

The Promise and Pitfalls of Co-Regulation: How Governments Can Draw on Private Governance for Public Purpose

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Our purpose in this chapter is to examine the potential role of nongovernmental actors, and especially those with close connections to the business community, in fostering positive regulatory outcomes. Such an effort might well strike some readers as quixotic, in light of several recent regulatory fiascos. Consider the following tales of crisis born of regulatory failure, one from the world of finance, the other from the domain of environmental protection. Both occurred in 2008. Each involves a regulatory program that almost all Americans, and indeed quite possibly most members of Congress, had never heard of, at least before these spectacular demonstrations of insufficient regulatory oversight. Each also powerfully underscores the potential dangers associated with placing primary responsibility for regulating business in the hands of the business community itself—a strategy long known as “self-regulation.”

The financial story concerns the collapse of three of America’s largest investment banks, developments that sent shockwaves through the global financial system. Bear Stearns and Merrill Lynch were acquired at fire-sale prices by J. P. Morgan Chase and Bank of America, respectively, while Lehman Brothers entered bankruptcy. The downfalls of these pillars of Wall Street had numerous causes, but a particularly important one was their remarkable reliance on leverage, which in each case came to exceed thirty dollars of financial obligations to one dollar of capital, far beyond the ratios that bankers and regulators would have deemed prudent thirty years ago. Bank executives, and regulators at the Securities and Exchange Commission, assumed that such heightened debt exposure would prove perfectly safe, partly because of a new initiative, the Consolidated Supervised Entities (CSE) Program. The CSE delegated regulatory risk assessment to the investment banks themselves. The banks’ risk managers,

using their own highly sophisticated internal computer models, would continuously assess the risk associated with the bank's overall investment portfolio and debt obligations, and then require adjustments in capital whenever the risk assessment warranted. In late September of this year, after an intensive SEC autopsy of what had gone wrong at Bear Stearns, the chairman of the SEC, Christopher Cox, proclaimed that the CSE was "fundamentally flawed," and ordered its termination. Bear Stearns, it turns out, did regular risk assessments, but somehow never assessed the biggest risk faced by the firm—the impact that a sharp downturn in housing prices could have on its massive investments in mortgage-backed securities.¹

The environmental story comes from eastern Tennessee. On December 22, after a series of heavy storms, an earthen dam gave way outside the small city of Kingston, releasing more than a billion gallons of toxic coal ash with dangerous concentrations of heavy metals. The Tennessee Valley Authority's nearby coal-fired power plant had sequestered the ash in the lagoon behind the dam. After the dam's collapse, a toxic stew containing 5.4 million cubic yards of coal ash inundated a portion of Roane County and contaminated a river coursing through a far larger region of Appalachia. Roughly eight years previously, the Environmental Protection Agency had been on the verge of issuing tough new rules about the handling and disposal of coal ash, because of growing scientific evidence that it poses serious threats to the quality of surrounding groundwater, and thus to human health. But confronted with intense opposition from electricity producers, including both privately owned utilities and publicly owned ones such as the TVA, the EPA backed off from adopting regulations that would have required much more costly measures to keep coal ash from leeching or cascading into the wider environment. During the Bush Administration, the EPA even shied away from issuing recommendations for state regulation of coal ash. Instead, it deferred to an "Action Plan" devised by the Utilities Solid Wastes Activity Group (USWAG), an organization of utilities that produce electricity from coal, and so must confront the vexing question of what to do with coal ash. The USWAG plan, which utilities could adopt voluntarily, called for a restricted set of standards for groundwater safety, occasional testing, and not much else. It completely skirted more expensive precautions such as linings for storage basins and reinforced dams. In early 2008, USWAG's executive director assured critics that "the utility companies want to do the right thing. They want to manage their ash so it won't have an adverse affect on human health and the environment." Such guarantees likely ring hollow to east Tennesseans whose houses now lie submerged under coal ash, or whose watersheds now have concentrations of arsenic that have increased more than a hundredfold.²

What lessons should legislators and regulators draw from such events? One of the authors of an essay in this volume, the economist Joseph Stiglitz, has not minced words in rendering his verdict on the CSE. “Self-regulation,” he insists in a January 2009 reflection on the causes of the financial crisis, “is preposterous.”³ If we equate “self-regulation” with the sort of vaguely defined, poorly designed, feebly monitored, largely sanctionless, and voluntary institutions represented by the CSE program and the USWAG Action Plan, Stiglitz’s judgment is surely correct.

But there are circumstances in which the state has delegated regulatory responsibilities to corporations, or to organizations affiliated with trade associations, with beneficial results. The problem often is not self-regulation *per se*, but the failure to integrate structures of private governance effectively within a larger institutional setting—to embed those structures within a broader framework of public oversight. In this chapter, we self-consciously use the term “co-regulation” to speak to the importance of integration and institutional design.

Governments across the globe have relied on private mechanisms of regulatory governance for decades, in a wide array of regulatory contexts. Such reliance almost always occurs at least partly as a means of reducing the public costs of regulation, and sometimes reflects rigid antagonism to the use of state power. But it can also emerge as a result of genuine concern for effective regulatory governance, and in some contexts, has actually furthered the common good. A burgeoning social-science literature has identified the key prerequisites for businesses and business-linked organizations to play constructive regulatory roles.⁴ Private regulatory actors must possess genuine commitment to regulatory purposes, have a sufficient degree of institutional autonomy, and receive adequate resources to do their jobs properly. Equally important, they must be directed and constrained by a larger framework of “co-regulation.” The state must furnish regulators with clear missions, and then maintain a close watch over those quasi-public or private regulators. To make such oversight efficacious, public regulators must receive accurate information about the activities of their private counterparts, and have sufficient expertise and capacity to assess the performance of nongovernmental regulators; and those nongovernmental regulators must face a credible threat that their public overseers will assume regulatory jurisdiction if they do not meet their obligations. It also helps if there is considerable transparency about the actions of quasi-public or private regulators that third parties can assist in the evaluation of regulatory performance. The key, in short, is to make sure that the private regulatory tail does not wag the commonweal’s dog.

After briefly laying our conceptual and definitional groundwork, we explicate the most important principles of effective nongovernmental regulation. Since

American environmental regulation has generated several instructive experiments with private regulatory governance over the last generation, we then explore that history in some detail. Finally, we offer some suggestions for how our principles might guide regulatory policy with regard to the environment and oversight of the financial system. We choose these two regulatory contexts because private regulatory governance has long been a key feature of public policy in these arenas, and because their complexities makes them prime candidates for some delegation of regulatory authority, albeit as part of a larger system of co-regulation.

