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An evaluation of the role of green marketing and a firm's internal practices for environmental sustainability

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The management of a firm's green operations is increasingly important for marketing strategists. The purpose of this study is to investigate the cross-influences of green marketing strategy and the key internal green functional areas in a firm. We use the antecedents of marketing strategy and identify relationships between green marketing strategy and key supporting internal environmental operations of firms with respect to (1) green suppliers, (2) environmental resource management, (3) green research and development, and (4) environmental manufacturing processes and procedures. The statistical techniques of parallel analysis, factor analysis and multiple regressions are used to analyze data collected from 332 firms. The results identify that among the four functional areas of firms adopting green marketing strategy. Two are more likely to influence green marketing strategy – supplier selection and research and development. Implications are discussed. The findings contribute to the theory of green marketing strategy. Future research is recommended.

Keywords: green marketing; green research and development; environmental resource management; green suppliers; environmental processes

Introduction

Coordination of internal functions of a firm contributes to the effectiveness of marketing focus (Ahmed & Rafiq, 2003). A firm's internal cross-functional support creates synergy and adds strength to the competitive power that propels the organization and establishes an organization's market edge and positioning (Chamorro & Banegil, 2006; Porter, 1979). Several researchers have argued that marketing is regarded less as a function, but more as a 'set of values and processes that all internal functions need to adopt in order to participate in implementing' (Moorman & Roland, 1999, p. 181) in a uniform way. In this regard, Haeckel (1997, p. 9) suggests that 'Marketing's future is not [to be only] a function of business, but is the function of business.' There are few empirical studies that measure the value of the marketing thoughts dominating the manufacturing function (Hausman, Montgomery, & Roth, 2002; Malhotra & Sharma, 2002; O'Leary-Kelly & Flores, 2002), while the other researchers consider green marketing as a philosophy that guides the behavior of the whole organization (Chamorro & Bañegil, 2006). However, in this paper we regard green marketing as equally critical and consider four key internal practices that influence green marketing strategy effectively, namely: (1) green environmental processes, (2) green supplier selection, (3) green research and development (R&D), and (4) green resources.

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Green marketing strategy not only influences the greening of products and processes but also the simultaneous greening of firms' overall behavior (Prakash, 2002). In terms of integration between marketing and the internal function and practices of a firm, several researchers argue that a stronger integration is required (Hausman et al., 2002; Malhotra & Sharma, 2002). Therefore, it is important to understand this effect on functional internal practices. This study aims to evaluate the extent to which a firm's green marketing strategy may influence other internal functions. It attempts to contribute to the theory of green marketing with emphasis on its organization-wide application. Specifically, the study will seek to answer the following research question: Does the green marketing strategy of a firm have any bearing upon its internal practices?

The paper begins with a discussion of the extant literature of green marketing and the green internal practices of firms. This is followed by the development of hypotheses. Collected data is analyzed and the findings are discussed. The final section discusses overall implications, limitations and future directions.

Green marketing strategy

Green marketing is defined as a strategic effort made by firms to supply customers with green goods and services (Grewal & Levy, 2008). Green marketing involves integrating environmentally related matters to a firm's marketing efforts to minimize the environmental impact of their activities (Rex & Baumann, 2007). It includes a broad range of 'green' activities that can influence the internal practices of a firm. It also leads to a strategic transformation of a company. In contrast to this micro view of marketing, several authors consider green marketing in a broader context beyond the activities, processes, and functions of a firm (Fraj-Andres, Martinez-Salinas, & Matute-Vallejo, 2009). The reality is that if going green will not drive increases in sales, market share, or improve reputation, then it defeats the purpose of meeting company profits (Ginsberg & Bloom, 2004). With any innovative strategy development there is a need to consider interdependencies with other corporate programs and policies (Olson, 2008) and thus green marketing strategy is no exception.

