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# Green product quality, green corporate image, green customer satisfaction, and green customer loyalty

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Previous studies have paid much attention on product quality, corporate image, customer satisfaction, and customer loyalty, but none have explored them about green innovation or environmental management aspects. This study wants to fill this research gap. Therefore, this study proposes the rare and novel constructs respectively – green customer satisfaction and green customer loyalty and provides a research framework to explore the relationships among green product quality, green corporate image, green customer satisfaction, and green customer loyalty. With the use of a questionnaire survey, consumers who had experienced purchasing green or environmental products were identified as the subjects of this study. The empirical results show that (1) green product quality is positively associated with green customer satisfaction and green customer loyalty; (2) green corporate image is positively associated with green customer satisfaction and green customer loyalty; and (3) green customer satisfaction is positively associated with green customer loyalty. The results indicate that green product quality could bring about green customer satisfaction and green customer loyalty. Additionally, green corporate image contributes to green customer satisfaction and green customer loyalty.

**Key words:** Green product quality, green corporate image, green customer satisfaction, green customer loyalty.

## INTRODUCTION

Corporate environmentalism or green management emerged in the 1990s and became popular internationally in the 2000s. Corporate social responsibility and green management are becoming major topics of discussion in this century. Following the European Union (EU) parliament's approval of the EU directives on waste electrical and electronic equipment (WEEE), Restriction of Hazardous Substances (RoHS), and Eco-design for energy-using products (EuP), a leading group of companies in the electronics and consumer products industry have adopted green standards in their business strategy. Some researchers suggested that green management may be a 'weapon', helping organizations to improve their competitiveness (Ambec and Lanoie, 2008; Hart, 1995; Porter and Van der Linde, 1995; Trung and Kumar, 2005). Green management in organizations had to go beyond regulatory compliance and needed to include conceptual tools such as pollution prevention,

product stewardship and corporate social responsibility (Hart, 2005).

Many studies have investigated the relationship between customer satisfaction and customer loyalty (Hellier et al., 2003; Butcher et al., 2002; Gountas and Gountas, 2007; Zboja and Voorhees, 2006; Fornell et al., 2006; Oliver, 1999). Additionally, several studies have found that product quality had a direct impact on performance, and was closely linked to customer satisfaction, customer loyalty, and repurchase intentions (Mittal and Walfried, 1998; Eskildsen et al., 2004), and some studies also indicated that corporate image had a significant impact on customer satisfaction and customer loyalty (Abdullah et al., 2000; Zins, 2001; Park et al., 2004; Chang and Tu, 2005; Martenson, 2007).

Although, previous studies had paid great attention to explore the relevant issues of customer satisfaction and customer loyalty, none of these looked into green or environmental issues. In its aim to fill this research gap, this study proposed the rare and novel constructs respectively – green customer satisfaction and green customer loyalty, and develops a research framework to explore the relationships among green product quality,

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green corporate image, green customer satisfaction, and green customer loyalty.

## LITERATURE REVIEW

### Green customer satisfaction

During the last four decades, satisfaction has been considered as one of the most important theoretical as well as practical issues for most marketers and customer researchers (Jamal, 2004). Satisfaction referred to a consumer's judgment that a product or service feature, or the product or service itself, was providing a pleasurable level of consumption-related fulfillment, including levels of under- or over-fulfillment (Oliver, 1997). Customer satisfaction can be seen as a fulfillment of consumers' consumption goals as experienced and described by consumers (Oliver, 2006). Previous studies have shown the existence of two different conceptualizations of customer satisfaction: transaction-specific and cumulative (Anderson, 1973; Anderson et al., 1994; Fornell, 1992). The transaction-specific customer satisfaction was a post-choice evaluative judgment of a specific purchase occasion (Anderson, 1973). In comparison, cumulative customer satisfaction was an overall evaluation based on the overall experience with the goods and services of a particular firm over time (Oliver, 1980). All definitions proposed, however, agree that the concept of satisfaction implied the necessary presence of a goal that the consumer wanted to achieve.

