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Adopting Proactive Environmental Strategy: The Influence of Stakeholders and Firm Size[1]

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ABSTRACT

While smaller firms are less likely to undertake as many environmental practices as larger firms, extant literature suggests that smaller firms may be more responsive to stakeholder pressures. This paper contributes to the development of stakeholder theory by deriving a size moderated stakeholder model and applying it to a firm's adoption of proactive environmental practices. The empirical results show that smaller firms are more responsive to value-chain, internal and regulatory stakeholder pressures. These findings suggest that researchers evaluating organizations and the natural environment should be cautious about associating stakeholder pressures directly with firms' environmental strategies. Rather, the relationship between stakeholder pressures and environmental strategy tends to vary with size.

Key words: strategic environmental management, stakeholders, firm size, moderation effects, proactive environmental strategy

INTRODUCTION

> "Environmental missteps can create public relations nightmares, destroy markets and careers, and knock billions off the value of a company. Companies that do not add environmental thinking to their strategy…risk missing upside opportunities in markets that are increasingly shaped by environmental factors."
>
> Esty and Winston (2006, p. 10).

Stakeholder theory suggests that the better a firm manages its relationship with various stakeholders, the better will be its financial performance (Donaldson & Preston, 1995; Freeman, 1984). In the context of the natural environment, stakeholders can pressure firms to adopt proactive environmental practices that improve their environmental performance. This improved performance can increase organizations' internal efficiency and external legitimacy which, in turn, can lead to competitive advantage and wealth creation (Esty & Winston, 2006; Hart 1995, 2005; Hart & Milstein, 2003).

Proactive environmental practices are intangible managerial innovations and routines that require organizational commitments towards improving the natural environment and which are not required by law (Hart, 2005). Examples of these practices include implementing environmental policies (Henriques & Sadorsky, 1996), utilizing internal assessment tools such as benchmarking and accounting procedures (Nash & Ehrenfeld, 1997), establishing environmental performance goals, publicly disclosing environmental performance information (Hart, 2005), performing internal and external environmental audits, training employees in ways to improve the environment, and linking employee compensation to environmental performance (Welford, 1998). By implementing these practices, firms can identify how their production activities interact with the environment and how they can prevent natural-resource degradation (Berry & Rondinelli, 1998; Rondinelli & Berry, 2000).

Previous research evaluating the extent to which stakeholders pressure organizations to adopt proactive environmental practices (Delmas, 2001; Henriques & Sadorsky, 1996, 1999; Sharma & Henriques, 2005) generally has focused on large firms. This focus, while expanding our knowledge of how larger entities relate to stakeholders, has led some scholars (e.g., Lefebvre, Lefebvre & Talbot, 2003; Lepoutre & Heene, 2006; Noci & Verganti, 1999) to argue that there is a critical shortage of research examining the environmental management of smaller firms. This shortage extends to our knowledge of stakeholder theory in that while it has been demonstrated that smaller firms face stakeholder pressures distinct from larger firms, the relationship between stakeholder pressures and size has not been addressed (Lepoutre & Heene, 2006).

To our knowledge, the size-moderated relationship between stakeholder pressures and the adoption of proactive environmental practices has not been considered. Our position is that a stakeholder's ability to pressure firms to adopt proactive environmental practices is likely to vary with the size of the firm. Because of their size, many small firms attract clients and employees from the local community. As a good reputation is central to small business success, small firms therefore are likely to be more responsive to stakeholder concerns (Besser, 1999). This is especially true at the local level where their success is often related to their degree of legitimacy and approval from local stakeholders (Perrini, 2006). Moreover, many owners of small firms are entrepreneurs that can integrate environmental responsibility into their organization's overall mission more easily (Larson, 2000). Such flexibility exists because smaller firms are less likely to be committed to their existing products and processes (Sharma & Henriques, 2005).

Because of their deeper pockets, larger firms, on the other hand, can allocate greater resources towards resisting stakeholder pressure for environmental change rather than yielding to stakeholder concerns (Bowen, 2002). Since size is a good measure of organizational power,

larger organizations are better able to resist external stakeholder pressure (Meznar & Nigh, 1995) by investing in lobbying and litigation. For instance, when regulatory stakeholders pursue enforcement actions and penalties against the larger organization, they are more likely to incur greater costs related to prolonged litigation. Greater costs may be one reason why regulatory stakeholders impose fewer civil penalties against the larger firm when it fails to comply with environmental regulations (Firestone, 2002). Regulators instead are more likely to negotiate alternative outcomes or ignore the transgressions altogether. For the same reasons, larger firms may also endure less threat of legal action from environmental groups. Consequently, increases in stakeholder pressures are anticipated to have a smaller impact on the adoption of proactive environmental practices in larger firms than in smaller firms.

The study makes two important contributions to existing stakeholder literature. To our knowledge, this research offers the first theoretical arguments describing how firm size affects the relationship between stakeholders and firms' proactive environmental practices. Our view is that factors such as resource scarcity, simplified decision making process, and greater innovation propensity influence the smaller firm to be more responsive to stakeholder pressures in their adoption of proactive environmental practices than larger firms.

The second contribution of this research is that it evaluates the relationship between stakeholder theory, size, and firms' adoption of proactive environmental practices using data collected in six countries and for numerous manufacturing sectors. Our results therefore are applicable to multiple international and organizational settings.

STAKEHOLDERS

Stakeholders are defined as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984, p. 46). Stakeholder theory is rooted in the practical concerns for managers—how they can be more effective at addressing

concerns of key stakeholder groups (Freeman, 2004). Managers think about stakeholders based on their perceptions (Donaldson & Preston, 1995) and therefore serve as a critical interpreter of stakeholder influence (Banerjee, 2001; Fineman & Clark, 1996). After assessing which stakeholders are salient (Mitchell, Agle & Wood, 1997), managerial perceptions of stakeholders subsequently establish how a firm's strategy will be influenced (Donaldson & Preston, 1995; Fineman & Clark, 1996; Henriques & Sadorsky, 1999). Because of their central role, managerial perceptions are the focus of this paper.

