Green marketing in B2B organizations: An empirical analysis from the natural-resource-based view of the firm

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Structured Abstract [Mandatory]

Purpose: Following the natural-resource-based view of the firm, this paper analyzes the influence of green marketing strategy on the performance of business-to-business organizations. Besides, it explores the role of organizational resources as drivers of proactive environmental management.

Design/methodology/approach: A model based on structural equations with partial least squares analysis is used to test the hypotheses. This model was tested on a sample of 181 industrial organizations.

Findings: Findings confirm that managers indirectly play a key role in the design and development of green marketing strategies through the integration of environmental values into the organizational culture. They also reveal that, while market-oriented practices directly determine economic performance, internally-oriented activities indirectly influence financial results through the improvement of the firm's environmental performance.

Research limitations/implications: This research partially integrates organizational resources as drivers of environmental behavior and do not explore the role of capabilities. The article proposes different implications considering the competitive consequences of green marketing strategy.

Practical implications: The article includes different practical implications about the effect of different environmental practices on different dimensions of organizational performance. It sheds light on the controversial link about environmental proactivity and performance.

Originality/value: This research empirically tests some of the theoretical underpinnings of the natural-resource-based view of the company in an under-researched context like the business-to-business context.

Keywords [Mandatory]: Green Marketing Strategy; Natural-resource-based view; Business-to-Business context; Organizational performance

Article Classification [Mandatory]: Research paper

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1. Introduction

In recent decades, industry has not remained isolated from social and institutional pressures regarding environmental problems that have required managers to improve their firms' environmental performance (Banerjee, 2002). Organizations' support for sustainability issues has arisen due to moral and ethical mandates, legal pressures, legitimacy searching and competitive opportunities (Hart and Milstein, 2003). This has resulted in the environmental transformation of industrial activities, the substitution of obsolete technologies, the development of cleaner goods, and the adoption of environmental positions to align corporate behaviour with market concerns (Aragón-Correa and Sharma, 2003).

Unquestionably, organizational interest in environmental issues has recently received a great deal of attention from researchers, and different special issues on the topic have been published in several of the most salient journals. Despite this attention, some important questions still remain unclear. The debate about the competitive consequences of environmental management is still open, since some studies show a positive link between proactive strategies and performance (Christmann, 2000; Menguc and Ozanne, 2005) and others report that reactive firms obtain higher benefits under certain circumstances (Sarkis and Cordeiro, 2001; Jacobs *et al*., 2010). One of the main explanations for these heterogeneous findings is the lack of solid theoretical foundations, and this is reflected in a great amalgam of studies that include different variables, propose fragmented causal relationships and employ diverse measurement procedures (López *et al*., 2009). Therefore, academics and practitioners are still interested in some normative questions that have been given non-unanimous answers, for instance: does it really pay to be green? What organizational resources favour the implementation of proactive environmental strategies? (Hillman and Kein, 2001; Delmas *et al*., 2011).

Moreover, environmental management has been under-researched in the context of business-to-business (B2B) relationships, since academics have been more interested in exploring how consumer firms, characterized by their high visibility and exposure to stakeholders, have been successful in implementing and communicating environmental practices. In the B2B context, the development of green marketing strategies is becoming essential for building long-term relationships, not only because of buyers' demands for

greener products and services (Sharma *et al*., 2010), but also because of their potential to contribute to the firm's operational and environmental efficiency (Russo and Fouts, 1997). However, to date, few papers have been devoted to analysing how industrial firms develop green marketing strategies, what resources and capabilities affect their implementation, and what the main organizational consequences of integrating green issues into the supply chain are.

In order to contribute to filling such gaps in the literature, this paper aims to analyze the influence of the development of proactive environmental marketing practices on the performance of B2B organizations. To do this, the paper employs Hart's (1995) natural-resource-based view (NRBV) of the company, exploring (i) the role of environmental culture and managerial support for environmental practices as drivers of green marketing strategy (GMS) in the B2B context and (ii) the impact of GMS on firms' competitiveness, specifically studying its influence on financial and environmental performance.

This work is structured as follows. First, we offer a literature review based on Hart's (1995) NRBV of the firm, and explore the conceptualization of GMS. Second, we propose a model that investigates the links between GMS, organizational resources and performance. Third, we present the research design, with emphasis on the data collection methods and measurement of variables. Fourth, the findings are presented based on a partial least squares analysis. Lastly, we discuss the main conclusions, managerial implications and limitations of this study.

2. The NRBV of the firm: the role of GMS

Contrary to the traditional views of strategic management, which consider that organizational strategy should act as a knee-jerk reaction to environmental pressures, Hart (1995) states that one of the most salient determinants for the development of new organizational capabilities comes from the restrictions of the natural environment. Theoretical underpinnings of the NRBV of the firm have their origin in Barney's (1991) resource theory, which sustains that differences in organizational performance are a consequence of the heterogeneity of firms' resources. Resources lead to the development of organizational capabilities that are usually complex, tacit, rare and difficult to copy,

and that eventually influence performance by generating differentiation and cost advantages. The NRBV considers innovative environmental solutions as key elements in the generation of organizational capabilities that require firms to go beyond reactive and end-of-pipe solutions. These capabilities are related to modern and innovative strategies like product stewardship, pollution prevention technologies, and the adoption of an organizational culture based on the principles of sustainable development. Thus, the proactive integration of environmental issues into strategic management seeks to convert potential threats to the natural environment into competitive opportunities for organizations (Sharma *et al*., 2007). Hart's (1995) theoretical arguments have been empirically tested in recent research, and the results suggest that environmental proactivity allows firms to improve their performance and to achieve competitive advantages (Judge and Douglas, 1998; Chow *et al*., 2008; Vachon and Klassen, 2008; Ateş *et al*., 2011).

