

Environmental strategy and performance in small firms: A resource-based perspective

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Abstract

In spite of the widespread recognition of the important roles that small and medium sized enterprises (SMEs) play in most economies, limited research has focused on their impacts on the natural environment and the strategies such enterprises adopt to reduce these impacts. It is usually assumed that SMEs lack the resources to implement proactive environmental strategies that go beyond minimum regulatory compliance. In this study of 108 SMEs in the automotive repair sector in Southern Spain, we found that SMEs undertake a range of environmental strategies from reactive regulatory compliance to proactive pollution prevention and environmental leadership. These strategies are associated with three organizational capabilities: shared vision, stakeholder management, and strategic proactivity, hypothesized based on the unique strategic characteristics of SMEs—shorter lines of communication and closer interaction within the SMEs, the presence of a founder's vision, flexibility in managing external relationships, and an entrepreneurial orientation. We also found that firms with the most proactive practices exhibited a significantly positive financial performance.

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1. Introduction

Global environmental problems such as climate change that require urgent solutions have increased societal awareness about the impact of business operations on the natural environment. Scholars have expressed concern about the difficulty of achieving real environmental improvements if the current social paradigms and normative frameworks that guide business decision-making remain unaltered (e.g. Newton and Harte, 1997). Another group of scholars have highlighted that managers tend to

frame the natural environment more as a strategic or subjective issue than as a normative or ethical one (Aragón-Correa et al., 2004; Banerjee, 2001; Cordano and Frieze, 2000; Sharma, 2000), and therefore advocate a strategic approach to promote change from within the organization (e.g. Clemens, 2001). While we recognize the complementarity and importance of both perspectives, in this study we adopt a strategic focus in an under-researched context: small and medium-sized enterprises (SMEs).

Research on organizations and the natural environment from the resource-based view of the firm (Barney, 1991; Rumelt, 1984; Wernerfelt, 1984) has shown that proactive corporate environmental strategies that go beyond regulatory compliance have a positive effect on corporate financial performance when mediated by valuable organizational capabilities (e.g. Christmann, 2000; Hart, 1995; Marcus and Geffen, 1998; Russo and Fouts, 1997; Sharma

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and Vredenburg, 1998; Wagner, 2005). Studies have also usually found that firm size has a significant effect on the degree of proactiveness, with larger organizations being more likely to adopt proactive environmental practices (e.g. Aragón-Correa, 1998; Buysse and Verbeke, 2003; Russo and Fouts, 1997; Sharma, 2000).

The findings that show that firm size affects the proactiveness of environmental strategies have perhaps led to an assumption that SMEs' lack of resources prevents them from implementing proactive strategies and that such initiatives may reduce their profitability (e.g. Russo and Fouts, 1997; Rutherford et al., 2000; Schaper, 2002). It may therefore lead to the assumption that the 'natural resource-based view of the firm' (Hart, 1995) may not be a useful perspective for SMEs. However, the above studies only include populations of large companies in their samples. Although some cases suggest that environmental policy in lesser-developed countries should develop to enable small-scale and artisan firms to form entities that are of a sufficiently large scale to allow adequate environmental protection (Tarras-Wahlberg, 2002); this option is not necessarily useful for competitive markets in developed countries. Therefore, it cannot be concluded from the available empirical evidence that SMEs are not likely to adopt proactive environmental strategies or even that they may not possess valuable organizational capabilities that enable them to generate such strategies.

SMEs have also not been the focus of environmental strategy research based on arguments about their presumed lack of interest in going beyond regulatory compliance (Greening and Gray, 1994; Russo and Fouts, 1997; Sharma and Vredenburg, 1998), the low degree of public interest in SMEs (Scott, 1990), and the difficulty of obtaining data from SMEs (Aragón-Correa, 1998; Rutherford et al., 2000). However, SMEs produce around 70% of the total global pollution (Smith and Kemp, 1998), 60% of the total carbon emissions (Marshall, 1998), and the sum total of SMEs' environmental impacts outweighs the combined environmental impact of large firms (Hillary, 2000). Therefore, it is imperative that such assumptions about the lower importance of studying environmental strategies of SMEs be based on empirical data rather than on conjecture. There is also broad agreement in the strategic management literature that the strategic distinctiveness of SMEs makes research focused in this context necessary (e.g. Barney et al., 2001; Dean et al., 1998; Way, 2002). Thus, strategic differences between big and small firms, the scope of SMEs' impacts on the global economy and on the natural environment, and the absence of previous analysis, all suggest the importance of giving detailed attention to the issue of the strategic behaviour of SMEs in their interface with the natural environment.

Accordingly, in this study we develop an organizational size-dependent perspective that links the unique strategic characteristics of SMEs—shorter lines of communication and closer interaction within the SMEs, the presence of a

founder's vision, flexibility in managing external relationships, and an entrepreneurial orientation—to the organizational capabilities that they are likely to develop and deploy to generate proactive environmental strategies. Our organizational size-dependent natural resource-based view for SMEs addresses two questions: (1) Based on the unique strategic characteristics of SMEs, which are the organizational capabilities likely to be associated with their proactive environmental strategies? and (2) What effect do such proactive environmental strategies have on the financial and competitive performance of these SMEs? We contribute to both: the natural resource-based view by showing that SMEs can adopt proactive environmental strategies based on specific capabilities associated with their unique strategic characteristics, and the resource-based view by identifying the type of organizational capabilities that are likely to help SMEs develop their competitive strategies in general.

2. Strategies of SMEs

2.1. Strategic management literature and SMEs

Despite the widespread recognition of the significant role that SMEs play in most economies, the competitive strategies of SMEs have attracted limited research effort as compared to the focus on large firms. This may be partly because early studies using the PIMS database (e.g. Strategic Planning Institute, 1977) reinforced the idea that large firms possessed numerous advantages over smaller firms, and espoused the virtue of growth-oriented strategies. SMEs were often marginalized as a residual class of firms that failed to become big, that frequently used old fashioned managerial approaches, that occupied secondary labour markets and niches (Scranton, 1999), and/or that were less likely to use strategic analysis and planning practices (e.g. Shuman et al., 1985).

Later studies showed that certain advantages might also accrue to smaller firms (e.g. Woo, 1987) and accordingly research began to focus on demonstrating the effectiveness of different strategies and practices for SMEs' performance (e.g. Risseuw and Masurel, 1994). It was argued that SMEs could gain advantage via focused (e.g. Brown, 1995; Porter, 1980) or flexible strategies for producing specialty products/services for niche markets (Lescure, 1999) as the only viable competitive options given their lack of resources (Lee et al., 1999).

2.2. Strategic characteristics of SMEs

Although the dominant perspective on SMEs has emphasized their lack of resources (e.g. D'Amboise and Muldowney, 1988; Eden et al., 1997), recent literature has proposed that SMEs possess certain characteristics such as internally generated funds, a simple capital structure, and an entrepreneurial orientation of the founders/managers

(Rangone, 1999; Yu, 2001), that can contribute to competitive advantage. It has also been argued that SMEs possess the flexibility to respond to changes in the general business environment, innovativeness to respond with agility to competitors' moves, and closer interaction amongst organizational employees. Each of these characteristics is discussed below.

Flexibility is probably the most widely cited among SME characteristics (e.g. Chen and Hambrick, 1995; Fiegenbaum and Karnani, 1991; Yu, 2001). Flexibility allows SMEs to pay greater attention to managing external relationships upon which they are dependant for critical resources to survive, more so than larger firms with larger internal resources. These include inter-firm relationships (especially where SMEs are sub-contractors or parts/services suppliers to large companies), personal relationships that provide them with new market opportunities (Hendry et al., 1995; Conner and Prahalad, 1996), and relationships with government agencies for identifying and attracting subsidies and technical assistance for small enterprises (Darnall, 2002).

Entrepreneurial orientation and innovativeness have also been cited as important characteristics of small firms (e.g. Hitt et al., 1991; Woo, 1987). However, given that SMEs have limited human resources, the competitive advantage from these characteristics depends mainly on the managers-founder's vision and her ability to extend her views to the rest of the employees (Merz and Sauber, 1995; Miller et al., 1988) and motivate their opportunity-seeking and problem solving behaviour.

Finally, small firms may also be distinguished from large ones in terms of the closer interaction among departments, shorter lines of communication, better personal links, more unified culture and stronger identity. While these features permit easier communications and the generation of shared understanding (Kogut and Zander, 1996), they may also create problems due to the greater intensity of personal interactions if shared values and vision are not sufficiently strong (Lawrence and Lorsch, 1969).

In summary, while the literature on SME strategies has traditionally focused on efficacy problems because of small firms' potential lack of recourses, conflicting evidence for this argument has been found (Chen and Hambrick, 1995). We argue that the unique characteristics of SMEs' enable them to develop and deploy certain organizational capabilities which may be one of the main reasons for these paradoxical findings. Accordingly, the following section develops arguments, from a resource-based view of the firm, to link the three characteristics discussed above—shorter lines of communication and closer interaction within the SMEs, the presence of a founder's vision, the flexibility in managing external relationships, and entrepreneurial orientation—with the generation of proactive environmental strategies, and the relationship of such strategies with SMEs' performance.