In essence, adopting a green marketing strategy re-orients a firm in terms of how it initiates and manages its green practices, how it rapidly responds to the growing green customer demand and changes in the dynamic market environment, how it targets its customers, promotes its market offerings, and uses its green initiatives to create a sustainable competitive advantage. To examine a firm's key functions such as green internal practices in line with, and in support of green corporate strategy, the following key variables are established to form the dependent variable which is the current focus of marketing: Targeting, predicting demand, promoting green products, and building competitive advantage from a focus on environmental priorities (Sharma, Lyer, Mehrotra, & Krishnan, 2010). This current focus of marketing consists of marketing strategies, specifically: (1) *Targeting green consumers*' which involves identifying green market segments for targeting and to tailor the company's market offerings to appeal to specific green segments (Belz & Peattie, 2009); (2) *Predicting demand for environmentally friendly products.* From a strategic point of view, it is important to understand the trend and longer term viability and attractiveness of a green market segment (Smith, 2010). This involves consumers' reasons to buy green products, identifying green product characteristics, understanding green pricing, and understanding consumers' perceptions, expectations and their willingness to compromise or trade-off (Luzio & Lemke, 2013); (3) *Promoting environmentally friendly products*, which relates to effectively promoting

green products to change and/or strengthen green attitudes and increase consumption. Several studies have identified consumers' perceptions of green products as the fundamental driving force in green consumption (D'Souza, Taghian, Lamb, & Peretiatkos, 2006; Tanner & Wölfing Kast, 2003); (4) *Building competitive advantage from a focus on environmental priorities*. Although production operations and marketing are linked to performance and morale (Hausman et al., 2002), researchers also find that the association and collaboration between production operations and marketing contribute to the creation and maintenance of a sustainable competitive advantage (e.g., Peattie, 1999; Prakash, 2002). As discussed above, marketing typically considers which type of goods or services to offer and the appropriate target market to serve; how to promote the product and forecast emerging variations in consumer's sentiments and preferences characterizing the demand structure. The green marketing task is performed by integrating and attracting support from all the relevant operational functions of the firm, to allow strong focus on customer needs (Tyrrell, 2004) and customers' values. By drawing on the green marketing literature, we identify green marketing strategy as a dependent variable to examine its outcome on a firm's internal practices. Below we outline a firm's internal practices that influence green marketing.

Environmental processes

Adopting a green marketing strategy directly attracts various changes in functional areas that support strategy implementation. Environmental processes adopt cleaner manufacturing processes and thus greener products. Managers are compelled to address environmental issues by placing greater emphasis on green manufacturing, processes and product recovery (Sarkis, 2001). Green firms integrate environmental processes in their production operations in several ways: redesign the process to meet the environmental objectives (DfE), life cycle analysis (LCA) (Hoffman, 2000; Kainuma & Tawara, 2006), and ISO 14001 certification (Sarkis, 2001); pollution prevention and pollution control processes (Klassen & Whybark, 1999).

Environmental processes also involve a firm's internal efforts in environmental assessment, planning, and implementation (Sroufe, Montabon, Narasimhan, & Wang, 2002). Environmental management standards (such as ISO 14001 mentioned previously) are the other type of environmental process guidelines that potentially increases environmental performance and operational performance (Fraj, Martínez, & Matute, 2011; Sroufe, 2003). Environmental standards not only lead to transformation of firms, but also motivate stakeholders to adopt Triple Bottom Line accounting (Elkington, 1997). Thus, implementing environmental management systems (EMS) is seen as an asset to a firm's environmental process (Klassen & Whybark, 1999; Vastag, 2004). Environmental standards assist in the green promotion of a firm's image and motivate marketing of differentiated products (D'Souza, Taghian, Lamb, & Peretiatko, 2007). Similarly, focusing on environmental processes also benefits the corporate image. This is undertaken by integrating environmental objectives in a firm's internal processes or operations (Korul, 2005). Thus, environmental processes take account of procedures and practices that improve environmental performance of firms (D'Souza, Taghian, & Sullivan-Mort, 2013; Handfield, Sroufe, & Walton, 2004). In other words, internal practices as described above are seen as a conduit that links green marketing with the environmental processes. Thus, we hypothesize that:

H1: Green marketing strategies are positively associated with environmental processes measures.

