

Making Self-Regulation  
More Than Merely  
Symbolic: The Critical  
Role of the Legal  
Environment

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Using data from a sample of U.S. industrial facilities subject to the federal Clean Air Act from 1993 to 2003, this article theorizes and tests the conditions under which organizations' symbolic commitments to self-regulate are particularly likely to result in improved compliance practices and outcomes. We argue that the legal environment, particularly as it is constructed by the enforcement activities of regulators, significantly influences the likelihood that organizations will effectively implement the self-regulatory commitments they symbolically adopt. We investigate how different enforcement tools can foster or undermine organizations' normative motivations to self-regulate. We find that organizations are more likely to follow through on their commitments to self-regulate when they (and their competitors) are subject to heavy regulatory surveillance and when they adopt self-regulation in the absence of an explicit threat of sanctions. We also find that historically poor compliers are significantly less likely to follow through on their commitments to self-regulate, suggesting a substantial limitation on the use of self-regulation as a strategy for reforming struggling organizations. Taken together, these findings suggest that self-regulation can be a useful tool for leveraging the normative motivations of regulated organizations but that it cannot replace traditional deterrence-based enforcement. ●

The organizational literature has long discussed how the law shapes and is shaped by organizations (e.g., Selznick, 1969; Edelman, 1990; Sutton et al., 1994; Edelman, Uggen, and Erlanger, 1999). More recently, it has described how organizational behavior can be influenced by non-legal interventions like social movement activism (Bartley, 2007; King and Soule, 2007; Reid and Toffel, 2009) and ranking systems (Sauder, 2008; Sauder and Espeland, 2009; Chatterji and Toffel, 2010). One common organizational response to these kinds of institutional pressures has been to adopt internal compliance structures such as grievance procedures (Sutton et al., 1994), corporate compliance offices (Edelman, 1992), management standards (King and Lenox, 2000; Delmas and Toffel, 2008), and codes of conduct (Bartley, 2007) to demonstrate a commitment to comply with legal mandates or bring corporate conduct into line with widely shared normative ideals like workplace fairness or environmental sustainability. The existing literature provides a rich empirical and theoretical account of how and why these kinds of "self-regulatory" structures emerge and diffuse broadly across organizational fields but leaves unanswered the key question of whether they actually change organizational behavior to conform to legal or normative ideals.

This question has become especially pressing as corporate internal compliance structures are increasingly integrated into twenty-first-century regulatory design. In an era of mounting regulatory demands and shrinking regulatory budgets, government agencies have encouraged companies to adopt self-regulatory structures in the hope that they will increase compliance and achieve regulatory goals. For instance, the U.S. Department of Agriculture's Hazard Analysis and Critical Control Point program reduces inspections of industrial food

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processors that build systematic safety checks into their production routines. The U.S. Occupational Health and Safety Agency offers similar benefits, through its Voluntary Protection Program, to companies that institute internal mechanisms to monitor compliance with workers' health and safety regulations. And the Sarbanes-Oxley Act (2002), adopted in the wake of major accounting scandals at Enron and World-Com, relies on public companies to establish systematic "internal controls" and periodically certify their efficacy to ensure the accuracy of corporate financial records. Social movement activists have similarly encouraged corporations to adopt self-regulatory structures in areas in which formal legal remedies are weak or nonexistent, like international labor and environmental standards (Bartley, 2003; Davis et al., 2008; Reid and Toffel, 2009).

These kinds of self-regulatory structures are designed to create what has been called a "corporate conscience" (Selznick, 1992: 352) by integrating normative concerns into the decision-making processes and motivational imperatives of those in business organizations typically oriented toward the instrumental pursuit of profit. Institutional scholars have generated a rich empirical and theoretical literature that examines both the promise and fragility of self-regulatory structures as instruments for instantiating "insecure or precarious values" (Rees, 1988: 10) in corporations. One strand of the literature highlights the mechanisms by which self-regulatory structures can institutionalize legal norms in organizations (Selznick, 1969; Stone, 1975; Dobbin and Sutton, 1998). The other focuses on the ways in which self-regulatory structures can serve as vehicles for circumventing, and even undermining, the core values that animate law (Edelman, Erlanger, and Lande, 1993; Edelman, Fuller, and Mara-Drita, 2001). Despite their distinct emphases, writers in each strand of scholarship recognize that "both outcomes occur" (Selznick, 1992: 234), yet neither account reveals much about the circumstances under which we might expect to see one or the other. In this article, we move beyond this fundamental tension in the literature to theorize about and empirically test the conditions under which fragile commitments to self-regulate are particularly likely to take hold. Analyzing data over a 10-year period from U.S. industrial facilities subject to the U.S. Clean Air Act, we examine how the legal environment, as constructed by the enforcement activities of regulators, might promote or inhibit effective self-regulation in those firms that purport to adopt it.

## **LAW, ORGANIZATIONS, AND SELF-REGULATION**

In his classic book on corporate responsibility and compliance, Stone (1975) argued that the deterrent effect of legal sanctions is insufficient to prevent harmful corporate behavior and promote compliance with law. He suggested that law could most effectively shape organizational behavior by generating normative commitments through systemic internal controls. Since then, regulatory scholars have argued that internal compliance structures can align the behavior of corporate organizations with law and social expectations (Gunningham and Rees, 1997: 364) and can remake the regulated corporation into a more reflexive (Teubner, 1983; Orts, 1995),

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responsive (Ayres and Braithwaite, 1992), and even democratic (Parker, 2002) institution.

As regulatory demands have increased in scope and complexity, organizations have turned to self-regulatory structures both to signify and to facilitate compliance. A number of studies have documented the rise of internal controls in corporations as they sought to comply with the mandates of civil rights laws governing the workplace (Edelman, 1990; Edelman, Erlanger, and Lande, 1993; Sutton et al., 1994). Other research has noted the widespread adoption of self-regulatory structures to signal, and ostensibly to promote, compliance with financial regulation (McCaffrey and Hart, 1998; Langevoort, 2002; Krawiec, 2003), environmental regulation (Coglianese and Nash, 2001a; Lenox and Nash, 2003), and workplace safety and labor regulation (Lobel, 2005; Estlund, 2010). But although it is clear that corporations have widely adopted self-regulatory structures, it is not at all clear whether these structures have brought about the kind of fundamental changes in those organizations that would improve legal compliance.

Institutional theory has long struggled with this question and with the fundamental tensions inherent in using self-regulatory structures to instantiate the normative aspirations of law and other value systems into the decision-making processes of corporate organizations. Institutional theory suggests that self-regulatory structures can become institutionalized in organizations that adopt them, generating both a real commitment to regulatory compliance and a set of practices to support this commitment. But scholars also recognize that the symbolic nature of self-regulatory structures makes them vulnerable to the task-related and efficiency imperatives of business organizations, which may lead these organizations to decouple them from practices (Meyer and Rowan, 1977) or to implement them in ways that distort the normative ideals that underlie the law (Edelman, Erlanger, and Lande, 1993). Although institutional theory has mapped the contested terrain of self-regulation, it has yet to chart the way out of this dilemma.

Selznick's (1969) pioneering work illustrated how an organization's adoption of legalistic structures and routines can contribute to the development of a "corporate conscience" (Selznick, 1992: 352) that builds legal values and constraints into corporate practices and decision-making processes. A significant body of research has documented the mechanisms by which this occurs, including decision-making structures and routines that build in consideration of normative concerns (Rees, 1988; Orts, 1995; Parker, 2002), empowered constituencies in the organization that have a stake in achieving certain normative outcomes (Rees, 1988; Selznick, 1992; Parker, 2002), and external normative pressure from either government or third-party stakeholders (Ayres and Braithwaite, 1991; McCaffrey and Hart, 1998; Parker, 2002). In addition to having direct effects on organizational decision-making processes, these kinds of organizational structures also generate normative scripts for motivating and justifying organizational actions that compete with instrumental accounts of the organization's imperatives and sometimes

transform the organization's understanding of its own instrumental interests (Dobbin and Sutton, 1998). In this way, self-regulatory structures can institutionalize precarious values like legal compliance.

A number of studies have demonstrated how internal compliance structures can instantiate commitments in organizations as employees become invested in their existence and begin to justify them on grounds that are compatible with the organization's task-related imperatives (Edelman, Erlanger, and Lande, 1993; Dobbin and Sutton, 1998; Short, 2006). But none of these studies has assessed whether the adoption of self-regulatory structures actually achieved the normative goals toward which they were directed. Moreover, the authors have all cautioned that grounding normative justifications for compliance in the structure and efficiency imperatives of organizations might significantly limit the meaning and impact of law on organizational behavior.

It is precisely these limits that dominate a second strand of institutional scholarship on internal compliance structures. This literature highlights the symbolic nature of self-regulatory structures and the ways in which they allow the task-related and efficiency imperatives of organizations to overwhelm and distort the normative ideals that underlie law. So, for instance, even as Edelman (1992: 1544) documented the widespread adoption of Equal Employment Opportunity and Affirmative Action policies and offices, she stressed that these formal structures "do not commit organizations to a particular type or degree of compliance," observing that many corporate adopters create these structures "as substitutes for compliance, as shams." Krawiec (2003: 491, 577) similarly characterized internal compliance structures as "window-dressing," arguing that the structure of corporate legal liability gives organizations "an incentive to invest in low-cost, potentially ineffective internal policing measures that fail to reduce organizational misconduct."

Qualitative studies of internal compliance structures have further articulated the limits of self-regulation, suggesting that they are not merely harmless window-dressing, decoupled from practices (Meyer and Rowan, 1977) but, instead, have the potential to undermine the values that animate the law. Edelman, Erlanger, and Lande (1993: 497) demonstrated, for example, that the corporate employees who staff internal compliance programs designed to remedy workplace discrimination "tend to subsume legal rights under managerial interests." Edelman, Fuller, and Mara-Drita (2001: 1632) similarly documented how internal compliance structures "undermine law's moral commitment to redressing historical wrongs" as they get interpreted through the lens of managerial interests and imperatives. Bisom-Rapp (1999) argued that internal compliance structures that operate in this manner mask ongoing discrimination both by making organizations appear compliant and by generating documentary evidence of the organization's nondiscriminatory intent that can be used to counter charges of discrimination. In this way, self-regulatory structures render the reality of ongoing workplace discrimination more difficult to perceive and to prove.

