A comparison of proactive and reactive environmental strategies in green product innovation

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Abstract: Companies are exposed to different kinds of pressures to respond to environmental sustainability issues. It is critical to understand how firms integrate environmental issues into their corporate agendas and how these integration strategies affect corporate performance. This paper investigates factors that motivate firms to adopt environmental marketing strategies and their relative impact on green product innovation performance. A comprehensive conceptual framework is developed and tested that portrays the antecedents and consequences of environmental marketing strategy (EMS). The results show that developing environmental strategies that exceed regulations (proactive strategies) leads to better new product performance than those that only adhere to regulations (reactive strategies). In addition, we find that commitment from top management becomes critical only for proactive strategies, not for reactive strategies. Finally, with regard to the consequences, we show that environmental marketing strategies lead to new product advantage and, ultimately, improved sustainable new product performance.

Keywords: sustainability; innovation; proactive and reactive environmental strategy; NPD; new product development.

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1 Introduction

In recent years, regulators are increasing legislation, community groups and activists are protesting against firms that have unsustainable business practices, and consumers are demanding sustainable or green products. Besides, environmental sustainability is now considered as one of the essential factors of innovation (Hopkins, 2010; Nidumolu et al., 2009; Kumar et al., 2013). Responding to these changes, an increasing number of firms have committed to including the natural environment in their innovation agendas and have adopted sustainable development practices (Kolk, 2008; Marcus and Fremeth, 2009; Madsen, 2009). In parallel to the business world, research on green innovation has rapidly grown over the last few years (Dangelico et al., 2013, 2016; Dangelico, 2016; Dangelico and Pujari, 2010; Genç and Di Benedetto, 2015). It is important to note that the term innovation should not be limited to technological changes. Innovation applies to a variety of areas such as product, marketing, organisational and process changes (OECD Report, 2005). Therefore, green product innovation (GPI) is defined as a multi-faceted process to satisfy relevant stakeholders wherein the impact of material, energy, and pollution on the environment are highlighted at different stages of the product's physical life cycle (Dangelico and Pujari, 2010). Although some has done to date on this topic, scholars agree that more empirical research on the key drivers of green product innovation performance is needed (Cronin et al., 2011; Gabler et al., 2015; Lirn et al., 2013). This study aims to fill this gap in the literature through empirically examining the key drivers of GPI.

In 1995, a revised version of the familiar resource-based view (RBV) (Barney, 1991), named the natural resource-based view (NRBV), was proposed as a systematic analysis of the relationship between the natural environment and a firm's performance, linking resource, capabilities and strategic outcomes (Hart, 1995). This model has subsequently been accepted among scholars and applied in research studies (i.e., Fraj et al., 2011; Walls et al., 2011). As noted by Hart and Dowell (2011), however, not much research has yet linked resources, capabilities and performance with a natural environment perspective. This study aims to contribute to the literature through developing a framework that links firms' resources, capabilities and performance with a sustainability angle. In particular, through some drivers, firms develop environmental marketing strategies which in turn affect new product performance (Banerjee et al., 2003; Alt et al., 2015; Lin, 2012; Menguc et al., 2010).

A firm may attempt to develop environmental marketing strategies in two ways:

- only adhering to regulations (reactive environmental strategies or RES) or
- exceeding the regulations (proactive environmental strategies or PES) (Hart, 1995; Aragón-Correa, 1998; Sharma and Vredenburg, 1998; Henriques and Sadorsky, 1999; Lin, 2012).

Proactively developed environmental policies have resulted in substantial cost savings for many firms, including 3M, AT&T, Chevron, DuPont, and IBM. In 2014 alone, GE earned $34 billion from its Ecoimagination program. Comparing the impact of RES and PES on performance is critical. Once more firms start to believe developing PES will have an additional contribution to their bottom line than just implementing RES, they will be more motivated to develop environmental strategies which will lead to the sustainability of resources. However, there are not many research studies that make a distinction between proactive and reactive environmental strategies, or that compares the effects of PES and RES on green product performance. To address this gap in the literature, this study models the antecedents and consequences of reactive and proactive environmental marketing strategies in the NRBV theory context and examines their relative impacts on GPI performance. The purpose of this study is to explore the research question of whether businesses are better off if they implement proactive environmental strategies (PES). If more firms proactively develop environmental marketing strategies to make innovations, society will have more economic and social benefits.

We utilise stakeholder theory (Harrison and Freeman, 1999; Henriques and Sadorsky, 1999) to determine environmental stakeholders and NRBV theory (Barney, 1991; Hart, 1995) to frame the model in terms of a resource-capability-performance relationship and to examine the consequences of reactive and PES on new product advantage and GPI performance.