Firm activity is embedded in a network of stakeholder relationships. In general, there are two types of stakeholders—primary and secondary. Primary stakeholders have a direct economic stake in the organization, (Donaldson & Preston, 1995), and include value chain participants—from commercial buyers and household consumers to suppliers—and internal stakeholders—from management to non-management employees (Freeman, 1984).

Value chain stakeholders respond positively to a firm's environmental actions in similar ways in that commercial buyers and household customers choose to purchase the firm's product or service and supply chain stakeholders choose to renew their selling agreements. They also may communicate satisfaction or dissatisfaction by way of direct engagement with managers or through correspondence. However, there is somewhat more variation in how value chain stakeholders affirm their discontent with a firm's environmental strategy. Commercial buyers, household consumers, and supply chain stakeholders all can file suit against the firm in which they are doing business. However, household consumers are more likely to engage in public boycotts (Henriques & Sadorsky, 1999), whereas corporate buyers and suppliers are more likely to respond by cancelling purchasing or selling agreements, stopping delivery of an input, or requesting environmentally sound substitutes.

Internal stakeholders include management and non-management employees, and are

critical allies to the success or failure of any firm strategy (Freeman, 1984). Employees (of all sorts) who are supportive of a firm's environmental goals are more likely to seek work within it, and (once there) continue their employment (Henriques & Sadorsky, 1996). They may also express satisfaction or dissatisfaction by way of direct discussion with the firm's executives or corporate boards. Dissatisfaction by both management and non-management employees can be voiced by way of employment termination. In more extreme cases, employees may engage in public whistle-blowing that exposes the firm's potentially negligent environmental practices (Henriques & Sadorsky, 1996).

Secondary stakeholders are not involved directly in the firm's economic transactions (Mitchell, Agle & Wood, 1997). Related to the natural environment, secondary stakeholders include societal stakeholders (Henriques & Sadorsky, 1999; Klassen & McLaughlin, 1996; Waddock & Graves, 1997) and environmental regulators (Henriques & Sadorsky, 1999; Waddock & Graves, 1997). The rising influence of societal stakeholders is one of the most significant developments in international affairs over the past 20 years (Doh & Guay, 2006). Societal stakeholders consist of public interest groups that include environmental and community organizations (Etzion, 2007; Hoffman, 2000) and professional groups such as labor unions and industry associations (Etzion, 2007). These organizations have the capacity to mobilize public opinion in favor of or in opposition to the firm (Freeman, 1984). Societal stakeholders generally utilize indirect approaches to influence firm behavior because they lack a direct economic stake in the organization (Sharma & Henriques, 2005). Such approaches include public protests, strikes, and industry calls for engagement. Moreover, in an effort to increase their salience (Mitchell, Agel & Wood, 1997), societal stakeholders often align to further influence a firm's environmental strategy.

Finally, environmental regulators are individuals within government who have the

authority to create environmental requirements and inspect the firm's compliance with those requirements (Carmin, Darnall, & Mil-Homens, 2003; Fineman & Clarke, 1996). Firms that fail to comply with environmental regulations or maintain satisfactory communications with regulatory stakeholders risk incurring non-compliance penalties (Henriques & Sadorsky, 1996) and having their operating permits revoked.

Combined, the above discussion suggests that there is a positive relationship between stakeholder pressures and the adoption of proactive environmental practices.

Hypothesis 1: There is a positive relationship between stakeholder pressures and the adoption of proactive environmental practices.

STAKEHOLDERS AND FIRM SIZE

Conventional wisdom in the broader corporate social responsiveness literature indicates that large firms are more environmentally responsive. For instance, a review of academic research on environmental issues in which the research design controlled for size (Bowen, 2000) revealed that 9 out of 10 relevant studies showed a significant correlation between firm size and environmental performance. In each instance, larger firms were associated with environmental proactiveness to a greater extent than smaller firms (Etzion, 2007).

Rationales offered for this association are that larger firms have greater societal visibility (Etzion, 2007; Jiang & Bansal, 2003) which may intensify stakeholder requests that larger businesses adopt more proactive environmental practices. However, an alternative point of view sees size as a constraining factor, imposing rigidity in the form of standard operating procedures, thus stifling local initiative and negatively affecting environmental initiative (King & Shaver, 2001). As a consequence, while there is strong evidence that size is related with the adoption of proactive environmental practices, a consistent relationship between size and environmental responsiveness has not yet been established in empirical environmental studies (Bowen, 2002).

Our position is that in the presence of pressures from primary and secondary stakeholders, a firm's adoption of proactive environmental practices is anticipated to vary based on its size. While research is lacking that explicitly evaluates these moderating relationships, there is an extensive literature studying the asymmetrical impact of government regulation on firms of varying size. For instance, scholarship evaluating the relationship between environmental regulation and organization performance has demonstrated the importance of direct and indirect effects of environmental regulation and how these effects vary with the size of the organization (Bartel & Thomas, 1985; Bartel & Thomas, 1987; Chilton & Weidenbaum, 1982). Much of this research suggests that environmental regulation imposes a greater cost burden on small firms than large firms which, in turn, provides a cost advantage to larger firms. Environmental regulations also create barriers to new firm entry (Dean & Brown, 1995; Dean, Brown, & Stango, 2000), which especially affects the resource constrained organization that tend to be smaller in size. As such, many smaller firms have difficulty staying in business; however, those that do may be particularly successful at responding to environmental issues. Their success is fueled by the smaller firm's ability to make faster decisions (Chen & Hambrick, 1995), and respond quicker to concerns facing their industry (Tushman & Romanelli, 1985) as a result of having more structural flexibility and movement. As such, smaller firms may be better equipped to address external pressures for environmental change (Jones & Klassen, 2001).

Smaller firms, in general, have resources that differ significantly from larger firms (Dean, Brown & Bamford, 1998), and which force them to seek competitive advantage in other ways. They also are characterized by a simplified decision making process (less bureaucracy) (Chen & Hambrick, 1995; Dean, Brown & Bamford, 1998). Further, smaller firms tend to be younger and therefore more innovative and/or focused on niche markets (FitzRoy, 1993; Stock, Greis, & Fischer, 2002). Our view is that these three factors—resource scarcity, simplified decision

making process, and greater innovation propensity—influence the smaller firm to be more responsive to stakeholder pressures (of all sorts) in their adoption of proactive environmental practices.