The Guises of Nongovernmental Regulation

Since the rise of the modern bureaucratic state, two distinct forms of private regulatory governance have arisen as adjuncts to public regulatory regimes. The first type vests the power to make and/or enforce regulatory rules in a nonprofit organization, usually allied to an industry trade association. Policymakers and academics frequently refer to these entities as “self-regulatory organizations,” or SROs. Prominent American examples include the Joint Committee on the Accreditation of Healthcare Organizations, which certifies that medical providers qualify for government reimbursement programs, the Financial Industry Regulatory Authority, which oversees securities exchanges and licenses stockbrokers, and the Institute of Nuclear Power Operators, which sets safety standards for nuclear power plants and plays a key role in their inspection.

The second type, which among social scientists often goes by the name of “management regulation,” involves analogous regulatory action within large-scale corporations, usually through the creation of internal regulatory departments, which have the responsibility of setting regulatory goals and overseeing their implementation. Amid all of the deregulation in the last two generations, this regulatory strategy has been embraced by such varied regulatory agencies as the Food and Drug Administration, the California Occupational Safety and Health Administration, and the Environmental Protection Agency. Many global corporations taking this path have done so at least in part to gain certification from the International Standards Organization (ISO), such that, with regard to a given aspect of their business (environmental stewardship, worker and product safety), they follow an identifiable set of socially advantageous managerial practices.

Regardless of whether private regulation is carried out by an SRO or a unit within a business firm, it can involve a range of regulatory functions and reflect a spectrum of coercive authority. Some nongovernmental regulators merely set standards; others primarily monitor regulatory compliance; still others enforce compliance; and yet still others perform all of these roles. In many instances, private governance has a wholly voluntary character, with firms possessing the

choice of whether or not to commit themselves to regulatory rules and oversight. In other contexts, the state has conferred quasi-public status on SROs, requiring business participation. SROs with statutorily mandated authority often have the capacity to fine violators of regulatory rules or bar them from further activity in the marketplace. By contrast, voluntary SROs have far weaker enforcement powers, since American antitrust law prohibits such vigorous enforcement actions by trade associations. They can only wield the power of publicity, “naming and shaming” the violators of voluntary standards, or expelling them from participation in the industry group.

The Principles of Effective Co-Regulation

From the earliest years of the modern regulatory state, the call for private regulation has frequently served as a crucial tactic in the politics of deflection. Whenever some corner of the business community faces a groundswell of popular support for regulations that will impinge on its commercial practices, the odds are good that its leaders will champion some form of industry-wide regulatory self-governance as a means to forestall more onerous rule making and enforcement by the state. As cases like the CSE Program and the USWAG Action Plan reveal, private regulation can reflect little more than such efforts to keep the state at bay, with highly regrettable consequences for the wider society. But sometimes, enduring fear of intrusive state action, especially when accompanied by substantive public oversight and an ongoing desire to improve a firm’s or industry’s public standing, has prompted considerably more substantive responses from business. The effectiveness of private regulation in a particular context—or, more precisely, the potential for credible co-regulation—depends on the following five factors: (1) the depth of concern for their reputation among regulated businesses; (2) the relevance of flexibility in regulatory detail; (3) the existence of sufficient bureaucratic capacity and autonomy on the part of nongovernmental regulators; (4) the degree of transparency in regulatory process; and (5) the seriousness of accountability. Before legislators or regulatory agencies choose to delegate regulatory authority to industry organizations or corporations, they should assess the regulatory lay of the land with respect to each of these issues.

Identifying the Depth of Reputational Concern

One crucial factor in effective co-regulation is how much business leaders actually care about achieving regulatory objectives. Corporate executives, of course, have a fiduciary responsibility to look out for the interests of their shareholders. That responsibility frequently requires negotiation of a highly complex environment occupied by regulators, economic stakeholders such as customers, suppliers,

insurers, and financiers, and social interests such as environmental groups and community organizations.⁵ On some occasions, the search for profitability actually encourages a corporate embrace of regulatory goals, such as the reduction of environmental degradation or the diminution of negative impacts on health and safety. Although many businesses seek such ends primarily as a means of preventing regulatory fines and liabilities, others do so in the hopes of enhancing their reputation among key stakeholders. As an analysis of the adoption of environmental management systems by S&P 500 firms concluded that “while the potentially high costs of compliance with existing and anticipated regulations, as well as the threat of liabilities, are inducing firms to be more proactive about managing their environmental impacts, the direct effects of these pressures are not as strong as those of nonregulatory pressures from consumers, investors and communities.”⁶ Given the infrequency of regulatory inspections and fines, the emphasis placed on the larger set of actors in a corporation’s organizational environment should come as no surprise. Yet, we must recognize that there is a wide range of activities in which firms may engage as they try to manage their reputations. At one end of the continuum, they may simply invest in public-relations efforts to create the *appearance* of social responsibility. At the other end of the continuum, they may make significant investments in redesigning products and processes, or they may even introduce internal management systems subject to external auditing, thereby going beyond regulatory requirements. The efficacy of co-regulation will depend on the extent to which it induces firms to move toward the maximal end of this continuum.

In recent decades, several trade associations have developed standards or model management systems for members, often in response to crises that threatened their collective reputations and raised the specter of impending regulation. Such activities can serve important functions: they can reduce the costs incurred by firms, create a context for industry actors to share information, and contribute to the development of an “industrial morality.”⁷ Moreover, if government and associations cooperate in the design of these systems, they can be integrated with regulation so that associations can serve, in effect, as surrogate regulators. But the existence of association codes or programs says little about their efficacy. If association programs are weak—that is, if they do not establish stringent expectations, require external auditing and information disclosure, and expel firms for noncompliance—they may invite problems of adverse selection. Firms with weak records may gravitate toward undemanding programs to enhance their reputations without changing their practices. This may create a Gresham’s Law of self-regulation: weak participants drive out firms seeking to make credible efforts. Thus, the chemical industry’s Responsible Care Program, which failed to eject members for noncompliance, tended to attract

firms with worse-than-average pollution records (although there is evidence of improvement as of late). In contrast, the American Forest and Paper Association's Sustainable Forestry Initiative, which mandated external auditing and expelled members for noncompliance, attracted firms with stronger performance records.⁸

Reputational concerns that result from a particular crisis, of course, may lessen as media attention fades. The manufacturing firm that responds to negative publicity about its environmental impact with a high-powered public relations initiative or contributions to the Nature Conservancy may well soon turn its focus to the next advertising campaign. By contrast, if firms make the investments to gain ISO certification for their environmental management systems, or to meet demanding requirements imposed by a trade association, regulatory practices may take on a greater permanence. The creation of highly trained staffs and complex information management systems can generate internal momentum for regulatory action, which can be magnified by the need of companies to demonstrate certified compliance with standards or association codes to gain access to the supply chains and bid-lists of other organizations. Optimally, reputational concern triggers far-reaching transformation of how corporations design their products, processes, and facilities, and in the commercial relationships that they forge with a broad array of public and private stakeholders.