Following the NRBV, as environmental pressures increase, firms are forced to create new strategies that should translate into competitive advantages (Gladwin, 1993). One of these new strategies, GMS, is related to the degree to which companies adjust their organizational and environmental objectives to improve the satisfaction of their customers' expectations (Menon and Menon, 1997; Banerjee *et al*., 2003). GMS has been seen as a determinant of firms' economic performance and of the generation of organizational capabilities such as new product performance (Baker and Sinkula, 2005). It involves actions aimed at responding to market demands for environmentally designed products and services, and practices related to logistics processes, and to the consideration of green aspects in pricing and communication strategies (Fuller, 1999). However, it cannot be seen as an isolated strategy focused on capturing the attention of greener buyers that aim to purchase environmentally certified goods (Crane, 2000). Rather, it encompasses all proactive, environmentally grounded actions that reveal a desirable corporate behaviour and that require a commitment from the whole organization. Therefore, GMS is seen as a dynamic and flexible organizational strategy that stimulates internal capabilities and focuses on the firm's desire to respond and be sensitive to diverse environmental and social concerns from various stakeholders (Polonsky, 1995).

However, the concept of GMS has also been criticized by academics because of its weak conceptual and theoretical development (Rivera, 2007). One of these criticisms comes from the fact that the marketing literature focuses on business-to-consumer (B2C) markets, where firms are easily recognized by audiences and face stronger social pressures. While the positive competitive consequences of environmental marketing in the B2C sphere are now accepted, research on the integration of environmental practices in the B2B context remains under-explored (Sharma *et al*., 2010). Attention to the marketing-manufacturer interface is also scarce, in terms of a competitive scenario where organizations are responding to environmental pressures by trying to design a greener supply chain that involves suppliers and buyers in the development of sustainable environmental policies (Zhu and Sarkis, 2004).

In this paper, we view GMS as an organizational strategy that encompasses all of the organizational activities that B2B firms carry out in order to satisfy their customers' environmental demands. It therefore involves not only modifications of products and processes to align corporate behaviour to buyers' demands, but also all the decisions aimed at externally communicating an environmentally responsible behaviour towards stakeholders.

3. Proposed model and development of hypotheses

3.1. Managerial support of environmental practices and environmental culture as drivers of GMS

Resources and capabilities have been shown to play a pivotal role within the NRBV. Organizational abilities related to continuous innovations, improving the shared vision of the organizational members, or to the firm's adaptability to stakeholder pressures explain why companies are successful in the implementation of their environmental strategies (Christmann, 2000). But the literature has primarily focused on technological and operations-oriented assets as sources of operational and environmental efficiency, and little research aims to explore the potential of more intangible aspects (Russo and Fouts, 1997). Managers' ethical backgrounds are frequently reflected in their choices, not only as individual consumers, but as decisions makers within their companies (Sharma and Nguan, 1999). Their individual values, ideals, knowledge of

problems, or even lifestyles may, therefore, affect their decisions at work and determine organizational orientation towards the environment (Fryxell and Lo, 2003).

Previous research has widely debated the extent to which decision makers' personal characteristics are transferred into a professional ethic that aims to translate private values into the corporate vision, to achieve corporate excellence and to attain environmental leadership within an industry (Roome, 1992; Gadenne, 2006). On the one hand, some studies report that while managers may consider environmental values within their personal life, they are not good emissaries of the environment if sustainability is not an emergent issue within their industry (Fineman, 1997). On the other hand, several authors see the individual commitment of managers, owners or founders as being directly connected to environmental practices, including green supply chain management. For example, Ramus and Steger (2000) reported that managerial support for environmental protection is positively related to employees' willingness to become involved in eco-initiatives. Menon and Menon (1997) saw managers concerned with sustainability values as the main catalysts of environmental integration. They discussed the power base of the "converts", a term used to refer to managers who are becoming champions of environmental causes and that try to influence other organizational members' views on the environment. If the degree of influence of these converts is high enough, their values, concerns and behaviours will determine other executives' behaviours and influence the firm's commitment towards the environment. However, this influence may be moderated by the level of dominance of the executive's coalition within the organization, and managerial concern for environmental leadership can be hindered if he/she does not belong to a dominant group (Aragón-Correa *et al*., 2004).

One of the consequences of managers' support for environmental principles is their desire to integrate these values into the organizational culture. Banerjee (2002) observes that one dimension of corporate environmental behaviour involves the firm's effort to create an internal climate in which organizational members share a set of values and beliefs related to environmental protection. While GMS refers to the degree of integration of environmental values within the strategic management process and marketing activities, environmental culture encompasses the extent to which organizational members recognize the legitimacy of environmental issues. Rather than

being limited to specific operational and commercial activities, environmental culture is revealed through employees' support for environmental practices, and is frequently codified in mission, vision and procedure statements (Stone *et al*., 2004).

Since it implies the generation and dissemination of environmental information and knowledge across functions, the adoption of organizational environmental culture is associated with the generation of central capabilities for the successful development of environmental practices. Such information is a key element for the generation of organizational learning that allows firms to construct impactful ideas and to implement management practices efficiently. Knowledge, because of its intangible nature, is a valuable organizational resource that acts as a catalyst in the implementation of environmental policy within strategic and operational areas (Marcus and Geffen, 1998). Moreover, organizational culture is related to a shared-vision capability, because it favours employees' learning, creativity and support for eco-initiatives (Ramus and Steger, 2000), and enhances cross-functional integration capacity, favouring the coordination, communication and involvement of different areas and departments (Song and Montoya-Weiss, 2001). Since knowledge is a collective rather than an individual process, devoting resources to creating and maintaining an organizational climate that encourages environmental protection can facilitate the implementation of complex environmental transformations. For example, the existence of green cross-functional teams can facilitate internal dialogue not only between departments within the organization, but also other organizations in the supply chain that contribute to the identification of environmental inefficiencies (Denison *et al*., 1996; Denton, 1999).

From these arguments we expect that managerial support and environmental culture, as valuable resources, affect the implementation of activities related to GMS in B2B firms. Companies with a stronger environmental culture and with a managerial team that supports green causes will accumulate abilities related to environmental protection that will allow them to more efficiently implement environmental issues at an operational level. In addition, it is expected that managerial interest in sustainability issues will be reflected in an effort to create an organizational climate oriented towards sustainability. Thus, it is hypothesized that:

H1) Managerial support for environmental protection positively affects the firm's development of GMS in the B2B context.

H2) Environmental culture positively affects the firm's development of GMS in the B2B context.

H3) Managerial support for environmental protection positively affects environmental culture in the B2B context.

