Strategic Management Journal
Strat. Mgmt. J., **29**: 1225–1240 (2008)
Published online in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/smj.711
Received 14 April 2004; *Final revision received 29 April 2008*

WHY DO PATTERNS OF ENVIRONMENTAL RESPONSE DIFFER? A STAKEHOLDERS' PRESSURE APPROACH

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The objective of this article is to analyze the strategies or patterns of adaptation of firms for responding to environmental requirements or expectations. We specifically analyze the influence of the different pressure agents or stakeholders on the degree of proactivity of these patterns. We therefore propose and validate four types of environmental response pattern, representing particular configurations of both the scope of environmental objectives and their allocation of internal resources. The analysis, which is focused on a sample of 240 industrial firms, provides empirical evidence enabling us to identify, understand, and evaluate the impact of stakeholders on the choice of environmental response pattern.

INTRODUCTION

The strategic management literature has investigated how firms react to environmental pressures from stakeholder groups. One important concern has been to identify where the pressures come from, that is, who are the stakeholder groups that demand environmentally friendly goods (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003; Sharma and Henriques, 2005; Eesley and Lenox, 2006). Other studies focus on actions and resources deployed by firms to meet such demands (Bansal, 2005; Christmann, 2000; Hart, 1995; Sharma and Vredenburg, 1998). There are also studies that test if the pattern of strategic behavior of firms to meet environmental goals is aligned with characteristics of the competitive strategy (Aragón-Correa, 1998; King and Lenox, 2000; Nakamura, Takahashi, and Vertinsky, 2001). Finally, authors such as Cordano and Frieze (2000) and Sharma (2000) also highlight the role of managerial values, attitudes, and interpretations in the decision making regarding corporate environmental commitment.

Taking this research work as a starting point, this study investigates the relationship between the efforts of firms to protect the natural environment and the demands of environmental sustainability they receive from stakeholder groups. For this purpose we propose four patterns of relationships between a firm and its environment that are ordered from less to more commitment to environmental goals. Next we validate if such patterns are correlated with the amount of time and resources firms devote to the implementation of the chosen environmental response. On the other hand, from an almost exhaustive list of stakeholder groups that can put environmental pressures to firms, we investigate if there exists a single dimension of environmental demands that firms attend with more or less proactive behavior, or if there are several dimensions, differentiated across stakeholder groups, that firms have to respond to in a selective way. Then differences in environmentally active firms in the

Keywords: environmental response patterns; environmental proactivity; stakeholders' pressure
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sample are explained as a function of pressures to pursue environmental goals firms perceive from their stakeholders.

The study contributes to the strategy literature by providing a scale of environmental commitment that can be used to appraise the dimension of social business strategy, which has to do with responding to demands of protecting the natural environment that come from all stakeholder groups. Previous research has identified several items that can potentially measure the degree of environmental proactive behavior of firms (Banerjee, 2002; Curkovic, 2003; Aragón-Correa, Matías-Reche, and Senise-Barrio, 2004), but a scale of proactive behavior has not been validated so far. The study contributes to the literature on managing stakeholders' demands by showing that there is a high correlation of environmental demands across stakeholder groups, so when a firm responds to one of them it is responding to them all. So far the literature has provided some intermediate levels of aggregation in the list of stakeholder groups (Buysse and Verbeke, 2003; Henriques and Sadorsky, 1999), but the finding that the list can be further aggregated into a single demand dimension is new in the literature. Finally, the scale of proactive environmental behavior is linearly correlated with the scale of environmental pressure, so we provide empirical evidence of the influence of stakeholders' environmental pressures on environmental behavior.

The article is structured as follows: below we present the main conclusions of the theoretical literature regarding stakeholders' environmental pressure and the degree of proactivity of firms' environmental response patterns and present the hypotheses to be tested. Next, we describe the characteristics of the sample firms, define the variables, and present the methodology. Then we discuss the results and end by summarizing the main conclusions of the study.

CONCEPTUAL FRAMEWORK

Stakeholders' pressure

According to authors such as Hart (1995) and Fineman and Clarke (1996), the management of relationships with the principal interest groups affected by, or simply aware of, the environmental impact of firms is a key strategic factor. As a result, it is of critical importance to identify the leading green stakeholders and appraise their pressure when studying the environmental response patterns of firms.

Henriques and Sadorsky (1999) identify four groups that demand firms to protect the natural environment: *regulatory stakeholders, organizational stakeholders, community stakeholders,* and the *media.* Buysse and Verbeke (2003) propose an alternative classification: *regulatory stakeholders, external primary stakeholders, internal primary stakeholders,* and *secondary stakeholders* (see Table 1).

Nevertheless, the identification of the principal stakeholders of any organization at any given moment is largely an empirical question (Buysse and Verbeke, 2003). In this regard, Mitchell, Agle, and Wood (1997) explain that stakeholders' salience perceived by managers is positively related to the accumulative impact of three attributes over time: power, legitimacy, and urgency. The model proposed by Mitchell *et al.* (1997) has been widely used in environmental management literature (for example, in Harvey and Schaefer, 2001; Jawahar and McLaughlin, 2001; Fernández-Gago and Nieto-Antolin, 2004; and Eesley and Lenox, 2006, among others). According to these arguments, managers' perceptions of stakeholders' salience comprise a reality shaped over time, rather than an objective reality. Furthermore, these perceptions can be significantly influenced by different factors, such as managers' values, characteristics, discretionality, and attitudes (Agle, Mitchell, and Sonnenfeld, 1999; Egri and Herman, 2000; Sharma, 2000). Then managerial interpretations are critical, since they ultimately determine the importance of stakeholders and, consequently, the environmental proactivity of firms (see Figure 1).

