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**DEPICTION OF THE REGULATOR-REGULATED ENTITY RELATIONSHIP
IN THE CHEMICAL INDUSTRY:
DETERRENCE-BASED V. COOPERATIVE ENFORCEMENT[‡]**

by Robert L. Glicksman* and Dietrich H. Earnhart**

Synopsis

For years, scholars and environmental policymakers have conducted a spirited debate about the comparative merits of two different approaches to enforcement of the nation's environmental laws – the coercive (or deterrence-based) and cooperative approaches. Supporters of the coercive model regard the deterrence of violations as the fundamental purpose of environmental enforcement. These supporters also regard the imposition of sanctions, which make it less costly for regulated entities to comply with their regulatory responsibilities and avoid enforcement than to fail to comply and run the risk of enforcement, as the most effective way for inducing regulated entities to comply with their regulatory obligations. Supporters of the cooperative approach to environmental enforcement focus more on compliance than deterrence. The cooperative approach, which emphasizes the provision of compliance assistance and incentives by regulatory agencies, operates on the premise that regulated entities react to a variety of motives that supply sufficient incentives to comply with regulatory obligations even without an overly punitive approach to enforcement. They contend that a coercive approach to enforcement may even be counterproductive if it engenders intransigence and ill will on the part of regulated entities.

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Few studies empirically test these competing theories about how best to induce environmental compliance. Our study, which is based on a survey we conducted of chemical manufacturing facilities that are regulated under the federal Clean Water Act, represents an effort to begin addressing the paucity of information on the effects of the two enforcement approaches on environmental compliance and behavior. Our study indicates that, although most of the respondents in our survey describe the relationships they have with their CWA regulators as generally either cooperative or coercive, they also report that some particular aspects of their relationships are more consistent with one enforcement approach, while other aspects are more consistent with the other enforcement approach. Our study calculates and interprets the correlations between all of the various aspects of the regulator-regulated entity relationship, especially the overall type of relationship – coercive versus cooperative. The results reveal only weak correlation between the various measures capturing the relationship between the regulator and the regulated entity. As an alternative means for depicting the weak connection between relationship aspects, we also cross-tabulate the responses to all possible pairs of relationship aspects. This analysis reveals less than complete overlap between the various measures capturing the relationship between the regulator and the regulated entity. We conclude that the relationship between a regulator and a regulated entity consists of multiple dimensions – no single underlying dimension seems to reflect all of the ways in which regulators and regulated entities interact.

The implications of these results for the debate over the impacts of the coercive and cooperative approaches to enforcement on behavior and performance are significant. Relationships between regulators and regulated entities tend to be multifaceted, with different aspects conforming to each of the two enforcement approaches. Environmental scholars and policymakers should recognize the nuanced nature of those relationships if they are to provide the most meaningful contributions to the ongoing debate over the impacts of coercive and cooperative enforcement approaches on the behavior and performance of regulated entities. Our study provides a starting point for delineating the various components of the regulator-regulated entity relationship.

I. INTRODUCTION

According to the U.S. Environmental Protection Agency (EPA), “[e]nvironmental laws and regulations are designed to protect human health and safeguard the environment. But they can achieve their purpose only when companies and facilities comply with requirements.”¹ Assuring compliance with environmental statutes, regulations, and the permit provisions that often apply them to individual regulated entities is therefore “a key operational goal of EPA and state environmental

¹U.S. EPA, STRATEGIC PLAN 2003, at 111. *See also* David L. Markell, *The Role of Deterrence-Based Enforcement in a Reinvented Federal/State Relationship: The Divide Between Theory and Reality*, 24 HARV. ENVTL. L. REV. 1, 5 (2000) (reporting the view of EPA’s Deputy Assistant Administrator of the Office of Enforcement and Compliance Assurance that “the importance of an effective compliance effort to the productive functioning of our environmental regulatory system is difficult to overstate”).

agencies.”² Unless regulated entities comply with the obligations imposed on them by the environmental laws, or are forced to answer for noncompliance, those laws will represent an impressive-looking edifice that in reality is little more than an empty lot fronted by a flimsy facade.

The question of how best to improve compliance rates by regulated entities, however, is not easily answered. As a group of researchers studying environmental compliance has put it, “[c]ompliance assurance is . . . among the most contentious issues in the post-2000 EPA policy agenda.”³ One component of any credible effort to assure regulatory compliance is a strong governmental enforcement presence. As Professor David Markell, an expert on environmental enforcement, has indicated, “EPA has long held, and continues to hold, the view that traditional, deterrence-based enforcement is an essential element of an effective environmental regulatory scheme.”⁴ Professor Joel Mintz, another expert on environmental enforcement, posits that “[e]nforcement is critical both as a control on firms and individuals who violate environmental standards and as a defense of the legitimacy of the governmental intervention that sustains voluntary compliance.”⁵ Congress has made an array of tools available to EPA to assist it in enforcing the federal pollution control laws. These tools include the authority to require regulated entities to keep record and submit reports to EPA and the right to inspect regulated facilities to gather information that may assist the pursuit of enforcement actions.⁶ If the government believes that noncompliance is occurring, it may initiate enforcement action, either through administrative proceedings or in court, in which it may seek to enjoin future noncompliance, impose civil or criminal penalties, or both.⁷ State environmental agencies typically have the same kinds of tools at their disposal.

²Mark Stoughton et al., *Toward Integrated Approaches to Compliance Assurance*, 31 ENVTL. L. REP. 11266, 11266 (2001).

³*Id.* at 11266. See also ROBERT L. GLICKSMAN ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 1000 (4th ed. 2003) (describing “increasing debate about ‘what works best’ in promoting compliance with environmental requirements”).

⁴Markell, *supra* note 1, at 10. See also David Markell, “Slack” in the Administrative State and Its Implications for Governance: The Issue of Accountability, 84 OR. L. REV. 1, 22 (2005) (quoting ENVIRONMENTAL LAW INST. ET AL., BEYOND ENFORCEMENT? ENFORCEMENT, COMPLIANCE ASSISTANCE, AND CORPORATE LEADERSHIP PROGRAMS IN FIVE MIDWEST STATES 2 (2003))[hereinafter Markell, *Slack*] (“[t]raditionally, compliance has been nearly synonymous with enforcement”).

⁵JOEL A. MINTZ, ENFORCEMENT AT THE EPA: HIGH STAKES AND HARD CHOICES 2 (1995). See also Clifford Rechtschaffen, *Promoting Pragmatic Risk Regulation: Is Enforcement Discretion the Answer?*, 52 U. KAN. L. REV. 1327, 1361 (2004) (contending that “enforcement resonates so strongly with the public because it is central to the legitimacy of the law. Enforcement is perceived as fundamental to the orderly working of the legal regime.”).

⁶See, e.g., 33 U.S.C. § 1318 (Clean Water Act); 42 U.S.C. § 7414 (Clean Air Act).

⁷See, e.g., 33 U.S.C. § 1319; 42 U.S.C. § 7413.

At the same time, some research on environmental enforcement has discerned “broad agreement at the federal and state levels that the traditional, exclusive reliance on penalty-based enforcement approaches to compliance assurance is inadequate.”⁸ That was the premise that fueled a shift in emphasis during the 1990s by both federal and state environmental agencies to “a more partnership-focused, less adversarial approach” that uses multiple tools to advance compliance assurance.⁹ EPA, for example, concluded that a penalty-based approach is reactive rather than proactive and is incomplete because it fails to reward voluntary compliance.¹⁰ Regulated entities and state officials joined in “sound[ing] the theme that an approach based on cooperation is more likely to produce compliance in many cases than an approach based on deterrence.”¹¹ During the 1990s, EPA responded to these calls for greater cooperation between the agency and regulated entities by adopting enforcement policies that are designed to provide a more flexible approach to inducing compliance with regulatory obligations by offering “compliance incentives” and “compliance assistance” to regulated facilities.¹² The results of EPA’s response is evident. In 1995, an

⁸Stoughton et al., *supra* note 2, at 11266.

⁹*Id.*

¹⁰Markell, *Slack*, *supra* note 4, at 53 (citing Michael M. Stahl, *Enforcement in Transition*, THE ENVTL. F., Nov.-Dec. 1995, at 19)).

¹¹GLICKSMAN ET AL., *supra* note 3, at 1000.

¹²Markell, *supra* note 1, at 14. Professor William Andreen explains the shift as follows:

In the early 1990s, EPA began to recognize a more explicit role for a cooperation-based approach to compliance. In doing so, EPA expanded its ability to provide compliance assistance to regulated entities. This has involved such things as workshops, seminars, on-site assistance, compliance guides, as well as the development of ten internet-based compliance assistance centers and the launch of a compliance assistance clearinghouse. At about the same time, EPA began to initiate a number of compliance incentive programs designed to encourage dischargers to self-audit their facilities and correct violations before they are discovered by government inspectors.

William L. Andreen, *Motivating Enforcement: Institutional Culture and the Clean Water Act*, ___ PACE ENVTL. L. REV. ___, ___ (forthcoming). See also Rechtschaffen, *supra* note 5, at 1332 (discussing EPA’s placement of greater emphasis beginning in the mid-1990s “on compliance assistance and compliance incentive methods and on integrating these tools with traditional enforcement methods,” including, in addition to the techniques referred to by Andreen, compliance assistance tools such as sector notebooks, hotlines, audit protocols, and checklists, and compliance incentive tools such as a policy to encourage compliance by small business); Markell, *Slack*, *supra* note 4, at 53-54.

“EPA defines compliance incentive policies as those policies that ‘encourage regulated entities to voluntarily discover, disclose and correct violations or clean up contaminated sites before they are identified by the government for enforcement investigation or response,’” while it defines compliance assistance as consisting of “information and technical assistance provided to the regulated community to help it meet the requirements of environmental law.” Markell, *supra* note 1, at 14 (quoting U.S. EPA, OPERATING PRINCIPLES FOR AN INTEGRATED

environmental enforcement expert wrote that “it seems most accurate to describe EPA’s enforcement practices as constituting, in the main, a deterrence system.”¹³ EPA’s subsequent commitment to the use of cooperative approaches to inducing compliance is reflected in a statement on its official website that “EPA’s enforcement efforts focus on assisting businesses and communities with compliance training and guidance.”¹⁴ Similarly, “it appears that many states have actually, to one extent or another, replaced traditional enforcement mechanisms with some form of cooperation-based strategy.”¹⁵ One explanation of this shift is the states’ desire to retain and attract business by holding out the promise of less rigorous, or at least less confrontational, enforcement.¹⁶

To confirm the distinction between the two enforcement approaches, a cooperative relationship is one in which government regulators provide flexibility to regulated facilities, including the provision of a variety of forms of compliance assistance. This assistance is designed to induce facilities to address noncompliance pro-actively. Within the coercive approach, regulators deter facilities from noncompliance by imposing sanctions without flexibility.

For all the debate that the recent emphasis on cooperative approaches to assuring compliance with the environmental laws has engendered, relatively little empirical research has been directed

EPA ENFORCEMENT AND COMPLIANCE ASSURANCE PROGRAM 8 (1996)). Compliance assistance includes “outreach,” “response to requests for assistance,” and “on-site assistance.”

¹³MINTZ, *supra* note 5, at 103.

¹⁴U.S. EPA, *Compliance and Enforcement*, <<http://www.epa.gov/eftpages/complianceenforcement.html>>.

¹⁵Andreen, *supra* note 12, at _____. See also Markell, Slack, *supra* note 4, at 22 (concluding that the states have shifted from deterrence-based enforcement to an “integrated compliance program” in which “deterrence-based enforcement is only one piece in a larger tool box of compliance-promotion approaches” to an even greater extent than EPA).