3.2. The influence of GMS on organizational performance

Numerous studies have previously analysed the relationship between the development of environmental strategies and organizational performance. For most organisations, aligning sustainability issues with shareholder value creation is still a challenge, and some see these as incompatible aims (Hart and Milstein, 2003). Obviously, sustainability requires firms to expand their economic responsibilities to social and environmental areas, and to devote resources to interacting with secondary stakeholders such as non-governmental organizations, environmental groups, etc. Thus, researchers and practitioners have been interested in similar questions, for instance: in a global and capitalist economy where organizations face important economic pressures, does it pay to become sustainable? Is expanding responsibilities to social and environmental areas in conflict with shareholder-value creation and capital market demands? (Hillman and Keim, 2001). Empirical research and theoretical developments have not led to unanimous conclusions about the link between sustainability and profit maximization (Freedman and Jaggi, 1982; Karagozoglu and Lindell, 2000; Mathur and Mathur, 2000), mainly because of the scarcity of theoretical foundations (López *et al*., 2009). This lack of theoretical underpinnings is reflected in the heterogeneous employment of different variables to conceptualize and measure environmental management and its consequences. For example, previous studies have seen environmental performance as a proxy measure of the firm's commitment towards the environment, while recent studies argue that environmental behaviour and performance are closely related and interdependent, but are different constructs (Zhu and Sarkis, 2004).

Environmental performance is the most salient outcome of environmental management (Klassen and Mclaughlin, 1996). Previous literature has shown how proactive practices typically favour the minimization of pollution emissions and, thus, seek to improve environmental performance indicators (Hart and Ahuja, 1996; Melnyk *et al*., 2003). However, the impact of environmental management on environmental performance varies depending on the nature of the technical and organizational activities. Most traditional and reactive measures, which are related to end-of-process solutions, fail to have any real impact on improving environmental performance since they are oriented towards reducing pollution emissions from the moment they are released into the environment (e.g. installation of filters on pipes) (Aragón-Correa, 1998). On the other hand, innovative proactive practices aim to redesign or to develop new processes, products and technologies that allow organizations to eliminate environmental inefficiencies before they are generated. These methods do not focus on repairing damage that has already been done, but rather are oriented towards redesigning organizational practices and operations in order to reduce waste and consumption, and to prevent the excessive generation of pollutants (Sharma and Vredenburg, 1998). They are usually a consequence of self-organizational initiative and responsibility towards the environment and society, and not a knee-jerk reaction to social or legal pressures. This pollution prevention approach requires firms to undertake complex modifications of their technologies, products and processes (e.g. the implementation of integral management processes or reverse logistics), but its impact on environmental performance is stronger than that of reactive practices (Shrivastava, 1995).

The development and implementation of proactive environmental strategies requires firms to identify all the environmental impacts of their organizational, productive and commercial activities. In this process, firms must devote technical and financial resources and time to identifying environmental risks that will have a material impact on their financial performance (Miller and Cardinal, 1994). In addition, environmental investments do not always have support from the market, and buyers frequently reject environmental products with higher prices or perceive them as being inferior in terms of quality (Karagozoglu and Lindell, 2000). Contrary to these views, some academics see proactive environmental strategies as a source of cost and differentiation advantage

(Porter and van der Linde, 1995). Identifying and preventing environmental risks also allows firms to find new ways to cut operational costs, reduce consumption, re-use products and materials, or differentiate their image from that of their competitors (Ambec and Lanoie, 2008). Opportunities to reduce costs from greener practices mainly come from the introduction of operational modifications that allow companies to reduce consumption of supplies, substitute raw materials with recycled and cheaper alternatives, or recycle or re-utilize components that were previously discarded (Vachon and Klassen, 2008). Moreover, the simplification of processes and the avoidance of economic fines and sanctions contribute to reducing costs and avoiding poor environmental performance (Vastag *et al*., 1996).

Focusing on differentiation advantages, GMS is related to sales growth (Baker and Sinkula, 2005), new product success (Pujari *et al*., 2003) and the capability of charging higher prices for environmental products (Stead and Stead, 1995). In the B2B context, it has been observed that large companies can become more credible by emphasizing their environmental activities to their organizational customers (Drumwright, 1994). Initiatives related to environmental certifications, eco-labelling or eco-design may open new market opportunities for environmentally-oriented companies generating first-to-market-advantages (Bellas and Nentl, 2007). It is also argued that organizational buyers prefer to establish close working relationships or formal partnerships with environmentally-certificated sellers (Klassen and Johnson, 2004).

The optimization of the firm's environmental performance may also exert a positive impact on financial indicators. As highlighted above, environmentally proactive companies implement activities that have an immediate impact on environmental performance and allow them to reduce exploitation and liability costs, and to benefit from pioneer advantages (López *et al*., 2009). Apart from a material impact on consumption and waste management, these practices also influence stakeholders' perceptions in such a way that the diffusion of environmental performance information opens access to new market segments, institutional financial support, and favourable evaluations from stockholders (Hamilton, 1995). Indeed, some studies report that improving environmental performance indicators allows companies to increase their value in the capital markets (Konar and Cohen, 2001). Prior research focusing on analyzing social communications

also suggests that organizations can benefit from publishing social and environmental reports. Richardson and Welker (2001) found that financial markets' reactions to social disclosure were different from reactions to financial disclosure. However, the existence of such a positive link is determined by the nature of the social activity reported. For instance, Godfrey *et al*. (2009) found that reporting about social initiatives aimed at a secondary stakeholder or society at large provides an "insurance-like" benefit. On the contrary, announcements about social activities that involve technical modifications yield no such benefits. Similarly, financial institutions typically perceive higher risks in investing in firms with poor environmental performance, and usually demand a higher risk premium from these companies or directly deny them credit (Henriques and Sadorsky, 1999). Consequently, it is expected that GMS will entail internal improvements in the organizational processes that will allow companies to reduce environmental damage and, eventually, to increase profitability. In addition, the optimization of a firm's environmental performance will lead it to achieve a superior performance overall, by reducing impacts and consumptions and by enhancing key stakeholders' perceptions of the company. Thus, it is hypothesised that:

H4) GMS positively influences environmental performance in the B2B context.