Resource scarcity. While smaller firms have resources that admittedly are more constrained (Bianchi & Noci, 1998), they also possess fundamentally different resources (Dean, Brown & Bamford, 1998) and use them in profoundly different ways. As a consequence, resource scarcity is likely to influence the smaller firm to be more responsive to stakeholder pressures. For instance, when faced with external pressures for environmental change, larger firms are more likely to use resource slack to build corporate buffers against pressures for environmental improvement (Bowen, 2002). In so doing, larger firms allocate a greater proportion of resources towards environmental lobbying activity and other activities that resist environmental change. By contrast, when faced with external pressure for environmental consideration, smaller firms are less likely to invest their scarce resources in political resistance. Rather, the smaller enterprise generally invests its limited resources to address the immediate environmental concern (Bowen, 2002). These notions are consistent with previous scholarship suggesting that resource weak organizations are more likely to respond to stakeholder pressures (Aragón-Correa, 1998; Lefebvre, Lefebvre & Talbot, 2003; Rutherfoord et al., 2000).

Additionally, there is some evidence suggesting that smaller firms are less likely to invest in environmental practices that have long run strategic benefits (Bianchi & Noci, 1998). Societal stakeholders, and especially regulatory stakeholders, therefore may be more suspicious of their environmental activities, and take greater legal action when transgressions are discovered. For instance, in the United States (U.S.), environmental agencies are seven times more likely to subject smaller firms to penalty actions related to violations of environmental regulations than larger firms charged with similar environmental wrongdoings (Firestone, 2002). Greater scrutiny

from regulatory stakeholders may be due to the fact that smaller firms have fewer resources to litigate penalties. In other instances, regulatory stakeholders may see quicker resolution of environmental transgressions by targeting smaller firms, thereby avoiding lengthy litigation and negotiations of alternative outcomes. For the same reasons, smaller firms may endure greater threats of legal action from environmental groups. Managers of smaller firms also are less safe from civil penalty liability (Firestone, 2002), and therefore are more likely to receive negative press and greater societal scrutiny about their environmental wrongdoings. Because of their scarcer resources, smaller firms therefore may be more likely to respond positively to stakeholder pressures.

Simplified decision making process. The second factor that influences the smaller firm to be more responsive to stakeholder pressures relates to its simplified decision making process. Smaller firms are less bureaucratic than larger firms (Hitt et al., 1990; Whetten, 1987). As a consequence, they have more flexibility in managing external relationships (Aragón-Correa et al., 2008). Smaller firms also are more simplistic structurally, have more streamlined operations, focus on narrower market domains (Chen & Hambrick, 1995), and have shorter lines of communication (Aragón-Correa et al., 2008). Faced with less structural inertia, smaller firms have faster decision speeds (Chen & Hambrick, 1995), and respond more quickly to industry concerns (Tushman & Romanelli, 1985). They also are more nimble at addressing external demands for environmental action (Jones & Klassen, 2001). Since smaller firms are characterized by fewer employees and less bureaucracy, they suffer from fewer issues related to internal coordination and communication (Baucus & Near, 1991), and can convey environmental concerns more directly from an employee to a manager or owner. These factors make it easier for the concerns of ordinary workers to be heard.

Greater innovation propensity. The third factor that influences the smaller firm to be

more responsive to stakeholder pressures relates to its innovation propensity. Conventional wisdom is that short planning horizons and lack of resources limit the smaller firm's propensity to innovate. However, Noci and Verganti (1999) challenge this view (as do other researchers—e.g., FitzRoy, 1993; Stock, Greis, & Fischer, 2002) by showing that many small and medium sized firms succeed at environmental innovation. By utilizing their resources differently and taking advantage of their less bureaucratic structure, many smaller firms are poised to innovate in ways that larger firms cannot (Jones & Klassen, 2001). Their stronger innovation propensity is further fueled by the smaller firm's greater social awareness and concern for the natural environment that is triggered by stakeholder concerns (Noci & Verganti, 1999). For these reasons, smaller firms may be more responsive to stakeholder pressures in their adoption of proactive environmental practices.

Hypothesis 2: Size moderates the relationship between stakeholder pressures and the adoption of proactive environmental practices such that the relationship is stronger for small firms.

METHODS

Data

To evaluate our hypotheses, we relied on data from a twelve-page survey developed by the Organisation for Economic Co-Operation and Development (OECD) Environment Directorate and a team of sixteen university researchers from Canada, France, Germany, Hungary, Japan, Norway and the U.S. The authors of this paper were part of this research team. The OECD survey was pre-tested in France, Canada and Japan before it was finalized. Prior to its dissemination, the survey was translated into each country's official language and back-translated to validate the accuracy of the original translation. In 2003, surveys were sent to individuals who worked in manufacturing facilities having at least 50 employees and who were

responsible for the firm's environmental activities. The manufacturing sector was selected because it produces more air, land, and water pollution than the service sector (Stead & Stead, 1992). The OECD sent two follow-up mailings to prompt additional responses. A total of 4,188 managers completed the survey. The response rate was 24.7 percent, which is consistent with previous studies of organizations' environmental practices (e.g., Christmann, 2000; Melnyk, Sroufe & Calantone, 2003).[2] More than two-thirds of the sample consisted of enterprises with fewer than 250 employees, and included publicly traded and privately owned facilities.

Respondents were identified by relying on public databases within each country. For instance, the Hungarian population was identified using data from the Hungarian Central Statistical Office and the Canadian population was identified using Dun & Bradstreet data. In France, Germany, Norway and the U.S., the OECD surveyed the population of manufacturing facilities with more than 50 employees. Because of resource constraints, the OECD utilized random sampling of the same types of respondents to collect its data in Canada and Hungary. By concentrating our analysis on the manufacturing sector in these six countries, we were able to explain the observed variability in environmental practices undertaken by these entities. While a sector-specific or country-specific analysis also would be a suitable research approach, the results would be less generalizable to other settings.