Green supplier selection

Green supplier selection also involves a firm's internal efforts in planning for green procurement. For example, Srivastava's (2007) meta-analysis of green supply chain management categorizes the key problems within supply chain operations and recognizes the importance of green procurement. The need for green resources and capabilities required to develop a green supply chain strategy has put not only suppliers under the spotlight (Shrivastava, 2007) but also firms that use them. To what extent should a buyer consider greenness of supply when it comes to differentiating competing products and companies? Firms select their suppliers depending on different criteria, but environmentally sound firms are likely to incorporate environmental issues in their procurement process (Handfield, Walton, Sroufe, & Melnyk, 2002). In order to remain green, firms are inclined to choose suppliers who are green in their activities (Green, Morton, & New, 1998).

The literature suggests that the evaluation of green suppliers should be based on a number of elements. First, suppliers are increasingly drawing attention to green resources owing to the importance of supplying green products and materials (Zhu, Sarkis, Cordeiro, & Lai, 2008), which would assist in producing and marketing green products. Second, to pursue environmental interests, green firms consider their supplier's green strategies for both their internal and external operations (Vachon & Klassen, 2006). In terms of their internal practices or operations, firms undertaking green decision-making related to product design, manufacturing processes and purchasing also observe other key elements of the supplier chain such as: creating environmental awareness; the inclusion of environmentally associated concepts when suppliers are evaluated (Lin & Juang, 2008) in terms of their position on environmental management; green manufacturing, processes and product recovery (Sarkis, 2001); life-cycle assessment (Hoffman, 2000; Kainuma & Tawara, 2006); and environmentally conscious design and waste minimization (Sarkis & Cordeiro, 2001; Theyel, 2001), all of which help in the positioning and differentiating of green products. Third, green firms also need to make considerable investment in the supplier selection process based on activities such as: monitoring, labeling, and training, while some may even have to depend on more expensive suppliers (Maignan, Hillebrand, & Mcalister, 2002), which would inherently increase the cost or price of the product, making it more difficult to market competitively. Fourth, some actions taken by firms affect not only suppliers indirectly but also the logistics system for marketing. For example, in some cases supplier compliance is necessary which includes reverse logistics (RL) and logistics network design, which provide ways to manage end-of-life product returns (Fleischmann, Krikke, Dekker, & Flapper, 2000; Fleischmann, Beullens, Bloemhof-Ruwaard, & Van Wassenhove, 2001; Jayaraman, Patterson, & Rolland, 2003; Srivastava & Srivastava, 2006; White, Massenet, Rosen, & Beckman, 2003). Finally, to increase flexibility, companies also develop joint initiatives with suppliers on the basis of their product design (design for the environment – DfE) and development processes (Handfield et al., 2002), all of which facilitates gaining a competitive advantage.

Sometimes firms may take alternative actions to maintain relationships or tradeoffs between environmental and economic performance (Scherpereel, van Koppen, & Heering, 2001; Wagner, Schaltegger, & Wehrmeyer, 2001). Similarly, examining relationships between operational practices and performance (Bowen, Cousins, Lamming, & Faruk, 2001; Zhu & Sarkis, 2004) shows that firms are willing to make a trade off, to some extent. Yet, there are several researchers who suggest that the whole supply chain should support the firm's total customer value beyond what consumer's expect (Hult, Ketchen, & Arrfelt,

2007). This is so because suppliers are also part of the market environment and they can drive or demand what they require (Prakash, 2002) which would indirectly impact on the firms' green marketing efforts.

Given that a supplier's green position is fundamentally important to a firm, it begs the question as to which indicators should firms use to select a green supplier that would enhance marketing strategies? Clearly, there are multiple approaches firms use to evaluate green procurement and several decisive factors contribute to the selection of a green supplier (Wittstruck & Teuteberg, 2012). Based on the literature, this research has considered several measures for supplier selection as addressed above. In addition, does environmental protection need to be the key criteria in supplier selection even if they are expensive? Eco-labels or environmental management standards are a priority for customers' environmental requirements which firms then demand of their own suppliers (Simpson & Power, 2005; Simpson, Power, & Samson, 2007). Environmental standard ISO 14021 relates to environmental labeling which is used as a guide to consumers to choose green products and simultaneously promote them. Manufacturers encourage suppliers to have this labeling as it mitigates transaction costs by reducing the information and uncertainty gap between firms and their suppliers (Chen, 2005). In addition, a supplier's green image can be used as a qualitative indicator for achieving competitive advantage (Chiou, Chan, Lettice, & Chung, 2011). Top management support and commitment is also essential for green supply chain management (Bowen et al., 2001; Luthra, Kumar, Kumar, & Haleem, 2011). Product-based green suppliers (Bowen et al., 2001) are another criterion for supplier selection. Green marketing strategies are likely to influence these several primary indicators discussed above that firm's consider when selecting suppliers. It is clear that firms require green marketing to be reflected throughout its processes such as the actions and policies of their supply chain, and no compromise should be made on their green products (Peattie & Crane, 2005). Accordingly, this leads to the following hypothesis:

H2: Green marketing strategies are positively associated with green supplier's selection.

