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INSTITUTIONAL PRESSURE AND  
ENVIRONMENTAL MANAGEMENT

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## INSTITUTIONAL PRESSURE AND ENVIRONMENTAL MANAGEMENT

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# **INSTITUTIONAL PRESSURE AND ENVIRONMENTAL MANAGEMENT**

## **ABSTRACT**

When integrated with key organizational characteristics, institutional theory can yield new insights to understand differences between firms' strategies. We propose that a company's functional organization and internal power structure influence its facility managers' sensitivity to and interpretation of institutional pressures. Combining over 500 responses from an original survey with existing data sources, we show how two corporate departments affect how facility managers perceive and respond to various institutional pressures to adopt environmental management practices.

## INTRODUCTION

The question of what drives organizations to adopt specific sets of management practices is central to organizational theory. The institutional perspective suggests that firms obtain legitimacy by conforming to the dominant practices within their institutional field (DiMaggio & Powell, 1983; Scott, 1992). The institutional perspective, however, has barely begun to address the fundamental issue of business strategy: why do organizations that share the same institutional field—and thus face common isomorphic institutional pressures—pursue different strategies?

Other perspectives in organizational theory analyze heterogeneity in firms' acquiring and deploying resources and management practices and put particular emphasis on internal organizational factors. For example, scholars of the resource based view describe firms' heterogeneous strategies as being driven mostly by their internal organization and resources (Penrose, 1959).

Several authors have started to integrate theories of institutional and organizational dynamics to develop an institutional-based explanation of heterogeneity. For example, Oliver (1991) combines institutional and resource dependence perspectives to predict the circumstances when organizations will resist institutional pressures. Greenwood and Hinings (1996) integrate institutional and internal organizational dynamics in order to explain radical change.

However these integrative approaches pay little attention to how the constituents of the institutional field interact with organizational actors. In a rare exception, Hoffman (2001) builds a conceptual model that connects the influence of institutions at the field level to the culture and practices at the organizational level.

In this paper we develop and test a model that links institutional and organizational dynamics. We argue that organizations differ in their ability to channel institutional pressures. We seek to identify the organizational access points that allow institutional pressures to permeate organizations. More specifically we maintain that functional departments within the organization play the role of receptors of institutional pressures. These departments in turn influence managers' sensitivity and response to various pressures from constituents of the institutional environment. In our model, the adoption of management practices by organizations varies therefore not only due to different levels of institutional pressures but also because of the organizational structure and processes that influence

managers' interpretations of these pressures.

We test our framework by examining the adoption of environmental management practices by manufacturing facilities located across the United States. Environmental management issues provide a rich empirical context because a broad array of private and public constituents exerts pressures on these facilities to adopt environmental management practices, and yet there remains great heterogeneity in the extent to which facilities have adopted these practices. In addition, these environmental management practices may not yet be institutionalized: they are not required by law and there is a lack of consensus on their actual effectiveness in terms of environmental performance. Goodrick and Salancik (1996) demonstrate that organizational influences on practices are greatest during the period of uncertainty before practices become institutionalized.

The paper proceeds as follows. After a brief review of institutional pressures, we develop hypotheses that describe how corporate functional departments influence their subsidiary facilities' perception of institutional pressures, and how this affects the adoption of management practices. We then describe our sample and empirical method, and present our results. We conclude by discussing how this study advances understanding of heterogeneous management practices through the lens of institutional theory, and how it can thus make important contributions to the study of business strategy.

## **INSTITUTIONAL PRESSURES**

The institutional perspective argues that firms are subject to institutional pressures within an institutional field. An institutional field is defined as "those organizations that...constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products" (DiMaggio & Powell, 1983: 148). Clearly, institutional fields are complex, comprised of a vast array of constituents with their own culture and interests (Scott, 2001). In the case of the natural environment, for example, institutional field constituents include governments, activists, local communities, trade associations, investors, and customers — each of which possesses its own conception of legitimate environmental management practices to address environmental concerns (Hoffman, 2001).

Firms contend with institutional pressures exerted by constituents from their market and non-market environments (Baron, 1995). Firms engage with constituents in their market environment

(e.g., customers, suppliers) via economic transactions while constituents in their non-market environment (e.g., regulators, environmentalist organizations) are interested in social, political, and legal issues (Baron, 2000; Baron, 1995). Non-market and market actors frame environmental management issues differently. For example, non-market actors such as regulators and activist groups typically view environmental issues as negative externalities, and often operate via the legal system and the mass media (e.g., as a court of public opinion). Constituents of the market environment tend to view environmental issues primarily within the rubric of business performance, focusing on their cost and efficiency implications. Market and non-market actors are thus quite likely to differ in their perceptions of which management practices constitutes a legitimate response to a facility's environmental concerns.

This diverse set of constituents is also likely to disagree about the legitimacy of management practices before such practices become institutionalized, which occurs when they come to take on a rule-like status in social thought and action (Meyer & Rowan, 1977: 41). The process of institutionalization involves a reinforcing feedback loop where increasing consensus among organizational decision-makers regarding the value of a management practice lead to further adoption (and thus diffusion) of the management practices (Tolbert & Zucker, 1996). Significant heterogeneity among firms adoption of environmental management practices suggests that this domain has yet to become fully institutionalized.

We argue that studying an institutional field marked by a diverse set of market and non-market constituents where the management practices are not yet institutionalized provides a unique opportunity to analyze the web of institutional forces and organizational factors that shape and guide the adoption of a management practice.

#### **FUNCTIONAL DEPARTMENTS AS RECEPTORS AND INTERPRETERS OF INSTITUTIONAL PRESSURES**

Few institutional scholars have investigated empirically how organizational characteristics affect organizations' responses to institutional pressures. For example, Goodrick and Salancik (1996) found that ownership structure influenced hospitals' medical routines. Kostova and Roth (2002) identified three relational characteristics that moderate an intraorganizational responsiveness to institutional pressures. In their study of the adoption of total quality management (TQM) practices by one multinational corporation's subsidiaries, they found that its subsidiaries' dependence, trust, and

identity with the parent organization affected their responsiveness to pressures exerted by the parent. However, while these analyses identified specific organizational characteristics that can prompt heterogeneous responses to institutional pressures, they did not address the question of how constituents of the institutional environment interact with individuals within the organization.

Hoffman was the first to point out the importance of organizations' functional structure and culture to explain heterogeneous responses to institutional pressures. Hoffman (2001: 138) notes, "the form of the response from the organization is as much a reflection of the institutional pressures that emerge from outside the organization as it is the form of organizational structure and culture that exist inside the organization." From this perspective, organizations provide multiple access points to institutional pressures.

Building on this approach, we propose that two organizational characteristics affect how the organization responds to institutional pressures. The first refers to preexisting channels through which managers perceive and assess the significance of an institutional pressure; the second refers to the ability of the recipients of such pressures to influence decisions within the organization.

### **Interpretation of the Pressure**

Organizations are complex, and consist of a "mosaic of groups structured by functional tasks" (Greenwood & Hinings, 1996: 1033). Because these functional groups focus on specialized tasks, they are able to handle some pieces of the organization contextual complexity (Blau, 1974). Functional groups develop their own cultural frames to interpret contextual complexity. As such, depending on the department that serves as the receptor of an institutional pressure, the issue at hand may be perceived as one of regulatory compliance, human resource management, operational efficiency, risk management, market demand, or social responsibility (Hoffman, 2001). In other words, the cultural frame of the department that receives an institutional pressure greatly influences how the pressure is ultimately interpreted by the organization's management. For example, individuals within a marketing department may see the potential for greener products as a result of responding to a market pressure, whereas individuals within a legal affairs department may see the potential for fewer liabilities as a result of responding to a non-market pressure. In addition, individuals within a functional area may benefit from demonstrating the salience of an institutional pressure to the rest of the organization. By showing the importance of an institutional pressure, they legitimate their existence within the organization. This idea that specific functional groups within

organizations receive and channel institutional pressures is consistent with institutional theory that considers professions as key carriers of ideas among and across institutional fields (DiMaggio & Powell, 1983).

### **Power Distribution within the Organization**

Organizations also differ in the relative influence various functional departments (e.g., marketing, legal, operations) exert in decision-making. Sociologists within the old institutionalism tradition emphasized issues of power, influence, and coalitions within organizations (Michels, 1962; Selznick, 1949). In an intraorganizational context, a department's power and influence come from a variety of sources, including its position within the formal organizational hierarchy, its centrality within social networks and workflows, and its ability to provide scarce, critical resources (Brass, 2002; Hinings, Hickson, Pennings, & Schneck, 1974; Salancik & Pfeffer, 1974). We believe that differences in how organizations distribute power across their functional departments explain heterogeneous responses to common institutional pressures. The extent to which departments that detects institutional pressures can convey these concerns to management depend upon how much influence these departments have on management decisions. As a result, influential departments increase the salience of constituents who exert pressure within their domain. Not only would this heightened saliency likely to result in such organizations being more sensitive to such issues, but such organizations would therefore be more likely to act upon pressures exerted by these constituents.

