Routledge
Taylor & Francis Group

The effect of green marketing strategy on business performance: a study of organic farms in Taiwan

Shwu-Ing Wu[*] and Syuan-Ru Lin

Department of Business Administration, National Chin-Yi University of Technology, Taichung, Taiwan

Many enterprises seek to enhance the effectiveness of their total quality management through the implementation of green marketing strategies. The aim of this study was to explore the influence of green marketing strategies on business performance by surveying all the 1287 organic farms certified and registered in Taiwan. We obtained 288 valid questionnaires and used structural equation modelling to investigate the direction and strengths of the relationships among various related dimensions. Our results demonstrate that organic farms are able to enhance their corporate image through green marketing strategies, thereby improving their business performance.

Keywords: green marketing strategy; business performance

Introduction

Chemical fertilisers and pesticides have been used to address insufficiencies in the food supply; however, these measures have resulted in environmental damage with potentially severe effects on human health (Allred & Addams, 2000). Many studies have proven that pesticides and chemical fertilisers can be extremely harmful to the human body (Charlier et al., 2003; Higashijima, Hotta, & Okamoto, 2000). This has led to the implementation of safety and environmental standards (Al-Darrab, Gulzar, & Ali, 2012).

Many enterprises seek to enhance the effectiveness their total quality management (TQM) through the implementation of green marketing strategies. This has led to the widespread adoption of contamination-free and non-destructive agricultural production methods, which has in turn driven the development of organic agriculture (Council of Agriculture Executive Yuan, 2010). The International Federation of Organic Agriculture Movements (1972) has defined Organic agriculture as a production system capable of sustaining the health of soils, ecosystems, and people. These methods rely on ecological processes, biodiversity, and growth cycles adapted to local conditions. Organic agriculture combines traditional methods with modern innovations based on a scientific understanding of the issues to protect the shared environment and promote fair relationships and a good quality of life for all involved.

In response to pressure from society and the goals of TQM, green marketing is becoming an increasingly important sector of the farming industry (Canan, 2005). These efforts have manifested in the production of pesticide-free agricultural products and chemical-free fertilisers as well as a reduction in excess packaging and facilities to conduct recycling. Taiwan has seen a profound growth in the number of individuals who have voluntarily adopted these measures in the growing of fruits and vegetables on newly converted organic farms (Tzuchi, 2014). Green marketing can help to promote a positive

---

*Corresponding author. Email: wusi@ncut.edu.tw

image for those who engage in these measures (Chen, Lai, & Wen, 2006; Yang, Yang, & Peng, 2011). As a result, the means by which corporations deal with the issue of environmental and marketing ethics has become an important concern (Chen, 2008). Environmental regulations were established under the assumption that such efforts would promote the generation of innovative measures to reduce pollution and eventually enhance the competitive advantage of those who make efforts in this area (Porter & Van, 1995). Firms that vigorously develop green products and marketing strategies can reduce environmental contamination while simultaneously promoting their corporate image and enhancing TQM (Foote, Gaffney, & Evans, 2010).

This study adopted green marketing strategies as an independent variable, with the quality of products and services, corporate image, and environmental protection as intervening variables. With business performance as a dependent variable, we then conducted an investigation into the cause-effect relationship between each variable. The study also adopted organic farms to validate the influence of green marketing strategies on business performance.

Literature review

Green marketing strategy

Kotler (2006) described green marketing as the commitment of an enterprise to the development of safe, eco-friendly goods and services by employing recyclable and easily decomposed packaging, better pollution prevention methods, and a more efficient use of energy. An emphasis on green marketing can help to minimise the environmental impact of a product throughout its lifespan, including the purchase of materials, manufacturing, selling, consumption, and disposal.

Green marketing can be viewed as a response to concerns about the global environment (Peattie, 1992) and can be examined from five perspectives: purchasing, manufacturing, packaging, transport and distribution, and waste disposal (Hart, 1995).

Quality of products and services

A company can manifest commitment to their customers through the quality of the products and services they provide (Gruen, Summers, & Acito, 2000). Quality is the best indicator of whether the established standards have been met (Levitt, 1972). The quality of products and services includes how the products and services are provided, the intangible value derived from the services, and the customers' level of involvement in them. Balacharnder and Srinivasan (1994) stated that firms can use product and service quality to enhance their competitive edge in order to improve customer satisfaction, promote purchase intention, and establish customer loyalty. This makes quality an important variable affecting the value perceived by customers as well as their loyalty (Allred & Addams, 2000).

This study adopted the concept of SERVQUAL, proposed by Parasuraman, Zeithaml, and Berry (1985) for the development of measurement items used to evaluate the quality of products and services provided by organic farms. This resulted in five dimensions: tangibility, reliability, responsiveness, assurance, and empathy.

Corporate image

Corporate image represents the overall impression of an enterprise (Ditcher, 1985). Worcester (1972) argued that corporate image is the product of the reciprocal effect of

the public's perceived experiences, feelings, beliefs, and thoughts about a company on its knowledge of the company. Corporate image represents a set of feelings, including the perceptions of employees, customers, shareholders, media, the general public and external stakeholders (Hatch, Gill-Body, & Portney, 2003). Efforts to maintain a premium brand image can help to enhance consumer satisfaction and garner the benefits of positive word-of-mouth and publicity (Rogerson, 1983).

Corporate image comprises three sub-aspects, including institution image, functional image, and merchandise image (Walters, 1978). This study applies these three aspects to the design of indicators used to assess corporate image.