Regulatory policymakers, then, should be more willing to delegate regulatory authority to the business community when they see deep-seated concern about corporate standing with the public, manifested by the willingness to make considerable investments in internal regulatory capacity. And they should pay close attention to whether structures of countervailing economic power stand ready to help police regulatory behavior.

Ascertaining the Importance of Flexibility

Public regulators frequently confront daunting problems of information scarcity and complexity, even as they must cope with serious resource constraints. Ponder for a moment the dilemmas of the environmental or the safety regulator. If all regulated entities employed the same technologies, production processes, and inputs, environmental and safety agencies would have little difficulty in designing effective technology-based regulations. If this homogeneity is absent—as it commonly is—regulators might be able to employ performance-based regulations, assuming that they possessed the capacity to assess outputs. But sometimes low levels of homogeneity accompany a limited capacity to assess outcomes. In such instances, there is a strong case for management-based regulation, “which requires firms to engage in their own planning and internal rulemaking efforts that are supposed to aim toward the achievement of specific public goals.”⁹ By delegating authority to firms, the administrative state vests responsibility in the

actors who possess the best information, thereby reducing the analytical and resource demands placed on regulators. In order to work, such approaches require that firms possess considerable flexibility, so that they can tailor internal regulatory systems to reflect the specific features of their firms and production processes. If successful, delegation can allow firms to go beyond what would be possible under traditional forms of regulation.

The delegation that is intrinsic to co-regulation creates a pair of related challenges for policymakers. First, as Cary Coglianese and David Lazer note, “the challenge for the regulator is . . . to find an optimal level of specificity that points firms in the right direction and enables inspectors to assess whether a firm has a good management system in place, but that also is not [so] specific that private managers no longer have the flexibility to adapt their practices to the individual conditions of their organizations.”¹⁰ Second, the architects of regulatory institutions must build in sufficient structures of accountability without simultaneously eliminating the incentives for participation. Delegation creates openings for miscommunication, shirking, and opportunistic behavior, vulnerabilities that grow under conditions of information scarcity and complexity. Regulatory design can limit such weaknesses by fostering increased transparency and accountability (this point will be developed in greater detail below). But regulatory policymakers should remain mindful of an unavoidable trade-off here. If these efforts dramatically increase regulatory transaction costs, they may create disincentives for potential participants.

Assessing the Prospects for Bureaucratic Capacity and Autonomy

In public policy, street-level bureaucrats are vitally important. To the extent that they fail to exercise their discretionary authority in a manner that reinforces the larger goals of policy, policy invariably fails. This observation holds as well for the private or quasi-public bureaucrats charged with critical responsibilities under strategies of co-regulation. A key question is whether corporations have the bureaucratic capacity, resources, and ethos necessary to implement regulatory schemes. Although large firms typically can call on sufficient administrative resources, the same cannot necessarily be said of small and medium-size enterprises (SMEs). To be effective participants in a system of co-regulation, corporations must be able to draw on personnel who grasp regulatory goals and who understand how their companies can achieve them. Business enterprises must have the flexibility to redesign products and processes, as well as the resources to implement the changes. They must have management systems in place to monitor performance, identify failures, and make necessary reforms. All of this can be difficult or impossible for SMEs. One study of enforced self-regulation of food safety, for example, concluded that SMEs routinely failed to develop

dynamic management systems, were incapable of assessing their own compliance, and lacked knowledge of legal requirements. “Organizationally incompetent,” these small-scale players in the food industry proved incapable of meeting their obligations.¹¹

The difficulties noted above may not be simply a consequence of scale. Social scientists interested in corporate social responsibility have now demonstrated that firms engaging in socially responsible production are more profitable than firms that do not, but there is considerable uncertainty regarding the causes of this phenomenon.¹² In many instances, profitable firms may simply be the ones with sufficient resources to develop the kinds of management systems and routines that allow them to go beyond regulatory requirements in managing their environmental, safety, and health impacts. Thus the capacity for participation in co-regulation may often be contingent on corporate profitability and therefore vulnerable to the larger business cycle. Large firms operating on narrow profit margins may not be willing or able to make the investments that are essential for effective co-regulation.

The implications for policymakers are twofold. First, rather than viewing co-regulation as a universal solution, legislators and administrative officials must design processes and institutions that can differentiate among firms and industry associations, based on their organizational capacities and exhibited records of regulatory compliance. Policymakers must accordingly retain more traditional forms of regulation for firms or economic sectors that do not measure up to the prerequisites of self-governance. Secondly, if the ultimate goal is to extend some form of co-regulation to a broader subset of firms, it may be necessary to promote organizational change to create both the capacity for private governance and enduring commitment to regulatory aspirations.¹³ The EPA has used various forms of outreach to educate corporate managers about how corporations have used environment management systems, design for environment, and green accounting to promote higher levels of environmental stewardship. Various trade associations have similarly employed peer auditing teams to convey effective strategies to association members seeking to build a capacity for internal regulatory governance. Such forms of support could prove critical to SMEs that lack the financial and analytical resources to achieve higher levels of regulatory compliance.