In this study, we focus on two departments—legal affairs and marketing—that differ significantly in their cultural frames and thus are quite likely to differ in their interpretation of institutional pressures. We selected the legal affairs and marketing departments because their focus is well divided between constituents of the non-market and market environments, respectively.

***Legal affairs department.*** Edelman and colleagues have been studying the role of the managerial profession in the domain of legal compliance and has shown that professionals bring along their ideas as they move between organizations, and as they participate in professional networks (Edelman & Suchman, 1997; Edelman, Uggan, & Erlanger, 1999). Fuller et al. (2000) argue that the formalization of a legal structure within organizations is a starting point for understanding how law enters into the everyday lives of employees. Edelman examines why organizations create legal structures and how these may signal fairness and attention to law (and thus

produce legitimacy) within organizations. Charged with assuring a company's legitimacy and "license to operate," legal affairs departments are typically the primary channel for institutional pressures from constituents in their organization's non-market environment. This department is typically involved in regulatory compliance activities and addressing inquiries and complaints from local communities, activist groups, and the media. The more influence legal affairs departments have on facility managers, the more they will be able to convey the importance of such institutional pressures. Organizations with more powerful legal affairs departments will more acutely perceive institutional pressures exerted by constituents of their non-market environment. Without an influential legal affairs department, facility managers may not perceive institutional pressures from non-market actors.

*Hypothesis 1: Facilities with a more influential corporate legal affairs department will be more perceptive to institutional pressures from non-market sources.*

**Marketing departments.** Marketing departments are responsible for orienting a firm's products and services to meet and anticipate customer demands. As such, they are particularly focused on identifying factors that can provide competitive differentiation, and are often acutely aware of industry trends and competitors' positioning. To the extent that customers are concerned about their suppliers' environmental management practices or performance, marketing departments are often the first to know. The more influence corporate marketing departments have on facility managers, the more they will be able to convey the importance of such institutional pressures. Without an influential marketing department, facility managers would be less likely to be aware of institutional pressures from the facility's market environment, and as a result would be less likely to act upon them.

*Hypothesis 2: Facilities with a more influential corporate marketing department will be more perceptive to institutional pressures from market sources.*

## **ORGANIZATIONAL RESPONSES TO INSTITUTIONAL PRESSURES**

In this paper we focus on management practices that seek to reduce the environmental impacts of operations beyond regulatory requirements. The main characteristics of these practices is that they are not required by law and there is no consensus about their effect on environmental performance. Their lack of institutionalization makes environmental management practices a

particularly appealing case study to examine through an institutional lens, since institutional theory posits that decisions about organizational practices that face uncertain tangible benefits are especially sensitive to institutional pressures. In addition, as Oliver (1991: 155) noted, “from an institutional perspective...the appearance rather than the fact of conformity is often presumed to be sufficient for the attainment of legitimacy.” Thus adopting environmental management practices—regardless of their immediate performance implications—may be particularly effective in enhancing organization legitimacy by helping to alleviate constituents’ about environmental performance. Bansal and Clelland (2004) have shown how firms can partially manage perception of their legitimacy by conveying information regarding changes in products or processes to demonstrate commitment to the environment. Studies in other domains have found that firms may engage in symbolic management as a means of responding to institutional pressure (e.g., Edelman, 1992; Westphal & Zajac, 1998).

In our case, these environmental management practices include environmental policies and procedures, formal training programs, and environmental auditing routines. In addition, managers can choose to have the comprehensiveness of their environmental management systems (EMS) validated by a third party by pursuing certification to the ISO 14001 Environmental Management System Standard.

A central tenant of our model is that a facility will adopt more comprehensive environmental management practices in response to greater *perceived* institutional pressure. For example, managers who perceive more environmental pressure from the government, local communities, and the media may be more likely to relieve this pressure by bolstering their compliance assurance programs. Likewise, organizations may have incentives to adopt an EMS that is certified by a third party to respond to customer pressure.

*Hypothesis 3: The more managers perceive institutional pressures, the more they will adopt management practices to alleviate these pressures.*

Figure 1 illustrates our model. This figure shows that facility-level managers’ perceptions of institutional pressures are a function of market and non-market pressure but are moderated by the organizational characteristics of the facility and the parent company. Specifically, we expect that perceptions of pressure will be affected by the influence of corporate functional areas (Hypotheses 1 and 2). Perceived pressures will, in turn, influence the adoption of environmental management practices (Hypothesis 3). In our model, we control for the observed level of market and non-market

pressure to distinguish perceived pressure from “actual” pressure. When predicting the influence of the corporate functional areas on perceived institutional pressure, we also control for firm size and regulatory stringency at the headquarters country as well as past compliance to isolate these potential influences from the hypothesized effects.

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Insert Figure 1 about here  
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## METHODS

Data for this study are derived from an original survey and publicly available databases. The survey gathered information about perceptions of institutional pressures, the relative influence of various corporate departments, and the management practices each facility has adopted. Additional measures of institutional pressures as well as firm and facility characteristics were obtained from existing databases.

### Sample

Our sample focuses on heavily polluting industrial sectors, which we identified based on their share of toxic chemical emissions reported to the US EPA’s Toxic Release Inventory (TRI) program. The following sectors were selected: pulp, paper and paperboard mills (SIC 26), chemical and allied products (SIC 28), petroleum refining (SIC 29), primary metals manufacturing (SIC 33), machinery manufacturing (SIC 35), electrical/electronics (SIC 36), automotive (SIC 37), and electric utilities (SIC 49).<sup>2</sup> In 2001, the 11,622 facilities from these industries that reported TRI data represent 47% of the total number of facilities that reported data to TRI and 78% of the total toxic air emissions reported in the TRI program that year (US EPA, 2003). To ensure we would have access to trend performance data, we restricted our sample to facilities that reported annual air emissions to the TRI program at least three times during 1996-2000. To ensure the availability of financial data, we further restricted our sample to facilities owned by publicly traded companies. These restrictions reduced our sample to 3160 facilities.

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<sup>2</sup> Facilities in these (and some other) industries must report TRI data annually when they employ 10 or more individuals and manufacture, import, process, or use more than designated minimum thresholds (typically 10,000–25,000 pounds) of any of 650 toxic chemicals (US EPA, 2001).

## Survey

We conducted a mail questionnaire survey to gather facility-level data on environmental management practices (EMPs) and managers' perceptions of why their facilities adopted these practices. Since we believed they would be most knowledgeable about both of these issues, we targeted our survey toward facility-level environmental and EHS (environment, health and safety) managers. The Survey Research Center (SRC) at the University of California at Santa Barbara called each facility to obtain the name of these individuals. Meanwhile, we pre-tested our questionnaire instrument to ensure that our questions were clearly understood and easily answerable by our respondents. After environmental managers from twelve large companies in our sample industries, a few environmental management consultants, and several faculty members who research environmental management issues completed our draft survey, we interviewed them to probe their interpretation of each question and to solicit suggestions to clarify them. This process resulted in refinements to several survey questions and response anchors.<sup>3</sup>

We sent the questionnaire to the entire sample twice in late 2003 (October 13 and November 4). The cover letter that accompanied the questionnaire provided a unique identification number that enabled respondents to complete the survey via a secure website instead of via the enclosed paper version. Between the two distribution dates (October 23 through November 12), the SRC attempted to telephone all of these facilities to encourage them to respond, and reached 2312 facilities (73% of the sample). In addition, postcards were sent in January 2004 to those who had not yet replied.

We received 536 responses. From our total sample of 3160, this 17% response rate is considered acceptable for a sample of this size. We tested sample representativeness in several ways. First, we ran an ANOVA analysis to and found that the different industries' response rates, which ranged from 13% (Refining; Electric Utilities) to 17% (Machinery; Electrical/Electronics) to 19% (Automotive; Primary Metals), were not statistically significant ( $F=0.03$ ). We then conducted t-tests to compare responders to non-responders along three dimensions. The two groups were statistically indistinguishable in terms of facility employment ( $p=0.19$ ), pollution levels measured as average logged pounds of toxic emissions in 2000-2001 ( $p=0.41$ ), and the environmental harm resulting from

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<sup>3</sup> The survey is available from the corresponding author.

these emissions ( $p=0.80$ ).<sup>4</sup> The result of these four comparisons provides reasonable assurance that the respondents are representative of the entire sample.

## Model

We employed a structural equation modeling (SEM) approach and estimated the model via maximum likelihood using AMOS Version 5 (Arbuckle, 1997). This method allows us to test the relationships associated with the model as a whole, as well as capture the unobservable major constructs through latent variables. Structural modeling addresses structural and measurement issues frequently found in survey-designed research and is increasingly being used in strategic management research (Capron, 1999; Simonin, 1999). The SEM method consists of two major components: (1) a measurement model that captures the manifestation of constructs or latent variables in terms of observable measures; and (2) a structural model that estimates the relationship between the latent variables. Consistent with the two-step approach advocated by Anderson and Gerbing (1988), we estimated a measurement model prior to examining structural model relationships.

