

THE RELATIONSHIP OF GREEN PRODUCT INNOVATION PERFORMANCE WITH CORPORATE COMPETITIVE ADVANTAGE AND BRAND IMAGE

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Abstract

The purpose of this research study is to investigate the relationship of green product innovation performance with corporate competitive advantage and green image. In this research study, independent variable was green product innovation performance and dependent variables were corporate competitive advantage and green image. Green image was sub divided into two dimensions namely green reputation and green credibility. To gather data, a self-administrated questionnaire was taken from prior published studies. Among 384 questionnaires, total 289 questionnaires were returned back and completely filled in all respects so the response rate remained 75.3%. Descriptive statistics has been analyzed using SPSS. For analysis of data, SEM (Structural equation modeling) has been incorporated using AMOS. The findings of this study revealed that green product innovation performance has significant and positive relationship with corporate competitive advantage and green image in automobile sector of Lahore, Pakistan. This research study will assist marketers and policy makers for understanding of gaining competitive advantage and green image by crafting suitable strategies regarding green product innovation performance.

Keywords: Green product innovation performance, corporate competitive advantage, green image, Green reputation, green credibility, automobile sector.

Introduction

With the expanding worry about natural issues from clients, people in general and governments around the globe, organizations have been building up various ecologically cordial projects and "green" items (e.g. green brands, green innovations, and eco-outline) (Hoffmann, 2007; Zhu et al., 2008; Yung et al., 2011). It is winding up noticeably progressively imperative for organizations to raise their ecological mindfulness since an ever increasing number of universal clients and purchasers are presently requiring their providers to create items that don't contain risky and lethal substances. They are likewise progressively anticipating that their providers should lessen their utilization of normal vitality amid the generation procedure with a specific end goal to decrease the negative effects of creation on nature (Chiou et al., 2011). Many organizations thought corporate ecological administration as a superfluous speculation, or even were deceived this would deter their improvement and development.

Despite what might be expected, a few past investigations imagined that contamination was the solid proof of wasteful employments of assets, and organizations that pioneer in green innovation will appreciate the "primary mover advantage," which enable them to request a higher cost for green items and, in the meantime, enhance their corporate images, grow new markets, and increase competitive advantage (Chen et al., 2006; Hart, 1995, 1997; Porter & van der Linde, 1995). Shrivastava (1995) proposes that organizations can separate their items, move forward item quality and lower the cost of creation through product and process innovations. Ceaseless innovation is a key answer for defeat weights from clients,

contenders, and controllers (Porter & Van der Linde, 1995). In the event that organizations will attempt green innovations energetically, they can acquire the benefit of separation and even change the current competitive guidelines to end up plainly one of fruitful organizations (Shrivastava, 1994; Hart, 1995). The previously mentioned green innovation has been touted as a powerful approach for firms to accomplish competitive advantage (Pujari, 2006; Lau et al., 2010). Confronting the patterns of strict ecological traditions and prominent natural cognizance of shoppers, organizations ought not evade their obligations, in light of the fact that these ecological patterns could be moved toward the force that drives them to improve their green center abilities, and further make their green innovation and green images (Chen, 2008).

There is absence of research in the Pakistani automobile industry with respect to green product innovation performance influences corporate competitive advantage and green image. This research study attempts to fill this gap. This has prompted the need of this exploration to propose the novel construct, "green product innovation performance", to build up its examination system, and further to utilize an exact examination to check the exploration theories, and investigate the administrative ramifications of green product innovation performance of firms. The objectives of this study were to find out the relationship of green product innovation performance with corporate competitive advantage and green image. In particular, this study will reply two research questions. 1) To what extent green product innovation performance impacts on corporate competitive advantage? 2) Is there any relationship between green product innovation performance and green image? To answer these questions, a questionnaire overview was directed with Pakistani automobile industry respondents. Section 2 introduces literature review and builds up the hypotheses which shape the premise of this examination. Section 3 shows the exploration technique and how the information were gathered and investigated. Section 4 talks about the key measurable outcomes and Section 5 talks about these outcomes and finishes up this paper.

Literature Review

Green product innovation performance:

Chen et al. (2006) defined "green product innovation performance," as the performance in product innovation that is identified with natural development, incorporating the innovation in product that are included in vitality sparing, contamination avoidance, squander recycling, no poisonous quality, or green product plans. This review alluded to the definition of Chen et al. (2006) for green product innovation performance. Firms may likewise execute green product innovation in item plan and bundling to build the points of interest of item differentiation (Shrivastava, 1995). Green product innovations viewed as a financially savvy implies for both customers and makers to meet ecological and business goals (Pujari, 2006; Wong et al., 2013). Green innovation is utilized to help the execution of ecological administration all together to fulfill the prerequisite of natural security (Lai et al., 2003).

