

## ORGANIZATIONAL RESPONSES TO ENVIRONMENTAL DEMANDS: OPENING THE BLACK BOX

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*This article combines new and old institutionalism to explain differences in organizational strategies. We propose that differences in the influence of corporate departments lead their facilities to prioritize different external pressures and thus adopt different management practices. Specifically, we argue that external constituents—including customers, regulators, legislators, local communities, and environmental activist organizations—who interact with influential corporate departments are more likely to affect facility managers' decisions. As a result, managers of facilities that are subjected to comparable institutional pressures adopt distinct sets of management practices that appease different external constituents. We test our framework in the context of the adoption of environmental management practices using an original survey and archival data obtained for nearly 500 facilities. We find support for these hypotheses. Copyright © 2008 John Wiley & Sons, Ltd.*

### INTRODUCTION

Within the field of strategic management research, the new institutional perspective has gained prominence in explaining the importance of social and cultural influences on strategic decisions (Ingram and Silverman, 2002). The new institutional approach suggests that firms obtain legitimacy by conforming to the dominant practices within their organizational field (DiMaggio and Powell, 1983; Scott, 1992). This approach, however, has barely begun to address an issue fundamental to business strategy research: why do organizations that face common institutional pressures adopt different management practices? In other words, how

might institutional forces lead to heterogeneity, rather than homogeneity, within an industry?

In this article, we test a model that links a variety of institutional pressures to organizational responses. We build on Hoffman (2001) to argue that organizations differ in their receptivity to institutional pressures from the diverse set of constituents in their external environments. We maintain that organizations channel pressures from market and nonmarket constituents to different functional departments, and that these functional departments, in turn, influence managers' sensitivity and responses to institutional pressures. Therefore, we argue that differences in organizations' adoption of management practices reflect not only different levels of institutional pressures (Edelman, 1992; Lounsbury, 2001), but also differences in the influence of their functional departments.

Our model integrates some views of what is sometimes called the 'old' institutional perspective that focuses on the internal dynamics of

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organizational change (Michels, 1962; Selznick, 1949). In this endeavor, we respond to the call from several authors for a wedding of the old and new institutional perspectives (Hirsch and Lounsbury, 1997a; Perrow, 1986). But more importantly, this integration enables us to bring new insights to the strategic management literature's central debate related to the respective role of environmental forces and organizational dynamics in explaining strategic choices (Greenwood and Hinings, 1996; Hambrick and Finkelstein, 1995).

Strang and Soule (1998: 285) argue that institutional analyses that contrast the adoption of distinct management practices 'can provide more nuanced views of the mechanisms involved' in their diffusion. Therefore, like Davis and Greve (1997), we test our framework by examining the adoption of two distinct management practices that can reduce organizations' impact on the natural environment. Specifically, we consider U.S. industrial facilities' adoption of (1) the international ISO 14001 Environmental Management System Standard, and (2) government-initiated voluntary environmental programs. Environmental management issues in general, and these management practices in particular, provide a rich empirical context for several reasons. First, organizations across different industries (Hoffman, 1999) and geographic locations (Sharma and Henriques, 2005) share a common organizational field with respect to the common issue of industrial environmental management. Second, a broad array of constituents of the organizational field exerts pressure on these facilities to adopt environmental management practices. This allows us to identify how the pressures from these various constituents can penetrate the organization via specific corporate departments. For example, organizations tend to adopt ISO 14001 and government-initiated voluntary programs to appease different stakeholders. Firms often adopt the ISO 14001 standard in anticipation of or in response to customer demand (Boiral, 2007; Delmas and Terlaak, 2001; Jiang and Bansal, 2003; King, Lenox, and Terlaak, 2005; Toffel, 2000). As a result, firms' marketing departments have a particular interest in the determination of whether it would be profitable to invest the time and money required to certify facilities to the ISO 14001 standard. On the other hand, government-initiated voluntary programs are explicit arrangements between companies and regulators. Prior research suggests that companies participate in these programs to

strengthen (or maintain strong) relationships with regulators (Delmas and Terlaak, 2001; Khanna, 2001; Khanna and Damon, 1999; Short and Toffel, 2008; Videras and Alberini, 2000). Legal departments, because they are involved in regulatory compliance activities, are likely to be predisposed to establishing good collaborative relationships with regulators.

We also focus on these two organizational practices because institutional pressures exert the greatest influence during the period of uncertainty before practices become institutionalized (Goodrick and Salancik, 1996). There are several reasons to believe that our two focal practices are not yet institutionalized: neither the ISO 14001 standard nor government-initiated voluntary environmental programs are required by law, there is a lack of consensus on their actual effectiveness, and there is significant heterogeneity within industries regarding their adoption (Bansal and Roth, 2000; Darnall and Edwards, 2006; Delmas and Terlaak, 2002; Henriques and Sadowsky, 1996; Sharma and Henriques, 2005; Videras and Alberini, 2000). Indeed, government voluntary environmental programs and the ISO 14001 standard are themselves institutions, sets of rules and norms that might be operating as a 'rational myth' that spurs 'ceremonial behavior' (Boiral, 2007). Under these circumstances, regulative, normative, and cognitive factors are likely to play a significant role in firms' decisions to adopt such organizational practices (DiMaggio and Powell, 1983).

The article proceeds as follows: after a brief review of the literature on the institutional perspective, we develop hypotheses that describe how corporate functional departments influence their subsidiary facilities' awareness of, or receptivity to, market and nonmarket pressures, and how this affects the adoption of particular management practices. We then describe our sample and empirical method, and present our results. We conclude by discussing how this study uses the lens of institutional theory to advance understanding of firms' heterogeneous management practices, and how this makes important contributions to the study of business strategy.

## LITERATURE REVIEW

The new institutional perspective suggests that firms obtain legitimacy by conforming to the

dominant practices within their institutional fields (DiMaggio and Powell, 1983; Scott, 1992). An organizational field includes '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 and Powell, 1983: 148). Scholars of new institutional theory have traditionally focused on how organizational strategies and practices converge through a legitimation process. In this paradigm, divergent strategies and practices exist either during a temporary pre-convergence period (e.g., Dobbin and Sutton, 1998; Edelman, 1992), or subsequently due to organizations being subjected to varying levels of institutional pressure (e.g., Lounsbury, 2001).

As Kraatz and Zajac (1996: 812) stated: 'neoinstitutional explanations of organization-environment relations draw their power and distinctiveness largely from an explicit rejection of traditional adaptation theories, and from an emphasis on institutional rather than technical environments.' The new institutional approach is, indeed, often contrasted with the so-called 'old' institutional perspective (Michels, 1962; Selznick, 1949) that emphasizes the capacity of people and organizations to construct and enact their environment and focus their attention on the dynamics of intraorganizational change (Hirsch and Lounsbury, 1997a). The central issues of the old institutionalism revolve around organizational influence, coalitions, and power; change occurs in response to the dynamics of organizations as they struggle with different values and interests (Clarke, 1994). According to DiMaggio and Powell (1991): 'the new and old institutionalisms identify different sources of constraint, with the older emphasizing the vesting of interests within the organization as a result of political tradeoffs and alliances, and the new stressing the relationship between stability and legitimacy and the power of common understandings that are seldom explicitly articulated' (DiMaggio and Powell 1991: 12). The authors also 'suspect that something has been lost in the shift from the old to the new institutionalism' (DiMaggio and Powell, 1991: 27).

Several authors have advocated for a wedding of the new and old perspectives (Hirsch and Lounsbury, 1997b; Perrow, 1986). For example, Hirsch and Lounsbury (1997b) argue that the inability to address interests and the generative capacity of

actors leads the new institutionalism into higher levels of abstraction. They claim that stability, persistence, and inertia are taken as givens, whereas change is viewed as an extraordinary disruption, usually externally generated. They suggest that a reconciliation between these theoretical currents would provide a more balanced approach to the action-structure duality (Hirsch and Lounsbury, 1997a).

Some researchers have begun to integrate theories of institutional and organizational dynamics to explain how differences can persist even among organizations that face comparable institutional pressures. For example, Oliver (1991) combines institutional and resource dependence perspectives to predict how organizations will strategically respond to various institutional pressures, and Greenwood and Hinings (1996) integrate institutional and internal organizational dynamics to explain radical change. Thornton and Ocasio (1999) explain how power and politics within organizations is contingent on higher order institutional logics. Fligstein (1987) specifies a model in which power within organizations shifts as a result of changes in the external environment. In addition, several authors have shown empirically that organizations' responses to institutional pressures are affected by organizational characteristics including ownership structure (Goodrick and Salancik, 1996), trust and identity (Kostova and Roth, 2002), as well as board of director interlocks and geographic proximity to peer organizations (Davis and Greve, 1997). However these integrative approaches often tend to view institutional forces as unified or monolithic, and pay little attention to how the constituents of the organizational field interact with actors within organizations. Organizational fields are quite complex. They are composed of vast arrays of constituents such as governments, activists, local communities, trade associations, investors, and customers, each of which possesses its own culture, interests, and conception of legitimate environmental management practices (Hoffman, 2001). Fligstein (1987) suggested that further research should interview organizational actors to assess their views of the field and the organization, and the effects of those views on subsequent organizational change.

Similarly, research in corporate environmental strategy has made significant advances in analyzing how institutional pressures affect firms' decisions to pursue 'beyond compliance' strategies

(Bansal and Roth, 2000; Darnall and Edwards, 2006; Henriques and Sadosky, 1996; Sharma and Henriques, 2005). But that literature, too, has rarely addressed linkages between organizational and field analyses. Thus, relationships between organizational factors and institutional pressures are not yet well understood.

In this article, we propose to integrate the new and old institutionalism by emphasizing the interaction of organizations' internal functional departments with a diverse set of constituents of a firm's external environment. Hoffman (2001) described the importance of organizations' functional structure and culture in explaining heterogeneous responses to institutional pressures. Hoffman (2001) notes that 'the form of organizational response 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' (Hoffman, 2001: 136–137). From this perspective, organizations provide multiple access points to institutional pressures. Building on this approach, we propose that organizational characteristics affect the extent to which facilities become aware of and respond to institutional pressures. This occurs because each functional department typically engages with a different set of institutional constituents, and because corporate functional departments vary in the extent to which they have influence on facility decision making.<sup>1</sup>

In contrast to the old institutionalism, the new institutional perspective typically views organizations as adapting their organizational structures to respond to changes in the institutional environment rather than the technical environment (Kraatz and Zajac, 1996).

Several scholars have argued that examining only institutional forces is not sufficient to explain divergent organizational change (D'Aunno, Succi, and Alexander, 2000; Kraatz and Zajac, 1996). Kraatz and Zajac (1996), investigating the effect of both the institutional and technical or market environment on organizational change, found pressures from the technical environment to be an important driver of organizational change. D'Aunno *et al.* (2000) argue that 'both institutional and market forces are likely to affect divergent change to

varying degrees in different organizational fields and, probably, in different historical periods. Moreover, institutional and market forces may interact in important ways to affect organizational change, and future research should aim to specify their roles more precisely' (D'Aunno *et al.*, 2000: 700–701). This speaks to the need to precisely define the external forces that pressure firms to engage in organizational change.

Our analysis builds on prior research that has combined institutional forces with market forces to better understand organization-environment relations (D'Aunno *et al.*, 2000; Kraatz and Zajac, 1996). Those studies compare the influence of institutional forces to that of market forces concerned with profits and cost efficiency. Rather than opposing market and institutional forces, we consider that institutional forces can bound and define rational arguments and approaches (Fligstein, 1990). In our approach, we differentiate two main sets of constituents of the organizational field, market and nonmarket constituents (Baron, 1995) and argue that both might be subject to institutional forces. In doing so, we build on Hoffman's (2001) insight that buyers and other market actors are constituents within an organizational field.

Firms engage with constituents in their market environment (e.g., customers, suppliers) via economic transactions, whereas constituents in firms' nonmarket environment (e.g., regulators, environmental organizations) are interested in social, political, and legal issues (Baron, 1995, 2000). Nonmarket and market actors frame environmental management issues differently (Hoffman and Ventresca, 1999). For example, constituents in the market environment tend to view environmental issues primarily within the rubric of business performance, focusing on their cost and efficiency implications. On the other hand, nonmarket actors such as regulators and activist groups, which typically view environmental issues as negative externalities, often operate via the legal system and the mass media (e.g., in the court of public opinion).