In this study we do not try to find out which factors influence the stakeholders' salience perceived by managers at any given moment of time. Our aim is limited to analyzing the influence of this perceived salience on the degree of proactivity of environmental response patterns. Nevertheless, in the same way that Henriques and Sadorsky (1999) and Buysse and Verbeke (2003) do, we synthesize the initially considered green stakeholders, since the correlation that often exists between stakeholders' salience perceived by managers would be an obstacle for the analysis of the proposed relationships in the hypotheses. In accordance with the results of a principal components analysis (PCA) we classify the stakeholders into the following

DOI: 10.1002/smj

Table 1. Classification of stakeholders

CLASSIFICATION BY HENRIQUES AND SADORSKY (1999)			
Regulatory stakeholders	Organizational stakeholders	Community stakeholders	The media
• Governments • Trade associations • Informal networks • Leading firms in environmental matters	• Customers • Suppliers • Employees • Shareholders	• Community groups • Environmental organizations • Other potential lobbies	• Mass media

CLASSIFICATION BY BUYSSE AND VERBEKE (2003)			
Regulatory stakeholders	External primary stakeholders	Internal primary stakeholders	Secondary stakeholders
• National (and regional) governments • Local public agencies	• Domestic customers • International customers • Domestic suppliers • International suppliers	• Employees • Shareholders • Financial Institutions	• Domestic rivals • International rivals • International agreements • Environmental non-governmental organizations • The media

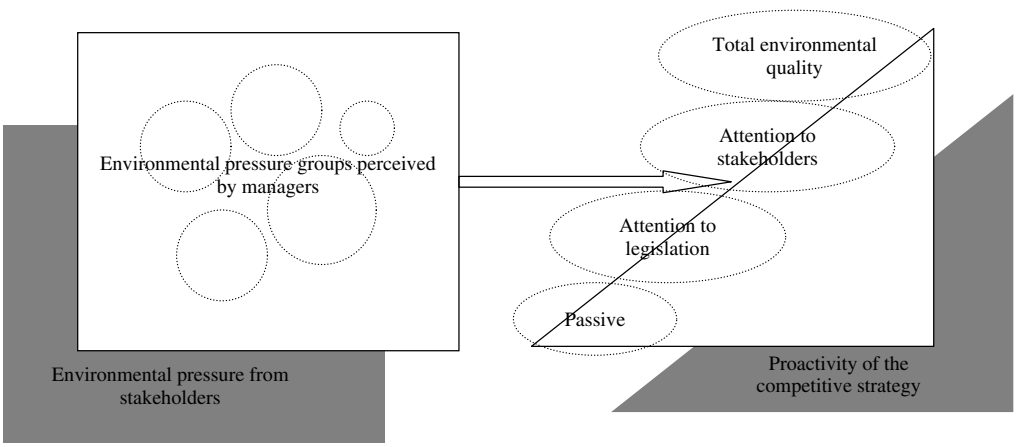


Figure 1. Stakeholders pressure and environmental response

five groups: *corporate government stakeholders, internal economic stakeholders, external economic stakeholders, regulatory stakeholders,* and *social external stakeholders*.

Proactivity of environmental response

According to the classification of environmental strategies established by Hunt and Auster (1990)[1] and Roome (1992),[2] Henriques and Sadorsky (1999) classify the different approaches to environmental issues as follows: *reactive strategy, defensive strategy, accommodative strategy,* and *proactive strategy*. Buysse and Verbeke (2003) refer to the classification established by Hart (1995)[3] and

[1] Hunt and Auster (1990) propose a classification of environmental strategies into five categories: beginner, firefighter, concerned citizen, pragmatist, and proactivist.

[2] Roome (1992) proposes five categories of environmental strategy: noncompliance, compliance, compliance plus, commercial and environmental excellence, and leading edge.

[3] Hart (1995) distinguishes four kinds of resource-based environmental approaches: the end-of-pipe approach, the pollution prevention or total quality management (TQM) approach, the product stewardship approach, and the sustainable development approach.

DOI: 10.1002/smj

propose an alternative classification into three categories of environmental strategy: *reactive strategy, pollution prevention,* and *environmental leadership*.

The different environmental strategies considered by Henriques and Sadorsky (1999) and Buysse and Verbeke (2003) are consistent with the scheme generally set forth in the literature (Schot, 1992; Steger, 1993; Post and Altman, 1994; Vastag, Kerekes, and Rondinelli, 1996; Aragón-Correa, 1998). This scheme is based on a *continuum* of internally consistent patterns of environmental practices ranging from the least advanced, which are not involved in protecting the natural environment or are limited to reacting to mandatory legislative requirements, to the most advanced, which voluntarily make environmental protection a focal point in the creation of competitive advantages. According to this scheme, patterns of environmental response differ in their degree of proactivity, that is, in their tendency to anticipate needs (related to environmental protection) and introduce changes voluntarily rather than as a reaction to environmental requirements and demands (Aragón-Correa, 1998; Aragón-Correa and Sharma, 2003; Sharma and Vredenburg, 1998).

In this study we refer to the degree of proactivity to propose four types of environmental response pattern: *passive response, attention to legislation response, attention to stakeholders' response,* and *total environmental quality response.* Each of these patterns represents a specific and internally consistent configuration of both the scope of environmental objectives and the allocation of internal resources to achieve them.

The validation of the proposed types enables us to present the most proactive environmental response patterns as those involving stakeholder management (periodical reports to shareholders/owners and clients, environmental requirements to suppliers), investment in environmental research and development, the adoption of measures aimed at both preventing and correcting pollution, staff training in environmental issues, and the allocation of environmental responsibilities. These aspects were selected considering the management practices that others such as Henriques and Sadorsky (1999), Banerjee (2002), Buysse and Verbeke (2003), Curkovic (2003) and Aragón-Correa *et al*. (2004) have associated to environmental proactivity, with consistent results.

Aragón-Correa (1998) provides empirical evidence of the relationship between business strategy and environmental approach. He shows that firms with more proactive business strategies have more advanced approaches to the natural environment. We have also considered this aspect when validating the proposed types of environmental response patterns (see Figure 1). We use an approach similar to that of Aragón-Correa (1998) and measure proactivity through indicators of what Miles and Snow (1978) describe as '*prospector firms,*'[4] based on three strategic dimensions: entrepreneurial, engineering, and administrative dimension.[5] We specifically use aspects such as degree of diversification, degree of internationalization, innovative tendencies, use of technological advances, and organizational flexibility to measure the overall proactivity of firms. The results obtained are consistent with those of Aragón-Correa (1998). We discover a positive association between environmental proactivity and all the aspects considered when measuring overall proactivity, except degree of diversification.

Hypotheses

In this study we analyze the relationship between stakeholders' pressure perceived by managers and the degree of proactivity of environmental response patterns. We use an approach similar to that of Henriques and Sadorsky (1999) and Buysse and Verbeke (2003), but our hypotheses are different.