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A substantial body of empirical literature evaluating voluntary regulation initiatives suggests that this skepticism is not unwarranted. Recent meta-analyses of self-regulation programs have concluded that participating companies perform no better (and sometimes perform worse) than their non-self-regulating counterparts (Lyon and Maxwell, 2007; Darnall and Sides, 2008). Despite the concerns they raise, scholars in this strand of literature recognize the potential of self-regulatory structures to proliferate and to support the realization of legal and normative ideals. For instance, Edelman (1990) discussed the possibility that the institutionalization of the normative ideals underlying particular laws might amplify their influence on organizations. And Edelman and Petterson (1999) showed that even when symbolically adopted self-regulatory structures do not themselves achieve legal or normative goals, they can prompt organizations to adopt more specialized structures that have had some success at achieving those ends.

These accounts provide important insights into the complex mechanisms by which self-regulatory structures shape and are shaped by adopting organizations and the tensions inherent in organizational self-regulation. But although the literature provides a rich framework for analysis, it tells us little about whether and under what circumstances self-regulatory structures will facilitate or undermine organizations' adherence to legal norms. Internal compliance structures have been established across a wide array of organizations operating in different environmental contexts, yet we know little about how such variation might affect their ability to shape organizational behavior. As a recent review of this literature noted, "scholarship on new regulatory forms has produced far more empirical research on their rise and character than on their translation into practice" (Schneiberg and Bartley, 2008: 50). To move beyond these tensions in the literature, we shift the analysis away from the self-regulatory structures and focus instead on the legal environment of the organizations that adopt them. Specifically, we investigate how the enforcement activities of regulators construct the legal environment in ways that may be more or less conducive to self-regulation.

Much like the institutional literature on self-regulatory structures, scholarship on regulatory enforcement has long recognized that organizations have multiple and potentially conflicting motivations for complying or not complying with law as well as for self-regulating or cooperating with regulators (Braithwaite, 1985; Kuperan and Sutinen, 1998; Winter and May, 2001). On the one hand, organizations can be "amoral calculators" (Kagan and Scholz, 1984), maximizing their payoffs by breaking the law or breaking their symbolic commitments whenever the benefits of doing so exceed the anticipated costs of getting caught. On the other hand, organizations and their individual members are also motivated by a complex set of normative concerns. Organizations might comply with the law to demonstrate their legitimacy (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Edelman and Suchman, 1997), because they have come to see compliance as integral to their corporate culture or identity (Selznick, 1969; Howard-Grenville, Nash, and Coglianese, 2008), or

simply because individuals within the organization believe it is the right thing to do (Morrison, 1991; Coglianese and Nash, 2001a; Gunningham, Thornton, and Kagan, 2005; Tyler, Callahan, and Frost, 2007). Successful regulatory design must recognize and engage these diverse motivations (Ayres and Braithwaite, 1992; Parker, 2006).

Successful self-regulation likewise results from a complex set of motivations. Research has shown that organizations will not reliably self-regulate without the pressure of deterrence (Rees, 1988; Sigler and Murphy, 1988; Ayres and Braithwaite, 1991; McCaffrey and Hart, 1998; Parker, 2002; Short and Toffel, 2008). At the same time, and by definition, meaningful self-regulation requires a certain amount of intrinsic organizational motivation. To theorize about the appropriate balance between intrinsic and extrinsic motivators for compliance outcomes, we draw on organizational scholarship on social control and cooperative behavior. Although it largely addresses the internal dynamics of organizations, this literature provides a rich theoretical framework for analyzing voluntary regulatory strategies that seek to secure the cooperation of regulated entities within the context of a coercive regulatory regime. The key insight is that, although enforcement tools like sanctions and surveillance can be effective means of social control (Sewell, 1998), they can also undermine intrinsic motivations to cooperate with others (Tenbrunsel and Messick, 1999; Malhotra and Murnighan, 2002) or execute certain tasks (Deci, Koestner, and Ryan, 1999). Below, we investigate how different tools in the enforcement portfolio, like regulatory threats and surveillance, may affect efforts to mobilize internal compliance structures and promote self-regulation.

### **Mobilizing Internal Compliance Structures**

The mobilization of internal compliance structures emerged as a regulatory strategy in the 1990s in response to a variety of institutional factors. A 1991 revision to the Federal Sentencing Guidelines for Organizations (Section 8B2.1) that granted leniency to firms with effective internal compliance programs spurred the broad adoption of such programs (Goldsmith and King, 1997; Krawiec, 2003). In the years that followed, regulators found ways to expand and make use of these structures. The regulatory “reinvention” initiatives of the Clinton administration encouraged regulators and regulated entities to experiment with self-regulation as a way to move “beyond compliance” to achieve regulatory goals over and above what the law required (Murray, 1999; Gardner, 2003). In addition, an increasing antipathy toward “command-and-control” regulation prompted a search for more cooperative ways of regulating that relied on the voluntary efforts of regulated firms (Short, 2009). Taken together, these conditions increased the pressure on regulated companies to adopt, or at least represent that they had adopted, systematic internal compliance structures.

In 1995, the U.S. Environmental Protection Agency (EPA) launched one of the first government programs specifically designed to instantiate practices of systematic, internal auditing into the compliance routines of regulated entities.

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"Incentives for Self-Policing: Discovery, Correction and Prevention of Violations," commonly referred to as the Audit Policy, is a penalty mitigation program that reduces or waives certain penalties for environmental compliance violations that are voluntarily reported to the government by regulated entities. But, as its title suggests, the program has much broader ambitions. The Audit Policy is designed not merely to identify undiscovered violations by getting facilities to report on themselves. Its primary objective is to encourage facilities to establish and maintain "systematic, objective, and periodic" procedures for policing themselves (*Federal Register*, 1995: 66708). In fact, the U.S. EPA has expressed the hope that such procedures would become institutionalized in regulated organizations, rendering "formal EPA investigation and enforcement action unnecessary" (U.S. Environmental Protection Agency, 2005).

The Audit Policy seeks to encourage adoption of internal compliance structures by conditioning the program's penalty mitigation benefits on a number of criteria, including, most critically, the discloser's representation of past and future internal compliance auditing practices. Like more traditional amnesty/disclosure programs, such as the U.S. Department of Health and Human Services' "Provider Self-Disclosure Protocol" and the U.S. Department of Justice's "Corporate Leniency Program," the Audit Policy requires prompt and voluntary disclosure (within 21 days of discovery) and remediation of the violation within 60 calendar days (U.S. Environmental Protection Agency, 2007). What distinguishes the Audit Policy is its insistence that voluntary disclosures arise from the "systematic discovery of the violation through an environmental audit or a compliance management system" (U.S. Environmental Protection Agency, 2000: 19618). Thus it is not simply an amnesty program for one-off discoveries of regulatory violations. The Audit Policy further requires a would-be voluntary discloser to make assurances that it will "prevent a recurrence of the violation" (U.S. Environmental Protection Agency, 2000: 19622). Accordingly, a voluntary disclosure under the Audit Policy is meant to be taken as a representation that the discloser has not only adopted formal internal compliance procedures but that it has also committed to maintaining them in the future to prevent subsequent violations.

Voluntary disclosures thus indicate organizations' commitments to self-regulate, but different institutional conditions will influence organizations' ability to implement those commitments. The nature and amount of regulatory pressure as well as organizations' experience navigating their regulatory environments can influence the likelihood that regulated organizations will follow through on commitments to self-regulate. Threats, surveillance, and experience can each moderate the efficacy of organizational self-regulation.

### **Effect of Regulatory Threats on Commitments to Self-Regulate**

Although all disclosures made under the Audit Policy are voluntary in the sense that they are not legally required, the EPA sometimes applies the policy against the backdrop of an

explicit enforcement threat. EPA-sponsored Compliance Incentive Programs, for example, target particular industries or regulated activities for heightened enforcement scrutiny. In these programs, the agency notifies a group of facilities of its concern about possible non-compliance with a specific set of regulatory requirements. The EPA specifies the relevant requirements, describes what must be done to come into compliance, and establishes a time period during which compliance violations may be disclosed and remedied. For companies that disclose violations and commit to ongoing internal compliance auditing, the penalty is waived or greatly reduced. At the same time, most Compliance Incentive Program letters and announcements contain explicit enforcement threats, for instance, that “companies that do not take advantage of this limited time offer face a greater risk of future inspections” (U.S. Environmental Protection Agency, 2009) or that failure to report and fix violations “could result in an enforcement action, including a fine” (U.S. Environmental Protection Agency, 2002a). Though these programs have been quite effective at prompting companies to disclose targeted violations to the EPA under the Audit Policy and remediate them (Short and Toffel, 2008), it is unclear whether companies disclosing under these conditions have implemented their accompanying pledge to engage in internal compliance auditing.

Meaningful self-regulation, like other forms of cooperative behavior, is driven by a complex mix of internal, external, and reputational motivations (Benabou and Tirole, 2006). Numerous studies have demonstrated the importance of external motivators like regulatory enforcement and punitive sanctions in prompting regulated organizations not only to comply with law but to regulate themselves. Regulatory penalties can promote formal compliance with legal requirements (Gunningham, Thornton, and Kagan, 2005; Mendelhoff and Gray, 2005; Shimshack and Ward, 2005). Punitive enforcement can also motivate organizations to adopt self-regulatory structures and policies, at least symbolically (Edelman, 1992; Sutton et al., 1994; Short and Toffel, 2008). In addition, punitive enforcement, or at least the possibility of it, appears to be essential to the ultimate success of regulatory schemes that incorporate self-regulation. Research has shown that self-regulatory initiatives tend to fail in the absence of external deterrence pressures like the possibility of sanctions (Ayres and Braithwaite, 1991; McCaffrey and Hart, 1998; King and Lenox, 2000; Parker, 2002; Short and Toffel, 2008).