Environmental protection

The notion of environmental protection has become increasingly popular due to growing concern regarding environmental pollution (Arcury & Christianson, 1990; Cottrel, 2003). It is hoped that products and services provided by firms that fail to address issues related to environmental awareness will eventually vanish from the market (Sheth, Newman, & Gross, 1991). Awareness of environmental protection is manifest in the 'green movement' (Hwang, Wen, & Chen, 2010). Companies must now reconsider the means by which they assess performance with the inclusion of environmental elements (Sarkis, 1995). Environmental precautions and well thought-out plans could help to minimise environmental pollution (Carolien & Han, 1996).

Shrivastava (1995) argued that environmental technologies should seek to promote savings in energy and other natural resources in order to minimise the impact of human activities on the environment. The results of such measures can be evaluated according to four functions: hardware, operating procedures, production technology, and management orientation.

Business performance

In addition to general financial indicators, assessments of performance should include overall performance, productivity, quality, adaptability, efficiency, profits and returns, growth, use of environment, and stability (Campbell, 1977). Delaney and Huselid (1996) divided performance into business performance and market performance. Scholars have found that 'service-orientation' influences the performance of employees and ultimately the company (Lytle & Timmerman, 2006). It was also found that marketing can have a positive effect on overall performance, non-financial performance, and financial performance (Azizi, Movahed, & Haghighi Khah, 2009), and that innovation has a significantly positive impact on performance.

This study employed balanced scorecard (Kaplan & Norton, 1996) as well as the scale proposed by Wu and Chen (2011) in the development of indicators for the assessment of business performance.

Research hypotheses

Influence of a green marketing strategy on the quality of products and services

Green products and marketing methods have been receiving a great deal of attention, and most consumers have expressed the opinion that green products are of better quality (Vermillion & Justin, 2010). Green marketing can augment one's impression of 'health' and 'eco-friendliness' while enhancing the perceived quality of products and services

(Sammy, 2008). This has prompted enterprises to develop green products and services capable of satisfying the demand for green consumption and to seek to upgrade their quality (Canan, 2005). According to one previous study on green marketing, consumers have greater faith in the quality of green products and services and are therefore more likely to purchase them (Greenseal, 2009). Thus, this study posits the following hypothesis:

> *H1*: Green marketing can have a significantly positive influence on the impressions held by consumers with regard to the quality of products and services.

The influence of a green marketing strategy on corporate image

A green marketing strategy is meant to highlight the emphasis of a firm on environmental issues in order to promote their corporate public image (Chen et al., 2006). Green marketing strategies can improve corporate reputation, enhance corporate image, and increase profits (Dangelico & Pujari, 2010). The main reason to pursue a green marketing strategy may therefore be to promote one's corporate image (Chen, 2010). This led to the following hypothesis:

> *H2*: A green marketing strategy can have a significantly positive influence on corporate image.

The influence of a green marketing strategy on environmental protection

An awareness of the need for environmental protection has led enterprises to place greater emphasis on green marketing strategies (Chen, 2008). The focus of the public and media on the environmental impact of corporate actions has led many enterprises to implement green marketing strategies (Peattie, 1992). A green marketing strategy allows enterprises to fulfil their duty to reduce environmental pollution, protect resources, and improve environmental performance (Carter, Kale, & Grimm, 2000). Thus, Purba (2002) found that efforts to influence business competiveness can have a positive impact on the environment. Thus, the following hypothesis is established:

> *H3*: A green marketing strategy can have a significantly positive influence on environmental protection.

Influence of green marketing strategies on business performance

Porter and Van (1995) pointed out that production procedures must often be adjusted in accordance with green technology, green procedures, and green marketing. New environmental regulations often drive the development of innovations capable of allowing companies to reduce pollution and enhance their competitive advantage. Green marketing tends to result in the creation of new markets with numerous benefits related to business performance (Chen, 2010). Thus, we propose the following hypothesis:

> *H4*: Green marketing strategies can have a significantly positive influence on business performance.

Influence of the quality of products and services on corporate image

Corporate image is the impression held by consumers regarding the ability of companies to satisfy customer needs, based on past purchase experience and is closely related to quality (Zimmer & Golden, 1988). High-quality products and services tend to

generate trust in firms and boost corporate image (Chen & Myagmarsuren, 2011; Singh & Sirdeshmukh, 2000). Hence, high-quality products and services can help to generate a positive corporate image (Andreassen & Lindestad, 1998). Thus, we propose the following hypothesis:

> *H5*: The quality of products and services can have a significantly positive influence on corporate image.

Influence of environmental protection on corporate image

Enterprises can enhance their corporate image and reputation through efforts to promote environmental protection (Dangelico & Pujari, 2010). Environmental protection can also increase resource utility (Fraj-Andre's, Martinez-Salinas, & Matute-Vallejo, 2009; Miles & Covin, 2000). Firms that actively adopt environmental protection strategies can exempt themselves from environmental protection protests and fines as well as promote their corporate image and develop new marketing opportunities (Berry & Rondinelli, 1998). Thus, we propose the following hypothesis:

> *H6*: Environmental protection can have a significantly positive influence on corporate image.