Corporate Competitive Advantage

Chen et al., (2006) characterized the "corporate competitive advantage" as that the organization possesses a few positions where the contenders can't duplicate its effective strategy and the organization can pick up the feasible advantages from this fruitful strategy. Organizations putting more responsibilities in ecological administration and green innovation effectively can limit creation squander, as well as upgrade the general profitability, increment corporate notoriety, and along these lines increment corporate competitive advantage under the patterns of the prominent environmentalism of buyers and serious global directions of ecological insurance (Berry, & Rondinelli, 1998; Chen, Lai, & Wen, 2006; Porter, & Van der Linde, 1995). Effective innovations can make outer impersonation more troublesome and enable firms to manage their advantages better (Schlegelmilch, Bohlen, & Diamantopoulos, 1996). Chen et al. (2006) found that green product and green assembling process innovations are decidedly connected with corporate competitive advantage. Chang, (2011) argued that the relation between green product innovation and competitive advantage is positive. The estimation of corporate competitive advantage contained eight items in this study. Based on above discussion, following hypothesis has been formulated.

H1: Green product innovation performance has significant and positive relationship with corporate competitive advantage.

Green Image

Past reviews measured the corporate image as indicated by the measurements of reputation and credibility (Lapierre, 1998; Martinez & Pina, 2005). Reputation is a benefit of the brand value (Schwaiger, 2004) that speaks to a worldwide

evaluation of the organization after some time (Gotsi & Wilson, 2001). On the other hand, the association's credibility is a critical measurement in the evaluation of administrations, because of their elusive nature and trust characteristics (Andrew, 1998; De Ruyter and Wetzels, 2000). Showcasing and corporate social obligation thinks about have made it apparent that green practices have for quite some time been viewed as a fundamental part of corporate reputation and a center component of corporate image (Miles & Covin, 2000; Schwaiger, 2004). Such hones additionally essentially influence the assessment of an organization's image, reputation, and much client unwaveringness (Dutta et al., 2008). Green brand image as characterized by Chen (2010), is an arrangement of view of a brand in buyer's mind that is connected to ecological responsibilities and ecological concerns. Along these lines, this review measured the green image as indicated by the measurements of "green reputation" and "green credibility".

Hence, this review alluded to the estimation of the corporate image proposed by Martinez & Pina (2005) to quantify the green image. Past examinations thought receiving proactive systems in the corporate environmental administration may not just separated from keeping the organization from confronting environmentalist dissents or punishments, additionally help organizations develop new market openings and increment competitive advantage (Berry and Rondinelli, 1998; Henriques and Sadorsky, 1999). Likewise, firms that pioneer in some new green items will appreciate the "primary mover advantage," which enable them to request higher costs for green items, to epitomize the idea of green items in the outline and bundle of their items to build their differentiation focal points of their items, and further to enhance the corporate images (Chen et al., 2006; Hart, 1995; Porter and van der Linde, 1995; Shrivastava, 1994, 1995). Chen, Y. S., 2008) found the positive association among green product innovation performance and green image in Taiwanese information and electronic companies. Based on above discussion, following hypothesis has been formulated.

H2: Green product innovation performance has significant and positive relationship with green image.

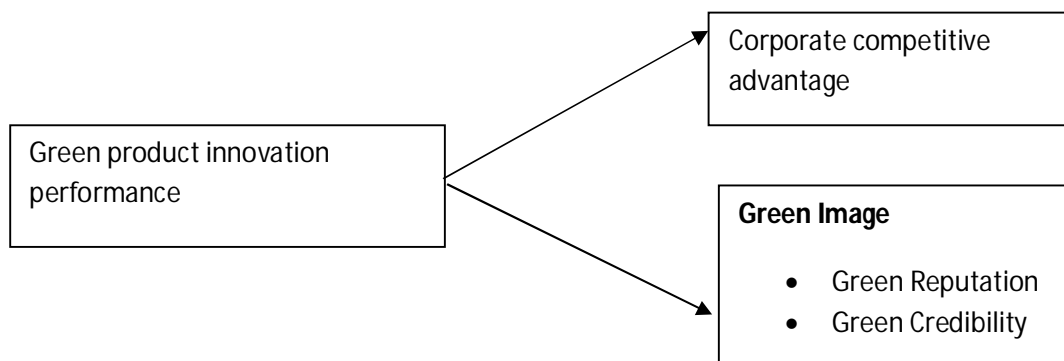


Figure01: Conceptual Framework

Methodology

Sampling and data collection

To quantify the causal effect of green product innovation performance on corporate competitive advantage and green image, a quantitative research was conducted in automobile sector of Lahore, Pakistan. In light of the suggestion of Krejcie & Morgan, (1970) table for assurance of sample size, we have utilized sample of 384 managers of manufacturing, marketing, R&D or environmental protection departments of automobile sector. Cross sectional overview system was utilized to assemble essential information from respondents with the assistance of questionnaire through convenience sampling method.