## Measures

In this section, we describe our measures for the measurement and structural models, including several control variables such as observed non-market pressure, observed market pressure, facility and firm compliance history, firm size, and regulatory stringency at the headquarters country.

***Perceived non-market and market pressures.*** Hypotheses 1 and 2 predict the extent to which organizations perceive non-market and market pressures. To measure these perceptions, we asked survey respondents to indicate the extent to which various external groups influenced their facility to improve environmental performance. The list of external groups included customers, suppliers, competitors, trade associations, local community, environmental organizations, regulators/legislators, the media, shareholders, and socially responsible investment (SRI) funds. Respondents ranked each stakeholder on a five-point scale from “no influence” (coded 0.2) to a “very strong influence” (coded 1). We conducted an exploratory principal components factor analysis to detect the underlying structure in the relationship among these variables. Missing observations were excluded listwise. The underlying variables loaded onto two factors: the first represents *perceived market pressure* exerted

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<sup>4</sup> We compared pollution levels using data from the US EPA’s Toxic Release Inventory (TRI) and environmental harm by weighting TRI air releases during 2000 and 2001 by each chemical’s toxicity weight from the US EPA’s TRACI scheme, summing these weighted totals (Toffel & Marshall, 2004) and logging the result.

by customers, suppliers, and competitors, while the second represents *perceived non-market pressure* exerted by the local community, environmental organizations, regulators, and the media; shareholders, trade associations, and SRI funds loaded fairly evenly across both factors. These two factors explained 55.7% of the variance, with Eigenvalues of 4.25 and 1.32. We removed the three variables that loaded fairly evenly on both factors (shareholders, trade associations, and SRI funds), and re-ran the analysis. The two resulting factors had Eigenvalues of 3.33 and 1.19 and explained 64.6% of the total variance.

***Environmental management practices.*** The comprehensiveness of a facility’s environmental management practices (EMPs) is the dependent variable for Hypothesis 3. We construct this latent variable by aggregating the extent to which the facility is implementing EMPs (Khanna & Anton, 2002). We chose variables representing the main elements of an EMS described in the ISO 14001 Environmental Management System Standard (ISO, 1996). These include the following categories: the extent to which the facility has (1) adopted and communicated an environmental policy to their staff; (2) adopted environmental objectives and targets; (3) implemented environmental training throughout the organization; and (4) implemented the ISO 14001 Environmental Management System standard. Details about these four categories are provided in Table 1. We normalized each category sum to a maximum score of 1. We conducted a principal component analysis of the four normalized category sums and confirmed that they loaded on only one factor (Eigenvalue of 2.028 that explains 50.7% of the variance).

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Insert Table 1 about here  
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***Functional department influence.*** To measure the influence of the corporate and legal affairs department and the corporate marketing department, we asked survey respondents: “To what extent have the following corporate departments influenced your facility to improve its environmental performance?” The five point scale ranged from “no influence” (coded 0.2) to “very strong influence” (coded 1). We also provided an additional option for respondents to note their corporation did not have each department, and we coded the department influence variables as “no influence” in such cases.

***Observed non-market pressure.*** Pressure from non-market actors (legislators, regulators,

non-governmental organizations) is considered a latent variable, which we construct using four measures, each of which we rescaled to maximum values of one. First, we include the facility's state's Congressional members' "National Environmental Scorecard" values published annually by the League of Conservation Voters, a measure that has been widely used for this purpose (Hamilton, 1997; Kassinis & Vafeas, 2002; Viscusi & Hamilton, 1999; Welch, Mazur, & Bretschneider, 2000). The average of the League of Conservation Voters' 1996 scores for each state's US Senate and House delegations to Congress was calculated. Second, we include the number of state-level environmental policy initiatives (toxic waste, air pollution and recycling programs) each state has implemented (Hall & Kerr, 1991: 142), a measure recently used by Welch et al. (2000). Third, we employ Renew America's 1989 assessment of how comprehensively each state's policies have addressed 17 environmental domains (e.g., air pollution, groundwater, soil conservation) (Hall & Kerr, 1991: 146). Fourth, we include a proxy of the community's propensity for collective action regarding environmental protection. We include the number of members of major environmental and conservation organizations in the facility's state per thousand state residents in 2003, following an approach others have used (Maxwell, Lyon, & Hackett, 2000; Welch et al., 2000; Wikle, 1995). These data were collected through a survey of 80 main environmental and conservation NGOs in 2003 (Delmas, 2004). We ran an exploratory principal components factor analysis on these four non-market measures. The four variables loaded on one factor with an Eigenvalue of 3.074, which explained 76.9% of the variance.

***Observed market pressure.*** Buyers motivate many companies to adopt environmental management practices (Jiang & Bansal, 2003; King, Lenox, & Terlaak, Forthcoming). Because companies are more likely to adopt the ISO 14001 Environmental Management System standard when they face markets with more adopters of this standard (Christmann & Taylor, 2001), we measure market pressure to adopt environmental management practices by considering the extent to which the facility's buyers have adopted ISO 14001. Because individual facility-level data are not available, we constructed an industry-level measure using the following equation:

$$OMP_j = \sum_k \left( \frac{ADOPT_k}{ESTAB_k} \times \frac{SALES_{j,k}}{SALES_j} \right)$$

where  $OMP_j$  is the observed market pressure on facilities in industry  $j$ ,  $ADOPT_k$  is the number of establishments in industry  $k$  that had adopted ISO 14001 (ISO, 2003),  $ESTAB_k$  is the total number of

establishments in industry  $k$  (US Census Bureau, 2003),  $SALES_{j,k}$  represents the total annual sales from firms in industry  $j$  to firms in industry  $k$ , and  $SALES_j$  represents the total annual sales from firms in industry  $j$ . Data for latter two variables were obtained from the most recent detailed Economic Input-Output (EIO) tables from the Bureau of Economic Analysis (BEA, 2000). In summary, our observed market pressure is a sales-weighted measure of the extent to which each industry's buying sectors have adopted ISO 14001.

***Environmental regulatory compliance.*** Past events that have shaken the organization may also influence both how managers perceive institutional pressures and how they respond to them (Elsbach & Sutton, 1992). For example, managers in firms whose reputations have suffered from pollution accidents may be more sensitive to environmental issues than those in other companies (Prakash, 2000). Similarly, past compliance problems can lead managers to be more sensitive to pressure from regulators and take additional steps to ensure compliance, such as hiring professionals with experience implementing programs that assure compliance (Edelman, 1990).

We control for a facility's poor compliance history as a potential source of increased sensitivity to non-market pressure. Facility non-compliance is considered a latent construct based on three variables: the sum of environmental compliance violations during 2002-2003, the number of formal enforcement actions during 1999-2003, and the logged sum of penalties accrued during 1999-2003 (Kassinis & Vafeas, 2002; Khanna & Anton, 2002; Russo & Fouts, 1997).<sup>5</sup> This information was obtained from the US Environmental Protection Agency's Integrated Data for Enforcement Analysis (IDEA) database, and we rescaled each to a maximum value of one. We conducted principal components factor analysis to confirm that these three items resulted in one factor (Eigenvalue of 2.13 that explained 71.0 % of the variance).

A facility's corporate-wide environmental non-compliance may also affect the corporate and legal affairs department's influence over its subsidiaries. To measure corporate-wide environmental compliance while reducing collinearity with the facility's own compliance history, we measured the non-compliance of the facility's corporate affiliates. To construct this measure, we used the US EPA's Risk Screening and Environmental Indicators (RSEI) database<sup>6</sup> to extract a list of facilities that reported the same "Parent DUNS" number (a unique identifier assigned by Dun and Bradstreet)

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<sup>5</sup> To avoid dropping facilities with no penalties, we added one before logging the sum of penalties.

<sup>6</sup> US EPA's Risk Screening and Environmental Indicators (RSEI) is available at <http://www.epa.gov/opptintr/rsei/index.html>

to the EPA's Toxic Release Inventory program as the facilities in our sample. We obtained the number of formal enforcement actions and sum of penalties (which we logged) for these corporate affiliates from the IDEA database, and rescaled these variables to a maximum value of one. A principal components factor analysis of these two items resulted in one factor with an Eigenvalue of 1.639, which explained 82.0 % of the variance.

***Stringency of environmental regulation in the headquarters country.*** Nations differ significantly in how their citizenries perceive the natural environment and in the stringency of their environmental regulations (Jamison & Baark, 1999; Perron, Vaillancourt, & Durand, 2001). These disparities lead to differing views on what company environmental actions are considered legitimate. These views can be particularly important in the country of a facility's headquarters because this often serves as a primary source of labor, capital, and media coverage. As such, corporate departments located in countries with more stringent environmental regulations may be more sensitive to institutional pressures to improve their environmental performance. We measure the relative stringency of environmental regulations at each facility's headquarters country using data from the World Economic Forum's WEF's 2001 Executive Opinion Survey of its members. Using a seven point scale, responses ranged from "lax compared to most other countries" to "among the world's most stringent" (WEF, 2002).