2 Literature review

2.1 Natural resource-based view of the firm theory

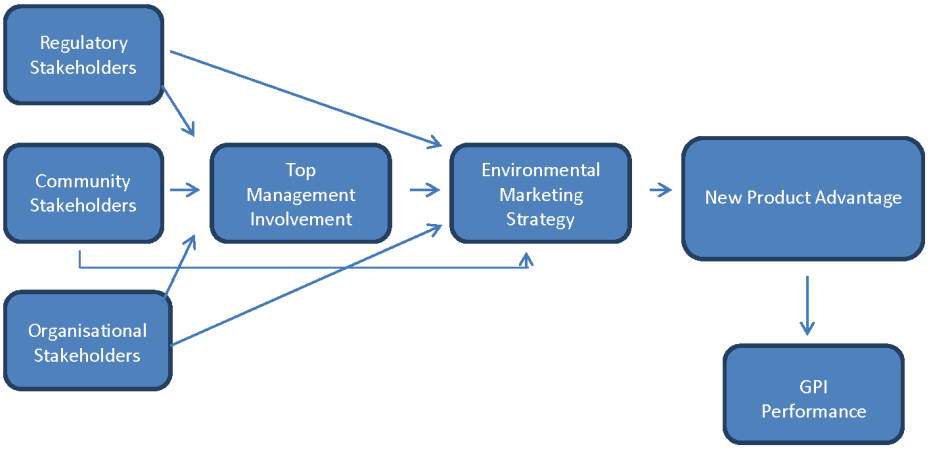
The RBV of the firm asserts that the performance of companies differs because of heterogeneity in a firm's valuable, rare, inimitable and non-substitutable resources and its

ability to translate these resources into capabilities (Barney, 1991). Hence, RBV theory asserts that there is a path dependency among resources, capabilities and firm performance. RBV is considered as compatible with sustainable new product development (NPD) researches (Hult, 2011). Hart (1995) asserts that constraints regarding the natural environment motivate firms to develop new and distinctive resources and capabilities, resulting in a sustained competitive advantage and improved performance. Hart concluded that "it is likely that strategy and competitive advantage in the coming years will be rooted in capabilities that facilitate environmentally sustainable economic activity—a natural-resource-based view of the firm" (NRBV) (Hart, 1995, p.991). As an empirical examination of NRBV, Sharma and Vredenburg (1998) discovered an association between PES and the presence of unique organisational capabilities. These capabilities, in turn, were found to have consequences for firm competitiveness. Similarly, firms that have better environmental responsiveness have been shown to achieve better performance results (Stone and Wakefield, 2000). Baker and Sinkula (2005) examined RBV from an environment perspective, noting that adopting an RBV orientation is associated with new product success and competitive advantage. A recent study on SMEs found a positive impact of SMEs' environmental strategy on their financial performance (Ko and Liu, 2017).

2.2 Stakeholder theory

Firms try to satisfy stakeholders with different strategies, leading to variations in corporate performance (Henriques and Sadorsky, 1999; Harrison and Freeman, 1999). Stakeholder theory studies how the relationships between an organisation and factors in its internal and external environment influence how the business conducts its activities (Freeman, 1984). Green product innovation requires satisfying multiple stakeholders which may have different motivations and emphasis (Dangelico et al., 2013). We define *environmental stakeholders* as individuals or groups that can affect or be affected by the actions of a firm regarding the natural environment (Freeman, 1984). Accordingly, the environmental stakeholders are regulators, community members and organisational members (Henriques and Sadorsky, 1999). The way in which a firm reacts to these stakeholders' demands determines its environmental marketing strategy (EMS) and GPI performance (Baker and Sinkula, 2005). These stakeholders play a vital role in order to make green innovation successful (Wymer and Polonsky, 2015). Based on Banerjee et al. (2003) and Baker and Sinkula (2005), we identified three drivers that motivate firms adopting environmental marketing strategies. Developing strategies for satisfying any stakeholders other than regulators will be considered as proactive strategies since developing these strategies are not obligatory. Therefore, firms develop reactive environmental strategies (RES) in order to satisfy regulatory stakeholders. On the other hand, firms implement PES when they are motivated to satisfy its community and organisational stakeholders. In the following section, we explain our hypotheses drawn from the proposed framework (see Figure 1).