Questionnaire

To measure the study's constructs, questionnaire items were taken from, prior published studies. For the measurement of green product innovation performance, four items were taken from Chen et al. (2006). To measure corporate competitive advantage, eight items were taken from Chen et al. (2006). In order to measure green image along with its dimensions; green reputation and green credibility, eight items were taken from the work of Martinez and Pina (2005). Five point Likert scales running from (1) strongly disagree to (5) strongly agree was used on every one item of the constructs. Scales were fit the setting of the survey.

Results and Analysis

Add up to 384 questionnaires were dispersed among managers. 289 questionnaires were finished in all regards demonstrating the response rate of 75.3%. Descriptive Statistics of the study were examined using SPSS 23 (Table 1).

Table 01: Measurement scales and indicators of constructs' Items

Constructs	Indicators	Mean	SD
Green Product Innovation Performance Chen et al. (2006)	GPIP1-The company chooses the materials of the product that produce the least amount of pollution for conducting the product development or design;	4.24	0.947
	GPIP2- the company chooses the materials of the product that consume the least amount of energy and resources for conducting the product development or design;	4.27	1.020
	GPIP3- the company uses the fewest amount of materials to comprise the product for conducting the product development or design;	4.19	0.987
	GPIP4-the company would circumspectly deliberate whether the product is easy to recycle, reuse, and decompose for conducting the product development or design	4.23	1.112
Corporate Competitive advantage Chen et al. (2006)	CCA1- the company has the competitive advantage of low cost compared to other competitors;	4.01	1.262
	CCA2- the quality of the products or services that the company offers is better than that of the competitor's products or services;	3.94	1.292
	CCA3- the company is more capable of R&D and innovation than the competitors;	3.87	1.199
	CCA4- the company has better managerial capability than the competitors;	3.86	1.295
	CCA5- the company's profitability is better;	3.99	1.183
	CCA6- the growth of the company exceeds that of the competitors;	3.96	1.292
	CCA7- the company is the first mover in some important fields and occupies the important position;	3.94	1.368
	CCA8- the corporate image of the company is better than that of the competitors.	3.76	1.260
Green Image Green Reputation Green Credibility Martinez and Pina (2005)	REP1- the company is regarded as the best benchmark of environmental management;	4.45	0.981
	REP2- the company is professional about environmental management;	4.15	1.039
		4.19	1.113

REP3- the company is successful about environmental management;	4.32	1.112
REP4- the company is well-established about environmental management;	4.50	0.989
REP5-the reputation of the company about environmental management is stable;	4.53	0.899
CRE1- the company is trustworthy about environmental management;	4.42	0.929
CRE2- the company is depend able about environmental management;	4.49	0.936
CRE3- the company concerns for customers about environmental management		

(Source: Cristina Calvo Porral Jean-Pierre Levy-Mangin , 2016)

Measurement Model

Confirmatory factor analysis was led utilizing AMOS 23. Figure 2 indicated measurement model of the study. Reliability of the constructs of the scale was scrutinized utilizing cronbach's alpha and composite reliability. Hair et al. (2010) saw that Cronbach's alpha and composite reliability qualities more conspicuous than 0.70 are widely appealing, while values lower than 0.70 show an insufficiency in inside consistency. Table 2 demonstrated that the Cronbach's alpha and composite reliability for all develops outflanked the edge estimation of 0.70, thusly setting up strong dependability among the measures. Confirmatory factor analysis has been performed through convergent and discriminate validity. First of all convergent validity has been accessed through standardized factor loading and AVE. Comes about showed that standardized factor loadings are profoundly critical. Other than that, the convergent validity was additionally accomplished when the AVE estimations of each construct in the model was observed to be bigger than 0.50, as set by Fornell and Larcker (1981). (Table 2).