The advantage of including both market and nonmarket constituents in our analysis is that these diverse constituents are likely to disagree about the legitimacy of a management practice before it becomes institutionalized, which occurs when it takes on a rule-like status in social thought and action (Meyer and Rowan, 1977; Tolbert and Zucker, 1996). Market and nonmarket constituents

<sup>1</sup> Several other organizational and managerial characteristics might affect how organizations perceive and respond to institutional pressures. We discuss some of these when we conclude with ideas for future research.

are thus quite likely to differ both in their interpretation of industrial environmental issues and in their perceptions of which management practices constitute legitimate responses (Hoffman, 2001). Focusing on an institutional field marked by a diverse set of market and nonmarket constituents provides a unique opportunity to analyze the web of institutional forces that shape and influence the adoption of management practices that are not yet institutionalized.

Although the origins of these two sets of constituents might differ, we argue that both can exert institutional pressures on firms in a context of pre-institutionalization of environmental management practices. First, as mentioned earlier, the management practices we examine are not yet institutionalized and there is still no empirical evidence of their technical efficiency or their actual impact on environmental performance. Regulative, normative, and cognitive factors that affect adoption decisions over and above the technical efficiency of the organizational practices are more likely to play a role in firms' decisions to adopt organizational practices under conditions of uncertainty. This includes circumstances in which the benefits of an organizational practice are poorly understood and the efficiency benefits of adoption are unclear (DiMaggio and Powell, 1983). Second, as Scott (2003) argued, technical forces primarily shape 'core functions' including work units and coordinating arrangements, whereas institutional forces shape more 'peripheral' structures such as managerial and governance systems.

## **ORGANIZATIONAL PERMEABILITY TO PRESSURES FROM MARKET AND NONMARKET CONSTITUENTS**

Organizations consist of a 'mosaic of groups structured by functional tasks' (Greenwood and Hinings, 1996: 1033) such as legal, human resources, and marketing departments. Individuals within an organization's functional departments interact with constituents of the organization's market and nonmarket environments through 'occupational communities,' that is, groups of individuals across organizations that share a common set of assumptions, language, and perspectives (Schein, 1996; van Maanen and Barley, 1984). Occupational communities emerge in part due to

common professional and occupational requirements (e.g., education, licensing requirements) and through ongoing contact among those within a given occupation. Members of occupational communities often read common trade journals and specialized newspapers and attend the same conferences at which emerging issues and appropriate solutions are discussed. As a result, 'salespeople the world over, accountants, assembly line workers, and engineers share some tacit assumptions about the nature of their work regardless of who their particular employer is at any given time' (Schein, 1996: 13). For example, Rosenkopf, Metiu, and George (2001) posit that interfirm relationships are enhanced by interpersonal bonds forged among mid-level managers in the technical committees of professional societies, trade associations, and standards bodies. They argue that these interactions expose participants to the same knowledge and issues that shape their views of technological development and facilitate collaboration.

Employees in functional departments provide vital links to members of their occupational communities within their organizations' market and nonmarket environments. For example, individuals within legal affairs departments typically interact with regulatory officials and lawyers from other firms, whereas those from marketing departments typically interact with consumers and rival marketing departments.

More broadly, 'the firm becomes a composite of core organizational responsibilities, each with its linkages to its own relevant constituency of the external environment,' where employees of functional departments engage with institutional constituents through 'preexisting channels of communication traditionally employed to engage these occupational communities and interpret and act on their demands' (Hoffman, 2001: 136). These channels of communication expose members of organizations' functional departments to the issues their occupational communities deem important and to the range of solutions viewed as legitimate. To what extent do these issues and solutions actually reach decision makers within these functional departments' organizations and actually influence their organizations' responses? This depends on how much influence a department has within its own organization, the topic to which we turn next.

## Functional departments' influence within organizations

A functional department's exposure to pressures from different sets of constituents has consequences that affect the rest of the organization. For example, by influencing decisions at subsidiary facilities, corporate functional departments diffuse their cultural frameworks to facility-level managers. As we argue below, this, in turn, affects facility managers' receptivity to external pressures, as well as their interpretation of these pressures.

There are several ways in which corporate functional departments can influence facility managers. They might grant facility managers varying degrees of decision-making autonomy, retaining ultimate control over some facility-level issues, thereby requiring facility managers to seek their approval before pursuing a particular course of action in these protected domains. Corporate training and documentation that offers guidance on how to address specific functional issues can also influence facility-level managers.

The literature has provided many rationales for why organizations differ in the relative influence various functional departments exert in decision making. Within a company, a department's relative power and influence derive from a variety of sources including position within the formal organizational hierarchy, centrality to social networks and workflows, and ability to provide scarce, critical resources (Brass, 2002; Hinings *et al.*, 1974; Salancik and Pfeffer, 1974).

The extent to which departments that detect external pressures can convey these concerns to management depends on the degree to which they can influence management decisions. Influential departments increase the salience of both the constituents who exert pressure within their domain as well as these constituents' issues. Because such pressures are more likely to attract the attention of managers, they are more likely to elicit organizational responses.

In summary, we argue that the relative influence of various functional departments on facilities' decisions affects how facility managers receive and interpret pressures from different constituents of their external environments, and that these differences have important implications for how facilities respond. Specifically, we posit that a functional department that is influential in its organization's decision making also diffuses its cultural frame.

This makes its organization more acutely aware of pressures exerted by institutional constituencies within this department's domain.

In this study, we focus on two departments that differ significantly in both their cultural frames and the external constituents with which they interact. We selected legal affairs and marketing departments because their interactions with constituents are particularly clearly divided between those in organizations' nonmarket and market environments, respectively (Hoffman, 2001). Because of these differences, we hypothesize that these departments are quite likely to differ in their awareness of, and receptivity to, institutional pressures.

### *The influence of corporate legal affairs departments*

Charged with assuring companies' legitimacy and 'license to operate,' legal affairs departments are typically the primary channel for pressures from constituents in their organizations' nonmarket environments. In the context of civil rights law, Fuller, Edelman, and Matusik (2000) have argued that formal legal structures within organizations shape employees' law consciousness. In our context, the legal affairs 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 over facility managers regarding environmental issues, the more they will be able to convey the importance of such institutional pressures. Thus, managers within facilities with more influential legal affairs departments will be more receptive to external pressures exerted by constituents of their nonmarket environments. This influence can take the form of direct control over decisions at the facility level or of more indirect influence through corporate-provided information and training. In contrast, in organizations without influential legal affairs departments, facility managers are likely to be less aware of pressures exerted by nonmarket actors. Thus, we hypothesize:

*Hypothesis 1: The extent to which corporate legal affairs departments influence facilities' environmental decisions is positively associated with the receptivity of facility managers to pressures from nonmarket constituents.*

*The influence of corporate marketing departments*

Marketing departments, being responsible for orienting firms' products and services to meet and anticipate customer demands, focus on identifying factors that can provide competitive differentiation, and are often acutely aware of industry trends and competitors' positioning. Those in marketing departments are thus often the first to know of customers' concerns about suppliers' environmental management practices or performance. The greater a corporate marketing department's influence over facility-level environmental management decisions, the more able it will be to convey the importance of pressures exerted by constituents in the facility's market environment, and to cast these as important to the facility's competitiveness in the marketplace. In the absence of an influential marketing department, we would expect facility managers to be less aware of pressures from their respective market environments. We thus hypothesize that:

*Hypothesis 2: The extent to which corporate marketing departments influence facilities' environmental decisions is positively associated with the receptivity of facility managers to pressures from market constituents.*

## **ORGANIZATIONAL RESPONSES TO INSTITUTIONAL PRESSURES**

Thus far we have described how corporate functional departments can magnify or diminish facilities' receptivity to pressures from various constituents. We now examine the outcomes of these differences in receptivity by focusing on two 'voluntary environmental strategies' that purportedly seek to reduce the environmental impacts of operations beyond regulatory requirements (Sharma, 2000): (1) adopting the ISO 14001 international environmental management standard, and (2) participating in government-initiated voluntary environmental programs. Although the range of voluntary environmental strategies is broad, we focus on ISO 14001 and government-initiated voluntary environmental programs because they are among the most commonly adopted by firms across a variety of industries in the United States (Dietz and Stern, 2002). The main difference between these practices is that governments initiate and are

often involved in the implementation of voluntary government programs, whereas governments are not directly involved in ISO 14001 (Braathen, 2003).

Neither type of program is required by law, nor is there a consensus about either's effect on environmental performance. Although these programs might be seen as desirable from either a market or nonmarket perspective, they could also be viewed as undesirable from the opposite perspective. In other words, because these practices are not yet institutionalized, they might be contested by some constituents of the field. Nonetheless, as Oliver (1991) noted, 'from an institutional perspective... the appearance rather than the fact of conformity is often presumed to be sufficient for the attainment of legitimacy' (Oliver, 1991: 155). Thus, adopting environmental management practices, regardless of their immediate performance implications, might be particularly effective in enhancing organizational legitimacy by helping to alleviate constituents' concerns about environmental performance. Bansal and Clelland (2004) have shown how firms can partially manage the 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 might engage in symbolic management as a means of responding to institutional pressure (e.g., Edelman, 1992; Westphal and Zajac, 1998).

### **ISO 14001**

The first environmental management practice on which we focus is the adoption of the ISO 14001 Environmental Management System (EMS) Standard. Issued by the International Organization for Standardization, this international standard characterizes the essential elements of an EMS and provides a framework for organizations seeking to reduce their environmental impacts beyond regulatory requirements. The standard's underlying logic is that organizations can reduce their environmental impacts if they manage environmental issues systematically, as doing so enables them to identify and focus their efforts on the particular aspects of production processes that result in the most environmental harm (Coglianese and Nash, 2001). The ISO 14001 standard requires that adopting organizations create an environmental policy, set objectives and targets, implement a program to achieve

those objectives, monitor and measure the program's effectiveness, correct problems, and conduct reviews aimed at improving the EMS. ISO 14001 does not require any particular environmental performance level or improvement rate other than a commitment to comply with applicable regulations. Environmental performance is thus not a criterion in the certification process.

More than 90,000 facilities around the world have adopted the ISO 14001 standard (International Organization for Standardization, 2005), largely in response to pressures from market constituents. Although ISO 14001 was designed as a voluntary standard, some organizations might have adopted it due to sensitivity to coercive pressure from their customers (Darnall and Edwards, 2006). In particular, many automakers and large electronics firms in the United States are strongly encouraging their suppliers to adopt the standard. In addition, many firms in Asia, anticipating that their European-based customers will require it of their suppliers, are adopting the standard. To some degree, adoption appears to be motivated by firms' vulnerability to mimetic pressure as firms imitate the behavior of other organizations tied to them through networks (Guler, Guillen, and MacPherson, 2002; Westphal, Gulati, and Shortell, 1997). Organizations that perceive that a large number of their competitors have adopted ISO 14001 are thus more likely to adopt the standard. Since some market actors value the ISO 14001 standard, we expect that facilities will adopt the standard in response to institutional pressure from market actors.

*Hypothesis 3: The receptivity of facility managers to pressures from market constituents is positively associated with their facilities' adoption of ISO 14001.*

Although there are several reasons facilities might respond to market-based pressures by adopting ISO 14001, there is less evidence to suggest that facilities with influential legal affairs departments will adopt the standard when they are under intense pressure from nonmarket actors such as activists and regulators. Because ISO 14001 lacks requirements that stipulate environmental procedures or even minimum levels of environmental performance, many environmental nongovernmental organizations are hesitant to rely on the standard as an indicator of management effort or environmental performance (Pringle, Leuteritz, and

Fitzgerald, 1998; Rondinelli and Vastag, 2000). Furthermore, implementing ISO 14001 and conducting the routine audits required by the standard might uncover regulatory violations, evoking concern about potential liability that discourages some firms from adopting (Orts and Murray, 1997; Rodgers, 1996). In a recent survey of firms in the United States, the majority of respondents noted two related factors that inhibit their adoption of ISO 14001: (1) uncertainty about regulatory agencies' potential 'utilization of EMS audit information,' and (2) 'potential legal penalties from voluntary disclosure' (Delmas, 2000: 23 [Table 6]). The ambiguity in the law regarding the benefits of adopting ISO 14001 leaves room for environmental lawyers to provide their own interpretation of the standard's potential value. Because it is part of the mission of lawyers to act conservatively to protect their clients, it is likely that they will highlight the potential drawbacks of adopting the standard. For example, the U.S. environmental law literature is replete with articles on the risks to corporations of adopting ISO 14001 (Mostek, 1998; Orts and Murray, 1997; Rodgers, 1996). Similarly, legal affairs departments' focus on liabilities and risk management make them especially likely to consider the risk that adopting ISO 14001 reduces firms' ability to credibly deny environmental wrongdoing in the face of a media exposé (Lyon and Maxwell, 2006). Therefore organizations with influential legal affairs departments might be less inclined to adopt ISO 14001. These organizations might view environmental issues more as threats than opportunities, and be especially wary of litigation (Sharma, Pablo, and Vredenburg, 1999).