Data that are collected using survey techniques may be susceptible to common method variance (bias), social desirability bias, non-response bias, and lack of generalizability. To check for common method variance, we relied on the post-hoc Harman's single-factor test (Podsakoff & Organ, 1986). The basic assumption of this test is that if a substantial amount of common method variance is present, a factor analysis of all the data will result in a single factor accounting for the majority of the covariance in the independent and dependent variables. The results of Harman's single-factor test revealed that five distinct factors accounted for the

majority of the variance in the variables, offering evidence that this type of bias was not a concern. Social desirability bias was addressed by ensuring anonymity for all respondents, and survey questions addressing stakeholder influences were separated from questions pertaining to proactive environmental practices. In instances where a social desirability bias exists, researchers are less likely to find statistically significant relationships because there is less variability in respondents' survey answers. However, by finding statistically significant relationships, additional evidence would be offered about the strength of the relationship between the variables of interest (Hardin & Hilbe, 2001). Non-response bias was checked by using Armstrong and Overton's (1977) method of comparing the responses of late respondents with those of early respondents. No clear biases emerged for countries in which secondary data sources could be obtained. Because of the international nature of this study, it was not possible to obtain secondary data for all non-respondents since publicly available databases either did not exist or were not complete. However, the OECD's examination of the distribution of its survey respondents by industry representation and size relative to the broader population found no statistically significant differences (Johnstone, *et al*., 2007). Generalizability was less of a concern because the OECD survey had broad applicability in that our subset of the data included publicly traded and privately held entities representing multiple industrial sectors in six OECD countries.

Facilities in North America (Canada, n=256 and U.S., n=489) and Europe (France, n=269; Germany, n=898; Hungary, n=466; and Norway, n=309) were the subject of this study. Japan was not selected because it lacked comparable location, political structure and social norms. Although the OECD data contained observations for facilities belonging to multi-plant firms, we limited our analysis to single-plant firms. We did so by relying on a question in the OECD survey that asked: How many production facilities does your firm have? Managers

reported a total number of production facilities reflecting both domestic and international operations. We focused our analysis to single-plant operations in order to draw inferences about firms. Doing so was important to ensure consistency between our hypotheses and data.[3]

Dependent Variable

Anton *et al.* (2004) define a firm's proactive environmental strategy as the sum of its proactive environmental practices. Proactive environmental practices are intangible managerial innovations and routines that require organizational commitments towards improving the natural environment and which are not required by law (Hart, 1995). These innovations and routines are knowledge-based advantages such as socially complex organizational processes (Barney, 1991; Rumelt, 1984; Wernerfelt, 1984), and management (Hart, 1995). Firms that have more proactive environmental strategies demonstrate a greater commitment towards environmental improvement. Examples of these practices include implementing environmental policies (Henriques & Sadorsky, 1996), utilizing internal assessment tools such as benchmarking and accounting procedures (Nash & Ehrenfeld, 1997), establishing environmental performance goals, publicly disclosing environmental performance information (Hart, 2005), performing internal and external environmental audits, training employees in ways to improve the environment, and linking employee compensation to environmental performance (Welford, 1998). As such, we examined nine proactive environmental practices: whether the firm 1) had a written environmental policy; 2) benchmarked environmental performance; 3) used environmental accounting; 4) had a public environmental report; 5) had environmental performance indicators/goals; 6) carried out external environmental audits; 7) carried out internal environmental audits; 8) had environmental training programs; 9) used environmental criteria in the evaluation and/or compensation of employees. When accounting for the adoption of multiple environmental practices, a common practice is to sum them (e.g. Anton et al., 2004; Khanna &

Anton, 2002), which is the approach followed in this paper.

Independent Variables

Size. Size was measured by determining how many full-time workers were employed at the firm. Previous empirical studies show that this measure of size is highly correlated with (and statistically equivalent to) other indicators of size, including sales, assets (Agarwal, 1979) and total employees (Kimberly & Evanisko, 1981; Agarwal, 1979). We used the natural logarithm of employees in our analysis because the number of employees is likely to have a skewed distribution, and because previous research on organization size (e.g., Agarwal, 1979) indicates that using a logarithmic transformation yields consistent results.

Stakeholder pressures. Pressures from primary stakeholders—value chain and internal stakeholders—and societal stakeholders were assessed by relying on OECD survey data that asked managers: How important do you consider each of the following influences on your environmental practices? Respondents considered the importance of household consumers, commercial buyers, suppliers, management employees, non-management employees, environmental groups, community organizations, labor unions, and industry or trade associations. They indicated whether these stakeholder pressures were "not important," "moderately important," or "very important" using a 3-point Likert scale where "not important"=1, "moderately important"=2 and "very important"=3. The nine stakeholder pressures were entered into a common factor analysis. While a limitation of this approach is that factor analysis is more appropriate for Likert scales having a greater number or ordinal points, the results of the factor analysis were consistent with previous literature in that three factors emerged to account for our three anticipated stakeholder groups. Further, these factors demonstrated large positive eigenvalues (3.480, 1.191, and 1.065) and together accounted for 63.7 percent of the total variance (with subsequent varimax rotation). The results are presented in

Table I.

INSERT TABLE I ABOUT HERE

An analysis of the factor loadings indicated that factor 1 accounted for respondents' general perceptions of *value chain stakeholders*, and included household consumers, commercial buyers and suppliers. The second factor captured respondents' perceptions of *internal stakeholders*, and included pressures from the firm's management employees and non-management employees. The last factor accounted for respondents' perceptions of *societal stakeholders*. This factor included environmental groups and community organizations, labor unions, and industry or trade associations. Reliability was assessed for the three factors using Cronbach's alpha (see Table I).

Pressures from *regulatory stakeholders* were measured by relying on OECD survey data that asked managers how many times they have been inspected by public environmental authorities (central, state/province and municipal governments) in the last three years. This measure of regulatory stakeholder pressure may not be as subjective as the OECD survey data asking for managers' perceptions of value chain stakeholders, internal stakeholders, and societal stakeholders. However, it is not completely objective in that it is subject to managers' perceptions of inspection frequency (Darnall, Seol & Sarkis, 2009) and this perception is likely to vary with the size of the firm. Smaller firms may feel threatened by inspections (and more likely to respond with proactive environmental management) while larger firms may be less intimidated by inspections (and more likely to resist adopting proactive environmental activities). Like other stakeholder pressures, managerial perceptions of inspection frequency establish how and to what extent environmental strategy will be influenced. The relationship between

inspection frequency and organizations' proactive environmental practices therefore relates to managerial perceptions of regulatory stakeholders (Darnall, Seol & Sarkis, 2009). As noted in other stakeholder research relying on managerial surveys (Berman, et al., 1999; Henriques & Sadorsky, 1999; Sharma & Henriques, 2005), there are rarely completely objective measures of stakeholder pressures.