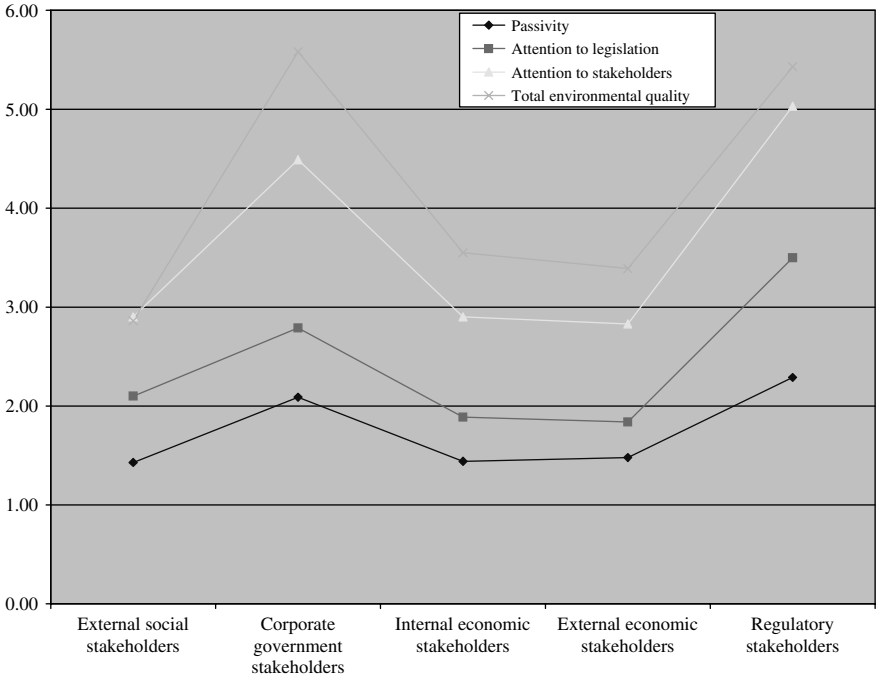
First, these authors consider different dimensions of the stakeholders' demand for environmental protection. The authors establish differences between stakeholder groups when they consider how the type of approach to the natural environment influences how the stakeholders are perceived.[6] Although we also contemplate different stakeholder groups, we do not distinguish between

[4] Miles and Snow (1978: 29) define prospector organizations as *'organizations which almost continually search for market opportunities and they regularly experiment with potential responses to emerging environmental trends. Thus these organizations often are the creators of change and uncertainty to which their competitors must respond.*'

[5] *Entrepreneurial dimension* refers to the firm's market orientation; *engineering dimension* refers to the technologies and processes used in the firm's principal activity; and, finally, *administrative dimension* refers to how strategies are coordinated and implemented within the firm.

[6] For example, Henriques and Sadorsky (1999) consider that the perceived importance of regulatory stakeholders will be higher for firms with defensive and accommodative profiles. However,

DOI: 10.1002/smj



[a] The variables that measure the stakeholders´ salience perceived by managers take values from 1 to 7.

Figure 2. Perceived pressure from stakeholders according to environmental response patterns[a]

them in their relationships with environmental response patterns. When we analyze these relationships we consider that managers perceive only one dimension of stakeholders' demand. The reason that leads us to consider managers' perceptions in this way is based on the empirical evidence that we obtained in the preliminary analyses. Indeed, although the four environmental response patterns prioritize the perceived pressures from stakeholder groups in different ways (as in Henriques and Sadorsky, 1999; and Buysse and Verbeke, 2003), these differences do not prevent the effect that the greater the stakeholder pressure perceived by managers, the more proactive is the firm's environmental response pattern, for every stakeholder group we consider (see Figure 2). We find a possible explanation for these results in the influence that managers' values and characteristics might have on the subjective perceptions of these pressures. These preliminary results lead us to consider the possibility that a high correlation might exist between the perceived pressures coming from different stakeholder groups. Thus, we propose Hypothesis 1. The acceptance of this hypothesis would mean to agree that the stakeholders' pressure perceived by managers can be analyzed across a single dimension:

> *Hypothesis 1: Managers perceive only one dimension of stakeholders' demand for environmental protection, rather than different demands coming from different stakeholder groups.*

On the other hand, authors such as Regens, Sheldon, and Elliott (1997) highlight the great power of government regulation to influence firms' environmental responses. Indeed, the efficacy of regulatory systems based on the coercive power of the authorities has been clearly accepted in the literature (Hahn and Stavins, 1992; Paton, 2000). However, governmental authorities are not the only group of stakeholders capable of influencing the environmental conduct of firms. Possibly, the clearest evidence of the disciplinary power of

the perceived importance of organizational stakeholders will be higher for proactive firms. As far as Buysse and Verbeke (2003) are concerned, they consider that the perceived importance of regulatory pressures is higher for firms adopting a pollution prevention strategy, while firms adopting an environmental leadership strategy are more likely to attach high importance to secondary stakeholders.

DOI: 10.1002/smj

other stakeholders is found in the proven efficacy of more flexible quasi-regulatory instruments such as, for instance, those based on the disclosure of information.[7] Actually, the publication of firms' environmental results is an effective regulatory element, given the ability of different stakeholders (consumers, environmentalist groups, financial institutions, insurance companies, and investors) to discipline the environmental behavior of firms (Cohen, 2001; Tietenberg and Wheeler, 2001).