Environmental resource management

Resource management refers to the management of energy sources and waste outputs. Resource management is important as it increases capabilities, and leverages them with the intention of creating and maintaining value for customers and shareholders (Sirmone, Hitt, & Ireland, 2007). It is also critical that resources are managed effectively and efficiently as it establishes the amount of value a firm creates (Ireland & Webb, 2006), and to optimize value creation it is important that resource usage is synchronized (Sirmone et al., 2007). In terms of managing green resources, and more particularly, with reference to waste minimization and pollution prevention, the benefits that ensue include a reduction of operating costs and comparatively lower overall costs when contrasted to competitors (Ball, 2002).

Hart's (1995) natural resource based view of a firm suggests that the connection between environmental challenges and firm's resources are operationalized through three interconnected strategic capabilities: pollution prevention, product stewardship, and sustainable development. These strategic capabilities provide insight into the management of resources. In essence, firms can internalize the challenges of minimizing emissions and waste, managing product life cycle costs, and, in general, minimizing their environmental

burden, in order to yield sustainable sources of competitive advantage (Hart, 1995). In other words, environmental resource management also involves a firm's internal efforts, for instance, the foundation for gaining competitive advantage is ingrained in a set of emerging capabilities such as waste minimization, green product design, and technology cooperation (Hart, 1994). An efficient and effective resource management process may contribute to obtaining a green competitive advantage that would increase green marketing efforts. Thus we hypothesize that:

H3: Green marketing strategies are positively associated with environmental resource management.

Green research and development

Green research & development (R&D) and the marketing of green products are also critical to cross functional collaboration (Song, Neeley, & Zhao, 1996). Green companies often pursue green R&D (Hart, 1997) leading to innovation in green product development and life cycle assessment (Foster & Green, 2000). There are several calls for R&D activity to be more proactive in creating greener offerings in firms' product lines; researchers have also identified a close relationship between R&D activity and sales and marketing activities (Foster & Green, 2000). Furthermore, the literature suggests that new project success is dependent not only on firms' strategy but also on their capacity to cross functionally incorporate marketing and R&D activities (Griffin & Hauser, 1992; Pujari, Wright, & Peattie, 2003). Accordingly the above discussion implies the following hypothesis:

H4: Green marketing strategies are positively associated with green R&D.

Method

Due to the exploratory nature of the current study, a triangulated method using both qualitative and quantitative analysis was used. The qualitative survey involved several approaches including informal discussions with several firms, in particular, those from the manufacturing sector listed in the database used. A target list of industries was obtained from a publicly accessible database available from the Australian Department of the Environment and Water Resources (National Pollutant Inventory [NPI], 2007). Following those discussions, 15 in-depth telephone interviews with middle managers of selected companies were conducted using the method proposed by Yin (2003). The qualitative analysis yielded variables which became part of a questionnaire that included those based on the literature. Existing scales such as those for environmental processes, green supplier selection and environmental resource management were confirmed by management in the qualitative study and suggestions were made regarding green research and development. Internal company standards, management accounting, organizational reputation, and total quality management were also some suggestions made. We identified that scales for green research and development and several items including some within green supplier selection, environmental processes, and resource management were required to be developed. These items were again tested for clarity and appropriateness in a pre-test on three managers. Consultations with three academics with expertise in the area were also made during the operationalization of these scales. A pilot study was also undertaken to identify any areas that may need revision. Many items were eliminated and modified on the basis of the feedback received. We also adhered to established techniques of item scaling (Crano & Brewer, 2001). Face validity of the items related to each construct was

established in the careful drafting of the questions and through the pre-testing of the research instrument.