Figure 1 The conceptual framework of proactive and reactive drivers of environmental marketing strategy (see online version for colours)



3 Hypotheses development

Regulators are important stakeholders who mandate compliance with environmental standards. Regulations have an impact on firms' strategies in various domains, such as product formulation, distribution channels (Green Market Alert, 1993) and packaging content (McCrea, 1993). A recent meta-analysis of green product innovation found environmental regulations as the most import external factor that drives the development of green product innovation (Dangelico, 2016). Here, we define regulatory stakeholders as an important driving factor for firms to implement environmental marketing strategies. We hypothesise:

> *H_1: The involvement of regulatory stakeholders (RS) is positively associated with environmental marketing strategy (EMS).*

Community stakeholders consist of environmental activists, non-governmental organisations (NGOs) and lobbies, and customers that attribute importance to the preservation of the natural environment and act to create pressure on firms to behave more responsibly on this issue. Product stewardship strategies extend beyond an organisation's response to regulations to integrate these external stakeholders' demands into product development process with the aim of minimising the negative consequences on environmental throughout the products' life cycles – from the extraction of raw materials to the use and disposal of products (Buysse and Verbeke, 2003; Lin, 2012). Customers can be willing to pay a price premium in exchange of self and environmental benefits (Chan et al., 2012; Dangelico and Vocalelli, 2017). In addition to that, customers generate more favourable attitudes towards and stronger intent to buy from companies that show proactive environmental practices (Kim, 2017). Due to these potential outcomes, community stakeholders, therefore, become a major motivation for firms to develop environmental marketing strategies. We hypothesise:

> *H_2: The involvement of community stakeholders (CS) is positively associated with environmental marketing strategy (EMS).*

Firm's organisational stakeholders such as investors, shareholders, and employees demand innovations that lower costs or improve value, either of which leads to the competitive advantage that makes the firm competitive in the long run. To satisfy organisational stakeholders, firms produce environmentally friendly products that help to target new markets and to maintain or increase market share (Roy, 1999). Demand from the market has been found to be one of the important factors that drive firms to develop green product innovation (Dangelico, 2016) Therefore, we hypothesise that the impact from organisational stakeholders is a leading factor to implement environmental marketing strategies. That is:

H_3: The involvement of organisational stakeholders (OS) is positively associated with environmental marketing strategy (EMS).

In order to create a sustainable impact on a firm's strategy, stakeholders need to get the approval of top management (Agle et al., 1999). In particular, integrating environmental strategies may challenge the existing organisational culture; therefore this requires solid support from top management. In fact, the commitment of top management has been found to be a key factor in the promotion of corporate environmentalism (Pujari et al., 2003). A lack of commitment and support on the part of management has been acknowledged in the literature as an impediment to the integration of environmental sustainability in the NPD processes (Boks, 2006). Thus, in our model, top management was framed to be a mediator between the strategy drivers and the EMS. Therefore, we hypothesise:

H_4: Top management involvement (TMI) mediates the impact of regulatory stakeholders on environmental marketing strategy (EMS).

H_5: Top management involvement (TMI) mediates the impact of community stakeholders on environmental marketing strategy (EMS).

H_6: Top management involvement (TMI) mediates the impact of organisational stakeholders on environmental marketing strategy (EMS).

3.1 Typology of environmental marketing strategy

Aragón-Correa (1998) classified the typologies of corporate responsiveness regarding the natural environment along with a continuum that ranges from reactive to proactive strategies. A firm may attempt to develop environmental marketing strategies with a range of 'reactive' to 'proactive' activities (Hart, 1995; Aragón-Correa, 1998; Sharma and Vredenburg, 1998; Henriques and Sadorsky, 1999; Lin, 2012). Reactive environmental strategies (RES) are practices that correspond to responding to regulatory requirements (Aragón-Correa and Sharma, 2003; Buysse and Verbeke, 2003). At the other end of the continuum, there are PES incorporates environmental issues beyond the legal requirements that are implemented to satisfy community and organisational stakeholders (Buysse and Verbeke, 2003). Complying with these stakeholders are not obligatory as in the case of regulatory stakeholders; however, developing PES might provide several other benefits for firms. For instance, PES are increasingly recognised as a means for obtaining long-term competitive advantage (Christmann, 2000) and for a greater likelihood of success (Connelly et al., 2011). PES will enable firms to better take advantage of market opportunities through tapping occasions where competition is

scarce, and hence lead to better GPI performance (Menguc et al., 2010). Accordingly, we propose the following hypotheses:

H_7: PES driven by satisfying community stakeholders has a better GPI performance than RES driven by rules and regulations.

H_8: PES driven by satisfying organisational stakeholders has a better GPI performance than RES driven by rules and regulations.

Incorporating environmental sustainability into marketing strategies can create a substantial differentiation aspect compared to competitors, which in turn can lead to a competitive advantage over the competition (Ferrell et al., 2010). Similarly, implementation environmental strategies in NPD process could result in new product advantage through the creation of a unique, superior benefit over competitive products (Rijsdijk et al., 2011). Therefore, we hypothesise that incorporating EMS into the NPD process is positively related to new product advantage. That is:

H_9: Environmental marketing strategy (EMS) is positively associated with new product advantage (NPA).