Based on this evidence, we accept that stakeholders are capable of disciplining the environmental behavior of firms. In contrast, Henriques and Sadorsky (1999) and Buysse and Verbeke (2003) study the impact of the type of approach to the natural environmental on the importance attached by managers to stakeholder groups. Buysse and Verbeke (2003) indicate that work can be done in both directions when studying this causal relationship: *'stronger environmental proactiveness likely leads to more sensitivity to stakeholder pressures, but these pressures may themselves trigger more proactiveness in environmental strategy'* (Buysse and Verbeke, 2003: 460). However, both Henriques and Sadorsky (1999) and Buysse and Verbeke (2003) analyze the perceived importance of stakeholders as a dependent variable. Thus, we propose Hypothesis 2, which, according to our knowledge of literature, has not been explicitly estimated before:

> *Hypothesis 2: The greater the stakeholders' environmental pressure perceived by managers, the more proactive is the environmental response of firms.*

EMPIRICAL BASIS

The sample

The population studied is represented by industrial firms with at least three employees located in Aragón. Aragón is a medium-sized 47, 669 km^2 region in the northeastern part of Spain.[8] In order to obtain the information necessary for the analysis, we sent a questionnaire to 3,985 firms from this population in July, 2003, by regular mail.[9] The questionnaire was addressed to the person responsible for environmental issues or, if there was no such person, to the general manager. We used literature on the topic as a basis to design the questionnaire and obtain detailed information about pressure from stakeholders and the firm's environmental response pattern. The survey also attempted to obtain information about certain aspects of their overall strategy. We had the collaboration of an expert panel in order to validate the content of the questionnaire.[10]

The period established for receiving replies was three months, by which time we had received 240 validly completed surveys.[11] The descriptive characteristics of the sample firms are detailed in Table 2.

Definition and validation of variables and initial evidence

This study proposes 14 groups of stakeholders capable of influencing environmental behaviors (see Table 3). The selection of these 14 pressure groups has content validity, because it is consistent with the literature on the topic and the opinions of the expert panel.[12] The variables presented in the first column of Table 3 reflect the environmental pressure from each stakeholder group perceived by managers. We measured these variables through seven-point Likert scales, where a value of 1 indicates 'not at all important pressure' and a value

[7] The most evident examples of this type of initiative are the TRI (Toxic Release Inventory) and EPER (European Pollutant Emission Register) databases, which publish the environmental results of U.S. and European firms, respectively.

[8] According to the Spanish National Account figures published by the National Statistics Institute, its economy represented 3.1 percent of Spain's gross domestic product in 2005.

[9] Access to this population was possible thanks to the cooperation of the Industrial Development Service of the Regional Government of Aragón, which provided us with a directory of all industrial firms registered in Aragón up to May, 2003. According to the National Statistics Institute, these industrial firms—we did not include firms in the construction, trade, and other services sector—represent 9.53 percent of the national total.

[10] The expert panel was formed by 11 people: six business professionals (managers), four representatives from national and regional public institutions, and one academic. All of them were familiar with the management of environmental issues at firms and/or public institutions. Using Likert scales with 11 categories (from 0 to 10) they appraised two aspects of the initial questionnaire: how easy it was to understand the items and their relevance for the object of the study. They were also invited to add new items of interest for this research.

[11] We considered a questionnaire to be valid when the respondent had answered at least 75 percent of the questions relevant to the analysis.

[12] 'Administration control,' for example, was classified as a different stakeholder than 'environmental legislation' as a result of the opinion of some expert panel members.

DOI: 10.1002/smj

Table 2. Description of the sample[a]

Variable	Description	%
SIZE: Number of employees	Less than 50 employees	73.58%
	From 50 to 250 employees	18.13%
	More than 250 employees	8.29%
SECTOR[c]	Food, beverage and tobacco	16.52%
	Textiles and tailored goods	7.83%
	Wood and cork	4.35%
	Paper; printing, graphic arts	5.65%
	Chemicals	6.09%
	Metallurgy	20.00%
	Machinery manufacturing	6.96%
	Electrical, electronics and optical materials/equipment	9.13%
	Manufacturing of transport materials	4.78%
	Various manufacturing industries	7.39%
	Others[b]	11.30%
FIRM OWNERSHIP	A single shareholder	11.50%
	A small number of shareholders	80.80%
	A large number of shareholders	7.60%

[a] Percentages calculated based on the number of responses obtained for each variable.
[b] The 'Others' category includes the sectors representing less than 4% of the sample.
[c] National Classification of Economic Activities (CNAE-93)

Table 3. Perceived pressures-proactivity of the environmental response

STAKEHOLDERS TYPES		Environmental response patterns					
		Passive	Attention to legislation	Attention to stakeholders	Total environmental quality		
		N = 45[a]	N = 112[a]	N = 53[a]	N = 21[a]	ANOVA[d]	
	$\overline{x}$[a]	$\overline{x}_{S1}$[b]	$\overline{x}_{S2}$[b]	$\overline{x}_{S3}$[b]	$\overline{x}_{S4}$[b]	F[b]	F[c]
Managers	3.43	2.23	3.00	4.64	5.48	25.73	29.08
Shareholders/owners	3.18	1.97	2.60	4.46	5.58	32.11	35.16
Employees	2.45	1.73	2.13	3.17	3.95	16.65	24.73
Labor unions	2.01	1.37	1.77	2.59	3.14	11.12	10.52
Customers	2.63	1.68	2.10	3.82	4.19	24.38	23.31
Suppliers	1.86	1.35	1.74	2.42	2.19	6.26	9.24
Financial institutions	1.63	1.31	1.44	1.98	2.47	7.97	9.77
Insurance companies	2.27	1.38	2.04	2.74	4.10	15.02	15.85
Competitors	2.53	1.68	2.00	3.72	4.25	25.33	28.43
Environmental legislation	3.94	2.42	3.60	5.37	5.62	25.08	25.72
Administration control	3.66	2.30	3.45	4.71	5.24	17.35	19.68
The media	2.34	1.71	2.13	3.12	3.00	8.98	11.76
Citizens/communities	2.42	1.40	2.34	3.14	3.24	10.80	10.00
Ecologist organizations	2.02	1.54	1.86	2.59	2.33	4.87	7.65

[a] Absent cases are excluded according to the variable.
[b] Absent cases are excluded according to the pair of variables.
[c] Absent cases are excluded according to the total list of variables.
[d] $p < 0.05$ in all cases.

of 7 indicates 'extremely important pressure.' The second column of Table 3 presents the mean values of these 14 variables, from which we can infer that the stakeholders that exercise the greatest pressure on firms are those related to direct environmental regulation and corporate government.