Ensuring Genuine Transparency

Like regulation carried out solely by governmental agencies, regulatory policy conceived and implemented by business organizations has to be visible to be effective. This principle has several dimensions. If regulatory goals are not defined with sufficient precision, we can hardly expect any regulatory agent,

whether public or private, to attain them. The same point holds for regulatory objectives that lack at least roughly measurable benchmarks. Even with plainly articulated aims and consistently defined metrics, though, private regulatory efforts will likely devolve into public-relations exercises unless their outcomes consistently reach the light of day. At a minimum, the results of inspections and other forms of monitoring must flow up the regulatory chain, from inspectors to corporate compliance officers and/or the heads of enforcement at SROs, and from those self-regulatory institutions to public oversight bodies. And the resulting reports must come in a sufficiently standardized form, and reach sufficiently well-trained and well-resourced oversight personnel, that industry regulators and the government can actually assess regulatory consequences. Additionally, this information should be available to commercial counterparties like banks and insurance companies, and all interested nongovernmental organizations, in order to magnify the reputational and economic ramifications of poor performance.

Poor reporting standards and practices invariably translate into shoddy regulation—an unsurprising pattern exemplified by the implementation of the CSE program for investment banks. According to the SEC's Inspector General's September 2008 report on the collapse at Bear Stearns, the firm's risk management team ignored numerous reporting requirements, but avoided even the most minor slap on the wrist for these transgressions.¹⁴ Self-regulation, however, does not necessarily involve such regulatory malfeasance. In the wake of the near meltdown at Three Mile Island, for example, the Institute of Nuclear Power Operators (INPO) quickly developed a culture of information sharing, from individual plants to INPO, from INPO to the Nuclear Regulatory Commission, and from INPO back to individual plants. INPO's efforts included not only intensive dissemination of information about safety strategies that worked well, but also an annual meeting of plant executives in which the organization disclosed annual safety rankings for nuclear facilities, from top to bottom. This ritual at once reinforced industry-wide social norms about the centrality of safety and galvanized managers' competitive drive, alongside their perhaps even stronger desire to avoid losing face among their peers.¹⁵

Independent auditing of self-regulatory activities by third parties offers a further means of ensuring the trustworthiness and accuracy of data about regulatory outcomes. This strategy has proved especially valuable when the regulated entities are multinational corporations whose business endeavors (logging in rain forests, reliance on global supply chains) span a multitude of jurisdictional boundaries. Regardless of the geographic reach of an industry's businesses, transparent monitoring is an essential element of any strategy to create institutions

of private governance that can actually attain society's regulatory objectives. Such monitoring, though, matters most when coupled with genuine oversight and enforcement.

Furnishing Mechanisms of Accountability

If SROs or schemes of management regulation are going to have more impact than simply forestalling more substantial action by the state, they must hold the economic actors in their jurisdiction to account, and simultaneously answer to governmental watchdogs that actually pay attention, and punish poor performance. SROs with statutory authority, such as the Financial Industry Regulatory Authority (formally the National Association of Securities Dealers), must have not just the power to levy fines or to take away the licenses of regulated firms that violate the rules, but also vigorous enforcement programs. Internal corporate regulators must possess authority that other departments within the enterprise are actually bound to respect.

It is at least equally important that public regulators keep a close eye on those charged with the responsibilities associated with regulatory self-governance, lest delegation degenerate into abdication. Governmental officials must regularly monitor self-regulatory activities, assess their performance, and, where appropriate, step in with more intrusive regulatory regimes, with their own rules and penalties. In some contexts, regulatory agencies might consider the creation of dual-track regulatory frameworks. Such two-tiered regulatory initiatives set performance floors, and then offer exemption from traditional regulatory inspections and enforcement regimes for firms that demonstrate the capacity to meet substantially higher standards through their own governance structures. Under such conditions, provisions for co-regulation are integrated into the regulatory structure and parties in the top tier have a clear sense that regulatory officials of the state stand ready, willing, and able to impose a traditional regulatory regime, if self-regulation fails to achieve public purposes.

Both the CSE Program and the USWAG initiative on the disposal of coal ash fell far short of these essential requirements. At Bear Stearns, for example, the risk management team was woefully understaffed, and lacked the authority to shape the day-to-day strategies of the traders with whom they worked side by side. For the CSE Program as a whole, the Trading and Markets Division had a mere seven inspectors to oversee the activities of investment banks that collectively controlled more than \$4 trillion in assets. Despite these limitations, and the spotty record of reporting by the investment banks, the SEC's Division of Trading and Markets nonetheless had inklings of significant problems with internal regulatory structures at the investment banks. Yet instead of viewing

themselves as obliged to step in to safeguard the public's interest, SEC officials consistently shied away from pressing the firm's executives or its risk managers to respond to these problems.¹⁶ If anything, the USWAG approach to coal ash impoundment leaves even more to be desired. Industry's preferences here involve remarkably tepid standards, minimal private monitoring, a complete lack of tangible sanctions for utilities that do not live up to their professed responsibilities, and essentially no oversight role for the EPA or state environmental agencies.¹⁷ Such forms of unmonitored or barely overseen self-regulation can only end in failure; regulatory policymakers should accordingly shun them.

Co-Regulation in Action: Environmental Policy Under Clinton and Bush

Environmental protection has proven to be an area ripe for co-regulation over the past generation, largely because of some significant limitations on key regulatory agencies. First, environmental statutes tend to be highly detailed, delegating minimal discretionary authority to the EPA. Given the sharp partisan conflicts of recent decades, there has been no substantial new environmental legislation since the Clean Air Act Amendments of 1990. Second, the EPA has functioned under extraordinary resource constraints. Its budget, adjusted for inflation, has not grown in the past three decades despite a more than doubling of the size of the U.S. economy. Third, from high-production-volume chemicals to emerging issues such as nanotechnology, the EPA is forced to manage levels of scientific complexity and uncertainty that are literally unparalleled in other regulatory arenas. Lacking the bureaucratic capacity and resources to develop the scientific and analytical foundations for new policy, the EPA frequently occupies an unenviable position. All of these constraints encouraged the delegation of considerable regulatory authority to private companies. The results reinforce key dimensions of our analysis.

In the 1990s, the Clinton administration responded to the constraints on environmental regulators by trying to “reinvent regulation,” with the hope of promoting collaboration and fostering reliance on private-sector resources. Partners for the Environment, a collection of reinvention projects and partnerships, involved collaboration between the EPA and some eleven thousand organizations, including state and local regulators, corporations, trade and professional associations, and research institutions. Project XL (for “eXcellence and Leadership”) emerged as the most important of the reinvention initiatives and made important steps toward meaningful co-regulation. Under Project XL, regulated entities were invited to submit proposals for innovative performance-based management systems. According to the EPA:

Participants are given the flexibility to develop common-sense, cost-effective strategies that will replace or modify specific regulatory requirements, on the condition that they produce greater environmental benefits. Based on the premise that these participants know better than the federal government how to reduce their pollution, Project XL reduces the regulatory burdens and promotes economic growth while achieving better environmental and public health protection.¹⁸

The EPA solicited proposals in the hope of initiating fifty pilot programs that could yield results broadly applicable to other regulated entities. Its review process was rigorous. The agency only considered applicants if they had a clean record of regulatory compliance, a detailed presentation of how their proposals would generate the expected results, and some guarantee that the outcomes would be superior to what would have been available under standard regulation. Once chosen, participants were required to submit voluminous documentation and evaluations, all of which were disseminated via the Internet.