Nevertheless, the regulatory compliance literature has long recognized that punitive enforcement is a double-edged sword that can compromise goodwill and actors’ intrinsic and reputational motivations to comply with the law and cooperate with regulators (Ayres and Braithwaite, 1992). Penalties administered by regulators in a particularly punitive or adversarial style may produce a backlash of resistance and recalcitrance in the regulated community (Bardach and Kagan, 1982; Kagan, 2001; Winter and May, 2001). Punitive enforcement can also destroy the reputational benefits firms get for good compliance behavior, undermining a key motivation for self-regulation (King, Lenox, and Terlaak,



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2005; Prakash and Potoski, 2006). Benabou and Tirole (2006: 1654) suggested that individuals often engage in altruistic or cooperative behavior to enhance their stature with others, but extrinsic incentives undermine the symbolic value of good behavior, "creating doubt about the extent to which [good deeds] were performed for the incentives rather than for themselves."

Numerous studies on motivating cooperation in organizations have demonstrated that intrinsic motivations are fragile and can be crowded out by attempts to manipulate behavior extrinsically using sanctions or rewards. For instance, Tenbrunsel and Messick (1999: 688) demonstrated that punitive sanctions blunt ethical or commitment-based motivations for cooperation and render the decision to cooperate as one "mainly about averting penalties or achieving rewards." Similarly, Malhotra and Murnighan (2002: 538) showed that binding contracts can undermine trust between transacting parties because each party attributes the other's cooperative behavior to legal coercion "rather than to each other's fair or noble motives." As a whole, this literature suggests that "the greater the external pressure or inducement for individuals performing acts consistent with their beliefs, the less committed they are to the act" (Howell and Higgins, 1990: 338). Notably, sanctions need not actually be imposed to produce these effects; "the explicit threat of punishment" (Fehr and Gächter, 2001) is sufficient to undermine intrinsic motivations.

Although we know of no empirical studies that explicitly address the relationship between punitive enforcement and organizational self-regulation, existing research strongly suggests that coercive pressure can undermine the self-regulatory commitments of organizations. Dobbin and Sutton's (1998) classic argument about the "strength of a weak state" asserts that it is the largely voluntary character of legal compliance that gives U.S. regulation its normative bite, as organizations develop durable and normatively justified commitments to the self-regulatory structures they adopt. Bartley (2007) similarly argued that voluntary forest certification programs have gained more credibility and legitimacy than voluntary labor standards certification programs, in part because the forest certification system was inspired and supported by an internal constituency of eco-conscious woodworkers, while labor standards were adopted solely to fend off the external threat of boycotts.

Even though self-regulation cannot be separated from the extrinsic motivations that prompt and support it, its efficacy depends heavily on the intrinsic and reputational motivations of the firms that adopt it. Consequently, although the EPA might be able to achieve greater symbolic adoption of self-regulatory procedures through coercive tactics (Short and Toffel, 2008), companies that issue such "coerced confessions" will be unlikely to implement effectively the accompanying internal compliance auditing practices. We posit that facilities that self-disclose a violation and commit to ongoing self-policing without a direct regulatory threat are particularly

likely to follow through on the commitment and that this should improve their compliance records:

**Hypothesis 1 (H1):** Among facilities that are not facing a direct regulatory threat, those that commit to adopting internal compliance auditing will improve regulatory compliance outcomes.

### **Effect of Regulatory Surveillance on Commitments to Self-Regulate**

Surveillance, like punitive sanctions, can be an effective tool of social control (Sewell, 1998). Numerous studies have shown that more heavily monitored facilities are better compliers than their less monitored peers (Magat and Viscusi, 1990; Braithwaite and Makkai, 1991; Kuperan and Sutinen, 1998; Gray and Shadbegian, 2005), but little is known about how surveillance affects organizational motivations to self-regulate. From the perspective of deterrence theory, an economic model that posits firms as rational actors that will comply with law only to the extent that the costs of doing so are less than the potential benefits of noncompliance, threatening to inspect (and possibly punish) a facility, as the EPA does in its Compliance Incentive Programs, is no different than conducting routine inspections that might or might not result in punishment. Both enforcement tools are merely ways to influence the regulated organization's expected costs, and both are "coercive" in the sense that they seek to induce particular behaviors by making undesirable behavior more costly. The organizational literature on sanctions and surveillance likewise sees the two as largely synonymous (e.g., Zald, 1978). Sewell (1998: 397), for instance, argued that, like sanctions, surveillance "tends to convey negative images of suspicion, distrust, and disobedience." However, despite apparent similarities between regulatory surveillance and punishment threats, there are reasons to believe that greater surveillance will more effectively motivate regulated organizations to make good on their pledges to self-regulate.

In the regulatory context, two key distinctions between threats and surveillance affect the way they moderate the self-regulatory behavior of organizations. The first is their effect on internal compliance constituencies. Effective compliance groups tend to develop a distinctive culture, somewhat removed from the rest of the firm (Langevoort, 2002), in which they "see themselves as pursuing a higher calling" (Ayres and Braithwaite, 1992: 24). Threatening to punish the organization for compliance lapses assumes instead that they are driven by less honorable motivations, which "insults them, demotivates them" (Ayres and Braithwaite, 1992: 24–25). In addition, regulatory penalties levied against an organization may prompt management to sanction its compliance personnel, further diminishing their morale and motivation. Surveillance, by contrast, can bolster compliance constituencies. Compliance personnel gain status and voice in the organization when the regulator comes around (Ayres and Braithwaite, 1992). One of Ayres and Braithwaite's (1992: 33) interview subjects, a compliance administrator in a nursing home, explained that managers are much more responsive to compliance concerns when they are anticipating inspectors' visits: "It helps us. Without them we'd have no power with the proprietor." In this

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way, surveillance can lend “authoritative support to law-abiding constituencies within the organization” (Ayres and Braithwaite, 1992: 33), bolstering a pillar of effective self-regulation.

Second, routine inspections lack the “cuing” or “framing” effect of actual sanctions or direct threats. Tenbrunsel and Messick (1999) demonstrated that framing an enforcement measure in a way that highlights rewards and punishments undermines the intrinsic motivation to cooperate, reframing the situation from one “infused with ethical and moral considerations, at least for some people, to one in which the choice is mainly about averting penalties or achieving rewards” (Tenbrunsel and Messick, 1999: 687–688). Gneezy and Rustichini (2000) reached a similar conclusion in their study of parents’ late pick-ups of their children from daycare centers. They found that when the daycare centers introduced a fine for late pick-ups, the practice increased rather than decreased. They explained this counterintuitive result by arguing that the threat of a fine reframed the decision to pick up on time from a moral choice focused on how much to impose on the caregivers’ generosity to a calculative one focused on how much the parent was willing to pay to purchase after-hours care.

Compliance Incentive Programs are explicitly designed to have a strong framing effect. They focus the attention of particular regulated entities on specific regulatory violations and on the penalties they will incur if the violations are not corrected. By contrast, routine regulatory inspections, although attended by the same negative possibilities, do not frame the situation in these terms and so should not necessarily dampen intrinsic motivations for compliance or for self-regulation. A number of studies have, in fact, demonstrated that surveillance is central to the meaningful implementation of an organization’s symbolic commitments. Studies have shown that decoupling is more likely when scrutiny is low, including situations in which there is no enforcement (Edelman, 1992), “when there is no office or expert to monitor progress” (Kalev, Kelly, and Dobbin, 2006: 592), or when adopters can hide their internal operations from external constituents (Westphal, Gulati, and Shortell, 1997). Self-regulatory structures have been shown consistently to improve regulatory compliance and performance outcomes only when they are supported by third-party monitoring (e.g., Potoski and Prakash, 2005; Weil, 2005; Toffel, 2006). A recent review of the literature on corporate social responsibility also reported a strong consensus among researchers that stakeholder monitoring is a key ingredient in responsible corporate behavior, including effective corporate self-regulation (Campbell, 2007). For these reasons, we expect regulatory surveillance to promote meaningful implementation of self-regulation commitments:

**Hypothesis 2 (H2):** Among heavily monitored facilities, those that commit to adopting internal compliance auditing will improve regulatory compliance outcomes.

Prior research has found that organizations sometimes respond differently to enforcement pressures affecting all organizations in their institutional field than to enforcement pressures aimed directly at them (e.g., Hirsch, 2009). Hence,

field-level as well as facility-level surveillance may moderate the implementation of self-regulation commitments. Intense field-level surveillance should be an effective tool for promoting implementation of self-regulation in individual organizations because it sends a strong normative message about expectations in the field, without the cuing effect described above (Gunningham and Rees, 1997; Hirsch, 2009). More intensive industrywide surveillance also signals to would-be self-regulators that their competitors are being watched too, providing greater assurance that investments in compliance will not disadvantage them vis-à-vis their competitors (Gunningham and Rees, 1997).

**Hypothesis 3 (H3):** Within heavily monitored industries, facilities that commit to adopting internal compliance auditing will improve regulatory compliance outcomes.

### **Effect of Experience on Commitments to Self-Regulate**

Regulated organizations' experiences in navigating their legal environments also influence the way they approach the commitment to self-regulate. Some will have been exemplary compliers, while others will have had more difficulty complying with regulatory demands. An organization's compliance experience is likely to be reflected in its compliance routines. Routines have been characterized as the "memory of an organization" (Cyert and March, 1963: 101), structural artifacts that "encode organizational capabilities and knowledge" (Feldman and Pentland, 2003: 98) accumulated through experience. The existence of good or poor routines may also drive, rather than merely reflect, good or poor compliance experience. Successful implementation of a commitment to self-regulate largely depends on the presence of self-regulatory routines, such as internal compliance auditing, designed to enhance the organization's capacity to comply with its legal obligations. One factor that may moderate the ability to implement self-regulatory routines is the extent to which they complement or conflict with an organization's existing compliance routines.