Influence of the quality of products and services on business performance

Corporations can enhance marketing performance by providing better products and/or services (Ofir, Simonson, & Yoon, 2009). High-quality products and services can promote customer satisfaction, strengthen loyalty, and lead to repeat purchases (Zeithaml & Bitner, 1996). Repurchase intention is directly determined by how consumers feel about the quality of products and services (Nadiri, Kandampully, & Hussain, 2009), with better products and services enhancing customer satisfaction and thereby promoting business performance (Lages, Silva, & Styles, 2009; Leonidoua, Katsikeasb, & Samieec, 2002). The quality of products and services can thus be seen as a strategic tool for improving business performance (Shapiro, 2010). The following hypothesis is therefore established:

> *H7*: The quality of products and services can have a significantly positive influence on business performance.

Influence of corporate image on business performance

Customers are more likely to maintain a long-term relationship with firms that have a good reputation and corporate image (Keller, 2003). A good corporate image can boost brand awareness, customer loyalty, increase sales, and help firms save on promotional expenses (Ailwadi & Keller, 2004). Such an image can also reduce consumer uncertainty during purchase decisions and enhance customer satisfaction through the accumulation of purchase experiences (Oliver, 1981). A strong corporate image can help to enhance business performance (Courtright & Smudde, 2009). Thus, promoting corporate image can have a profound influence on business performance, making it indispensable to management strategy (Herstein, Mitki, & Jaffe, 2008; Liu, Wang, & Chen, 2009). Thus, the following hypothesis is established:

> *H8*: Corporate image can have a significantly positive influence on business performance.

Influence of environmental protection on business performance

Environmental protection and management can positively influence business performance; therefore, firms can promote business performance by advertising their efforts at environmental responsibility, while incorporating concepts related to environmental protection into the design and packaging of products to differentiate their products from those of their competitors (Shrivastava, 1995). Porter and Van (1995) discovered that firms dedicated to environmental protection can solve issues related to pollution and increase profits, thereby achieving a win-win situation. Companies that highlight their environmental performance assessments and goals are clearly seeking to achieve sustainable development (Dias-Sardinha, Reilnders, & Antunes, 2002; Koner & Cohen, 2001). The results of efforts to promote environmental protection have a positive correlation with business performance (Zhu & Joseph, 2004). Thus, the following hypothesis is established:

> *H9*: Environmental protection can have a significantly positive influence on business performance.

Methodology

Research framework

This study formulated the research hypothesis and framework in Figure 1, which was validated using a questionnaire survey followed by structural equation modelling (SEM) analysis. The study adopted green marketing strategies as an independent variable and explored its influence on mediating variables (the quality of products and services, corporate image, and environmental protection) and the dependable variable (business performance). The study also explored the strength of identified correlations among the variables.

Measurement variables

This study designed a questionnaire based on current theories and literature. The questionnaire was divided into five parts. (1) Green marketing strategy, comprising 5 aspects (purchasing, manufacturing, packaging, transport and distribution, and waste disposal) which included 20 items (refer to Hart, 1995); (2) Quality of products and services, comprising seven items (refer to Parasuraman, Zeithaml, & Berry, 1988); (3) Corporate image, comprising five items (refer to Walters, 1978); (4) Environmental protection, comprising six items (refer to Shrivastava, 1995); (5) Business performance, comprising four aspects
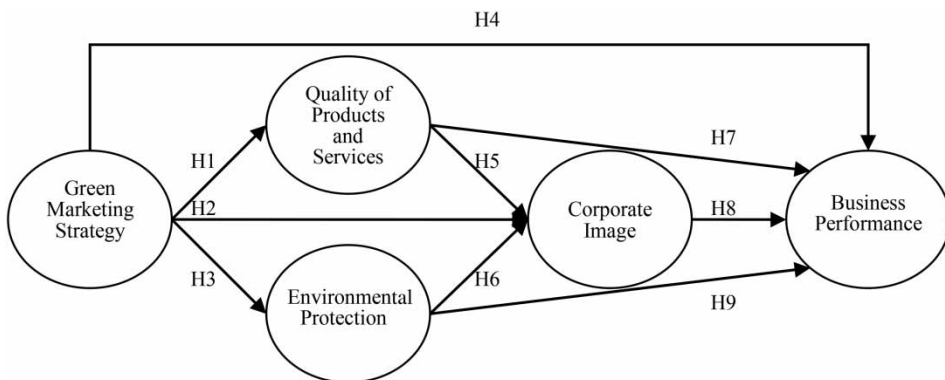

Figure 1. The research framework.

(financial, customer, internal business processes, and learning and growth) and 15 items (refer to Kaplan & Norton, 1996). All question items were assessed using a Likert seven-point scale with higher scores indicating a higher level of agreement.

Questionnaire design

We conducted both a pre-test and pilot test prior to the formal survey. In the pre-test, convenience sampling was used to select 10 organic farmers for in-depth interviews. The findings revealed that a number of the question items were unclear. These sentences were subsequently modified and two inappropriate business performance items were deleted.

Convenience sampling was then employed to select 60 organic farms for the pilot test. Reliability and validity analyses were conducted on the data, the results of which presented a Cronbach's α exceeding 0.7 for each aspect with eigenvalues over 1 and cumulative explained variance exceeding 0.5. Moreover, the factor loadings were greater than, or close to, 0.5, and the item-to-total correlation coefficients exceeded or were close to 0.5, indicating strong reliability and convergent validity (Kerlinger, 1978; Nunnally, 1978).

Sampling

This study surveyed the owners or CEOs of 1287 verified organic farms in Taiwan over a four-month period. We employed the personal interview method. Elimination of invalid questionnaires resulted in 288 valid questionnaires. According to Bentler and Chou (1987), samples should be at least five times the number of estimated parameters, and Boomsma and Hoogland (2001) claimed that a sample size in the 200–400 range is the most appropriate for SEM analysis. Thus, sample size in this study was deemed acceptable. To reduce common-method bias, the business performance items were answered by owners and all the others were dealt with by CEOs.