Control Variables. Since the OECD data were for a diverse set of organizations operating within multiple manufacturing sectors and countries, it was important to control for potential heterogeneities. We accounted for whether or not firms were publicly traded since publicly traded and privately owned firms differ significantly in their organizational structure in ways that are *independent* of size (Darnall & Edwards, 2006; Mascarenhas, 1989). While there is some overlap between ownership structures in funding streams and disposition of revenues, there are clear differences in who is served by the firm's productive capacity and its general aim (Darnall & Edwards, 2006). Related to the natural environment, publicly traded and privately owned firms have varied levels of resources and capabilities available for developing a proactive environmental strategy which relate to their organizational structure (Darnall & Edwards, 2006). Whether or not the firm was publicly traded was measured by using OECD survey data indicating whether the firm was listed on a stock exchange.

We also accounted for whether or not firms were foreign owned. Foreign owned firms are likely to contend with a broader array of pressures from stakeholders both at home and abroad. For instance, Nakamura et al. (2001) suggest that foreign owners may increase their environmental initiatives to secure goodwill from the regulatory authorities of their host country so as to increase their legitimacy in the eyes of these authorities.

We also controlled for export orientation since the more export oriented the organization, the higher the benefits it may accrue from the more visible actions taken to protect the

environment. The reason for this is that foreign customers tend to be less able to monitor the performance of the firm (Nakamura et al., 2001). More visible signs of environmental commitment may legitimatize their reason for doing business with the firm (Bansal & Hunter, 2003). Export orientation was measured using OECD survey data indicating whether the firm's market scope was local, national, regional, or global.

Older operations often utilize mature environmental technologies and capital equipment (Portney & Stavins, 2000) which may affect a firm's decision to adopt proactive environmental practices. As such, we controlled for firm's age. Similarly, firms with stronger overall business performance may have greater resources to adopt proactive environmental practices. Business performance was measured by relying on OECD survey data that asked respondents to assess their overall business performance over the past three years. Respondents replied using a five-point scale indicating whether their revenue was "so low as to produce large losses," "insufficient to cover our costs," "at break even," "sufficient to make a small profit," or "well in excess of costs."

Firms that have investments in environmental research and development are more likely to adopt proactive environmental practices. A budget for environmental research and development meets Barney's (1991) definition of a *tangible resource* in that it is a physical asset that a firm owns. A firm's proactive environmental practices are not resources per se. Rather they represent a firm's ability to deploy those resources, thus putting them to routine productive use (Collis & Montgomery, 1995). These abilities include less tangible knowledge-based practices that involve socially complex organizational processes (Barney, 1991; Rumelt, 1984; Wernerfelt, 1984) and management (Hart, 1995). Environmental research and development therefore represents a resource which increases the probability that a company will develop proactive environmental practices. Environmental research and development was assessed by

relying on OECD survey data that asked managers whether or not their firm had a research and development budget allocated towards environmental matters.

To account for the possibility that firms using a great deal of natural resources in the manufacturing processes may be more sensitive to the potential impact these resources may have on the environment, we relied on survey data that asked respondents to rank their negative environmental impacts (1= no negative impacts; 2= moderate negative impacts; 3= large negative impacts). Together with the industry dummy variables, this variable also helps to account for differences in resources use.

Finally, dummy variables were used to account for manufacturing sector and country of operation. The U.S. was the omitted country dummy variable and the chemical sector was the omitted industry dummy variable. Descriptive statistics are shown in Table II. Variance inflation factors (VIFs) were each close to one and much less than the recommended maximum threshold of 10, indicating that multicollinearity between the non-interacted independent variables is not a concern (Kennedy, 2003). With respect to our interaction terms, as suggested by Aiken and West (1991), variables involved in moderation effects were centered (converted to Z scores) to avoid problems with possible multicollinearity.

INSERT TABLE II ABOUT HERE

Empirics

To estimate our relationship of interest, we relied on a count model. Count models are used when a dependent variable represents the number of events that occur (Greene, 2003). Examples include a firm's number of patents filed or its number of reported accidents. Our dependent variable, the count of proactive environmental practices, has a minimum value of zero

and a maximum value of nine. Estimates of the regression parameters are obtained by using quasi-maximum likelihood estimation. Quasi-maximum likelihood standard errors, which are robust to misspecified distributional form, are computed for the coefficient estimates.

Model significance is determined using likelihood ratio test statistics. These statistics are distributed as χ^2 with degrees of freedom equal to the number of restrictions being tested. The goodness of fit statistic for a particular model is -2 times the log likelihood of that model. The difference between the goodness of fit between an unrestricted model against a restricted model (that only includes a constant term and dummy variables for industry and country) shows that the explanatory variables have a statistically significant joint impact on the determination of environmental practices in each of the three models.

RESULTS

Model 1 in Table III is the restricted model and included for comparison purposes. More than half of the estimated coefficients are statistically significant at the 1% probability level. The estimated coefficient on the size variable is positive and statistically significant ($p < 0.01$) in all three models indicating that larger firms have more proactive environmental practices. Model 2 incorporates perceived stakeholder pressures and shows an improvement in model fit. The log likelihood increases from -3188.95 (Model 1) to -2906.78 (Model 2) and the adjusted R-squared increases by 43%. The likelihood ratio test statistic shows that the hypothesis of jointly rejecting the coefficients on the perceived stakeholder pressure variables equal to zero can be rejected at $p < 0.01$. The estimated coefficient on each of the stakeholder variables is positive and statistically significant indicating that increases in perceived stakeholder pressure are associated with greater numbers of proactive environmental practices. These findings support Hypothesis 1, which states that there is a positive relationship between stakeholder pressures and the adoption of proactive environmental practices.