It is much easier to implement routines that are compatible with longstanding practices and understandings than to implement routines that go against the grain of existing practices. Organizational routines typically exert "strong inertial forces" (Haveman, 1992: 49) on organizational practices by providing scripts that encode behavior (March and Simon, 1958; Cyert and March, 1963) and generating meanings through which employees understand these behaviors (Feldman, 2003). Although routines can be a source of dynamism under certain conditions (Haveman, 1992; Feldman and Pentland, 2003; Howard-Grenville, 2005), organizations are resistant to change when managers attempt to impose new routines from above (Feldman, 2003) or when the new routines are not a logical outgrowth of existing routines (Haveman, 1992). For instance, Marcus (1988) demonstrated that companies' past compliance routines locked them into "beneficent" or "vicious" cycles that constrained safety managers' ability to implement new regulatory demands flexibly and effectively. Feldman (2003) found that it is particularly difficult for managers to change existing routines

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intentionally by prescribing new ones, because employees attach meanings to the existing routines that may be incompatible with behaviors necessary to implement the new ones. Kalev, Kelly, and Dobbin (2006: 591–592) similarly observed that workers often ignore the new routines that managers attempt to impose on them, perhaps “because individuals face information overload, and thus stick to the familiar, or because the old ways of doing things have been imbued with meaning and value over time.” Because a new routine is particularly likely to be successfully implemented when it builds on established routines and competences (Haveman, 1992), organizations with superior compliance experience should be well poised to successfully implement their commitments to self-regulate.

**Hypothesis 4 (H4):** Among facilities with superior compliance experience, those that commit to adopting internal compliance auditing will be more likely to preserve their superior regulatory compliance outcomes.

## METHOD

### Context and Sample

The Audit Policy provides an ideal empirical context in which to investigate the connection between symbolic adoption of self-regulatory structures and regulatory outcomes. First, the program has generated an extensive dataset on companies’ representations of having adopted internal compliance auditing procedures. Second, the Audit Policy is embedded in an inspection-based regulatory regime that generates data on outcomes for both organizations that identify themselves as self-regulators and those that do not, enabling us to compare their compliance performance. This kind of data would be impossible to replicate in a claims-based regulatory scheme like that governing employment discrimination, in which violations depend on plaintiffs’ highly contingent ability to mobilize and vindicate their legal rights, and where the claims that do arise are often settled confidentially, rendering significant aspects of the enforcement scheme invisible to researchers. Our research setting enables us to overcome the “difficulty of observing decoupling of organizational practices across large samples of organizations” (Westphal and Zajac, 2001: 202). In this way, our findings help to develop a more general framework for understanding the possibilities and limitations of institutionalizing self-regulatory structures within organizations.

We tested our hypotheses on a sample of industrial facilities located across the United States that are subject to the federal Clean Air Act (CAA) (*United States Code*, Title 42, Chapter 85, 2008), which applies to a wide range of industries and activities that emit air pollutants beyond regulatory thresholds. Our sample period extends from 1993, two years before the Audit Policy was launched, through 2003. The CAA gives the U.S. EPA broad authority to set limits on air pollutants emitted by both stationary sources such as chemical plants, utilities, and steel mills and mobile sources such as automobiles and trucks. The facilities in our sample are all regulated under the stationary source provisions of the CAA.

The Clean Air Act provides the U.S. EPA with broad enforcement powers to inspect regulated facilities and seek administrative, civil, and criminal penalties for noncompliance. CAA inspections entail “visits to a facility . . . for the purpose of gathering information to determine whether it is in compliance,” which may include “interviewing facility or site representatives, reviewing records and reports, taking photographs, collecting samples, and observing facility or site operations” (U.S. Environmental Protection Agency, 2010). The federal CAA delegates significant enforcement authority to the states, such that both the federal EPA and state environmental regulators conduct CAA inspections, and our dataset includes all of these inspections. Regulators target CAA inspections and establish enforcement priorities based on a number of factors, including patterns of noncompliance and the significance of the environmental and health risks associated with specific pollutants or industrial activities (U.S. Environmental Protection Agency, 2002b). Major enforcement initiatives during our sample period, 1993–2003, have targeted petroleum refineries, coal-fired power plants, pulp mills, and mining facilities.

Violations of the CAA can take a number of forms, including “violating performance standards, violating emissions standards, releasing hazardous air pollutants in disregard of emission standards, making false statements in required documents, and tampering with required monitoring devices” (Scalia, 1999: 9). Facilities regulated under the CAA are also commonly cited for failing to plan for and manage hazardous air pollutants according to the terms of their operating permits (Stretesky and Gabriel, 2005: 874–875). Depending on the severity of the violation and its enforcement priorities, the EPA may seek to correct and/or punish the violation through a variety of enforcement vehicles, including field citations issued on site by inspectors, administrative penalties and orders adjudicated by the agency, judicially imposed civil penalties, monetary and injunctive relief, and criminal penalties, including fines and imprisonment (Reitze and Hoffman, 1994: 740).

The stringency of CAA enforcement has varied over the period of our study. For instance, the number of judicial enforcement actions and the amount of civil and criminal penalties collected rose throughout most of the 1990s, then began to decline in the late 1990s and continued to do so through the end of our study period. In FY 1993, the U.S. EPA made 80 civil judicial referrals under the CAA. That figure fluctuated greatly but remained greater than 80 for four out of six years between FY 1993 and FY 1998, when it stood at 113. From FY 1998 to FY 2003, the figure never rose above 80, fluctuating between 79 and 49 referrals (U.S. Environmental Protection Agency, 2008a: E-2b). The number of criminal enforcement fines and penalties also rose, from \$44 million in FY 1993 to a high of \$227 million in FY 1997, then gradually declined to \$83 million in FY 2003 (all figures in adjusted FY 2008 dollars) (U.S. Environmental Protection Agency, 2008b: E-3). The number of citizen suits seeking to enforce environmental laws also declined over the same time period, from a high of 29 in 1998 to 18 in 2002 (May, 2003: 10718, table 13).

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To test our hypotheses, we developed a matched sample of facilities that disclosed violations of the CAA and other environmental statutes under the Audit Policy and facilities that were otherwise similar but did not disclose any violations under the Audit Policy. The primary empirical approaches to facilitating causal inference include modeling selection bias using instrumental variables and developing a matched sample (Shadish, Cook, and Campbell, 2002). Unable to identify a convincing instrumental variable, we developed a matched sample in an attempt to identify a subset of disclosing and non-disclosing facilities that were otherwise as similar as possible. Specifically, our matching approach sought to identify a matched sample comprising facilities that disclosed violations of environmental statutes under the Audit Policy and facilities that were otherwise similar but did not disclose any violations under the Audit Policy.

Our empirical model estimated the extent to which inspections at facilities that disclosed violations under the Audit Policy, and thereby purported to adopt self-regulation, were subsequently more likely to yield no violations. We compared the compliance records of disclosing facilities before and after disclosing with the compliance records of facilities that did not make such representations over the same time period. This difference-in-differences approach relies on an identifying assumption that, had they not participated in the Audit Policy, the trend in disclosers' outcomes during the post-disclosure period would have been indistinguishable from that of non-disclosers. Prior empirical research has demonstrated, however, that self-disclosing violations under the Audit Policy is more likely to occur among facilities that face greater regulatory pressure (Short and Toffel, 2008), which suggests that self-disclosers might differ in important ways from the entire population of non-disclosers.

To bolster the plausibility of the identifying assumption, we compared disclosing facilities to a matched set of non-disclosers that looked similar to them in the years prior to disclosure. The logic was that a matched group of disclosers and non-disclosers that appear similar before disclosure would continue to appear similar over the ensuing years, were there no disclosures. In developing a matched sample, we sought to replicate a randomized experiment that compares "treated" with "controls" that do not differ systematically from each other at the time the treatment, in our case disclosure, occurs (Shadish, Cook, and Campbell, 2002). Estimating treatment effects by constructing a matched control group and analyzing panel data using a difference-in-differences approach is a robust approach (Smith and Todd, 2005) that has been used in many recent program evaluations (e.g., Shadish, Cook, and Campbell, 2002; Villalonga, 2004; Galiani, Gertler, and Schargrodsky, 2005; Qian, 2007).

To develop our matched sample, we implemented case-control matching based on seven criteria that prior research has revealed to be associated with facilities' decisions whether to disclose violations under the Audit Policy (Short and Toffel, 2008). We considered each discloser's 3-digit Standard Industry Classification (SIC) industry code. We also included each facility's record of annual inspections,

violations, and enforcement actions, in each case considering the values one year and two years before it disclosed to the Audit Policy. We included as the disclosers' matched controls non-disclosing facilities that matched exactly on these seven dimensions. We designated the former's disclosure year as the "match year" for this matched group of facilities and repeated this process for all self-disclosers. Our analysis included each matched facility's observations starting two years before and extending five years after the match year. This resulted in a matched sample of 7,274 facilities including 373 adopters and 6,901 non-adopters. Column 1 of table 1 tabulates these facilities by industry.

Because conditional fixed effects logistic regression models are only identified for facilities in which the dependent variable varies during the sample period, our regression models are only identified for facilities that experienced at least one inspection that yielded a violation and at least one inspection that yielded no violations. These restrictions resulted in a matched sample of 832 facilities (6,150 facility-year observations) including 64 facilities (724 facility-year observations) that disclosed violations and committed to self-policing. Column 2 of table 1 reports a tabulation of these facilities by industry. Note that the distributions of facilities across industries in columns 1 and 2 are similar. For example,

Table 1

**Industry Composition of Sample**

SIC Code and Industrial Sector	Entire Matched Sample (N = 7,274 facilities)		Matched Facilities with Variation in Inspection Outcomes (N = 832 facilities)*	
	Facilities	Percent	Facilities	Percent
13 Oil and gas extraction	109	1%	14	2%
14 Mining and quarrying of nonmetallic minerals, except fuels	116	2%	22	3%
20 Food and kindred products	588	8%	52	6%
22 Textile mill products	121	2%	14	2%
24 Lumber and wood products, except furniture	381	5%	33	4%
26 Paper and allied products	140	2%	15	2%
27 Printing, publishing, and allied industries	164	2%	9	1%
28 Chemicals and allied products	914	13%	141	17%
29 Petroleum refining and related industries	325	4%	32	4%
30 Rubber and miscellaneous plastics products	373	5%	67	8%
32 Stone, clay, glass, and concrete products	336	5%	31	4%
33 Primary metal industries	488	7%	57	7%
34 Fabricated metal products, except machinery and transportation equipment	987	14%	145	17%
35 Industrial and commercial machinery and computer equipment	168	2%	12	1%
36 Electronic and other electrical equipment and components, except computer equipment	179	2%	9	1%
37 Transportation equipment	299	4%	32	4%
49 Electric, gas, and sanitary services	573	8%	58	7%
80 Health services	242	3%	28	3%
Other industries	771	11%	61	7%

\* This is the subset of the matched sample of facilities with variation in inspection outcomes and was therefore estimated via the primary conditional fixed effect logistic regression models.