***Corporate size.*** We measured corporate size as logged corporate revenues, which we rescaled to a maximum value of one. We obtained this information from Dun and Bradstreet, Onesource, Hoovers, and Compustat.

There are two main limitations to our cross sectional survey method. First, one could argue that there is a potential bias resulting from asking respondents both about their environmental management practices and the pressures they face to improve environmental performance. Second, our analysis could be vulnerable to concerns about reverse causality. Instead of perceptions of institutional pressures leading to the adoption of management practices (as we hypothesize), perhaps such practices were adopted first and then subsequently rationalized as responses to institutional pressures. However, since we are interested in identifying where such pressures originate, it is unlikely that respondents will rationalize the sources of perceived pressures based on the specific management practices they have already adopted. While we cannot rule out the possibility that some respondents might have applied such *ex post* rationalization when completing our survey, our

questionnaire made an important distinction to discourage such responses. We asked about institutional pressures to improve the facility's environmental *performance*, not to adopt environmental management practices. In addition, we believe that managers would more likely bias their responses toward autonomy and thus *underreport* external factors that influence their decisions.

Table 2 presents descriptive statistics for all observed variables employed in our analysis.<sup>7</sup>

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Insert Table 2 about here  
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## RESULTS

### Measurement Model

The measurement model refers to the construction of latent variables from observable items. We tested the measurement model by examining individual item reliability, Cronbach's alpha, internal consistency, and discriminant validity (see Table 3). The measurement model provided acceptable item reliability, since all the item loadings for each were significant ( $p < 0.001$ ).

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Insert Table 3 about here  
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We tested internal consistency for each latent variable using three methods. First, we calculated the Cronbach alpha reliability coefficient using standardized item scores (mean=0, variance=1) so that the scale and its reliability were based on the sum of standardized variables. Alpha was above the common threshold of 0.7 for all but one latent variable, where the 0.67 value for *environmental management practices* is still well above the cutoff point of 0.60 recommended for new scales (Nunnally & Bernstein, 1994). Second, we calculated *internal consistency* ( $\rho_{ic}$ ) for each latent variable by dividing (a) the squared sum of the individual loadings by (b) the sum of the variance of their error terms and the squared sum of the individual loadings (Fornell & Larcker, 1981). The values calculated for each of our latent variables exceed the threshold value of 0.70

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<sup>7</sup> Correlations among all observed variables are available from the corresponding author.

(Nunnally, 1978), which suggests that our measurement model demonstrates adequate internal consistency. Third, we calculated “average variance extracted” ( $\rho_{ave}$ ). This measures the amount of variance captured by the construct in relation to the amount of variance attributable to measurement error. For each latent variable, average variance extracted is calculated as (a) the sum of the squared item loadings divided by (b) the sum the variance of the error terms and the squared item loadings. Convergent validity is judged to be adequate when average variance extracted is at least 0.50, which indicates that the variance captured by the construct exceeds the variance due to measurement error (Fornell & Larcker, 1981). As displayed in Table 3, the average variance extracted values are satisfactory for all constructs.

Discriminant validity refers to the extent to which measures of different constructs are distinct. Discriminant validity is deemed adequate when the variance shared between two constructs is less than the variance shared between a construct and its measures (Fornell, Tellis, & Zinkhan, 1982). The variance shared by any two constructs is obtained by squaring the correlation between the two constructs. The variance shared between a construct and its measures is the average variance extracted. Discriminant validity was assessed by comparing (a) the correlations between a given construct with all other constructs to (b) the average variance extracted for the focal construct. Table 3 shows the correlation matrix for the constructs; the diagonal elements have been replaced by the square root of the construct’s average variance extracted. Our constructs demonstrate adequate discriminant validity because these diagonal elements are greater than the off-diagonal elements in the corresponding rows and columns.

## **Structural Model**

The results of the structural model are presented in Table 4.<sup>8</sup>

**Goodness of fit.** We find that the  $\chi^2$  is statistically significant (539.4, df=254, p=0.000), which could suggest some misspecification of the model although it is well recognized that this statistic is sensitive to sample size (Arbuckle & Wothke, 1999). We consider other structural diagnostics for the overall fit of the model that are not sensitive to sample size (Bentler, 1990). The

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<sup>8</sup> To estimate the model, we make several identifying assumptions. We assume that a facility’s observed non-market pressures (which we measure at the state-level) are not directly correlated with corporate size, regulatory stringency at the headquarters country, or the compliance histories of the facility or its corporate affiliates. In addition, we assume that regulatory stringency at the headquarters country is not directly correlated with corporate size or the compliance record of the facility or its corporate affiliates.

root mean squared error of approximation (RMSEA, Steiger, 1990) is an estimate of the discrepancy between the original and reproduced covariance matrices in the population. Cudeck and Browne (1983) suggested that an RMSEA of 0.05 represents a close fit and that RMSEAs of less than 0.08 represent a reasonable fit. In our model, the RMSEA is 0.048 (with a 90% confidence interval ranging from 0.042 to 0.053), which is within the acceptable range. Likewise, the incremental fit index (IFI, Bollen, 1989), the Tucker-Lewis index (TLI, Tucker & Lewis, 1973) and the comparative fit index (CFI, Bentler, 1990) are each between 0.927 and 0.939, above the common threshold of 0.90 that designates an acceptable fit. These structural diagnostics indicate a very good relative fit of the proposed theoretical model to the underlying data.

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Insert Table 4 about here  
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**Testing of the hypotheses.** As Table 4 illustrates, the results provide significant support for most of the hypothesized relationships. There is a significant positive path between the perceived influence of the corporate legal department and perceived non-market pressure ( $\beta = 0.144$   $p < 0.001$ ), providing support for Hypothesis 1. Likewise, the significant positive relationship between the perceived influence of the corporate marketing department and perceived market pressure ( $\beta = 0.319$ ;  $p < 0.001$ ) provides support for Hypothesis 2. Unstandardized regression coefficients represent the amount of change in the consequent variable from a one unit change in the antecedent variable. Since the antecedent variables for both Hypotheses 1 and 2 range from 0.2 to 1 and were based on 5-point Likert scales in our survey, a one-point change in these underlying scales represents a 0.2 change in the antecedent variables. Based on our model results, a 0.2 increase in the perceived influence of the corporate legal department increases perceived non-market pressure by 0.029 ( $0.2 * 0.144$ ), which is 22% of the latter's mean value (0.132). A 0.2 increase in the perceived influence of the corporate marketing department increases perceived market pressure by 0.064 ( $0.2 * 0.319$ ), which is 35% of the latter's mean value (0.184).

Our results provide partial support for Hypothesis 3, which suggested that perceived pressures from non-market and market constituents would encourage facilities to adopt environmental management practices. While the coefficients of both of these paths are positive, only the influence of perceived market pressure is significant at conventional levels ( $\beta = 0.546$ ;  $p <$

0.001). Because this relationship is between two latent variables, we interpret the economic significance using the standardized coefficient: when perceived market pressure increases by one standard deviation, environmental management practices increases by 0.367 standard deviations. The influence of perceived non-market pressure is not significant ( $\beta = 0.183$ ;  $p = 0.24$ ). Together, these results imply that while perceived market pressures from customers, suppliers and competitors lead facilities to adopt “beyond compliance” environmental management practices, we found no evidence that pressure from non-market actors (regulators, community groups, environmental organizations, and the media) influences facilities to adopt such practices.

Turning to the control variables, we first examine the other factors that might affect the influence of the corporate and legal affairs department. While firm size ( $\beta = 0.344$ ,  $p < 0.001$ ) and corporate environmental non-compliance ( $\beta = 0.197$ ,  $p = 0.11$ ) increase the influence of the corporate and legal affairs department, we find no evidence that this department’s influence is affected by observed non-market pressure ( $\beta = 0.002$ ,  $p = 0.98$ ) or the stringency of environmental regulations at the headquarters country ( $\beta = 0.419$ ,  $p = 0.17$ ). Corporate marketing departments are more influential in larger firms ( $\beta = 0.140$ ,  $p = 0.01$ ) and when facilities face greater observed environmental pressure from customers ( $\beta = 0.089$ ,  $p = 0.01$ ).

Turning to the factors that influence perceptions, facilities with worse compliance records ( $\beta = 0.137$ ,  $p = 0.01$ ) and that face greater observed non-market pressure ( $\beta = 0.054$ ,  $p = 0.09$ ) perceive more environmental pressures from non-market constituencies. One standard deviation increases in these antecedents increases the perception of environmental pressures from non-market constituencies by 0.129 and 0.072 standard deviations, respectively. We found no evidence that the stringency of environmental regulations at the headquarters country influenced facilities’ perception of non-market pressures ( $\beta = 0.034$ ,  $p = 0.80$ ). As expected, we found that greater observed market pressures led to greater perceptions of market pressures ( $\beta = 0.115$ ,  $p < 0.001$ ), where a one standard deviation increase in the former is associated with a 0.220 standard deviation increase in the latter.