Companies faced a growing pressure to become responsible and greener. Several stakeholders pressed companies to reduce their negative impacts on society and the natural environment (Bansal, 2005; Barnett, 2007). With the rise of environmentalism, not only did consumers become more willing to purchase products that generate minimum impact, but also society became more concerned with the environment. Additionally, international environmental regulations have increased dramatically and become stricter in recent years. In this context, this study proposed a rare construct – green consumer satisfaction, and defined the term as the customer sensed that consumption fulfilled some need, goal, desire about environmental or green concerns and that this fulfillment was 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.

### Green customer loyalty

Customer loyalty referred to the behavior of customers to maintain a relation with an institute through purchase of its products and services (Behara et al., 2002; Singh and

Sirdeshmukh, 2000). Loyalty was a deeply held commitment to re-buy or re-patronize a preferred product or service in the future (Oliver, 1997). In other words, loyalty can be viewed as the future behavior commitment to purchase a product or service, or the linkage with a firm on all occasions when other alternatives were possible. Therefore, customer loyalty involved a positive attitude toward the firm's product or service, followed by favorable behavior that leads to buying it and recommending it to others (Backman and Compton, 1991; Martensen et al., 2000). Customer loyalty was also a stable source of revenue for firms, serving at the same time as an information channel that acted informally by recommending the product or service to family and friends (Reid and Reid, 1993).

Customer loyalty can be defined from a behavioral, attitudinal, or situational perspective (Chaudhuri and Holbrook, 2001; Uncles, Dowling et al., 2003). Behavioral loyalty was articulated as the purchase and usage behavior displayed by customers in their historical purchasing and use of a brand and the competing brands. Attitudinal loyalty was normally reflected by an emotional bond with a brand and strong customer preferences for the brand. Situational loyalty depended on the shopping and purchasing situation. Although, all three types of loyalty have a role to play in marketing, most firms would prefer customer loyalty to be attitudinal. Based on the mention above, this study proposed a novel construct – green customer loyalty, which had relevance to environmental commitments and concerns. This study defined green customer loyalty as the customer wanted to maintain a relation with an institute which involved environmental or green concerns, and committed to re-buy or re-patronize a preferred product consistently in the future. It was the intention to repurchase, the desire to recommend, show tolerance for a higher price, and purchase other products with (from) an institute.

### The positive effect of green consumer satisfaction on green customer loyalty

Satisfaction was often used as a predictor of future consumer purchases (Newman and Werbel, 1973; Kasper, 1988; Oliver, 1999). Satisfied customers had a higher likelihood of repeating purchases in time (Zeithaml et al., 1996), of recommending that others try the source of satisfaction (Reynolds and Arnold, 2000; Reynolds and Beatty, 1999), and of becoming less receptive to the competitor's offerings (Fitzell, 1998). Furthermore, several studies have found the relationship between customer satisfactions and customer loyalty (Hellier et al., 2003; Butcher et al., 2002; Gountas and Gountas, 2007; Zboja and Voorhees, 2006; Fornell et al., 2006; Oliver, 1999). Although, previous studies had paid great attention to explore the relevant issues of customer satisfaction and customer loyalty, none explored them about

green or environmental issues. Therefore, this study wanted to fill this research gap, and proposed the following hypothesis:

Hypothesis 1: Green customer satisfaction is positively associated with green loyalty.

### **The positive effect of green product quality on green customer satisfaction and green customer loyalty**

The product quality can be a good starting point for providing customer satisfaction and generating customer loyalty. Johnson and Etlie (2001) described that product quality as the result of performance, which, in turn can be labeled as the degree of customization and freedom from defects or how reliably the product met customer requirements. The product quality dimension included product packaging, product design, product features, warranties, etc. (Abdul-Muhmin, 2002). High product quality could gain greater product acceptance from customers as well as lead to satisfaction of retailers and wholesalers (Schellhase et al., 2000). The product quality had a direct impact on performance, and was closely linked to customer satisfaction, customer loyalty, and repurchase intentions (Mittal and Walfried, 1998; Eskildsen et al., 2004). Additionally, several studies provided strong empirical support about product quality was being an antecedent, with a positive relationship to overall customer satisfaction. These suggested that maintaining good product quality will provide satisfaction to customers and further generate customer loyalty (Chumpitaz and Papparoidamis, 2004; Kotler et al., 2005).