¹⁶See, e.g., Richard Webster, *Federal Environmental Enforcement: Is Less More?*, at 4 (manuscript on file with authors) (claiming that “[a]necdotal evidence suggests that states have moved away from deterrence-based enforcement towards compliance assistance because they want to be more attractive to new business and encourage existing businesses to stay or grow”). Compare *id.* at 6 (describing “suspicion among environmental groups that these [cooperative enforcement] initiatives merely provide cover for decreasing *de facto* environmental standards through enforcement”). More generally, Professor Andreen asserts that “[e]nforcement . . . is an attractive target, due to its obscurity for an administration or a Congress intent on undermining an Act with which it fundamentally disagrees”). Andreen, *supra* note 12, at _____.

Administrative law scholars have suggested that “[a]s regulators’ discretion increases, so does the potential for special interest groups to influence agency policy.” Mark Seidenfeld, *Bending the Rules: Flexible Regulation and Constraints on Agency Discretion*, 51 ADMIN. L. REV. 429, 459 (1999). That assessment may explain why regulated entities may prefer a cooperative to a coercive relationship with their regulators, given the greater flexibility that tends to inhere in the cooperative model of environmental enforcement. See *infra* notes 23-52 for a description of the manner in which the cooperative model differs from the coercive model of enforcement.

at a comparison of the traditional, deterrence-based (or coercive) enforcement approach and the cooperative enforcement approach to inducing compliance with environmental regulatory obligations.¹⁷ This article is designed to provide some insight into how regulated entities perceive the nature of their relationships with environmental regulators. In particular, the article reports on a survey that we, in collaboration with two other researchers,¹⁸ conducted of facilities in the chemical industry that are regulated under the National Pollutant Discharge Elimination System Permit (NPDES) program established by the federal Clean Water Act (CWA).¹⁹ The article addresses whether the individual respondents working at those facilities appear to characterize the facilities' relationships with CWA regulators as coercive or cooperative in nature by analyzing responses to a series of questions that relate to different aspects of the relationship between CWA regulators and regulated facilities.

Despite the dichotomy between coercive and cooperative approaches to inducing compliance with the environmental laws, it is clear that federal and state agencies rarely rely exclusively on one approach. As Professor Clifford Rechtschaffen stated recently:

While [the] distinctions [between coercive and cooperative approaches to enforcement] are significant and influence the enforcement policies of states and the federal government, it is also true that in practice, most environmental enforcement systems are a pragmatic combination of the two approaches. This is true to an even greater extent now as a result of recent reforms adopted by the EPA.

Numerous studies of agency enforcement demonstrate that most enforcers use a flexible, hybrid strategy that includes elements of both coercion and cooperation; few rigidly adhere to legalistic procedures.²⁰

¹⁷ At present the data available allow little to be said about the effect of diverting resources from deterrence-based enforcement to compliance assistance. There is good evidence that traditional deterrence-based enforcement encourages compliance. However, there is no systematic study of whether compliance assistance achieves success at individual facilities at the expense of overall compliance rates, as deterrence theory would suggest. Thus, to date, the states' shift to compliance assistance has been more of an act of faith than a rational policy choice.

Webster, *supra* note 16, at 8.

¹⁸ The other researchers associated with the survey are Don Haider-Markel, a political scientist at the University of Kansas and director of a survey center, and Tat Ebihara, a wastewater engineer with LFR Levine Fricke and formerly a professor at the University of Kansas.

¹⁹33 U.S.C. § 1342.

²⁰Rechtschaffen, *supra* note 5, at 1330.

A hybrid approach to improving compliance rates might be composed, for example, of an offer to provide compliance assistance to a particular regulated entity, coupled with a public threat of more frequent inspections.²¹

Given the broad discretion that statutes such as the CWA and state environmental laws typically vest in federal and state regulators, the agencies have a considerable range of choices at their disposal in deciding which mix of traditional, coercive enforcement techniques and cooperative ventures to apply in particular instances of known or suspected noncompliance.²² Insights into how regulated entities perceive the nature of their relationships with environmental regulators should facilitate future research into how regulated entities are expected to react under each type of relationship, which should assist environmental regulators in devising the mix of enforcement approaches that is most apt to result in desirable levels of compliance by regulated industries.

Part II of this article summarizes the theoretical debate over the advantages and disadvantages of both coercive and cooperative approaches to enforcement. It also describes the few empirical studies that directly compare the two approaches in the context of environmental regulation. Part III describes both the methods we used in administering our survey to facilities in the chemical industry regulated under the NPDES permit program and the results from our analysis of the survey responses. Our analysis of the survey responses reveals that most of the participants in our survey report that they have cooperative relationships with their CWA regulators. A closer look at their responses to a series of questions designed to elicit responses to various aspects of the regulator-regulated entity relationship, however, reveals that the relationship is unlikely to be distinctively either cooperative or coercive. Instead, the respondents in our survey of the chemical industry report that some components of their relationships are cooperative in nature, while others are coercive.

This conclusion has significant implications both in analyzing previous empirical studies on the effectiveness of coercive and cooperative approaches to enforcement and compliance and in designing and conducting future studies of this kind. Our conclusion that the relationship between an environmental regulator and a regulated entity consists of multiple dimensions suggests that, before assessing the effect of this relationship on environmental behavior and/or performance on the part of regulated entities, future researchers should measure the various characteristics of the relationship, rather than treat it in simplistic fashion as a monolithic reflection of one or the other approach to enforcement. Our survey questions reflect one attempt to describe the multifaceted nature of the relationship between the regulator and the regulated entity. Future research efforts should be able to build on and refine these initial efforts to provide a more accurate portrayal of the

²¹*Id.* at 1333.

²²*See, e.g., id.* at 1334 (quoting Robert H. Kuehn, *Remedying the Unequal Enforcement of Environmental Law*, 9 ST. JOHN'S J. LEGAL COMMENT. 625, 640 (1994)) (“few areas of the law invest more discretion in agency employees or are more hidden from the public’s view and oversight than an agency’s enforcement actions”).

impacts of coercive and cooperative approaches to environmental enforcement and compliance.

II. COERCIVE AND COOPERATIVE APPROACHES TO ENFORCEMENT IN CONTEXT: THEORY AND PRACTICE

The literature on environmental enforcement distinguishes between the coercive, or deterrence-based, and cooperative approaches to enforcement. We describe each of those approaches and summarize the arguments that have been made in favor of and against reliance on each approach. We also discuss the relatively skimpy body of empirical studies that have been conducted on the effectiveness of the two approaches. That discussion makes clear that much work remains to be done in comparing the impact that the coercive and cooperative enforcement approaches have on environmental enforcement. In this article, we begin to address the need for further empirical analysis that compares the two enforcement approaches. In particular, we provide a more complete assessment of the prevalence of the two approaches based on facility-level data. More important, we seek to identify the prevalence of a mixed approach by assessing multiple dimensions of any relationship between a regulator and the regulated entity. Based on our assessment, we demonstrate that a richer appreciation of this multi-dimensional relationship is needed before comparing the effectiveness of the two enforcement approaches, coercive versus cooperative.

A. The Theoretical Debate

A review of the legal, political science, and economics literature on environmental enforcement reveals a debate about the comparative efficacy of two different models of environmental enforcement – the coercive (or deterrence) model and the cooperative model. The difference between the two models essentially boils down to an emphasis on the use of sticks (the coercive or deterrence model) or carrots (the cooperative model).²³

1. *The Coercive Approach to Environmental Enforcement and Compliance*

The *coercive or deterrence model* “reflects the view that policing and deterring violations are the essential core of environmental agencies’ activities and that other compliance activities are either (1) secondary and dispensable or (2) second-best compromises made to accommodate the realities of limited resources.”²⁴ In its efforts to implement this approach, EPA traditionally “sought to identify significant violators and then pursued such violators through formal enforcement actions that sought to penalize the violators by imposing sanctions that exceeded the economic benefit the

²³See CLIFFORD RECHTSCHAFFEN & DAVID L. MARKELL, REINVENTING ENVIRONMENTAL ENFORCEMENT AND THE STATE/FEDERAL RELATIONSHIP 59 (2003).

²⁴Markell, *Slack*, *supra* note 4, at 22 (quoting ENVIRONMENTAL LAW INST., *supra* note 4, at 2).

violators reaped through non-compliance, while also requiring a timely return to compliance.”²⁵ As Professor Markell explains, “[k]ey elements of this model included: (1) monitoring compliance by the regulated community; (2) identifying violations; and (3) pursuing timely and appropriate enforcement actions against significant violators.”²⁶

The coercive model is premised on the idea that regulated entities are rational economic actors whose principal motivations include maximization of profits.²⁷ According to one recent account:

Two visions of the firm dominate the compliance literature. The first is the firm as a rational profit-maximizer, obeying the law only when it is in the firm's best economic interest to do so. Thus, violations occur when the perceived benefits of noncompliance exceed the anticipated cost of sanctions. This view of the firm is consistent with deterrence theory, which regulators have historically relied upon in developing their enforcement programs. The rational profit-maximizer view typically leads to the use of traditional enforcement techniques; namely, extensive government monitoring and inspections coupled with penalties for observed violations.²⁸

The deterrence model therefore postulates that decisions regarding compliance are based on self-interest; businesses comply when the costs of noncompliance outweigh the benefits of

²⁵*Id.* at 47.

²⁶*Id.* at 49.(citing U.S. GAO, ENVIRONMENTAL PROTECTION: MORE CONSISTENCY NEEDED AMONG EPA REGIONS IN APPROACH TO ENFORCEMENT 4 (2000), *available at* www.gao.gov/new.items/rc00108.pdf).

²⁷Although the CWA regulates facilities that discharge pollutants into surface bodies of water (point sources, as defined in 33 U.S.C. § 1362(14)), individuals or groups of individuals make decisions that ultimately result in the facility's compliance or noncompliance. The CWA subjects those who engage in certain kinds of violations to criminal penalties. *Id.* § 1319(c). Accordingly, a “rational” individual would also take into account as part of his or her decisionmaking process the potential personal consequences of decisions that bear on compliance, including the possibility of incarceration. This article does not address criminal prosecutions arising from alleged noncompliance with the CWA.

²⁸Timothy F. Malloy, *Regulation, Compliance and the Firm*, 76 *TEMPLE L. REV.* 451, 453-55 (2003). *See also* David B. Spence, *Can the Second Generation Learn from the First? Understanding the Politics of Regulatory Reform*, 29 *CAPITAL U. L. REV.* 205, 207 (2001) (stating that regulatory systems based on the deterrence model proceed on the premise, “consistent with the rational actor model of the firm, that compliance decisions were based on an expected value calculation. Firms would tend to comply with environmental regulations if the expected value of doing so was positive.”).

noncompliance.²⁹ The benefits of noncompliance with environmental regulations consist of money saved by not purchasing, installing, and operating pollution control equipment and training workers. The costs of noncompliance include any additional costs of coming into compliance once a violation is detected as compared to coming into compliance earlier, plus any penalties imposed for being found in violation, discounted by the probability that the violations will be detected. These costs can also include damage to the business's reputation,³⁰ potential tort liability,³¹ and legal system expenses.³²

The deterrence model proceeds on the premise that increasing the certainty and severity of penalties will deter noncompliance. Because regulated entities will comply with their legal obligations only when they are convinced that the government might detect and penalize noncompliance, a facility's compliance status depends on the likelihood that violations will be detected by those entitled to enforce regulatory obligations³³ and the severity of the sanctions that

²⁹Professor Michael Vandenburg has stated that:

the standard economic deterrence model has applied a rational choice analysis to enforcement compliance decision-making. Common formulations of the standard deterrence model assume that an individual will seek to maximize expected utility and thus will comply with an environmental law when the costs of noncompliance exceed the benefits. The costs of noncompliance are assumed to be the product of the certainty and severity of formal legal sanctions. Following this approach, individuals are not motivated to comply absent the threat of formal legal sanctions.