Research results and findings

Reliability and validity analysis

Our results presented a Cronbach's α value between 0.842 and 0.945 for each aspect with item-to-total correlation coefficients exceeding 0.5 for each item, thereby demonstrating the good overall reliability of the questionnaire (as shown in Table 1).

Exploratory factor analysis identified five factors that could be extracted from the items related to green marketing strategy, three factors from business performance, and only one from the other categories. The eigenvalue of each factor was above 1, the cumulative explained variance exceeded 0.6, and the factor loadings of each item were all higher than 0.6, indicating that convergent validity was achieved.

This questionnaire employed questions drawn from relevant research that underwent semantic modification by scholars and experts as well as adjustments proposed by organic farmers. In its final form, the test passed reliability and validity testing in a pilot test, indicating good content validity.

Furthermore, our results showed that the correlation coefficient of any two aspects was lower than the Cronbach's α value of any single aspect, indicating that discriminant validity was achieved (Gaski & Nevin, 1985).

The study also used AMOS software to conduct confirmatory factor analysis (CFA) in order to further determine the efficiency and construct validity of the measurement scale

Table 1.   Reliability and validity analysis of questionnaire ($n = 288$).

Aspects and items	Item-total correlation coefficients	Factor loading	Eigenvalue	Cumulative explained variance (%)	Cronbach's α
Green marketing strategy					
Green purchasing					
Use biodegradable, recyclable materials	0.798	0.841	3.269	16.347	0.910
Use contamination-free green materials	0.835	0.815			
Purchase safety certified materials	0.816	0.801			
Do not use toxic, harmful ingredients, or indecomposable materials	0.737	0.746			
Green manufacturing					
Use as much natural products as possible	0.817	0.784	3.007	31.38	0.884
Avoid wasting energy and materials	0.799	0.774			
No toxic substances	0.716	0.704			
Avoid producing waste matter, wastewater, exhaust gas	0.670	0.701			
Green packaging					
Use recyclable, reusable packaging materials	0.756	0.801	2.974	46.249	0.894
Use easy to decompose packaging materials	0.795	0.785			
Use natural, non-toxic packaging materials	0.802	0.761			
Reduce unnecessary packaging and printing	0.715	0.669			
Green transport and distribution					
Select the best delivery route to reduce energy consumption	0.821	0.821	2.961	61.052	0.874
Collect old products on the delivery route to save time and avoid wasting resources	0.699	0.755			
Centralised deliveries to reduce wasting energies on multiple small shipments	0.751	0.746			
Use transportation options with low greenhouse gas emission and low energy consumption	0.671	0.725			

(*Continued*)

Table 1.   Continued.

Aspects and items	Item-total correlation coefficients	Factor loading	Eigenvalue	Cumulative explained variance (%)	Cronbach's α
Green waste disposal					
Recycle and reuse	0.769	0.842	3.213	77.117	0.904
Recycle waste disposal	0.824	0.826			
Pay attention to the total amount of resources recycled	0.794	0.820			
Conduct safety measures	0.766	0.728			
Quality of products and services					
Employees are kind and polite when interacting with customers	0.827	0.868	2.792	75.147	0.932
Provide reliable healthy products	0.834	0.836			
Feature organic labeling	0.763	0.794			
Use special technology to produce organic products	0.808	0.768			
Can provide customised services	0.748	0.756			
Offer safety product	0.819	0.746			
Provide prompt	0.730	0.734			
Corporate image					
Prompt service	0.725	0.823	4.664	58.300	0.886
Multiple sales channels	0.745	0.812			
Diverse promotion campaigns	0.743	0.806			
Attractive design in packaging	0.711	0.805			
Abundant products or services	0.707	0.793			
Environmental protection					
Management ideas with environmental protection thinking	0.911	0.917	1.918	74.756	0.945
Management policies minimise pollution	0.893	0.898			
Production plan to protect the environment	0.847	0.878			
Production technologies to reduce contamination	0.855	0.876			
Meets environmental protection standards	0.826	0.850			
Makes efforts to protect natural environment	0.685	0.774			
Business performance					
Financial aspect					
Revenue growth rate	0.857	0.856	3.665	22.904	0.912

(*Continued*)

Table 1.   Continued.

Aspects and items	Item-total correlation coefficients	Factor loading	Eigenvalue	Cumulative explained variance (%)	Cronbach's α
maintains stable growth					
Yield rate meets desired goals	0.776	0.823			
Market share meets company goals	0.769	0.820			
Sales growth increases each year	0.799	0.786			
Customer aspect					
Positive word-of-mouth	0.872	0.874	3.634	45.615	0.924
Strong customer loyalty	0.852	0.832			
Customers introduce new customers	0.812	0.831			
High customer satisfaction	0.764	0.798			
Learning and growth and internal business process aspect					
Employees are willing to learn and grow	0.850	0.866	5.030	77.052	0.936
Employees are satisfied with job content	0.880	0.854			
Employees are team players	0.851	0.843			
Employees are professionals	0.843	0.840			
Employees have highly efficient	0.731	0.701			

for hotels and motels. CFA showed that χ^2/df is 2.104, root mean square residual (RMR) is 0.052, goodness of fit index (GFI) is 0.922, adjust goodness of fit index (AGFI) is 0.890, normed fit index (NFI) is 0.945, relative fit index (RFI) is 0.931, comparative fit index (CFI) is 0.970, root mean square of approximation (RMSEA) is 0.052, all model indicators met or came close to the aforementioned standards (Bentler, 1990; Hoxmeier, Nie & Purvis, 2000; Joreskog & Sorbom, 1989b). Additionally, all the factor loadings that connected latent variables and measured items exceeded 0.60 and showed significant effects, demonstrating the efficiency and construct validity of each measured item. Discriminant validity was also demonstrated by all measured dimensions and factors.