A comprehensive database of manufacturing firms across Australia listed all the required information for this study including names of firms, their addresses, and relevant information on the category and quantity of substance emissions. There are over 3000 industry emission categories reported annually to the NPI which requires firms exceeding a certain threshold level of emissions in Australia, to submit a report to the NPI. On this database, there are approximately 48,000 firms with pollution stacks. As the intention of this research was to select only high polluting firms, indicated by emission levels reported as exceeding 99,532 kg, those firms that did not meet this benchmark were excluded from the target list. According to the ANZSIC classification scheme, the following are the larger break up categories: organic industrial chemical manufacturing; paint manufacturing; plastic extruded product manufacturing; industrial gas manufacturing; motor vehicle manufacturing, and other.

Dillman (1978) method was used to enhance response rates. Firms were contacted through multiple mailings. For example, the initial mail-out was followed by a reminder postcard after 15 days and then a second mail-out. In total, 1208 firms were sent questionnaires and 332 usable responses were received, representing a 27% response rate. This response rate is relatively low in comparison to other studies that report a response rate of over 40% (Diaz de Rada, 2001). It appears that the length of the questionnaire (nine pages) used in this study may have been a factor explaining lower response rates.

Data were screened for outliers. Bartlett's test of Sphericity ($p = .000$) was less than .05 and the Kaiser–Meyer–Olkin measure of sampling adequacy (.850) was above .6 thereby indicating that the use of factor analysis was appropriate (Pallant, 2005). To assess measurement validity, this study used the content validity method. Prior to conducting data analysis, we first employed Harman's one-factor test to identify whether common method variance (CMV) existed (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The test identified that using a one-factor solution (i.e., assuming the entire items load on one factor) explains 21% of the variance, which is below the cut-off of 0.50, suggesting CMV is not an issue. Notably, a review of the literature indicates that even when CMV does exist, the bias is not sufficient to significantly change results (Doty & Glick, 1998). Social desirability bias was addressed by highlighting anonymity for all respondents.

There are controversies using Kaiser Criterion i.e., retention of principal components with eigenvalues above 1 or using Scree Plot as a way of determining the number of components to extract (Pallant, 2005). The change in the elbow of the Scree Plot showed 3–4 factors that could be retained. Parallel analysis is an alternate way of determining the number of factors to retain (Watkins, 2000). Using Monte Carlo PCA for Parallel analysis (as shown in Table 1), if the eigenvalue from this research is larger than the criterion value of Parallel analysis then the decision to retain this factor is taken. The results of the Parallel analysis confirm that only four of the factors from the Scree Plot require further investigation. Thus factor analysis supports the claim that there are four principal factors (Table 1).

Tables 2 and 3 detail the factor analysis of 'green marketing' on the four internal functional areas of green activities of firms and reports the factor loadings obtained. The factor analysis extraction method used principal components analysis, Varimax rotation, with five iterations. Principal components analysis is used because the purpose is to identify and compute scores for the factors underlying the firm's internal green activities. In Table 2, seven of the items loaded on a factor best interpreted as 'Environmental Processes;' eight of the items loaded on a factor interpretable as 'Green Supplier,' six of

Table 1. Comparison of eigenvalues from principal components analysis (PCA) and parallel analysis.

Component	Actual eigenvalue from PCA	Criterion value from parallel analysis	Decision
1	9.33	1.61	Accept
2	4.50	1.53	Accept
3	2.65	1.47	Accept
4	1.93	1.41	Accept
5	1.33	1.36	Reject
6	1.07	1.32	Reject

the items loaded on 'Environmental Resource Management,' and three of the items loaded on 'Green Research and Development.' These factor scores were used in multiple regression analysis to determine if a firm's internal functions, as measured by those four factors, were influenced by green marketing. The correlation between the variables (lower than .6) indicates that there is no problem with multicollinearity. Four factors loaded on Green Marketing in Table 3. In factor analysis, together, the first four factors account for 59.4% of the variance contained within this data. These four principal factors were used as dependent variables.