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both samples are distributed across many industries, chemicals and allied products (SIC 28) and fabricated metal products (SIC 34) being the most highly represented in both the entire matched sample and the subset identified in the conditional fixed effects logistic regression models.

## Measures

When an organization disclosed regulatory violations under the Audit Policy, it nominally committed to implement internal policies to monitor its regulatory compliance. To assess whether organizations followed through on this commitment, we focused our analysis on regulatory outcomes, for two reasons. First, because of the information asymmetry within our empirical context, we (like regulators) could not directly observe facilities' actual audit practices. Second, the EPA and other regulatory agencies explicitly encouraged regulated entities to engage in internal auditing for the very purpose of improving compliance outcomes. Outcome measures employed in prior studies of compliance with environmental as well as occupational health and safety regulation have been either self-reported by regulated entities (Magat and Viscusi, 1990; Gray and Scholz, 1991; Earnhart, 2004; Mendelhoff and Gray, 2005; Shimshack and Ward, 2005) or recorded by agency inspectors (Braithwaite and Makkai, 1991; Gray and Scholz, 1993; U.S. General Accounting Office, 2001; Gray and Shadbegian, 2005). Because we sought to assess organizations' self-policing efforts, we relied on regulatory compliance records created by regulatory inspectors. We created *clean inspection* as a dichotomous variable based on a facility's regulatory inspection on a given date, coded 1 when the inspection resulted in no compliance violations (i.e., was "clean") and coded 0 when the inspector cited the facility for one or more violations. This distinction between whether or not inspections resulted in violations has been used in other empirical analyses of regulatory compliance (e.g., Gray and Scholz, 1993; U.S. General Accounting Office, 2001). We obtained data on CAA regulatory inspections and violations from the U.S. EPA's Aerometric Information Retrieval System (AIRS)/AIRS Facility Subsystem database.

The primary independent variable in our analysis is *disclosed*, a dichotomous variable coded 1 in the years after a facility disclosed one or more regulatory violations under the U.S. EPA Audit Policy and formally committed to self-regulate, and 0 beforehand. This variable was always coded 0 for facilities that never disclosed violations under the Audit Policy. We obtained data on violations disclosed to the Audit Policy from three sources: (1) the U.S. EPA Integrated Compliance Information System (ICIS) database, (2) the U.S. EPA Audit Policy Docket, and (3) lists of participants in various EPA Compliance Incentive Programs. The U.S. EPA provided these datasets in response to Freedom of Information Act requests.

We gathered data to control for several other factors that have been shown to influence compliance. Prior research has indicated that a facility's current compliance behavior can be affected by its recent regulatory experience (Magat and Viscusi, 1990; Gray and Deily, 1996; Helland, 1998; Gunningham, Thornton, and Kagan, 2005; Shimshack and Ward,

2005). In addition, when considering which facilities to target for inspection, the EPA takes into account facilities' compliance and enforcement histories (U.S. Environmental Protection Agency, 1999), and facility managers' perceived likelihood of being inspected can influence their compliance behavior (Laplante and Rilstone, 1996; Shimshack and Ward, 2005). We thus calculated each facility's *annual number of CAA violations* in each of the prior two years, which we top coded at the 99th percentile (3 violations) to reduce the impact of outliers. The results of our models were virtually identical when we replaced these two top-coded violation counts with either the annual violation counts (not top-coded) or the log of the annual violation counts (taken after adding 1). Because regulators might attempt to ensure that they return to inspect a facility before a certain time elapses (and in some cases face legal minimum requirements regarding how often they must return to particular facilities), we measured the *number of years since the facility received a CAA inspection*, which we top coded at 4 to reduce the impact of outliers.

We also controlled for whether a facility was certified to the ISO 14001 Environmental Management System Standard, which has been shown to improve regulatory compliance (Dasgupta, Hettige, and Wheeler, 2000; Coglianese and Nash, 2001b; Potoski and Prakash, 2005). We identified facilities that had been certified to ISO 14001 by 2004, using the World Preferred Database, and created *certified to ISO 14001* as a dichotomous variable coded 1 in all years after a facility was certified to the ISO 14001 standard, and 0 otherwise.

Changes in state-level enforcement capacity can influence facility managers' perceptions of deterrence strength, and thereby compliance behavior (Cohen, 2000; Shimshack and Ward, 2005; Thornton, Gunningham, and Kagan, 2005). We developed two variables to capture variation in enforcement capacity within states over time. Using data from the U.S. EPA's AIRS database, we calculated the *total Clean Air Act penalties* that environmental regulators assessed in each state-year and the total number of *facilities regulated by the Clean Air Act* in each state-year.

### Model Specification

Our analysis estimated whether regulatory inspections were more likely to yield no violations (i.e., clean inspections) after facilities had indicated, through voluntary disclosure of a violation under the Audit Policy, that they had committed to self-regulate. We employed a conditional fixed effects logistic regression model to estimate the probability of a *clean inspection*. In our model, the individual inspection was the unit of analysis. Because many facilities in our matched sample maintained uniformly clean compliance records during our sample period, the estimates generated by our conditional fixed-effects logistic models were based on a subset of our sample. Specifically, our matched sample of 7,274 facilities included 6,442 facilities for which inspections were always "clean" and 832 facilities for which inspections were not always clean. The latter form the effective sample upon which our primary conditional fixed logistic models were estimated because these panel models are only identified for

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facilities with variation in their dependent variable. As robustness tests, we reestimated our specifications as linear probability models using Ordinary Least Squares (OLS) with facility fixed effects. Unlike our primary conditional fixed effects logistic models, this technique yields estimates that are based on the entire matched sample because OLS does not drop facilities that lack variation in the dependent variable. Although OLS presents considerable inference problems with dichotomous dependent variables, it has the advantage of retaining all perfectly predicted groups, thereby more accurately estimating the effects of control variables. These OLS models yielded the same inferences as our conditional fixed effects logistic model.

We included in all models all of the variables described above as well as a series of seven dummy variables indicating each year before, during, or after the match year (i.e., one year before the match year, the match year, one year after the match year, and so on through five years after the match year). These additional dummy variables enabled us to control for temporal factors common to each match group, such as changes in presidential administrations, Congress, and EPA leadership, that might affect facility managers' expectations about enforcement intensity.

We also included facility-level conditional fixed effects to control for time-invariant factors that might affect a facility's compliance behavior, such as year of construction, EPA regional and state regulatory authorities, industry, proximity to the regulatory inspector, and political power and demographic characteristics of the local community (Gray and Deily, 1996; Helland, 1998; Lynch, Stretesky, and Burns, 2004; Gawande and Bohara, 2005; Shimshack and Ward, 2005; Delmas and Toffel, 2008).

We tested our hypotheses by estimating our model on subsets of the facilities about which we hypothesized, an approach used by many other organizational scholars (e.g., Eisenhardt and Tabrizi, 1995; Zenger and Marshall, 2000; Simon, 2005; Xiao and Tsui, 2007) and in program evaluations of voluntary environmental programs and educational policies (e.g., Bali and Alvarez, 2003; Brouhle, Griffiths, and Wolverton, 2009). To test H1, we estimated our model on the subsample of facilities (and their matched controls) that disclosed a violation to the Audit Policy without a direct regulatory threat, defined as those facilities that were not targeted by a U.S. EPA Compliance Incentive Program in the disclosure (or match) year. As noted above, Compliance Incentive Programs encouraged facilities in particular EPA regions or industries that conducted specific regulated activities to reexamine their compliance with a related regulatory issue and self-disclose and correct any violations they discovered. Letters from the regulator informing a facility that it had been targeted by a Compliance Incentive Program often contained an explicit warning that failure to conduct the review and disclose a violation put a facility at risk of being prioritized for scrutiny. We used Freedom of Information Act requests to obtain data from the U.S. EPA on the facilities targeted by its Compliance Incentive Programs.

To test H2, we estimated our model on the subset of facilities individually subjected to heavy regulatory monitoring—at least two inspections during the two years prior to the disclosure (or match) year. We constructed this subset based on CAA regulatory inspection data obtained from the U.S. EPA’s AIRS database.

To test H3, we estimated the model on a subset of facilities in heavily monitored industries, those subjected to above-average levels of regulatory inspection. To identify this subset, we calculated inspection intensities as the average number of times a facility in each industry (2-digit SIC code) was inspected in each state and year, using facility industry identifiers from the agency’s Facility Registry System (FRS). We included facilities in industries with inspection intensities that exceeded the median industry inspection intensity level for its state-year, focusing on the year prior to each facility’s disclosure (or match) year.

We tested H4 by estimating our model on the subset of facilities that had superior compliance experience, which we operationalized as no compliance violations or enforcement actions in the year in which the facility disclosed to the Audit Policy or in either of the previous two years, and their matched controls. A record of three years with no compliance problems should constitute a reasonable threshold for constructing a subset of facilities with superior compliance histories. We obtained facilities’ compliance data from the U.S. EPA’s AIRS and ICIS databases.

## RESULTS

Summary statistics and correlations for the entire matched sample are provided in table 2. Table 2 also reports summary statistics for the subset of the matched sample that exhibited variation in inspection outcomes during our sample period, which is the subsample on which the conditional fixed effects logistic estimates are based. The summary statistics between the entire matched sample and the subset used in the logistic regression model are similar.

We also calculated each facility’s total number of inspections that yielded at least one violation. These distributions are reported in table 3. The main difference between the two distributions is, as expected, that the subset used as the basis of the logistic model estimates excludes facilities that lacked variation in inspection outcomes (e.g., facilities for which inspections yielded no violations).