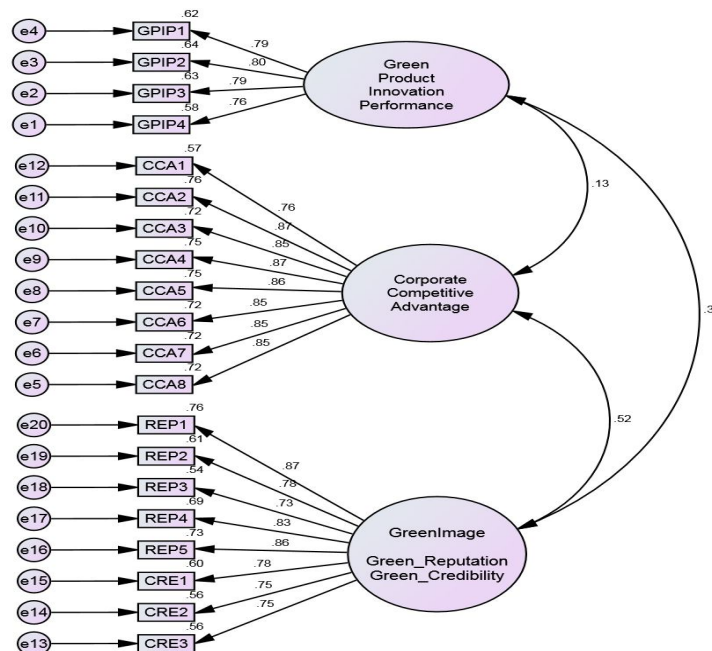


Figure 02: Measurement Model

Table 02: Reliability and Convergent Validity

Constructs	Items	Reliability		Convergent Validity	
		Cronbach's Alpha (α)	Composite Reliability	Standardized Loadings	Average Variance Extracted
Green purchase intentions performance	GPIP1	0.863	0.865	0.785	0.616
	GPIP2			0.800	
	GPIP3			0.791	
	GPIP4			0.762	
Corporate Competitive Advantage	CCA1	0.952	0.952	0.756	0.714
	CCA2			0.874	
	CCA3			0.846	
	CCA4			0.869	
	CCA6			0.865	
	CCA7			0.846	
	CCA8			0.846	
				0.850	
Green Image • Green Reputation • Green Credibility	REP1	0.930	0.932	0.872	0.631
	REP2			0.779	
	REP3			0.734	
	REP4			0.828	
	REP5			0.857	
	CRE1			0.775	
	CRE2			0.750	
	CRE3			0.748	

Discriminant validity was tried by contrasting the shared variances amongst components and singular element AVE (Fornell & Larcker, 1981). Table 3 demonstrates that every shared variances between elements in the model were lower than the square root of the individual component AVE, affirming acceptable discriminant legitimacy and that that the constructs were both theoretically and experimentally different from each other.

Table 03: Correlations of Latent Variables and Square Root of AVE

<u>Variables</u>	Green product innovation performance	Corporate competitive advantage	Green Image • Green Reputation • Green Credibility
Green product innovation performance	0.785		
Corporate competitive advantage	0.133	0.845	
Green Image • Green Reputation • Green Credibility	0.321	0.516	0.794

Note: Correlations of latent constructs are off-diagonal and square root of AVE is on diagonal.

The ranges of measurement model fit index were acceptable. CFI=0.952, NFI=0.919, AGFI=0.836, TLI=0.945, IFI=0.952 and RMSEA= 0.066.

Structural Model

Structural model of the study is illustrated in figure 3.

Results of Structural Model

The fitness of structural model and hypotheses testing was done by using AMOS 23. The confidence level at which this study is significant is 95%. The ranges of structural model fit index were acceptable. CFI=0.936, NFI=0.903, AGFI=0.817, TLI=0.927, IFI=0.936 and RMSEA= 0.076. Standardized path coefficient for each significant causal impact is illustrated in figure 3.