H5) GMS positively influences economic performance in the B2B context.

H6) Environmental performance positively influences economic performance in the B2B context.

Figure 1 shows the theoretical model and the hypotheses underlying it. It proposes environmental culture and managers' support for environmental practices as drivers of GMS. Moreover, it explores whether firms that develop proactive environmental initiatives attain significantly better economic and financial performance in the B2B context.

Figure 1 about here

4. Method

4.1. Sample and data collection

Data was obtained from a survey mailed to 2,098 industrial organizations' environmental managers operating in a European country. This target population was extracted from a purchased database and covered firms operating in various industrial sectors, and with a minimum of 150 employees. The choice of the target population was made on the basis of: its importance for the economy of the country; the size of the organization, because larger firms tend to be more aware of their environmental impacts; and the broad range of environmental practices and situations that companies pertaining to different sectors are involved in. The most relevant sectors within this population were food, textiles, wood and paper, non-mineral, chemical, machinery, metallurgy, electronics, furniture, automobiles and other organizations. In order to improve the response rate, managers were given the option of receiving a report with the main conclusions of the study, once it had been completed. One month after the first mailing, a reminder was sent to the organizations' environmental managers. Some 361 valid questionnaires were received, giving a response rate of 17.20%. Of the 361 questionnaires, 181 were returned by firms that exclusively operated in B2B contexts, and 180 were from organizations involved in business-to-consumer, business-to-retailer, or mixed practices. T-tests revealed no differences between B2B and B2C organizations in terms of the variables studied. However, when testing these differences for individual items, B2C companies were more intensively implementing certain activities related to environmental communications and positioning. This can be explained by the high levels of visibility of B2C organizations, who find it desirable to implement these measures to gain social legitimacy (Bowen, 2000). Almost 71% of the respondents reported being environmental managers or deputies, and the remainder were general managers or persons in charge of departments such as marketing, engineering or research and development. T-tests revealed no differences between the environmental managers' responses and other managers'. Non-response bias was analyzed following Armstrong and Overton's procedure (1977), and revealed no differences between early and later respondents. In addition, the common method bias was examined using Harman's one-factor test (Podsakoff and Organ, 1986). All the variables (excluding environmental

performance, which was conceived as a formative construct) were entered into an exploratory factor analysis. The results revealed that no single factor emerged from this analysis, and that there was no single factor which could account for the majority of the variance, thus suggesting that common method bias was not a major problem in this research.

4.2. Measurement of variables

The variables in the study were measured through different scales elaborated as a result of an exhaustive literature review (Table 1). However, to measure GMS we designed a novel scale based on both the literature review and on a qualitative approach that consisted of the development of in-depth interviews with seven managers working within the industrial sector. These interviews were semi-structured and their duration ranged between 60 and 90 minutes. The interviews were audio recorded, transcribed and analyzed using Nudist-Nvivo software. The data was supplemented with additional information in the form of sustainability reporting, advertising and communications material, etc. Coherently with current conceptualizations of GMS, the final scale included a plethora of activities that help firms to attain their environmental, economic and marketing objectives (Table 1). It consisted of 14 items that managers had to evaluate in terms of the degree of implementation of different activities within their organizations (1= nil intensity; 5= high intensity).

Table 1. Measurement of variables

Variable	*Items*	
Managerial Support for Environmental Practices Banerjee *et al*. (2003)	MSEP1	The top management team in our firm is committed to environmental preservation
	MSEP2	Our firm's environmental efforts receive full support from our top management.
	MSEP3	Our firm's environmental strategies are driven by the top management team.
Environmental Culture Banerjee (2002); Banerjee *et al*. (2003)	EC1	Environmental issues are very relevant to the major function of our firm
	EC2	At our firm, we make a concerted effort to make every employee understand the importance of environmental preservation
	EC3	We try to promote environmental preservation as a major goal across all departments
	EC4	Our firm has a clear policy statement urging environmental awareness in every area of operations
	EC5	Environmental preservation is a high priority activity in our firm
	EC6	Preserving the environment is a central corporate value in our firm
Green Marketing Strategy Ad-hoc scale based on different authors and a qualitative approach	GMS1	Use environmental considerations in product design
	GMS2	Use ecological and clean materials in packaging
	GMS3	Develop market research to detect green needs in the market
	GMS4	Launch green-positioned brands onto the market
	GMS5	Use recycled or re-usable containers in logistics
	GMS6	Use recycled or re-usable materials in our products
	GMS7	Consider environmental issues in distribution and reverse logistics systems
	GMS8	Select cleaner transportation systems
	GMS9	Provide information about environmental management to consumers and institutions
	GMS10	Form green alliances or collaboration agreements with governmental agencies
	GMS11	Employ green arguments in advertising and promotions
	GMS12	Use eco-labels or environmental certification
	GMS13	Provide sponsorship or patronage for environmental groups or events
	GMS14	Consider environmental aspects within price policy
Economic Performance Sharma and Vredenburg, 1998; González-Benito and González-Benito, 2005b, etc.	ECP1	Firm's profitability
	ECP2	Sales growth
	ECP3	Firm's economic results
	ECP4	Profit before tax
	ECP5	Market share
Environmental Performance Klassen and McLaughlin (1996); López *et al*., 2009, etc.	ENP1	Generation of atmospheric emissions
	ENP2	Dumping and toxic waste
	ENP3	Transportation systems
	ENP4	Territory occupation
	ENP5	Biodiversity
	ENP6	Noise
	ENP7	Impact on landscape and ecosystems
	ENP8	Renewable resources consumption
	ENP9	Non-renewable resources consumption

To measure top management support for environmental practices and organizational environmental culture, we employed the scales proposed in Banerjee's (2002) study, and subsequently validated in Banerjee *et al*. (2003). These five-point Likert scales collected different propositions where managers had to indicate their degree of agreement (1= total disagreement; 5= complete agreement). Managers' support for environmental practices included three items involving aspects relating to the degree of executives' commitment to environmental preservation, managerial team support for the firm's environmental progress, and their roles as drivers and coordinators of such policies. The firm's environmental culture scale referred to the degree of integration of the environmental values into the organizational culture. It collected six items that assessed facets relating to the efforts of the organization towards inculcating environmental values in their employees, establishing a formal environmental policy, and internally communicating the importance of environmental protection.