DOI: 10.1002/smj

The study's final objective required us to define a variable that would measure the proactivity of environmental responses. We called this variable 'environmental proactivity' (EP) and it was designed considering four categories of environmental response patterns: *passive response, attention to legislation response, attention to the stakeholders' response,* and *total environmental quality response*, with assigned proactivity values from 1 to 4 respectively. The definition of each of these four levels of the EP variable is shown in Table 4, by means of a list of associated environmental practices (voluntary work associated to environmental objectives, allocation of time and financial resources to environmental issues, adoption of more or less preventive technical and organizational measures, existence of an environmental management system, and finally, assignment of environmental responsibilities at the firm). These definitions were included in the questionnaire and the respondents were asked to choose the most appropriate description applicable to environmental management at their firms, and also to identify the characteristics that led them to choose such a description.[13]

As regards the validity of the self-classification variable, EP, it has content validity, first because the expert panel played an active role in defining proactivity levels and, second, because respondents were required to comply with at least three of the characteristics of the environmental response pattern chosen in the questionnaire. Moreover, in order to obtain evidence of convergent validity, the survey included 14 indicators of environmental

[13] For this purpose, we informed the respondents that, in order to identify with one of the four descriptions (the names of the categories were omitted) it was necessary to comply with at least three of the characteristics.

Table 4. Environmental response patterns

Description 1:
- The environmental objective is not an objective currently pursued by your firm.
- Your firm hardly dedicates any time and/or financial resources to environmental protection.
- Your firm does not adopt any kind of technical or organizational environmental protection measure.
- Your firm does not plan to obtain environmental certifications.
- Your firm does not have any person who is responsible for dealing with environmental matters.

Description 2:
- The environmental objective of your firm consists only of complying with legislation on environmental matters.
- Your firm dedicates only the time and financial resources to environmental protection that are necessary to comply with legislation.
- The environmental measures adopted by your firm have not involved any significant change in the production and work methods, or in the organizational structure.
- The environmental measures adopted by your firm are not certified.
- Environmental matters in your firm are resolved by external professionals and/or by internal personnel who are not exclusively dedicated to the environment.

Description 3:
- The environmental objective of your firm is not just limited to complying with legislation on the environment, but rather it also attends to the requirements of customers, suppliers... on the subject.
- Your firm dedicates the necessary time and resources to environmental protection in order to comply with legislation and, furthermore, in order to attend to environmental pressures from other agents.
- The environmental measures adopted by your firm have required modification of production and work methods and/or modification of the organizational structure.
- Some of the environmental measures adopted by your firm are certified or are in the process of being certified.
- The firm regularly requests the services of external professionals specializing in environmental matters and/or has qualified internal personnel to take care of these matters.

Description 4:
- The environmental objective is one of the priority objectives of your firm.
- Your firm dedicates important budgets to environmental protection for reasons that go beyond complying with legislation and attending to pressures from other agents.
- The environmental measures adopted by your firm are highly relevant to conditioning both production processes and organizational structure and how work is performed at your firm.
- The environmental measures adopted by your firm are certified.
- The responsibility for environmental matters is clearly assigned to one or various persons of your firm who are specialized in this matter and/or to a department.

DOI: 10.1002/smj

Table 5. Convergent validity of the variable 'proactivity of the environmental response'

Indicators of proactivity of the environmental response				Environmental response patterns					
				Passive	Attention to legislation	Attention to stakeholders	Total environmental quality		
				N = 45[a]	N = 112[a]	N = 53[a]	N = 21[a]	ANOVA[d]	
		r	$\overline{x}$[a]	$\overline{x}_{R1}$[b]	$\overline{x}_{R2}$[b]	$\overline{x}_{R3}$[b]	$\overline{x}_{R4}$[b]	F[b]	F[c]
E1	Your firm is resigned to comply with the minimum required by environmental legislation.	−0.31	3.94	4.37	4.44	3.25	2.24	10.52	7.96
E2	The environmental objectives are perfectly defined at your firm.	0.59	3.87	2.08	3.59	4.87	6.19	29.09	34.62
E3	The budget for environmental investment represents an important percentage of the total investment budget of your firm.	0.48	2.55	1.54	2.13	3.38	4.45	22.12	19.79
E4	Investment in environmental R&D (research and development) represents an important percentage of the total R&D of your firm.	0.36	2.09	1.41	1.81	2.64	3.40	12.67	11.66
E5	Your firm uses some environmental impact correction measures such as, for example, purifiers, waste treatment, and/or recycling, soil restoration, air filters...	0.49	4.78	2.93	4.60	5.89	6.43	23.98	19.21
E6	Your firm attempts to substitute the raw materials/products used that pollute the most with others that pollute less.	0.34	4.65	3.61	4.50	5.23	5.95	8.80	8.59
E7	At your firm, technologies are used that minimize the pollution produced and that prevent a subsequent purification and/or waste treatment process.	0.42	4.47	3.24	4.19	5.51	5.71	15.24	14.54
E8	The employees at your firm receive training on environmental questions.	0.58	3.56	2.22	3.01	4.72	6.10	32.18	31.95
E9	Environmental protection is one of the basic values of your firm's policies.	0.60	3.93	2.63	3.42	5.00	6.29	29.41	33.73
E10	Environmental matters are preferably resolved by internal personnel at your firm.	0.39	4.02	3.10	3.59	4.92	5.71	13.99	13.30
E11	It is clearly established who on the staff at your firm assumes the environmental responsibilities.	0.50	4.43	3.00	4.00	5.70	6.19	22.45	23.29
E12	Your firm periodically prepares an environmental report for the shareholders or owners.	0.56	2.26	1.51	1.48	2.88	6.19	60.43	53.13

DOI: 10.1002/smj

Table 5. (*Continued*)

Indicators of proactivity of the environmental response				Environmental response patterns					
				Passive	Attention to legislation	Attention to stakeholders	Total environmental quality		
				N = 45[a]	N = 112[a]	N = 53[a]	N = 21[a]	ANOVA[d]	
		r	$\overline{x}$[a]	$\overline{x}_{R1}$[b]	$\overline{x}_{R2}$[b]	$\overline{x}_{R3}$[b]	$\overline{x}_{R4}$[b]	F[b]	F[c]
E13	Your firm reports its environmental behavior to its customers.	0.50	2.49	1.73	1.78	3.49	5.20	32.81	30.36
E14	Your firm requires its suppliers to be environmentally certified.	0.36	2.13	1.55	1.70	2.74	3.95	13.90	12.55
G1	Degree of diversification of the firm.	−0.03	2.26	2.41	2.24	2.15	2.30	0.16	0.10
G2	Degree of internationalization of the firm.	0.39	3.00	2.14	2.57	3.53	5.76	15.27*	14.11
G3	The firm undertakes innovative projects, in spite of the associated risk.	0.35	3.83	2.93	3.57	4.88	4.57	10.72*	10.98
G4	Use of new information and communication technologies.	0.22	4.63	4.30	4.40	5.11	5.50	3.85*	4.07
G5	R&D investment.	0.41	3.48	2.71	2.99	4.32	5.30	13.16*	15.87
G6	Employee involvement in decision-making process.	0.23	3.76	3.67	3.46	4.19	4.75	3.65*	4.32