For Environmental Processes, respondents were asked to rate their responses on a seven-point Likert scale ranging from 1 strongly disagree to 7 strongly agree. For all the other factors, respondents were also asked to rate their responses on a seven-point Likert-scale ranging from 1 strongly unimportant to 7 strongly important. In terms of Environmental Processes, due care has been taken to observe procedures related to the processes such as waste, environmental impact assessment procedures, environmental audit, and the emphasis on EMS and then incorporate these observations in the construct.

The firms surveyed agreed that they were involved in environmental procedures and practices. All firms surveyed affirmed they were undertaking Green R&D activities. However, they did not regard energy and water efficient production methods or reduction in greenhouse gases to be important for their green research and development. They were neutral about new methods of pollution control. Thus, while other areas of Green product R&D are important to firms, research in terms of efficient production resource methods and emissions do not appear to be important.

Four variables were considered in terms of green marketing. The alpha value of the independent variable, green marketing, is .902. There is a strong positive correlation between the variables as $r > .6$ in all cases. Multiple linear regressions are identified to predict the probability of a categorical outcome variable based on one or more predictor variables (Field, 2009). A multiple regression can be used for a combination of variables; including both categorical and continuous, whereby multiple regression is used as a general data analytic approach (Tabachnick & Fidell, 2001).

From the multiple regression analysis, variance explained in the independent variable (i.e., green marketing) is 22% (R^2 .219), which is significant (.000) at ($F = 22.869$, $p < 0.00$). Table 4 shows the coefficients. The Beta standardized coefficients explain the relative strength of each predictor.

In Table 4 and in Figure 1, it can be seen that green marketing strategy is positively associated with green supplier evaluation and the relationship is moderate, whereas, green marketing strategy is positively associated with green research and development and has a weak relationship. This supports the research suggested by Rao and Holt (2005) where

Table 2. Key functions – factor loadings and descriptive statistics.

Environmental processes				
Alpha = .910, CR = .91, AVE = 60.64				
Waste handling procedures	.78	5.84	1.48	332
Environmental audit procedures and processes	.85	5.94	1.66	332
Emphasis on EMS	.79	5.57	1.74	332
Hazard assessment procedures and processes	.78	6.11	1.41	332
Safety audit procedures and processes	.77	6.28	1.28	332
Pollution monitoring tech	.76	5.60	1.82	332
EIA procedures	.71	5.20	1.94	332
Green supplier selection				
Alpha = .796, CR = .89, EVE = 50.9				
Environment is the key criteria in supplier selection even if they are expensive	.86	3.04	1.343	332
Buying from green suppliers who endorse eco-labels	.78	3.39	1.510	332
Commitment from your organization for green buying	.84	3.51	1.367	332
Environment is the key criteria in supplier selection	.79	3.25	1.456	332
Buy only from suppliers who supply green products	.79	3.43	1.344	332
Purchasing and procuring with environmental in view	.61	3.34	1.899	332
Green procurement policy	.43	3.77	1.599	332
Buying green to differentiate products	.48	3.39	1.878	332
Environmental resource management				
Alpha = .868, CR = .87, AVE = 54.04				
Energy supplies	.895	3.80	2.64	332
Non-renewable resources	.856	3.19	2.45	332
Water resources	..80	4.14	2.72	332
Recycling	.68	4.75	2.36	332
Renewable energy sources	.68	3.42	2.40	332
Waste reduction technologies	.43	1.96	2.55	332
Green research and development				
Alpha = .943, CR = .91, AVE = 78.05				
Energy and water efficient production methods	.904	3.21	2.98	332
Reduction in green-house gases	.88	2.97	2.81	332
New methods of pollution control	.87	2.64	2.67	332

Note: Alpha, Cronbach's α; CR, composite reliability; AVE, average variable extracted.

Table 3. Green marketing strategy.

Green marketing Alpha = .902, CR = .91, AVE = 78.05	Score	Mean	Std. deviation	*N*
Customer demand of your green products over next 3–5 years	.86	3.90	2.03	332
Company has environmental competitive advantage in marketing their goods or services over competitors	.85	3.43	1.80	332
Promote green environmental components of the product	.84	3.57	2.00	332
Environmental marketing can contribute to increasing competence in the marketing process of targeting green consumers.	.83	3.75	1.79	332

Note: Alpha, Cronbach's α; CR, composite reliability; AVE, average variable extracted.

they identified that greening the different stages of the supply chain leads to increased competitiveness and economic performance.