Finally, we found that facilities that are part of larger firms ( $\beta = 0.256$ ,  $p < 0.001$ ) and that face greater observed market pressures ( $\beta = 0.086$ ,  $p = 0.05$ ) adopted more environmental management practices. One standard deviation increases in these antecedents lead environmental management practices to increase by 0.232 and 0.111 standard deviations, respectively. Just as we

found no evidence that perceived pressures from non-market constituents led facilities to adopt more “beyond compliance” environmental management practices, we found no evidence that observed pressures from non-market constituents affected the comprehensiveness of a facility’s environmental management practices ( $\beta = 0.028$ ,  $p = 0.66$ ).

***Robustness Tests.*** We conducted three robustness tests. First we compared our model to several plausible alternative models (McDonald & Ho, 2002). We first considered a more classic institutional model by omitting the influence of the marketing and legal affairs departments and perceived pressures from market and non-market constituencies. Our second alternative model added the potential influence of the two corporate departments to the reduced model. Finally, we added the perceived influences of the market and non-market constituencies to the reduced model (but omitted the influence of the corporate departments). For all three alternative models, the main goodness-of-fit indicator deteriorated: RMSEA increased beyond 0.050, the conventional threshold that represents a good fit.

Second, to check the sensitivity of the results to the statistical method, we estimated regression equations corresponding to the paths of the structural equations. In these regressions, we included variables with direct and indirect paths and ran three individual regressions for each of the hypothesized paths, using standard errors robust to heteroscedasticity. We also ran the regression as a three-stage simultaneous equations model. In all four cases, the regressions yielded results similar to the structural equation. In particular, in all four regressions, the coefficients on the hypothesized variables in all four regressions had the same signs and significance as our original structural equation model.

A third potential concern derives from heterogeneity within our sample that is not controlled for in our structural equation model. Specifically, because our sample includes facilities from several industries and structural equation modeling techniques do not allow for industry dummies, it is possible that unobserved differences between these industries may account for some of our results. To test whether our results were sensitive to unobserved industry differences, we re-ran the three regressions representing single paths and the integrated 3-stage simultaneous equations model including industry dummies. We initially controlled for industry differences using dummies for 2-digit SIC Codes, and subsequently we controlled for differences between 3-digit SIC Codes. Across all of these regression specifications, the coefficients on the hypothesized variables remained of the

same sign and significance as the results of our original structural equation, which provides strong evidence that our results are robust to industry effects. Together, these robustness tests suggest that our results are highly robust to alternative variable measures, alternative statistical methods, and the addition of industry controls

## **DISCUSSION AND CONCLUSION**

Institutional theory describes how isomorphic institutional pressures lead to common organizational practices. In the traditions of this framework, persistent heterogeneity among various firms within the same industry might be attributed to differences in the *composition* of their institutional fields. For example, firms located in different states or communities with distinct preferences would face different institutional pressures, which would result in dissimilar organizational practices. Differing *levels* of institutional pressure could also lead to heterogeneous activities during any specific period, but ultimately these are purported to result in common organizational structures and practices to ensure legitimacy. As a consequence, few have employed institutional theory to understand questions of strategy, which focus on *persistent differences among organizations that share common institutional fields*.

In this paper, we have argued that beyond exposure to different levels of institutional pressures, organizational structure is key to explaining why organizations adopt heterogeneous management practices. Although our results have to be taken with caution because of the limitations of our cross sectional empirical approach, we have shown that the organizational structure influences how facility managers perceive institutional pressures. Differences in managers' perception of institutional pressures emerge because organizations channel these pressures to different organizational functions such as legal affairs departments and marketing departments, and these units interpret issues according to their distinct cultural frames.

Constituents of an organization's non-market environment (regulators, NGOs, local communities, the media) tend to view environmental issues as negative externalities, where the facility "gets away" with imposing costs on society. In this frame, environmental management is viewed as unproductive, and a zero-sum game where field constituents and firms compete to avoid bearing these costs. This debate is typically settled by government, either via the courts or by the imposition (or not) of increased regulatory scrutiny or additional laws and regulations. Accordingly,

such issues are typically addressed by organizations' legal affairs departments. In this cultural frame, adopting additional environmental management practices is more likely to be viewed as avoiding sanctions from failing to meet these constituents' expectations of legitimate organizational behavior (e.g., full legal compliance, conducting expected levels of community outreach).

In contrast, organizations view pressures exerted by their customers, suppliers, and competitors—constituents within their market environment—as business drivers. Such pressures are typically channeled through an organization's marketing department, whose objectives are to grow market share and profits. Here, adopting “beyond compliance” environmental practices that are demanded by customers or are already implemented by competitors are more likely to be culturally framed as indicators of superior management and risk-mitigated business partners. When framed this way, adopting such management practices is more likely to be viewed as garnering rewards.

In summary, institutional pressures from different field constituents are channeled to different organizational functions, which influence how they are perceived by facility managers. And these differences in perception are critical because they in turn influence organizations' responses in terms of adopting management practices. Controlling for the observed level of institutional pressure from market actors, we found that organizations that *perceived* more institutional pressure from these constituents adopted more “beyond compliance” management practices. On the other hand, after controlling for observed levels of institutional pressure from non-market constituents, we found that organizations that perceived more institutional pressure from these constituents were not more likely to adopt more “beyond compliance” management practices than organizations that perceived less pressure from these constituents.

We used the natural environment as our empirical setting because of the richness and the complexity of the environmental field. In this domain, we build upon empirical research that has shown that institutional pressures from field constituents including customers, regulators, legislators, local communities, environmental activist organizations have influenced companies to adopt environmental management practices (Baron, 2003; Carraro, Katsoulacos, & Xepapadeas, 1996; Christmann & Taylor, 2001; Delmas, 2002; Florida & Davison, 2001; Henriques & Sadosky, 1996; Khanna & Anton, 2002; Lawrence & Morell, 1995; Majumdar & Marcus, 2001; Maxwell et al., 2000; Raines, 2002; Rugman & Verbeke, 1998; Vidovic & Khanna, 2003).<sup>9</sup> However, this prior

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<sup>9</sup> See Delmas & Toffel (2004) for a more extensive review of this literature.

research has not explained why firms respond differently to similar pressures from a common institutional field, and largely neglected how different pressures are translated into action. We addressed these research opportunities by hypothesizing and testing how organizational structure and culture influences managerial perceptions of—and responses to—institutional pressures.

More broadly, this study contributes the institutional theory perspective by offering a more complex specification of the neo-institutional model. This study has introduced a more complex notion of the field where many constituencies interact, and has provided a more complex view of organization responses to field pressure. We present a model based on both institutional and organizational factors where firms' heterogeneous responses are explained by the interaction between the constituents of the field and specific functional areas within organizations. We stress the importance of the role of individuals within functional units, the issue of power and influence within organizations, and the influence of path dependency in explaining strategic heterogeneity. These organizational characteristics were emphasized by the old institutional sociology but were omitted by the new institutional sociology. In the spirit of Greenwood and Hinings (1996), our study brings the new and old institutionalism together.

Further research is required in several areas. Although we did not include it in our model, the interaction between institutional pressures is likely to magnify or temper their influence on company practices. For example, pressure from environmental activist groups can generate media coverage that encourages the formulation of more stringent regulations. To prevent this, industry leaders can attempt to encourage laggard firms to adopt environmental practices (King & Lenox, 2000; Prakash, 2000). In addition, our cross sectional empirical approach precluded us from examining how organization's perceptions of institutional pressures may change over time. Future research can examine dynamic factors that may alter organizations' perceptions of institutional pressures, such as cumulative positive experience engaging with stakeholders or the shock of being targeted by regulators, community protests, or activist campaigns.

Finally, several authors have pointed out the importance of the characteristics of individual managers to explain corporate ecological responsiveness (Bansal & Roth, 2000; Cordano & Frieze, 2000). Further research could investigate whether these individual characteristics also influence the perception of institutional pressure and its interpretation by specific departments. One could imagine that the facility manager's nationality could imbue similar cultural-based sensitivities as those we

ascribed to the influence of the headquarters country. In addition, corporate marketing and legal affairs department managers' prior experience with stakeholders when they were employed at other firms could influence their current sensitivity to institutional pressures. A richer understanding of such personal attributes would provide an important supplement to the organizational characteristics identified in this paper.