[a] Absent cases are excluded according to the variable.
[b] Absent cases are excluded according to the pair of variables.
[c] Absent cases are excluded according to the total list of variables.
[d] $p < 0.05$ in all cases except variable G1.

activity—E1 to E14—and six indicators of overall strategy proactivity—G1 to G6—(see Table 5). We measured these 20 variables using seven-point Likert scales, where a value of 1 means that the respondent does not at all agree with the item and a value of 7 means that the respondent completely agrees with the item. The correlations between each of these variables (E1 to E14 and G1 to G6) and the EP variable, which are shown in the first column of Table 5, show initial evidence of the convergent validity of the EP variable.[14] As additional evidence of convergent validity, Table 5 presents the results of an analysis of variance. The results of this analysis enable us to reject the null hypothesis of equal means in the variables across the levels of the EP variable in all except one case (G1). Then these results provide evidence of convergent validity of the self-classification variable EP and show the consistence of our environmental response patterns with the types previously proposed in the literature and certain aspects of firms' overall strategy.

Returning to Table 3 and the results presented in the first row, approximately one-half of the firms (112) identified with the *attention to legislation response*. Only 20 percent identified with the *passive response* (45 firms). The remaining firms identified with the *attention to the stakeholders' response* (53 firms), and, to a lesser extent, with a *total environmental quality response* (21 firms).

Table 3 also shows the mean values of perceived pressure from stakeholders according to environmental proactivity level (EP variable). An analysis of variance was performed based on these mean values (see Table 3). The initial evidence provided by this study indicates the existence

[14] All the items except G1 present significant correlations with the environmental response proactivity variable.

DOI: 10.1002/smj

Table 6. Goodness-of-fit statistics and indices

Estimated models		d.f.	χ^2 S-B	R-RMSEA	SRMR	GFI	AGFI	R-BBN	R-CFI
FOCFA-1D	Unidimensional	77	405.170	0.156	0.089	0.636	0.504	0.769	0.803
FOCFA-4D	4 dimensions	71	201.56	0.140	0.063	0.761	0.647	0.847	0.922
FOCFA-5D	5 dimensions	67	149.360	0.084	0.052	0.831	0.734	0.915	0.950
SOCFA-5D	5 dimensions	72	170.776	0.088	0.061	0.805	0.716	0.903	0.941
SEM- SOCF -5D	5 dimensions	85	194.297	0.085	0.066	0.791	0.705	0.897	0.939

CFAFO-*N*D: First-Order Confirmatory Factor Analysis Model with *N* Dimensions.
CFASO-*N*D: Confirmatory Factor Analysis Model with 1 Second-Order Dimension and *N* First-Order Dimensions.
SEM-CFSO-*N*D: Structural Equation Model with a Confirmatory Factor Analysis Model with 1 Second-Order Dimension and *N* First-Order Dimensions.

of a positive relationship between stakeholder pressures perceived by managers and the degree of proactivity of firms' environmental response.[15] The results in Table 3 also show that the trend of the relationship between perceived pressure and proactivity is similar for all stakeholders. This shows a need for a more in-depth analysis of the set of pressure groups and their impact on environmental response patterns.

Methodology

Since the number of variables for analyzing stakeholder pressure was too large in relation to the size of our sample, we considered the possibility of identifying an underlying structure in the set of 14 variables, which would enable us to consider a smaller number of variables when analyzing their effect on the representative strategic environmental behavior variable. Determining the underlying structure in a set of variables requires the specification of latent dimensions, namely variables that are not susceptible to direct observation. They are inferred based on a set of observed variables and may present measurement errors. The models specified for this purpose are commonly called *measurement models*.

In order to relate different measurement models with other variables, *structural equation models* are appropriate. The basic tools of our research therefore comprise structural equation models with latent variables (SEM) and an analysis of the covariance structure. More specifically, in this research we use the maximum likelihood (ML) estimation method, thereby using the 'robust' covariance matrix as the base (Satorra and Bentler, 1994; Bentler and Dudgeon, 1996; Rivera and Satorra, 2002).

RESULTS

The first step in our analysis consists of exploratory testing using principal components analysis on the set of variables representing the 14 stakeholder pressure groups. The results of this first exercise suggest the existence of an underlying structure in the set of variables.[16]

From the results of the exploratory analyses, two possible structures can be specified *a priori*: a unidimensional model and two multidimensional models with four and five dimensions respectively. Once these possible structures are determined *a priori*, we propose various confirmatory factor analysis models in order to judge the suitability of those three structures (Tables 6 and 7). The five-dimension model presents better results in terms of goodness-of-fit indices and statistics[17] (Table 6). With regard to the estimated parameters in this model, note that all the factor loadings reach values exceeding 0.7, where the reliability coefficients of the observed variables (R^2) exceed 0.5 (Table 7).

[15] The results enable us to reject the null hypothesis of equal means in the 14 stakeholder groups across the proactivity levels ($p < 0.05$).

[16] After retaining up to five initial components, the observation of both the commonalities of the observed variables and the percentages of explained variance of the components shows the existence of an underlying structure. Furthermore, the first component explains almost 60 percent of the total variance and all the commonalities of the observed variables exceed 0.50.

[17] The choice from among the possible measurement models is based on chi-square difference tests (χ^2S-B), specifically the Lagrange multiplier (LM) test (Bentler, 1995) and the modification index (MI) (Jöreskog and Sörbom, 1996). The use of these tests involves accepting the models with more parsimony, meaning those models that have more degrees of freedom (providing that they have reasonable fit statistics).