Because some nonmarket constituents contest the validity of ISO 14001, we hypothesize that facilities might be less likely to adopt the standard in response to pressure from nonmarket actors. Therefore, we hypothesize that:

*Hypothesis 4: The receptivity of facility managers to pressures from nonmarket constituents is negatively associated with their facilities' adoption of ISO 14001.*

### **Government-initiated voluntary programs**

Government-initiated voluntary programs are collaborative arrangements between firms and regulators whereby firms voluntarily commit to actions

that might improve their environmental performance (Delmas and Terlaak, 2001).<sup>2</sup> These programs are designed by policy makers to associate private benefits with the voluntary provision of public goods (Delmas and Terlaak, 2001). Examples of government-initiated programs include the Climate Challenge program established by the U.S. Department of Energy to reduce CO<sub>2</sub> emissions in the electric utility industry, or the U.S. Environmental Protection Agency's (EPA) WasteWise Program designed to reduce companies' waste (Delmas and Keller, 2005; Delmas and Montes, 2007). Firms might participate to gain favorable publicity or greater flexibility in complying with existing regulations, or to deter the imposition of new regulations (Decker, 2005; Lyon and Maxwell, 2004; Maxwell and Decker, 2006; Segerson and Miceli, 1998).

The past decade has seen increasing use of these voluntary programs as supplements to, and sometimes replacements for, traditional command-and-control regulation (Börkey and Lévêque, 1998; Mazurek, 1998). As in the case of ISO 14001, some reservations have been expressed about the actual effectiveness of voluntary programs (Delmas and Keller, 2005; Harrison, 1998; King and Lenox, 2000; Rivera and DeLeon, 2004; Welch, Mazur, and Bretschneider, 2000). In particular, there are still concerns that 'free-riding' behavior

might be difficult to avoid within voluntary programs (Delmas and Keller, 2005). As such, like ISO 14001, these programs are not yet fully institutionalized.

Because of the active participation of public authorities in these programs, the literature has emphasized political and regulatory influences as motivating participation in these voluntary programs (Delmas and Terlaak, 2001; Lyon and Maxwell, 2004; Short and Toffel, 2008). We therefore hypothesize that:

*Hypothesis 5: The receptivity of facility managers to pressures from nonmarket constituents is positively associated with their facilities' adoption of government-initiated voluntary environmental programs.*

In contrast to ISO 14001, prior research has found little evidence that pressures from market actors such as buyers or suppliers influence the decision to participate in government-initiated voluntary environmental programs. We therefore do not hypothesize a relationship between pressures from market constituents and the adoption of these programs.

Figure 1 illustrates our hypotheses. It shows that the receptivity of facility managers to pressures from market (nonmarket) constituents is a function both of the pressures exerted by these actors as well as the relative influence of their marketing (legal affairs) departments, as described in

<sup>2</sup> For additional reviews of voluntary environmental programs, see Khanna (2001) and Morgenstern and Pizer (2007).

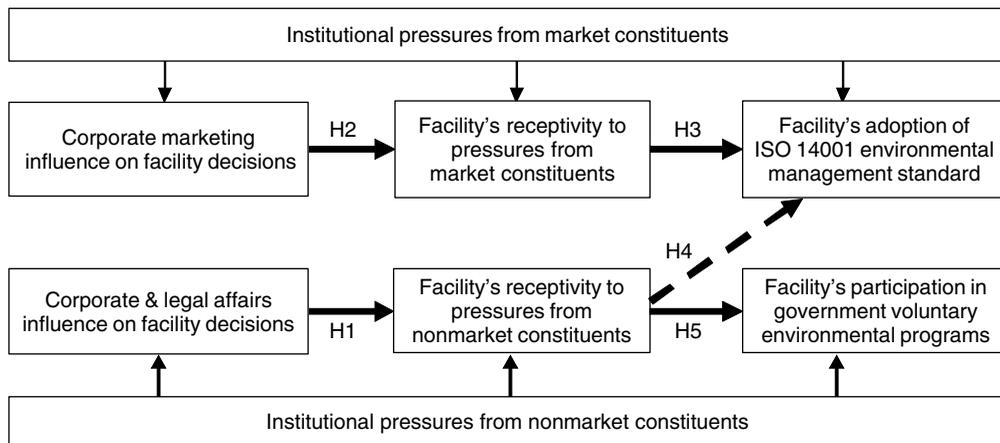


Figure 1. Institutional pressures, facility receptivity, and management practices: hypothesized relationships *Note:* Thick solid lines depict hypotheses that predict positive relationships. The thick dashed line depicts the hypothesis that predicts a negative relationship

Hypothesis 1 (2). This receptivity to different constituents will, in turn, influence the adoption of different environmental management practices. We predict that receptivity to pressures from market actors will encourage facilities to adopt ISO 14001 (Hypothesis 3), and expect that receptivity to such pressures from nonmarket actors will induce facilities to resist the adoption of ISO 14001 (Hypothesis 4) and adopt government voluntary programs (Hypothesis 5).

## METHODS

Data for this study were derived from an original survey and publicly available databases. The survey gathered information about perceptions of institutional pressures, the relative influence of various corporate functional departments, and the management practices adopted by each facility. 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 U.S. EPA's Toxic Release Inventory (TRI) program.<sup>3</sup> 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>4</sup> In 2001, the 11,622 facilities from these industries that reported TRI data represented 47 percent of the total number of facilities that reported data to TRI and 78 percent of the total toxic air emissions reported in the TRI program

that year (U.S. Environmental Protection Agency, 2003). To ensure access to data on performance trends, 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 resulted in a sample of 3,160 facilities.

### Survey

We conducted a mail survey to gather facility-level data on environmental management practices (EMPs) and managers' perceptions of why their facilities adopted these practices. The questionnaire inquired about the facility's environmental management practices, relations with various stakeholders, participation in voluntary environmental management programs, tracking and reporting of various environmental aspects, and sources of environmental information and pressure to improve environmental performance.

Like much of the previous survey-based literature on environmental management (e.g., Johnstone *et al.*, 2004; Klassen, 2001; Madsen and Ulhøi, 2003), we chose respondents we believed would have the most information to answer the survey questions. We suspected that because facilities' environmental managers and environmental, health, and safety (EHS) managers make environmental management decisions at the facility-level, they would be particularly well informed about the internal and external factors that influence these decisions. Because interviews we conducted while pretesting the survey instrument confirmed that these individuals were the most knowledgeable about these issues, we targeted our survey at facility-level environmental and EHS managers. The Survey Research Center (SRC) at the University of California at Santa Barbara called each facility to obtain the names of these individuals.

We pretested our questionnaire instrument to ensure that our questions were clearly understood and easily answerable by respondents. We arranged for a variety of respondents to complete our draft survey. These included environmental managers from 12 large companies in our sample industries, a few environmental management consultants, and several faculty members who research environmental management issues. We then interviewed these individuals to probe their interpretation of

<sup>3</sup> Facilities in a variety of industrial sectors must annually report TRI data if 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 (U.S. Environmental Protection Agency, 2001).

<sup>4</sup> As discussed earlier, Hoffman (1999) described how organizational fields can be formed around common issues such as industrial environmental management. Because the structural equation modeling approach cannot include industry dummies, we ran several robustness tests to ensure that industry effects did not confound our results. These tests and their results are described herein.

each question and to solicit clarifying suggestions. This process resulted in refinements to several survey questions and response anchors. Based on our pretest, the eight-page, 32-question survey required 15–20 minutes to complete.

We sent the questionnaire to the entire sample twice in late 2003 (October 13 and November 4).<sup>5</sup> The cover letter that accompanied the questionnaire provided a unique identification number that enabled respondents to complete the survey via a secure Web site instead of via the enclosed paper version. Shortly after each of the two distribution dates (October 23 through November 12), the SRC attempted to telephone all of these facilities to encourage them to respond. It reached 2,312 facilities (73% of the sample). Postcards were sent in January 2004 to facilities that had not yet responded.

We received 536 responses. From our total sample of 3,160 facilities, this 17 percent response rate is comparable to other recent survey-based strategy research (e.g., Hoskisson *et al.*, 2004; McEvily and Chakravarthy, 2002; Slater and Olson, 2001). We tested sample representativeness in several ways. First, we ran an analysis of variance and found that the different industries' response rates, which ranged from 13 percent (refining; electric utilities) to 17 percent (machinery; electrical/electronics) to 19 percent (automotive; primary metals), were not statistically significant ( $F = 0.03$ ). We then conducted t-tests to compare responders to nonresponders along three dimensions. The two groups were statistically indistinguishable in terms of facility employment ( $p = 0.19$ ), pollution levels measured as average log pounds of toxic emissions in 2000–2001 ( $p = 0.41$ ), and the environmental harm resulting from these emissions ( $p = 0.80$ ).<sup>6</sup> The results of these comparisons provide reasonable assurance that the respondents are representative of the entire sample. We tested for nonresponse bias by comparing early and late respondents, since late respondents have been shown to be similar to nonrespondents (Armstrong and Overton, 1977). We created two sets of late respondents: all those who responded anytime after we

sent the survey a second time, and a subset of these who responded only after receiving the postcard reminder several weeks later (Cantwell and Mudambi, 2005). We compared each set of late respondents to the early respondents across the 11 survey measures using a chi-squared test of independence. In both cases, the responses from early and late respondents were virtually indistinguishable. Overall, these results suggest that nonresponse bias is unlikely to be a serious concern.

## Model

We employed a structural equation modeling (SEM) approach and estimated the model via maximum likelihood using AMOS Version 5 (Arbuckle, 1997). This method simultaneously estimates the latent variables and the relationships between them and other observable 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; Shook *et al.*, 2004; Simonin, 1999).

We tested Hypotheses 1 and 2 in our structural model by estimating the extent to which corporate functional departments influence facilities' receptivity to institutional pressures, controlling for the level of institutional pressures exerted by market and nonmarket constituents. Several other factors might affect corporate functional departments' influence on facilities. In particular, past levels of institutional pressure could explain the current influence of functional departments. To control for this, we predict the level of influence of the departments using several variables from publicly available databases that go back several years before the survey was conducted. For example, we control for historical environmental compliance at the facility's corporate affiliates during 1999–2003 because noncompliance experienced during this period might affect the current influence of its corporate legal affairs department. In addition, we control for the stringency of environmental regulations of the facility's headquarters country, as this might affect how closely the corporate legal affairs department scrutinizes its facilities' environmental practices. Finally, we control for the size of the company, as this might affect the extent to which its corporate departments influence facility decisions.

<sup>5</sup> The survey is available from the corresponding author.

<sup>6</sup> We compared pollution levels using data from the U.S. 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 U.S. EPA's TRACI scheme, then summing these weighted totals (Toffel and Marshall, 2004) and logging the result.

To test Hypotheses 3–5, we estimate the extent to which a facility's receptivity to market and nonmarket pressures affects its decision to adopt two distinct environmental management practices. In our structural model, we include several control variables that might also influence adoption of these environmental management practices, including corporate size, market and nonmarket pressures exerted on the facility and corporation, and the facility's historical environmental compliance record.

## Measures

In this section, we describe our measures for the measurement model and the structural model. In addition to the hypothesized relationships, we control for the observed level of market and nonmarket pressures to distinguish pressures actually exerted from the receptivity of facilities to these pressures.