Since executives are usually less reluctant to offer subjective information than to provide objective data involving their organizations' performance, this aspect was also measured by means of a subjective procedure. To capture economic performance, a five-item scale adapted from other studies (Sharma and Vredenburg, 1998; González-Benito and González-Benito, 2005b) was designed. It included items involving pecuniary indicators of the firm's performance, such as profitability, sales growth, overall results, profit before tax and market share. The answers were on a five-point Likert scale where managers had to indicate the position of their company by comparing it with the performance of their main competitors (1= compared to our competitors, our position is much worse; 5= compared to our competitors, our position is much better). The environmental performance scale covered nine items which the environmental managers had to evaluate using a five-point Likert scale (1= nil impact; 5= high impact), according to the impact on their organizations of different facets relating to atmospheric emissions, waste, land occupation, biodiversity, consumption of resources, etc. This conception of environmental performance is coherent with Klassen and McLaughlin (1996), who view it as a measurement of the impact of organizational activity on the environment. It should be noted that, while the other scales can be considered reflective because the concept they measure antecedes the indicators, the environmental performance scale is essentially

formative. The different items that compose the different organizational impacts on the environment build the construct and may have a relative importance (Chin, 1998a). For example, although one organization may exert a high impact on the landscape and ecosystems, its emphasis on the consumption of renewable resources does not necessarily have to be high. Therefore, indicators do not necessarily have to be correlated as the construct is reflective. Considering that the sample includes organizations from different industries with different operations, processes and technologies, this is even clearer, since the industries will have dissimilar patterns of environmental impact (one indicator can have a high weight in one industry and have minor relevance in others). Therefore, it is the combination of these variant measures (different indicators of environmental performance) which defines the construct of environmental performance (Petter *et al*., 2007). Consequently, for this scale, each indicator captures different aspects of environmental performance, and as a result, the construct should be interpreted as formative.

5. Results analysis

The data obtained was analyzed using the partial least squares (PLS) statistical regression method (Grey and Meister, 2004). The reason for selecting this technique lies in its advantages over covariance-based methods, since PLS facilitates the simultaneous utilization of formative and reflective scales (Chin 1998b; Haenlein and Kaplan, 2004), and new and previously validated measurement instruments (Holland, 1999). In addition, it is less sensitive to sample size compared to covariance-based methods (Chin, 1998a).

The PLS method allows researchers to simultaneously assess measurement and structural models. Before the development of the structural model, the initial psychometric properties of the reflective scales were examined (Bontis, 1998) through an exploratory factor analysis. Cronbach's alpha for all the scales, as can be seen in Tables 2 and 3, were above the critical threshold of 0.7, which guarantees their internal consistency. At this stage, items ECP2 and ECP5 were deleted because of their low correlation with the rest of the scale.

Table 2. Exploratory factor analysis and reliability of managerial support for environmental practices, environmental culture and economic performance scales

Managerial Support for Environmental Practices MSEP		**Environmental Culture** EC	
ITEMS	**Factor loading**	**ITEMS**	**Factor loading**
MSEP1	0.94	EC1	0.84
MSEP2	0.93	EC2	0.86
MSEP3	0.90	EC3	0.88
Variance explained: 85.8%, Alpha = 0.91		EC4	0.86
Economic Performance ECP		EC5	0.91
ITEMS	**Factor loading**	EC6	0.86
ECP1	0.89		
ECP3	0.94		
ECP4	0.90		
Variance explained: 83.5%, Alpha = 0.90		Variance explained: 75.3%, Alpha = 0.93	

Exploratory factor analysis with Varimax rotation revealed the unidimensionality of managerial support, environmental culture and economic performance scales. Factor analysis for the GMS scale revealed the existence of two different dimensions that explained 62.12% of the variance (Table 3). The first dimension covers activities that involve complex environmental transformations of products and processes that have a major potential for reducing environmental impact. The second encompasses activities that organizations carry out with the purpose of improving their relationships with external stakeholders such as society, their clients or the community. Activities included in this factor do not require firms to incorporate complex changes into their processes, but can be seen as tactical decisions that allow them to project an image of environmental responsibility in the marketplace. The first dimension was named process-oriented GMS (POGMS), and the second was called market-oriented GMS (MOGMS). It should be noted that this multi-dimensional solution is consistent with previous research. For example, Menon and Menon (1997) theoretically conceived environmental marketing as a multidimensional construct according to the strategic nature of environmental decisions. Strategic and quasi-strategic dimensions referred to product and process transformation (implementation of pollution prevention technologies, eco-design, etc.), in which the main motivation is to improve environmental performance and require larger investments and cooperation from other members of the supply chain. More tactical

levels include reversible and short-term focus decisions (green advertising, environmental positioning, communications, etc.), the implementation of which is frequently the responsibility of the marketing department. In this line, Rivera (2007) also distinguished between operational and commercial-market dimensions of environmental marketing strategy. González-Benito (2005a; 2005b) also defended the idea that the environmental proactivity construct is comprised of different dimensions that are affected differently by diverse economic, market, ethical and social motivations; and which influence the different dimensions of corporate performance, depending on the nature of each dimension.