DOI: 10.1002/smj

Table 7. Parameters and reliability coefficients

		FOCFA-1D		FOCFA-4D						FOCFA -5D							SOCFA -5D							
		F	R^2		F1	F2	F3	F4	R^2		F1	F2	F3	F4	F5	R^2		F1	F2	F3	F4	F5	F6	R^2
x_1	Managers	0.71	0.50	x_1	0.84				0.71	x_1	0.91					0.83	x_1	0.91						0.83
x_2	Shareholders/owners	0.70	0.49	x_2	0.83				0.69	x_2	0.87					0.76	x_2	0.88						0.77
x_3	Employees	0.74	0.55	x_3	0.83				0.69	x_3		0.94				0.88	x_3		0.93					0.86
x_4	Labor unions	0.68	0.46	x_4	0.70				0.49	x_4		0.80				0.64	x_4		0.81					0.66
x_5	Customers	0.73	0.53	x_5		0.79			0.62	x_5			0.79			0.62	x_5			0.80				0.64
x_6	Suppliers	0.74	0.54	x_6		0.81			0.66	x_6			0.82			0.68	x_6			0.80				0.64
x_7	Financial institutions	0.75	0.56	x_7		0.84			0.71	x_7			0.84			0.71	x_7			0.83				0.70
x_8	Insurance companies	0.72	0.52	x_8		0.76			0.58	x_8			0.76			0.58	x_8			0.76				0.57
x_9	Competitors	0.76	0.58	x_9		0.80			0.63	x_9			0.80			0.63	x_9			0.82				0.66
x_{10}	Environmental legislation	0.76	0.58	x_{10}			0.92		0.85	x_{10}				0.93		0.86	x_{10}				0.92			0.84
x_{11}	Administration control	0.78	0.60	x_{11}			0.92		0.85	x_{11}				0.92		0.85	x_{11}				0.93			0.87
x_{12}	The media	0.77	0.60	x_{12}				0.87	0.76	x_{12}					0.87	0.76	x_{12}					0.87		0.76
x_{13}	Citizens/communities	0.74	0.55	x_{13}				0.84	0.71	x_{13}					0.84	0.71	x_{13}					0.84		0.71
x_{14}	Ecologist organizations	0.73	0.53	x_{14}				0.81	0.66	x_{14}					0.82	0.67	x_{14}					0.82		0.67
CF1 (Fornell and Larcker)[b]		0.54		**CF1**	0.64	0.64	0.85	0.71		**CF1**	0.79	0.76	0.64	0.85	0.71		**CF1**	0.80	0.76	0.64	0.86	0.71	0.69	
CF2 (Omega)[c]		0.94		**CF2**	0.88	0.90	0.92	0.88		**CF2**	0.89	0.86	0.90	0.92	0.88		**CF2**	0.89	0.86	0.90	0.92	0.88	0.92	
				F1	1					**F1**	1						**F1**						0.82	0.67
				F2	0.74	1				**F2**	0.76	1					**F2**						0.82	0.67
				F3	0.74	0.67	1			**F3**	0.62	0.72	1				**F3**						0.85	0.72
				F4	0.70	0.77	0.76	1		**F4**	0.73	0.61	0.67	1			**F4**						0.83	0.69
										F5	0.63	0.65	0.75	0.75	1		**F5**						0.85	0.73

FOCFA-*N*D: First-Order Confirmatory Factor Analysis Model with *N* Dimensions.
SOCFA-*N*D: Confirmatory Factor Analysis Model with 1 Second-Order Dimension and *N* First-Order Dimensions.
[a] $p < 0.00$
[b] Fornell and Larcker (1981)
[c] McDonald (1985)

Moreover, the magnitude of the reliability coefficients of the latent variables or dimensions (CF1 and CF2) is indicative of reliability and convergent validity. With regard to discriminant validity, the factor loadings (correlations between the observed variables and their respective dimensions) exceed the correlations that are observed between the dimensions, so we can conclude that the proposed structure presents sufficient evidence of the validity of multidimensional constructs (Bagozzi, 1980; 1982a; 1982b; 1984).[18]

In sum, from the results presented in Tables 6 and 7 we can conclude that the environmental pressure perceived by the managers of the sample firms comes from five stakeholder groups (F1–F5). With reference to the items they represent, they have been called as follows: *corporate government stakeholders* (F1), *internal economic stakeholders* (F2), *external economic stakeholders* (F3), *regulatory stakeholders* (F4), and *external social stakeholders* (F5).

However, after observing the correlation matrix between the dimensions that represent these five pressure groups in Table 7, and in view of the good results of the unidimensional model in terms of reliability, we consider the possibility of a second-order factor, which synthesizes the five dimensions described above (F6). As a result, we estimate a second-order confirmatory factor analysis model with five first-order dimensions. The results of this analysis, shown in Tables 6 and 7, lead us to accept the existence of a second-order factor capable of summarizing the information contained in the five first-order dimensions.[19]

Then the results show that the pressure from different stakeholders is perceived by managers as one, which leads us to accept Hypothesis 1, which states that managers perceive only one dimension of stakeholders' demand for environmental protection. This means that, when they perceive pressure from one of the five stakeholder groups we have identified, they also perceive pressure from the rest. We have found a possible explanation for this in Agle *et al*. (1999), Sharma and Nguan (1999), and Sharma (2000), who show that the values, characteristics, and attitudes of managers influence how they interpret environmental issues.

Finally, in order to validate the proposed structure of 'perceived environmental pressure' within the theoretical framework (nomological validity), we include the 'environmental proactivity' variable in our model. The result is a structural equation model with five first-order dimensions and a second-order factor. The latter determines the firms' 'environmental proactivity,' which is the endogenous variable of the measurement model based on the observed 'proactivity of environmental response' variable. As shown in Figure 3, this causal model adequately represents the observed relationships.[20] The parameter of interest reaches a value of 0.67 ($R^2 = 0.45$). This result leads us to accept Hypothesis 2, as it confirms the existence of a positive and significant impact of perceived pressures from green stakeholders on the degree of proactivity of environmental response patterns.

CONCLUSIONS

Using literature on the topic as a reference, this study analyses the ability of stakeholders to discipline the environmental behavior of firms. According to the results obtained from a sample of Spanish industrial firms, managers, or the people responsible for environmental matters, perceive environmental pressure from different stakeholder groups. Managers attach the greatest importance to two of these groups, *regulatory stakeholders* and *corporate government stakeholders*. Furthermore, managers also perceive pressure from other, either internal or external, agents: *external economic stakeholders, internal economic stakeholders,* and *external social stakeholders*.