INSERT TABLE III ABOUT HERE

To test Hypothesis 2, interaction effects for stakeholder pressures and size are included in Model 3. The fit of Model 3 is significantly better than the fit of Model 2, as indicated by the significance of the likelihood ratio statistic. These findings indicate that size is an important factor in moderating the effect of stakeholder pressures on environmental practices. The moderating effect of size on *value chain stakeholders* is negative and statistically significant at the 1% level. Additionally, the estimated coefficient on size moderating internal stakeholders, and the estimated coefficient on size moderating *regulatory stakeholders* are each negative and significant at the 10% and 5% level respectively. The moderating effect of size on *societal stakeholders*, however, is statistically insignificant, indicating that societal stakeholder pressures affect large and small firms in the same way. These results indicate that size moderates value-chain, internal and regulatory stakeholder pressures.

To determine whether the moderating relationship is stronger for smaller firms (Hypothesis 2), we computed marginal effects for each perceived stakeholder pressure variable (summary statistics are shown in Table IV). Marginal effects are calculated as the first derivative of the count regression function with respect to the perceived stakeholder pressure variable of interest. Derivatives are evaluated at each sample value. For each perceived stakeholder pressure variable, there is a direct effect, an indirect (moderation) effect, and a total effect. For example, for an average smaller firm (the first quartile in firm size), a one unit increase in perceived value chain stakeholder pressures increases the count of proactive environmental practices by 0.138. By contrast for an average larger firm (the fourth quartile in firm size), a one unit increase in perceived value chain stakeholder pressures increases the count of proactive environmental

practices by 0.016. Notice that for an average smaller firm, the direct and indirect effects are both positive while for an average larger firm, the direct effects are positive but the indirect effects are negative. Moreover, for smaller firms, the mean and the median indirect effects are positive for each of the perceived stakeholder pressures (with the exception of societal stakeholder pressures), which indicates that the total marginal effect is greater than the direct effect. For larger firms, however, the mean and median indirect effects are negative (with the exception of societal stakeholder pressures), which indicates that the total marginal effect is less than the direct effect. In other words, although larger firms undertake more environmental practices than do smaller firms, when faced with pressures from value chain, internal and regulatory stakeholders, smaller firms appear to be more responsive (indirect effect) than do their larger counterparts. These findings offer additional support for Hypothesis 2.

INSERT TABLE IV ABOUT HERE

DISCUSSION

This research explores the multifaceted relationship between, managerial perceptions of stakeholder pressures, size and firms' proactive environmental practices across multiple industries and countries. While many empirical studies have investigated the relationship between stakeholder pressures and environmental management for the case of large firms (e.g., Henriques & Sadorsky, 1996, 1999; Delmas, 2001; Sharma & Henriques, 2005), to our knowledge, no scholarship has investigated the size moderated relationship between firms' stakeholder pressures and environmental management. This research offers empirical evidence supporting the notion that firm size has a much more nuanced relationship with managerial perceptions of stakeholders and their association with proactive environmental practices than

previously considered. That is, when evaluating the direct effects of managerial perceptions of stakeholder pressure on proactive environmental practices, greater perceived pressure from primary (value chain, internal) and secondary (regulatory, societal) stakeholders are associated with an increased likelihood that firms adopt proactive environmental practices. Similarly, we found that smaller firms adopt fewer proactive environmental practices than their larger counterparts.

However, when we evaluate the moderating effect of size on perceived stakeholder influences, the impact of primary and secondary stakeholder pressures differs across small and large firms. That is, smaller firms are more acutely affected by perceived pressures from value chain stakeholders, internal stakeholders, and regulatory stakeholders. While smaller firms may rarely be subject to some stakeholder pressures, when they are, these pressures (however modest) appear to be regarded as quite threatening and therefore encourage the smaller firm to respond with greater vigor. These findings respond to the argument that a weakness of stakeholder theory lies in the underspecification of the organization/stakeholder relation itself (Friedman & Miles, 2002). From a manager's point of view, it matters less whether perceived stakeholder pressures reflect *actual* levels of stakeholder pressures (Henriques & Sadorsky, 1999). Rather, managers who *perceive* a certain stakeholder's pressure as being important are more likely to undertake actions to address that stakeholder's concerns (Henriques & Sadorsky, 1999). We argue that in general the ability for smaller firms to respond with greater vigor is related to their resource scarcity, simplified decision making process, and greater innovation propensity.

The broader literature discussing size suggests that while smaller entities are more resource constrained (Bianchi & Noci, 1998), when faced with external pressures for environmental change, they are less likely to invest their scarce resources in political resistance (than is the case for larger organizations), and more likely to address the environmental concern

(Bowen, 2002). Smaller firms also have a more simplified decision making process due to their more streamlined operations, and focus on narrower market domains (Chen & Hambrick, 1995). These factors allow the smaller firm to respond more quickly to address demands for environmental action (Jones & Klassen, 2001). Smaller firms also can be more efficient innovators (FitzRoy, 1993; Stock, Greis, & Fischer, 2002) and therefore have a greater propensity to invest in proactive environmental change (Jones & Klassen, 2001). Combined, these factors influence smaller firms to be more responsive to stakeholder calls for environmental responsibility.

The practical significance of the relationship between stakeholder pressures, size and environmental management is significant for public policy and management practice. Each year activists spend millions of dollars annually trying to pressure larger firms to do "right" by the environment. However, these stakeholders may have greater success targeting the smaller firm or the stakeholders that most affect the smaller firm's environmental responsiveness in an effort to influence its environmental activities. While the smaller firm may feel disadvantaged in its ability to allocate its scarce resources towards building political resistance and corporate buffers against stakeholder pressures (Bowen, 2002), this disadvantage may be offset by the fact that by the smaller firm may benefit from its environmental proactiveness by increasing its internal efficiencies (Darnall, 2009; Porter & van der Linde, 1995), external legitimacy, business value, competitive position (Russo & Fouts, 1997). Since small and medium sized firms comprise approximately 90 percent of the manufacturing landscape in the U.S. (U.S. Census, 2004) and approximately 99.2 percent in Europe (European Communities, 2003), and provide 44 percent of all manufacturing jobs in the U.S. (U.S. Census, 2004) and 56.9 percent in Europe (European Communities, 2003), the relationship between size, stakeholder pressures, and the adoption of environmental practices is clearly an important issue to society.