Amidst this trend of popular customer environmentalism and with stricter international environmental regulations, companies can not only embody green or environmental concept in the feature, design, and package of their product to increase product differentiation, but they should also satisfy the environmental needs of customers and further create customer loyalty as well as a competitive advantage (Chen et al., 2006; Hart, 1995; Peattie, 1992; Porter and van der Linde, 1995; Shrivastava, 1995). Therefore, this study proposed the following hypotheses:

Hypothesis 2: Green product quality is positively associated with green customer satisfaction.

Hypothesis 3: Green product quality is positively associated with green customer loyalty.

### **The positive effect of green corporate image on green customer satisfaction and green loyalty**

Corporate image was a perception developed from the

interaction among the institute, personnel, customers, and the community (Walters, 1978) and was an association with the institute's ability to position itself in the customer's mind (LeBlanc and Nguyen, 1997). Credibility was a measure of the institute's ability to meet customer requirements, including professional expertise, service and product quality, and trustworthiness (both service and ethical reliability). Keller (1998) had also identified credibility as a factor that contributes to the overall image of an institute. Previous studies have found that corporate image had a significant impact on customer satisfaction and customer loyalty (Abdullah et al., 2000; Zins, 2001; Park et al., 2004; Chang and Tu, 2005; Martenson, 2007).

With the prevailing environmental consciousness of consumers and strict international regulations related to environmental protection, companies can undertake green marketing activities to investigate consumers' green attitudes and behaviors, to identify the market of green products, and to stratify the green market into different segments based on consumer needs (Jain and Kaur, 2004). Additionally, several studies also revealed that environmental image not only can satisfy the customer's environmental desires and green needs, but can also increase their sales and enhance their competitive advantage (Hu and Wall, 2005; Corrigan, 1996; Chen et al., 2006; Porter and van der Linde, 1995; Chen, 2008, 2010). Therefore, this study proposed the following hypotheses:

Hypothesis 4: Green corporate image is positively associated with green customer satisfaction.

Hypothesis 5: Green corporate image is positively associated with green customer loyalty.

## **METHODOLOGY AND MEASUREMENT**

This study investigated the relationships among green product quality, green corporate image, green customer satisfaction, and green customer loyalty. The research framework of this study was shown in Figure 1.

### **Data collection and samples**

This study used the questionnaire survey to verify the hypotheses and research framework. The subjects were consumers who had the experience of purchasing green or environmental products. The questionnaire items in this study were adopted from past literature. To increase the content validity, the questionnaires were mailed to 10 scholars and experts and they were asked to refine and modify the questionnaire items. The comments and suggestions from these respondents were used to improve the readability and ease of understanding of this questionnaire. Therefore, the questionnaire had a high level of content validity.

The samples were randomly selected from the "Taiwan Yellow Pages". The respondents were asked to return the completed questionnaires within two weeks through mail. To increase the effective survey response rate, this study mailed the follow-up

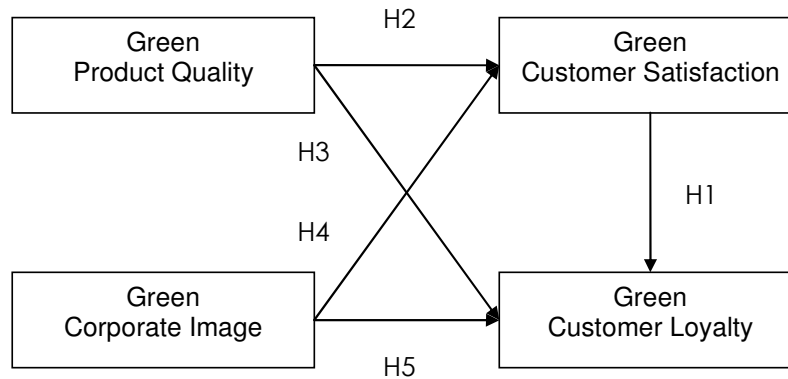


Figure 1. Research framework.

questionnaires after two weeks. Before the mailing of the follow-up questionnaires, this study called the respondents who had not responded, explained the objectives of this study, and confirmed their contact information. A total of 600 questionnaires were sent. There were 196 valid questionnaires, with an effective response rate of 32.67%.