3. A size-dependent perspective on SMEs' environmental strategy

3.1. Corporate environmental strategies

In spite of differences in nomenclature, typologies of corporate environmental strategy place firms' environmental strategies along a continuum ranging from reactive strategies that merely aim to meet legal requirements and implement pollution controls, to more proactive strategies that include voluntary eco-efficient practices for reducing energy and waste and pollution prevention practices that require innovations in processes, products and operations to reduce energy and material use at the source, to environmental leadership strategies where products, processes, and even business models are re-designed to minimize the ecological footprint along the entire product life cycle (Aragón-Correa, 1998; Buysse and Verbeke, 2003; Hart, 1995; Roome, 1992; Sharma, 2000; Sharma and Vredenburg, 1998).

A proactive environmental strategy requires changes in routines and operations and has been identified as an organizational competence (e.g. Christmann, 2000; Hart, 1995) because it requires the complex coordination of several human and technical skills and heterogeneous resources (Amit and Schoemaker, 1993) in order to reduce environmental impacts and simultaneously maintain or increase firm competitiveness. Extant research based on samples of only larger firms has shown that organizations with a larger size are more likely to undertake the most proactive environmental strategies (Aragón-Correa, 1998; Russo and Fouts, 1997; Sharma, 2000). Scholars have consequently argued that because proactive environmental strategies require accumulation of, and complex interaction among, skills and resources such as physical assets, technologies, and people (Ramus and Steger, 2000; Russo and Fouts, 1997; Sharma, 2000; Shrivastava, 1995), SMEs' limited resources might prevent them from adopting such practices (e.g. Greening and Gray, 1994; Russo and Fouts, 1997). Although a curvilinear relationship between firm size and environmental strategy may be possible based on potential synergies between complementary assets (Christmann, 2000), the lack of flexibility of large firms, and the limited resources of very small firms,¹ to our knowledge there is no evidence to support this relationship. The extant literature supports a linear relationship considering that big firms have greater access to the resources required for the implementation of the proactive environmental strategies.

This generalized impression of SMEs has persisted although systematic research on SMEs' environmental strategies has been absent from extant literature. Supporting this assumption, descriptive studies of SMEs have often highlighted their poor level of environmental commitment, describing them as mainly interested in controlling emis-

¹We thank our reviewers for suggesting this idea as potential research for the future.

sions of pollution to comply with environmental regulations (e.g. Rutherford et al., 2000; Schaper, 2002; Williamson and Lynch-Wood, 2001).

However, a few descriptive studies in several countries contradict this assumption and have shown that SMEs may successfully implement environmental strategies consistent with the advanced environmental practices of big firms (e.g. Bianchi and Noci, 1998; Carlson-Skalak, 2000; Hillary, 2000) including innovations that prevent pollution at the source rather than pollution control at the end-of-the-pipe. Therefore, we argue that, contrary to the current dominant thinking about SME environmental strategies as being mainly reactive, they are also likely to exhibit proactive strategies based on certain organizational capabilities related to the unique strategic characteristics of SMEs.

3.2. Organizational capabilities for SMEs' proactive environmental strategies

Drawing on the natural resource-based view of the firm (e.g. Hart, 1995) and the unique characteristics of SMEs discussed above, we present arguments and develop hypotheses in this section for the capabilities that will be associated with SMEs' proactive environmental strategies based on a fit with their unique characteristics discussed in the strategic management literature. These capabilities are (1) shared vision, which is related to the owner-founder's vision and the close interaction and communication between the owner-founder and the organizational members; (2) strategic proactivity which is related to SME's entrepreneurial orientation and innovativeness; and (3) stakeholder management, which is related to SMEs flexibility in managing their inter-organizational and external relationships. These three capabilities have also been analysed in the natural resource-based view literature, which is predominantly based on large firm samples (e.g. Aragón-Correa and Sharma, 2003; Christmann, 2000; Marcus and Geffen, 1998; Russo and Fouts, 1997; Sharma and Vredenburg, 1998). Our contribution in this study is to develop a theoretical basis to identify a subset of the several capabilities discussed in the literature that are relevant and more likely for SMEs for developing proactive environmental strategies.

3.2.1. Shared vision

The organizational capability of shared vision exists when an organization's members collectively have similar values and beliefs about its objectives and mission (Oswald et al., 1994). The capability of shared vision does not simply mean that employees know their managers' objectives; rather, shared vision entails a shared feeling that the firm's objectives are important and appropriate and that all of its members may contribute to defining them. Goal clarity and shared responsibility for organizational objectives are two basic characteristics of shared vision and positively affect organizational learning and

employee creativity at the interface between business and the natural environment (Ramus and Steger, 2000).

Hart (1995) proposed that firms having a demonstrated capability of shared vision would be able to accumulate the skills necessary for developing a proactive environmental strategy earlier than firms without such a capability because these strategies depend "upon tacit skill development through employee involvement" (Hart, 1995, p. 999). Similarly, research on corporate environmental change argues for the importance of employee support in the SME context (Barret and Murphy, 1996; Ruiz-Quintanilla et al., 1996; Wehrmeyer and Parker, 1996) although the empirical evidence is mainly based on the large firms' context (e.g. Andersson and Bateman, 2000; Ramus and Steger, 2000).

On the positive side, as compared to large firms, SMEs may be burdened with less bureaucracy and fewer restrictions and provide more opportunities for direct communication and shared experiences amongst organizational members (O'Gorman and Doran, 1999). On the negative side, SME managers have been shown to have difficulty developing clear objectives and communicating with subordinates owing to lack of resources and unprofessional management (Smeltzer and Fann, 1989; Way, 2002), and lack interest in analysis offered by employees during the process of setting precise objectives and in reaching consensus among managers and employees (Merz and Sauber, 1995). Therefore, size alone does not make a shared vision capability intrinsic to an SME. Rather, we argue that only the SMEs that are able to exploit close interactions between the owner-founder's vision and employees into a capability of a shared vision for a sustainable business are more likely to implement a proactive environmental strategy. For instance, Raymond et al. (1998) showed that organizational support is positively associated with the implementation of business process reengineering in SMEs. This leads us to argue that the importance of a shared vision capability for a proactive environmental strategy will be at least as high in SMEs as in larger organizations. Therefore:

Hypothesis 1. *A capability of shared vision will be positively associated with the development of proactive environmental strategies by SMEs.*

3.2.2. Stakeholder management

Stakeholder pressures have often been cited as factors contributing to the adoption of proactive environmental practices by firms (e.g. Céspedes-Lorente et al., 2003; Cordano et al., 2004; Henriques and Sadosky, 1999; Sharma and Henriques, 2005; Wheeler et al., 2003). This literature has mostly offered empirical evidence in the large firm context for the importance of this capability for generating proactive environmental strategies.

Sharma and Vredenburg (1998, p. 735) specifically defined this capability as "the ability to establish trust-based collaborative relationships with a wide variety of stakeholders, especially those with non-economic goals".

Henriques and Sadorsky (1999) showed that environmentally proactive firms usually view all their stakeholders as important and actively manage their environmental concerns and, for instance, Sharma and Henriques (2005) linked specific stakeholder pressures to specific sustainability practices by facilities in the Canadian forest products industry.

Stakeholders such as environmental non-governmental organizations (NGOs) usually target larger firms (and not necessarily the worst polluters), because these firms are often the most likely to respond in order to avoid damage to their reputations (Bianchi and Noci, 1998; Greve, 1989). Small firms may enjoy a degree of anonymity and therefore might be able to avoid undertaking some environmental practices, if they are so inclined (Dean et al., 2000). However, SMEs that are interested in proactive environmental practices need to pay careful attention to their stakeholders' interests. Although their small size provides them with flexibility in responding to changes in the general business environment, small firms are also seriously challenged by unfavourable and hostile environments (Merz and Sauber, 1995).

SMEs have limited internal resources to survive hostility by external forces and are less likely than large firms to have access to media or publicity. Therefore, SMEs need an organizational ability to be sensitive to the preferences of, and collaborative with, relevant external groups to garner external resources for adopting technologies, processes, and systems required for proactive environmental practices. Understanding and managing societal concerns via engagement in trust-based relationships can help expand SME's resources for undertaking proactive environmental practices through environmental coalitions and alliances (Rondinelli and London, 2003), governmental technological help and grants (Darnall, 2002), participation in green networks (Lehmann et al., 2005), and free consulting (Bianchi and Noci, 1998). Similarly, Flannery and May (2000, p. 646) found that, in a sample of 139 SMEs in the US metal-finishing industry, managers' decisions and intentions concerning the treatment of hazardous wastewater were influenced positively by "their assessment of support from important others", that is external stakeholders. McEvily and Marcus (2005) showed how SMEs engaged their suppliers to develop capabilities for pollution prevention. Therefore:

Hypothesis 2. *A capability of stakeholder management will be positively associated with the development of proactive environmental strategies by SMEs.*

3.2.3. Strategic proactivity

Strategic proactivity is a firm's ability to initiate changes in its strategic policies regarding its entrepreneurial, engineering, and administrative activities, rather than reacting to events (Aragón-Correa, 1998). The concept draws on the prospector orientation described in Miles and Snow's (1978) typology and involves taking initiative to

shape the general business environment to one's own advantage (Chen and Hambrick, 1995). Proactiveness has been proposed as a key dimension (with innovation and risk taking) of an entrepreneurial orientation (Covin and Slevin, 1990; Lumpkin and Dess, 1996; Miller, 1987) and Stopford and Baden-Fuller (1994) showed that these dimensions help firms to gain new capabilities.