Table 3. Exploratory factor analysis and reliability of the GMS scale

ITEMS	**Factor 1 Process-Oriented** POGMS	**Factor 2 Market-Oriented** MOGMS
GMS1	**0.87**	0.18
GMS2	**0.83**	0.16
GMS3	0.36	**0.68**
GMS4	0.36	**0.64**
GMS5	**0.81**	0.07
GMS6	**0.83**	0.20
GMS7	**0.82**	0.30
GMS8	0.39	**0.70**
GMS9	0.17	**0.71**
GMS10	0.14	**0.70**
GMS11	0.02	**0.61**
GMS12	0.13	**0.73**
GMS13	0.12	**0.73**
GMS14	0.19	**0.67**
Total explained variance: 68.33% POGMS Alpha = 0.89, MOGMS Alpha = 0.87		

Having explored the validity and reliability of the scales, the structural model was validated using SmartPLS 2.0 (Ringle *et al*., 2005) through a bootstrapping procedure of 500 subsamples. In this process, to guarantee convergent validity, indicators GMS4 and GMS11 were excluded because their factorial loadings were inferior to 0.6. The results obtained from the model's validation process are shown in Table 4. Once again, the reliability indicators show acceptable levels, and their reliability and average variance extracted (AVE) indicators exceed the minimum thresholds. It is important to note that,

for the formative construct, the weights indicate the relative importance of each indicator in the dependence formation. Formative indicators of the environmental performance construct do not have to be correlated and, consequently, traditional reliability analyses cannot be applied in this case. In addition, following Bollen and Lenox (1991), items with non-significant weights were not discarded, in order to preserve content validity. SPSS also confirmed the inexistence of multicollinearity for this construct, since the VIF value was below 3.3 (Diamantopoulos and Siguaw, 2006).

Table 4. Reliability and convergent validity of the structural model

	Item	Loading	Weight	T-value	Cronbach's Alpha	Compose Reliability	Extracted Variance
MSEP	MSEP1 MSEP2 MSEP3	0.94*** 0.93*** 0.90***	n/a	100.15 75.24 44.77	0.92	0.94	0.85
EC	EC1 EC2 EC3 EC4 EC5 EC6	0.84*** 0.86*** 0.88*** 0.86*** 0.91*** 0.86***	n/a	38.54 34.79 48.47 39.57 69.99 37.57	0.93	0.95	0.75
POGMS	GMS1 GMS2 GMS5 GMS6 GMS7	0.87*** 0.84*** 0.82*** 0.83*** 0.82***	n/a	43.60 26.89 25.53 26.67 26.02	0.89	0.91	0.70
MOGMS	GMS3 GMS8 GMS9 GMS10 GMS12 GMS13 GMS14	0.72*** 0.70*** 0.74*** 0.73*** 0.69*** 0.73*** 0.72***	n/a	16.22 14.72 18.75 18.25 15.21 18.78 19.74	0.87	0.89	0.52
ENP	ENP1 ENP2 ENP3 ENP4 ENP5 ENP6 ENP7 ENP8 ENP9	n/a	0.51*** 0.32** 0.14 0.14 0.35** 0.26** 0.18* 0.27* 0.38**	2.80 2.42 1.04 1.00 2.42 2.06 1.67 1.71 2.46	n/a	n/a	n/a
ECP	ECP1 ECP3 ECP4	0.89*** 0.94*** 0.91***	n/a	32.82 81.81 51.57	0.91	0.94	0.83

Note 1: *** p<0.01; ** p<0.05; * p<0.10.
Note 2: see Tables 1, 2 and 3.

To assess discriminant validity, we compared every construct AVE indicator with the correlations between such variables (Fornell and Larcker, 1981). As can be seen in Table 5, the model does not present discriminant validity problems since the squared roots of the AVE indicators are above the correlation values.

Table 5. Discriminant validity

	MSEP	EC	POGMS	MOGMS	ENP	ECP
MSEP	**0.92**					
EC	0.71	**0.86**				
POGMS	0.26	0.55	**0.83**			
MOGMS	0.36	0.63	0.12	**0.72**		
ENP	0.20	0.25	0.34	0.29	**n/a**	
ECP	0.35	0.28	0.20	0.43	0.33	**0.91**

Note 1: figures on the diagonal indicate the square root of the AVE; figures not on the diagonal show estimated correlations.
Note 2: see Tables 1, 2 and 3.

Having validated the measurement model, the next step consisted of the evaluation of the structural model through a bootstrapping procedure. The predictive capacity of this model was confirmed since the R^2 for all the predicted variables in the model are above the minimum threshold of 0.1 (Falk and Miller, 1992), which allows us to evaluate the significance of the structural parameters (Table 6). It should be highlighted that, at this stage, the two main factors obtained in the exploratory factor analysis for the GMS construct have been considered as independent factors. This will allow us to independently analyze the relationships between variables and, therefore, to obtain richer and more disaggregated information about the structural parameters that constitute the proposed model. As a consequence, hypotheses 1, 2, 4 and 5, which involve the direct antecedents and consequences of the GMS, are built as double hypotheses where two relationships will be examined.

Table 6. Structural model

Hypothesis		Path	Standardized β	Bootstrap T-value	Hypothesis Verification
H1	**MSEP→GMS**	MSEP→POGMS	0.064	0.83	*Rejected*
		MSEP→MOGMS	0.077	0.67	
H2	**EC → GMS**	EC→POGMS	0.501	5.78***	*Supported*
		EC→MOGMS	0.632	9.57***	
H3	**MSEP → EC**	MSEP → EC	0.679	15.63***	*Supported*
H4	**GMS→ENP**	POGMS→ENP	0.295	2.26**	*Partially Supported*
		MOEMS→ENP	0.022	0.17	
H5	**GMS→ECP**	POGMS→ECP	0.012	0.15	*Partially Supported*
		MOGMS→ECP	0.291	3.33***	
H6	**ENP→ECP**	ENP→ECP	0.248	2.18**	*Supported*

Note 1: R^2 (POGM) = 0.21, R^2 (MOGM) = 0.35; R^2 (EC) = 0.46; R^2 (ENP) = 0.11, R^2 (ECP) = 0.16.
Note 2: see Tables 1, 2 and 3.

On the basis of the results of the structural model, hypothesis 1 cannot be supported. The influence of managerial support for environmental practices on the degree of implementation of GMS is positive, but not significant. However, firms with a strong environmental culture are also more intensive in terms of their development of GMS at process and market levels, confirming hypothesis 2. Moreover, as expected, managerial support for environmental issues favours the creation of a stronger environmental culture, thus supporting hypothesis 3. These findings suggest that top executives are not directly involved in the design and implementation of GMS, but their commitment to environmental protection is materialized in their effort to create an internal environmentally responsible climate. The findings also show that operationally focused GMS positively influences environmental performance. However, market-oriented actions do not have a significant impact on this variable. This result is not surprising, since market-oriented practices involve decisions relating to the firm's desire to project an image of environmental responsibility, but do not imply the tangible modification of products and processes. This finding leads us to partially support hypothesis 4. Coherently with the nature of the dimensions of GMS, only market-oriented practices positively influence economic performance. Developing environmental activities that differentiate the company from its competitors may allow it to increase sales or to impose higher prices on their products. However, the influence of process-oriented practices on economic performance is not direct, but rather is indirect through economic performance. These activities allow companies to improve their environmental performance by

reducing pollutants and consumption or by managing resources more rationally, which, in turn, will have a positive influence on economic results. Figure 2 summarizes the significant paths in the structural model.