We did not find any statistically significant evidence that pressures from societal stakeholders (environmental groups, community organizations, labor unions and industry or trade associations) vary with size. One reason may be due to our sample, which focused on single-plant firms. The literature suggests that small firms are more likely to have employees, managers, and owners who all come from the same geographic location and share a sense of common community involvement. Hence, they have a closer connection to the community (Bowen, 2002; Chen & Hambrick, 1995; Dean, Brown & Bamford, 1998). The success of smaller sized firms therefore is more closely related to approvals from local stakeholders (Perrini, 2006), and therefore more responsive to local stakeholder calls for environmental responsibility. However, because our sample was constrained to single-plant firms, these differences may be lessened. Future research would benefit by extending our analysis to examine whether smaller multi-plant firms might be more responsive to perceived pressures from societal stakeholders (and other stakeholder groups) than larger multi-plant firms when adopting proactive environmental practices.

In order to investigate the relationship between stakeholder pressures, size and proactive environmental practices, this research relied on a cross section of multi-country data that included numerous manufacturing sectors. The estimated coefficients for country and industry were statistically significant in most cases, indicating the importance of controlling for country and industry effects. One limitation to our study is that by using cross section data, we were unable to capture any dynamic effects that may affect the relationship between stakeholder pressures, size and proactive environmental practices. Future research could focus not only on recognizing the importance of size moderated stakeholder effects but also studying whether size moderated stakeholder effects change across time.

Another constraint to our approach relates to how we measured firms' proactive

environmental practices. After a careful reading of Hart (2005), we defined proactive environmental practices as intangible managerial innovations and routines that require organizational commitments towards improving the natural environment and which are not required by law. While Anton *et al.* (2004) show that firms which adopt more proactive environmental practices demonstrate a greater likelihood of improving their environmental performance, we do not measure environmental performance directly since doing so is beyond the scope of this paper. Additionally, data limitations prevented us from accounting for the relative importance of firms' proactive environmental practices in that some practices may have a stronger relationship with environmental performance than others, perhaps because they address stakeholder concerns to a greater degree. By appreciating the nuanced relationship between stakeholder pressures, size, and the adoption of proactive environmental practices, scholars could extend this research to consider these issues.

While the OECD survey requested that the person responding to its survey be the individual responsible for environmental matters within the firm, we were not able to ensure whether the respondents in our sample had decision-making power with respect to environmental actions. Understanding these distinctions is relevant for future research. That is, environmental managers with no decision making authority may perceive stakeholder influences differently from individuals who have decision making power. Additionally, while we restricted our sample to assess single-plant firms, there might be some organizations in our study that were, in fact, part of a larger group (or a division of a larger group), perhaps trading under a different name, for which the survey respondents may have been unaware.

Finally, future research should take a closer look at why managers of smaller firms tend to be affected more by value chain stakeholders, internal stakeholders and regulatory stakeholders than their larger counterparts. Our view is that differences may exist because

resource scarcity, simplified decision making process, and stronger innovation propensity. However, some of these factors may be related more or less to different types of stakeholder relationships. For instance, smaller firms may respond more to regulatory stakeholders because of their resource scarcity and simplified decision making processes, whereas they may respond more to value chain stakeholders because of their stronger innovation propensity and related need to work more closely with its suppliers and customers. By contrast, the smaller firms may be motivated to address internal stakeholder pressures because of their simplified decision making process. Understanding these relationships would help advance stakeholder theory and our knowledge of what factors motivate different sized firms to consider whether some stakeholder pressures are more relevant than others.

CONCLUSION

In developing a more comprehensive understanding of the relationship between stakeholder pressures and proactive environmental practices, this study shows that researchers, managers, and policy makers need to be cautious about associating stakeholder pressures directly with the number of environmental practices across all types of firms, large and small. Rather, the relationship between stakeholder pressures and proactive environmental practices varies with size. While smaller firms are less likely to undertake as many proactive environmental practices as larger firms, they are more responsive to perceived pressures from value chain, internal, and regulatory stakeholders. The importance of size moderating stakeholder pressures has significant implications for future research in management strategy. We hope that demonstrating this relationship stimulates scholars to consider the extent to which size moderates stakeholder pressures in other research areas as well.

NOTES

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2. Survey response rates in these studies were 20.1 percent and 10.35 percent respectively.
3. Within the U.S, Canada, France, Germany, Hungary and Norway, the majority of manufacturing operations are characterized as being single-plant firms (U.S. Census, 2004; Statistics Canada, 2008; European Communities, 2003; Statistics Norway, 2008). After adjusting for missing observations, our sample consisted of 907 firms.

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Table I. Stakeholder factor analysis [a]

Stakeholder Group	Factor Loadings		
	Value chain Stakeholders	***Internal Stakeholders***	***Societal Stakeholders***
Household consumers	**.725**	-.157	.221
Commercial buyers	**.786**	.195	.119
Suppliers of goods and services	**.687**	.352	.106
Management employees	.089	**.855**	.224
Non-management employees	.142	**.837**	.246
Environmental groups	.196	.136	**.771**
Community organizations	.202	.174	**.691**
Labor unions	-.012	.116	**.717**
Industry or trade associations	.208	.218	**.686**
Alpha Coefficients	**0.636**	**0.785**	**0.748**

[a] Loadings stronger than ± 0.50 are bolded.
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table II. Correlations and descriptive statistics

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Count of environmental practices	1.00												
2	Size (natural log)	0.32	1.00											
3	Publicly traded	0.17	0.15	1.00										
4	Foreign owned	0.15	0.17	0.25	1.00									
5	Market scope	0.08	0.24	0.08	0.14	1.00								
6	Age	0.06	0.15	-0.06	-0.14	-0.03	1.00							
7	Business performance	0.11	0.04	0.00	0.10	0.07	-0.05	1.00						
8	Impact on natural resources	0.20	0.15	-0.01	-0.02	0.00	0.11	0.01	1.00					
9	Environmental R&D	0.17	0.07	0.04	0.03	-0.04	0.01	0.03	0.03	1.00				
10	Value chain stakeholders	0.15	0.10	0.00	0.03	-0.02	-0.01	0.02	0.04	0.07	1.00			
11	Internal stakeholders	0.27	0.15	0.05	0.06	0.09	-0.02	0.10	0.13	0.09	-0.01	1.00		
12	Societal stakeholders	0.16	0.15	0.12	0.03	-0.06	0.05	-0.04	0.07	0.12	-0.02	-0.02	1.00	
13	Regulatory stakeholders	0.34	0.25	0.01	0.03	0.06	0.16	-0.03	0.16	0.05	0.06	0.12	0.11	1.00
	Mean	3.45	0.03	0.07	0.11	3.09	3.42	3.56	1.82	0.05	0.01	0.01	0.00	0.01
	Std. Dev.	2.60	0.98	0.26	0.31	1.01	1.00	0.99	0.63	0.23	0.99	0.99	1.00	1.00
	Variance inflation factors	---	1.26	1.10	1.14	1.10	1.08	1.03	1.06	1.03	1.03	1.07	1.07	1.12