The NPD literature consistently finds that new product advantage – offering a unique, superior product relative to the competition – is one of the most, if not the most important determinant of new product performance (Cooper, 1979; Cooper and Kleinschmidt, 1988). Multi-item measures of product advantage have been found to be significantly related to measures of product innovation performance (e.g., Song and Parry, 1997; Calantone and Di Benedetto, 2012). Consistent with this prior research, we hypothesise that:

H_{10}: NPA is positively associated with GPI performance.

4 Methodology

To test the above hypotheses, we collected data from completed GPI projects via an online survey. In the following sections, we describe the sample, the data collection procedures and the survey instrument.

4.1 Sample

This empirical study is conducted at the individual GPI project level: we study the processes and outcomes related to specific GPI projects and not on overall GPI performance at the firm or division level. The rationale beyond this is every NPD project is unique in terms of the resources and goals to achieve so taking it at the project level is a better representation of specific goals and utilisation of resources. Product/project managers in various US companies who fit the study objectives were contacted via an online research panel company (Research Now). We applied filters in collecting the data to ensure that the final sample consisted only of respondents who had worked actively on GPI projects for which performance data were available. Respondents who participated in the study were working in companies that operate across several industries. In order to increase the diversity of projects in the study, we maintained the anonymity of the respondents. In addition, we specifically requested projects that differed in terms of

product newness and that had been completed within the past five years. The key participants were the 'product/project managers' or the 'team leaders' of the GPI projects, as the people with the most direct responsibility for the project. This approach is consistent with previous research studies (Henard and Szymanski, 2001), and no differences were found when single or multiple respondents' approaches were used (Slater and Narver, 2000).

While the use of multiple respondents would reduce concerns about potential response biases; however, it may create several problems. First, finding multiple well-informed respondents is a very difficult task (Poutziouris et al., 2006). Second, this approach may create measurement error (Tallon, 2007) and survey administration problems (Felekoglu and Moultrie, 2014). Using well-informed single informants is an alternative strategy to address these concerns, and is still widely used in management and NPD fields (Ingenbleek et al., 2013; Smets et al., 2013). In our study, we carefully selected informants who are likely to possess the most relevant information due to their key positions, experience, or expertise in the NPD process. Moreover, we paid close attention that the hierarchical level of key informants is consistent as suggested by Montoya-Weiss and Calantone (1994). Additionally, we followed the procedural and statistical remedies that were suggested by Podsakoff et al. (2003) to minimise potential common method bias. First, we ensured respondents about anonymity and confidentiality of their responses. Second, we used different scale formats for the predictor and criterion variables in order to reduce method biases caused by commonalities in scale endpoints and anchoring effects. In particular, we used the format of 'agree – disagree' for the predictor variables. On the other hand, we used 1 = 'a great financial failure', and 7 = 'a great financial success', 1 = 'far less than our objectives', and 7 = 'far exceeded our objectives' type of formats when measuring our criterion variable. Finally, we placed several filler questions between construct measures which aimed to dilute participants' perceptions of any direct connection between the constructs.

To encourage participation, we ensured that all responses would be confidential and promised to give them an executive summary of results upon request. Respondents received a hyperlink to an internet-based questionnaire by e-mail. They were requested to complete the survey for the most newly commercialised product that they have knowledge about and for which performance information were accessible. Each participant was asked to complete the questionnaire, which assessed his or her perceptions regarding the hypothesised constructs, and was asked for performance measures and company demographic information (e.g., industry type, number of employees). A total of 1200 respondents were contacted. Overall, 282 questionnaires were returned, representing a response rate of 23.5%. After the elimination of incomplete sixty-three surveys, we ended up 219 usable questionnaires. The sample covered a range of industries, including industries involved in electrical and electronic devices, chemicals, hospital and medical devices, agriculture and processed food products, machinery, pharmaceuticals, automotive and spare parts, and steel products. T-tests were applied to see if there is a significant difference between early and late responses, and the results were not significant for any variables (Armstrong and Overton, 1977). Early respondents were defined as first 50% of the surveys completed and late respondents were defined as the last 50%. We also performed a multivariate analysis of variance (MANOVA) to compare early and late respondents for all of the variables. Similarly, the results did not show a significant difference at the 95% confidence level, suggesting there were no

significant differences between early and late respondents. Both of these analyses suggested that non-response bias was not a concern.

4.2 Measures

We reviewed the literature to identify scales to measure each construct. All of the measures were previously adopted and validated in earlier research studies. This section details how we measured each construct. The questionnaire instrument was composed of three parts, preceded by a cover letter describing the purpose of our survey. The first part consisted of items for measuring the hypothesised constructs. The second part contained items measuring the performance of the GPI projects, and the third part contained items measuring company descriptive data, including the number of employees, the year founded, the industry sector, and so forth. We used seven-point Likert scales, ranging from strong disagreement (1) to strong agreement (7) for all constructs. Firm size (a control variable) was measured by the number of employees.