Based on data from 105 large firms in different Spanish economic sectors, Aragón-Correa (1998) showed that strategic proactivity encouraged adoption of proactive natural environmental strategies. Although previous empirical research regarding the influence of strategic proactivity on environmental approaches has been mainly based on large companies, some evidence shows the importance of strategic proactivity for small firms. For example, Dean et al. (1998) showed that environmental regulation of specific activities or sectors tends to generally discourage SMEs' presence but attracts specific kinds of proactive SMEs. This finding is especially interesting considering that small firms often show a greater propensity for action than their larger rivals (Chen and Hambrick, 1995). Moreover, entrepreneurial orientation and innovativeness are important characteristics of small firms (e.g. Hitt et al., 1991; Woo, 1987) seeking focused niche strategies in competitive markets dominated by large firms with deep pockets (Lescure, 1999; Lee et al., 1999). Therefore:

Hypothesis 3. *A capability of strategic proactivity will be positively associated with the development of proactive environmental strategies by SMEs.*

3.3. The influence of proactive environmental strategy on SME performance

Although there is mixed evidence regarding the influence of proactive environmental strategies on the financial performance of the firms (e.g. Bansal, 2005; Christmann, 2000; Margolis and Walsh, 2003), the majority of the studies have found a positive relationship. This positive relationship in the context of large firms (e.g. Klassen and McLaughlin, 1996; Russo and Fouts, 1997) has been explained as a result of mutual influence between proactive environmental strategies and valuable competitive capabilities (Christmann, 2000; Hart, 1995; Majumdar and Marcus, 2001; Russo and Fouts, 1997; Sharma and Vredenburg, 1998). The most proactive strategies focused on business redefinition and innovation in products and processes to prevent pollution and waste at the source enable an organization to align itself with changes in its general business environment (Aragón-Correa and Sharma, 2003), and have been shown to be associated with lower costs, improved reputation, and generation of new organizational capabilities (Christmann, 2000; Hart, 1995; Sharma and Vredenburg, 1998). The adoption of mid-range environmental strategies focused on eco-efficiency to reduce energy and waste have been found to reduce

environmental impacts and simultaneously provide firms with competitive advantage through reduction of costs and addition of net value (Lehni, 2000; WBCSD, 2001).

Although researchers have extensively examined the influence of environmental practices on large firms' performance, studies of small firms' environmental approaches have often used varying dependent variables. For example, Flannery and May (2000) investigated the influences on shaping environmentally ethical decision intentions, and Dean and colleagues (1998, 2000) estimated the effect of environmental regulations on the formation of small US manufacturing establishments. The descriptive studies on SME environmental practices generally assume that legislative pressures are the only way to generate advanced environmental practices among small firms because environmental activities do not have any positive implications for SMEs' performance (e.g. Rutherford et al., 2000). However, Miles et al. (1999) emphasized that the relationship between financial performance and the adoption of environmental standards for SMEs needed further analysis. They stated that "it is reasonable to expect that competent management and a more proactive stance on environmental issues will be rewarded in the small business sector as well" (Miles et al., 1999, p. 120).

Since organizational capabilities have been empirically found to mediate the link between environmental strategy and financial performance in the context of large firms (e.g. Christmann, 2000; Russo and Fouts, 1997; Sharma and Vredenburg, 1998), we argue that small firms will reap similar benefits. However, in this study, we did not examine these mediation effects and leave it for future research. We propose that there will also be a direct relationship between proactive environmental strategy and financial performance based on the arguments presented above.

Hypothesis 4. *Proactive environmental strategies will be positively associated with financial performance of SMEs.*

4. Research method

4.1. Sample and procedures

We used data from automotive garages, mainly truck and car repair and maintenance facilities in Southern Spain, to examine our hypotheses. The automobile industry has a major impact on the natural environment (e.g. Orsato et al., 2002) at each stage of its life cycle—from production, utilization and operation, repair and maintenance, to final disposal. The garages focus on repair and maintenance of automotive products which generates significant environmental impacts such as noise, high levels of CO₂ generation in tests, high levels of consumption of energy and water, use of contaminants and toxic materials such as chemicals and paint, and dangerous wastes. Consequently, this industry is receiving growing attention from legislators.

We initially interviewed six managers and key members of an industry association of the automotive garage sector, three consultants, and two academics interested in the area. Data on SMEs' environmental practices, performance, and their organizational capabilities are not available from published sources. Therefore, based on the interviews and extant literature, we developed a questionnaire to measure our constructs.

The population for this study consisted of all the automotive garages (210 firms) located in the region of Southern Spain (including the provinces of Malaga, Granada, and Almeria). All these firms were designated SMEs according to official standards² (European Commission, 1999). By controlling for industry and geographical effects we limited our potential to draw broadly generalizable conclusions but this allowed us to control for extraneous confounding influences and focus on our variables of interest. Our secondary research suggests that the majority of the European automotive garages face a fairly homogeneous context in competitive and legal terms. Automotive garages also have many similarities with small firms in other sectors including intensive competition, complex regulation, and lack of resources—especially financial—as compared to larger companies.

Studies based on data gathered from SMEs usually tend to be inconclusive because of very low response rates (Meritt, 1998) or the difficulty that the respondents may have in interpreting answers to questions (Smith and Kemp, 1998). Therefore, we decided to administer the structured questionnaire personally via interviews with each informant. Additionally, because the vast majority of the CEOs were native Spanish speakers, the questionnaire was written in Spanish to avoid problems in interpretation. All the items are provided in the Appendix after translation into English. The personal survey administration took significantly greater time and effort compared to mail surveys but allowed us to ensure the appropriate identity of the respondents and their understanding of the questions. These factors contributed to greater data accuracy and reliability.

As is usual in strategic and environmental research (e.g. Banerjee, 2001; Cordano and Frieze, 2000; Christmann, 2000; Flannery and May, 2000; Sharma, 2000), data were collected from the general managers because they are the most knowledgeable about their organization as a whole and usually play a crucial role in designing environmental strategies, especially in the SME context. To reduce possible social desirability bias, we: (1) promised that our analyses would be aggregated and no organization would be identified individually; (2) randomly compared

²When the research was conducted, the European Commission's definition of SME was based on companies with fewer than 250 employees with either an annual turnover not exceeding €40 million or an annual balance sheet total not exceeding €27 million (adjustments are made in these values regularly), and those that were independent with less than 25% of the capital or voting rights owned by one enterprise or jointly by several enterprises.

self-evaluation of managers with the evaluation of environmental practices of their firms by competitors³; and (3) included questions about specific actions and strategies rather than about general ethical claims (Banerjee, 2001).

The general managers of 149 firms agreed to participate in this research and we were able to interview 126 of these managers. Fourteen interviews were not used for this study because of missing values, leaving a final sample of 108 interviews representing 51.42% of the contacted population. The sampled firms had an average size of six employees. We did not find significant differences between the descriptive characteristics of firms that were included in the study in terms of location, activities, and size versus the overall population.

Although a single informant in each firm is often used in strategic management research due to the difficulty of obtaining multiple informants in larger surveys, we recognize the potential for mono-method bias in our data. Therefore we increased the confidence in our data by: (1) undertaking a factor analysis which showed the absence of a single general factor to account for most of the covariance in our variables, indicating the absence of common method variance problems for our data (Podsakoff and Organ, 1986); (2) comparing self-evaluation of managers with competitors' perceptions of their firms which allowed us to compare managers' responses with external sources of well-informed evaluators (see footnote 2 for details); and (3) personally identifying qualified respondents and administering the questionnaires. Previous literature has shown that the views of a single but well-qualified informant may better capture a firm's approach as compared to the views of several respondents in the case of small organizations where relevant decisions are often highly centralized (Chandler and Hanks, 1993; Lyon et al., 2000).

4.2. Measures

4.2.1. Environmental strategy

Due to limited or non-availability of publicly available environmental performance data, a firm's environmental strategy has been usually measured in terms of self-perceptions of managers (e.g. Aragón-Correa, 1998; Christmann, 2000; Flannery and May, 2000; Sharma, 2000; Sharma and Vredenburg, 1998). In our case, this was the only feasible approach since there are no publicly available data on environmental practices of garages in Spain.

³A random sample of 46 managers from our final respondent firms was asked about the most visible environmental practices of one or several competitors (usually nearby garages), resulting in a sample of 70 externally evaluated firms. Averaging evaluations created external evaluations of specific firms when several of them were available. A correlation of 0.71 between rate of external evaluations developed by competitors and self-evaluations developed by managers for sampled practices increases our confidence in the data.

We used two groups of items to measure the proactiveness of the environmental strategy of each garage. The items were grouped based on theoretically well-differentiated categories ranging from the most innovative prevention practices to the simplest eco-efficient practices. Although both groups of items include proactive practices, they are significantly different in terms of their complexity and objectives, ranging from major changes in product and process design to saving energy and reducing waste. These have been analysed differently in extant literature (e.g. Hart, 1995; Marcus and Anderson, 2006).