The results of the conditional fixed effects logistic regression models are provided in tables 4 and 5, where we report coefficients and clustered standard errors by facility to account for the non-independence of observations from the same facilities. To facilitate interpretation, we also report odds ratios (OR).

**Regulatory threat.** The results of the model that tested H1 are reported as model 1 in table 4. The statistically significant positive coefficient on *disclosed* indicates that facilities not facing a direct regulatory threat that disclosed to the Audit Policy, and in doing so committed to self-regulate,

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Table 2

<b>Summary Statistics and Correlations</b>										
Entire Matched Sample (N = 32,375 inspections)										
Variable	Mean	S.D.	Min.	Max.	1	2	3	4	5	6
1. Inspection is "clean" (no violations) (dummy)	0.97	0.18	0	1						
2. Disclosed (dummy)	0.04	0.20	0	1	-.02					
3. Certified to ISO 14001 (dummy)	0.01	0.09	0	1	.00	.04				
4. Years since last CAA inspection	1.58	0.99	1	4	-.02	-.04	-.01			
5. Annual number of violations, lagged 1 year	0.05	0.29	0	3	-.06	.04	.01	-.10		
6. Log total CAA penalties in state-year	13.94	1.78	7.60	17.56	-.02	.06	.02	-.05	.08	
7. Log number of CAA regulated facilities in state-year	7.45	0.67	4.06	8.29	.06	-.01	.01	-.10	-.00	.38

Matched Facilities with Variation in Inspection Outcomes (N = 6,150 inspections)*				
Variable	Mean	S.D.	Min.	Max.
1. Inspection is "clean" (no violations) (dummy)	0.83	0.38	0	1
2. Disclosed (dummy)	0.07	0.26	0	1
3. Certified to ISO 14001 (dummy)	0.01	0.11	0	1
4. Years since last CAA inspection	1.38	0.83	1	4
5. Annual number of violations, lagged 1 year	0.26	0.61	0	3
6. Log total CAA penalties in state-year	14.19	1.56	8.16	17.56
7. Log number of CAA regulated facilities in state-year	7.35	0.65	4.08	8.29

\* This is the subset of the matched sample of facilities with variation in inspection outcomes and is therefore estimated via the primary conditional fixed effects logistic regression models.

Table 3

<b>Count of Facilities in Sample</b>				
Number of a facility's inspections that yielded at least one violation during the sample period	Entire Matched Sample (N = 7,274 facilities)		Matched Facilities with Variation in Inspection Outcomes (N = 832 facilities)*	
	Number of facilities	Percent	Number of facilities	Percent
0	6,389	87.8 %	-	-
1	726	10.0 %	676	81.3 %
2	116	1.6 %	114	13.7 %
3	28	0.4 %	28	3.4 %
4	10	0.1 %	9	1.1 %
5	3	0.04 %	3	0.4 %
6	1	0.01 %	1	0.1 %
7	-	-	-	-
8	1	0.01 %	1	0.1 %

\* This is the subset of the matched sample of facilities with variation in inspection outcomes and is therefore estimated via the primary conditional fixed effects logistic regression models.

Table 4

**Conditional Fixed Effects Logistic Regression Results\***

Variable	Regulatory Threat Level				Regulatory Surveillance: Facility-Level			
	Model 1 (low) H1		Model 2 (high)		Model 3 (high) H2		Model 4 (low)	
	Coefficients	Odds ratios	Coefficients	Odds ratios	Coefficients	Odds ratios	Coefficients	Odds ratios
Disclosed	1.122** (0.327)	3.07	0.357 (0.684)	1.43	1.043** (0.334)	2.84	0.567 (0.499)	1.76
Certified to ISO 14001	0.656 (0.820)	1.93	1.172 (1.678)	3.23	1.488 (0.999)	4.43	-0.275 (1.034)	0.76
Number of years since last CAA inspection	0.205** (0.055)	1.23	0.614* (0.263)	1.85	0.254 (0.155)	1.29	0.279** (0.063)	1.32
Number of violations 1 year ago	1.188** (0.189)	3.28	0.718* (0.333)	2.05	0.867** (0.215)	2.38	1.443** (0.237)	4.24
Number of violations 2 years ago	1.182** (0.176)	3.26	1.075** (0.348)	2.93	0.858** (0.191)	2.36	1.609** (0.271)	5.00
Log total CAA penalties in state-year	0.005 (0.050)	1.01	-0.349 (0.189)	0.71	-0.101 (0.068)	0.90	0.078 (0.069)	1.08
Log number of CAA regulated facilities in state-year	-0.141 (0.463)	0.87	0.207 (1.294)	1.23	0.248 (0.563)	1.28	0.037 (0.631)	1.04
1 year before match	-0.552** (0.175)	0.58	-2.067* (0.854)	0.13	-0.960** (0.226)	0.38	-0.017 (0.394)	0.98
Match year	-1.142** (0.177)	0.32	-2.691** (0.877)	0.07	-1.496** (0.262)	0.22	-0.658** (0.247)	0.52
1 year after match	-1.477** (0.208)	0.23	-3.001** (0.803)	0.05	-2.016** (0.307)	0.13	-0.837** (0.251)	0.43
2 years after match	-1.390** (0.245)	0.25	-3.816** (0.852)	0.02	-2.059** (0.367)	0.13	-0.811** (0.285)	0.45
3 years after match	-1.447** (0.242)	0.24	-3.718** (0.826)	0.02	-2.008** (0.338)	0.13	-0.938** (0.303)	0.39
4 years after match	-1.386** (0.258)	0.25	-3.114** (0.907)	0.04	-1.994** (0.376)	0.14	-0.691* (0.323)	0.50
5 years after match	-1.048** (0.318)	0.35	-1.960 (1.129)	0.14	-1.981** (0.448)	0.14	0.006 (0.412)	1.01
Observations (inspections)	5,372		778		3,610		2,540	
Firms	766		66		338		494	

\*  $p < .05$ ; \*\*  $p < .01$ .

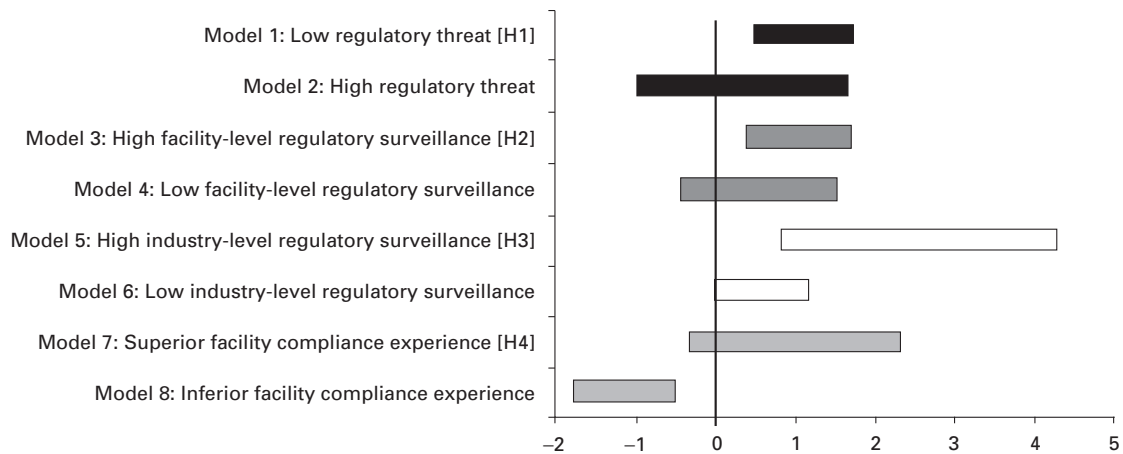
\* Robust standard errors, clustered by facility, are in parentheses.

subsequently improved the likelihood of clean inspections by a factor of 3.1 compared with their matched controls. This result supports H1, which predicted that disclosing without coercive pressure would be associated with subsequent improvements in regulatory compliance outcomes.

As a robustness test, we employed a more restrictive definition to classify facilities as not being under regulatory threat. We further restricted this classification to facilities that were not targeted by a Compliance Incentive Program in the year they disclosed to the Audit Policy as well as in the year prior to their disclosure (and their matched controls). Estimating our model on this smaller sample of facilities yielded results (*disclosed*  $\beta = 1.11$ ,  $p < .01$ ; OR = 3.0; N = 5311) nearly

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**Figure 1. Confidence intervals of difference in difference estimates.\***



\*This figure depicts the 5% to 95% confidence intervals of the *disclosed* coefficients from the models presented in tables 4 and 5.

identical to those generated by our primary model, reported as model 1 in table 4.

For completeness, we report as model 2 the results of the opposite subsample about which we did not hypothesize: facilities that self-disclosed to the Audit Policy in a year in which they *were* targeted by a Compliance Incentive Program (and their matched controls). In contrast to our earlier results, the odds ratio on *disclosed* is close to 1 and not statistically significant, indicating that facilities that disclosed while facing an enforcement threat subsequently exhibited compliance records that were indistinguishable from their matched controls. Figure 1 depicts the 5 percent to 95 percent confidence intervals of the *disclosed* coefficient for each of these models as well as all other models reported in tables 4 and 5.

**Regulatory surveillance.** In model 3, the positive, statistically significant coefficient on *disclosed* indicates that among more heavily inspected facilities, those that disclosed and committed to self-regulate substantially improved their compliance records by a factor of 2.8 compared with their matched controls. This finding supports H2, which predicted that heavily monitored facilities would implement their commitments to self-regulate in ways that would improve compliance. Again, for completeness, we report, as model 4, results for the unhypothesized subsample of less heavily inspected facilities, those inspected at most once during the two years prior to their disclosure or match year. The compliance records of these less heavily monitored facilities remained statistically indistinguishable from those of their matched controls.