## REFERENCES

- Anderson, J. C. & Gerbing, D. W. 1988. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3): 411-423.
- Arbuckle, J. & Wothke, W. 1999. *AMOS 4 user's reference guide*. Chicago: Smallwaters Corporation.
- Arbuckle, J. L. 1997. *Amos User's Guide Version 3.6*. Chicago, IL: Smallwaters Corporation.
- Bansal, P. & Clelland, I. 2004. Talking trash: Legitimacy, impression management, and Unsystematic risk in the context of the natural environment. *Academy of Management Journal*, 47(1): 93-103.
- Bansal, P. & Roth, K. 2000. Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4): 717-736.
- Baron, D. 2000. *Business and its Environment, 3rd edition*. Upper Saddle River, NJ: Prentice Hall.
- Baron, D. P. 1995. Integrated strategy: Market and nonmarket components. *California Management Review*, 37(2): 47-65.
- Baron, D. P. 2003. Private politics. *Journal of Economics & Management Strategy*, 12(1): 31-66.
- BEA. 2000. 1997 Standard Make and Use Tables. US Department of Commerce, Bureau of Economic Analysis. [http://www.bea.gov/bea/dn2/i-o\\_benchmark.htm](http://www.bea.gov/bea/dn2/i-o_benchmark.htm), accessed Apr. 16, 2004.
- Bentler, P. M. 1990. Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88: 588-606.
- Blau, P. M. 1974. *On the Nature of Organizations*. New York: John Wiley & Sons.
- Bollen, K. A. 1989. *Structural equations with latent variables*. New York: Wiley.
- Brass, D. J. 2002. Intraorganizational Power and Dependence. In J. A. C. Baum (Ed.), *The Blackwell Companion to Organizations*: 138-157. Oxford, UK: Blackwell Publishers Ltd.
- Capron, L. 1999. Long-Term Performance of Horizontal Acquisitions. *Strategic Management Journal*, 20(11): 987-1018.
- Carraro, C., Katsoulacos, Y., & Xepapadeas, A. (Eds.). 1996. *Environmental policy and market structure*. Boston: Kluwer Academic Publishers.

- Christmann, P. & Taylor, G. 2001. Globalization and the environment: Determinants of firm self-regulation in China. *Journal of International Business Studies*, 32(3): 439-458.
- Cordano, M. & Frieze, I. H. 2000. Pollution reduction preferences of US environmental managers: Applying Ajzen's theory of planned behavior. *Academy of Management Journal*, 43(1): 627-641.
- Cudeck, R. & Browne, M. W. 1983. Cross-validation of covariance structures. *Multivariate Behavioral Research*, 18: 147-167.
- Delmas, M. 2004. *Survey of environmental and conservation NGO membership in the United States*. Donald Bren School of Environmental Science and Management Mimeo.
- Delmas, M. & Toffel, M. W. 2004. Stakeholders and Environmental Management Practices: An Institutional Framework. *Business Strategy and the Environment*, 13(4): 209-222.
- Delmas, M. A. 2002. The diffusion of environmental management standards in Europe and the United States: An institutional perspective. *Policy Sciences*, 35: 91-119.
- DiMaggio, P. J. & Powell, W. W. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2): 147-160.
- Edelman, L. B. 1990. Legal Environments and Organizational Governance: The Expansion of Due Process in the American Workplace. *American Journal of Sociology*, 95(6): 1401-1440.
- Edelman, L. B. 1992. Legal ambiguity and symbolic structures: Organizational mediation of civil rights law. *American Journal of Sociology*, 97(6): 1531-1576.
- Edelman, L. B. & Suchman, M. C. 1997. The legal environments of organizations. *Annual Review of Sociology*, 23: 479-515.
- Edelman, L. B., Uggem, C., & Erlanger, H. 1999. The endogeneity of legal regulation: Grievance procedures as rational myth. *The American Journal of Sociology*, 105: 406-454.
- Elsbach, K. D. & Sutton, R. I. 1992. Acquiring organizational legitimacy through illegitimate actions: A marriage of institutional and impression management theories. *Academy of Management Journal*, 35: 699-738.
- Florida, R. & Davison, D. 2001. Gaining from green management: Environmental management systems inside and outside the factory. *California Management Review*, 43(3): 64-84.
- Fornell, C. & Larcker, D. F. 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18: 39-50.
- Fornell, C., Tellis, G. J., & Zinkhan, G. M. 1982. Validity Assessment: A Structural Equations Approach Using Partial Least Squares. In B. J. Walker, W. O. Bearden, W. R. Darden, P. E. Murphy, J. R. Nevin, J. C. Olson, & B. A. Weitz. (Eds.), *An Assessment of Marketing Thought & Practice*: 405-409. Chicago: American Marketing Association.
- Fuller, S. R., Edelman, L. B., & Matusik, S. F. 2000. Legal readings: Employee interpretation and mobilization of law. *Academy of Management Review*, 25(1): 200-216.

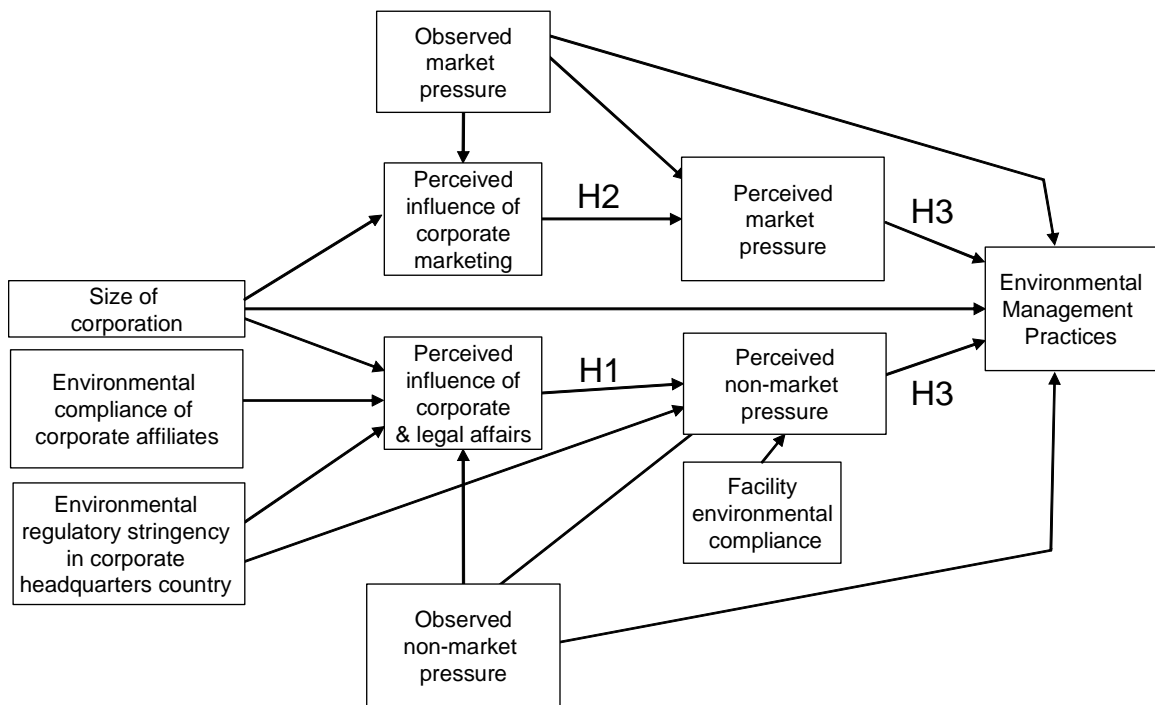
- Goodrick, E. & Salancik, G. R. 1996. Organizational discretion in responding to institutional practices: Hospitals and Cesarean births. *Administrative Science Quarterly*, 41: 1-28.
- Greenwood, R. & Hinings, C. R. 1996. Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of Management Review*, 21(4): 1022 - 1054.
- Hall, B. & Kerr, M. L. 1991. *1991-1992 green index : a state-by-state guide to the nation's environmental health*. Washington D.C.
- Hamilton, J. T. 1997. Taxes, torts, and the toxics release inventory: Congressional voting on instruments to control pollution. *Economic Inquiry*, 35(4): 745-762.
- Henriques, I. & Sadorsky, P. 1996. The determinants of an environmentally responsive firm: An empirical approach. *Journal of Environmental Economics & Management*, 30(3): 381-395.
- Hinings, C. R., Hickson, D. J., Pennings, J. M., & Schneck, R. E. 1974. Structural conditions of intraorganizational power. *Administrative Science Quarterly*, 19: 22-44.
- Hoffman, A. J. 2001. Linking organizational and field-level analyses - The diffusion of corporate environmental practice. *Organization & Environment*, 14(2): 133-156.
- ISO. 1996. *ISO 14001: Environmental Management Systems -- Specification with Guidance for Use*. Geneva: International Organization for Standardization (ISO).
- ISO. 2003. *ISO Survey of ISO 9000 and ISO 14001 Certificates: 12th Cycle Report*. Geneva: International Organization for Standardization.
- Jamison, A. & Baark, E. 1999. National Shades of Green: Comparing the Swedish and Danish Styles in Ecological Modernisation. *Environmental Values*, 8(2): 199-218.
- Jiang, R. J. & Bansal, P. 2003. Seeing the need for ISO 14001. *Journal of Management Studies*, 40(4): 1047-1067.
- Kassinis, G. & Vafeas, N. 2002. Corporate boards and outside stakeholders as determinants of environmental litigation. *Strategic Management Journal*, 23(5): 399-415.
- Khanna, M. & Anton, W. Q. 2002. Corporate environmental management: Regulatory and market-based pressures. *Land Economics*, 78(4).
- King, A. & Lenox, M. 2000. Industry self-regulation without sanctions: The chemical industry's responsible care program. *Academy of Management Journal*, 43(4): 698-716.
- King, A. A., Lenox, M. J., & Terlaak, A. Forthcoming. The strategic use of decentralized institutions: Exploring certification with the ISO 14001 management standard. *Academy of Management Journal*.
- Kostova, T. & Roth, K. 2002. Adoption of an organizational practice by subsidiaries of multinational corporations: Institutional and relational effects. *Academy of Management Journal*, 45(1): 215-233.
- Lawrence, A. T. & Morell, D. 1995. Leading-edge environmental management: Motivation, opportunity, resources and processes. In D. Collins, & M. Starik (Eds.), *Special Research Volume of Research in*