The first group of practices was measured using 14 items drawn from Aragón-Correa's (1998) measure for environmental strategies designed to cover the whole range of environmental practices that a firm might adopt including product and process innovations for pollution prevention. Table A1 in the Appendix shows the results of standardized varimax rotation of these items resulting in two significant factors (eigenvalues > 1). Responses were on a five-point scale ranging from 1 for "we have not addressed this issue at all" to 5 for "we are the leaders on this practice in our sector". Unless otherwise noted, all subsequent scales were created by using the same five-point response format.

The second group of practices included nine items to evaluate the importance that managers gave to their firm's implementation of various eco-efficient practices. These environmental practices have been suggested as the first steps toward proactive environmental practices, and/or as specifically applicable to SMEs (e.g. Schmidheiny, 1992; Smith and Kemp, 1998). Exploratory principal components analysis with varimax rotation showed that these items formed two factors with eigenvalues > 1 (Please refer to Table A2 in the Appendix).

4.2.2. Stakeholder management

Following previous environmental research (Buysse and Verbeke, 2003; Cordano and Frieze, 2000; Flannery and May, 2000), we used Ajzen and Fishbein's (1980) technique as a guide to measure the capability of stakeholder management. First, we listed nine categories of stakeholders (such as local communities, shareholders, the media, environmentalists, and customers), and asked the general managers to rate (from 1 to 5) the level of attention they paid to each category in managing their enterprises. Second, we asked the informants to evaluate (from 1 to 5) their perception of the importance of each stakeholder for the environmental performance of the firm. Similar to Buysse and Verbeke's (2003) methodology, we weighted the managers' attention to each stakeholder by the perceived attention of each stakeholder to environmental impacts of the firm. The scores ranged from 1 to 25, with a higher score indicating a higher capability of stakeholder management. Exploratory principal components analysis with varimax rotation of those nine items showed that they formed three factors with eigenvalues > 1 (Please refer to Table A3 in the Appendix).

4.2.3. Shared vision

We used three items (shown in the Appendix) based on previous literature on shared ideas about organizational objectives and the ways in which employees influence those objectives (e.g. Jehn, 1995; Oswald et al., 1994). Each item was measured on a five-point Likert response scale (1=“strongly disagree”, 5=“strongly agree”). Exploratory principal components analysis with varimax rotation of those three items showed that they formed only one factor with eigenvalue > 1 (Cronbach’s alpha = 0.791). A high average score was indicative of a high degree of shared vision in a garage.

4.2.4. Strategic proactivity

We used three bipolar items from Aragón-Correa’s (1998) validated scale measuring proactivity in a firm’s generic business strategy (refer to the Appendix). The scale draws on Miles and Snow’s (1978) well-known typology. We asked each respondent to position his or her firm on a scale of 1–5 that was constructed so that high values matched a “prospector” strategy and low values, a “defender” strategy. We inverted this pattern for the second question to avoid skewing the answers. Exploratory principal components analysis with varimax rotation of those three items showed that they formed only one factor with eigenvalue > 1 (alpha = 0.770). A high score was indicative of high development of strategic proactivity in a garage.

4.2.5. Firm performance

Strategy and environment scholars have used subjective perceptions of managers (e.g. Judge and Douglas, 1998; Sharma and Vredenburg, 1998) and objective data (e.g. Russo and Fouts, 1997) to measure firm performance. We included questions tapping both types of assessment in our interviews, but the garage managers were more open to offering their perceptions rather than to offering precise quantitative data (only 61 offered quantitative data). Therefore, we tested the model using a perceptual measure of financial performance in which each respondent rated his or her organization’s performance relative to that of other firms in the garage industry using two items (see Appendix). These two items were drawn from Judge and Douglas (1998). These authors provide an extensive discussion and details about the potential of this process of measurement and similar processes in previous strategic literature (e.g. Miller and Friesen, 1984; Powell, 1995). The final measure was an average of the two items (alpha = 0.69), and a high score was indicative of a high level of performance in the garage as compared to the garage industry. Where possible, we calculated the correlation between the objective and subjective data. These were high and statistically significant (0.62, $p < 0.01$).

4.2.6. Control variables

All our sampled firms were SMEs according to institutional definitions. However, the breadth of this category

suggested the need to use organization size to control for potential differences. The size indicators initially used were annual turnover and number of employees. Both indicators were highly and significantly correlated in this sample and we chose to use the number of employees. The logarithm of an organization’s number of employees was used to measure size. We also added a dummy variable to control potential external influences based on whether or not the garage was associated with an automotive dealer or was independent.

5. Analysis and results

5.1. Analysis

In a preliminary analysis, the two variables measuring proactive environmental practices were first subjected to a cluster analysis using a non-hierarchical optimising procedure to determine whether different groups of similar firms could be grouped on the basis of their environmental strategies (Hair et al., 1998).

Buyse and Verbeke’s (2003) classification of environmental strategies suggested a three-cluster solution which showed in our data a relatively small group of firms ($n = 26$) characterized by high levels of innovative and preventive environmental practices and of eco-efficient practices. A second group ($n = 45$) showed a high level of eco-efficient practices and an intermediate level of innovative and preventive practices. Finally, a group of firms ($n = 37$) exhibited the lowest levels of both eco-efficient and innovative practices. We identified these groups as exhibiting “leadership,” “pollution prevention,” and “reactive” environmental strategies, respectively, based on Buyse and Verbeke’s (2003) terminology. The first group exhibits the greatest proactiveness, the second group exhibits some proactive practices focusing on simpler eco-efficiency solutions, and the third group does not exhibit any proactive practices. A four-cluster solution would divide the last group into two but not provide additional information.

Although the cluster analysis was developed using standardized values as recommended to avoid any influences of scales, Table 1 shows average scores using raw values for the different variables in each emerging group to avoid problems in interpreting standardized values. The “leadership” group have the highest values for all the analysed variables, the “pollution prevention” group shows intermediate values, and the ‘reactor’ group has the lowest values for the organizational capabilities and environmental performance. Test statistics from one-way analyses of variance (ANOVA F s) were all significant except for shared vision, showing the robustness of the solution (Hair et al., 1998). Cluster analyses were repeated on randomly selected sub-samples, indicating that the results can be considered independent of sample characteristics (Henriques and Sadosky, 1999).

Table 1
Clustering of sampled firms based on their environmental strategies

	Group 1: “Leader”	Group 2: “Pollution prevention”	Group 3: “Reactive”	ANOVA <i>F</i>
N	26	45	37	
Innovative preventive practices	4.04	2.76	1.76	196.021***
Eco-efficient practices	4.66	4.45	3.45	58.780***
Shared vision	4.73	4.47	4.38	1.728
Stakeholder management	13.49	12.23	10.51	6.881**
Strategic proactivity	3.11	1.97	1.91	7.312***
Performance	3.34	2.89	2.56	9.302***

** $p < 0.01$.
*** $p < 0.001$.

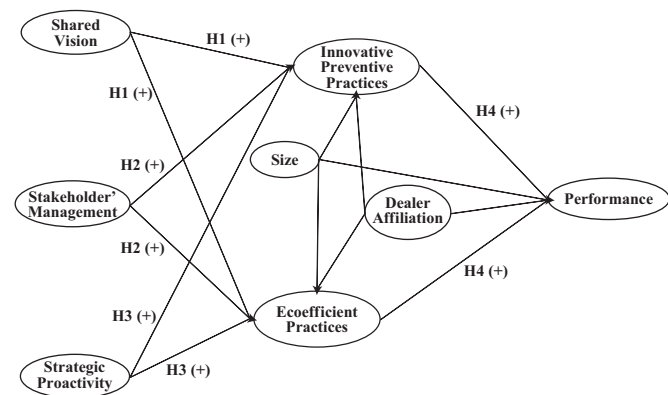


Fig. 1. Hypothesized model.

The results show that the patterns of environmental strategies for the sampled SMEs are congruent with theoretical typologies ranging from reactive (“reactor”) to the most proactive strategies (“pollution prevention” and “leader”). Our classification is also consistent with previous classifications for large firms (e.g. Buysse and Verbeke, 2003). The values in Table 1 for the rest of the variables suggest support for Hypotheses 1–4. Next, we used a structural equation model for a definitive test of our hypotheses (Fig. 1).

5.2. Results

We examined our hypotheses using structural equation modelling (LISREL 8.3) with the covariance matrix as input and the assumption of no error. This provided a conservative test of the model (Hair et al., 1998) and was estimated using the weighted least squares (WLS)⁴ method. We used a recursive non-saturated model, taking shared vision (ξ_1), stakeholder management (ξ_2), strategic proactivity (ξ_3), size (ξ_4), and dealer affiliation (ξ_5) as the

⁴The sample sized was 108. Sample size, as in any other statistical method, provides a basis for the estimation of sampling error..... While there is no correct sample size, recommendations are for a size ranging between 100 to 200 (Hair et al., 1998, p. 637).

exogenous latent variables. Size and dealer affiliation were control variables, innovative preventive practices (η_1) and eco-efficient practices (η_2) were the first-grade endogenous latent variables, and performance (η_3) was the second-grade endogenous latent variable. Such analysis allows for modelling based on both latent variables and manifest variables, a property well suited for the hypothesized model where most of the represented constructs are abstractions of unobservable phenomena.