Michael P. Vandenburg, *Beyond Elegance: A Testable Typology of Social Norms in Corporate Environmental Compliance*, 22 *STAN. ENVTL. L.J.* 55, 61, 63-64 (2003).

³⁰*See, e.g.*, Jonathan M. Karpoff et al., *The Reputational Penalties for Environmental Violations: Empirical Evidence*, 48 *J. L. & ECON.* 653 (2005).

³¹*See, e.g.*, Michael P. Vandenburg, *The Private Life of Public Law*, 102 *COLUM. L. REV.* 2029, 2059 (2005) (arguing that the incentives to comply with environmental laws may derive from a variety of factors, including tort liability). *Cf.* Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 *DUKE L.J.* 795, 829 (2005) (asserting that “[f]irms might also be motivated [to comply with environmental regulations] by a desire to avoid the potential for future tort liability”). *But cf. id.* at 832 (claiming that, “although firms may try to control their environmental impact to avoid tort liability or to reap the public relations benefits of being perceived as ‘green,’ these incentives may not be enough to ensure compliance”).

³²*See* RECHTSCHAFFEN & MARKELL, *supra* note 23, at 60-61.

³³Under the CWA, both the government and private citizens (including environmental public interest groups) are authorized to initiate enforcement actions. 33 U.S.C. §§ 1319 (government enforcement), 1365 (private enforcement). This article does not address the role of citizen enforcement.

noncompliance may trigger.³⁴ The essential task for enforcement agencies, therefore, is to make penalties high enough and the probability of detection great enough that it becomes economically irrational for regulated entities to violate the law.³⁵ It is also necessary for regulated entities to perceive that there is a significant likelihood that the government will bring enforcement action when they are detected. In 1992, EPA described the four key elements of an effective enforcement program as follows: “(1) There is a good chance violations will be detected; (2) The response to violations will be swift and predictable; (3) The response will include an appropriate sanction; and (4) Those subject to requirements perceive that the first three factors are present.”³⁶

Under an enforcement approach based on the deterrence model,³⁷ an inspection of a facility

³⁴Robert A. Kagan et al., *Explaining Corporate Environmental Performance: How Does Regulation Matter?*, 37 L. & Soc'y 51, 61 (2003). The incentives will not operate in the same fashion for all regulated facilities. The benefits of noncompliance may be greater, for example, for a facility with high control costs than for a facility with low control costs. Thus, even if the likelihood of detection and the severity of the sanction are equal for both, it may be more “rational” for the facility with the higher avoided costs of compliance to decide not to take the steps necessary to come into compliance.

³⁵As one expert on environmental enforcement and compliance explains:

Economists who study firm compliance and deterrence invariably start with the “optimal penalty” model of Gary Becker. The basic insight of that seminal article is that potential offenders respond to both the probability of detection and the severity of punishment of being detected and convicted. Thus, deterrence may be enhanced either by raising the penalty, by increasing monitoring activities to raise the likelihood that the offender will be caught, or by changing legal rules to increase the probability of conviction. Becker's model ultimately leads to an “efficient” level of crime, whereby the marginal cost of enforcement is equated to the marginal social benefit of crime reduction.

Mark A. Cohen, *Empirical Research on the Deterrent Effect of Environmental Monitoring and Enforcement*, 30 ENVTL. L. REP. (ENVTL. L. INST.) 10245, 10245 (2000) (citing Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968)). Cohen also has characterized Becker's “seminal” article as “the starting point for virtually all subsequent economic analyses of crime and punishment.” Mark A. Cohen, *Environmental Crime and Punishment: Legal/Economic Theory and Empirical Evidence on Enforcement of Federal Environmental Statutes*, 82 J. OF CRIM. L. & CRIMINOLOGY 1054, 1063 (1992). Moreover, according to Cohen, “[m]odels of ‘optimal’ enforcement and penalties generally do not distinguish between civil and criminal remedies, since both impose costs on the offender that will be internalized into its decision calculus.” *Id.* Accordingly, the same considerations that govern decisions bearing on potential civil liability also may affect decisions bearing on the risk that the facility will be subjected to criminal fines.

³⁶Markell, *Slack*, *supra* note 4, at 50 (quoting U.S. EPA, OFFICE OF ENFORCEMENT, PRINCIPLES OF ENVIRONMENTAL ENFORCEMENT 2-3 (1992)).

³⁷Deterrence theory distinguishes between specific deterrence and general deterrence, though the distinction also applies to a cooperative enforcement approach. “*Specific deterrence* refers to the effect that an inspection or enforcement activity targeting a particular firm has on that firm's subsequent environmental performance.” Cohen, *supra* note 35, at 10246. *See also* Markell, *Slack*, *supra* note 4, at 51 (defining the goal of specific deterrence as

subject to environmental regulation may be conducted in an effort to detect violations and collect evidence for subsequent enforcement actions, not to provide compliance advice to the inspected entity.³⁸ Because increasing the incidence of government monitoring tends to be expensive, the proponents of the deterrence model “often argue that the best way to increase the effectiveness of enforcement of environmental laws as a deterrent to noncompliance is to increase the likelihood of conviction or the severity of the sanction.”³⁹ Supporters of the coercive approach claim that:

deterrence-based enforcement activity has provided a strong source of motivation for regulated entities. Fear of enforcement action and its attendant public embarrassment has caused many companies and facilities to move into compliance. Deterrence has prevented many noncomplying parties from gaining an unfair competitive advantage over those who comply. And it has helped drive the application of technologies that can improve business performance and profitability.⁴⁰

2. *The Cooperative Approach to Environmental Enforcement and Compliance*

An alternative model of environmental enforcement is the *cooperative model*. According to one account, this model is a “reaction to the adversarial enforcement methods suggested by the deterrence model.”⁴¹ The cooperative model emphasizes compliance, not the deterrence of noncompliance. Accordingly, the primary function of an inspection may not be, as it is under the deterrence model, to accumulate evidence of violations for subsequent enforcement actions, but rather to provide advice to regulated entities as a means of facilitating compliance. Under this

ensuring that “the specific violator pursued through an enforcement action will learn its lesson and not violate again”). General deterrence captures corporate responses to the underlying “threat” of receiving a government intervention. It involves deterring the broader regulated community from noncompliance. RECHTSCHAFFEN & MARKELL, *supra* note 23, at 60-61. See also Cohen, *supra*, at 10246 (stating that “[g]eneral deterrence refers to the effect of an enforcement activity on the behavior of a large number of persons or firms”); Markell, *supra*, at 51 (describing the goal of general deterrence as ensuring that “other regulated parties will take heed of the government’s enforcement presence and activity and will be more likely to comply with their legal obligations as a result”). The preceding literature focuses almost exclusively on general deterrence. Consistent with this focus, we also consider only general deterrence.

³⁸The federal government may pursue enforcement action under the CWA without having conducted a prior inspection. If a report that is submitted by a polluting facility to its regulator demonstrates on its face that its pollution levels have exceeded the levels authorized in its NPDES permit, an inspection is not necessary to provide evidence of noncompliance.

³⁹Vandenburgh, *supra* note 29, at 64-65.

⁴⁰Markell, *Slack*, *supra* note 4, at 52.

⁴¹Vandenburgh, *supra* note 29, at 61.

approach, an inspection serves largely as an opportunity to resolve problems.⁴² Cooperative enforcement approaches have been described as an example of “negotiate and control,” as compared with the traditional “command and control” environmental regulatory regime with which coercive enforcement has traditionally been associated.⁴³

Under both the coercive and cooperative models, facility inspections and enforcement actions serve as threats. Under the coercive model, the general deterrent effect of an inspection or an enforcement action of one facility derives exclusively from the threat it creates for other facilities that may be the subject of similar actions in the future. Under the cooperative model of enforcement, however, regulated facilities may be afforded more opportunities to avoid sanctions by resolving noncompliance before a penalty is assessed or other enforcement action pursued than under the coercive model. A cooperative regulator might even withdraw a pending sanction for past noncompliance once compliance has been achieved. Such a regulator may choose to refrain from sanctioning a facility that has violated its NPDES permit as a result of a cooperative history between the regulator and the facility. As a result, the cooperative approach “emphasizes flexible or selective enforcement that takes into consideration the particular circumstances of an observed violation.”⁴⁴ Indeed, “[l]evying penalties is seen as a mark of the [cooperative] system’s failure (to otherwise obtain compliance); compliance systems rely far more on rewards and incentives than penalties.”⁴⁵

A cooperation-based system of enforcement views corporations not as economic actors solely interested in maximizing profits, but as institutions influenced by a mix of civic and societal motives. This model postulates that corporations are generally inclined to comply with the law (although developing accurate measurements of such inclinations is problematic). According to some analysts of environmental regulation, corporations have internalized the general societal norms of

⁴²RECHTSCHAFFEN & MARKELL, *supra* note 23, at 70. Professor Rechtschaffen describes the kind of compromise that may result:

In one . . . initiative directed at steel "minimills," one EPA regional office announced that facilities would have six months within which to conduct self-audits and disclose violations under EPA's self-audit/disclosure policy. After those six months, multimedia inspection teams would inspect all nonauditing facilities and take appropriate enforcement action.

Rechtschaffen, *supra* note 5, at 1333.

⁴³Markell, *Slack*, *supra* note 4, at 56 (quoting David A. Dana, *The New “Contractarian” Paradigm in Environmental Regulation*, 2000 U. ILL. L. REV. 35, 37 (2000)).

⁴⁴John T. Scholz, *Cooperation, Deterrence, and the Ecology of Regulatory Enforcement*, 18 L. & SOC'Y REV. 179 (1984).

⁴⁵Clifford Rechtschaffen, *Deterrence vs. Cooperation and the Evolving Theory of Environmental Enforcement*, 71 S. CAL. L. REV. 1181, 1188 (1998).

environmental protection.⁴⁶ If businesses are generally committed to compliance with their regulatory obligations even without a coercive enforcement presence, the imposition of sanctions in the event that noncompliance occurs is not only unnecessary, but may even be counterproductive. A sanction-oriented response to noncompliance may make regulated entities resentful and less likely to cooperate with regulators in the future.⁴⁷ Such a shift in attitude may matter to regulators if it increases the intransigence of regulated facilities, thereby increasing the costs of monitoring compliance and pursuing noncompliance.⁴⁸ Although the presence of clear and well understood regulatory obligations (such as the effluent limitations contained in NPDES permits) may reduce the incidence of overcompliance, facilities regulated under the CWA may still choose to overcomply as a means of avoiding noncompliance that results from random variations in plant operations or unexpected events that may occasionally push a plant into noncompliance. A coercive response to these noncompliance events may breed especially strong resentment or ill will.

The environmental enforcement literature that supports the cooperative model of enforcement therefore tends to urge that regulators treat regulated entities found to be in noncompliance as “partners.” Regulated entities afforded such a regulatory reception, so the argument goes, will tend to respond more positively to suggestions and advice tendered by regulators on how to achieve

⁴⁶RECHTSCHAFFEN & MARKELL, *supra* note 23, at 215 (citing Keith Welks, Voluntary Compliance Measures in the United States 5 (Oct. 1996) (unpublished report for the North American Commission for Environmental Cooperation)).

⁴⁷*Id.* at 67-68. See also Raymond J. Burby & Robert G. Paterson, *Improving Compliance with State Environmental Regulations*, 12 J. OF POL'Y ANALYSIS & MGMT. 753, 756 (1993) (arguing that “[t]he overzealous use of deterrence can foster resentment and retaliation, leading regulated groups to apply political pressure to reduce enforcement or repeal the offending regulatory program”). Perhaps this willingness to apply political pressure on the part of regulated entities represents the most important weakness of a coercive enforcement approach. Our survey of chemical manufacturing facilities inquires whether or not the regulated entities had asked an elected official to help with a difference of opinion between the facility and the regulator in the preceding three-year period. Five percent of the sampled facilities had requested this assistance. (In addition, 19% of the sampled facilities had asked the supervisor of the facility’s water regulator to help with a difference of opinion between the facility and the regulator.)