The brief demographics were showed below. In the gender aspect, 56% of the respondents were female. In the age aspect, 72% were between 30 and 49 year old. In the marriage aspect, 69% were married. In the degree of education aspect, 89% were college level and above.

### Definitions and measurements of variables

The questionnaire items in this study were measured on a five-point Likert Scale where 1 □ strongly disagree and 5 □ strongly agree. The definitions of variables were defined as follows. All the measurement items were listed in the Appendix 1.

#### Green product quality

This study referred to the definitions of Abdul-Muhmin (2002) and Chen (2006), and defined green product quality as the dimensions of product features, product design, and product package that are involved in energy-saving, pollution-prevention, waste recycling, and being environment friendly.

#### Green corporate image

This study referred to the definitions of Walters (1978) and Chen (2008), and defined green corporate image as the perceptions developed from the interaction among the institute, personnel, customers, and the community that are linked to environmental commitments and environmental concerns.

#### Green customer satisfaction

This study referred to the definitions of Oliver (1997), (2006), Bansal (2005), and Barnett (2007), and defined green customer satisfaction as the customer sensed that consumption fulfilled some need, goal, desire about environmental or green concerns and that this fulfillment was pleasurable. It was the outcome of the

consumption that the performance met or exceeded the green needs of customers, requirements of environmental regulations, and sustainable expectation of society.

#### Green customer loyalty

This study referred to the definitions of Reid and Reid (1993) and Oliver (1997), and defined green customer loyalty as the customer wanted to maintain a relation with an institute which was involved environmental or green concerns, and committed to re-buy or re-patronize a preferred product consistently in the future. It was the intention to repurchase, the desire to recommend, show tolerance for a higher price, and purchase other products with (from) an institute.

## EMPIRICAL RESULTS

This study utilized SEM to verify the research framework and hypotheses, and used AMOS to obtain empirical results. Table 1 showed the mean, standard deviation, and correlation matrix of constructs.

#### Reliability and validity

The factor analysis of the four constructs was shown in Table 2. Every construct can be classified into only one factor. This study referred to the previous studies to design the questionnaire items and employed pretests for the questionnaire revisions. Therefore, the measurement of this study was acceptable in content validity. The Cronbach's  $\alpha$  coefficient of each construct was shown in Table 1. Generally, the minimum requirement of Cronbach's  $\alpha$  coefficient should be greater than 0.7 (Hair et al., 1998). The Cronbach's  $\alpha$  coefficient of each construct was greater than 0.7. Therefore, all constructs reached the basic threshold for reliability.

Next, AMOS was used to run the confirmatory factor analysis. The results of the confirmatory factor analysis were shown in Table 1. With regard to reliability, the

**Table 1.** Descriptive statistics, correlation coefficients, reliability and validity.

<b>Constructs</b>	<b>(A)</b>	<b>(B)</b>	<b>(C)</b>	<b>(D)</b>
Green product quality (A)	1.000			
Green corporate image (B)	0.488**	1.000		
Green customer satisfaction (C)	0.334**	0.622**	1.000	
Green customer loyalty (D)	0.405**	0.565**	0.681**	1.000
Mean	3.763	4.054	3.930	4.075
Standard deviation	0.680	0.574	0.610	0.588
Cronbach's $\alpha$	0.853	0.877	0.922	0.885
Composite reliability	0.855	0.879	0.924	0.888
AVE	0.596	0.646	0.754	0.726
Square root of AVE	0.772	0.804	0.868	0.852