### *Receptivity to nonmarket and market pressures*

Hypotheses 1 and 2 predict the extent to which facility managers are receptive to pressures from nonmarket and market constituents. To measure this, we asked survey respondents to indicate the extent to which various external groups influenced their facilities to improve environmental performance. The list of external groups included customers, suppliers, competitors, trade associations, local communities, environmental organizations, regulators/legislators, the media, shareholders, and socially responsible investment (SRI) funds. This list corresponds to external stakeholders identified by scholars in the corporate environmental strategy literature (Henriques and Sadosky, 1999). Respondents ranked each stakeholder on a five-point scale from 'no influence' (coded 0.2) to 'very strong influence' (coded 1). We conducted an exploratory principal components factor analysis to detect the underlying structure in the relationships among these variables. Missing observations were excluded listwise. The underlying variables loaded onto two factors: the first represents the *receptivity to market pressure* exerted by customers, suppliers, and competitors; the second represents the *receptivity to nonmarket pressure* exerted by local communities, environmental organizations, regulators, and the media. Shareholders, trade associations, and SRI funds loaded fairly evenly across both factors. These two factors explained 55.7 percent 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 reran the analysis. The two resulting factors had Eigenvalues of 3.33 and 1.19 and explained 64.6 percent of the total variance.

### *Environmental management practice*

The adoption of ISO 14001 is the dependent variable for Hypotheses 3 and 4. To measure this, we asked respondents: 'What is the status of the certification of ISO 14001 at your facility?' We presented the following five-point scale: 'not being considered' (coded 1), 'future consideration' (2), 'planning to implement' (3), 'currently implementing' (4), and 'successfully implemented' (5). By providing intermediate values for facilities that were considering adoption or were in the midst of adopting, we obtained a more nuanced measure than a simple dichotomous response as to whether or not the facility had already adopted the standard.

Participation in government-initiated voluntary programs is the dependent variable for Hypothesis 5. To measure this, our survey asked: 'What is the status of your participation in voluntary U.S. EPA or state programs such as Energy Star, Waste-Wise, Environmental Performance Track, etc.?' We presented the following four-point scale: 'not being considered' (coded 1), 'future consideration' (2), 'planning to participate' (3), and 'currently participating' (4).<sup>7</sup> Table 1 provides a simplified cross-tabulation that illustrates the prevalence of the two environmental management practices in our sample. We aggregate the two categorical variables into facilities 'adopting' these practices (including 'currently implementing/participating' and 'successfully implemented') or 'not adopting' these practices (including 'not being considered', 'future consideration', and 'planning to participate/implement'). The cross-tabulation of these aggregated variables reveals significant heterogeneity in our sample in the adoption of the two practices. Of the 536 respondents, 493 provided data for all measures in our model. Of these 493 facilities, 66 facilities (13% of the respondents) adopted both ISO 14001 and participated in one or more government voluntary programs. In addition, 191 facilities (39% of the respondents) adopted

<sup>7</sup> In the model, we rescaled this and all other variables to have a maximum of one.

Table 1. Adoption of environmental management practices in our sample

	Government voluntary program status		Total
	Not adopting <sup>a</sup>	Adopting <sup>b</sup>	
<b>ISO 14001 status</b>			
Not adopting <sup>a</sup>	236 (48%)	54 (11%)	290 (59%)
Adopting <sup>c</sup>	137 (28%)	66 (13%)	203 (41%)
Totals:	373 (76%)	120 (24%)	493 (100%)

Notes:

<sup>a</sup> Includes 'Not being considered,' 'Future consideration,' and 'Planning to participate/implement'

<sup>b</sup> Includes 'Currently participating'

<sup>c</sup> Includes 'Currently implementing' and 'Successfully implemented'

Table 2. Descriptive statistics of observed variables

	Mean	S.D.	Minimum	Maximum
( $\eta_1$ ) ISO 14001 implementation status	0.58	0.34	0.20	1.00
( $\eta_2$ ) Government voluntary program participation	0.56	0.29	0.25	1.00
( $\eta_3$ ) <i>Receptivity to nonmarket 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
( $\eta_4$ ) <i>Receptivity to 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
( $\xi_1$ ) <i>Facility environmental noncompliance</i>				
→ Number of formal enforcement actions	0.06	0.11	0.00	1.00
→ Log sum of penalties	0.14	0.27	0.00	1.00
→ Number of environmental compliance violations	0.13	0.19	0.00	1.00
( $\xi_2$ ) <i>Corporate environmental noncompliance</i>				
→ Log sum of penalties	0.33	0.35	0.00	1.00
→ Number of formal enforcement actions	0.08	0.16	0.00	1.00
( $\xi_3$ ) <i>Nonmarket pressure exerted</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
( $\xi_4$ ) Market pressure exerted	0.34	0.26	0.00	1.00
( $\xi_5$ ) Influence of corporate legal affairs department	0.70	0.28	0.20	1.00
( $\xi_6$ ) Influence of corporate marketing department	0.45	0.24	0.20	1.00
( $\xi_7$ ) Stringency of environmental regulations in headquarters country	0.91	0.04	0.48	1.00
( $\xi_8$ ) Corporate size	0.65	0.18	0.09	1.00

Note: 493 observations.

only ISO 14001 or participated in one or more government voluntary programs. Finally, 236 facilities (48% of the respondents) adopted none of these practices.

*Functional department influence*

We presume that within a single company, corporate functional departments exert varying amounts

of influence on decisions in different domains. For example, one might reasonably expect corporate legal departments to exert more influence on contractual terms than on production decisions. To bolster the validity of our measure, we focused this question on our domain of interest, environmental performance. Environmental performance can be enhanced through a variety of management practices about which lawyers and marketers might have strong preferences such as compliance-oriented tasks (e.g., implementing documented policies and routine training) and tasks more visible to customers (e.g., adopting the ISO 14001 Environmental Management System standard or various industry voluntary programs). To measure the influence of the corporate legal affairs department and 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 provided an option for respondents to indicate that their corporation did not have either department, and coded the department influence variables as 'no influence' in such cases.

#### *Nonmarket pressure exerted*

Pressure from nonmarket actors (legislators, regulators, nongovernmental organizations) is considered a latent variable, which we constructed using four measures obtained from publicly available databases, each of which we rescaled to a maximum value of one. First, we included 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 and Vafeas, 2002; Viscusi and Hamilton, 1999; Welch *et al.*, 2000). We calculated the average of the League of Conservation Voters' 1996 scores for each state's U.S. Senate and House delegations to Congress. Second, we included the number of state-level environmental policy initiatives (toxic waste, recycling programs) each state had implemented (Hall and Kerr, 1991: 142), a measure recently used by Welch *et al.* (2000). Third, we employed 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 and Kerr, 1991: 146). Fourth, we included a proxy for a community's propensity for collective action regarding environmental protection. Following an approach others have used (Maxwell, Lyon, and Hackett, 2000; Welch *et al.*, 2000; Wikle, 1995), we included the number of members of major environmental and conservation organizations in the facility's state per thousand state residents in 2003. These data were collected through a survey of 80 main environmental and conservation nongovernmental organizations (NGOs) in 2003.<sup>8</sup> We ran an exploratory principal components factor analysis on these four nonmarket measures. The four variables loaded on one factor with an Eigenvalue of 3.07, which explained 76.9 percent of the variance.

#### *Market pressure exerted*

Buyers motivate many companies to adopt environmental management practices and standards (Christmann and Taylor, 2001; Henriques and Sadorsky, 1996; Jiang and Bansal, 2003; King *et al.*, 2005). 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 and Taylor, 2001), we measured market pressure to adopt environmental management practices by considering the extent to which a facility's buyers had adopted ISO 14001. Because individual facility-level data are not available, we constructed an industry-level measure using the following equation:

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

where  $MPE_j$  is the market pressure exerted on facilities in industry  $j$ ,  $ADOPT_k$  is the number of establishments in industry  $k$  that had adopted ISO 14001 (International Organization for Standardization, 2003),  $ESTAB_k$  is the total number of establishments in industry  $k$  (U.S. 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

<sup>8</sup> Delmas M. 2004. Survey of environmental and conservation NGO membership in the United States. Donald Bren School of Environmental Science and Management, University of California, Santa Barbara, unpublished mimeograph.

firms in industry  $j$ . Data for the latter two variables were obtained from the most recent detailed Economic Input-Output (EIO) tables from the Bureau of Economic Analysis (2000). In summary, market pressure exerted 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 an organization might also influence how managers perceive and respond to institutional pressures (Elsbach and Sutton, 1992). For example, managers in firms whose reputations have suffered from accidents resulting in pollution might be particularly sensitive to environmental issues (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 controlled for a facility's poor compliance history as a potential source of increased sensitivity to nonmarket pressure. Facility noncompliance 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 log sum of penalties accrued during 1999–2003 (Kassinis and Vafeas, 2002; Khanna and Anton, 2002; Russo and Fouts, 1997).<sup>9</sup> This information was obtained from the U.S. EPA's Integrated Data for Enforcement Analysis (IDEA) database. We rescaled each to a maximum value of one, and 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).

The level of environmental compliance of corporations as a whole might also affect corporate legal affairs departments' influence over their subsidiaries. To measure corporate-wide environmental compliance, we measured the noncompliance of facilities' corporate affiliates. To construct this measure, we extracted from the U.S. EPA's Risk Screening and Environmental Indicators (RSEI) database a list of facilities that reported to the

EPA's TRI program the same 'Parent DUNS' number (a unique identifier assigned by Dun & Bradstreet) as the facilities in our sample.<sup>10</sup> We obtained the number of formal enforcement actions and the value of penalties (which we log) 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 1.64, which explained 82.0 percent of the variance.

### *Stringency of environmental regulations in the headquarters' country*

Nations differ significantly in how their citizenries perceive the natural environment and in the stringency of their environmental regulations (Jamison and Baark, 1999; Perron, Vaillancourt, and Durand, 2001). These disparities lead to differing views of which company environmental actions are considered legitimate. These views can be particularly important in the facility's headquarters country 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 might be more sensitive to institutional pressures to improve their environmental performance. We measure the relative stringency of environmental regulations in each facility's headquarters country using data from the World Economic Forum's 2001 Executive Opinion Survey (EOS) of its members (World Economic Forum, 2002 [EOS included on CD-ROM]). Using a seven-point scale, responses ranged from 'lax compared to most other countries' to 'among the world's most stringent' (World Economic Forum, 2002).

### *Corporate size*

We measured corporate size as log corporate revenues, which we rescaled to a maximum value of one. We obtained this information from Dun & Bradstreet, Onesource, Hoover's, and Compustat.

Figure 2 illustrates our structural model, which includes our hypothesized relationships as well as the other factors for which we control that might influence these variables. Our model includes

<sup>9</sup> To avoid dropping facilities with no penalties, we added one before logging the sum of penalties.

<sup>10</sup> U.S. EPA's Risk Screening and Environmental Indicators (RSEI) is available at <http://www.epa.gov/opptintr/rsei/index.html>.

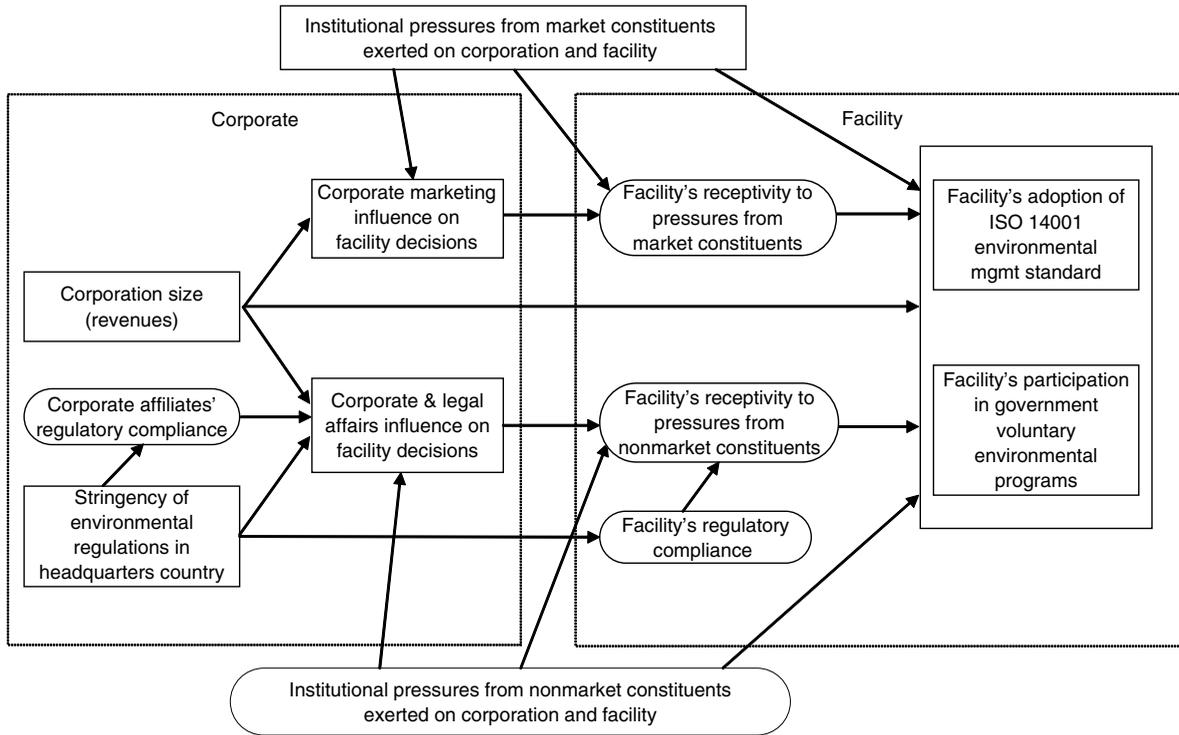


Figure 2. Structural model<sup>11</sup>

seven directly observed measures (indicators) depicted as rectangles and five theoretically derived concepts (latent variables or factors) depicted as ovals.