⁴⁸See Sidney A. Shapiro & Randy S. Rabinowitz, *Punishment Versus Cooperation in Regulatory Enforcement: A Case Study of OSHA*, 49 ADMIN. L. REV. 713, 718-19 (1997) (claiming that, if the government imposes sanctions despite the belief of environmental managers that they have made good faith efforts to comply, “corporate officers may react by being less cooperative with regulatory agencies,” such as by refusing to identify new problems for regulators or contesting enforcement actions even if the firm's legal costs will exceed the size of the fine); Kagan et al., *supra* note 34, at 61-62 (citing to theorists who claim that “a uniformly aggressive style of regulation is likely to engender legalistic and political resistance”).

A risk exists “that too much deterrence will have the effect of stifling other socially desirable activities. Unlike street crime that has no social utility, most environmental offenses are byproducts of socially desirable production or distribution processes.” Cohen, *supra* note 35, at 10251. Of course, this risk of over-deterrence applies to both enforcement approaches, coercive and cooperative. However, the risk is greater within a coercive approach.

compliance than will entities saddled with a coercive enforcement presence.⁴⁹ Such a “partnership” should involve the use of flexible guidelines rather than uniform rules, an emphasis on before-the-fact prevention of violations instead of after-the-fact sanctions for noncompliance, the provision of compliance assistance by regulators.⁵⁰

Independent of the incentives for compliance provided by any enforcement approach, due to market forces, voluntary compliance may comport with a regulated entity’s self-interest. Compliance may result in cost savings for regulated entities because steps taken to assure compliance may also produce more efficient business operations by reducing waste management costs, reducing raw material acquisition costs, lowering energy costs, reducing insurance premiums in response to good compliance history, reducing the costs of borrowing if lenders regard those who comply as less risky investments, and reducing the likelihood of tort judgments or other third party liabilities. In addition, compliance may allow a firm to market itself as “green,” affording it competitive advantages. Finally, a good environmental performance record can attract capital from investors seeking to pour their money into “socially responsible” businesses.⁵¹ It is possible that these extra-regulatory factors provide a sufficient impetus toward compliant behavior that no regulatory presence is necessary, or at least that they do not provide a payoff in terms of incremental improvements in compliance that justify the cost of implementing an enforcement strategy.⁵² If an enforcement strategy is necessary for inducing compliance, a cooperative enforcement approach may resonate better with regulated entities given the facility’s willingness to respond to market signals for better environmental management. Use of a coercive enforcement approach may be more likely to generate resentment. Moreover, the use of a cooperative enforcement might even prompt polluting facilities to respond to market signals more strongly or at least increase the likelihood that a given facility will respond to those signals. This conjecture is speculative since no previous study examines this particular interplay.

⁴⁹RECHTSCHAFFEN & MARKELL, *supra* note 23, at 67-68.

⁵⁰See Raymond J. Burby, *Coercive v. Cooperative Pollution Control: Comparative Study of State Programs to Reduce Erosion and Sedimentation Pollution in Urban Areas*, 19 ENVTL. MGMT. 359, 361 (1995).

⁵¹RECHTSCHAFFEN & MARKELL, *supra* note 23, at 218-20.

⁵²Both coercive and cooperative approaches to enforcement require regulators to invest in monitoring and enforcement. It is possible that these costs will be greater under a coercive approach because regulators feel the need for more frequent inspections due to the lack of cooperation between regulators and regulated facilities and because enforcement action tends to be more frequent under a coercive approach. See Burby, *supra* note 50, at 360. On the other hand, the technical assistance that regulators provide on an ongoing basis under a cooperative enforcement regime may be even more costly than the costs of monitoring and enforcement incurred by coercive regulators. Cf. Douglas C. Michael, *Cooperative Implementation of Federal Regulations*, 13 YALE J. ON REG. 535, 543 (1996) (arguing that one of the prerequisites to a successful enforcement approach based on voluntary compliance is effective monitoring of regulated entities). Michael asserts that even if regulators choose a cooperative approach, “[r]esidual reliance on direct enforcement is necessary in a system of self-regulation.” *Id.* at 548.

3. *The Coercive Retort*

Supporters of the deterrence model, however, have been wary of claims that the cooperative approach is likely to engender higher levels of compliance and that deterrence-based enforcement is likely to be counterproductive. Professors Rechtschaffen and Markell provide a good summary of the arguments that have been made to rebut the contention that a coercive enforcement approach is counterproductive.

[A]s a general proposition, there are several reasons for skepticism about the argument that deterrence-based enforcement is counterproductive. First, this contention rests on certain suppositions about enforcement behavior, most notably that inspectors are rigid and legalistic, and respond to all violations with formal sanctions. . . . [T]hese assumptions . . . are belied by studies showing that enforcement personnel in fact eschew formal, legalistic actions, and instead rely heavily on informal negotiations (while using traditional sanctions as a backup) to achieve compliance. Second, the advocates of this position presuppose that most corporations are inclined to generally comply with law for civic or social reasons, an assumption that is problematic. . . . Third, the cooperative model underemphasizes the economic pressures for noncompliance. Coaxing and persuasion may be very productive when firms are making good-faith efforts to comply and have ample resources to do so. It is far less likely to work when compliance will have significant financial consequences for a firm.⁵³

Rechtschaffen and Markell also describe responses to the claim that considerations that bear on the normal conduct of day-to-day business actually provide regulated entities with sufficient incentives to comply even without the threat of sanctions, making enforcement unnecessary.⁵⁴ In other words, while the potential for more efficient operation may induce some firms to comply with their regulatory obligations voluntarily, some compliance measures will increase a firm's expenses, cutting against its willingness to comply without the pressures provided by enforcement action. Moreover, even if compliance makes business sense in the long-term, it may result in short-term financial losses that regulated firms are unwilling to bear, given the pressure for corporate management to provide immediate returns on shareholder investments. In addition, the benefits of being perceived as "green" may be less important to some firms than others; in particular, this factor may be a less significant inducement toward compliance for firms that do not directly market consumer products. In response to the claim that voluntary compliance may redound to the benefit

⁵³RECHTSCHAFFEN & MARKELL, *supra* note 23, at 231. A firm's ability to borrow money and the cost of borrowing may affect its willingness to invest in compliance.

⁵⁴Rechtschaffen and Markell, however, do not assess the possibility of a cooperative enforcement approach prompting a greater response to market forces or it being more effective in the presence of market forces for better environmental protection.

of a regulated firm in the stock market, the skeptics have responded that many regulated firms are not publicly traded, and therefore will not be affected by this factor. One argument applies only to a cooperative enforcement approach. Investors may not be impressed by the disclosure of a firm's noncompliance if they are not convinced that noncompliance will result in a strong governmental response, which may well be the case under a cooperative regime.⁵⁵

For these reasons and those noted above, critics of the cooperative approach suggest, regulated facilities are unlikely to achieve levels of compliance when these facilities are parties to a cooperative enforcement relationship, which deemphasizes sanctions and the threat of sanctions, as great as the levels of compliance achieved when facilities are parties to a coercive relationship, in which regulated facilities perceive regulators as inclined to initiate enforcement action that can adversely affect the firm's bottom line.

Another criticism of the cooperative approach is its tendency to reduce accountability and transparency. As Professor Markell has explained:

This reduction in accountability may manifest itself in at least three ways. First, regulated parties may gain additional leverage over the disposition of cases. Second, regulators may gain additional discretion to address cases as they believe appropriate – the surfeit of options may provide additional insulation from public oversight or scrutiny. Third, as indicated above, there is the possibility that the expanded tool box will reduce accountability in the sense that it will relieve pressure on regulators to produce traditional results. Because of these possible consequences, Professor [David] Dana and others have suggested that contractarian approaches are likely to benefit the regulated community and have the potential to disenfranchise the interested public, at least to some degree.⁵⁶

Related to the reduction of accountability and transparency, the cooperative approach has the potential to undermine what Rechtschaffen and Markell refer to as “the expressive function” of deterrence-based enforcement, in that enforcement action “gives voice to the public's desire to regulate and sanction undesirable behavior” by conveying “a set of meanings about environmental

⁵⁵RECHTSCHAFFEN & MARKELL, *supra* note 23, at 221-25. With this exception, the critics' responses to the role of market forces that is touted by supporters of the cooperative approach do not address the interplay between market forces and the type of relationship between the regulator and the regulated entities

Both regulators and investors may adjust their responses in accordance with the nature of the alleged noncompliance. Regulators operating under either a cooperative or coercive regime will tend to be more inclined to pursue enforcement actions for serious violations. Similarly, investors and potential investors may be more likely to respond negatively to reports of what they perceive to be serious instances of noncompliance than to reports of minor violations.

⁵⁶Markell, *Slack*, *supra* note 4, at 57.

violations that is very different from that communicated by an overly cooperative-oriented approach, with its emphasis on negotiation and conciliation. The message conveyed by deterrence reaffirms for the public that environmental statutes are important and that transgressions are something to be taken very seriously.”⁵⁷

4. *Summary of the Debate over the Coercive and Cooperative Approaches to Environmental Enforcement and Compliance*

In sum, scholars and environmental policymakers have conducted a spirited debate about the comparative merits of the coercive and cooperative approaches to enforcement of the nation’s environmental laws. Those who support the coercive model regard the deterrence of violations as the fundamental purpose of environmental enforcement. They regard enforcement actions whose goal is to impose sanctions that impose costs that exceed the economic benefits of noncompliance as the most effective way to induce regulated entities to comply with their regulatory obligations. In their view, the greater the likelihood and severity of the sanctions are, the greater the deterrent impact of enforcement activities will be. Under this view, the task for enforcement agencies is to make it economically irrational for regulated entities to violate the law, and a strong coercive presence by enforcement officials is the best way to accomplish that task. Supporters of the cooperative approach to environmental enforcement focus more on compliance than deterrence. The cooperative approach includes a larger dose of both compliance assistance and compliance incentives on the part of regulatory agencies. The cooperative approach to enforcement proceeds on the premise that regulated entities react to a variety of motives that include not only maximizing the bottom line, but also internalizing societal norms in favor of environmental protection, taking advantage of good compliance records to enable a firm to market itself as “green,” and creating an image of environmental responsibility that may attract investment. Indeed, the advocates of the cooperative approach contend, a coercive approach to enforcement may be counterproductive if it engenders intransigence and ill will on the part of regulated entities. The advocates of the coercive approach are skeptical of the significance of factors other than economically rational behavior in inducing compliance with regulatory obligations.

Theory aside, is there any empirical evidence to back the claims of either side of the debate about the comparative effectiveness of these differing approaches to environmental enforcement and compliance? That question is the focus of the next section.

B. Previous Empirical Studies of Coercive v. Cooperative Enforcement

⁵⁷*Id.* at 235-37.

To date, there is little empirical analysis on the use of cooperation-oriented strategies.⁵⁸ In particular, few studies examine the comparative efficacy of cooperation-oriented strategies. One article analyzing the use of the cooperative approach in regulation of water pollution in Canada states that “past studies that have hailed the merits of cooperative enforcement have offered surprisingly little by way of empirical support.”⁵⁹ There seems to be even less research that directly compares deterrence and cooperative strategies. According to Professor Rechtschaffen, “[t]he argument that cooperation works better than deterrence to achieve compliance with environmental law is unconvincing. Most fundamentally, it is largely untested. . . . [T]here is little in the way of empirical evidence that can be used in deciding which enforcement techniques approaches based on deterrence or cooperation are most likely to achieve regulatory goals.”⁶⁰ Most of the evidence is anecdotal.⁶¹

One researcher has relied on the fact that rates of compliance with water pollution controls are significantly lower in the pulp and paper industry in Canada, where the cooperative approach to enforcement is generally followed, than in the United States to conclude that the growing consensus in favor of cooperative enforcement is misplaced.⁶² Another researcher concluded that “[t]he best performing state programs [for nonpoint sources of water pollution] tend to be those that use a highly coercive approach, both with the private sector and in securing local government adoption and enforcement of pollution control regulations.”⁶³ Still others have concluded that the impact of the

⁵⁸*See, e.g.*, Shapiro & Rabinowitz, *supra* note 48, at 720 (arguing that there is “little evidence” to verify the assertion that agency cooperation with regulated entities will increase compliance).