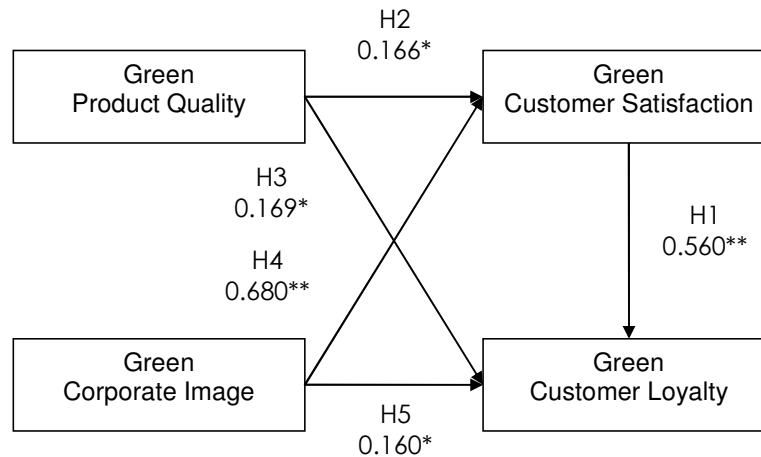
\*p < 0.05, \*\* p < 0.01.

**Table 2.** Factor analysis of this study.

<b>Constructs</b>	<b>Items</b>	<b>Factor loading</b>	<b>Accumulation percentage of explained variance (%)</b>
Green product quality (A)	A1	0.778	0.855
	A2	0.819	
	A3	0.748	
	A4	0.741	
Green corporate image (B)	B1	0.836	0.879
	B2	0.790	
	B3	0.843	
	B4	0.743	
Green customer satisfaction (C)	C1	0.857	0.924
	C2	0.922	
	C3	0.893	
	C4	0.796	
Green customer loyalty (D)	D1	0.791	0.888
	D2	0.919	
	D3	0.841	

composite reliability of each construct was above 0.7. Therefore, it indicated good reliability. Additionally, there are two measurements to confirm the validity of the constructs. First, if the average variance extracted (AVE) of a construct was greater than 0.5, then it meant that there is convergent validity for the construct. As shown in Table 1, the AVE of all constructs were greater than 0.5. Therefore, these results supported the convergent validity of the measurement (Fornell and Larcker, 1981). Second, this study applied Fornell and Larcker's measure of AVE to access discriminative validity of the measurement (Fornell and Larcker, 1981). To satisfy the condition of discriminative validity, the square root of a construct's

AVE must be greater than the correlations between the construct and other constructs in the model. For example, the square root of the AVE for two construct, green product quality and green corporate image, were 0.772 and 0.804 in Table 1. The correlation between green product quality and green corporate image was 0.488 in Table 1. It can be observed that the square root of the AVE for two constructs were greater than the correlation between two constructs. It demonstrated that there was an adequate discriminative validity between two constructs. The square roots of all constructs' AVEs in Table 1 were greater than the correlations among all constructs in Table 1. Therefore, these results supported



**Figure 2.** The results of structural model, \*  $p < 0.05$ , \*\*  $p < 0.01$ .

the discriminative validity of the measurement.

### The results of the structural model

All the fit indices revealed a good fit for the model (root mean square error of approximation [RMSEA] =0.055; root mean square residual [RMR] =0.021; normed fit index [NFI] =0.936; comparative fit index [CFI] =0.975; goodness-of-fit index [GFI] =0.917). The results of the structural model were shown in Figure 2. All five paths estimated were significant. This study found that both green product quality and green corporate image can not only increase green customer satisfaction, but also enhance green customer loyalty. Additionally, green customer satisfaction can further enhance green customer loyalty. Therefore, H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub>, H<sub>4</sub>, and H<sub>5</sub> were all supported in this study.

### Conclusions

In recent year, business ethics, social responsibility, sustainable development, and environmental issues have become important strategic concerns among companies. At the same time, customers in major international markets were demanding that companies produced higher quality products that are consistent with societal and environmental values if they wish to remain competitive in global markets. Therefore, companies increasingly paid attention to green concepts, such as green management, green marketing, green products, etc.