Fig. 1 shows our proposed model and the hypotheses. Table 2 presents the means, standard deviations, reliability coefficients, and correlations among the variables. Prior to conducting our analyses, we followed the procedure outlined by Bono and Judge (2003) for examining the measurement properties of our three multidimensional variables to prevent interpretational problems inherent in simultaneous estimation of measurement and structural models.

As suggested in extant literature (e.g. Cordano and Frieze, 2000; Flannery and May, 2000), the dimensions of stakeholder management emerging from the exploratory factorial analysis were highly interrelated in our data. A second-order confirmatory factor analysis (loading items on the three dimensions on a single transformational factor) demonstrated a reasonable fit for the data ($\chi^2 = 18.95$; $df = 20$; $RMSEA = 0.001$; $CFI = 0.99$; $IFI = 0.99$) with standardized loadings ranging from 0.97 to 0.40 (Fig. 2). Whereas this model is not a perfect fit for the data, because of cross-loading among some of the items, alternative models were unambiguously rejected. For instance, our model is a better fit than a single-factor model in which items are loaded directly on the final factor ($\chi^2 = 137.56$; $df = 27$; $RMSEA = 0.195$; $CFI = 0.74$; $IFI = 0.74$). Hence, the three factors were considered indicators of a single measure, which we labelled “stakeholder management.” Subsequent analyses were conducted using a single factor for stakeholder management. The final measure was a weighted average of the three factors using the standardized loadings obtained from the second-order factor analysis, and a high score was indicative of a high capability for stakeholder management.

Table 2
Means, standard deviations, and correlations

	Mean	s.d.	1	2	3	4	5	6	7	8
1. Shared vision	4.49	0.75	0.791							
2. Stakeholder management	11.93	3.36	0.076	0.693						
3. Strategic proactivity	2.24	1.42	−0.065	0.257**	0.770					
4. Innovative preventive practices	2.73	0.96	0.167	0.324***	0.293**	0.778				
5. Eco-efficient practices	4.21	0.94	0.180	0.067	0.110	0.417***	0.705			
6. Performance	2.90	0.76	0.266**	0.087	−0.003	0.450***	0.430***	0.691		
7. Size	1.17	1.05	−0.079	0.035	0.427***	0.190*	−0.106	−0.002	–	
8. Dealer affiliation	0.51	0.50	−0.031	−0.070	0.216*	0.202*	0.005	0.099	0.280**	–

Scale reliabilities (Cronbach's alpha) are on the diagonal in boldface.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

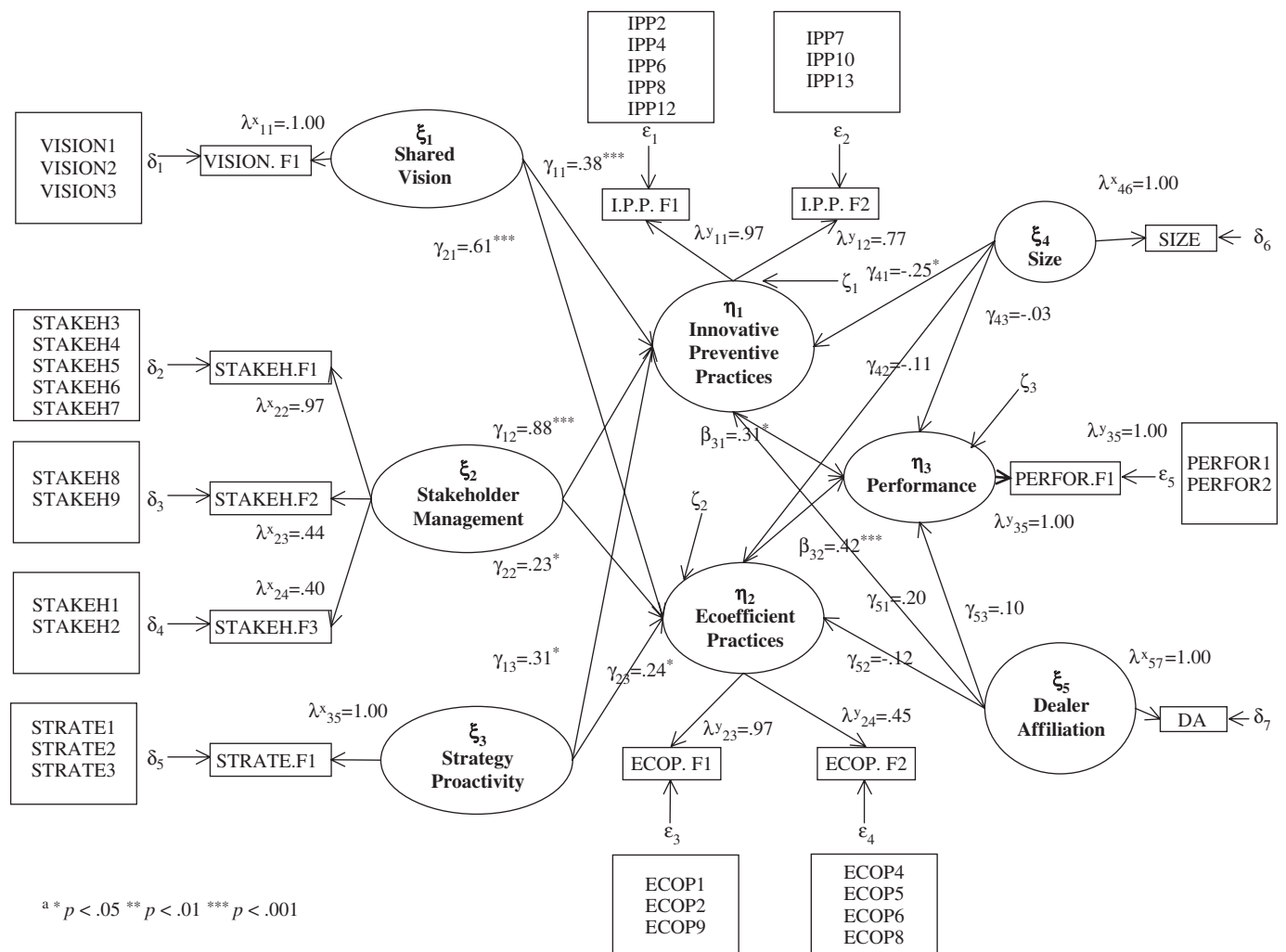


Fig. 2. Results of processes for estimation of measurements and model (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$).

Similar analysis was conducted for the measures of the innovative-preventive practices and the eco-efficient practices. Examination of residuals and modification indices of the second-order confirmatory factor analyses (loading the items on the two dimensions on a single transformational

factor for each variable) suggested to avoid the final inclusion of specific items (IPP1, IPP3, IPP5, IPP9, IPP11 and IPP14, and ECOP3, and ECOP7) to reinforce the fit of each measure. The final model (Fig. 2) demonstrated a reasonable fit for the data for innovative-preventive

practices ($\chi^2 = 27.95$; $df = 19$; $RMSEA = 0.066$; $CFI = 0.95$; $IFI = 0.95$) with standardized loadings ranging from 0.97 to 0.77, and the eco-efficient practices ($\chi^2 = 33.40$; $df = 14$; $RMSEA = 0.113$; $CFI = 0.87$; $IFI = 0.87$) with standardized loadings ranging from 0.97 to 0.45. Whereas these models were not a perfect fit for the data, because of cross-loading among some of the items, alternative models were unambiguously rejected. For instance, these models were a better fit than a single-factor model, in which items are loaded directly on the final factor of the innovative-preventive practices ($\chi^2 = 39.10$; $df = 20$; $RMSEA = 0.094$; $CFI = 0.89$; $IFI = 0.90$) or eco-efficient practices ($\chi^2 = 33.40$; $df = 14$; $RMSEA = 0.113$; $CFI = 0.87$; $IFI = 0.87$). Hence, the two factors were considered indicators of a single measure, which we labelled “innovative-preventive practices” and “eco-efficient practices.” The final measures were weighted averages of the two factors using the standardized loadings obtained from the second-order factor analysis, and high scores were indicative of high degrees of innovative-preventive practices and eco-efficient practices, respectively, in a garage’s environmental strategy.

Final results of this model, which are displayed in Fig. 2, revealed that each final item significantly loads on its respective construct showing high convergent validity of the measurement scale for each construct.