### Limitations

Our measures and use of a survey to gather some of our data are not without limitations. Since several of our antecedent and consequent variables were measured using items in a questionnaire completed by a single respondent, we conducted the Harman one-factor test to assess whether common method variance is a serious issue (Podsakoff and Organ, 1986). This test involves entering all self-reported variables into a factor analysis and examining the unrotated factor solution. High common method variance is indicated by the emergence of a single factor, or by a single general factor that explains the majority of the covariance (Podsakoff and Organ, 1986). We entered all 11 self-reported

items into a principal components factor analysis. The results yielded two factors with Eigenvalues greater than one, the first of which explained only 38 percent of the variation. Because no single dominant factor accounts for most of the variation among the self-reported variables, common method variance is unlikely to be a serious problem in the data.<sup>12</sup>

Table 2 presents descriptive statistics for all observed variables employed in our analysis.<sup>13</sup>

## RESULTS

### Measurement model

The measurement model refers to the construction of latent variables from observable items. In our case, we constructed five latent variables from

<sup>11</sup> Observed variables are depicted as rectangles and latent variables as ovals. For clarity, correlations included in the structural model are omitted from this figure, as are the items that measure the latent variables.

<sup>12</sup> We also entered *all* the variables in our model, including those based on archival data, into a principal components factor analysis. The results yielded six factors with eigenvalues greater than one, the first of which explains only 16 percent of the variation.

<sup>13</sup> Correlations among all observed variables are available from the corresponding author.

Table 3. Results of measurement model

Latent variables	Mean	Variance	Number of items	Cronbach's alpha	Composite reliability	Average variance extracted	Correlations between latent variables (square root of average variance extracted in the diagonal)					
							( $\eta_3$ )	( $\eta_4$ )	( $\xi_1$ )	( $\xi_2$ )	( $\xi_3$ )	
( $\eta_3$ ) Receptivity to nonmarket pressure	0.13	0.01	4	0.79	0.98	0.94	0.97					
( $\eta_4$ ) Receptivity to market pressure	0.18	0.01	3	0.76	0.98	0.95	0.67	0.98				
( $\xi_1$ ) Facility environmental noncompliance	0.00	0.01	3	0.79	0.99	0.97	0.10	0.03	0.99			
( $\xi_2$ ) Corporate environmental noncompliance	0.00	0.02	2	0.78	0.95	0.95	0.07	0.00	0.00	0.97		
( $\xi_3$ ) Nonmarket pressure exerted	0.00	0.03	4	0.90	0.99	0.98	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_3</math>) Receptivity to nonmarket pressure</i>				
→ Influence of local community	1.49	0.16	9.39	0.71
→ Influence of environmental organizations	1.41	0.15	9.42	0.76
→ Influence of media	1.33	0.14	9.40	0.76
→ Influence of regulators/legislators	1.00	fixed		0.46
<i>(<math>\eta_4</math>) Receptivity to market pressure</i>				
→ Influence of competitors	1.43	0.11	13.29	0.79
→ Influence of customers	1.49	0.12	12.28	0.71
→ Influence of suppliers	1.00	fixed		0.69
<i>(<math>\xi_1</math>) Facility environmental noncompliance</i>				
→ Number of formal enforcement actions	1.00	fixed		0.89
→ Log sum of penalties	2.13	0.14	14.99	0.80
→ Number of environmental compliance violations	1.09	0.09	12.33	0.58
<i>(<math>\xi_2</math>) Corporate environmental noncompliance</i>				
→ Log 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>) Nonmarket pressure exerted</i>				
→ League of Conservation Voters' 1996 state scorecard rating	1.00	fixed		0.63
→ Number of state-level environmental policy initiatives	1.30	0.08	16.53	0.99
→ Renew America assessment of state's environmental policy comprehensiveness	1.13	0.06	19.14	0.91
→ State's environmental and conservation organization members per thousand residents	1.08	0.08	14.30	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.

16 items. We tested the measurement model by examining individual item reliability, internal consistency, and discriminant validity (see Table 3). The measurement model provided acceptable item

reliability, all of the item loadings being statistically significant ( $p < 0.001$ ).

We tested internal consistency for each latent construct using three methods. First, we calculated

the Cronbach alpha reliability coefficient using standardized item scores (mean = 0, variance = 1) such that the scale and its reliability were based on the sum of standardized variables. Alpha was above the common threshold of 0.7 for every latent variable (Nunnally and Bernstein, 1994). Second, we calculated *composite reliability* ( $\rho_c$ ) for each latent variable by dividing (a) the squared sum of the individual standardized loadings by (b) the sum of the variance of their error terms and the squared sum of the individual standardized loadings (Fornell and Larcker, 1981). The values calculated for each of our latent variables exceed the threshold value of 0.70 (Nunnally, 1978), which suggests that our measurement model demonstrates adequate internal consistency. Third, we calculated the 'average variance extracted' ( $\rho_{ave}$ ), which 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 standardized loadings divided by (b) the sum of the variance of the error terms and the squared item standardized 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 and 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, and Zinkhan, 1982). The variance shared by any two constructs is obtained by squaring the correlation between them. 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 and 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 constructs' 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>14</sup>

### Goodness of fit

We find that the  $\chi^2$  is statistically significant (394.8, df = 204, 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 and Wothke, 1999). We consider other structural diagnostics for the overall fit of the model that are not sensitive to sample size (Bentler and Bonett, 1980). The 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 of 0.044 (with a 90% confidence interval ranging from 0.037 to 0.050) is within the acceptable range. Likewise, the 0.956 incremental fit index (IFI) (Bollen, 1989), the 0.944 Tucker-Lewis index (TLI) (Tucker and Lewis, 1973), and the 0.955 comparative fit index CFI (Bentler, 1990) are all 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.

### Testing the hypotheses

As Table 4 illustrates, the results provide significant support for the hypothesized relationships. There is a significant positive path between the influence of the corporate legal department and receptivity to nonmarket pressure ( $\beta = 0.15$  p < 0.001), providing support for Hypothesis 1. Likewise, the significant positive relationship between the influence of the corporate marketing department and receptivity to market pressure ( $\beta = 0.31$ ;

<sup>14</sup> To estimate the model, we make several identifying assumptions. We assume that a facility's observed nonmarket pressures (which we measure at the state level) are not directly correlated with corporate size, regulatory stringency in the country of the headquarters, or the compliance histories of the facility or its corporate affiliates. In addition, we assume that regulatory stringency in the country of the headquarters is not directly correlated with corporate size or the compliance record of the facility or its corporate affiliates.

Table 4. Structural model paths

Hypothesis	Antecedent variable	Consequent variable	Unstandardized regression weight	Standard error	Critical ratio	p value	Standardized regression weight
<b>H1</b>	<b>(<math>\xi_2</math>) Influence of corporate legal affairs department</b>	<b>(<math>\eta_3</math>) Receptivity to nonmarket pressure</b>	<b>0.15</b>	<b>0.02</b>	<b>6.20</b>	<b>***</b>	<b>0.36</b>
	( $\xi_3$ ) Nonmarket pressure exerted	( $\eta_3$ ) Receptivity to nonmarket pressure	0.05	0.03	1.62	0.11	0.07
	( $\xi_1$ ) Facility environmental noncompliance	( $\eta_3$ ) Receptivity to nonmarket pressure	0.14	0.05	2.74	0.01	0.13
	( $\xi_7$ ) Stringency of environmental regulations in headquarters country	( $\eta_3$ ) Receptivity to nonmarket pressure	0.02	0.13	0.17	0.87	0.01
<b>H2</b>	<b>(<math>\xi_6</math>) Influence of corporate marketing department</b>	<b>(<math>\eta_4</math>) Receptivity to market pressure</b>	<b>0.31</b>	<b>0.03</b>	<b>10.31</b>	<b>***</b>	<b>0.55</b>
	( $\xi_4$ ) Market pressure exerted	( $\eta_4$ ) Receptivity to market pressure	0.12	0.02	5.67	***	0.24
<b>H3</b>	<b>(<math>\eta_4</math>) Receptivity to market pressure</b>	<b>ISO 14001 implementation status</b>	<b>1.01</b>	<b>0.22</b>	<b>4.59</b>	<b>***</b>	<b>0.40</b>
	( $\xi_8$ ) Corporate size	( $\eta_1$ ) ISO 14001 implementation status	0.31	0.07	4.29	***	0.17
	( $\xi_1$ ) Market pressure exerted	( $\eta_1$ ) ISO 14001 implementation status	0.20	0.06	3.40	***	0.16
	( $\xi_5$ ) Nonmarket pressure exerted	( $\eta_1$ ) ISO 14001 implementation status	0.17	0.09	1.99	0.05	0.08
<b>H4</b>	<b>(<math>\eta_3</math>) Receptivity to nonmarket pressure</b>	<b>(<math>\eta_1</math>) ISO 14001 implementation status</b>	<b>-0.36</b>	<b>0.22</b>	<b>-1.68</b>	<b>0.09</b>	<b>-0.13</b>
<b>H5</b>	<b>(<math>\eta_3</math>) Receptivity to nonmarket pressure</b>	<b>(<math>\eta_2</math>) Voluntary program participation</b>	<b>0.40</b>	<b>0.20</b>	<b>1.95</b>	<b>0.05</b>	<b>0.16</b>
	( $\xi_8$ ) Corporate size	( $\eta_2$ ) Voluntary program participation	0.16	0.07	2.19	0.03	0.10
	( $\xi_4$ ) Market pressure exerted	( $\eta_2$ ) Voluntary program participation	-0.01	0.06	-0.20	0.84	-0.01
	( $\xi_1$ ) Nonmarket pressure exerted	( $\eta_2$ ) Voluntary program participation	0.10	0.08	1.17	0.24	0.05
	( $\eta_4$ ) Receptivity to market pressure	( $\eta_2$ ) Voluntary program participation	0.22	0.19	1.17	0.24	0.10
<i>Additional controls</i>	( $\xi_7$ ) Stringency of environmental regulations in headquarters country	( $\xi_5$ ) Influence of corporate legal affairs department	0.41	0.30	1.36	0.18	0.05
	( $\xi_8$ ) Corporate size	( $\xi_5$ ) Influence of corporate legal affairs department	0.34	0.08	4.20	***	0.22
	( $\xi_3$ ) Nonmarket pressure exerted	( $\xi_5$ ) Influence of corporate legal affairs department	0.00	0.07	0.03	0.98	0.00
	( $\xi_2$ ) Corporate environmental noncompliance	( $\xi_5$ ) Influence of corporate legal affairs department	0.21	0.13	1.64	0.10	0.09
	( $\xi_8$ ) Corporate size	( $\xi_6$ ) Influence of corporate marketing department	0.14	0.06	2.58	0.01	0.11
	( $\xi_4$ ) Market pressure exerted	( $\xi_6$ ) Influence of corporate marketing department	0.09	0.04	2.46	0.01	0.10

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

$p < 0.001$ ) provides support for Hypothesis 2. Based on the standardized coefficients, a one-point increase in the five-point Likert scale of corporate legal departments' influence on facility-level environmental decisions is associated with a 23 percent increase in facilities' receptivity to nonmarket pressure. A comparable increase in corporate marketing departments' influence is associated with a 34 percent increase in facilities' receptivity to market pressures.<sup>15</sup>

Our results also provide strong support for our hypotheses that predict the adoption of environmental management practices. Hypothesis 3 predicted that, even after controlling for the actual pressure exerted by market constituents, facilities that are more receptive to pressure from their market constituents are more likely to adopt ISO 14001. Our model confirms this positive relationship ( $\beta = 1.01$ ;  $p < 0.001$ ). The standardized coefficient implies that a one standard deviation increase in receptivity to market pressure is associated with a 0.40 increase in ISO 14001 implementation status, or two points on the five-point Likert scale that measures ISO 14001 implementation.<sup>16</sup> As predicted by Hypothesis 4, we find that greater receptivity to nonmarket pressure is associated with *less* enthusiasm for ISO 14001 ( $\beta = -0.36$ ;  $p = 0.09$ ). A one standard deviation increase in receptivity to nonmarket pressure is associated with a 0.13 decrease in ISO 14001 implementation status (recoded to a maximum of 1), which is equivalent to just over half a point (0.65) on the original five-point Likert scale for ISO 14001 implementation. Consistent with Hypothesis 4, we find that facility managers who perceive more nonmarket pressure are less willing to adopt ISO 14001 ( $\beta = -0.36$ ,  $p = 0.09$ ). This could suggest

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<sup>15</sup> 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 five-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 nonmarket pressure by 0.030 ( $0.2 \times 0.15$ ), which is 23 percent 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 0.062 ( $0.2 \times 0.31$ ), which is 34 percent of the latter's mean value (0.184).