This is also suggestive of the literature that environmentally sound firms are likely to incorporate environmental issues in their procurement process (Handfield et al., 2002).

Table 4. Coefficients.

Model	Unstandardized coefficients		Standardized coefficients		
	B	Std. error	Beta	*t*	Sig.
(Constant)	− 1.000E − 013	.049		.000	1.000
Env. processes	− .038	.055	− .038	− .66	.49
Suppliers	.388	.052	.388	.75	.00
Resource mgt	.033	.058	.033	.57	.57
R&D	.185	.056	.185	.32	.00

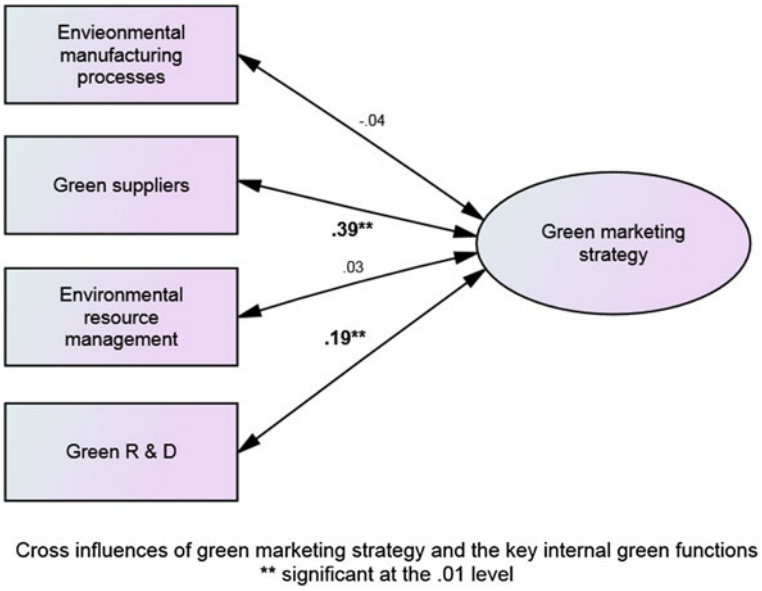

Figure 1. Cross influences of green marketing strategy and the key internal green functions.

Similarly, green supply chain improves competitiveness and economic performance in terms of new market opportunities and market share (Rao & Holt's research, 2005), thereby suggesting that green marketing strategies are critical to a firm's success.

In order to remain green, firms are inclined to choose suppliers who are green in their activities (Green, Morton, & New, 1998). The literature suggests that the evaluation of green suppliers should be based on a number of elements. First, suppliers are increasingly drawing attention to green resources owing to the importance of being supplied with green products and materials (Zhu et al., 2008), which would assist in producing and marketing green products. Second, to pursue environmental interests, green firms consider their supplier's green strategies for both their internal and external operations (Vachon & Klassen, 2006). In terms of their internal practices or operations, firms undertaking green decision-making related to product design, manufacturing processes, and purchasing also observe other key elements of the supplier chain such as; creating environmental awareness and including environmentally associated concepts when suppliers are evaluated (Lin & Juang, 2008) in terms of their position on environmental management.

It is evident that green research & development (R&D) and the marketing of green products are important for cross functional collaboration (Song, Neeley, & Zhao, 1996). It influences innovation in green product development and life cycle assessment (Foster & Green, 2000). It is also necessary for R&D activity to be more proactive in creating greener offerings for firms' product lines; researchers have identified close co-operation between R&D activity and sales and marketing activities (Foster & Green, 2000). These findings support the view that companies need to make imperative changes in their R&D if they want to attain sustainability (Kotler, 2011).

Environmental resource management and environmental processes were found to be not significant. This could be possible due to regulation observed by firms as discussed below. Regulation is mandatory in several instances as in the case of waste minimization, cleaner production, and energy and resource efficiency.

Discussion

Our research question is framed broadly as: Does the green marketing strategy of a firm have any bearing upon the internal practices'? Also relevant are Kotler's (2011) research imperatives which concern the factors that make companies compete on the levels of sustainability and what required changes should be made with marketing practices? Similarly relevant is the notion that stakeholders are associated with green marketing strategy and its impact and that a moderate relation exists between the firm's own economic sector and organizational characteristics (Rivera-Camino, 2007). Prior research has shown limited conclusive evidence on the link between green marketing strategy and a firm's internal green practices.