⁵⁹Kathryn Harrison, *Is Cooperation the Answer? Canadian Environmental Enforcement in Comparative Context*, 14 J. OF POL'Y ANALYSIS & MGMT. 221, 223 (1995).

⁶⁰*See, e.g.*, Rechtschaffen, *supra* note 45, at 1205.

⁶¹Shapiro & Rabinowitz, *supra* note 48, at 720 (asserting that “[t]here is little empirical evidence on the relative effectiveness of cooperative and legalistic enforcement policies” and that “[m]ost of the evidence is anecdotal and open to dispute”).

⁶²Harrison, *supra* note 59, at 222 (asserting that “the conclusion that rates of compliance [with water pollution controls] are significantly lower in [the pulp and paper industry] in Canada [where the cooperative approach to enforcement is followed] than the United States casts doubt on the growing consensus in favor of cooperative enforcement”). Harrison also concluded that, “[i]n the case of the pulp and paper industry, the cooperative Canadian approach to enforcement has delivered disappointing results compared to the more adversarial U.S. approach. This study therefore casts doubt on the relatively untested assumption that cooperative enforcement is equally if not more effective than the adversarial approach.” *Id.* at 240.

⁶³Burby, *supra* note 50, at 368. *See also id.* (claiming that his study shows that EPA and the states “cannot expect to reduce nonpoint source pollution substantially through programs that lack coercion”). For purposes of the CWA, a point source includes “any discernible, confined and discrete conveyance . . . from which pollutants are or may be discharged.” 33 U.S.C. § 1362(14). Any source of water pollution that does not qualify as a point source is a nonpoint source, which the Act does not define. “According to the EPA, nonpoint source pollution is caused by diffuse sources that are not regulated as point sources and normally is associated with agricultural, silvicultural and

government's choice of enforcement strategies on compliance with regulatory obligations depends on the kind of regulatory standard at issue and that, in particular, the cooperative approach is better suited to inducing compliance with performance standards than with specification⁶⁴ standards.⁶⁵ Finally, a recent study by Professor Andreen concludes that compliance rates for major dischargers under the CWA "have remained stubbornly static" during the period during which many states have

urban runoff, runoff from construction activities, etc. In practical terms, nonpoint source pollution does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition, or percolation." *United States v. Plaza Health Labs., Inc.*, 3 F.3d 643, 652 n.3 (2d Cir. 1993) (citing EPA Office of Water, Office of Water Regulations and Standards, *Nonpoint Source Guidance 3* (1987)).

Although the CWA largely ignores nonpoint sources of water pollution, nothing in the statute prohibits the states from regulating them. *Cf.* 33 U.S.C. § 1370 (providing that nothing in the CWA precludes the states from imposing pollution abatement requirements more stringent than federal standards adopted under the CWA). If a state chooses to adopt enforceable restrictions for nonpoint sources, such as mandatory best management practices, it has the option of overseeing compliance with those restrictions pursuant to either a coercive or cooperative enforcement approach.

⁶⁴Both design (or specification) and performance standards typically specify a goal that takes the form of a mandatory cap (often expressed numerically) on discharges. Under the CWA, EPA derives this effluent limitation on the basis of its determination of the level of pollution control that it is feasible for a particular group of regulated entities to achieve. Specification and performance standards diverge, however, with respect to the degree of discretion afforded to regulated facilities in determining how to achieve the applicable effluent limitation. A design standard is one in which:

the agency defines the method by which regulated entities are required to achieve the goal – such as by installing and operating a particular kind of pollution control technology or work practice – whereas under a performance standard, regulated entities are free to achieve the goal any way they want. They can use the model technology or work practice identified by the agency as the one that makes compliance possible, or they can devise alternative means of meeting the goal. In theory at least, regulated entities subject to a performance standard have an incentive to develop such alternative means if they provide a more efficient means of achieving the regulatory goal.

Sidney A. Shapiro & Robert L. Glicksman, *Goals, Instruments, and Environmental Policy Choice*, 10 *DUKE ENVTL. L. & POL'Y F.* 297, 305 (2000). Performance standards, not specification standards are the norm under the federal pollution control laws, including the CWA. *Id.* at 306.

⁶⁵According to Burby and Patterson, "[w]hile deterrence of violations through monitoring and inspections stimulates compliance with both specification and performance standards, building commitment and capacity to obey the law through a cooperative approach to enforcement has much more impact on the degree of compliance attained for performance standards than for specification standards." Raymond J. Burby & Robert G. Patterson, *Improving Compliance with State Environmental Regulations*, 12 *J. OF POL'Y ANALYSIS & MGMT.* 753, 754 (1993). *See also id.* at 766 (arguing that "[d]eterrence measures provide a needed backstop for dealing with recalcitrant firms who evade regulatory requirements for financial gain or merely through sloth or incompetence").

“replaced traditional enforcement mechanisms with some form of cooperation-based strategy.”⁶⁶ He concludes based on that evidence that “[t]he new, more flexible approach has not improved rates of compliance.”⁶⁷

While these studies help to inform our understanding of cooperative enforcement strategies, they represent only rudimentary steps. In particular, only one of these studies gathers facility-specific data on the type of relationship between regulators and regulated entities. As important, none of these studies considers this relationship as consisting of multiple dimensions. In this article, we examine both of these aspects. In particular, we distinguish between the relative presence of one enforcement approach or the other by assessing multiple dimensions. In this regard, we demonstrate in reality that no single type of approach exists for any given facility. Instead, the relationship is represented by shades of gray. This assessment demonstrates that an accurate depiction of the regulator – regulated entity relationship should precede any analysis of the comparative efficacy of coercive and cooperative enforcement regimes.

III. COERCIVE V. COOPERATIVE ENFORCEMENT IN THE CHEMICAL INDUSTRY

In light of the sharp debate between those who advocate moving away from a traditional deterrence-based approach to achieving compliance with environmental statutes such as the CWA and those who are skeptical that such a shift will improve compliance, it would be useful to know more about what kinds of relationships actually exist between point sources regulated under the CWA. Our study attempts to shed light on this debate. To do so, we designed and implemented a survey of regulated facilities in the chemical industry, which includes a series of questions that require the respondents to characterize the nature of their relationship with CWA regulators and certain aspects of their interactions with regulators. In particular, our survey includes a series of questions that are designed to indicate whether a particular respondent has a cooperative or a coercive relationship with state or federal regulatory authorities. This section of the study describes the methods that we used to elicit responses to these questions. It also describes our analysis of the survey responses and the implications of our analytical results on any future research that examines the comparative advantages and disadvantages of the coercive and cooperative approaches to environmental enforcement.

A. Survey Sample Selection and Respondent Participation

Our analysis relates to the relationships between CWA regulators and point sources in the chemical industry whose discharges are subject to effluent limitations set forth in NPDES permits. We choose the industrial sector of chemical and allied products as the focus of our study because it

⁶⁶Andreen, *supra* note 12, at 19.

⁶⁷*Id.*

serves as an excellent vehicle for examining the efficacy of government interventions on corporate environmental performance. EPA has demonstrated a strong interest in this sector,⁶⁸ and regards one of the sub-sectors, industrial organics (SIC-code 2869), as a priority industrial sector.⁶⁹ The chemical industry is responsible for a significant portion of the nation's industrial output and a significant portion of all wastewater discharges by facilities subject to CWA regulation. Nevertheless, the chemical industry is not necessarily representative of all industrial sectors. Indeed, its unique attributes contribute to our interest in studying it. Some firms in the chemical industry, for example, have demonstrated an interest in promoting pollution reduction and prevention through efforts prompted by the Responsible Care program, which is a voluntary management initiative supported by the American Chemical Council.⁷⁰

The original population of facilities chosen for administration of our survey⁷¹ is drawn from EPA's PCS database as of September, 2001.⁷² This original population includes 2,596 chemical facilities, which were supposed to have NPDES permits for pollution discharge into water. Of these facilities, 499 were designated as major facilities and 2,097 as minor facilities. We included in the survey sample only facilities that met the following criteria: (1) they were still in operation as of 2002; (2) they held an NPDES permit; (3) they discharged regulated pollutants into surface water bodies; and (4) their contact information was available from either EPA or alternative sources, such as phone books.

After excluding the facilities that did not fit the relevant criteria, the population surveyed is 1,003 facilities. From this group of eligible respondents, 267 facilities completed at least 90 percent of the survey, implying a survey response rate of 26.6 percent. Although this rate may seem fairly low, it is comparable to previous large-scale surveys of industrial sectors.

⁶⁸See, e.g., Environmental Protection Agency & Chemical Manufacturers Association, *Root Cause Analysis Pilot Project*, Doc. No. EPA-305-R-99-001 (May 1999); Environmental Protection Agency, *Chemical Industry Environmental Baseline Report, 1990-1994*, Doc. No. EPA-305-R-96-002.

⁶⁹See, e.g., Paul S. Farber et al., "EPA's Multi-Media Enforcement & Inspection Program," in *A Survival Guide to Multimedia Inspections*, 10 ENVTL. PROT. MAG. No. 1 (1999), available at <http://www.kerleyink.com/technology/MULTI-ME.htm>

⁷⁰See <http://www.dow.com/commitments/care/> (describing Responsible Care, "a voluntary initiative within the global chemical industry to safely handle our products from inception in the research laboratory, through manufacture and distribution, to ultimate disposal, and to involve the public in our decision-making processes").

⁷¹The survey questionnaire was developed with the assistance of Mark Cohen, the Director of the Vanderbilt Center for Environmental Management. The survey was pre-tested with a sample of 20 facilities in the Kansas City metropolitan area. For a full copy of the survey, see *EPA Grant Facility Survey, Spring 2002*, <http://www.ku.edu/pri/CEP/EPA/surveyinstrument.pdf>.

⁷²The PCS database includes data on inspections performed by federal and state regulators and on enforcement actions taken by federal administrative agencies and courts.

We find no systematic state or regional bias in participation when we compare the original sample of 1,003 potentially eligible facilities to the 267 facilities that actually completed the survey. For example, only the Midwest region is slightly over-represented in the response group, and only the Northeast region is slightly under-represented. These differences, however, are small. In addition, across most of the states the difference between representation in the original sample and representation in the response group averages less than two percent. There is some difference in the participation of major versus minor facilities. In the original sample, 69 percent of facilities are minor facilities and 31 percent are major facilities. In the group of survey respondents, major facilities are slightly over-represented at 39 percent. Because this difference is significant, we choose not to compare the responses of major and minor facilities.⁷³

B. Tabulation and Interpretation of the Survey Responses Relating to Coercive v. Cooperative Enforcement

Our survey includes a series of questions that are designed to indicate whether a particular respondent has a cooperative or a coercive relationship with state or federal regulatory authorities. The question that most directly solicits information about the nature of the relationship between CWA regulators and regulated facilities simply asks the respondents to characterize the manner in which the water regulator with whom they typically work treats the facility and its employees. The categories are “generally coercive,” “generally cooperative,” and “don’t know.” As Table 1 below indicates, only 2.7% state that the relationship is “generally coercive,” while 96.2% state that it is “generally cooperative.” Obviously, the vast majority of the respondents regard their relationships with their principal regulators as cooperative.