The results of the model testing H3 are reported as model 5 in table 5. The positive, statistically significant coefficient on *disclosed* indicates that among facilities in more heavily inspected industries, those that disclosed to the Audit Policy

Table 5

**Conditional Fixed Effects Logistic Regression Results\***

Variable	Regulatory Surveillance: Industry-Level				Facility Compliance Experience			
	Model 5 (high) H3		Model 6 (low)		Model 7 (superior) H4		Model 8 (inferior)	
	Coefficients	Odds ratios	Coefficients	Odds ratios	Coefficients	Odds ratios	Coefficients	Odds ratios
Disclosed	2.563** (0.883)	12.97	0.581 (0.299)	1.79	0.996 (0.680)	2.71	-1.140** (0.332)	0.32
Certified to ISO 14001	2.222 (2.095)	9.23	0.394 (0.831)	1.48	0.116 (1.040)	1.12	0.189 (1.069)	1.21
Number of years since last CAA inspection	0.324** (0.108)	1.38	0.160* (0.066)	1.17	0.242** (0.070)	1.27	0.089 (0.115)	1.09
Number of violations 1 year ago	1.753** (0.358)	5.77	0.969** (0.193)	2.64	1.701** (0.250)	5.48	0.484* (0.231)	1.62
Number of violations 2 years ago	1.525** (0.431)	4.60	1.067** (0.182)	2.91	1.772** (0.252)	5.88	0.516** (0.164)	1.68
Log total CAA penalties in state-year	-0.127 (0.099)	0.88	0.005 (0.054)	1.01	-0.033 (0.067)	0.97	-0.040 (0.085)	0.96
Log number of CAA regulated facilities in state-year	0.136 (1.243)	1.15	-0.120 (0.447)	0.89	-1.283 (0.703)	0.28	1.617* (0.650)	5.04
1 year before match	0.953* (0.476)	2.59	-0.878** (0.191)	0.42	-0.844* (0.425)	0.43	-0.611** (0.193)	0.54
Match year	-0.586 (0.397)	0.56	-1.363** (0.199)	0.26	-2.269** (0.413)	0.10	-0.814** (0.234)	0.44
1 year after match	-0.671 (0.440)	0.51	-1.733** (0.232)	0.18	-3.367** (0.429)	0.04	0.754* (0.303)	2.13
2 years after match	-1.024 (0.542)	0.36	-1.613** (0.261)	0.20	-3.506** (0.460)	0.03	0.968** (0.361)	2.63
3 years after match	-1.068* (0.534)	0.34	-1.688** (0.262)	0.19	-3.772** (0.475)	0.02	1.352** (0.348)	3.86
4 years after match	-0.633 (0.555)	0.53	-1.633** (0.277)	0.20	-3.619** (0.484)	0.03	1.394** (0.443)	4.03
5 years after match	-1.113 (0.628)	0.33	-0.958** (0.344)	0.38	-3.238** (0.513)	0.04	2.119** (0.645)	8.33
Observations (inspections)	963		5,187		3,952		2,198	
Firms	190		642		582		250	

\*  $p < .05$ ; \*\*  $p < .01$ .

\* Robust standard errors, clustered by facility, are in parentheses.

and committed to self-regulate substantially improved their compliance records compared with their matched controls. The odds ratio of 13 indicates that inspections among facilities in more heavily inspected industries that disclosed to the Audit Policy increased from a baseline of 69.0 percent clean (average *clean inspection* prior to disclosure) to a predicted 96.7 percent probability after disclosing under the Audit Policy. This finding supports our contention in H3 that in more heavily monitored industries, disclosing facilities would meaningfully implement their commitments to self-regulate and would therefore realize improved compliance records relative to those of their matched controls. For completeness, we also estimated the model on the opposite subset about which we did not hypothesize, facilities in less heavily



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monitored industries (those with inspection intensities below the median for their state in the year prior to the disclosure or match year). The results of model 6 indicate a smaller improvement among these self-disclosers, significant only at the 10-percent level. A Wald test indicated that the relative improvement among disclosers in heavily monitored industries exceeded the relative improvement among disclosers in less scrutinized industries (Wald  $\chi^2 = 4.54$ ;  $p = .03$ ).

**Regulatory experience.** Model 7 tests H4. As noted earlier, this model is estimated on the subsample of facilities that had superior compliance experiences, defined as no compliance violations or enforcement actions in the adoption (or match) year or in either of the previous two years. The odds ratio on *disclosed* is positive, as predicted, but not statistically significant. This finding does not support H4, which predicted that among facilities with superior compliance histories, disclosing facilities would be more likely than their matched controls to maintain perfect compliance records. The odds ratio being large in magnitude (2.71) but not statistically significant suggests the possibility that a substantively important effect might be cloaked by an imprecise estimate, warranting further research.

One interesting finding is derived from the opposite subset of facilities about which we did not hypothesize, those with at least one compliance violation or enforcement action in the adoption year or either of the two preceding years. Among this subset of inferior compliers, the statistically significant negative coefficient on *disclosed* in model 8, properly interpreted in conjunction with the large odds ratios on the post-match year counters (ranging from 2.1 to 8.5), indicates that disclosing facilities subsequently improved their compliance at a slower pace than their matched controls.

**Statistical power and subgroup analysis.** A potential concern associated with subgroup (subsample) analysis of multiple subgroups relates to statistical inference. Because four subgroup analyses were performed at the 5-percent significance level, the probability that at least one of these analyses would be statistically significant simply by chance was 0.19 (calculated as  $1 - 0.95^4$ , assuming independence between tests). We can decrease the odds of a false positive by increasing the threshold for inference to the 1-percent significance level, in which case the probability of at least one of the four tests being statistically significant by chance falls to just 0.04 (calculated as  $1 - 0.99^4$ , assuming independence between tests). In fact, the three hypotheses for which we found statistical support were each significant at the 1-percent level, indicating that our results are robust to this potential risk of false positives from multiple subgroup analysis tests.

**Additional results and extensions.** An additional finding worth noting is the relationship between facilities' compliance experience and their compliance outcomes in the subsequent year. Our results provided consistent evidence that facilities previously cited for violations were especially likely to improve future compliance. Specifically, the odds ratios on the lagged

counts of prior CAA violations were consistently positive and statistically significant across all regression models reported in tables 4 and 5. These results are consistent with those from another study that found steel facilities with recent enforcement actions to be especially likely to comply with Clean Air Act regulations going forward (Gray and Deily, 1996).

Our main results are presented above for each of our four focal groups individually. But because surveillance and direct threats might often occur together, we explored whether highly monitored disclosers would significantly improve their compliance records even in the absence of regulatory threats. To test this, we identified the group of disclosers that were highly monitored (pursuant to H2) *and* not subjected to a Compliance Incentive Program in the adoption year (pursuant to H1) and their matched controls. Estimating our model on this smaller subset (N = 3018 inspections) yielded results (*disclosed*  $\beta = 1.29$ ;  $p < .01$ ; OR = 3.6) similar to our main results from testing H1 and H2. This indicates that among facilities subjected to high regulatory surveillance, disclosers subsequently improved their compliance records compared with their matched controls and that this difference in improvement rates persisted even among the subset of highly monitored disclosers and matched controls that did not face regulatory threats.

## DISCUSSION

The findings of this study suggest that the enforcement strategies and relationships of the legal environment play an important role in moderating organizations' implementation of their commitments to self-regulate. Facilities *not* facing regulatory threats that disclosed regulatory violations and committed to self-regulate exhibited improved regulatory outcomes. This supports the notion that a weak regulatory state can exert a peculiar normative strength (Dobbin and Sutton, 1998). In contrast, facilities that disclosed while facing regulatory threats did not improve their regulatory outcomes compared with their matched controls, suggesting that bald displays of coercive power by the state can undermine more normatively based motivations to self-regulate (Deci and Ryan, 1985; Tenbrunsel and Messick, 1999).

Nevertheless, our findings also demonstrate that the state need not, and should not, abdicate its role as regulatory enforcer, as some have suggested (Klein, 1997; U.S. Environmental Protection Agency, 2005). Although our findings suggest that direct regulatory threats impede successful implementation of self-regulation commitments, we demonstrate that high levels of regulatory surveillance at both the field and organizational levels promote the implementation of self-regulation. Unlike sanctions and threats, surveillance does not appear to dampen normative motivations and thus can be an effective tool not only for deterring harmful behavior but also for enhancing the self-regulatory performance of regulated organizations. Our extension further suggests that surveillance improves outcomes even when it is not accompanied by a direct

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threat. Of course, surveillance in a complex regulatory scheme like the one we analyzed always occurs against a general background threat of sanctions. What we demonstrate is that, for the purpose of fostering organizations' self-regulating capacities, threats of punishment are better left in the background.

Consistent with concerns others have raised about the hollow nature of commitments to self-regulate (Edelman, Erlanger, and Lande, 1993; Edelman, Fuller, and Mara-Drita, 2001), our findings on organizations' experience with regulatory compliance counsel caution in relying on self-regulation to realize regulatory goals. We found that among facilities with poor compliance histories, those that disclosed violations subsequently realized slower improvements in regulatory outcomes than their non-disclosing counterparts. This suggests that, among poor compliers, self-regulation might be symbolically adopted more "as window dressing to deflect attention and or culpability resulting from illegal actions" (McKendall, DeMarr, and Jones-Ridders, 2002: 367) than as a tool for improving compliance practices.

In addition to theorizing about and testing the conditions that moderate organizations' ability to follow through on commitments to self-regulate, we make five key contributions to the literature. First, we put the institutional literature into a productive dialogue with scholarship on self-regulation. As Vaughan (1990: 230) noted, "[w]hile empirical and theoretical work on the external control of organizations is extensive, we know much less about the organizational dimensions of self-regulation." We seek to begin building a body of theoretical and empirical knowledge about organizational self-regulation by identifying some of the conditions under which self-regulatory structures are integrated into organizational life in ways that can achieve regulatory goals.