On the face of things, Project XL appeared to incorporate all the key features of effective co-regulation: it delegated authority to firms with sufficient capacity, provided flexibility, and maintained high levels of accountability and transparency. And the program generated some impressive results, as indicated by the experience of Intel. Under Project XL, Intel set emissions targets for its Maricopa County facility relative to baseline levels permissible under the Clean Air Act. In some cases, these targets were quite ambitious (for example, 80 percent of the baseline for volatile organic compounds, 45 percent of the baseline for carbon monoxide, 8 percent of the baseline for particulate matter, and 5 percent of the baseline for sulfur dioxide). The chip maker remained well below the nine emissions targets, each of which was well below what would be acceptable under existing laws. Several other participants, such as Merck Pharmaceuticals, demonstrated comparable improvements in environmental performance. A report on Project XL by the Organization for Economic Cooperation and Development concluded that “Intel Corporation and Merck Pharmaceuticals both have exceeded by wide margin their initial targets for air emissions set out in their Project XL agreements.”¹⁹ Unfortunately, the application process was bedeviled by lengthy delays and high regulatory-transaction costs. The negotiations involving Intel spanned seventeen months and cost the firm some \$588,000. While some companies were willing to accept the costs and delays, others withdrew otherwise promising applications.²⁰ Moreover, many business leaders worried that Project XL did not provide sufficient latitude for innovation, even as many regulators found the program difficult to reconcile with the EPA’s bureaucratic culture.²¹

The Bush administration retained numerous Clinton-era regulatory partnerships and created many new ones. In a few cases, these efforts have clearly borne fruit. For instance, the HPV (High Production Volume) Chemical Challenge Program enlisted corporations to collect toxicological data on chemicals, thereby supplementing the EPA's database without having to work through the cumbersome provisions of the Toxic Substances Control Act.²² But in most of the Bush-era partnerships, members simply pledged that they would cooperate in the promotion of environmentally friendly practices. Some corporations went so far as to submit estimates of their accomplishments, but because these programs were not integrated into the regulatory structure and the results were unaudited, it is difficult to evaluate whether they in fact contributed to gains in environmental quality. These efforts certainly did not constitute examples of co-regulation.

In contrast to these partnerships, the National Environmental Performance Track (or NEPT) appears to hold greater promise. NEPT is an environmental green track, or alternative regulatory framework, based on the experiences gained from state-level green tracks and experiments in EPA Region 1 (New England). The EPA admits organizations to NEPT if they employ a high-quality environmental management system (EMS) assessed by third-party auditors using the EPA's assessment protocol, have a demonstrated commitment to continuous improvement, and have a strong record of compliance. The benefits of participation include: greater flexibility in compliance, streamlined permitting and reporting requirements, a lower inspection priority, and public recognition.²³ It is important to note that with NEPT, the EPA introduced co-regulation as a supplement to traditional forms of regulation that remained in place for firms not admitted to the green track. By the end of 2008, NEPT claimed 547 members, including such major corporations as 3M, Andersen Corporation, Bristol-Meyers Squibb, Coca-Cola, Hewlett-Packard, Intel, Johnson & Johnson, Monsanto, and Xerox, as well as large-scale public entities such as military bases. According to the EPA, NEPT members have reduced water use by 3.66 billion gallons, reduced greenhouse gas emissions by over 300,000 metric tons of carbon dioxide equivalents, reduced hazardous wastes by more than 52,000 tons, and realized impressive increase in the use of recycled materials.²⁴ The ultimate impact of NEPT, of course, might seem to be subject to significant constraints. It extends co-regulation to a relatively limited universe of organizations (both private and public sector) that have a demonstrated commitment to, and capacity for, genuine internal regulatory governance. But this is what we would expect: co-regulation is not a universal response to circumscribed regulatory capacity.

Future Directions for Policy—Co-Regulation and the Environment

The record of private regulatory initiatives in environmental policy suggests several potential avenues for the nation's regulatory agenda. Most obviously, we must recognize that the proliferation of partnerships at the EPA and the lack of institutional integration in the agency have been products, in part, of the difficulties of negotiating the cumbersome requirements of key statutes that simultaneously limit bureaucratic discretion and fail to provide regulators with the tools they need to execute their duties. Consider the Toxic Substances Control Act.²⁵ Under section 6 of TSCA, the EPA is authorized to regulate the manufacture, processing, distribution, use, or disposal of existing chemicals if it has determined that they pose an “unreasonable” risk to human health or the environment. It can also ban existing chemicals, but it bears the burden of proving that chemicals will present an unreasonable risk, that the agency has adopted the least burdensome regulatory response, and that the benefits of a ban outweigh the costs. Since the passage of this legislation in 1976, the EPA's regulatory efforts have been hamstrung by the failure of Congress to explicitly define what constitutes “unreasonable” risk. Moreover, the agency has encountered profound difficulties in accessing sufficient information to substantiate the determination of risk, the efficacy of substitutes, and the economic impacts of the regulatory response. Accordingly, it should come as no surprise that the majority of existing chemicals have not undergone basic toxicological testing.²⁶ TSCA section 4 authorizes the EPA to promulgate rules requiring testing for environmental and health effects for new and existing chemicals. Yet, in a regulatory catch-22, such rules must be justified with findings regarding production, exposure, and potentially unreasonable levels of risk that are difficult to substantiate without the very data that the rules would generate. Without the statutory authority to mandate information disclosure, the EPA has been forced to rely on partnerships and corporate voluntarism. Congress should accordingly revise TSCA and other key statutes to give the EPA the basic tools it needs to execute its regulatory duties.