GPI performance is defined as the competitiveness of a green new product in the marketplace, and the profitability of the product relative to competitors (Clemens, 2006; Judge and Douglas, 1998). As in previous studies in NPD research, we use subjective measures of success (Ernst et al., 2010; Song and Parry, 1997) which permit comparisons of various projects across multiple firms and industries (Atuahene-Gima, 1995) (please see the appendix for specific scale items).

4.3 Psychometric properties of the scales

Before starting the main analyses, several tests were conducted to validate the psychometric properties of the scales. First, potential common method bias was discarded using the Harman test, which revealed that four different factors emerged from a factor analysis that explained more than 73% of the extracted variance (Podsakoff and Organ, 1986). The unrotated principal component factor analysis and the principal component analysis with varimax rotation both showed the presence of four distinct factors with eigenvalues greater than 1.0. Thus, no general factor was apparent. Moreover, the confirmatory factor analysis showed that the single-factor model did not fit the data well: $\chi^2 = 2395.847$, $p = 0.000$, GFI = 0.479; CFI = 0.679; RMSEA = 0.150. Table 1 reports the means, variances, standard deviations, skewness and kurtosis for all of the variables. Examination of the skewness and kurtosis values for all of the variables (see Table 1) indicated that the RS and NPA variables were skewed. Necessary transformations were applied to these variables to ensure normality. To assess the reliability of all of the scales, the value of Cronbach's alpha was studied and was found that it far exceeded the recommended threshold of 70% in all cases (Nunnally, 1978; see Table 1).

An exploratory factor analysis (EFA) was performed on the independent variables relating to the motivations for developing an environmental strategy, using principal component analysis (the varimax method). EFA produced three factors with factor loadings of 0.60 as cut-off points (except for the fourth item in the regulatory forces construct), 1 accounting for 79% of the variance, (K–M–O statistic 0.93, Bartlett statistic 2378, significance 0.000). Next, we performed two confirmatory factor analyses (CFAs) to test the unidimensionality in order not to violate the rule-of-thumb five-to-one ratio of sample size-to-parameter estimates for two groups of theoretically interrelated variables (Bentler and Chou, 1987). Model 1 contained RS, CS and OS constructs (GFI = 0.908;

CFI = 0.964; RMSEA = 0.077). Model 2 included EMS, TMI and NPA constructs (GFI = 0.910; CFI = 0.965; RMSEA = 0.092). Both of the CFA models revealed good fit. The significant factor loadings verified convergent validity for all of the scales (Tables 2 and 3).

Table 1 Descriptive statistics and reliability

	Mean	*Std. deviation*	*Variance*	*Skewness*		*Kurtosis*		
	Statistic	*Statistic*	*Statistic*	*Statistic*	*Std. error*	*Statistic*	*Std. error*	*Cronbach's alpha*
CS[1]	55.297	120.967	1.463	–0.934	0.164	0.724	0.327	0.880
RS	54.030	127.138	1.616	–1.029	0.164	1.174	0.327	0.892
OS	53.455	125.885	1.585	–0.746	0.164	0.302	0.327	0.944
EMS	52.359	141.445	2.001	–0.685	0.164	–0.212	0.327	0.926
TMI	55.723	121.082	1.466	–0.843	0.164	0.375	0.327	0.909
NPA	58.782	101.437	1.029	–1.164	0.164	1.200	0.327	0.938
PERF	55.240	0.90154	0.813	–0.449	0.164	0.742	0.327	0.883

[1]RS: Regulatory stakeholders, CS: community stakeholders, OS: organisational stakeholders, EMS: environmental marketing strategy, TMI: top management involvement, NPA: new product advantage, PEFR: GPI performance.

Table 2 Confirmatory factor analysis – model 1 (Standardised estimates)

			Estimate	*S.E.*
CS3[1]	←	F1	0.884*	
CS2	←	F1	0.763*	0.054
CS1	←	F1	0.882*	0.055
RS5	←	F2	0.753*	
RS3	←	F2	0.789*	0.078
RS2	←	F2	0.802*	0.077
RS1	←	F2	0.862*	0.081
OS6	←	F3	0.842*	
OS5	←	F3	0.886*	0.051
OS4	←	F3	0.879*	0.061
OS3	←	F3	0.878*	0.059
OS2	←	F3	0.867*	0.06
OS1	←	F3	0.794*	0.069

*$p < 0.01$

[1]RS: Regulatory stakeholders; CS: community stakeholders, OS: organisational stakeholders.