***Corporate Social Performance and Policy, Sustaining the Natural Environment: Empirical Studies on the Interface Between Nature and Organizations***: 99-126. Greenwich, CT: JAI Press.

- Majumdar, S. K. & Marcus, A. A. 2001. Rules versus discretion: the productivity consequences of flexible regulation. *Academy of Management Journal*, 44(1): 170-179.
- Maxwell, J. W., Lyon, T. P., & Hackett, S. C. 2000. Self-regulation and social welfare: The political economy of corporate environmentalism. *The Journal of Law & Economics*, 43(2): 583-619.
- McDonald, R. P. & Ho, M.-H. R. 2002. Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7(1): 64-82.
- Meyer, J. W. & Rowan, B. 1977. Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83: 340-363.
- Michels, R. 1962. *Political Parties*. New York: Collier Press.
- Nunnally, J. C. 1978. *Psychometric Theory*. New York: McGraw-Hill.
- Nunnally, J. C. & Bernstein, I. H. 1994. *Psychometric theory*. New York: McGraw-Hill.
- Oliver, C. 1991. Strategic responses to institutional processes. *Academy of Management Review*, 16(1): 145-179.
- Perron, B., Vaillancourt, J.-G., & Durand, C. 2001. A Global Problem for a Global Movement? An Exploratory Study of Climate Change Perception by Green Groups' Leaders from Quebec (Canada) and Costa Rica. *Society and Natural Resources*, 14(10): 837-855.
- Prakash, A. 2000. Responsible Care: An assessment. *Business & Society*, 39(2): 183-209.
- Raines, S. S. 2002. Implementing ISO 14001--An international survey assessing the benefits of certification. *Corporate Environmental Strategy*, 9(4): 418-426.
- Rugman, A. M. & Verbeke, A. 1998. Corporate strategies and environmental regulations: An organizing framework. *Strategic Management Journal*, 19(4): 363-375.
- Russo, M. V. & Fouts, P. A. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal*, 40: 534-559.
- Salancik, G. R. & Pfeffer, J. 1974. The bases and uses of power in organizational decision making: The case of a university. *Administrative Science Quarterly*, 19: 453-473.
- Scott, W. R. 1992. *Organizations: rational, natural, and open systems* (3rd ed.). Englewood Cliffs N.J.: Prentice Hall.
- Scott, W. R. 2001. *Institutions and organizations* (2nd ed.). Thousand Oaks Calif.: Sage Publications.
- Selznick, P. 1949. *TVA and the Grass Roots: A Study in the Sociology of Formal Organization*. Berkeley: University of California Press.
- Simonin, B. L. 1999. Ambiguity and the Process of Knowledge Transfer in Strategic Alliances. *Strategic Management Journal*, 20(7): 595-623.

- Steiger, J. H. 1990. Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, 25: 173-180.
- Toffel, M. W. & Marshall, J. D. 2004. Improving environmental performance assessment: Comparative analysis of weighting methods used to evaluate chemical release inventories. *Journal of Industrial Ecology*, 8(1-2): 143-172.
- Tolbert, P. S. & Zucker, L. G. 1996. The institutionalization of institutional theory. In S. Clegg, C. Hardy, & W. R. Nord (Eds.), *Handbook of Organizational Studies*: 175-190. London, UK: Sage.
- Tucker, L. R. & Lewis, C. 1973. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38: 1-10.
- US Census Bureau. 2003. *2001 County Business Patterns for the United States*. Washington DC.
- US EPA. 2001. *The Emergency Planning and Community Right-to-Know Act: Section 313 Release and Other Waste Management Reporting Requirements. EPA 260/K-01-001*. Washington DC: US Environmental Protection Agency.
- US EPA. 2003. *2001 Toxics Release Inventory (TRI) Public Data Release: Executive Summary. EPA 260-S-03-001*. Washington DC: US Environmental Protection Agency.
- Vidovic, M. & Khanna, N. 2003. *Reducing Toxic Releases through Voluntary Efforts: Incentives for Participation in the 33/50 Program and Implications for the Distribution of Pollution*. Paper presented at the Western Economic Association International 78th Annual Conference, Denver, Colorado.
- Viscusi, W. K. & Hamilton, J. T. 1999. Are Risk Regulators Rational? Evidence from Hazardous Waste Cleanup Decisions. *The American Economic Review*, 89(4): 1010-1027.
- WEF. 2002. *The Global Competitiveness Report 2001-2002*. New York: World Economic Forum (WEF) in collaboration with the Center for International Development (CID) at Harvard University, and the Institute for Strategy and Competitiveness (ISC), Harvard Business School.
- Welch, E. W., Mazur, A., & Bretschneider, S. 2000. Voluntary behavior by electric utilities: Levels of adoption and contribution of the climate challenge program to the reduction of carbon dioxide. *Journal of Policy Analysis and Management*, 19(3): 407-425.
- Westphal, D. & Zajac, E. J. 1998. Symbolic management of stockholders: Corporate governance reforms and shareholder reactions. *Administrative Science Quarterly*, 43: 127-153.
- Wikle, T. 1995. Geographical patterns of membership in US environmental organizations. *The Professional Geographer*, 47: 41-48.

**FIGURE 1**  
**A Model of Institutional Pressures Moderated by Parent Company and Facility Characteristics**



**TABLE 1**  
**Categories of Environmental Management Practices**

<b>Environmental management practice category</b>	<b>Survey questions</b>	<b>Responses [Coding in brackets]</b>
Environmental policy	If your facility has an environmental policy, do you (check all that apply) <ul style="list-style-type: none"> <li>▪ Post the policy around our facility?</li> <li>▪ Post it on the Internet?</li> <li>▪ Distribute it to all facility employees?</li> <li>▪ Most employees have discussed the policy discussed with a manager/supervisor</li> </ul>	For each sub-question: “No” [0] “Yes” [1]
Environmental objectives	For which of these environmental issues do you have objectives and targets? <ul style="list-style-type: none"> <li>▪ Air emissions</li> <li>▪ Water pollution</li> <li>▪ Solid waste</li> <li>▪ Hazardous waste</li> <li>▪ Noise</li> <li>▪ Other</li> </ul>	For each sub-question: “No” [0] “Yes” [1]
Training	Approximately, what proportion of your employees at your facility has received environmental training over the past 12 months in the following departments? <ul style="list-style-type: none"> <li>▪ Management</li> <li>▪ Operations</li> <li>▪ Maintenance</li> <li>▪ Engineering, R&amp;D, Design</li> <li>▪ Environment, health &amp; safety</li> <li>▪ Sales</li> <li>▪ Purchasing / Procurement</li> </ul>	“0-20%” [0.2] “21-40%” [0.4] “41-60%” [0.6] “61-80%” [0.8] “81-100%” [1.0]  “No such department at my facility” recoded as missing
ISO 14001 status	<ul style="list-style-type: none"> <li>▪ What is the status of ISO 14001 certification at your facility?</li> </ul>	“Not being considered” [0.2] “Future consideration” [0.4] “Planning to implement” [0.6] “Currently implementing” [0.8] “Successfully implemented” [1.0]