Other survey questions solicit responses about particular aspects of the relationship between regulators and regulated entities that we regard as relevant to whether those relationships are generally cooperative or generally coercive. In one question, we ask each respondent to characterize the manner in which the regulator with whom it typically works treats the facility and its employees. The categories are “always fair,” “sometimes fair, sometimes unfair,” “always unfair or arbitrary,” and “don’t know.” We consider the first category to be more indicative of a cooperative relationship than the second and the second to reflect a more cooperative relationship than the third. As indicated in Table 2 below, no respondent reports that the treatment is always unfair, 18.8% of the respondents report that it “sometimes fair, sometimes unfair,” and 80.1% report that it is “always fair.” Thus,

⁷³Other statistical analysis indicates that only the distinction between minor and major facilities proves important for explaining whether or not a contacted facility completed the administered survey. This statistical analysis demonstrates that neither the preceding history of inspections nor the preceding enforcement actions against a particular facility explains whether or not a contacted facility responded to the survey. Moreover, the analysis demonstrates that the decision to respond is not explained by the EPA region in which a particular facility resides. Thus, even if the threat of inspections and enforcement actions varies across EPA regions, this variation does not explain whether or not a contacted facility responds to the survey. (The analysis is not able to control for variation across states in a similar fashion given the large number of individual states, relative to the sample size.)

most of the respondents appear to perceive of their relationships with regulators as more cooperative than coercive as indicated by their assessment of treatment, but the percentage of respondents is lower than the percentage based on the most direct assessment of the overall relationship.

An additional question focuses on whether the regulated facility typically works with a federal or state water regulator. Our conjecture is that regulated facilities may tend to work more cooperatively with state regulators than with federal regulators because state regulators tend to work closer to the regulated facility. Regulated facilities may be more concerned about maintaining cooperative relationships with regulators who are part of the same community in which they live and work. As Table 3 below indicates, 96.2% of the respondents report that their facility typically works with state regulators, while only 1.2% report that they typically work with federal regulators.⁷⁴

Another question inquires whether the facility typically works with the same individual water regulator, or multiple regulators that vary with the circumstances. We posit that regulated entities typically will find it easier to maintain a cooperative relationship with a single regulator than with multiple regulators whose approaches to compliance may differ and who may not understand the facility's past compliance history. Table 4 below indicates that 56.3% of the respondents report that they typically work with the same regulator, while 41.8% report that they typically work with multiple regulators.

An additional question inquires whether or not, over the past three years, anyone in the facility asked the supervisor of the facility's water regulator to help with a difference of opinion between the facility and the regulator. We regard a negative answer as reflecting less friction between the regulator and the facility than a positive answer. A positive answer may reflect a sign that a previously cooperative relationship has gone sour.⁷⁵ Thus, a negative response indicates a cooperative relationship. As Table 5 below reveals, 79.5% of the respondents state that their facility did not seek help from the supervisor of the regulator, while 18.3% state that the facility did so. Thus, for at least a sizeable chunk of the facilities, there appears to have been some period of non-cooperation, or at least a difference of opinion, between CWA regulators and regulated facilities.

A related question inquires whether or not, over the past three years, anyone at the facility asked a local, state, or federal elected official to help the facility with a difference of opinion between the facility and a water regulator. We regard a negative answer as more reflective of a cooperative relationship than an affirmative answer, for reasons described in connection with the previous

⁷⁴The predominance of state regulators reflects the fact that EPA has delegated NPDES permitting authority to state environmental agencies in most states. According to EPA's website, only five states have not received authority to administer at least some aspect of the NPDES permit program. See *National Pollutant Discharge Elimination System; State Program Status*, <<http://cfpub.epa.gov/npdes/statestats.cfm> (last visited Jan. 9, 2006)>.

⁷⁵Alternatively, the appeal to a regulator's supervisor may represent an effort by the regulated facility to escape the adverse consequences of a pre-existing coercive relationship with a non-responsive regulator.

question. As Table 6 below indicates, more than 94% of the respondents report that no one contacted an elected official to help with a difference of opinion between a regulator and the regulated facility. Only 4.6% report that the facility made such a request. Of those respondents who report that they contacted an elected official, a follow-up question inquires whether the official was most often a local official, a state official, or a federal official. Twenty-three and a half percent of the relevant respondents report that the elected official contacted by the facility was most often a local official; 41.2% report that it was a state official; only 5.9% report that it was a federal official.

The final question in this portion of the survey attempts to discern indirectly the type of relationship existing between the regulator and the regulated entity based on a specific hypothetical scenario. This question inquires how likely it is that the respondent's facility would allow regulators access to plant facilities if they arrived unannounced. The categories are "always likely," "likely," "somewhat likely," "not at all likely," and "don't know." The more likely the respondent is to allow unannounced access, the more cooperative we regard the relationship as being between that respondent's plant and the CWA regulator. As Table 7 below indicates, 90% of the respondents report that it is "always likely," while none say it is "not at all likely." These responses provide some evidence that companies are willing to cooperate with regulators performing unannounced inspections.

In addition to the set of questions that reflect on relations between the regulator and the regulated entity either directly or indirectly, the survey asks a pair of questions that relate to the respondents' individual attitudes on the value of regulation.⁷⁶ The first question in this pair asks whether each respondent, on the whole, thinks it should or should not be the government's responsibility to impose strict laws to make industry do less damage to the environment. The categories are "definitely should be," "probably should be," "probably should not be," "definitely should not be," and "don't know." We regard an individual who thinks it is the government's responsibility to impose such laws to be more likely to cooperate with its facility's regulator than one who does not think so. As Table 8 below indicates, 56.7% of the respondents report that it "definitely should be," while 35.2% report that it "probably should be." Only a total of 6.1% of the respondents report that it "probably should not be" or "definitely should not be."⁷⁷

⁷⁶The questions discussed so far in this article focus on various aspects of the *facility's* relationship with its regulator. This group of questions focus on the *individual respondent's* attitudes toward government regulation and the likelihood of compliance by facilities in the absence of regulation.

⁷⁷It is not unusual to portray corporate officials as resenting the intrusion of government officials into their business affairs, particularly when the officials are seeking to force the business to undertake activities that have the potential to reduce corporate profitability. The very high percentage of respondents who answer this question affirmatively ("definitely should be" or "probably should be") therefore may seem surprising. The results here might be due to the fact that most of those answering the survey were environmental managers, who are perhaps likely to feel that their jobs are important, so that compliance with environmental regulations is important, too. These attitudes may or may not reflect the views of others at the facility.

The second question in this pair inquires how much the respondents agree or disagree with the statement that "Companies will behave responsibly when it concerns environmental protection, regardless of government regulation." The categories are "strongly agree," "agree," "neither agree or disagree," "disagree," "strongly disagree," and "don't know." We regard those who "strongly agree" or "agree" as more likely to be willing to cooperate with regulators than those who do not. As Table 9 below indicates, 11.5% of the respondents "strongly agree" with the statement, 28.7% "agree," 9.6% "neither agree nor disagree," 37.5% "disagree," and 11.1% "strongly disagree." Thus, a total of 48.6% of the respondents disagree to some extent with the notion that industry would behave responsibly in the absence of government regulation. Only 40.2% of the respondents agree. In part, the respondents may believe that, even though their facilities would prefer to behave responsibly even in the absence of government regulation, their competitors might not do so, and if they do not, those competitors will gain an advantage in the market as a result of their avoidance of environmental control costs. Thus, regulation is necessary to provide a level playing field.⁷⁸

Together with the responses to the previous question about the government's responsibility to regulate, these responses seem to indicate agreement among many of the respondents that government regulation of activities that create risks of environmental harm is not only legitimate but necessary. That result is consistent with other survey results, in which half of corporate environmental managers agreed that federal enforcement is inadequate, and that more effective enforcement is necessary to insure equal treatment for all regulated entities.⁷⁹ It is also possible to read the responses to these two questions as an expression of fairly solid recognition among the industry respondents of the utility of a coercive enforcement presence, in the absence of which dischargers might have decreased incentives to comply with regulatory obligations.⁸⁰

The next subsection compares the responses to the individual questions that relate directly or indirectly to the relationship between the regulator and the regulated entity.

C. Correlations and Cross-Tabulations

⁷⁸Professor Plater reports that "one candid executive once said to me: Actually, we all need mandatory government regulations to give us a compelling reason to do the right thing and make sure our competitors do too; 'Good fences make good neighbors.'" Zygmunt J.B. Plater, *Dealing with Dumb and Dumber: The Continuing Mission of Citizen Environmentalism*, 20 J. ENVTL. L. & LITIG. 9, 31 (2005).

⁷⁹See Robert R. Kuehn, *The Limits of Devolving Enforcement of Federal Environmental Laws*, 70 TUL. L. REV. 2373, 2387 (1996).

⁸⁰On the other hand, those who conclude that the government has legitimate environmental protection responsibilities, and that companies will not behave responsibly in the absence of government regulation, might be more willing to cooperate with regulators than those who think government regulation is illegitimate and unnecessary. Some respondents may even believe that a government enforcement presence is legitimate and necessary in the abstract, but still react in a hostile and non-cooperative manner when the facility in which they work becomes the focus of enforcement action.

This sub-section compares the responses to the individual questions relating directly or indirectly to the relationship between the regulator and the regulated entity, which are described above. In particular, this subsection calculates and interprets the correlations between all possible pairs of responses, *e.g.*, correlation between the overall type of relationship – coercive versus cooperative – and the treatment of a regulated entity by its regulator. The subsection also cross-tabulates the responses to all possible pairs of questions and interprets these cross-tabulations. This analysis demonstrates that the relationship between a regulator and a regulated entity consists of multiple dimensions. In other words, no single underlying dimension seems to reflect all of the responses.

First, we calculate and interpret the correlations between all possible pairs of responses. Table 10 reports the Pearson pairwise correlation coefficients. In general, these statistics reveal only weak correlation between the various measures capturing the relationship between the regulator and the regulated entity. Of the 21 pairwise correlations, only six are positive and statistically significantly different from zero (*i.e.*, the p-value associated with the correlation coefficient is no greater than 0.10). Of these significantly positive correlations, the largest magnitude is only 0.35, indicating limited connection between these pairs of responses. As important, five of the correlations are actually negative though the coefficients are insignificantly different from zero. The remaining 10 correlations are positive but insignificantly different from zero.

Second, we cross-tabulate the responses to all possible pairs of questions and interpret these cross-tabulations. To facilitate the creation and interpretation of the cross-tabulations, we collapse each response into two categories, while excluding the “don’t know” responses. In this way, each response cleanly divides responses into indicating the presence of either a “coercive relationship” or a “cooperative relationship”. Disregarding the exclusion of “don’t know” responses, this re-arrangement affects only two individual questions and responses:

- (1) Treatment of the Regulated Entity by its Regulator:
Always Fair (“Cooperative”) versus Sometimes Fair, Sometimes Unfair (“Coercive”);
- (2) Likelihood of Allowing Regulators Access to Plant Facilities without Announcement:
Always Likely (“Cooperative”) versus Likely or Somewhat Likely (“Coercive”).

Table 11 reports the resulting cross-tabulations. As with the correlation coefficients, in general, these statistics reveal less than complete overlap between the various measures capturing the relationship between the regulator and the regulated entity. To demonstrate this point, our analysis focuses on the cells of each cross-tabulation that demonstrate a conflict in the classification of the regulator-regulated entity relationship based on the two measures of this relationship, *i.e.*, one measure indicates a coercive relationship, while the other measure indicates a cooperative relationship. These conflicting cells are shown as the off-diagonal elements of each two-by-two table.