Table 3 Confirmatory factor analysis – model 2 (Standardised estimates)

			Estimate	*S.E.*
EMS3[1]	←	F1	0.867*	
EMS2	←	F1	0.911*	0.051
EMS1	←	F1	0.918*	0.052
TMI3	←	F2	0.859*	
TMI2	←	F2	0.892*	0.052
TMI1	←	F2	0.885*	0.053
NPA6	←	F3	0.825*	
NPA5	←	F3	0.849*	0.058
NPA4	←	F3	0.868*	0.065
NPA3	←	F3	0.836*	0.065
NPA2	←	F3	0.838*	0.075
NPA1	←	F3	0.844*	0.072

* $p < 0.01$

[1]EMS: Environmental marketing strategy, TMI: top management involvement, NPA: new product advantage.

To test convergent validity, we performed an exploratory factor analysis (EFA) on the project performance scale by requiring eigenvalues greater than 1. The result from the EFA analyses produced a single factor for the scale. Then a confirmatory factor analysis was run on the financial performance scale. The results indicated that one factor model fit the data well for the scale (GFI = 0.995; CFI = 0.999; RMSEA = 0.026). This indicated the evidence of convergent validity for the project performance scale. Therefore, the results of both the exploratory and confirmatory factor analyses suggest that all of the scales exhibited unidimensionality.

Table 4 Convergent and discriminant validity analysis report

	CR	*AVE*	*CS*	*RS*	*OS*	*EMS*	*TMI*	*NPA*
CS	0.882	0.714	0.845*					
RS	0.878	0.644	0.596	0.802*				
OS	0.944	0.737	0.758	0.608	0.858*			
EMS	0.927	0.808	0.746	0.697	0.826	0.899*		
TMI	0.910	0.772	0.724	0.551	0.796	0.792	0.879*	
NPA	0.937	0.711	0.588	0.437	0.579	0.496	0.668	0.843*

CR: Composite reliability.

AVE: Average variance extracted.

*denotes square root of AVE and other numbers are correlations between variables.

We also tested convergent validity by calculating the average variance extracted. Since they are all larger than 0.5, the scales are good in terms of convergent validity (Hair et al., 2010; see Table 4). Composite reliabilities also show the good reliability of

the scales since they are all larger than 0.7. Additionally, the scales are all acceptable in terms of discriminant validity since the square root of average variance extracted for a particular variable is larger than the correlation of that variable with other variables (see Table 4). Therefore the scales are acceptable in terms of construct validity. Having adequate psychometric properties, the constructs were established by averaging the responses of the remaining items in a particular scale.

5 Analyses and results

After we eliminated one insignificant path and we estimated a reduced model (chi^2 with 8 df = 13.909, $p < 0.084$, goodness-of-fit index [GFI] = 0.982, comparative-fit index [CFI] = 0.995, RMSEA = 0.058). Based on the goodness of fit statistics, the reduced model fit the data better than the full model. The prediction of H_1 regarding RS as an antecedent to EMS received support, with a path coefficient of 0.23 ($p < 0.05$). Hypothesis 2 predicted that CS would be positively related to environmental strategy (EMS). We found that the CS → EMS path was significant (path coefficient of 0.143, $p < 0.05$), supporting H2. As H3 predicted, OS was also found to have a significant influence, being positively related to EMS as well (OS → EMS path coefficient is 0.277, $p < 0.05$; see Table 5).

Table 5 Path model (Standardised estimates)

Path	*Estimate*	*S.E.*
TMI ← CS	0.283*	0.06
TMI ← OS	0.582*	0.058
EMS ← CS	0.143*	0.048
EMS ← OS	0.277*	0.053
EMS ← RS	0.23*	0.094
EMS ← TMI	0.36*	0.051
NPA ← EMS	0.755*	0.022
PERF ← NPA	0.775*	0.167

*$p < 0.01$.

RS: Regulatory stakeholders, CS: community stakeholders, OS: organisational stakeholders, EMS: environmental marketing strategy, TMI: top management involvement, NPA: new product advantage, PEFR: GPI performance.

We report the direct, indirect, and total effects of all of the antecedents on the constructs of EMS in Table 6. H_5, which examines the mediating effect of TMI between CS and EMS, was also supported, since it had a significant direct effect (0.143, $p < 0.001$), as well as a significant indirect effect (0.102, $p < 0.001$) on ES. Similarly, H_6 hypothesised that TMI would mediate the impact of OS on EMS. However, counter to what was predicted in H_4, TMI did not significantly mediate the effect of RS on EMS, since RS had no indirect effect on TMI; see Table 7.

Table 6 The total standardised effects of different motivations on GPI performance

	PERF
	Total standardised effect
RS[1]	0.134
CS	0.144
OS	0.285

[1]RS: Regulatory stakeholders, CS: community stakeholders, OS: organisational stakeholders, PEFR: GPI performance.