Second, we add momentum to a recent movement to shift scholarship on law and organizations into the realm of outcomes (e.g., Kalev, Kelly, and Dobbin, 2006; Schneiberg and Bartley, 2008; Hirsch, 2009), where it can address important questions about the extent to which formal organizational responses to regulation are truly transformative rather than symbolic or ceremonial (Edelman and Suchman, 1997). There are a number of reasons why scholarship in this area has not focused on the effects of self-regulatory structures. In part, this gap in the literature is an artifact of important theoretical concerns with the adoption, diffusion, and legitimacy of organizational structures that flow from the institutional orientation of existing scholarship. In part, the gap springs from a desire to move law and society scholarship beyond simple measurements of the distinction between formal law, or law on the books, and legal outcomes, or law in action, toward a more complicated understanding of the processes by which both law and legal outcomes are constructed. And, in part, the paucity of research on the effects of self-regulatory structures springs from the difficulty of obtaining data on both the existence of internal compliance structures and the outcomes they produce. All of these factors tend to "sideline issues of implementation, effectiveness, and local impact"

(Schneiberg and Bartley, 2008: 49). Yet if internal compliance structures are mediating institutions, as prior research has demonstrated, they have also become (or at least purport to be) full-fledged regulatory institutions that have been integrated deeply into contemporary regulatory regimes, including those that failed to prevent recent financial and environmental catastrophes. This development demands scholarship that addresses how these structures affect the regulatory behavior of the organizations that adopt them.

Third, we expand prevailing conceptions of the legal environment. Despite the centrality of the legal environment to theorizing about law and organizations, the construct is surprisingly under-theorized and under-socialized in the literature. Institutional studies of internal compliance structures have uniformly posited that organizations adopt them symbolically, in response to external pressures in the legal environment (Meyer and Rowan, 1977; Edelman, 1990; Sutton et al., 1994; Kalev, Kelly, and Dobbin, 2006). But although law is identified as a key environmental factor prompting the adoption of symbolic structures and procedures, it is portrayed in these studies as a disembodied, abstract, and undifferentiated force. This literature attends to how the organizational response to legal mandates mediates the meaning of compliance but ignores how variation in the implementation of those legal mandates might mediate the nature of the organizational response. Socio-legal scholarship demonstrates that even the most formal legal mandates are implemented through a complex network of relationships between regulators and regulated entities (Hawkins, 1984; McAllister, 2007). Our study indicates that the nature of these relationships influences the way regulated entities understand and respond to their legal environments and that this will, in turn, influence the extent to which they integrate certain regulatory goals and ideals into their organizational practices.

Fourth, we demonstrate that there are important distinctions between the effects of sanctions and surveillance on organizational behavior that are not fully captured by either deterrence theory or the organizational literature on social control and cooperation. Although coercive regulatory threats appear to have dampened intrinsic motivations to self-regulate, surveillance had the opposite effect. Disclosing facilities in heavily monitored industries were more likely than those in less monitored industries to follow through on their commitments to self-regulate. Furthermore, even direct surveillance of individual facilities promoted effective implementation of self-regulation. We theorized this distinction to be due partly to a cuing or framing effect that accompanies threats of sanctions, but not routine surveillance, and partly to distinctions between individuals and organizations that are not fully fleshed out in the existing literature. For instance, whereas individual employees may view surveillance of their activities as "oppositional" (Langevoort, 2002: 96), employees who work in an organization's compliance group may see surveillance of the company's compliance activities as empowering and supportive of what they do (Ayres and Braithwaite, 1992). Surveillance may also provide a critical mechanism for

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validating organizational commitments to self-regulate. To establish cooperative or socially responsible behavior in competitive marketplaces, organizations must be able to make credible commitments and read the commitment levels of others (Frank, 1996; Campbell, 2007). Surveillance can help solve this commitment problem (Frank, 1996) by validating the efforts of successful self-regulators and distinguishing them from other firms. Though this study provides a framework for thinking about these issues, further research is needed to determine the extent to which the distinction we have identified between sanctions and surveillance holds more broadly.

Finally, we introduce possibilities for agency into institutional accounts from which agents have been largely lacking (DiMaggio, 1988; Fligstein, 2001). Our findings demonstrate that effective self-regulation is a product not only of structural conditions in organizations and environments but of what regulators do. This has important practical and theoretical implications. As a practical matter, our findings provide tools that regulators can use to implement enforcement schemes that seek to leverage the self-regulating capacities of regulated organizations. As a theoretical matter, this approach helps to bridge organizational literatures on internal compliance structures, social control of individuals, and social control of organizations that have much to learn from one another. As regulators increasingly turn to voluntary and cooperative strategies to achieve regulatory goals, these bodies of scholarship can provide key insights into the mix of incentives and normative motivations that will most effectively shape organizational behavior.

## **Limitations and Future Research**

Our study has a number of limitations but also reveals several promising areas for future research. First, our dependent variable is mediated by the regulatory inspectors who cite violations and thus reflects the perceptions, cognitive biases, professional commitments, and relationships they bring to the task (Hawkins, 1984; McAllister, 2007). Nevertheless, we have reason to believe that these mediating factors do not impinge on our conclusions here. First, structurally, the EPA strictly segregates its office for voluntary programs from its field inspection operations to avoid any actual or apparent conflict of interest. Second, our interviews with individual inspectors revealed strong evidence against there being any systematic bias in favor of (or against) voluntary disclosers. Some inspectors reported that they did not even know whether the facilities they inspected were voluntary disclosers or not, and those that did know said that this knowledge had no impact on the way they conducted their inspections. An inspector with comparatively broad experience inspecting voluntary disclosers reported that, in his view, self-policing produced mixed results and thus necessitated ongoing scrutiny. Discussing the quality of compliance auditing by voluntary disclosers, he said, "It really varies. I've seen companies that took it to heart, but it didn't affect how we inspect them, and I've seen companies where they say, 'We're part of all these programs,' and found a lot of violations" (interview transcript #1, 2009). As another inspector

put it, "We look at everything and it makes no difference one way or the other" (interview transcript #5, 2009). Thus, although we cannot rule out the possibility that bias of one kind or another exists among inspectors, we are confident that it is neither prevalent nor systematic enough to undermine our conclusions.

Second, our findings on regulatory threats speak to the issue of regulatory style rather than to the optimal magnitude of penalties. For instance, it is possible that the prospect of very high penalties would provide sufficient extrinsic motivation for organizations to comply, obviating concerns about the effect of penalties or punitive style on other kinds of motivations. We could not address this issue because our models did not incorporate data on the size of penalties. Incorporating such data and modeling the effects of penalty magnitude on intrinsic motivations and the effective implementation of self-regulation are important projects for future research. But there are significant social and political constraints on the size of penalties, limiting regulators' practical ability to impose optimal fines for undesirable behavior. This certainly is the case in the U.S. environmental context (our research setting), where potential penalties are quite small relative to the potential benefits that regulated firms can reap from violating the law. These practical realities highlight the importance of our project, because the success of any regulatory scheme in which penalties are constrained will depend largely on the extent to which it can cultivate a sufficient level of "self-motivation to obey the law" (Akerlof and Dickens, 1982: 318).

Another potential limitation relates to our methodology. Although applying a difference-in-differences approach to a matched sample is viewed as a robust approach to program evaluation and has been used in many empirical studies, this approach does not explicitly correct for selection on unobservables. To the extent that unobservables are fixed over time, they are absorbed by the facility-level conditional fixed effects included in our regression specifications. Despite our matching on several factors that prior research has shown to determine Audit Policy adoption, as in all studies that rely on matching on observables, a hidden bias might remain in our estimates if unobservable, facility-level, time-varying shocks occur that are correlated with a facility's disclosure decision and compliance outcomes. To affect the inferences from our analysis, however, this would have had to occur disproportionately among the disclosers or the matched non-disclosers group. We have no reason to suspect that this concern seriously biases our results, but we acknowledge that it is a possibility.

Many questions remain for future research. First, although we have identified a number of conditions that contribute to the meaningful implementation of self-regulation, more work must be done to flesh out other organizational and environmental determinants. Such work should attend not only to the fixed and structural characteristics of organizations and their environments but to dynamic conditions created by social actors that create the legal environment in which organizations operate. Second, our finding that

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surveillance promotes effective self-regulation suggests the need for a more fine-grained analysis of different regulatory tools to examine their varying impacts on organizations' normative motivations. The regulatory tool kit has been expanding in recent years, and this demands both theoretical and empirical reconsideration of the relationship between different tools of social control and the intrinsic or normative motivations of their objects. Third, our findings suggest the need for a more explicit dialogue between the literatures on the social control of individuals within organizations and the legal control of organizations by regulators. We demonstrate here that theoretical insights from the former can predict outcomes in the latter, but a more sustained analysis of the relationship between the two is needed.

Finally, future research is needed to better understand the relationship between firms' poor past performance and their ability to effectively implement self-regulation. The most significant limitation of self-regulatory structures that we identified is their implementation at facilities with historically poor compliance performance. Facilities among this subset that voluntarily disclosed and committed to self-regulate improved more slowly than their non-disclosing counterparts. In this context, the adoption of self-regulatory structures appears to have retarded rather than accelerated compliance improvement, suggesting that self-regulation may not be an appropriate tool for reforming historically poor compliers. Self-regulatory technologies could be of more limited value if they prove incapable of transforming the practices of struggling organizations.

## **Commitment to Self-Regulate**

Many have argued that activating the self-regulating capacities of organizations is critical to maintaining legal compliance and achieving social goals in increasingly complex national and international regulatory regimes (e.g., Ayres and Braithwaite, 1992; Orts, 1995; Murray, 1999; Lobel, 2005). Our analysis suggests both the possibilities and the limitations of this approach to regulation. Although the self-regulatory commitments of some Audit Policy disclosers appear to have been merely symbolic, others appear to have followed through on their commitments to self-regulate, exhibiting improved compliance outcomes and suggesting that these organizations institutionalized the self-regulatory structures they pledged to adopt. We demonstrated that the nature and amount of regulatory pressure applied to regulated organizations, as well as the experience of these organizations in navigating their regulatory environments, affects the likelihood that they will follow through on their commitments to self-regulate. We showed that high levels of regulatory surveillance, at both the field and organizational levels, promote successful implementation of commitments to self-regulate, as does an enforcement posture that avoids direct regulatory threats. Self-regulation is not a one-size-fits-all solution, but it can play an important role in promoting compliance, especially when regulatory agents shape the legal environment in ways that encourage organizations to make good on their pledges to self-regulate.

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