change their model.

II. (E) Green Brand Equity (GBE)

Customer-based Green Brand Equity is defined from the perspective of the customer and is based on consumer knowledge, familiarity, and associations with respect to the features of a Green vehicle. Proponents contend that for a Green brand to have value, it must be valued by the customer. A thorough understanding of Green Brand Equity from the customer's point of view is essential for successful Green Brand Management of the vehicle companies.

III. Objective and Methodology

The objective of the paper is to discuss the behaviour of customers of two-wheelers and three-wheelers in view of the green marketing practices (GMP) followed by the two-wheeler and three-wheeler companies and to evaluate their Green Satisfaction (GS), Green Trust (GT) and Green Loyalty (GL) on the GBE. For this purpose 650 customers were selected from the data bases of different Regional Transport Offices (RTO) in Kerala by applying the Multi-stage stratified random sampling method and the data were collected by using a structured interview schedule.

IV. Hypothesis

The changes in the Green satisfaction (GS), Green Trust (GT) and Green Loyalty (GL) of the customers do not make any change in the Green Brand Equity (GBE) of the customers.

V. Statistical Method for Analysis

The hypothesis is tested with Omnibus Tests of Model Coefficients, and Hosmer and Lemeshow Test in the Logistic regression model.

VI. Results and Discussion

Table 1 clearly indicates the correlation among the GS, GT, GL and the GBE of the customers of two-wheelers and three-wheelers. These four variables are highly interconnected and inter-correlated, as the correlation coefficients are statistically significant at 1 per cent level of significance ($p<.05$ in all cases).

Table 1: Correlation Matrix

Factors	Sig.	Green Satisfaction	Green Trust	Green Loyalty	Green Brand Equity
Green Satisfaction	Pearson Correlation	1	.634**	.777**	.764**
	Sig. (2-tailed)		.000	.000	.000
	N	650	650	650	650
Green Trust	Pearson Correlation	.734**	1	.937**	.893*
	Sig. (2-tailed)	.000		.000	.018
	N	650	650	650	650
Green Loyalty	Pearson Correlation	.777**	.737**	1	.970**
	Sig. (2-tailed)	.000	.000		.000
	N	650	650	650	650
Green Brand Equity	Pearson Correlation	.764**	.793*	.870**	1
	Sig. (2-tailed)	.000	.018	.000	
	N	650	650	650	650
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Source: Survey data

The logistic model is specified as;

$$\log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 x_1 + \ldots + \beta_k$$

Where; $p = \dfrac{e^{-(\beta_0 + \beta_1 x_1 + \ldots + \beta_k)}}{1 + e^{-(\beta_0 + \beta_1 x_1 + \ldots + \beta_k)}}$

This model is used to explain the given problem that GBE is affected by GS, GT, and GL. Therefore, Logistic Regression Model is applied to measure the GBE in terms of GS, GT and GL. The results are reported below.

Table 2: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	500.056	3	.000**
	Block	500.056	3	.000**
	Model	500.056	3	.000**

Source: Survey data

*Significant at 5 per cent level of significance

** Significant at 1 per cent level of significance

The omnibus test is the starting point and it is seen that the model is statistically significant ($p=000<.01$).

Table 3: Logistic Regression Model Summary

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke R Square
1	384.962[a]	.537	.722
a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.			

Source: Survey data

As per Table 3 Model summary, Cox and Snell R square and Nagelkerke R square are 0.537 and 0.722 respectively indicating that the percentage of GBE is accounted for by all included predictor variables such as GS, GT and GL.

Table 4: Classification Table of Logistic Regression[a]

			Predicted		
	Observed		GBE CODED		Percentage Correct
			.00	1.00	
Step 1	GBE CODED	Low	242	32	88.3
		High	37	339	90.2
	Overall Percentage				89.4
a. The cut value is .500					

Source: Survey data

It may be observed from the Classification Table (Table 4) that correct prediction from the model turns out to be 88.3 and 90.2 per cent respectively for the

two levels of GBE. This is held statistically valid as seen from the Hosmer and

Lemeshow Test (value of the Chi-square 97.693 with p=0.000<0.01)

Table 5: Hosmer and Lemeshow Test

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	97.693	8	.000**

Source: Survey data
*Significant at 5 per cent level of significance
** Significant at 1 per cent level of significance

Finally, the impact of GS, GT, and GL on GBE is individually evaluated and presented in the equation.