We begin our interpretation with those cross-tabulations that involve the overall relationship between the regulator and the regulated entities – coercive versus cooperative. Tables 11.d, 11.l, 11.m, 11.p, 11.s, and 11.t reports these cross-tabulations. As shown in these tables, in some respects, those who report that they generally have cooperative relationships also report that particular aspects of their relationships are more consistent with a coercive than with a cooperative relationship. The converse is also true: those who report that they have coercive relationships, nevertheless describe some aspects of their relationships with regulators in a manner than seems to reflect cooperation. For example, Table 11.m reports the cross-tabulations between the overall regulator-regulated entity relationship and the type of interaction with the regulator – same individual regulator versus multiple regulators. As shown, a rather large portion of the respondents (41%) provide conflicting indications of the relationship between the regulator and the regulated entity. Moreover, of those facilities experiencing a coercive relationship, 29% are nevertheless working with the same individual regulator. As stronger evidence, of those facilities working with multiple regulators, 95% nevertheless experience a cooperative relationship.

To complete our analysis, we systematically interpret each of the 21 pairwise cross-tabulations shown in Table 11. In particular, Tables 11.a through Table 11.f report the cross-tabulations that involve the likelihood of allowing regulators access to plant facilities without announcement. Table 11.a reports the cross-tabulation between the likelihood of allowing regulators access to plant facilities without announcement and the typical type of regulator – state versus federal. As shown, only 10% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Yet, of those facilities working mostly with a federal regulator, 67% are still “always likely” to allow access to their plant operations in response to an unannounced visit. As stronger evidence, of those facilities who were not “always likely” to allow access, 96% still work mostly with a state regulator.

Table 11.b reports the cross-tabulation between the likelihood of allowing regulators access to plant facilities without announcement and the type of interaction with the regulator – same individual regulator versus multiple regulators. As shown, 43% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As similar evidence, of those facilities working with multiple regulators, 90% are still “always likely” to allow access to their plant operations in response to an unannounced visit. Of those facilities who were not “always likely” to allow access, 54% still work with the same individual regulator.

Table 11.c reports the cross-tabulation between the likelihood of allowing regulators access to plant facilities without announcement and the treatment of the regulated entity by its regulator. As shown, 26% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As much stronger evidence, of those facilities not receiving “always fair” treatment, 94% are still “always likely” to allow access to their plant operations in response to an unannounced visit. Of those facilities who were not “always likely” to allow access, 88% still receive “always fair” treatment.

Table 11.d reports the cross-tabulation between the likelihood of allowing regulators access to plant facilities without announcement and the overall relationship. As shown, 12% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Despite this limited evidence, of those facilities in a coercive relationship, 100% are still “always likely” to allow access to their plant operations in response to an unannounced visit. Of those facilities who were not “always likely” to allow access, 100% still maintain a cooperative relationship.

Table 11.e reports the cross-tabulation between the likelihood of allowing regulators access to plant facilities without announcement and the request for assistance from the regulator’s supervisor. As shown, 25% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As stronger evidence, of those facilities that requested assistance, 90% are still “always likely” to allow access to their plant operations in response to an unannounced visit. And, of those facilities who were not “always likely” to allow access, 79% still found no need for assistance.

Table 11.f reports the cross-tabulation between the likelihood of allowing regulators access to plant facilities without announcement and the request for assistance from an elected official. As shown, 13% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As much stronger evidence, of those facilities that requested assistance, 83% are still “always likely” to allow access to their plant operations in response to an unannounced visit. As important, of those facilities who were not “always likely” to allow access, 92% still found no need for assistance.

Tables 11.g through Table 11.k report the remaining cross-tabulations that involve the typical type of regulator – state versus federal. This set of cross-tabulations does not as strongly reveal an incomplete overlap between the measures capturing the regulator-regulated entity relationship because the number of respondents working mainly with a federal regulator is so small: only three facilities. Table 11.g reports the cross-tabulation between the typical type of regulator – state versus federal – and the type of interaction with the regulator – same individual regulator versus multiple regulators. As shown, 41% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Of those facilities that work with multiple regulators, 98% are still working mostly with a state regulator. (No facilities work with the same federal regulator.)

Table 11.h reports the cross-tabulation between the typical type of regulator – state versus federal – and the treatment of the regulated entity by its regulator. As shown, 19% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As stronger evidence, of those facilities not receiving “always fair” treatment, 98%

are still working mostly with a state regulator. Of those facilities who work mostly with a federal regulator, 50% still receive “always fair” treatment.

Table 11.i reports the cross-tabulation between the typical type of regulator – state versus federal – and the overall relationship. As shown, only 4% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Yet, of those facilities experiencing a coercive relationship, 100% are still working mostly with a state regulator. Moreover, of those facilities who work mostly with a federal regulator, 100% still experience a cooperative relationship.

Table 11.j reports the cross-tabulation between the typical type of regulator – state versus federal – and the request for assistance from the regulator’s supervisor. As shown, 21% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As stronger evidence, of those facilities that requested assistance, 100% are still working mostly with a state regulator. And, of those facilities who work mostly with a federal regulator, 100% still found no need for assistance.

Table 11.k reports the cross-tabulation between the typical type of regulator – state versus federal – and the request for assistance from an elected official. As shown, only 6% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Yet, of those facilities that requested assistance, 100% are still working mostly with a state regulator. Moreover, of those facilities who work mostly with a federal regulator, 100% still found no need for assistance.

Tables 11.l through 11.o report the remaining cross-tabulations that involve the type of interaction with the regulator – same individual regulator versus multiple regulators. In particular, Table 11.l reports the cross-tabulations between the type of interaction with the regulator and the treatment of the regulated entity by its regulator. As shown, 37% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Similarly, of those facilities not receiving “always fair” treatment, 35% are still working with the same individual regulator. As stronger evidence, of those facilities working with multiple regulators, 71% still receive “always fair” treatment.

Table 11.m reports the cross-tabulations between the type of interaction with the regulator and the overall regulator-regulated entity relationship. As shown, a rather large portion (41%) of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Moreover, of those facilities experiencing a coercive relationship, 29% are still working with the same individual regulator. As stronger evidence, of those facilities working with multiple regulators, 95% still experience a cooperative relationship.

Table 11.n reports the cross-tabulations between the type of interaction with the regulator and the request for assistance from the regulator's supervisor. As shown, a quite large portion (43%) of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Similarly, of those facilities that requested assistance, 51% are still working with the same individual regulator. Of those facilities working with multiple regulators, 78% still found no need for assistance.

Table 11.o reports the cross-tabulations between the type of interaction with the regulator and the request for assistance from an elected official. As shown, a rather large portion (43%) of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Similarly, of those facilities that requested assistance, 50% are still working with the same individual regulator. As even stronger evidence, of those facilities working with multiple regulators, 94% still found no need for assistance.

Tables 11.p through 11.r report the remaining cross-tabulations that involve the treatment of the regulated entity by its regulator. In particular, Table 11.p reports the cross-tabulations between the treatment of the regulated entity by its regulator and the overall regulator-regulated entity relationship. As shown, 16% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. More strongly, of those facilities not receiving "always fair" treatment, 86% are still experiencing a cooperative relationship. (None of those facilities who experience a coercive relationship receive "always fair" treatment. In this case, the two measures of the regulator-regulated entity relationship fully align.)

Table 11.q reports the cross-tabulations between the treatment of the regulated entity by its regulator and the request for assistance from the regulator's supervisor. As shown, a substantial portion (24%) of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As stronger evidence, of those facilities that requested assistance, 63% are still receiving "always fair" treatment. Similarly, of those facilities not receiving "always fair" treatment, 63% still found no need for assistance.

Table 11.r reports the cross-tabulations between the treatment of the regulated entity by its regulator and the request for assistance from an elected official. As shown, a substantial portion (21%) of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. As additional evidence, of those facilities that requested assistance, 67% are still receiving "always fair" treatment. More important, of those facilities not receiving "always fair" treatment, 92% still found no need for assistance.

Tables 11.s through 11.t report the remaining cross-tabulations that involve the overall regulator-regulated entity relationship – coercive versus cooperative. In particular, Table 11.s reports the cross-tabulations between the overall regulator-regulated entity relationship and the request for assistance from the regulator's supervisor. As shown, 18% of the respondents provide conflicting

indications of the relationship between the regulator and the regulated entity. As stronger evidence, of those facilities that requested assistance, 90% are still experiencing a reportedly cooperative relationship. As weaker evidence, of those facilities experiencing a coercive relationship, 29% still found no need for assistance.

Table 11.t reports the cross-tabulations between the overall regulator-regulated entity relationship and the request for assistance from an elected official. As shown, only 7% of the respondents provide conflicting indications of the relationship between the regulator and the regulated entity. Yet, of those facilities that requested assistance, 92% are still experiencing a reportedly cooperative relationship. Similarly, of those facilities experiencing a coercive relationship, 86% still found no need for assistance.

Table 11.u reports the last cross-tabulation, which involves the request for assistance from the regulator's supervisor and the request for assistance from an elected official. As shown, a reasonably substantial portion of the respondents (18%) provide conflicting indications of the relationship between the regulator and the regulated entity. As somewhat stronger evidence, of those facilities that requested assistance from an elected official, 42% still requested no assistance from the regulator's supervisor. As even stronger evidence, of those facilities requesting assistance from the regulator's supervisor, 86% still found no need for assistance from an elected official. (Of course, if these two forms of assistance represent substitutes, then only one form of requested assistance may be expected. In this case, the identified combinations do not represent conflicting indications of the regulator-regulated entity relationship.)

In general, these cross-tabulations provide substantial evidence for the conclusion that the relationship between a regulator and a regulated entity consists of multiple dimensions. Therefore, before assessing the effect of this relationship on environmental behavior and/or performance on the part of regulated entities, future research should comprehensively measure the various characteristics of the relationship. The questions in this survey represent one attempt to describe the multifaceted nature of the relationship between the regulator and the regulated entity. Future research efforts may refine these initial efforts.

IV. CONCLUSIONS CONCERNING COERCIVE V. COOPERATIVE MODELS OF ENFORCEMENT

Environmental regulations amount to little if regulated entities do not comply with them. How best to induce those entities to comply with their regulatory responsibilities has for some time been the subject of fierce debates. On the one hand, some environmental enforcement experts regard deterrence as the essential and overriding component of any effective effort to induce higher rates of compliance by regulated entities. Under this view, regulated entities respond more to threats to the corporate bottom line than to any other factor. Unless enforcement efforts engender a perception among regulated entities that it is less costly for them to comply than it is to resist compliance and risk the imposition of costly sanctions, these entities will have little incentive to alter their behavior

to improve their compliance posture. On the other hand, other experts contend that regulated entities are responsive to a host of factors, including but not limited to a desire to minimize the cost of environmental regulation. These factors create an environment in which the provision of compliance assistance and incentives may be a more effective technique for inducing compliance than the creation of a strong deterrent based on a rigorous enforcement presence. The proponents of a cooperative approach generally do not support elimination of deterrence-based enforcement. Rather, they regard such enforcement as a last resort which, if used excessively, can engender resistance by regulated entities that winds up being counterproductive to the ultimate goal of enhanced compliance.

To date, few empirical studies test the impacts of coercive and cooperative approaches to enforcement on the ground. The study of the chemical industry described in this article represents an effort to begin addressing the paucity of information on the effects of the two enforcement approaches on environmental behavior or compliance. Our study of facilities in the chemical industry that are regulated under the CWA indicates that the vast majority of the respondents describe the relationships they have with their CWA regulators as cooperative rather than adversarial (or coercive). The responses to additional questions reveal, however, that in some respects, those who report that they generally have cooperative relationships also report that particular aspects of their relationships are more consistent with a coercive than with a cooperative relationship. The converse is also true: those who report that they have coercive relationships nevertheless describe some aspects of their relationships with regulators in a manner than seems to reflect cooperation.

To generate these results, our study cross-tabulates the responses to all possible pairs of questions, *e.g.*, cross-tabulation between the overall type of relationship – coercive versus cooperative – and the treatment of a regulated entity by its regulator – always fair versus not always fair. In general, these cross-tabulations reveal less than complete overlap between the various measures capturing the relationship between the regulator and the regulated entity. As further analysis, we also calculate and interpret the correlations between all possible pairs of responses. Similar to the cross-tabulations, these statistics reveal only weak correlation between the various measures capturing the relationship between the regulator and the regulated entity. Overall, the analysis demonstrates that the relationship between a regulator and a regulated entity consists of multiple dimensions – no single underlying dimension seems to reflect all aspects of the regulator-regulated entity relationship.