**TABLE 2**  
**Descriptive Statistics of Observed Variables**

	Mean	S.D.	Minimum	Maximum
<i>(<math>\eta_1</math>) Environmental management practices</i>				
→ Extent to which the facility adopts and communicates an environmental policy	0.55	0.30	0.00	1.00
→ Extent to which the facility adopts environmental objectives and targets	0.52	0.24	0.00	1.00
→ Extent to which the facility implements environmental training throughout the organization	0.77	0.27	0.20	1.00
→ Extent to which the facility has implemented ISO 14001	0.58	0.34	0.20	1.00
<i>(<math>\eta_2</math>) Perceived non-market pressure</i>				
→ Influence of local community	0.57	0.25	0.20	1.00
→ Influence of environmental organizations	0.44	0.22	0.20	1.00
→ Influence of media	0.40	0.21	0.20	1.00
→ Influence of regulators/legislators	0.69	0.26	0.20	1.00
<i>(<math>\eta_3</math>) Perceived market pressure</i>				
→ Influence of competitors	0.48	0.24	0.20	1.00
→ Influence of customers	0.59	0.27	0.20	1.00
→ Influence of suppliers	0.38	0.19	0.20	1.00
<i>(<math>\xi_1</math>) Facility environmental non-compliance</i>				
→ Number of formal enforcement actions	0.06	0.11	0.00	1.00
→ Logged sum of penalties	0.14	0.27	0.00	1.00
→ Number of environmental compliance violations	0.13	0.19	0.00	1.00
<i>(<math>\xi_2</math>) Corporate environmental non-compliance</i>				
→ Logged sum of penalties	0.33	0.35	0.00	1.00
→ Number of formal enforcement actions	0.08	0.16	0.00	1.00
<i>(<math>\xi_3</math>) Observed non-market pressure</i>				
→ League of Conservation Voters' 1996 state scorecard rating	0.48	0.23	0.00	1.00
→ Number of state-level environmental policy initiatives	0.58	0.19	0.13	1.00
→ Renew America assessment of state's environmental policy comprehensiveness	0.67	0.18	0.34	1.00
→ State's environmental and conservation organization members per thousand residents	0.37	0.21	0.08	1.00
<i>(<math>\xi_4</math>) Observed market pressure</i>				
→ Observed market pressure	0.34	0.26	0.00	1.00
<i>(<math>\xi_5</math>) Influence of corporate &amp; legal affairs department</i>				
→ Influence of corporate & legal affairs department	0.70	0.28	0.20	1.00
<i>(<math>\xi_6</math>) Influence of corporate marketing department</i>				
→ Influence of corporate marketing department	0.45	0.24	0.20	1.00
<i>(<math>\xi_7</math>) Stringency of environmental regulations in headquarters country</i>				
→ Stringency of environmental regulations in headquarters country	0.91	0.04	0.48	1.00
<i>(<math>\xi_8</math>) Logged corporate sales</i>				
→ Logged corporate sales	0.65	0.18	0.09	1.00

Note: 493 observations.

**TABLE 3**

**Results of Measurement Model**

<i>Latent variables</i>	Mean	Variance	Number of items	Cronbach's alpha	Internal consistency	Average variance extracted	Correlations between latent variables (square root of average variance extracted in the diagonal)						
							( $\eta_1$ )	( $\eta_2$ )	( $\eta_3$ )	( $\xi_1$ )	( $\xi_2$ )	( $\xi_3$ )	
( $\eta_1$ ) Environmental management practices	0.32	0.03	4	0.67	0.982	0.94	0.97						
( $\eta_2$ ) Perceived non-market pressure	0.13	0.01	4	0.79	0.996	0.98	0.38	0.99					
( $\eta_3$ ) Perceived market pressure	0.18	0.01	3	0.76	0.994	0.98	0.48	0.67	0.99				
( $\xi_1$ ) Facility environmental non-compliance	0.00	0.01	3	0.79	0.996	0.99	0.15	0.10	0.03	1.00			
( $\xi_2$ ) Corporate environmental non-compliance	0.00	0.02	2	0.78	0.996	0.99	0.03	0.07	0.00	0.00	1.00		
( $\xi_3$ ) Observed non-market pressure	0.00	0.03	4	0.90	0.997	0.99	0.05	0.15	0.01	0.23	0.00	0.99	

*Measurement paths*

	Unstandardized regression weight	Standard error	Critical ratio	Standardized regression weight
<i>(<math>\eta_1</math>) Environmental management practices</i>				
→ Extent to which the facility adopts and communicates an environmental policy	1.10	0.11	9.83	0.74
→ Extent to which the facility adopts environmental objectives and targets	0.53	0.07	7.14	0.44
→ Extent to which the facility implements environmental training throughout the organization	0.75	0.09	8.09	0.55
→ Extent to which the facility has implemented ISO 14001	1.00	fixed		0.60
<i>(<math>\eta_2</math>) Perceived non-market pressure</i>				
→ Influence of local community	1.49	0.16	9.41	0.71
→ Influence of environmental organizations	1.39	0.15	9.45	0.75
→ Influence of media	1.33	0.14	9.43	0.76
→ Influence of regulators/legislators	1.00	fixed		0.46
<i>(<math>\eta_3</math>) Perceived market pressure</i>				
→ Influence of competitors	1.36	0.10	13.49	0.77
→ Influence of customers	1.43	0.12	12.43	0.70
→ Influence of suppliers	1.00	fixed		0.70
<i>(<math>\xi_1</math>) Facility environmental non-compliance</i>				
→ Number of formal enforcement actions	0.92	0.07	12.33	0.89
→ Logged sum of penalties	1.95	0.16	12.41	0.80
→ Number of environmental compliance violations	1.00	fixed		0.59
<i>(<math>\xi_2</math>) Corporate environmental non-compliance</i>				
→ Logged sum of penalties	2.33	0.20	11.61	0.83
→ Number of formal enforcement actions	1.00	fixed		0.77
<i>(<math>\xi_3</math>) Observed non-market pressure</i>				
→ League of Conservation Voters' 1996 state scorecard rating	0.93	0.07	14.30	0.63
→ Number of state-level environmental policy initiatives	1.21	0.06	22.08	0.99
→ Renew America assessment of state's environmental policy comprehensiveness	1.05	0.05	21.77	0.91
→ State's environmental and conservation organization members per thousand residents	1.00	fixed		0.74

Notes: 493 observations. Cronbach's alpha calculated on standardized items (mean 0, variance 1). All items were statistically significant ( $p < 0.001$ ) determinants of the latent variables.

**TABLE 4**  
**Structural Model Paths**

Hypothesis	Antecedent variable		Consequent variable	Unstandardized regression weight	Standard error	Critical ratio	p value	Standardized regression weight
H1	( $\xi_5$ ) Influence of corporate & legal affairs department	→ ( $\eta_2$ )	Perceived non-market pressure	0.14	0.02	6.13	***	0.35
H2	( $\xi_6$ ) Influence of corporate marketing department	→ ( $\eta_3$ )	Perceived market pressure	0.32	0.03	10.73	***	0.56
H3	( $\eta_2$ ) Perceived non-market pressure	→ ( $\eta_1$ )	Environmental management practices	0.19	0.16	1.18	0.24	0.12
H3	( $\eta_3$ ) Perceived market pressure	→ ( $\eta_1$ )	Environmental management practices	0.55	0.16	3.39	***	0.37
<i>Controls</i>	( $\xi_7$ ) Stringency of environmental regulations in headquarters country	→ ( $\xi_5$ )	Influence of corporate & legal affairs department	0.42	0.30	1.38	0.17	0.05
	( $\xi_8$ ) Logged corporate sales	→ ( $\xi_5$ )	Influence of corporate & legal affairs department	0.34	0.08	4.23	***	0.23
	( $\xi_3$ ) Observed non-market pressure	→ ( $\xi_5$ )	Influence of corporate & legal affairs department	0.00	0.07	0.03	0.98	0.00
	( $\xi_2$ ) Corporate environmental non-compliance	→ ( $\xi_5$ )	Influence of corporate & legal affairs department	0.20	0.13	1.58	0.11	0.09
	( $\xi_8$ ) Logged corporate sales	→ ( $\xi_6$ )	Influence of corporate marketing department	0.14	0.06	2.56	0.01	0.11
	( $\xi_4$ ) Observed market pressure	→ ( $\xi_6$ )	Influence of corporate marketing department	0.09	0.04	2.50	0.01	0.10
	( $\xi_1$ ) Facility environmental non-compliance	→ ( $\eta_2$ )	Perceived non-market pressure	0.14	0.05	2.79	0.01	0.13
	( $\xi_7$ ) Stringency of environmental regulations in headquarters country	→ ( $\eta_2$ )	Perceived non-market pressure	0.03	0.13	0.26	0.80	0.01
	( $\xi_3$ ) Observed non-market pressure	→ ( $\eta_2$ )	Perceived non-market pressure	0.05	0.03	1.71	0.09	0.07
	( $\xi_4$ ) Observed market pressure	→ ( $\eta_3$ )	Perceived market pressure	0.12	0.02	5.30	***	0.22
	( $\xi_8$ ) Logged corporate sales	→ ( $\eta_1$ )	Environmental management practices	0.26	0.06	4.54	***	0.23
	( $\xi_4$ ) Observed market pressure	→ ( $\eta_1$ )	Environmental management practices	0.09	0.04	1.96	0.05	0.11
	( $\xi_3$ ) Observed non-market pressure	→ ( $\eta_1$ )	Environmental management practices	0.03	0.06	0.44	0.66	0.02

Note: 493 observations. \*\*\* p<0.001