Figure 2 about here

6. Conclusions, implications for management and limitations of the study

The purpose of this research was to empirically test the effect of GMS on firm performance and the extent to which this strategy is driven by intrinsic organizational resources such as managerial support for environmental practices and environmental culture. Thus, this study contributes to the literature by explicitly testing the path process between different relevant variables that reinforce the NRBV of the company, and clarifying how organizational resources determine organizational commitment to the environment.

The findings suggest that GMS in the B2B context encompasses two different dimensions which involve activities that radically differ in their orientation. On the one hand, process-oriented activities refer to environmental actions, including transformations of products and internal processes, that are aimed to reduce environmental impact. Decisions relating to eco-design, the substitution of materials or the implementation of green logistics are environmental decisions that require substantial internal modifications which allow industrial companies to improve their environmental performance. On the other hand, market-oriented activities are taken with the purpose of externally projecting a greater environmental commitment. This dimension does not require complex organizational changes, but may be useful in capturing the attention of industrial buyers that seek to establish relationships with environmentally responsible suppliers.

In relation to organizational resources, the findings show that firms with a strong environmental culture tend to integrate environmental issues into their marketing strategies more intensively. This occurs because creating an environmental culture means generating and disseminating information across levels and departments to allow decision makers to develop tacit and valuable knowledge around environmental strategies. Companies that allocate resources to creating an internal climate oriented towards

sustainability issues, that promote employee participation in eco-initiatives, or that simply codify this commitment into formal policies and norms, will more efficiently transfer environmental values into specific strategies and actions. Therefore, prior to the development of an environmental transformation, firms need to devote resources to developing their organizational capabilities, in order to create new knowledge that is relevant for different organizational areas (Marcus and Geffen; 1998). This is especially significant in the industrial context, where technological, environmental, marketing, social and managerial issues are frequently closely related. Thus, the existence of cross-functional teams involved in the design and development of proactive environmental initiatives can benefit companies by improving coordination and integration, and favouring innovation (Denison *et al*., 1996). Indeed, Denton (1999) highlights that employee involvement is essential in improving pollution control, and that the existence of cross-functional green teams facilitates cooperation and knowledge sharing in order to solve environmental inefficiencies. However, developing an environmental culture is not an easy task, since employees often have little knowledge of environmental issues in their personal life, or in their organizations. As discussed by Macnaghten (2003, p. 80), institutional and organizational initiatives should begin from "*people's concern for themselves, their families and localities as points of connection for the wider, 'global' environmental issues*". In addition, firms should consider that knowledge creation can result from interactions with internal members, but also arise as a result of cooperation with external stakeholders (Poncelet, 2004). As recently argued by Delmas *et al*. (2011), firms that have previously established research partnerships will be more efficient in the building of new capabilities relating to emerging environmental technologies.

However, managerial support for environmental practices does not directly determine the development of process- and market-oriented GMS, though it does determine organizational environmental culture. This result could indicate that environmental managers see top managers as not being directly involved in the design and development of more operational environmental practices. This does not mean that executives' environmental values and visions are not reflected in their professional life, however. As explained by Wycherley (1999), environmental activities reflect a "way of life", and top managers' and founders' visions about the environment are filtered through

the whole organization. However, certain operational and environmentally friendly purchasing practices are the consequence of middle-management support (Carter *et al*., 1998; Walker *et al*., 2008). Thus, the influence of top management on environmental culture indicates that managerial involvement in environmental protection practices is at the corporate level, and that middle and lower managers are responsible for implementing specific tactics and strategic actions.

According to our findings, process-oriented GMS does not directly determine firms' economic results, but rather is seen indirectly through environmental performance. Incorporating green aspects into product design or into production and logistics processes may initially bring about complex modifications and higher costs. However, the results indicate that developing proactive initiatives at this level pays, and that it drives industrial firms not only to reduce environmental impacts, but also to achieve superior performance. Environmental operational modifications require firms to reduce waste and emissions and to substitute pollutants, which positively determines environmental performance but, eventually, contributes to cost reductions, operational improvements and organizational efficiency. On the contrary, because of its commercial and externally oriented nature, market-oriented practices do not influence environmental performance, but do directly determine economic indicators. Implementing actions to communicate the firm's environmental responsibility may bring about opportunities to increase sales and revenues and gain market share. As previously noted, industrial buyers frequently give priority to suppliers that meet certain environmental standards. However, environmental certifications have limited impact with regards to differentiating firms, since they have become widespread standards that the great majority of companies have adopted. Environmental marketing actions may allow industrial firms to go further and to inform and communicate their green practices more efficiently, which, in turn, will differentiate them from their competitors.

In any case, market-oriented practices should not be seen as a business panacea to project a desirable image in a scenario where consumer and financial markets penalize undesirable behaviours. Understanding MOGMS as a set of isolated activities that can occasionally be employed to dispel a "bad reputation" can be interpreted by stakeholders as a "legitimacy-search" tactic, rather than a truly environmental shift. This raises

relevant questions for academics and practitioners: what is the real motivation behind certain market-oriented practices? Is environmental positioning and image a consequence of a real internal transformation, or is it merely a short-term market-motivated decision? How can organizations differentiate themselves through environmental or social positioning? Are organizations sincere and credible when disclosing environmental information, or are they just trying to provide candid information about good environmental news? In industrial markets, where the adoption of ecological positioning seems less attractive than in B2C contexts, adherence to an environmental norm is a prerequisite to accessing certain clients that demand their suppliers to be certified. However, being certified does not imply that environmental management is optimal, and when facing certain requirements, an organization may encounter obstacles in meeting such demands (e.g. changes in product design, problems related to the use of recoverable packaging or containers, etc.). Yet few companies seem to understand that adopting a proactive, environmentally oriented philosophy requires them to support their information and communicational practices with tangible changes to products and processes, such as packaging modifications, replacement of polluting materials, renewable energy use, etc. Without these changes, companies can be seen to be using false "pseudo-green marketing" that will eventually generate distrust among consumers and adversely affect corporate reputation. Thus, for small businesses, being environmentally certified is a necessary prerequisite for accessing certain clients, but is not a strategy for differentiating themselves in industrial markets. However, the adoption of more proactive positions can allow companies to go a step further, in terms of adapting their strategies towards the needs of the value chain, increasing the flexibility of their processes and enhancing their innovativeness and gaining the trust of customers.