<sup>16</sup> The survey measured ISO 14001 implementation status on a five-point Likert scale, which we rescaled to a maximum of one for use in the model. Thus, one point on the Likert scale corresponds to 0.20.

that facilities with influential legal affairs departments might be convinced by their lawyers that ISO 14001 could be associated with liabilities, which would make facility managers less inclined to adopt the standard. Hypothesis 5 predicted that facilities that are more receptive to pressure from nonmarket constituents are more likely to adopt government voluntary programs. As predicted, the coefficient on this path is positive and statistically significant ( $\beta = 0.40$ ;  $p = 0.05$ ). The standardized coefficient implies that a one standard deviation increase in receptivity to nonmarket pressure is associated with a 0.16 increase in government voluntary program participation (recoded to a maximum of 1), which is equivalent to just over half a point (0.64) on the four-point Likert scale that measures government voluntary program participation.<sup>17</sup> Overall, these results confirm our hypotheses that companies respond to perceived institutional pressures in different ways, depending on which constituent is exerting pressure.

We found no evidence that participation in government voluntary programs is associated with receptivity to market pressure ( $\beta = 0.22$ ;  $p = 0.19$ ). Turning to the control variables, we first examine factors that might affect the influence of the corporate legal affairs department. Although firm size ( $\beta = 0.34$ ,  $p < 0.001$ ) and corporate affiliates' environmental noncompliance ( $\beta = 0.21$ ,  $p = 0.10$ ) increase the influence of the corporate legal affairs department, we find no evidence that this department's influence is affected by nonmarket pressure exerted ( $\beta = 0.00$ ,  $p = 0.98$ ) or the stringency of the headquarters country's environmental regulations ( $\beta = 0.41$ ,  $p = 0.18$ ). Corporate marketing departments are more influential in larger firms ( $\beta = 0.14$ ,  $p = 0.01$ ) and when facilities face greater environmental pressure exerted by customers ( $\beta = 0.09$ ,  $p = 0.01$ ).

What else influences facilities' receptivity to institutional pressures? Facilities with poor compliance records ( $\beta = 0.14$ ,  $p = 0.01$ ) or that face greater nonmarket pressure exerted ( $\beta = 0.05$ ,  $p = 0.11$ ) are more receptive to environmental pressures from nonmarket constituents. One standard deviation increase in these antecedents increases the perception of environmental pressures from

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<sup>17</sup> The survey measured government voluntary program implementation on a four-point Likert scale, which we rescaled to a maximum of one for use in the model. Thus, one point on the Likert scale corresponds to 0.25.

nonmarket constituents by 0.13 and 0.07 standard deviations, respectively. We found no evidence that the stringency of environmental regulations in the headquarters country influenced facilities' receptivity to nonmarket pressures. As expected, we found receptivity to market pressure to be positively associated with the amount of market pressure exerted ( $\beta = 0.12$ ,  $p < 0.001$ ), where a one standard deviation increase in the latter is associated with a 0.24 standard deviation increase in the former. Taken as a whole, our results suggest that influential legal affairs departments appear to magnify the salience of pressures exerted by nonmarket constituents, and that a similar process occurs with marketing departments and pressures exerted by market constituents. The increased salience of these pressures appears to heighten facility managers' awareness of these issues, which subsequently increases the likelihood of an organization response that these constituents view as legitimate.

Finally, we found the adoption of ISO 14001 to be positively associated with facilities that are part of larger firms ( $\beta = 0.31$ ,  $p < 0.001$ ), and those on which market constituents ( $\beta = 0.20$ ,  $p < 0.001$ ) and nonmarket constituents ( $\beta = 0.17$ ,  $p = 0.05$ ) exert more environmental pressure. Our finding that heterogeneity in the adoption of this management practice is partially due to organizations being subjected to different levels of pressure exerted by a common institutional constituent confirms prior research (Darnall and Edwards, 2006; Edelman, 1992; Lounsbury, 2001).

A greater propensity to participate in government voluntary programs was exhibited by facilities in larger firms ( $\beta = 0.16$ ,  $p = 0.03$ ), although we found no significant influence from direct institutional pressures exerted by nonmarket or market constituents, or by the extent to which facilities were subjected to such pressure from their market constituents.

### Robustness tests

We conducted several robustness tests. First, we compared our model to three plausible alternative models (McDonald and Ho, 2002). We developed the first alternative model to accommodate potential *direct* relationships between corporate departments' influence and facilities' adoption decisions. Specifically, we added two new

links to our original model: (1) between corporate legal influence and government voluntary program implementation, and (2) between corporate marketing influence and ISO 14001. The results of this model confirm the results of our original model: all hypothesized relationships remain statistically significant with the predicted sign. The standardized estimates are very similar to those in our original model. Following Arbuckle (2006), we compare this alternative model to our original model using the Bayes Information Criterion (BIC) and Browne-Cudeck (1989) Criterion (BCC). The results indicate that the original model provides a better fit.<sup>18</sup>

To compare our model to a more classic institutional approach, we developed a second alternative model in which we omit the two receptivity variables and instead directly link pressures from external constituents (nonmarket and market actors) and constituents of the firm (corporate marketing and legal affairs departments) to the adoption of the two management practices. This alternative model yields fit statistics that are substantially (and statistically significantly) worse than our original model. In sum, our original model adds significant explanatory power to a more classic institutional approach.

To test Hypotheses 1 and 2, which predicted positive associations between the influence of particular corporate departments and facilities' receptivity to pressure from particular external constituents, we use survey data that we gathered contemporaneously. In the original model, we include paths extending from the corporate influence to the receptivity variables. To examine whether our results are robust to the inclusion of the reverse paths, we developed a third alternative model in which we added two new paths extending from facilities' receptivity to nonmarket (market) pressures to the influence of the corporate legal affairs (marketing) department. The results of this model yielded nearly identical estimates of the original hypothesized relationships. In addition, neither of

<sup>18</sup> The original model's BIC value of 983.90 is 7.6 units lower (better) than the alternative model's (BIC of 991.5), providing 'strong evidence' that the original model is superior (Arbuckle, 2006: 333; Raftery, 1995). The small difference in BCC values (0.6) indicates that there is 'no credible evidence' that either model is superior (Arbuckle, 2006: 330; Burnham and Anderson, 1998: 128).

the two new 'reverse' paths was statistically significant, and the model fit statistics declined substantially.<sup>19</sup> Therefore, our main results are robust to the inclusion of these 'reverse' paths, and the model fit statistics favor our original model.

A second 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 might account for some of our results. To test whether our results were sensitive to differences between industries, we estimated regression equations corresponding to the paths of the structural equations. We ran individual regressions for each of the four consequent variables in our hypotheses. In each regression, we included all antecedent variables from our model (i.e., direct and indirect antecedents) as well as industry dummies, and used standard errors robust to heteroscedasticity. The results of each of these regressions yielded coefficients on the hypothesized variables that were of the same sign and significance as in our original structural equation, regardless of whether we controlled for industry differences at the two-digit or three-digit SIC code level. The results of a multivariate regression, which accommodates our two ultimate dependent variables (ISO 14001 adoption and voluntary program participation), also yielded coefficients of the same sign and significance as our main results. These results provide strong evidence that our results are robust to industry effects.

We also assessed whether our results were robust to a dichotomous (rather than a five-point ordinal) approach to measuring adoption of the two environmental management practices. We transformed the *ISO 14001 implementation status* and *Voluntary program participation* categorical variables into dichotomous variables by recoding them as '1' when a facility is adopting or has adopted these practices ('currently' implementing/participating) and '0' otherwise ('not being considered,' 'future consideration,' or 'planning to implement'). We then estimated the two path models described above that predict these adoption dummy variables

using a probit specification. The results of these probit regressions support our main results. Specifically, facilities that are more receptive to market pressure are more likely to adopt ISO 14001, and those more receptive to nonmarket pressure are less likely to adopt ISO 14001 and more likely to adopt government voluntary programs. Together, these robustness tests suggest that our results are highly robust to alternative variable measures, the addition of industry controls, and alternative specifications.<sup>20</sup>

## DISCUSSION AND CONCLUSION

Institutional theory can help overcome important challenges in strategy research. As Ingram and Silverman (2002) noted, 'given the importance of institutions for determining the success or failure of specific strategies or actors, consideration of ways to influence the creation and maintenance of favorable institutions is fundamental to any organization's strategy' (Ingram and Silverman, 2002: 20). Institutional theory has traditionally described how isomorphic institutional pressures lead to common organizational practices. In the tradition of this framework, persistent heterogeneity among various firms within the same industry might be attributed to differences in the *composition* of their organizational fields. For example, firms located in different states would face different institutional pressures, which could 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 organizational fields*. We therefore need more informed theories about how and why organizations respond differently to institutional pressures.

This article seeks to contribute to filling this void. 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 should be interpreted

<sup>19</sup> The original model's BIC is 7.7 units lower (better) than this alternative model's. The BCC values of the two models are nearly identical.

<sup>20</sup> Results available upon request from the authors.

with caution owing to the limitations of our cross-sectional empirical approach, we have shown that organizational structure is associated with facility managers' awareness of institutional pressures. Differences in managers' receptivity to institutional pressures emerge because organizations channel these pressures to different organizational functions, such as legal affairs and marketing departments. As these different corporate functional departments influence facility decision making, they heighten their facilities' awareness of pressures from different institutional constituents.

Constituents of an organization's nonmarket environment (regulators, NGOs, local communities, the media) tend to view environmental issues as negative externalities whereby facilities 'get away' with imposing costs on society. In this frame, environmental management is viewed as unproductive and a zero-sum game in which 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 associated with 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, the objectives of which 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 exerted by different field constituents are channeled to different organizational functions, which influence how they are received by facility managers. These differences in receptivity are critical because they, in

turn, influence organizations' responses in terms of adopting management practices that have yet to be institutionalized. We found that organizations that were more receptive to institutional pressure from market constituents (controlling for the amount of pressure exerted) were more likely to adopt the environmental management standard ISO 14001, and that organizations that were more receptive to institutional pressure from nonmarket constituents (controlling for the amount of pressure exerted) were more likely to adopt government-initiated voluntary programs and less likely to adopt ISO 14001.

We used the natural environment as our empirical setting because of the richness and complexity of the environmental field. In this domain, we build upon empirical research that has shown that pressures from field constituents including customers, regulators, legislators, local communities, and environmental activist organizations have influenced companies to adopt environmental management practices (Baron, 2003; Carraro, Katsoulacos, and Xepapadeas, 1996; Christmann and Taylor, 2001; Delmas, 2002; Florida and Davison, 2001; Henriques and Sadorsky, 1996; Khanna and Anton, 2002; Lawrence and Morell, 1995; Majumdar and Marcus, 2001; Maxwell *et al.*, 2000; Raines, 2002; Rugman and Verbeke, 1998; Sharma and Henriques, 2005; Vidovic and Khanna, 2003).<sup>21</sup> We also build upon research that studies how organizational factors influence firms' choices of environmental strategies (Bansal and Roth, 2000; Cordano and Frieze, 2000; Darnall and Edwards, 2006; Sharma, 2000; Sharma and Vredenburg, 1998). But this prior research has not focused on the interaction between institutional pressures and organizational characteristics to explain the adoption of proactive strategies. We addressed these research opportunities by hypothesizing and testing how organizational structure influences managerial receptivity and responses to various institutional pressures. Our results revealed that differences in the degree to which corporate departments influence facility-level decisions lead facilities to respond differently to similar institutional pressures.