The hypothesized model provided an acceptable fit to the data ($\chi^2 = 86.25$; $df = 60$; $RMSEA = 0.08$; $AGFI = 0.89$; $NNFI = 0.89$; $CFI = 0.92$; $IFI = 0.91$). All of the modification indices for the beta pathways between major variables were small, suggesting that adding additional paths would not significantly improve the fit. The statistically significant parameters (see Fig. 2) predicting that the capability of shared vision would have a positive influence on the development of proactive environmental strategies by influencing the innovative-preventive and the eco-efficient practices ($\gamma_{11} = 0.38$ and $\gamma_{21} = 0.61$, respectively; $p < 0.001$) support Hypothesis 1. A positive and statistically significant parameter estimate for the path between stakeholder management capability and innovative-preventive practices ($\gamma_{12} = 0.88$, $p < 0.001$), and eco-efficiency ($\gamma_{22} = 0.23$, $p < 0.05$) provides support for Hypothesis 2. Hypothesis 3, regarding the influence of a strategic proactivity capability on environmental proactiveness, was also supported by the parameter estimates ($\gamma_{13} = 0.31$ and $\gamma_{23} = 0.24$, respectively; $p < 0.05$). Finally, Hypothesis 4, regarding the relationship between a proactive environmental strategy and firm performance, was supported by positive and significant parameter estimates for the path between innovative-preventive strategies and performance ($\beta_{31} = 0.31$, $p < 0.01$) and for the path between eco-efficiency and performance ($\beta_{32} = 0.42$, $p < 0.01$).

The influence of control variables was tested for each of the three dependent variables in our model. The control variable for size showed a positive and statistically significant ($p < 0.01$) association with innovative-preventive

practices. The influence of size on eco-efficient practices and performance was not significant for the sampled firms. The analysis of the influence of dealer affiliation was not significant for our sample. We also fit several nested models to the data, each one incorporating different assumptions about parameters (Bollen and Long, 1993). These alternative models indicated that our proposed model was parsimonious and a good fit. Detailed information about alternative models is available upon request.

6. Discussion, conclusions, and future research

Our contribution is to show, contrary to conventional wisdom in the extant literature, that even SMEs can adopt proactive environmental practices and that these practices can lead to superior financial performance via specific capabilities based on the unique strategic characteristics of SMEs. Moreover, our research also contributes to the resource-based view by showing that this perspective is relevant for SMEs’ competitive strategies generally.

As we had expected, SMEs’ potential to adopt proactive environmental practices is associated with specific organizational capabilities based on their unique strategic characteristics of shorter lines of communication and closer interaction, the presence of a founder’s vision, flexibility in managing external relationships, and an entrepreneurial orientation. These capabilities were shared vision, stakeholder management, and strategic proactivity.

Our data clearly clustered SMEs’ environmental strategies into reactive, pollution prevention, and leadership categories, similar to findings for large firms (Buysse and Verbeke, 2003) and firms with proactive environmental strategies showed a positive and significant relationship with performance for our sampled firms, similar to the findings for larger firms (Aragón-Correa, 1998; Judge and Douglas, 1998; Russo and Fouts, 1997).

The simultaneous influence of firm size and organizational capabilities on innovative-preventive environmental practices suggests that size, a common proxy for organizational resources, is a relevant but not a deterministic condition for developing the most proactive environmental strategies. Therefore, our findings contradict the traditional assumption that SMEs cannot develop proactive environmental strategies owing to scarcity of slack resources. Our results support the natural resource-based view perspective (Hart, 1995) that indicates that organizational capabilities are critical for strategies of both large firms and SMEs.

Furthermore, our results have shown that the capabilities promoting the development of environmentally proactive approaches in the sampled SMEs coincide with those found for large companies in previous research (e.g. Marcus and Geffen, 1998; Ramus and Steger, 2000; Sharma and Vredenburg, 1998). Although researchers concerned with organizational size have stated that what applies to large firms may not apply to small ones, recent studies (e.g. Flannery and May, 2000) and our own results show similar relationships for large and small firms.

Traditional arguments in the small firm context may have to be restated from the perspective of the resource-based view, that is, large and small firms both require organizational capabilities for competitive strategies. However, large and small firms may follow different paths and generate different sets of capabilities based on different sets of characteristics. Therefore, although some features of these three capabilities for SMEs may be similar to those in large organizations, the foundations for those capabilities may be significantly different for big and small-size organizations. While larger firms may deploy resources such as sophisticated systems for knowledge management, public relations campaigns, or significant investments in R&D to develop these three capabilities, small organizations may build these capabilities based on their unique strategic characteristics discussed above.

We also showed a positive and significant relationship between innovative-preventive environmental practices and eco-efficient practices and firm performance for the sampled SMEs. The positive relationship between the most proactive environmental practices and firm performance is also consistent with those obtained for larger firms (e.g. Judge and Douglas, 1998; Russo and Fouts, 1997), and it shows that a proactiveness in environmental strategy may be an appropriate alternative for both small and large firms.

It is especially interesting that our results show, in a SME context, a positive and significant relationship between firm performance and eco-efficient practices analysed as a systematic pattern of simple but multiple, consistent and co-ordinated practices that simultaneously reduce environmental impacts and organizational costs. This is relevant for practitioners and policy makers because eco-efficient practices have been often suggested as first steps for adoption by small firms and others starting on the path of environmental change. Viewed from a resource-based perspective, this result may help to differentiate between an isolated practice (e.g. switching off lights when not necessary) and a systematic pattern of practices demanding certain organizational capabilities (rather than resources or critical size). Partial analysis of our data indicates that certain eco-efficient practices might indirectly prevent the generation of organizational capabilities that

are positively related to firm performance if implemented in an isolated way by deterring innovation.

The main limitation of our study arises from our modelling of environmental strategy as exclusively a function of internal capabilities. External conditions are also relevant to the development of environmental initiatives (Aragón-Correa and Sharma, 2003; Clemens, 2001; Newton and Harte, 1997). Future research needs to complement the internal influences with the role of social and normative paradigms in the SMEs' environmental behaviour. We attempt in our study to minimize external influences via homogeneity of the context of the sampled organizations. Finally, we caution that our results do not allow definitive statement about the direction of the causality in the analysed relationships and may have limited generalizability due to the business and geographical peculiarities of our sample.

Overall, our study confirms that SMEs have an important role to play in reducing the negative impacts of business on the natural environment. Considering the absolute impact of the SME sector on global economies, more research attention should be paid to the environmental practices of SMEs. Although previous research has shown that larger firms are often environmentally more proactive than smaller ones, paradoxically many of the capabilities needed to develop proactive environmental approaches may be fostered by certain strategic characteristics of small firms. Future longitudinal work could confirm the direction of causality between capabilities, environmental performance, and financial performance. Research comparing large and small firms can show that SMEs may be at a resource disadvantage but not a capability disadvantage when it comes to environmental advances and this would have important implications for policy makers and practitioners.

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Appendix A

The results of standardized varimax rotation for innovative preventive practices are shown in Table A1. Exploratory principal components analysis results are shown in Table A2 and A3.

❖ Performance

Please, rate your firm overall performance on each of the following objectives relative to others in their industry (1, much worse to 5, much better) ($\alpha = 0.691$):

1. Return on investment.
2. Earnings growth.

Please, could you provide the approximate return on investment for your firm for the last year.

❖ Shared vision ($\alpha = 0.76$):

1. The objectives of this organization are very well-known to everybody working here.
2. Everybody working in this garage influences the way to work and the objectives of the firm.

3. Everybody in this organization freely contributes his/her points of view about how to run it smoothly.

❖ **Strategic proactivity** ($\alpha = 0.77$):

For each item, respondents positioned their firms on a 1–5 scale anchored by the responses given here.

- | | | |
|--|-----------|---|
| 1. The field within which the firm currently conducts our business is: | | |
| Narrow (related areas with prospect of change) | 1 2 3 4 5 | Broad (diversified and continuing to develop) |
| 2. The main focus of concern in relation to the garage's technological process is: | | |
| Having cost-efficient technologies | 1 2 3 4 5 | Having flexible and innovative technologies |
| 3. Planning in this garage is: | | |
| Tremendously rigorous and predetermined | 1 2 3 4 5 | Tremendously open, impossible to complete before acting |

Table A1

Factor loadings of exploratory principal components analysis for innovative preventive practices^a

Item	Factor 1: IPPF1	Factor 2: IPPF2
1. Sponsorship of natural environmental events (IPP1)		0.419
2. Use of natural environmental arguments in marketing (IPP2)	0.526	
3. Natural environmental aspects in administrative work (IPP3)		0.476
4. Periodic natural environmental audits (IPP4)	0.795	
5. Systematic programme for water recycling (IPP5)	–	–
6. Program of residue recycling (IPP6)	0.435	
7. Purchasing criteria including ecological requirements (IPP7)		0.710
8. Natural environmental seminars for executives (IPP8)	0.591	
9. Environmental training for employees (IPP9)	0.805	
10. Use of ISO certifications on quality and/or environmental aspects (IPP10)		0.637
11. Insurance planning to cover potential environmental risks (IPP11)		0.524
12. Procedures' manual including precise instructions on environmental operations in the garage (IPP12)	0.546	
13. Filters and controls on emissions and discharges (IPP13)		0.628
14. Use of "Life cycle analysis" (IPP14)		0.665
Eigenvalues	4.330	1.322
Cronbach alpha	0.754	0.733
Percentage of variance explained	20.21	20.16

^a"Varimax" rotation was performed.