The revision of key environmental statutes, of course, can be a difficult and time-consuming task. But there are less contentious reforms that could strengthen the incentives for sensible environmental co-regulation, such as participation in NEPT. First, and most importantly, new legislation should mandate the disclosure of audited environmental data for all firms, using standard metrics. At present, many firms have the leeway to gild their reputations for environmental stewardship through astute public relations because stakeholders rarely have access to high-quality information about environmental performance. In those instances in which corporations furnish data about that performance, they too often present it with a bewildering array of metrics and baselines that make

meaningful comparisons difficult. Mandatory disclosure of standardized information about environmental impacts, akin to the publication of financial data that the Securities and Exchange Commission requires of public companies, would force a higher level of corporate accountability, particularly if combined with summary statistics for the top quartile of firms in a given industry. Such disclosure would create far stronger incentives for firms and trade associations to adopt credible management systems designed to reduce environmental impacts. The influence of the Toxic Release Inventory on corporate behavior provides clear evidence that what gets measured gets managed, so long as the public has ready access to the relevant data.²⁷

Second, NEPT has proven itself to be an important innovation at EPA, justifying efforts to strengthen it and expand its reach. At present, NEPT requires that participants have a high-quality environmental management system (EMS), but the EPA has failed to require certification under ISO 14001—the global EMS standard—as a requirement for entry. This reticence is peculiar on several counts. EPA was intimately involved with the development of ISO 14001 (an EPA official co-chaired the Technical Committee responsible for developing this code). Moreover, ISO 14001 certification has become an increasingly important prerequisite for accessing global supply chains, and several studies have found that such certification correlates with the positive environmental performance. In the past decade, some trade associations have strengthened their own EMS codes to bring them into compliance with ISO 14001 (for example, the American Chemistry Council took this step in 2002, through changes in Responsible Care). Integrating ISO 14001 into NEPT would reinforce these trends, while reducing the regulatory transaction costs associated with entry, insofar as each EMS would not have to be examined *de novo*.

Third, and finally, the incentives for participation in NEPT and certification under ISO 14001 could be enhanced through government procurement practices. A series of executive orders beginning with EO 12873 (1993) and culminating in EO 13424 (2007) have promoted environmentally preferable purchasing. President Bush's EO 13424, for example, instructed the head of each agency to "require in agency acquisitions of goods and services (i) use of sustainable environmental practices, including acquisition of bio-based, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and (ii) use of paper of at least 30 percent post-consumer fiber content" (section 2). A new executive order could reinforce co-regulation by explicitly requiring that the government accord procurement preferences to businesses that participate in NEPT and/or are certified under ISO 14001. Since the United States government is the world's single largest consumer of goods and services, this simple

change in procurement practices—if rigorously enforced—could have a transformative effect on association codes, corporate environmental management, and participation in the EPA’s National Environmental Performance Track. It would likely also trigger similar shifts in procurement requirements by many states and municipalities.

Insofar as these changes create greater incentives for credible co-regulation, they will contribute to gains in environmental quality by engaging a broader field of forces, including markets, supply chains, and government procurement. By reducing the demands placed on regulators, such reforms can free up scarce resources that can be focused more effectively on helping firms build a capacity for internal regulatory governance, as well as identifying and sanctioning recalcitrant businesses that currently believe (and not without reason) that the low probability of inspection allows them to pollute with few consequences.

Future Directions for Policy— Co-Regulation and the Financial System

Over the next few years, Congress and the regulatory agencies with authority over the financial sector are exceedingly likely to embark on far-reaching reforms. Prevailing proposals range from adoption of new substantive constraints on financial companies, such as tougher limits on leverage and firm size, tighter rules on executive compensation, and requirements that bond rating be insulated from conflicts of interest, to requirements that financial firms trade complex derivatives in standardized forms on public exchanges, much tighter enforcement of existing and new regulations through beefed-up budgets for administrative agencies, and fundamental structural reorganization of the regulatory agencies charged with ongoing rule-making and enforcement. Within this large and complex agenda for change, policymakers will have to come terms with the roles that industry self-policing will play in the new regulatory architecture.

In light of the profound failure of schemes such as the CSE program, there will be a strong temptation to look askance at any regulatory role for financial firms or nongovernmental organizations. But we would argue that the question ought not to be whether the American state should defer to self-regulation—that path leads at best to unmet public goals, and at worst to crisis and disaster. Rather, policymakers should ask whether they ought, in at least some areas, to strengthen institutions of co-regulation. Even with substantial increases in regulatory budgets, the American state is unlikely to fill every regulatory niche required by America’s exceedingly complex financial system.

Three areas especially call out for attention here. One involves the parts of the securities markets where private governance already plays a central role—the stock and futures exchanges, FINRA’s regulation of stockbrokerages, and

the Financial Accounting Standards Board's formulation of guidance for corporate accounting. The SEC and Congressional oversight committees should undertake a fresh examination of FINRA's and FASB's regulatory performance, considering whether current arrangements sufficiently meet the requirements of meaningful co-regulation. The Bernard Madoff scandal certainly raises troubling questions about the degree to which FINRA, and before it NASD, was fulfilling its obligations to oversee the activities of broker-dealers during the past two decades. NASD officials inspected Madoff's firm periodically over that time frame, yet at no point uncovered the practices that eventually grew into a multibillion-dollar Ponzi scheme. The disastrous consequences resulting from such apparently kid-glove treatment of a prominent NASD leader suggests one obvious point of departure for reassessing the functioning of the financial sector's quasi-public and private regulators. Whether such reassessment comes from the SEC, or through the auspices of congressional hearings, investigators should surely ask whether these regulators continued to manifest a genuine concern for the financial markets' reputation for probity, a concern quite evident in the two generations following the Great Depression and the New Deal; whether they have been meeting the requirements of meaningful transparency; and to what extent their focus on accountability gave way before the rampant cronyism of the last decade.

A second area concerns some key financial intermediaries—mortgage brokers, investment advisers, and hedge funds—whose behavior contributed to the current financial crisis. Mortgage brokers directed hundreds of thousands of Americans into dangerous loans, often in order to maximize their own commissions; investment advisers steered tens of thousands of investors into risky securities like collateralized debt obligations (CDOs) without sufficient attention to the attendant risks; hedge funds plowed money into CDOs and other even more exotic financial instruments such as credit default swaps, oblivious to the implications for systemic financial stability. There is a growing consensus in favor of heightened federal regulation over all of these economic players. A strategy of co-regulation might especially make sense in the case of mortgage brokers and investment advisers, given the structural parallels between them and stockbrokerages. Dispersed throughout the entire country, and reflecting great diversity in scale and forms of business organization, these intermediaries might lend themselves to at least partial oversight by newly created SROs, in line with the advantages of regulatory flexibility. The alternative of traditional administrative regulation will surely confront daunting problems of monitoring and regulatory coverage.