More broadly, our study contributes to strategic management research by offering a more comprehensive specification of the neoinstitutional model.

<sup>21</sup> See Delmas and Toffel (2004) for a more extensive review of this literature.

We account for external constituents who exert pressures on organizations and internal organizational constituents who operate within corporate departments and facilities. We explain firms' heterogeneous strategies through the interaction between these distinct sets of constituents. First, we unpack the simultaneous influence of various constituents from organizations' market and non-market environments, which is necessary for effective strategizing (Ingram and Silverman, 2002). Second, we stress the importance of influential functional units within organizations in explaining strategic heterogeneity. These organizational characteristics were emphasized by the old institutional sociology, but omitted by the new institutional sociology. In the spirit of Greenwood and Hinings (1996), our study brings the new institutionalism and old institutionalism together.

Further research is required in several areas. Although we did not include it in our model, the interaction among institutional constituents 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 and Lenox, 2000; Prakash, 2000). In addition, our cross-sectional empirical approach precluded us from examining how organizations' perceptions of institutional pressures might change over time. Future research can examine dynamic factors that might alter organizations' perceptions of institutional pressures, such as accumulating positive experiences of engaging with particular stakeholders or the shock of being targeted by regulators, community protests, or activist campaigns.

Finally, several authors have pointed out the importance of additional organizational characteristics to explain corporate responsiveness to pressures to improve environmental performance. These include the capabilities, resources, and ownership structure of the firm (Darnall and Edwards, 2006; Sharma, 2000; Sharma and Vredenburg, 1998), corporate identity and managerial discretion (Sharma, 2000), and the characteristics of individual managers (Bansal and Roth, 2000; Cordano and Frieze, 2000). Further research could leverage our empirical approach to investigate these potential influences, such as examining the extent to which managers' personal characteristics and

professional experiences influence their perception of institutional pressures. For example, it seems feasible that a facility manager's nationality could imbue similar cultural-based sensitivities to those we ascribed to the influence of the headquarters country. In addition, corporate marketing and legal affairs department managers' prior experience with stakeholders while 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.

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## REFERENCES

- Arbuckle J. 1997. *Amos User's Guide Version 3.6*. Smallwaters Corporation: Chicago, IL.
- Arbuckle J. 2006. *Amos 7.0 User's Guide*. Amos Development Corporation: Spring House, PA.
- Arbuckle J, Wothke W. 1999. *AMOS 4 User's Reference Guide*. Smallwaters Corporation: Chicago, IL.
- Armstrong J, Overton T. 1977. Estimating nonresponse bias in mail surveys. *Journal of Marketing Research* **14**: 396–402.
- 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 DP. 1995. Integrated strategy: market and non-market components. *California Management Review* **37**(2): 47–65.
- Baron DP. 2000. *Business and Its Environment* (3rd edn). Prentice Hall: Upper Saddle River, NJ.

- Baron DP. 2003. Private politics. *Journal of Economics and Management Strategy* **12**(1): 31–66.
- Bentler PM. 1990. Comparative fit indexes in structural models. *Psychological Bulletin* **107**(2): 238–246.
- Bentler PM, Bonett DG. 1980. Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin* **88**(3): 588–606.
- Boiral O. 2007. Corporate greening through ISO 14001: a rational myth? *Organization Science* **18**(1): 127–146.
- Bollen KA. 1989. *Structural Equations with Latent Variables*. Wiley: New York.
- Börkey P, Lévêque F. 1998. Voluntary approaches for environmental protection in the European Union. Working Party on Economic and Environmental Policy Integration Report EV/EPOC/GEEI(98)29. Organisation for Economic Cooperation and Development: Paris.
- Braathen NA. 2003. *Voluntary Approaches for Environmental Policy: Effectiveness, Efficiency and Usage in Policy Mixes*. Working Party on National Environmental Policies, Environmental Policy Committee. Organisation for Economic Co-operation and Development: Paris, France.
- Brass DJ. 2002. Intraorganizational power and dependence. In *The Blackwell Companion to Organizations*, Baum JAC (ed). Blackwell Publishers Ltd.: Oxford, UK; 138–157.
- Browne MW, Cudeck R. 1989. Single sample cross-validation indices for covariance structures. *Multivariate Behavioral Research* **24**(4): 445–455.
- Bureau of Economic Analysis. 2000. *1997 Standard Make and Use Tables* (Vol. 2004). U.S. Department of Commerce: Washington, DC.
- Burnham KP, Anderson DR. 1998. *Model Selection and Inference: A Practical Information-Theoretic Approach*. Springer-Verlag: New York.
- Cantwell J, Mudambi R. 2005. MNE competence-creating subsidiary mandates. *Strategic Management Journal* **26**(12): 1109–1128.
- 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*. Kluwer Academic Publishers: Boston, MA.
- 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.
- Clarke L. 1994. *The Essence of Change*. Prentice Hall International: Hemel Hempstead, UK.
- Coglianesi C, Nash J. 2001. *Regulating from the Inside: Can Environmental Management Systems Achieve Policy Goals?* Resources for the Future: Washington, DC.
- Cordano M, Frieze IH. 2000. Pollution reduction preferences of U.S. environmental managers: applying Ajzen's theory of planned behavior. *Academy of Management Journal* **43**(1): 627–641.
- Cudeck R, Browne MW. 1983. Cross-validation of covariance structures. *Multivariate Behavioral Research* **18**(2): 147–167.
- Darnall N, Edwards D Jr. 2006. Predicting the cost of environmental management system adoption: the role of capabilities, resources and ownership structure. *Strategic Management Journal* **27**(4): 301–320.
- D'Aunno T, Succi M, Alexander JA. 2000. The role of institutional and market forces in divergent organizational change. *Administrative Science Quarterly* **45**(4): 679–703.
- Davis G, Greve H. 1997. Corporate elite networks and governance changes in the 1980s. *American Journal of Sociology* **103**(1): 1–37.
- Decker CS. 2005. Do regulators respond to voluntary pollution control efforts? A count data analysis. *Contemporary Economic Policy* **23**(2): 180–194.
- Delmas M. 2000. Barriers and incentives to the adoption of ISO 14001 by firms in the United States. *Duke Environmental Law and Policy Forum* **11**(1): 1–38.
- Delmas M. 2002. The diffusion of environmental management standards in Europe and the United States: an institutional perspective. *Policy Sciences* **35**(1): 91–119.
- Delmas M, Keller A. 2005. Strategic free riding in voluntary programs: the case of the US EPA WasteWise program. *Policy Sciences* **38**(1): 91–106.
- Delmas M, Montes M. 2007. Voluntary agreements to improve environmental quality: are late joiners the free riders? ISBER Working paper #07, University of California, Santa Barbara.
- Delmas M, Terlaak A. 2001. A framework for analyzing environmental voluntary agreements. *California Management Review* **43**(3): 44–63.
- Delmas M, Terlaak A. 2002. Regulatory commitment to negotiated agreements: evidence from the United States, Germany, The Netherlands, and France. *Journal of Comparative Policy Analysis* **4**(1): 5–29.
- Delmas M, Toffel MW. 2004. Institutional pressure and environmental management practices. In *Stakeholders, Environment and Society (New Perspectives in Research on Corporate Sustainability)*, Sharma S, Starik M (eds). Edward Elgar Publishing: Cheltenham, UK; 209–222.
- Dietz T, Stern PC (eds). 2002. *New Tools for Environmental Protection: Education, Information, and Voluntary Measures*. National Academy Press: Washington, DC.
- DiMaggio PJ, Powell WW. 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review* **48**(2): 147–160.
- DiMaggio PJ, Powell WW. 1991. Introduction. In *The New Institutionalism in Organizational Analysis*, Powell WW, DiMaggio PJ (eds). University of Chicago Press: Chicago, IL; 1–38.
- Dobbin F, Sutton J. 1998. The strength of a weak state: the rights revolution and the rise of human resource management divisions. *American Journal of Sociology* **104**(2): 441–476.
- Edelman LB. 1990. Legal environments and organizational governance: the expansion of due process in the American workplace. *American Journal of Sociology* **95**(6): 1401–1440.

- Edelman LB. 1992. Legal ambiguity and symbolic structures: organizational mediation of civil rights law. *American Journal of Sociology* **97**(6): 1531–1576.
- Elsbach KD, Sutton RI. 1992. Acquiring organizational legitimacy through illegitimate actions: a marriage of institutional and impression management theories. *Academy of Management Journal* **35**(4): 699–738.
- Fligstein N. 1987. The intraorganizational power struggle: the rise of finance presidents in large corporations, 1919–1979. *American Sociological Review* **52**(1): 44–58.
- Fligstein N. 1990. *The Transformation of Corporate Control*. Harvard University Press: Cambridge, MA.
- 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 DF. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* **18**(1): 39–50.
- Fornell C, Tellis GJ, Zinkhan GM. 1982. Validity assessment: a structural equations approach using partial least squares. In *An Assessment of Marketing Thought and Practice*, Walker BJ, Bearden WO, Darden WR, Murphy PE, Nevin JR, Olson JC, Weitz BA (eds). American Marketing Association: Chicago, IL: 405–409.
- Fuller SR, Edelman LB, Matusik SF. 2000. Legal readings: employee interpretation and mobilization of law. *Academy of Management Review* **25**(1): 200–216.
- Goodrick E, Salancik GR. 1996. Organizational discretion in responding to institutional practices: hospitals and Cesarean births. *Administrative Science Quarterly* **41**(1): 1–28.
- Greenwood R, Hinings CR. 1996. Understanding radical organizational change: bringing together the old and the new institutionalism. *Academy of Management Review* **21**(4): 1022–1054.
- Guler I, Guillen MF, MacPherson JM. 2002. Global competition, institutions, and the diffusion of organizational practices: the international spread of the ISO 9000 quality certificates. *Administrative Science Quarterly* **47**(3): 507–531.
- Hall B, Kerr ML. 1991. *1991–1992 Green Index: A State-By-State Guide to the Nation's Environmental Health*. Island Press: Washington, DC.
- Hambrick DC, Finkelstein S. 1995. The effects of ownership structure on conditions at the top: the case of CEO pay raises. *Strategic Management Journal* **16**(3): 175–193.
- Hamilton JT. 1997. Taxes, torts, and the toxics release inventory: congressional voting on instruments to control pollution. *Economic Inquiry* **35**(4): 745–762.
- Harrison K. 1998. Talking with the donkey: cooperative approaches to environmental protection. *Journal of Industrial Ecology* **2**(3): 51–72.
- Henriques I, Sadorsky P. 1996. The determinants of an environmentally responsive firm: an empirical approach. *Journal of Environmental Economics and Management* **30**(3): 381–395.
- Henriques I, Sadorsky P. 1999. The relationship between environmental commitment and managerial perceptions of stakeholder importance. *Academy of Management Journal* **42**(1): 87–99.
- Hinings CR, Hickson DJ, Pennings JM, Schneck RE. 1974. Structural conditions of intraorganizational power. *Administrative Science Quarterly* **19**(1): 22–44.
- Hirsch PM, Lounsbury M. 1997a. Ending the family quarrel. *American Behavioral Scientist* **40**(4): 406–418.
- Hirsch PM, Lounsbury M. 1997b. Putting the organization back into organization theory. *Journal of Management Inquiry* **6**(1): 79–88.
- Hoffman AJ. 1999. Institutional evolution and change: environmentalism and the U.S. chemical industry. *Academy of Management Journal* **42**(4): 351–371.
- Hoffman AJ. 2001. Linking organizational and field-level analyses: the diffusion of corporate environmental practice. *Organization & Environment* **14**(2): 133–156.
- Hoffman AJ, Ventresca MJ. 1999. The institutional framing of policy debates. *American Behavioral Scientist* **42**(8): 1368–1392.
- Hoskisson RE, Cannella AA Jr, Tihanyi L, Faraci R. 2004. Asset restructuring and business group affiliation in French civil law countries. *Strategic Management Journal* **25**(6): 525–539.
- Ingram P, Silverman BS. 2002. The new institutionalism in strategic management. In *Advances in Strategic Management* (Vol. 19), Ingram P, Silverman BS (eds). JAI Press: New York; 1–30.
- International Organization for Standardization. 2003. *ISO Survey of ISO 9000 and ISO 14001 Certificates: 12th Cycle Report*. International Organization for Standardization: Geneva, Switzerland.
- International Organization for Standardization. 2005. *The ISO Survey of Certifications: 2004* (14th edn). International Organization for Standardization: Geneva, Switzerland.
- 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 RJ, Bansal P. 2003. Seeing the need for ISO 14001. *Journal of Management Studies* **40**(4): 1047–1067.
- Johnstone N, Scapecchi P, Yiterhus B, Wolff R. 2004. The firm, environmental management and environmental measures: lessons from a survey of European manufacturing firms. *Journal of Environmental Planning and Management* **47**(5): 685–707.
- Kassinis G, Vafeas N. 2002. Corporate boards and outside stakeholders as determinants of environmental litigation. *Strategic Management Journal* **23**(5): 399–415.
- Khanna M. 2001. Non-mandatory approaches to environmental protection. *Journal of Economic Surveys* **15**(3): 291–324.
- Khanna M, Anton WQ. 2002. Corporate environmental management: regulatory and market-based pressures. *Land Economics* **78**(4): 539–558.
- Khanna M, Damon L. 1999. EPA's voluntary 33/50 program: Impact on toxic releases and economic