Table 7 The mediation effect of top management involvement (TMI)–standardised estimates

	EMS	
	Direct	*Indirect*
RS[1]	0.23	0
CS	0.143	0.102
OS	0.277	0.209

[1]RS: Regulatory stakeholders, CS: community stakeholders, OS: organisational stakeholders, EMS: environmental marketing strategy.

H_7 predicted that PEMS driven by CS would have a greater influence on PERF than the one driven by RS. This hypothesis was supported, since the total standardised effect of CS on PERF is greater than the total standardised effect of RS on PERF (0.144 > 0.134). Similarly, H_8 was also supported, since the total standardised effect of OS on PERF was greater than the total standardised effect of RS on PERF (0.285 > 0.134; see Table 7).

H_9 proposed a direct effect of EMS on new product advantage. This, too, was supported, with a significant path coefficient of 0.755, $p < 0.001$). Finally, we found that the NPA → PERF relation was significant, supporting our H_{10} with a significant path coefficient of 0.775 ($p < 0.001$; see Table 5).

6 Discussion

Researching how environmental strategies are integrated into GPI is a promising area of study. Specifically, exploring the question of when does it pay to be green, we examined whether firms are better off when they invest beyond the regulatory requirements. The objective of this research was to build and empirically test a model that integrates environmental sustainability into the green innovation process, by examining the drivers of proactive and reactive EMS (PES & RES) and their relative impact on GPI. In particular, we assessed whether firms can improve their performance when they proactively develop environmental marketing strategies compared to just complying with the regulations in terms of the impact on innovation performance. This study reveals empirical evidence and highlights the value of corporate voluntary practices for the environment, which induces firms to have better GPI performance. Given the good fit of the data to the proposed model, we were able to find the support that the payoff is greater when companies developed PES in responding to their community and organisational stakeholders. This result is a clear contribution to literature, as this is the first study that

analyses the comparison of driving factors of proactive and reactive environmental strategies and the consequences of these strategies in terms their impact on performance.

Our results show that the impact of environmental strategies developed in response to community and organisational stakeholders on new product advantage and GPI project performance are higher than the impact of environmental strategies developed in response to regulatory stakeholders. In other words, PES were found to lead to better GPI performance than reactive environmental strategies. As proactive environmental approaches require the development of certain organisational capabilities (Aragón-Correa and Sharma, 2003), this helps to explain the reasoning behind the positive impact on GPI performance.

This study has important theoretical implications since our results showed that there are certain path dependencies in our framework that supports NRBV theory (Barney, 1991; Hart, 1995). Our results confirm that PES can be driven by the community and organisational stakeholders. In order these drivers to be effectively integrated into firms strategies; they need to get support from the top management. Consistent with stakeholder theory, this signifies the importance of top management in fostering environmental sustainability. This is also consistent with prior findings that top management attitudes are a significant driver (Carballo-Penela and Castromán-Diz, 2015), even the strongest factor (Liu et al., 2015), of adoption of proactive environmental studies (Carballo-Penela and Castromán-Diz, 2015).

The impact from regulatory stakeholders also had a significant direct influence on environmental strategy, since regulations are important incentives for developing environmental strategies. Nevertheless, the impact was not found to require support from top management; reactive environmental strategies developed in response to regulatory requirements does not involve employee training or top management support (Henriques and Sadorsky, 1999). This result can be also explained by the fact that regulations are coercive and need to be implemented at all conditions to avoid penalties.

Consistent with prior research (Song and Parry, 1997; Calantone and Di Benedetto, 2012) which states that new product advantage is an important determinant of new product performance, we find that adding environmental considerations into the green innovation process provides new product advantage, such as additional benefits and value for consumers, which in turn leads to better GPI performance. This result is also consistent with Baker and Sinkula's (2005) prior work that found EMS leads to new product success.

Altogether, our results have several implications for managers. Our conclusions show the value of additional investment in environmental activities in terms of their impact on performance. PES may necessitate extensive involvement in sustainable management practices such as material replacement, adoption of product and process innovation, manufacturing redesign, creative problem solving or collaboration with stakeholders which may incur additional costs. These additional costs may discourage business to take these proactive initiatives. Our results confirm that firms can actually improve their performance and be financially better off while doing the right thing for the environment. Moreover, top managers have critical responsibilities in this process, since their involvement is a requirement for these initiatives to be accomplished.