Some answers to these questions can be informed by this research such as the issue of firms competing on levels of sustainability by addressing green marketing strategies, as this influences a green supplier evaluation and research and development. This internal cross-functional areas support creates synergy and adds strength to the competitive power. This paper strengthens the view that green marketing influences internal green practices such as green supplier selection and green research and development. The paper also finds that changes can be made to investing in green research and development, more particularly in areas of energy and water efficient production methods, reduction in greenhouse gases, and in new methods of pollution control.

Although green products are generally not translating into 'actual market place and environmental success' (Olson, 2013, p. 782), stakeholders expect firms to engage in responsible green behavior. As expected, results show that firms incorporating environmental activities are more likely to be involved in green marketing and a majority of the firms surveyed affirmed this. It is also evident that cross functional input is critical for the design and development of proactive environmental initiatives (Denison, Hart, & Kahn, 1996) especially in terms of investing in green R&D.

Internal practices that were used to test suppliers' selection were based on firm level decisions such as commitment, green procurement policy, and product qualities like product differentiation. Other indicators related to identifying green suppliers selection generally focus on the degree of emphasis suppliers place on the environment irrespective of the cost of their products. Buying from green suppliers who endorse eco-labels may mean that the criteria for the supplier selection need to be structured to ensure that the suppliers are selected from those who are already ISO14001 certified or are in the process of obtaining the certificate. Overall, this supports the view that both marketing and green suppliers must have greater inter-functional coordination.

In regards to consistent 'green' priority-based R&D activities, there is a need to identify relevant, adequate, and directional information to the R&D department, more specifically in terms of innovative green products. Periodic reports would also act as requests for the designing of projects that give priority to directly addressing issues related to consumers' perceptions, sentiments, attitudes, and preferences. The results of collaboration between the R&D department and the marketing department would provide legitimacy for producing 'green' products. It would also provide sound sustainable competitive advantage for the company by responding to competitors' initiatives.

It is concerning that the results do not indicate any association between green marketing and 'environmental processes' and 'environmental resource management.' It was expected that adopting environmental processes and procedures would provide clarity of organizational behavioral patterns that result in the proper application of an environmental management system. Perhaps environmental regulation could be a strong factor that inhibits the association of environmental processes with green marketing. This may be because a majority of the firms are following green processes which are indicated by their mean values falling in the range of 5–7, less than one standard deviation away from the mean. These firms may have a strong environmental culture and are inclined to address environmental issues more rigorously in their marketing strategies (Fraj, Martinez, & Matute, 2013). It was also expected that the management of resources would result in efficiency and cost reduction in terms of types and magnitude of resources (energy) used and the management of recycling and waste reduction would enhance the 'green' marketing through lower costs and potentially higher profits. Perhaps further investigation into this area could provide useful insights.

Limitations and future research

There are some limitations in this study and the results reported need to be used with caution. The findings of this study are based on respondents' subjective responses rather than more objective archival data. These self-reported measures are not only subjective but may also reflect some social desirability bias. Where possible, more objective measures could be used that can verify these findings. The research is also constrained by analyzing only four internal green practices of firms. There are several other potential domains that can be examined for example, environmental management accounting, human resource capabilities, and other critical resources that can be utilized to execute proactive green initiatives.

Future research could empirically analyze RL and green marketing strategies observed by firms. The sample comprises only medium and large-sized firms; small firms were not included as their emissions were below the cutoff point in this study. Surveying smaller firms may provide different results. This survey is based on a cross-sectional design. It would be logical to use longitudinal studies to provide some indication of variation in the green internal practices of the firms under study. In addition, a repeat survey would be a distinct advantage if new policies or regulations on the environment, such as dismissal of the carbon tax in Australia, are introduced and firms' reaction to this is analyzed. While this study has several limitations, it contributes to identifying a pragmatic role for green marketing strategy formulation and related cross-influences with other key supporting functions and internal green processes. In conclusion, our findings show that firms' green marketing strategy influences research and development activities and green supplier selection.

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