### DISCUSSION

This study developed a research framework to explore

the relationships among green product quality, green corporate image, green customer satisfaction, and green customer loyalty. First, this study revealed that green product quality had positive effects on green customer satisfaction and green customer loyalty. These findings were consistent with the literature (Schellhase et al., 2000; Mittal and Walfried, 1998; Eskildsen et al., 2004). Moreover, previous studies also suggested that companies can enhance their competitive advantage by increasing product differentiation (Hart, 1995; Peattie, 1992; Porter and van der Linde, 1995; Shrivastava, 1995). Therefore, companies incorporated green ideas in their products not only can satisfy the environmental needs of customers, but also increase green customer satisfaction and green customer loyalty. Second, this study revealed that green corporate image had positive effects on green customer satisfaction and green customer loyalty. Several studies suggested that customer satisfaction and customer loyalty can be achieved by the corporate image depending on the development in the markets (Abdullah et al., 2000; Chang and Tu, 2005; Martenson, 2007; Hu and Wall, 2005). Therefore, the findings of this study agreed with those studies. Additionally, this study reconfirmed the result of Chen (2010) that green brand image was positively associated with green satisfaction. It was clearly that green corporate image could be one of important sources of green customer satisfaction. Third, this study revealed that green customer satisfaction had a positive effect on green customer loyalty. This finding supported previous research findings on the relationship between customer satisfaction and customer loyalty (Hellier et al., 2003; Butcher et al., 2002; Gountas and Gountas, 2007; Zboja and Voorhees, 2006; Fornell et al., 2006; Oliver, 1999). The finding of this study enhanced the understanding and knowledge of the antecedents of green customer loyalty. Both green product quality and green corporate image

were important for green customer satisfaction which was in turn appeared to be a good antecedent of green customer loyalty.

### Theoretical contributions and managerial implications

There are several theoretical and managerial implications. First, the main theoretical contribution of this study was to propose the rare and novel constructs respectively – green customer satisfaction and green customer loyalty, and extend the research about customer satisfaction and customer loyalty into the green context. Secondly, another theoretical contribution of this study was to develop a research framework to explore the relationships among green product quality, green corporate image, green customer satisfaction, and green loyalty, and then further undertake an empirical test to verify these relationships. Therefore, this study successfully filled the research gap of customer satisfaction and customer loyalty about green issues. Third, the results of this study clearly indicated that green product quality could gain green customer satisfaction and green customer loyalty. Even though company investment in green activities (e.g., green management, green innovation, and green marketing) would increase the business cost in the short term, these investments would become a source of firm performance and competitive advantage. Last, this study also found that green corporate image was helpful in achieving green customer satisfaction and green customer loyalty. In some industries or markets, customers had limited abilities to evaluate the product quality. The corporate image would be an important criterion to judge the quality of an unfamiliar product. Therefore, managers should build and maintain their green corporate image anytime and anywhere.

### LIMITATIONS AND FURTHER STUDIES

There are some limitations in this study. First, this study focused on the 3C products in Taiwan, so that further studies can focus on other products in other countries and compare with this study. Second, quality included product quality and service quality, but this study only focused on product quality. Therefore, further studies can focus on service quality. Third, this study only provided cross-sectional data, so that further studies can employ longitudinal data for meaningful comparison. Finally, this study hoped that the results of this study were constructive and useful to other researchers, managers, and institutions, serving as basis for further studies.

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**Appendix 1.** Measurement items.

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**A. Green product quality**

1. The products of this company meet or exceed the requirements of environmental regulations.
2. The products of this company consume the least amount of resources and energy.
3. The products of this company are easy to recycle, disassemble, decompose, and reuse.
4. The products of this company result in minimum environmental damage.

**B. Green corporate image**

1. The green products of this company are credible and stable.
2. This company has sufficient abilities to meet the green needs of customers.
3. This company has a fine environmental reputation.
4. This company has excellent performance with respect to environmental management and green innovation.

**C. Green customer satisfaction**

1. I am satisfied with my decision to purchase the green products of this company.
2. I am glad to purchase the green products of this company.
3. I believe that I do the right thing in purchasing these green products.
4. I feel that I contribute to the environmental protection and sustainable development.

**D. Green customer loyalty**

1. I will continue to do shopping with this company.
  2. I am willing to recommend my family and friends to do shopping with this company.
  3. I can accept the higher price of the green products, even though the price of other general products (not green products) are cheaper than that of green products.
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