Relationship model analysis

AMOS 17.0 software was used to conduct SEM, following the criteria of the good model (Hu & Bentler, 1999), to ensure consistency with the following criteria: χ^2/df should be less than 3 (Carmines & Maciver, 1981), the RMSEA value should be less than 0.05, and the GFI, AGFI, RFI, NFI, and CFI indicators should be greater than 0.9 (Bagozzi & Yi, 1988; Joreskog & Sorbom, 1989a). The findings indicated that the relevance of the overall model was close to, or met, the ideal standard, thereby demonstrating that the proposed model is acceptable, as shown in Table 2.

Path analysis revealed the following. Green marketing strategy had a positive effect on the quality of products and services ($\lambda_1 = 0.573, p = .000$), thereby supporting *H1*. Green

Table 2. The fitness analysis of full model.

χ^2	df	χ^2/df	p-Value	RMR	GFI	AGFI	NFI	RFI	CFI	RMSEA
587.148	324	1.812	.000	0.101	0.877	0.846	0.912	0.898	0.958	0.053

marketing strategy had a positive effect on corporate image ($\lambda_2 = 0.273$, $p = .003$), thereby supporting *H2*. Green marketing strategy had a positive effect on environmental protection ($\lambda_3 = 0.738$, $p = .000$), thereby supporting *H3*. Green marketing strategy had no significant influence on business performance ($\lambda_4 = 0.127$, $p = .186$), thereby rejecting *H4*. The quality of products and services had a positive effect on corporate image ($\lambda_5 = 0.575, p = .000$), thereby supporting *H5*. However, environmental protection was shown to have no significant influence on corporate image ($\lambda_6 = -0.130$, $p = .070$), thereby rejecting *H6*. The quality of products and services had a positive effect on business performance ($\lambda_7 = 0.379$, $p = .000$), thereby supporting *H7*. In addition, corporate image had a positive effect on business performance ($\lambda_8 = 0.400$, $p = .000$), thereby supporting *H8*. Finally, environmental protection had a positive effect on business performance ($\lambda_9 = 0.175$, $p = .020$), thereby supporting *H9*. In summary, green marketing strategy appears not to enhance business performance directly; however, it can have a positive influence on the quality of products and services as well as on corporate image, thereby promoting business performance. Our results indicate that environmental protection is an internal operation of farms and therefore has no direct effect on corporate image. Nonetheless, these efforts can promote business performance. Measures to promote environmental protection were identified as important variables with regard to their influence on the business performance of organic farms. These results are presented in Figure 2.

Analysis of influence effects

After analysing the influences and effects of the independent on the dependent variables, direct and indirect effects were used for further analysis. Our results show (Table 3) that green marketing strategy had the greatest direct effect on environmental protection (0.738). However, regarding the indirect effect of green marketing strategies on business
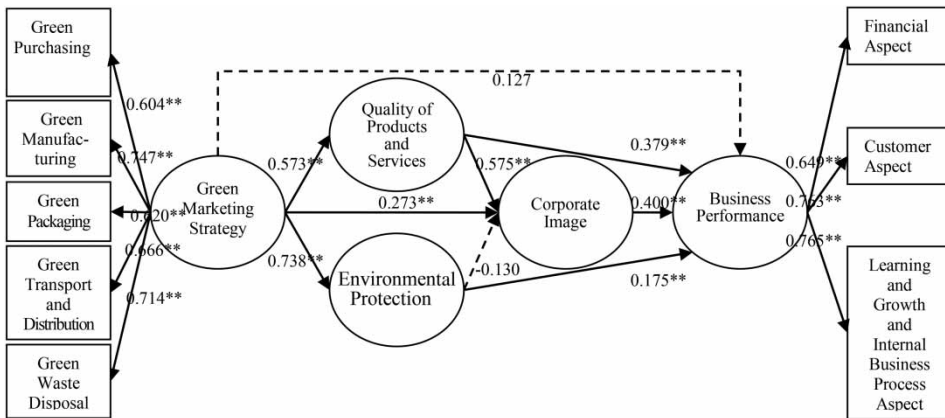

Figure 2. The relationship model.

Table 3.   Analysis of influence effects.

Factor	Direct effect	Indirect effects
Green marketing strategy→Quality of products and services	0.573	–
Green marketing strategy→Corporate Image	0.273	–
Green marketing strategy→Environmental protection	0.738	–
Green marketing strategy→Business performance	0.127	–
Quality of products and services→Corporate image	0.575	–
Environmental protection→Corporate image	−0.130	–
Quality of products and services→Business performance	0.379	–
Corporate image→Business performance	0.400	–
Environmental protection→Business performance	0.175	–
Green marketing strategy→Quality of products and services→Business performance	–	0.573*0.127 = 0.0728
Green marketing strategy→Corporate image→Business performance	–	0.273*0.400 = 0.1092
Green marketing strategy→Environmental protection→Business performance	–	0.738*0.175 = 0.1292
Green marketing strategy→Quality of products and services→Corporate image→Business performance	–	0.573*0.575*0.400 = 0.1318
Green marketing strategy→Environmental protection→Corporate image→Business performance	–	0.738*−0.130*0.400 = −0.0384

performance, the greatest influence appears to be the effect of green marketing strategy on the quality of products and services, followed by corporate image, and then business performance (0.1318); the second path runs from green marketing strategy to environmental protection, and then to business performance (0.1292).