Table A2

Factor loadings of exploratory principal components analysis results of eco-efficient practices^a

Items	Factor 1: ECOF1	Factor 2: ECOF2
1. We always switch off those lights and machines which are not necessary (ECOP1)	0.862	
2. All the water taps are always perfectly closed when they are not in use (ECOP2)	0.723	
3. When possible, we used recycled water to save water (ECOP3)	–	–
4. We systematically separate dangerous wastes of the rest (ECOP4)		0.650
5. We systematically separate all the different kind of wastes (ECOP5)		0.658
6. We are activate to participate in buying and selling in waste markets (ECOP6)		0.538
7. We always avoid wasting the chemical products that we use in the garage (ECOP7)	0.629	
8. We store boxes and papers to use again or recycle them (ECOP8)		0.790
9. We always try to avoid high level of noises with potential to generate fines (ECOP9)	0.523	
Eigenvalues	2.954	1.273
Cronbach alpha	0.720	0.610
Percentage of variance explained	24.47	22.50

^a"Varimax" rotation was performed.

Table A3

Factor loading of exploratory principal components analysis results of stakeholder management^a

Item	Factors		
	Factor 1: STAKHF1	Factor 2: STAKHF2	Factor 3: STAKHF3
1. Competitors (STK1)			0.876
2. Leaders in the sector (STK2)			0.843
3. Customers (STK3)	0.725		
4. Suppliers (STK4)	0.766		
5. Stockholders/owners (STK5)	0.672		
6. Friends and relatives (STK6)	0.613		
7. Employees (STK7)	0.780		
8. Unions (STK8)		0.726	
9. Environmental activists (STK9)		0.879	
Eigenvalues	2.779	1.521	1.261
Cronbach alpha	0.765	0.515	0.695
Percentage of variance explained	28.605	17.514	15.738

^a“Varimax” rotation was performed.

References

- Ajzen, I., Fishbein, M., 1980. Understanding attitudes and predicting social behavior. Prentice-Hall, Englewood Cliffs, NJ.
- Amit, R., Schoemaker, P.J., 1993. Strategic assets and organizational rent. *Strategic Management Journal* 14, 33–45.
- Andersson, L.M., Bateman, T.S., 2000. Individual environmental initiative: championing natural environmental issues in U.S. business organizations. *Academy of Management Journal* 43, 548–570.
- Aragón-Correa, J.A., 1998. Strategic proactivity and firm approach to the natural environment. *Academy of Management Journal* 41, 556–567.
- Aragón-Correa, J.A., Sharma, S., 2003. A contingent resource-based view of proactive corporate environmental strategy. *Academy of Management Review* 28, 71–88.
- Aragón-Correa, J.A., Matias-Reche, F., Senise-Barrio, M.E., 2004. Managerial discretion and corporate commitment to the natural environment. *Journal of Business Research* 57 (9), 964–975.
- Banerjee, S.B., 2001. Managerial perceptions of corporate environmentalism: interpretations from industry and strategic implications for organizations. *Journal of Management Studies* 38, 489–513.
- Bansal, T., 2005. Evolving sustainability. A longitudinal study of corporate sustainable development. *Strategic Management Journal* 26.
- Barney, J.B., 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17, 99–120.
- Barney, J., Wright, M., Ketchen, D.J., 2001. The resource-based view of the firm: ten years after 1991. *Journal of Management* 27, 625–641.
- Barret, S., Murphy, D., 1996. Managing corporate environmental policy: a process of complex change. In: Wehrmeyer, W. (Ed.), *Greening People*. Greenleaf, Sheffield, England, pp. 75–98.
- Bianchi, R., Noci, G., 1998. Greening SMEs’ competitiveness. *Small Business Economics* 11, 269–281.
- Bollen, K.A., Long, J.S., 1993. *Testing Structural Equation Models*. Sage, Newbury Park, CA.
- Bono, J.E., Judge, T.A., 2003. Self-concordance at work: toward understanding the motivational effects of transformational leaders. *Academy of Management Journal* 46, 554–571.
- Brown, R., 1995. *Marketing for Small Firms*. Holt, Rinehart and Winston, London.
- Buyse, K., Verbeke, A., 2003. Proactive environmental strategies: a stakeholder management perspective. *Strategic Management Journal* 24, 453–470.
- Carlson-Skalak, S., 2000. E Media’s Global zero: design for environment in a small firm. *Interfaces* 30, 66–83.
- Céspedes-Lorente, J., Burgos-Jiménez, J., de Álvarezil, M.J., 2003. Stakeholders’ environmental influence. An empirical analysis in the Spanish hotel industry. *Scandinavian Journal of Management* 19, 333–359.
- Chandler, G.N., Hanks, S.H., 1993. Measuring the performance of emerging business: a validation study. *Journal of Business Venturing* 8, 391–408.
- Chen, M., Hambrick, D.C., 1995. Speed, stealth, and selective attack: how small firms differ from large firms in competitive behavior. *Academy of Management Journal* 38, 453–482.
- Christmann, P., 2000. Effects of ‘best practices’ of environmental management on cost advantage: the role of complementary assets. *Academy of Management Journal* 43, 663–680.
- Clemens, B., 2001. Three phases of environmental strategies. *Journal of Environmental Management* 62, 221–231.
- Conner, R.K., Prahalad, C.K., 1996. A resource-based theory of the firm: knowledge versus opportunism. *Organizational Science* 7, 477–501.
- Cordano, M., Frieze, I.H., 2000. Pollution reduction preferences of U.S. environmental managers: applying Ajzen’s theory of planned behavior. *Academy of Management Journal* 43, 627–641.
- Cordano, M., Frieze, I.H., Ellis, K.M., 2004. Entangled affiliations and attitudes: an analysis of the influences on environmental policy stakeholders’ behavioral intentions. *Journal of Business Ethics* 49, 27–40.
- Covin, J.G., Slevin, D.P., 1990. New venture strategic posture, structure and performance: an industry life cycle analysis. *Journal of Business Venturing* 5, 123–135.
- D’Amboise, G., Muldowney, M., 1988. Management theory for small business: attempts and requirements. *Academy of Management Review* 13, 226–240.
- Darnall, N., 2002. Motivations for participating in a US voluntary environmental initiative: the multi-state working group and EPA’s EMS pilot program. In: Sharma, S., Starik, M. (Eds.), *Research in Corporate Sustainability: The Evolving Theory and Practice of Organizations in the Natural Environment*. Edward Elgar Publishing, Inc., Northampton, MA, pp. 123–154.
- Dean, T.J., Brown, R.L., Bamford, C.E., 1998. Differences in large and small firm responses to environmental context: strategic implications from a comparative analysis of business formations. *Strategic Management Journal* 19, 709–728.
- Dean, T.J., Brown, R.L., Stango, V., 2000. Environmental regulation as a barrier to the formation of small manufacturing establishments: a longitudinal examination. *Journal of Environmental Economics and Management* 40, 56–75.
- Eden, L., Levitas, E., Martinez, R.J., 1997. The production, transfer and spillover of technology: comparing large and small multinationals as technology producers. *Small Business Economics* 9, 53–66.
- European Commission, 1999. *The European Observatory for SMEs Fifth Annual Report 1997*. European Network for SME Research, Brussels.
- Fiegenbaum, A., Karnani, A., 1991. Output flexibility: a competitive advantage for small firms. *Strategic Management Journal* 12, 101–114.
- Flannery, B.L., May, D.R., 2000. Environmental ethical decision making in the U.S. metal-finishing industry. *Academy of Management Journal* 43, 642–662.
- Greening, D.W., Gray, B., 1994. Testing a model of organizational response to social and political issues. *Academy of Management Journal* 37, 467–498.
- Greve, M.S., 1989. Environmentalism and bounty hunting. *Public Interest* fall, 15–19.
- Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C., 1998. *Multivariate Data Analysis*, fifth ed. Prentice-Hall, Englewood Cliffs, NJ.
- Hart, S.L., 1995. A natural-resource-based view of the firm. *Academy of Management Review* 20, 874–907.
- Hendry, C., Arthur, M.B., Jones, A.M., 1995. *Strategy Through People: Adaptation and Learning in the Small-Medium Enterprise*. Routledge, London.