- performance of firms. *Journal of Environmental Economics and Management* **37**(1): 1–25.
- King AA, Lenox MJ. 2000. Industry self-regulation without sanctions: the chemical industry's responsible care program. *Academy of Management Journal* **43**(4): 698–716.
- King AA, Lenox MJ, Terlaak A. 2005. Strategic use of decentralized institutions: exploring certification with the ISO 14001 management standard. *Academy of Management Journal* **48**(6): 1091–1106.
- Klassen RD. 2001. Plant-level environmental management orientation: the influence of management views and plant characteristics. *Production and Operations Management* **10**(3): 257–275.
- 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.
- Kraatz MS, Zajac EJ. 1996. Exploring the limits of the new institutionalism: the causes and consequences of illegitimate organizational change. *American Sociological Review* **61**(5): 812–836.
- Lawrence AT, Morell D. 1995. Leading-edge environmental management: motivation, opportunity, resources and processes. In *Research in Corporate Social Performance and Policy, Sustaining the Natural Environment: Empirical Studies on the Interface Between Nature and Organizations*, Collins D, Starik M (eds). JAI Press: Greenwich, CT; 99–126.
- Lounsbury M. 2001. Institutional sources of practice variation: staffing college and university recycling programs. *Administrative Science Quarterly* **46**(1): 29–46.
- Lyon TP, Maxwell JW. 2004. *Corporate Environmentalism and Public Policy*. Cambridge University Press: Cambridge, UK.
- Lyon TP, Maxwell JW. 2006. Greenwash: corporate environmental disclosure under threat of audit. Working paper No. 2006-07, Kelley School of Business, Department of Business Economics and Public Policy, Indiana University, Bloomington, IN.
- Madsen H, Ulhøi JP. 2003. Have trends in corporate environmental management influenced companies' competitiveness? *Greener Management International* **44**: (Winter): 75–88.
- Majumdar SK, Marcus AA. 2001. Rules versus discretion: the productivity consequences of flexible regulation. *Academy of Management Journal* **44**(1): 170–179.
- Maxwell JW, Decker CS. 2006. Voluntary environmental investment and responsive regulation. *Environmental and Resource Economics* **33**(4): 425–439.
- Maxwell JW, Lyon TP, Hackett SC. 2000. Self-regulation and social welfare: the political economy of corporate environmentalism. *The Journal of Law and Economics* **43**(2): 583–619.
- Mazurek J. 1998. The use of voluntary agreements in the United States: an initial survey. Working Party on Economic and Environmental Policy Integration Report ENV/EPOC/GEEI(98)27. Organisation for Economic Cooperation and Development: Paris, France.
- McDonald RP, Ho M-HR. 2002. Principles and practice in reporting structural equation analyses. *Psychological Methods* **7**(1): 64–82.
- McEvily SK, Chakravarthy B. 2002. The persistence of knowledge-based advantage: an empirical test for product performance and technological knowledge. *Strategic Management Journal* **23**(4): 285–305.
- Meyer JW, Rowan B. 1977. Institutionalized organizations: formal structure as myth and ceremony. *American Journal of Sociology* **83**(2): 340–363.
- Michels R. 1962. *Political Parties*. Collier Press: New York.
- Morgenstern RD, Pizer WA (eds). 2007. *Reality Check: The Nature and Performance of Voluntary Environmental Programs in the United States, Europe, and Japan*. Resources for the Future: Washington, DC.
- Mostek M. 1998. Limited privilege and immunity for self-evaluative environmental audits in Nebraska: moving environmental performance to the next level. *Creighton Law Review* **32**(2): 545.
- Nunnally JC. 1978. *Psychometric Theory*. McGraw-Hill: New York.
- Nunnally JC, Bernstein IH. 1994. *Psychometric Theory*. McGraw-Hill: New York.
- Oliver C. 1991. Strategic responses to institutional processes. *Academy of Management Review* **16**(1): 145–179.
- Orts EW, Murray PC. 1997. Environmental disclosure and evidentiary privilege. *University of Illinois Law Review* **1997**(1): 1–69.
- 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 & Natural Resources* **14**(10): 837–855.
- Perrow C. 1986. *Complex Organizations: A Critical Essay*. Random House: New York.
- Podsakoff PM, Organ DW. 1986. Self-reports in organizational research: problems and prospects. *Journal of Management* **12**(4): 531–544.
- Prakash A. 2000. Responsible care: an assessment. *Business and Society* **39**(2): 183–209.
- Pringle J, Leuteritz KJ, Fitzgerald M. 1998. ISO 14001: A discussion of implications for pollution prevention. ISO 14000 workgroup white paper. National Pollution Prevention Roundtable: Washington, DC.
- Raftery AE. 1995. Bayesian model selection in social research. In *Sociological Methodology*, Marsden PV (ed). Jossey-Bass: San Francisco, CA; 111–163.
- Raines SS. 2002. Implementing ISO 14001—an international survey assessing the benefits of certification. *Corporate Environmental Strategy* **9**(4): 418–426.
- Rivera J, DeLeon P. 2004. Is greener whiter? The Sustainable Slopes Program and the voluntary environmental performance of western ski areas. *Policy Studies Journal* **32**(3): 417–437.
- Rodgers KE. 1996. The ISO environmental standards initiative. *New York University Environmental Law Journal* **5**: 181–276.
- Rondinelli D, Vastag G. 2000. Panacea, common sense, or just a label? The value of ISO 14001 environmental

- management systems. *European Management Journal* **18**(5): 499–510.
- Rosenkopf L, Metiu A, George VP. 2001. From the bottom up? Technical committee activity and alliance formation. *Administrative Science Quarterly* **46**(4): 748–772.
- Rugman AM, Verbeke A. 1998. Corporate strategies and environmental regulations: an organizing framework. *Strategic Management Journal*, April Special Issue **19**: 363–375.
- Russo MV, Fouts PA. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal* **40**(3): 534–559.
- Salancik GR, Pfeffer J. 1974. The bases and use of power in organizational decision making: the case of a university. *Administrative Science Quarterly* **19**(4): 453–473.
- Schein EH. 1996. Three cultures of management: the key to organizational learning. *Sloan Management Review* **38**(1): 9–20.
- Scott WR. 1992. *Organizations: Rational, Natural, and Open Systems* (3rd edn). Prentice Hall: Englewood Cliffs, NJ.
- Scott WR. 2003. *Organizations: Rational, Natural and Open Systems* (5th edn). Prentice-Hall: Upper Saddle River, NJ.
- Segerson K, Miceli TJ. 1998. Voluntary environmental agreements: good or bad news for environmental protection? *Journal of Environmental Economics and Management* **36**(2): 109–130.
- Selznick P. 1949. *TVA and the Grass Roots: A Study in the Sociology of Formal Organization*. University of California Press: Berkeley, CA.
- Sharma S. 2000. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal* **43**(4): 681–697.
- Sharma S, Henriques I. 2005. Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal* **26**(2): 159–180.
- Sharma S, Pablo AL, Vredenburg H. 1999. Corporate environmental responsiveness strategies: the importance of issue interpretation and organizational context. *Journal of Applied Behavioral Science* **35**(1): 87–108.
- Sharma S, Vredenburg H. 1998. Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal* **19**(8): 729–753.
- Shook CL, Ketchen DJ Jr, Hult GTM, Kacmar KM. 2004. An assessment of the use of structural equation modeling in strategic management research. *Strategic Management Journal* **25**(4): 397–404.
- Short JL, Toffel MW. 2008. Coerced confessions: self-policing in the shadow of the regulator. *Journal of Law, Economics & Organizations* **24**(1): 45–71.
- Simonin BL. 1999. Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal* **20**(7): 595–623.
- Slater SF, Olson EM. 2001. Marketing's contribution to the implementation of business strategy: an empirical analysis. *Strategic Management Journal* **22**(11): 1055–1067.
- Steiger JH. 1990. Structural model evaluation and modification: an interval estimation approach. *Multivariate Behavioral Research* **25**(2): 173–180.
- Strang D, Soule SA. 1998. Diffusion in organizations and social movements: from hybrid corn to poison pills. *Annual Review of Sociology* **24**: 265–290.
- Thornton PH, Ocasio W. 1999. Institutional logics and the historical contingency of power in organizations: executive succession in the higher education publishing industry, 1958–1990. *American Journal of Sociology* **105**(3): 801–843.
- Toffel M. 2000. Anticipating greener supply chain demands: one Singapore company's journey to ISO 14001. In *ISO 14001: Case Studies and Practical Experiences*, Hillary R (ed). Greenleaf Publishing: Sheffield, UK.
- Toffel MW, Marshall JD. 2004. Improving environmental performance assessment: a comparative analysis of weighting methods used to evaluate chemical release inventories. *Journal of Industrial Ecology* **8**(1–2): 143–172.
- Tolbert PS, Zucker LG. 1996. The institutionalization of institutional theory. In *Handbook of Organizational Studies*, Clegg S, Hardy C, Nord WR (eds). Sage: London, UK; 175–190.
- Tucker LR, Lewis C. 1973. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika* **38**(1): 1–10.
- U.S. Census Bureau. 2003. 2001 County business patterns for the United States. Bureau of the Census: Washington, DC.
- U.S. Environmental Protection Agency. 2003. 2001 Toxics release inventory (TRI) public data release: executive summary. EPA 260-S-03-001: Environmental Protection Agency: Washington, DC.
- U.S. Environmental Protection Agency. 2001. *The Emergency Planning and Community Right-to-Know Act Section 313 Release and Other Waste Management Reporting Requirements*. EPA 260/K-01-001: Environmental Protection Agency: Washington, DC.
- Van Maanen J, Barley S. 1984. Occupational communities: culture and control in organizations. In *Research in Organizational Behavior*, Staw BM, Cummings LL (eds). JAI Press: Greenwich, CT; 287–365.
- Videras J, Alberini A. 2000. The appeal of voluntary environmental programs: which firms participate and why? *Contemporary Economic Policy* **18**(4): 449–460.
- 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 WK, Hamilton JT. 1999. Are risk regulators rational? Evidence from hazardous waste cleanup decisions. *The American Economic Review* **89**(4): 1010–1027.

## *Organizational Responses to Environmental Demands*

- Welch EW, 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 JD, Gulati R, Shortell SM. 1997. Customization or conformity? An institutional and network perspective on the content and consequences of TQM adoption. *Administrative Science Quarterly* **42**(2): 366–394.
- Westphal D, Zajac EJ. 1998. Symbolic management of stockholders: corporate governance reforms and shareholder reactions. *Administrative Science Quarterly* **43**(1): 127–153.
- Wikle T. 1995. Geographical patterns of membership in U.S. environmental organizations. *The Professional Geographer* **47**(1): 41–48.
- World Economic Forum. 2002. *The Global Competitiveness Report 2001–2002*. Oxford University Press: New York.