Conclusions and suggestions

Discussion

Despite growing awareness regarding the importance of environmental protection, few studies have sought to determine the degree to which the implementation of green marketing strategies can enhance the quality of products and services, protect the environment, and impact business performance. This study selected organic farms as a subject to investigate the influence of green marketing strategies through the establishment of a relationship model and an effective measurement scale. Our findings provide a valuable resource for industry players and academics investigating correlations in this area.

This study developed a relationship model to illustrate the effectiveness of a green marketing strategies implemented by organic farms. Our results identified one key path by which green marketing first improves the quality of products and services, then indirectly promotes corporate image and enhances business performance. The second most important path involves the enhancement of environmental protection through green marketing strategies, which then results in the strengthening of business performance. This indicates that the implementation of a green marketing strategy by organic farms can help to boost business performance while enhancing the quality of their products and services, corporate image, and promoting environmental protection. These results demonstrate that the vigorous development of a green marketing strategy can help to enhance TQM.

Our findings suggest that organic farms should persist in green marketing strategies in order to continue improving the quality of their products and services, which is consistent with the findings of Vermillion and Justin (2010) and Greenseal (2009). Organic farms should also continue implementing green marketing strategies in order to promote a positive corporate image, as previously described by Chen et al. (2006), Dangelico and Pujari (2010) and Chen (2010). Our result indicating that high-quality products and services and a positive corporate image can enhance business performance is consistent with the findings of Ofir et al. (2009), Nadiri et al. (2009), and Courtright and Smudde (2009).

The implementation of green marketing strategies by organic farmers can also promote environmental protection, further enhancing business performance. This important finding is consistent with the research of Carter et al. (2000) and Purba (2002).

Nonetheless, a green marketing strategy was not found to have a significant direct influence on business performance. Instead, we found that the quality of products and services and corporate image are key mediating variables between green marketing strategy and business performance. Environmental protection does not appear to have a significant direct influence on corporate image; however, the achievements of organic farms with regard to environmental protection were shown to directly enhance business performance, which is consistent with previous research such as Koner and Cohen (2001).

These results indicate that to improve business performance farms should provide high-quality organic products and good service, and then leverage these achievements through promotions.

Study limitations and suggestions

This study examined only one type of farm; therefore, these results are not necessarily generalisable to other types of agricultural enterprise or other industries. Future research should provide comparisons between various types of farms and even among other industries.

Farm characteristics such as size and production may exercise a decisive influence over the results and may be considered mediating variables of the cause-effect relationships.

Regarding business performances, even financial performances were measured based on interviewees' perception, which can be subjective rather than objective. Future researchers can add real financial data to take a double check.

Regarding research methodology, the 1287 interviewees are all owners or CEOs of the organic farms. This may cause some sampling problems because their perception on customer loyalty may be different from that of their real customers and also their perception on employee satisfaction may be different from that of their real employees.

This research did not explore upstream and downstream sectors of the organic farm industry. Future researchers could extend this work to consumers who purchase organic farm products as well as the vendors who sell them.

References

Ailawadi, K.L., & Keller, K.L. (2004). Understanding retail branding: Conceptual insights and research priorities. *Journal of Retailing*, *80*(4), 331–342.

Al-Darrab, I.A., Gulzar, W.A., & Ali, K.S. (2013). Status of implementation of safety, quality and environmental management systems in Saudi Arabian industries. *Total Quality Management & Business Excellence*, *24*(3–4), 336–354.

Allred, A.T., & Addams, H.L. (2000). Service quality at banks and credit unions: What do their customers say? *International Journal of Bank Marketing*, *18*(4), 200–207.

Andreassen, T.W., & Lindestad, B. (1998). Customer loyalty and complex services: The impact of corporate image on quality, customer satisfaction and loyalty for customers with varying degrees of service expertise. *International Journal of Service Industry Management*, *9*(1), 7–23.

Arcury, T.A., & Christianson, E.H. (1990). Environmental worldview in response to environmental problems: Kentucky 1984 and 1988 compared. *Environment and Behavior*, *22*(3), 387–407.

Azizi, S., Movahed, S.A., & Haghighi Khah, M. (2009). The effect of marketing strategy and marketing capability on business performance, case study: Iran's medical equipment sector. *Journal of Medical Marketing*, *9*(4), 309–317.

Bagozzi, R.P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*(1), 74–94.

Balachander, S., & Srinivasan, K. (1994). Selection of product line qualities and prices to signal competitive advantage. *Management Science*, *40*(7), 824–841.

Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238–246.

Bentler, P.M., & Chou, C.P. (1987). Practical issues in structural modeling? *Sociological Methods and Research*, *16*, 78–117.

Berry, M.A., & Rondinelli, D.A. (1998). Proactive corporate environmental management: A new industrial. *Academy of Management Executive*, *12*(2), 38–50.

Boomsma, A., & Hoogland, J.J. (2001). The robustness of LISREL modeling revisited? *Sychometrika*, *51*, 313–325.

Campbell, J.P. (1977). *On the natural of organizational effectiveness*. San Francisco, CA: Jossey-Bass.