7 Limitations and future directions

As with all studies, our study has also its limitations which create avenues for future research studies. The use of single response could be a primary limitation of this study. Nevertheless, data obtained from key informants, especially those who are at a senior level within the organisation, who possess high levels of knowledge, and are highly involved in decision making, resembles objective data in terms of validity and reliability properties (Henard and Szymanski, 2001). Additionally, due to high overall inter-rater agreement in an organisation, single informant bias does not create a problem (Van Doorn et al., 2013). Moreover, no difference was found between the mean responses of those most knowledgeable representative of each network and the mean responses of other network representatives (Wincent et al., 2013). Second, the use of cross-sectional design in collecting data does not allow one to draw causal conclusions. Although it is useful for hypotheses testing, future researchers might test relationships through longitudinal studies in order to improve our understanding of the existing knowledge on this subject. Third, there are also limitations that arise from survey-based research. Self-reported data are subject to bias, although common-method bias was found not to be a significant issue in this study.

In addition to overcoming the limitations, future studies on this topic could aim to contribute through exploring different relevant variables. In this study, we only looked at the effect on subjective performance. One future research direction would focus on including other performance measures. Another avenue for future research would be to examine organisational factors that drive proactive environmental strategy development. Furthermore, future studies can address what specific environmentally-related actions should be undertaken, at early and later stages of the GPI process, what specific role top management should play to increase compliance with environmental actions by members of the GPI team, and which environmental actions offer the most efficient investment in terms of cost outlay and benefits to the firm as well as to society in general.

8 Conclusion

In conclusion, this study provides a substantial contribution to the environmental management literature in that it compares PES with the reactive strategies in regard to their effects on new product advantage and GPI performance. The results of this study highlighted that proactively developing environmental strategies lead to a better new product performance. This supports a win-win situation both for the firm and the planet. Therefore, the results from this study strengthen the viewpoint that "you can do well by doing good".

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Note

[1]As a result, we dropped this item from the scale.

Appendix

GPI performance (adapted from Song and Parry 1997; Ernst et al., 2010).

To what extent do you agree with the following statements related to the success of the new product:

- how successful was this new product from an overall profitability standpoint? (1 = 'a great financial failure', and 7 ="a great financial success")

- relative to your firm's other new products, how successful was this new product in terms of revenues? (1 = 'far less than our other new products', and 7 = 'far greater than our other new products')
- relative to your firm's other new products, how successful was this new product in terms of profits? (1 = 'far less than our other new products', and 7 = 'far greater than our other new products")
- Relative to your firm's objectives, how successful was this new product in terms of profits? (1 = 'far less than our objectives', and 7 = 'far exceeded our objectives")

Regulatory stakeholders (adapted from Banerjee et al., 2003)

(1 = 'strongly disagree' and 7 = 'strongly agree")

To what extent do you agree with the following statements related to the success of the new product?

- regulation by government agencies has greatly influenced our firm's environmental strategy
- environmental legislation can affect the continued growth of our firm
- stricter environmental regulation is a major reason why our firm is concerned about its impact on the natural environment
- our firm's environmental efforts can help shape future environmental legislation in our industry
- our industry is faced with strict environmental regulation.

Community stakeholders (adapted from Banerjee et al., 2003)

(1 = 'strongly disagree' and 7 = 'strongly agree")

- our customers feel that environmental protection is a critically important issue facing the world today
- the North American public is very concerned about environmental destruction
- our customers are increasingly demanding environmentally friendly products and services.

Organisational stakeholders (adapted from Banerjee et al., 2003)

(1 = 'strongly disagree' and 7 = 'strongly agree")

- being environmentally conscious can lead to substantial cost advantages for our firm
- our firm has realised significant cost savings by experimenting with ways to improve the environmental quality of our products and processes
- by regularly investing in research and development on cleaner products and processes, our firm can be a leader in the market
- our firm can enter lucrative new markets by adopting environmental strategies
- our firm can increase market share by making our current products more environmentally friendly

- reducing the environmental impact of our firm's activities will lead to a quality improvement in our products and processes.

Top management involvement (adapted from Banerjee et al., 2003)

(1 = 'strongly disagree' and 7 = 'strongly agree')

To what extent do you agree with the following statements related to the success of the new product?

- the top management team in our firm is committed to environmental preservation
- our firm's environmental efforts receive full support from our top management
- our firm's environmental strategies are driven by the top management team.

Environmental marketing strategy (adapted from Banerjee et al., 2003)

(1 = 'strongly disagree' and 7 = 'strongly agree")

To what extent do you agree with the following statements related to the success of the new product?

- we emphasise the environmental aspects of our products and services in our ads
- our marketing strategies for our products and services have been considerably influenced by environmental concerns
- in our firm, product-market decisions are always influenced by environmental concerns.

New product advantage (adapted from Rijsdijk et al., 2011)

(1 = 'strongly disagree' and 7 = 'strongly agree')

To what extent do you agree with the following statements related to the success of the new product?

- the new product provides many benefits to the customer
- the new product offers much value to the customer
- the new product offers many advantages
- the new product is superior to competing products
- the new product is the best of its kind in the market
- the new product is superior in its category.