- Henriques, I., Sadorsky, P., 1999. The relationship between environmental commitment and managerial perceptions of stakeholder importance. *Academy of Management Journal* 42, 87–99.
- Hillary, R., 2000. Small and Medium-Sized Enterprises and the Environment. Greenleaf, Sheffield.
- Hitt, M.A., Hoskisson, R.E., Harrison, J.S., 1991. Strategic competitiveness in the 1990s: challenges and opportunities for U.S. executives. *Academy of Management Executive* 5, 7–22.
- Jehn, K.A., 1995. A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly* 40, 256–282.
- Judge, W.Q., Douglas, T.J., 1998. Performance implications of incorporating natural environmental issues into the strategic planning process: an empirical assessment. *Journal of Management Studies* 35, 241–262.
- Klassen, R.D., McLaughlin, C.P., 1996. The impact of environmental management on firm performance. *Management Science* 42, 1199–1214.
- Kogut, B., Zander, U., 1996. What firms do? Coordination, identity, and learning. *Organization Science* 7, 502–519.
- Lawrence, P.R., Lorsch, J.W., 1969. *Organization and Environment: Managing Differentiation and Integration*. R.D. Irwin, Homewood, IL.
- Lee, K.S., Lim, G.H., Tan, S.J., 1999. Dealing with resource disadvantage: generic strategies for SMEs. *Small Business Economics* 12, 299–311.
- Lehmann, M., Christensen, P., Larsen, J.M., 2005. Self-regulation and new institutions: the case of Green Network in Denmark. In: Sharma, S., Aragón-Correa, J.A. (Eds.), *New Perspectives in Research on Corporate Sustainability: Corporate Environmental Strategy and Competitive Advantage*. Edward Elgar Publishing, pp. 96–113.
- Lehni, M., 2000. *Eco-efficiency: Creating More Value with Less Impact*. World Business Center for Sustainable Development, Geneva.
- Lescure, M., 1999. Small- and medium-size industrial enterprises in France. In: Odaka, K., Sawai, M. (Eds.), *Small Firms, Large Concerns*. Oxford University Press, Oxford.
- Lumpkin, G.T., Dess, G.G., 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review* 21, 135–172.
- Lyon, D.W., Lumpkin, G.T., Dess, G.G., 2000. Enhancing entrepreneurial orientation research: operationalizing and measuring a key strategic decision making process. *Journal of Management* 26, 1055–1085.
- Majumdar, S.K., Marcus, A.A., 2001. Rules versus discretion: the productivity consequences of flexible regulation. *Academy of Management Journal* 44, 170–179.
- Marcus, A., Anderson, M., 2006. A dynamic capability and the acquisition of competencies in supply chain and environmental management. *Journal of Management Studies* 43, 19–46.
- Marcus, A.A., Geffen, D., 1998. The dialectics of competency acquisition: pollution prevention in electric generation. *Strategic Management Journal* 19, 1145–1168.
- Margolis, J.D., Walsh, J.P., 2003. Misery loves companies: rethinking social initiatives by business. *Administrative Science Quarterly* 48, 268–305.
- Marshall, 1998. *Economic Instruments and the Business Use of Energy*. Stationery Office, London.
- McEvily, W., Marcus, A., 2005. Embeddedness and the acquisition of competitive capabilities. *Strategic Management Journal* 26, 1033–1055.
- Merrit, J.Q., 1998. EM into SME won't go: attitudes, awareness and practices in the London Borough of Croydon. *Business Strategy and the Environment* 7, 90–100.
- Merz, G.R., Sauber, M., 1995. Profiles of managerial activities in small firms. *Strategic Management Journal* 16, 551–564.
- Miles, M.P., Munilla, L.S., McClurg, T., 1999. The impact of ISO 14000 environmental management standards on small and medium sized enterprises. *Journal of Quality Management* 4, 11–122.
- Miles, R., Snow, C., 1978. *Organizational Strategy, Structure and Process*. McGraw Hill, New York.
- Miller, D., 1987. The structural and environmental correlates of business strategy. *Strategic Management Journal* 8, 55–76.
- Miller, D., Friesen, P.H., 1984. *Organizations: A Quantum View*. Prentice-Hall, Englewood Cliffs, NJ.
- Miller, D., Droge, C., Toulouse, J.M., 1988. Strategic process and content as mediators between organizational context and structure. *Academy of Management Journal* 31 (3), 544–569.
- Newton, T., Harte, G., 1997. Green business: Technician kitsch? *Journal of Management Studies* 34, 75–98.
- O'Gorman, C., Doran, R., 1999. Mission statements in small and medium-sized businesses. *Journal of Small Business Management* 37, 59–66.
- Orsato, R.J., den Hond, F., Clegg, S.R., 2002. The political ecology of automobile recycling in Europe. *Organization Studies* 23, 639–665.
- Oswald, S.L., Mossholder, K.W., Harris, S.G., 1994. Vision salience and strategic involvement: implications for psychological attachment to organization and job. *Strategic Management Journal* 15, 477–489.
- Podsakoff, P.M., Organ, D.W., 1986. Self reports in organizational research: problems and prospects. *Journal of Management* 12, 531–544.
- Porter, M.E., 1980. *Competitive Strategy*. The Free Press, New York.
- Powell, T., 1995. Total quality management as competitive advantage: a review and empirical study. *Strategic Management Journal* 16, 15–37.
- Ramus, C.A., Steger, U., 2000. The roles of supervisory support behaviors and environmental policy in employee 'ecoinitiatives' at leading-edge European companies. *Academy of Management Journal* 43, 605–626.
- Rangone, A., 1999. A resource-based approach to strategy analysis in small-medium sized enterprises. *Small Business Economics* 12, 233–248.
- Raymond, L., Bergeron, F., Rivard, S., 1998. Determinants of business process reengineering success in small and large enterprises: an empirical study in the Canadian context. *Journal of Small Business Management* 36, 72–85.
- Risseuw, P., Masurel, E., 1994. The role of planning in small firms: empirical evidence from a service industry. *Small Business Economics* 7.
- Rondinelli, D.A., London, T., 2003. How corporations and environmental groups cooperate: assessing cross-sectoral alliances and collaborations. *Academy of Management Executive* 17, 61–76.
- Roome, N., 1992. Developing environmental management strategies. *Business Strategy and the Environment* 1, 11–24.
- Ruiz-Quintanilla, S.A., Bunge, J., Freeman-Gallant, A., Cohen-Rosenthal, E., 1996. Employee participation in pollution reduction: a socio-technical perspective. *Business Strategy and the Environment* 5, 137–144.
- Rumelt, R., 1984. Toward a strategic theory of the firm. In: Lamb, R. (Ed.), *Competitive Strategic Management*. Prentice-Hall, Englewood Cliffs, NJ, pp. 556–570.
- Russo, M.V., Fouts, P.A., 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal* 40, 534–559.
- Rutherford, R., Blackburn, R.A., Spence, L.J., 2000. Environmental management and the small firm: an international comparison. *International Journal of Entrepreneurial Behaviour and Research* 6, 310–325.
- Schaper, M., 2002. Small firms and environmental management: predictors of green purchasing in Western Australian pharmacies. *International Small Business Journal* 20, 235–251.
- Schmidheiny, S., 1992. *Changing Course: A Global Business Perspective on Development and the Environment*. MIT Press, Cambridge, MA.
- Scott, W.R., 1990. *Ideology and the New Social Movements*. Unwin Hyman, London.
- Scranton, P., 1999. Moving outside manufacturing: research perspectives on small business in twentieth-century America. In: Odaka, K., Sawai, M. (Eds.), *Small Firms, Large Concerns*. Oxford University Press, Oxford.
- Sharma, S., 2000. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal* 43, 681–697.

- Sharma, S., Henriques, I., 2005. Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal* 26, 159–180.
- Sharma, S., Vredenburg, H., 1998. Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal* 19, 729–753.
- Shrivastava, P., 1995. Environmental technologies and competitive advantage. *Strategic Management Journal* 16, 183–200.
- Shuman, J.C., Shaw, J.J., Sussman, G., 1985. Strategic planning in smaller rapid growth companies. *Long Range Planning* 18, 48–53.
- Smeltzer, L.R., Fann, G.L., 1989. Comparison of managerial communication patterns in small, entrepreneurial organizations and large, mature organizations. *Group and Organization Studies* 14, 198–215.
- Smith, M.A., Kemp, R., 1998. *Small Firms and the Environment 1998: A Grounded Report*. Groundwork, Birmingham.
- Stopford, J.M., Baden-Fuller, C., 1994. Creating corporate entrepreneurship. *Strategic Management Journal* 15, 521–536.
- Strategic Planning Institute, 1977. *Selected Findings from the PIMS Program*. Strategic Planning Institute, Cambridge, MA.
- Tarras-Wahlberg, N.H., 2002. Environmental management of small-scale and artisanal mining: the Portovelo–Zaruma goldmining area, southern Ecuador. *Journal of Environmental Management* 65, 165–179.
- Wagner, M., 2005. How to reconcile environmental and economic performance to improve corporate sustainability: corporate environmental strategies in the European paper industry. *Journal of Environmental Management* 76, 105–118.
- Way, S.A., 2002. High performance work systems and intermediate indicators of firm performance within the US small business sector. *Journal of Management* 28, 765–785.
- WBCSD, 2001. *The Business Case for Sustainable Development: Making a Difference Toward the Johannesburg Summit 2002 and Beyond*. World Business Center for Sustainable Development, Geneva.
- Wehrmeyer, W., Parker, K.T., 1996. Identification and relevance of environmental corporate cultures as part of a coherent environmental policy. In: Wehrmeyer, W. (Ed.), *Greening People*. Greenleaf, Sheffield, England, pp. 163–184.
- Wernerfelt, B., 1984. A resource-based view of the firm. *Strategic Management Journal* 5, 171–1804.
- Wheeler, D., Colbert, B., Freeman, R.E., 2003. Focusing on value: reconciling corporate social responsibility, sustainability and a stakeholder approach in a network world. *Journal of General Management* 28, 1–28.
- Williamson, D., Lynch-Wood, G., 2001. A new paradigm for SME environmental practice. *TQM Magazine* 13, 424–432.
- Woo, C.Y., 1987. Path analysis of the relationship between market share, business-level conduct and risk. *Strategic Management Journal* 8, 149–168.
- Yu, T.F., 2001. Toward a capabilities perspective of the small firm. *International Journal of Management Reviews* 3, 185–197.