Canan, A.Y. (2005). Environmentally conscious consumers. *Akdeniz University Faculty of Economics and Administrative Sciences Faculty Journal/Akdeniz Universitesi Iktisadi ve Idari Bilimler Fakultesi Dergisi*, *5*(10), 238–263.

Carmines, E., & MacIver, J. (1981). *Analyzing models with unobserved variables: Analysis of covariance structures*. Beverly Hills, CA: Sage.

Carolien, H., & Han, B. (1996). Ecodesign: A promising approach. *Delft University of Technology*, 16–21.

Carter, C., & Ellram, L. (1998). Reverse logistics: A review of the literature and framework for future investigation. *Journal of Business Logistics*, *19*(1), 85–102.

Carter, C.R., Kale, R., & Grimm, C.M. (2000). Environmental purchasing and firm performance: An empirical investigation. *Transportation Research Part E: Logistics and Transportation Review*, *36*, 219–228.

Charlier, C., Albert, A., Herman, P., Hamoir, E., Gaspard, U., Meurisse, M., & Plomteux, G. (2003). Breast cancer and serum organochlorine residues. *Occupational and Environmental Medicine*, *60*, 348–351.

Chen, C.F., & Myagmarsuren, O. (2011). Brand equity, relationship quality, relationship value, and customer loyalty: Evidence from the telecommunications services. *Total Quality Management & Business Excellence*, *22*(9), 957–974.

Chen, Y.S. (2008). The driver of green innovation and green image: Green core competence. *Journal of Business Ethics*, *81*(3), 531–543.

Chen, Y.S. (2010). The drivers of green brand equity: Green brand image, green satisfaction, and green trust. *Journal of Business Ethics*, *93*(2), 307–319.

Chen, Y.S., Lai, S.B., & Wen, C.T. (2006). The influence of green innovation performance on corporate advantage in Taiwan. *Journal of Business Ethics*, *67*, 331–339.

Cottrell, S.P. (2003). Influence of Sociodemographics and environmental attitudes on general responsible environmental behavior among recreational boaters. *Environment and Behavior*, *35*(3), 347–375.

Council of Agriculture Executive Yuan. (2010). Retrieved from http://www.coa.gov.tw/show_index.php

Courtright, J.L., & Smudde, P.M. (2009). Leveraging organizational innovation for strategic reputation management. *Corporate Reputation Review*, *12*, 245–269.

Dangelico, R., & Pujari, D. (2010). Mainstreaming green product innovation: Why and how companies integrate environmental sustainability. *Journal of Business Ethics*, *95*(3), 471–486.

Delaney, J.T., & Huselid, M.A. (1996). The impact of human resource management practices on perceptions of organizational performance. *Academy of Management Journal*, *39*(4), 949–969.

Dias-Sardinha, I., Reijnders, L., & Antunes, P. (2002). From environmental performance evaluation to eco-efficiency and sustainability balanced scorecard. *Environmental Quality Management*, *12*(2), 51–64.

Ditcher, E. (1985). What's in an image. *The Journal of Customer Marketing*, *2*, 75–81.

Foote, J., Gaffney, N., & Evans, J. (2010). Corporate social responsibility: Implications for performance excellence. *Total Quality Management & Business Excellence*, *21*(8), 799–812.

Fraj-Andre's, E., Martinez-Salinas, E., & Matute-Vallejo, J. (2009). A multidimensional approach to the influence of environmental marketing and orientation on the firm's organizational performance. *Journal of Business Ethics*, *88*(2), 263–286.

Gaski, J.F., & Nevin, J.R. (1985). The differential effects of exercised and unexercised power sources in marketing channel. *Journal of Marketing Research*, *22*, 130–142.

Green Seal. (2009). National green buying research. Retrieved from http://www.greenseal.org/resources/green_buying_research.cfm

Gruen, T.W., Summers, J.O., & Acito, F. (2000). Relationship marketing activies, commitment, and membership behaviors in professional associations. *Journal of Marketing*, *64*, 34–49.

Hart, S.L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, *20*, 986–1014.

Hatch, J., Gill-Body, K.M., & Portney, L.G. (2003). Determinants of balance confidence in community-dwelling elderly people. *Physical Therapy*, *83*, 1072–1079.

Herstein, R., Mitki, Y., & Jaffe, E.D. (2008). Corporate image reinforcement in an era of terrorism through integrated marketing communication. *Corporate Reputation Review*, *11*(4), 360–370.

Higashijima, S.I., Hotta, Y., & Okamoto, H. (2000). Visualization of cranial motor neurons in live transgenic zebrafish expressing green fluorescent protein under the control of the islet-1 promoter/enhance. *The Journal of Neuroscience*, *20*(1), 206–218.

Hoxmeier, J.A., Nie, W., & Purvis, G.T. (2000). The impact of gender and experience on user confidence in electronic mail. *Journal of Organizational and End User Computing*, *12*(4), 10.

Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternates? *Structural Equation Modeling*, *6*(1), 1–55.

Hwang, Y.D., Wen, Y.F., & Chen, M.C. (2010). A study on the relationship between the PDSA cycle of green purchasing and the performance of the SCOR model. *Total Quality Management & Business Excellence*, *21*(12), 1261–1278.

International Federation of Organic Agriculture Movements. (1972). Organic farming. Retrieved from http://en.wikipedia.org/wiki/Organic_agriculture

Joreskog, K.G., & Sorbom, D. (1989a). *LISREL 7: A guide to the program and applications*. Chicago, IL: SPSS.

Joreskog, K.G., & Sorbom, D. (1989b). *LISREL 7 User's Reference Guide*. Chicago: Scientific Software.