Finally, policymakers might wish to think through the advantages and disadvantages of creating a quasi-public, nongovernmental institution to oversee

the process of bond rating, which appears to have been thoroughly corrupted by conflicts of interest. The staffing and funding of such an institution would, no doubt, pose great challenges of regulatory design, as would the creation of opportunities for public input into setting standards and devising mechanisms of oversight by the relevant regulatory agencies. But this approach would seem to offer one way to avoid endemic conflicts of interest, while keeping the government out of the business of ranking the relative risk associated with various securities.

The financial scandals of the past several years, along with heightened public support for stricter regulation of the financial markets, improves the chances for crafting strategies of co-regulation that make a difference. The historical record, both within and outside the realm of finance, suggests that industries beset by crisis, especially crisis that has sullied their standing with the public, frequently prove more committed to building regulatory institutions that actually achieve their goals. That same record makes clear that to be effective, private regulatory governance must confront the scrutiny of an engaged and properly resourced regulatory state.²⁸ With attention to the right principles of design, targeted co-regulation might help American policymakers recreate the basic culture of trust so crucial to modern financial markets.

Co-Regulation As Policy Tool

We began this essay with two brief vignettes about regulatory failure. The victims of the credit crisis and the environmental disaster in eastern Tennessee now look to Washington policymakers for solutions. One could certainly forgive those policymakers for looking at a broken dam and a crippled financial system and concluding that self-regulation necessarily translates into no regulation at all. To be sure, proponents of private regulatory structures all too often design them in a haphazard and cavalier fashion, or embrace them as part of a larger political agenda that rejects a positive role for regulation. Corporations have a powerful incentive to maximize profits and, absent the constraints imposed by regulatory policy, many firms will, sooner or later, impose large and tragic costs on society. Given the stakes, reliance of any kind on private regulation might seem just too risky.

Yet there is powerful evidence that in the right circumstances, and with the right execution, strategies that incorporate private governance can extend the reach of regulation to areas that are simply beyond the analytical and budgetary capabilities of public regulators. Legislators and administrative agencies should view nongovernmental regulation as a policy instrument that can make sense in many, if by no means all, regulatory contexts. The key challenge is to design systems that provide the benefits of self-governance without sacrificing the high levels of accountability that one expects from public regulation.

We have argued that the substantial advantages of regulatory delegation, either to SROs or individual corporations, can result if and only if such delegation occurs within a larger system of co-regulation. The government must design regulatory institutions to ensure that the flexibility for internal regulation is extended only to organizations with the requisite capacity and expertise; it must simultaneously take great care to maximize transparency and accountability. If implemented with care, a regime of co-regulation can extend the capacity of public regulators to promote the public interest. It can harness reputational concerns, market and supply-chain forces, and the capabilities of trade and standards-setting organizations to achieve goals that are currently beyond the reach of public regulators. Co-regulation, if it represents ingenuity in policy design and dedication to sustained oversight, can mean smarter regulation, and better government.

Obviously, our conclusions give rise to many more specific questions, in each of the thematic areas that we have examined. How should we go about distinguishing genuine regulatory concern from a politically savvy charade? What degree of heterogeneity among regulated entities should trigger the search for regulatory delegation to nonstate actors? What kinds of management systems and corporate compliance departments are necessary to assure that an SRO or a corporation has the capacity, and the dedication, to participate in co-regulation? What quantity, and quality, of information disclosure will meet the demands of transparency? How should public regulators devise metrics or baselines for such corporate reporting, so as to ensure comparability of results? When, precisely, does monitoring and enforcement by private regulatory actors, or the oversight of those actors by public officials, attain a sufficient standard of accountability? The answers to these questions will inevitably vary across regulatory domains. Prerequisites for effective co-regulation in food safety, for example, will surely differ considerably from what is required in environmental management or finance. As such, they deserve careful consideration from scholars in every relevant social science discipline, as well as from the representatives of trade associations and public interest groups, and from analysts within regulatory agencies, the Office of Management and Budget, and congressional committees responsible for regulatory oversight.

What we propose here, then, is neither a blueprint nor a formula. Instead, we offer a analytical framework—some broad principles and key questions—that should help legislators and regulatory officials sensibly choose when to give representatives of business some measure of regulatory authority, and think more systematically about the need to integrate these efforts into a system of co-regulation. Policymakers must approach any potential reliance on nongovernmental regulatory structures with open eyes and an appreciation for the

challenges of making them work. Legislators and bureaucrats cannot take corporate commitment to regulatory purposes for granted, even as they should not presume that any profession of such commitment is necessarily a mere smokescreen. They cannot approach co-regulation in the hope of discovering a cost-free solution—governments cannot create meaningful disclosure, much less meaningful accountability, without significant expenditure of resources. They further cannot assume that a given framework of co-regulation, once sensibly created, will achieve its goals without serious, consistent oversight. There is simply no regulatory free lunch.