Table 6: Logistic Regression Co-efficient

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ᵃ	GS	.260	.060	19.002	1	.000**	1.297
	GT	.490	.069	50.669	1	.000**	1.633
	GL	.198	.031	40.184	1	.000**	1.219
	Constant	-31.288	2.743	130.122	1	.000**	.000
a. Variable(s) entered on step 1: GS, GT, GL.							

Source: Survey data
*Significant at 5 per cent level of significance

** Significant at 1 per cent level of significance

All the variables in the equations such as GS, GT, and GL can better explain the level of GBE, as the variables are statistically significant and its Exp (B) is greater than 1. It is inferred that any positive change in these predictor variables turns out to make positive significant changes in GBE.

VII. Conclusion

Based on the significant values of Chi-square in the Omnibus test of model coefficients, Nagelkare R square, Chi-square value in the

Hosmer Lemeshow test and the significant beta coefficients and Exp (B) in the model, this hypothesis is rejected with the conclusion that GBE is always affected by the GS, GT, and the GL of the customers and any change in the GS, GT and GL changes the GBE of the customers correspondingly. Moreover, by examining the output of logistic regression model, the change in the probability of GS, GT, and GL affects the change in the probability of GBE. This can be validated by observing the significant Chi-square values obtained in the Omnibus test of

model co-efficients, Nagelkare R square, Chi-square value in the Hosmer Lemeshow test and significant beta co-efficients and Exp (B) in the Logistic Regression Model.

References

Abdel-Rahman, A., (1996), *Administrative Efficiency and Effectiveness: An Islamic Perspective,* The Islamic Quarterly, 40, 139–154.

Ajzen, I., & Driver, B., (1992), *Prediction of Leisure Participation from Behavioral, Normative, and Control Beliefs: An Application of the Theory of Planned Behavior,* Leisure Sciences, 13, pp. 185–191.

Anderson, J., & Gerbing, D., (1988), *Structural Equation Modeling in Practice: A Review and Recommended Two-step Approach, Psychological Bulletin,* 103, pp. 411–423.

Antil, J., (1984), *Socially Responsible Consumers: Profile and Implications for Public Policy,* Journal of Macro-marketing, 4, pp.18–39.

Bagozzi, R., Yi, Y., & Phillips,W., (1991), *Assessing Construct Validity in Organizational Research,* Administrative Science Quarterly, 36, pp, 421–458.

Balderjahn, I., (1988*), Personality Variables and Environmental Attitudes as Predictors of Ecologically Responsible Consumption Patterns,* Journal of Business Research, 17, pp. 51–56.

Bamberg, S., (2003), *How does Environmental Concern Influence Specific Environmentally Related Behaviors? A New Answer to an Old Question,* Journal of Environmental Psychology, 23, pp. 21–32.

Banerjee, S., Gulas, C., & Iyer, E., (1995), *Shades of Green: A Multidimensional Analysis of Environmental advertising,* Journal of Advertising, 24(2), pp. 21–31.

Barr, S., Ford, N., & Gilg, A., (2003), *Attitudes towards Recycling Household Waste in Exeter, Devon: Quantitative and Qualitative Approaches,* Local Environment, 8, pp. 407 421.

Crane, A. and Peattie, K., (1999), *Has Green Marketing Failed or was it never Really Tried?* Business Strategy and Environmental Conference, Leeds, September, pp. 120-129.

Danis, J, (1992), *Ethics and Environmental Marketing,* Journal of Business Ethics, 2(2), 81-87, pp. 122-139.

D'Souza, C., and Peretiatko, R., (2002), *The Nexus between Industrialization and Environment : A Case Study of Indian Enterprises,* Environmental Management and Health, 13(1), pp. 80-97.

Jain, S. K. and Kaur, G., (2003), *Strategic Green Marketing : How should business Firms Go about Adopting it?,* Indian Journal of Commerce, 55(4); Oct-Dec : 1-16.

Titterington, A, Davis, C. and Cochsane, A., (1996), *Forty Shades of Green: A Classification of Green Consumering in Northern Ireland,* Journal of Euro Marketing, 5(3) : 35-43.