Kaplan, R.S., & Norton, D.P. (1996). Strategic learning and the balanced. *Scorecard Strategy and Leadership*, *24*(5), 18–24.

Keller, K.L. (2003). *Strategic brand management-building, measuring, and managing brand equity*. Upper Saddle River, NJ: Prentice Hall.

Kerlinger, F.N. (1978). Similarities and differences in social attitudes in four western countries. *International Journal of Psychology*, *13*, 25–37.

Koner, S., & Cohen, M.A. (2001). Does the market value environmental performance? *The Review of Economics and Statistics*, *83*(2), 281–290.

Kotler, P. (2006). *Marketing management*. Upper Saddle River, NJ: Pearson Prentice Hall.

Lages, L.F., Silva, G., & Styles, C. (2009). Relationship capabilities, quality, and innovation as determinants of export performance. *Journal of International Marketing*, *17*(4), 47–70.

Leonidoua, L.C., Katsikeasb, C.S., & Samieec, S. (2002). Marketing strategy/determinants of export performance: A meta-analysis. *Journal of Business Research*, *55*(1), 51–67.

Levitt, T. (1972). Production-line approach to service. *Harvard Business Review*, *50*, 41–52.

Liu, S.F., Wang, W.C., & Chen, Y.H. (2009). Applying store image and consumer behavior to window display analysis. *Journal of American Academy of Business*, *14*(2), 70–74.

Lytle, R.S., & Timmerman, J.E. (2006). Service orientation and performance: An organizational perspective. *Journal of Services Marketing*, *20*(2), 36–147.

Miles, M.P., & Covin, J.G. (2000). Environmental marketing: A source of reputational, competitive, and financial advantage. *Journal of Business Ethics*, 23(3), 299–311.

Miles, M.P., Manila, L.S., & Russell, G.R. (1997). Marketing and environmental registration/certification what industrial marketers should understand about ISO14000. *Industrial Marketing Management*, 26(4), 363–370.

Nadiri, H., Kandampully, J., & Hussain, K. (2009). Zone of tolerance for banks: A diagnostic model of service quality. *The Service Industries Journal*, 29(11), 1546–1564.

Nunnally, J.C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.

Ofir, C., Simonson, I., & Yoon, S.O. (2009). The robustness of the effects of consumers' participation in market research: The case of service quality evaluations. *Journal of Marketing*, 73(6), 105–114.

Oliver, R.L. (1981). Measurement and evaluation of satisfaction processes in retailing setting. *Journal of Retailing*, 57(3), 25–48.

Parasuraman, A., Zeithaml, V.A., & Berry, L.L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4), 41–50.

Parasuraman, A., Zeithaml, V.A., & Berry, L.L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1),12–40.

Peattie, K. (1992). *Green marketing*. London: Pitman.

Porter, M.E., & Van, D.L.C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, 9, 97–118.

Purba, R. (2002). Greening the supply chain: A new initiative in South East Asia. *International Journal of Operations and Production Management*, 22(5), 632–655.

Rogerson, W.P. (1983). Reputation and product quality. *The Bell Journal of Economics*, 14(2), 508–516.

Sammy, S. (2008). Knowledgeable green transition. *Management, Surface Mount Technology*, 22(5), 30–30.

Sarkis, J. (1995). Manufacturing strategy and environmental consciousness. *Technovation*, 15(2), 79–97.

Shapiro, S.L. (2010). Dose service matter? An examination of donor perceptions of service quality in college athletics. *Sport Marketing Quarterly*, 19(3), 154–165.

Sheth, J.N., Newman, B.I., & Gross, B.L. (1991). Why we buy: A theory of consumption values. *Journal of Business Research*, 22, 159–170.

Shrivastava, P. (1994). Castrated environment: Greening organizational studies. *Organization Studies*, 15(5), 705–726.

Shrivastava, P. (1995). Environmental technologies and competitive advantage. *Strategic Management Journal*, 16, 183–200.

Singh, J., & Sirdeshmukh, D. (2000). Agency and trust mechanisms in consumer satisfaction and loyalty judgments. *Academy of Marketing Science*, 28, 150–167.

Tzuchi. (2014). Cleanse the heart, love and medicine cure the sick, Hualien, Taiwan, R.O.C. Retrieved from http://tw.tzuchi.org/en/index.php?

Vermillion, L.J., & Justin, P. (2010). Green marketing making sense of the situation. *Allied Academies International Conference: Proceedings of the Academy of Marketing Studies*, 15(1), 68–72.

Walters, C.G. (1978). *Consumer behavior: An integrated framework*. New York, NY: Richard D.

Worcester, R.M. (1972). *Consumer market research handbook*. New York, NY: McGraw-Hill.

Wu, S.I., & Chen, J.H. (2011). Comparison between manufacturing companies that are ISO certified and those not certified using performance measurement model. *Total Quality Management & Business Excellence*, 22(8), 869–890.

Yang, C.C., Yang, K.J., & Peng, S.Y. (2011). Exploration strategies and key activities for the system of environmental management. *Total Quality Management & Business Excellence*, 22(11), 1179–1194.

Zeithaml, V.A., & Bitner, M.J. (1996). *Service marketing*. New York, NY: McGraw-Hill.

Zhu, Q., & Joseph, S. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 22, 265–289.

Zimmer, M.R., & Golden, L.L. (1988). Impressions of retail stores: A content analyses of consumer images. *Journal of Retailing*, 54(3), 65–91.