N= 907, Correlations (absolute value) greater than 0.065 (0.085) are significant at the 5% (1%) level of significance.

Table III. Impact of size and stakeholders on environmental practices

	Model 1		Model 2		Model 3	
Variable	***Coefficient***	***Std. Error***	***Coefficient***	***Std. Error***	***Coefficient***	***Std. Error***
Size	0.183***	0.022	0.105***	0.021	0.157***	0.024
Publicly traded	0.249***	0.063	0.225***	0.059	0.230***	0.054
Foreign owned	0.162***	0.060	0.115*	0.059	0.113**	0.056
Market scope	0.014	0.023	0.000	0.022	0.003	0.021
Age	0.020	0.025	0.008	0.023	0.003	0.023
Business performance	0.049**	0.021	0.042**	0.020	0.051**	0.020
Impact of natural resources	0.184***	0.038	0.126***	0.037	0.129***	0.035
Environmental R&D	0.198***	0.077	0.158**	0.073	0.143**	0.070
Food	-0.163*	0.095	-0.072	0.087	-0.107	0.089
Textiles	-0.448***	0.127	-0.418***	0.136	-0.426***	0.131
Wood	-0.274***	0.096	-0.244***	0.094	-0.263***	0.098
Paper	-0.265**	0.107	-0.209**	0.092	-0.219**	0.094
Nonmetal	-0.298**	0.140	-0.348***	0.124	-0.376***	0.127
Metal	-0.144**	0.064	-0.130**	0.061	-0.128**	0.058
Machine	-0.251***	0.065	-0.135**	0.060	-0.150**	0.059
Transportation	-0.268***	0.082	-0.160*	0.083	-0.204**	0.081
Canada	-0.511***	0.156	-0.424***	0.154	-0.385***	0.137
France	-0.363***	0.091	-0.138	0.088	-0.117	0.087
Germany	-0.206**	0.080	-0.135*	0.075	-0.092	0.077
Hungary	-0.283***	0.093	-0.197**	0.091	-0.186**	0.090
Norway	-0.007	0.093	0.154*	0.089	0.199**	0.091
Constant	0.939***	0.171	0.998***	0.163	0.942***	0.160
Value chain stakeholders			0.067***	0.021	0.091***	0.022
Internal stakeholders			0.151***	0.025	0.164***	0.024
Societal stakeholders			0.048**	0.024	0.050*	0.027
Regulatory stakeholders			0.153***	0.021	0.172***	0.022
Size x Value chain stakeholders					-0.057***	0.021
Size x Internal stakeholders					-0.032*	0.019
Size x Societal stakeholders					0.002	0.021
Size x Regulatory stakeholders					-0.030**	0.015
R-squared	0.230		0.322		0.336	
Adjusted R-squared	0.212		0.303		0.314	
Log likelihood	-3188.95		-2906.78		-2866.24	
Goodness of Fit	6377.89		5813.55		5732.48	
χ^2 test for model significance[a]	1037.51***		1601.85***		1682.92***	
χ^2 test for change in model[b]			564.34***		81.07***	

N=907. Unstandardized coefficient estimates and quasi-maximum likelihood standard errors shown.
*** p < 0.01, ** p < 0.05, * p < 0.10

[a] Likelihood ratio test of a model against a restricted model that includes a constant and dummy variables for industry and country effects.

[b] Likelihood ratio test for the change in model significance (Model 2 vs Model 1, or Model 3 vs Model 2).

Table IV. Marginal effects of perceived stakeholder pressures by firm size

Firm Size	Value Chain Stakeholders			Internal Stakeholders			Societal stakeholders			Regulatory Stakeholders		
Description	***Direct***	***Indirect***	***Total***	***Direct***	***Indirect***	***Total***	***Direct***	***Indirect***	***Total***	***Direct***	***Indirect***	***Total***
First Quartile– Small Firm												
Mean	0.083	0.055	0.138	0.149	0.030	0.179	0.046	-0.002	0.044	0.156	0.028	0.184
Median	0.085	0.052	0.142	0.152	0.029	0.187	0.047	-0.002	0.045	0.159	0.027	0.192
Maximum	0.173	0.383	0.513	0.309	0.212	0.446	0.095	0.003	0.093	0.324	0.197	0.443
Minimum	-0.033	-0.081	-0.114	-0.059	-0.045	-0.104	-0.018	-0.012	-0.016	-0.062	-0.042	-0.104
Std. Dev.	0.037	0.035	0.066	0.066	0.019	0.081	0.020	0.001	0.020	0.070	0.018	0.083
Observations	227	227	227	227	227	227	227	227	227	227	227	227
Fourth Quartile– Large Firm												
Mean	0.137	-0.121	0.016	0.246	-0.067	0.179	0.076	0.004	0.080	0.258	-0.063	0.195
Median	0.139	-0.106	0.030	0.249	-0.058	0.178	0.077	0.003	0.081	0.260	-0.055	0.195
Maximum	0.222	-0.022	0.106	0.398	-0.012	0.280	0.123	0.014	0.134	0.417	-0.011	0.300
Minimum	0.050	-0.439	-0.260	0.090	-0.243	0.078	0.028	0.001	0.028	0.094	-0.227	0.083
Std. Dev.	0.029	0.072	0.058	0.051	0.040	0.040	0.016	0.002	0.017	0.054	0.037	0.041
Observations	227	227	227	227	227	227	227	227	227	227	227	227