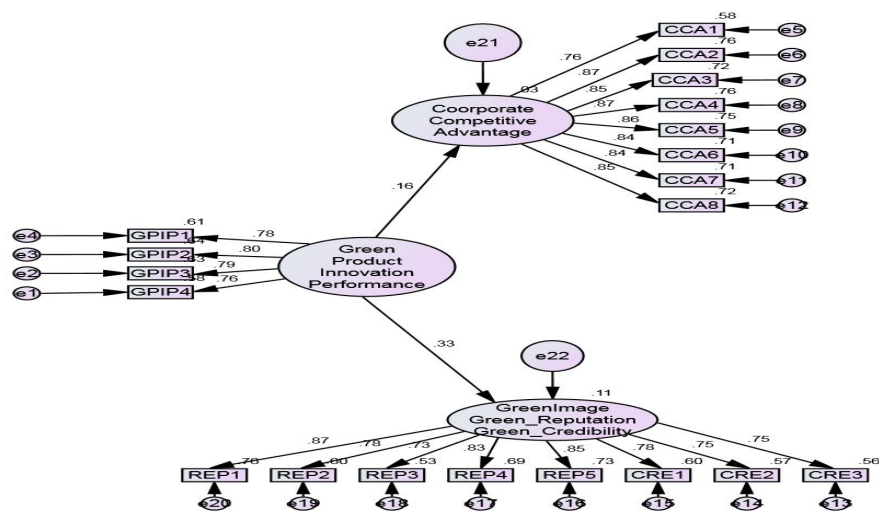


Figure 03: Structural Model

Results indicated that both two hypotheses were supported. Green product innovation performance was found to have significant and positive impact on corporate competitive advantage ($\beta=0.159, p=0.013$) and green image ($\beta=0.332, p=***$).

Table 04: Results

Hypothesis	Hypothesized Path	Standardized Path Coefficients	p-value	Results
H1	Green product innovation performance → Corporate competitive advantage	0.159	0.013	Supported
H2	Green product innovation performance → Green Image (Green Reputation, Green Credibility)	0.332	***	Supported

Note: $p < 0.05$; *** $p < 0.001$

Discussion

The aim of this research study was to determine the impact of green product innovation performance on corporate competitive advantage and green image (green reputation, green credibility) in the automobile sector of Pakistan. The exogenous variable of the study was green product innovation performance while corporate competitive advantage and

green image (green reputation, green credibility) were endogenous variables of the study. Table 4 indicated standardized path coefficient and p-value of the relationship between green product innovation performance and corporate competitive advantage and found significantly positive relationship. Therefore H1 was supported. The value of standardized path coefficient is 0.159 and p value is 0.013. The outcome shows that the more the interest in the green product innovation was, the more grounded the corporate competitive advantage was. The finding of the study was consistent with the work of Chen, Lai, & Wen, (2006), who found the relationship among green product innovation performance and corporate competitive advantage in covering the semiconductor industry, the information hardware industry, the optoelectronic industry, the communication industry, the consumer electronics industry and the electronic component industry in Taiwan and found significantly positive relationship.

Hypothesis H2 was also supported as it demonstrated the impact of green product innovation performance on green image (green reputation, green credibility) and found it significantly positive. The value of standardized path coefficient is 0.332 and p value is highly significant. This relationship mentioned strongest impact of green product innovation performance on green image green (green reputation, green credibility). The finding of this study is consistent with the work of Chen, (2008), who found impact of green product innovation performance on green image in information and electronics companies in Taiwan and found significantly positive relationship.

Conclusion and Recommendations

Convincingly, different striking concentrations are highlighted in this study and essential suggestions are given for managers. One of the important contribution of this review in existing literature is that is scrutinized the impact of green product innovation performance on corporate competitive advantage in automobile sector and found positive relationship. Managers ought to pick the materials of the item that deliver minimal measure of pollution, consume minimal measure of vitality and assets and least measure of materials to include the item to conduct the item improvement or plan. By focusing on all these points, managers can give careful consideration on items and administrations of organization, R&D and innovation, administrative capacity, corporate picture of the organization, profitability and growth of the company.

Another vital contribution of this study is that it highlighted the impact of green product innovation performance on green image along with its dimensions; green reputation and green credibility in automobile sector. Managers should pick the materials of the thing that convey insignificant measure of contamination, devour negligible measure of imperativeness and resources and slightest measure of materials to incorporate the thing to direct the thing change or plan. By paying more attention on all these factors, managers can regard company as best benchmark, professional, successful, well-established, stable reputation, trustworthy, dependable and customers' concern about environmental management. It is recommended to managers and policy makers to pay more attention on green product innovation performance to achieve corporate competitive advantage and green image in automobile industry of Pakistan. By focusing on all above-mentioned points, automobile makers can accomplish and attain a strong competitive position in industry.

Limitations and future directions for Research:

This research study had few limitations. First of all this research study focused on automobile sector. In future researchers can choose different sectors such as electronic industry. This research study had led in Lahore, Pakistan. In future, researchers can choose different cities of Pakistan. As the nature of this study is cross sectional, therefore the researchers in future can acquire time series data. This research study focused only on green product innovation performance. In future, researchers can select green process innovation performance to find out its impact on competitive advantage and green image. Researchers can also find out the impact of green product innovation performance on other variables such as market share.

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