Despite the evidence in these findings that there exist potential benefits associated with GMS, managers of B2B organizations should be aware that the "greening" of the supply chain requires firms to implement more integrated approaches. These include intra- and inter-firm diffusion of best environmental practices, environmental technology transfers, organizational cooperation and partnership, and environmental performance measurement (Angell and Klassen, 1999). As noted above, once again, knowledge seems to play a pivotal role in the integration of green values within the supply chain.

Developing these integrated approaches requires organizational capabilities that are embedded within the entire organization, since it requires involvement of subsidiaries and suppliers, employee training, and internal and external knowledge-sharing or regular auditing of suppliers' and retailers' performance (Andersen and Skjoett-Larsen, 2009). Certainly, this can provide obvious competitive and environmental opportunities for B2B companies in terms of cost and waste reduction, internal and external stakeholders' identification, or corporate reputation. However, the emergence of economic benefits may be delayed, since the implementation of an environmental transformation within the supply chain requires not only large investment, but also profound and complex changes at different levels and in different organizational areas.

Finally, some limitations and future research lines should be highlighted. First, this study employs subjective measures of environmental practices, and of their consequences for performance, which may suffer from social desirability bias. Furthermore, our data is cross-sectional, so we cannot observe the dynamic consequences of environmental decisions. Reinforcing these findings with objective measures and developing longitudinal studies should represent priorities in this type of investigation. Second, it should be pointed out that the respondents included environmental managers who were asked about their perceptions of top management's concern with sustainability issues. As has been shown, executives' interests in these issues are reflected in cultural aspects, more than in specific operational and market-oriented actions. It would be interesting to explore how the values of environmental managers are reflected in the firm's environmental decisions, and whether their belongingness to dominant coalitions within the organization determine these practices. Third, the paper is constrained to analyzing the role of environmental culture and corporate commitment as drivers of GMS. At this point, case studies and qualitative approaches should be developed in the B2B context in order to identify critical resources in the implementation of proactive environmental initiatives, and complementary capabilities that are consequences and facilitators of environmental decision making. For example, it is important to analyze how learning orientation manifestations (shared vision, intra-organizational knowledge sharing, open-mindedness, etc.) affect environmental innovation capability, and how they contribute to creating an environmental culture not only within the organization, but also

within the supply chain. In this context, current approaches must be expanded by considering that organizational capabilities can be generated not just inside the organization, but also externally as a result of collaboration and cooperation with external stakeholders (e.g. by establishing partnerships, technologies and knowledge transfer, etc.). Little is known about how green teams catalyze changes in other levels of the supply chain to demonstrate best practices and its benefits, and involve members in the search of more efficient solutions. Knowledge creation and organizational learning should also be examined as a result of external collaboration, a process where green teams can perform a pivotal role.

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Figure 1. Proposed model and hypotheses

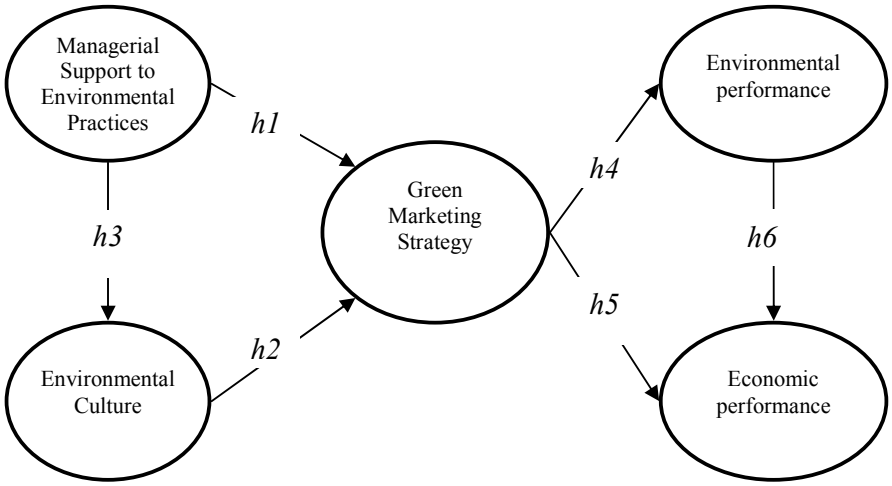
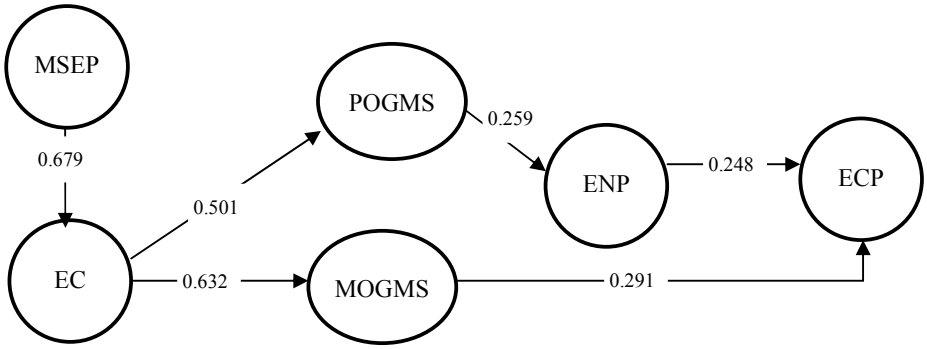


Figure 2. Results of the structural model



Note: see tables 1, 2 and 3