The results also enable us to conclude that, in general, when managers perceive pressure from any of these five groups of stakeholders, they

[18] Bagozzi's methodological approach (1980; 1982a; 1982b; 1984) for validating multidimensional constructs presents two kinds of evidence. The first refers to the internal structure of the construct, meaning *reliability, convergent validity,* and *discriminant validity*. The second is related to the subsequent utility of the instrument, meaning the *predictive* or *nomological validity* of the measurement model.

[19] Note the great stability observed in the estimated parameters of this model, in the factor loadings and in all the reliability indices (slight differences in the hundredths) pertaining to the first-order dimensions. Moreover, the factor loadings of the first-order dimensions with respect to the second-order factor are 0.82, 0.82, 0.85, 0.83, and 0.85 respectively, and the two reliability coefficients of the second-order factor are 0.69 (Fornell and Larcker coefficient) and 0.92 (omega coefficient). Note that the increase in degrees of freedom compensates the weak variation of the goodness-of-fit statistics and indices.

[20] The stability observed in the estimated parameters accounts for the robustness of the analyses shown (there are differences only in the hundredths in the first- and second-order factor loadings).

DOI: 10.1002/smj

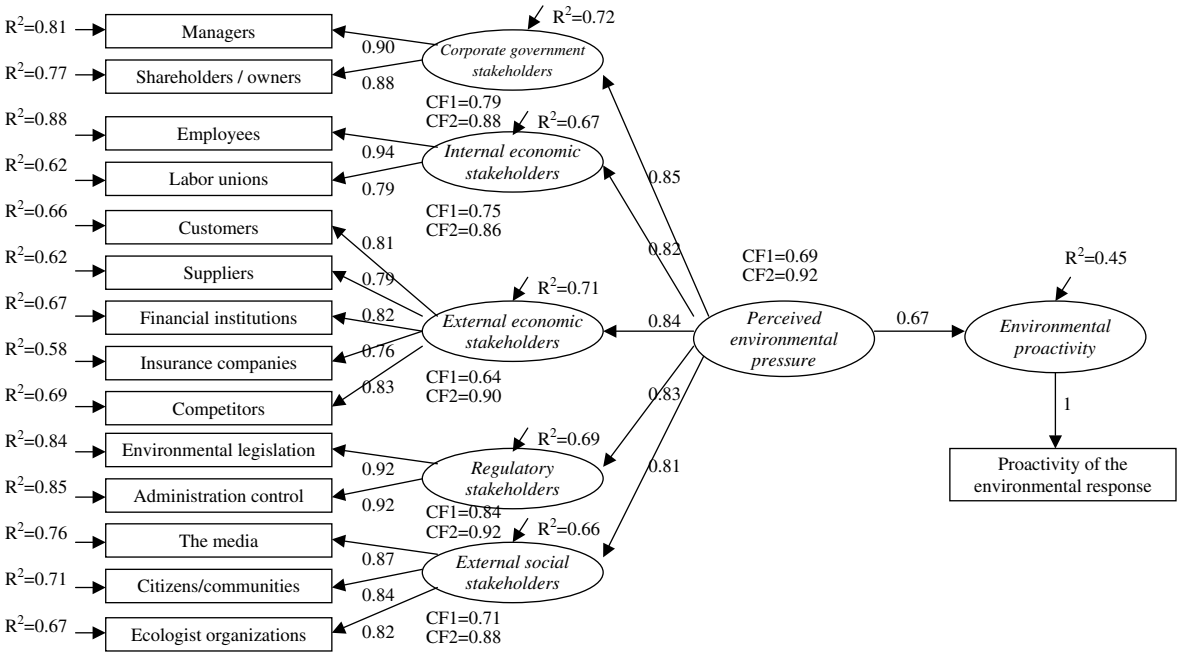


Figure 3. Structural model and measurement model of the perceived environmental pressure

also perceive pressure from the rest. That is managers perceive only one dimension of stakeholders' demand for environmental protection. This result may suggest the importance of managers' personal attitudes, values, and beliefs for how they interpret environmental issues. Certain of their personal characteristics, therefore, could be biasing the intensity of their perception of environmental pressure. Corroboration of this argument is leading us to approach a future field of research considering the personal values of managers as a variable that affects their perceptions.

Additionally, we have found that firms do not respond selectively to the different stakeholder groups, but they respond to all of them in a similar way. Therefore firms face a single demand function for environmental protection and respond by committing resources to satisfy this demand. Indeed, the results obtained in this study indicate that there is a positive relationship between the environmental demands from stakeholders perceived by managers and the proactivity of the environmental response of firms. Thus, the greater the environmental demand perceived by managers, the more solutions the firm tends to adopt beyond the mandatory environmental requirements established by the authorities, and even beyond market or society expectations.

Finally, the results of this study should be interpreted with caution for several reasons. First, because the proposed types of environmental response cannot be taken as a strict characterization of all possible specific cases. Actually, a firm's degree of environmental commitment will depend on a variety of aspects, such as the kind of business, the potential environmental problems, the size of the organization, or the complexity of its corporate structure (Hunt and Auster, 1990). This means that an environmental management program that could be classified as proactive for one firm could represent a minimal effort for another.

Second, our results show that environmental pressure from stakeholders leads to greater environmental proactivity, but it tells us nothing of the impact of such proactivity on firms' economic results. In this respect, Vastag *et al.* (1996) claim that even though a poor environmental management may have negative consequences for a firm, a too advanced environmental response pattern could generate unnecessary risk for its competitiveness and profitability.

Finally, the characteristics of the sample firms (basically small, family-owned firms, or firms with a highly concentrated ownership) prevent us from applying the conclusions obtained to all types of industrial contexts.

DOI: 10.1002/smj

ACKNOWLEDGEMENTS

We thank Professor Vicente Salas-Fumás and two anonymous reviewers for their helpful suggestions and comments. This study is part of the results obtained in the framework of research project SEJ2005-07341, financed by MEC-FEDER, the CREVALOR Excellence Research Group, acknowledged by the Diputación General de Aragón (Spain), and under the sponsorship of FUNDEAR.

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