The implications of these results for the debate over the comparative effectiveness of the coercive and cooperative approaches to enforcement are significant. They demonstrate that empirical studies that assess the effectiveness of the two approaches on environmental behavior or performance should avoid characterizing the relationship between regulators and regulated entities as either distinctively coercive or cooperative. Those relationships tend instead to be multi-faceted, with different aspects conforming to one or the other of the two enforcement approaches. Scholars who design future empirical studies on environmental enforcement and compliance, and

environmental policymakers who assess the results of such studies, would do well to recognize the nuanced nature of the relationship between regulators and regulated entities if these studies are to provide the most meaningful contributions to the ongoing debate over the impacts of coercive and cooperative enforcement approaches on the behavior and performance of regulated entities. Our study provides one starting point for delineating the various components of the regulator-regulated entity relationship.

TABLES

**Table 1
General Relationship between Regulator and Regulated Entity (N=260)**

Category	Frequency	%
Generally Coercive	7	2.7
Generally Cooperative	250	96.2
Don't Know	3	1.1

**Table 2
Treatment of Regulated Entity by Regulator (N=261)**

Category	Frequency	%
Always Fair	209	80.1
Sometimes Fair, Sometimes Unfair	49	18.8
Always Unfair or Arbitrary	0	0
Don't Know	3	1.1

**Table 3
Typical Regulator: State versus Federal (N=259)**

Category	Frequency	%
State	250	96.5
Federal	3	1.1
Don't Know	6	2.3

Table 4
Type of Interaction with Regulator:
Same Individual Regulator versus Multiple Regulators (N=260)

Category	Frequency	%
Same Individual Regulator	147	56.5
Multiple Regulators	109	41.9
Don't Know	4	1.5

Table 5
Request for Assistance from Supervisor of Facility's Regulator (N=258)

Category	Frequency	%
No	206	79.8
Yes	49	19.0
Don't Know	3	1.2

Table 6
Request for Assistance from an Elected Official (N=260)

Category	Frequency	%
No	245	94.2
Yes	12	4.6
Don't Know	3	1.2

Table 7
Likelihood of Allowing Regulators Access to Plant Facilities without Announcement (N=260)

Category	Frequency	%
Always Likely	234	90.0
Somewhat Likely	7	2.7
Likely	17	6.5
Not at All Likely	0	0
Don't Know	2	.8

Table 8
Attitude of Individual Responding for Facility of Government's Responsibility to Impose Environmental Laws (N=259)

Category	Frequency	%
Definitely Should Be	148	57.1
Probably Should Be	92	35.5
Probably Should Not Be	9	3.5
Definitely Should Not Be	7	2.7
Don't Know	3	1.2

Table 9
Assessment by Individual Responding for Facility of whether Companies Behave
Responsibly (N=259)

Category	Frequency	%
Strongly Disagree	29	11.2
Disagree	98	37.8
Neither Agree Nor Disagree	25	9.7
Agree	75	29.0
Strongly agree	30	11.6
Don't Know	2	1.0

Table 10
Correlations between Individual Measures of the Regulator-Regulated Entity Relationship

(p-values shown in parentheses)

Measure	(1)	(2)	(3)	(4)	(5)	(6)
(1) Likelihood of Allowing Regulators Access to Plant without Announcement – Always Likely vs Not						
(2) Typical Type of Regulator – State vs Federal	0.089 (0.162)					
(3) Type of Interaction with Regulator – Same Individual vs Multiple Individuals	0.021 (0.745)	0.106 (0.096)				
(4) Treatment of Regulated Entity by Regulator - Always Fair Treatment vs Not	- 0.055 (0.382)	0.070 (0.267)	0.224 (0.000)			
(5) Overall Relationship – Coercive vs Cooperative	- 0.054 (0.388)	- 0.015 (0.811)	0.099 (0.115)	0.345 (0.000)		
(6) Requested Assistance from Regulator's Supervisor – Yes vs No	0.015 (0.808)	- 0.054 (0.394)	0.059 (0.350)	0.222 (0.000)	0.2222 (0.000)	
(7) Requested Assistance from Elected Official – Yes vs No	0.055 (0.383)	- 0.024 (0.709)	0.033 (0.602)	0.080 (0.205)	0.076 (0.227)	0.221 (0.000)

Table 11

Cross-Tabulations of Individual Measures of the Regulator-Regulated Entity Relationship

Table 11.a. Likelihood of Allowing Regulators Access to Plant Facilities without Announcement and Typical Type of Regulator – State versus Federal (N=250)

	Coercive: Federal	Cooperative: State
Coercive: Not Always Likely to Allow Access	1 (0.40 %)	23 (9.20 %)
Cooperative: Always Likely to Allow Access	2 (0.80 %)	224 (89.60 %)

Table 11.b. Likelihood of Allowing Regulators Access to Plant Facilities without Announcement and Type of Interaction with Regulator – Same Individual versus Multiple Individuals

	Coercive: Same Individual	Cooperative: Multiple Individuals
Coercive: Not Always Likely to Allow Access	11 (4.35 %)	13 (5.14 %)
Cooperative: Always Likely to Allow Access	97 (38.34 %)	132 (52.17 %)

Table 11.c. Likelihood of Allowing Regulators Access to Plant Facilities without Announcement and Treatment of the Regulated Entity by its Regulator

	Coercive: Not Always Fair Treatment	Cooperative: Always Fair Treatment
Coercive: Not Always Likely to Allow Access	3 (1.18 %)	21 (8.24 %)
Cooperative: Always Likely to Allow Access	46 (18.04 %)	185 (72.55 %)

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Table 11.d. Likelihood of Allowing Regulators Access to Plant Facilities without Announcement and Overall Relationship – Coercive versus Cooperative

	Coercive: Overall Coercive	Cooperative: Overall Cooperative
Coercive: Not Always Likely to Allow Access	0 (0.00 %)	24 (9.45 %)
Cooperative: Always Likely to Allow Access	7 (2.76 %)	223 (87.80 %)

Table 11.e. Likelihood of Allowing Regulators Access to Plant Facilities without Announcement and Request for Assistance from the Regulator’s Supervisor

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Not Always Likely to Allow Access	5 (1.98 %)	19 (7.51 %)
Cooperative: Always Likely to Allow Access	43 (17.00 %)	186 (73.52 %)

Table 11.f . Likelihood of Allowing Regulators Access to Plant Facilities without Announcement and Request for Assistance from an Elected Official

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Not Always Likely to Allow Access	2 (0.79 %)	22 (8.66 %)
Cooperative: Always Likely to Allow Access	10 (3.94 %)	220 (86.61 %)

Table 11.g. Typical Type of Regulator – State versus Federal – and Type of Interaction with Regulator – Same Individual versus Multiple Individuals

	Coercive: Same Individual	Cooperative: Multiple Individuals
Coercive: Typically State Regulator	2 (0.80 %)	0 (0.00 %)
Cooperative: Typically Federal Regulator	103 (41.20 %)	145 (58.00 %)

Table 11.h. Typical Type of Regulator – State versus Federal – and Treatment of the Regulated Entity by its Regulator

	Coercive: Not Always Fair Treatment	Cooperative: Always Fair Treatment
Coercive: Typically State Regulator	1 (0.40 %)	1 (0.40 %)
Cooperative: Typically Federal Regulator	47 (18.73 %)	202 (80.48 %)

Table 11.i. Typical Type of Regulator – State versus Federal – and Overall Relationship – Coercive versus Cooperative

	Coercive: Overall Coercive	Cooperative: Overall Cooperative
Coercive: Typically State Regulator	0 (0.00 %)	2 (0.80 %)
Cooperative: Typically Federal Regulator	7 (2.80 %)	241 (96.40 %)

Table 11.j. Typical Type of Regulator – State versus Federal – and Request for Assistance from the Regulator’s Supervisor

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Typically State Regulator	0 (0.00 %)	3 (1.21 %)
Cooperative: Typically Federal Regulator	48 (19.43 %)	196 (79.35 %)

Table 11.k. Typical Type of Regulator – State versus Federal – and Request for Assistance from an Elected Official

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Typically State Regulator	0 (0.00 %)	3 (1.20 %)
Cooperative: Typically Federal Regulator	11 (4.42 %)	235 (94.38 %)

Table 11.l. Type of Interaction with Regulator – Same Individual versus Multiple Individuals – and Treatment of the Regulated Entity by its Regulator

	Coercive: Not Always Fair Treatment	Cooperative: Always Fair Treatment
Coercive: Same Individual Regulator	32 (12.50 %)	77 (30.08 %)
Cooperative: Multiple Individuals	17 (6.64 %)	130 (50.78 %)

Table 11.m. Type of Interaction with Regulator – Same Individual versus Multiple Individuals – and Overall Relationship – Coercive versus Cooperative

	Coercive: Overall Coercive	Cooperative: Overall Cooperative
Coercive: Same Individual Regulator	5 (1.96 %)	103 (40.39 %)
Cooperative: Multiple Individual Regulators	2 (0.78 %)	145 (56.86 %)

Table 11.n. Type of Interaction with Regulator – Same Individual versus Multiple Individuals – and Request for Assistance from the Regulator’s Supervisor

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Same Individual Regulator	24 (9.56 %)	84 (33.47 %)
Cooperative: Multiple Individual Regulators	25 (9.96 %)	118 (47.01 %)

Table 11.o. Type of Interaction with Regulator – Same Individual versus Multiple Individuals – and Request for Assistance from an Elected Official

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Same Individual Regulator	6 (2.37 %)	102 (40.32 %)
Cooperative: Multiple Individual Regulators	6 (2.37 %)	139 (54.94 %)

Table 11.p. Treatment of the Regulated Entity by its Regulator and Overall Relationship – Coercive versus Cooperative

	Coercive: Overall Coercive	Cooperative: Overall Cooperative
Coercive: Not Always Fair Treatment	7 (2.72 %)	42 (16.34 %)
Cooperative: Always Fair Treatment	0 (0.00 %)	208 (80.93 %)

Table 11.q. Treatment of the Regulated Entity by its Regulator and Request for Assistance from the Regulator's Supervisor

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Not Always Fair Treatment	18 (7.11 %)	30 (11.86 %)
Cooperative: Always Fair Treatment	31 (12.25 %)	174 (68.77 %)

Table 11.r. Treatment of the Regulated Entity by its Regulator and Request for Assistance from an Elected Official

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Not Always Fair Treatment	4 (1.57 %)	45 (17.65 %)
Cooperative: Always Fair Treatment	8 (3.14 %)	198 (77.65 %)

Table 11.s. Overall Relationship – Coercive versus Cooperative – and Request for Assistance from the Regulator’s Supervisor

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Overall Coercive	5 (1.98 %)	2 (0.79 %)
Cooperative: Overall Cooperative	44 (17.39 %)	202 (79.84 %)

Table 11.t. Overall Relationship – Coercive versus Cooperative – and Request for Assistance from an Elected Official

	Coercive: Assistance	Cooperative: No Assistance
Coercive: Overall Coercive	1 (0.39 %)	6 (2.35 %)
Cooperative: Overall Cooperative	11 (4.31 %)	237 (92.94 %)

Table 11.u. Request for Assistance from the Regulator’s Supervisor and Request for Assistance from an Elected Official

	Coercive: Assistance Elected Official	Cooperative: No Assistance Elected Official
Coercive: Requested Assistance Regulator’s Supervisor	7 (2.75 %)	42 (16.47 %)
Cooperative: No Requested Assistance Regulator’s Supervisor	5 (1.96 %)	201 (78.82 %)