Notes

- 1 “Chairman Cox Announces End of Consolidated Supervised Entities Program,” Press Release, Securities and Exchange Commission, September 26, 2008, available at <http://www.sec.gov/news/press/2008/2008-230.htm>, accessed December 31, 2008; Office of Inspector General, U. S. Securities and Exchange Commission, *SEC’s Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program* (Washington, D. C., 2008); Stephen Labaton, “Agency’s ‘04 Rule Let Banks Pile up New Debt,” *The New York Times*, October 3, 2008: A1.
- 2 Earth Justice, “Comments on the Utility Solid Waste Activities Group’s ‘Utility Industry Action Plan for the Management of Coal Combustion Products,’” Pursuant to EPA Notice of Data Availability, August 29, 2007, Submitted January 28, 2008, available at http://www.earthjustice.org/library/references/noda_appendix_-d.pdf, accessed January 5, 2009; “Tennessee: Early Warnings on Ash Pond Leaks,” *Chattanooga Times Free Press*, January 5, 2009, available at <http://timesfreepress.com/news/2009/jan/05/tennessee-early-warnings-ash-pond-leaks/?local>, accessed January 7, 2009; Shaila Dewan, “Hundreds of Coal Ash Dumps Lack Regulation,” *The New York Times*, January 7, 2009: A1. Quote from Steve Mocarsky, “Health Risk from Fly Ash Dumping Debated: Environmentalist: Stricter Rules, Fed Oversight Needed. Utility Spokesman Disagrees,” available at <http://dev.centreforenergy.com/NewsMarkets/displayNewsArticle.asp?From=NewsSearch&Search=&NumberStoriesToDisplay=ALL&ResultCategoryType=2,3&NewsPageID=58&NewsID=9992359&template=2,3&currPage=13>, accessed January 21, 2009.
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- 4 For especially useful overviews of this literature, see John Braithwaite, “Enforced Self-Regulation: A New Strategy for Corporate Crime Control,” *Michigan Law Review* 80 (1982): 1466–1507; Neil Gunningham and Joseph Rees, “Industry Self-Regulation: An Institutional Perspective,” *Law and Policy* 19 (1997): 363–414; Marc Eisner, “Corporate Environmentalism, Regulatory Reform, and Industry Self-Regulation: Toward Genuine Regulatory Reinvention in the United States,” *Governance* 17 (2004): 146–67; and Edward J. Balleisen, “The Prospects for Effective ‘Co-Regulation’ in the United States: A Historian’s View from the Early Twenty-

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- 5 See Amy J. Hillman and Gerald D. Keim, “Shareholder Value, Stakeholder Management, and Social Issues: What’s the Bottom Line?” *Strategic Management Journal* 22, no. 2 (2001): 125–39; and Benjamin Cashore and Ilan Vertinsky, “Policy Networks and Firm Behaviours: Governance Systems and Firm Responses to External Demands for Sustainable Forest Management,” *Policy Sciences* 33 (2000): 1–30.
 - 6 Madhu Khanna and William Rose Q. Anton, “Corporate Environmental Management: Regulatory and Market-Based Incentives,” *Land Economics* 78, no. 4 (November 2002): 555.
 - 7 Neil Gunningham and Joseph Rees, “Industry Self-Regulation” (*see note 4 above*).
 - 8 Michael J. Lennox and Jennifer Nash, “Industry Self-Regulation and Adverse Selection: A Comparison Across Four Trade Association Programs,” *Business Strategy and the Environment*, 12 (2003): 343–56. *See also* Andrew A. King and Michael J. Lennox, “Industry Self-Regulation Without Sanctions: The Chemical Industry’s Responsible Care Program,” *Academy of Management Journal*, 43, no. 4 (2000): 698–716.
 - 9 Cary Coglianese and David Lazer, “Management-Based Regulation: Prescribing Private Management to Achieve Public Goals,” *Law & Society Review* 37, no. 4 (December 2003): 692. This discussion follows the argument presented by Coglianese and Lazer.
 - 10 *Ibid.*, 715.
 - 11 Robyn Fairman and Charlotte Yapp, “Enforced Self-Regulation, Prescription, and Conceptions of Compliance within Small Businesses: The Impact of Enforcement,” *Law and Policy* 27, no. 4 (October 2005): 504, 516. *See also* John Braithwaite, “Enforced Self-Regulation” (*see note 4 above*). He argues: “For businesses below a certain size, a viable and independent compliance unit is impossible. Direct government inspections must be retained for small businesses. In particular, government inspectors would continue to have a vital role in catching fly-by-night operators who calculatedly operate on the fringe of the law” (1501).
 - 12 *See* Jean B. McGiorie, Alison Sundgren, and Thomas Schneeweis, “Corporate Social Responsibility and Firm Financial Performance,” *Academy of Management Journal* 31, no. 4 (1988): 854–52; and Ronald M. Roman, Sefa Hayibor, and Bradley R. Agle, “The Relationship Between Social and Financial Performance: Repainting a Portrait,” *Business & Society* 38, no. 1 (1999): 109–25.
 - 13 *See* Andrew Hopkins, “Beyond Compliance Monitoring: New Strategies for Safety Regulators,” *Law & Policy* 29, no. 2 (April 2007): 210–27.
 - 14 *SEC’s Oversight of Bear Stearns and Related Entities* (*see note 1 above*).
 - 15 Joseph Rees, *Hostages of Each Other: The Transformation of Nuclear Safety since Three Mile Island* (Chicago: University of Chicago Press, 1994).
 - 16 *SEC’s Oversight of Bear Stearns and Related Entities* (*see note 1 above*).

- 17 In twenty-three states that prohibit state environmental agencies from adopting standards that are tougher than those required by the federal EPA, state regulation of fly ash lagoons is particularly limited. *See* Earth Justice, “Comments on the Utility Solid Waste Activities Group’s ‘Utility Industry Action Plan’” (*see* note 2 above); The Utility Solid Waste Activities Group, *et al*, “Comments on Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments, Pursuant to EPA Notice of Data Availability,” August 29, 2007, submitted February 11, 2008, available at <http://www.uswag.org/pdf/2008/NODACComments.pdf>, accessed January 5, 2009.
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- 21 *See* Allen Blackman, James Boyd, Alan Krupnick, and Janice Mazurek, “The Economics of Tailored Regulation and the Implications for Project XL” (Washington, DC: Resources for the Future, 2001); and Alfred A. Marcus, Donald A. Geffen, and Ken Sexton, *Reinventing Environmental Regulation: Lessons from Project XL* (Washington, DC: Resources for the Future, 2002).
- 22 *See* Marc Allen Eisner, *Governing the Environment: The Transformation of Environmental Regulation* (Boulder, CO: Lynne Rienner, 2007): 185–88, 193–95.
- 23 *See* U.S. Environmental Protection Agency, *National Environmental Performance Track: Program Guide* (Washington, DC: Environmental Protection Agency, 2001). *See also* Eisner, *Governing the Environment*, 188–93 (*see* note 22 above).
- 24 This data is taken from <http://www.epa.gov/performancetrack/index.htm> (accessed December 29, 2008).
- 25 Lynn L. Bergeson, Lisa M. Campbell, and Lisa Rothenberg, “TSCA and the Future of Chemical Regulation,” *EPA Administrative Law Reporter* 15, no. 4 (2000): 1–23.
- 26 Environmental Protection Agency, *Chemical Hazard Data Availability Study: What Do We Really Know About the Safety of High Production Volume Chemicals?* (Washington, DC: Environmental Protection Agency, 1998).
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- 28 For more extended discussion of these historical patterns, *see* Balleisen, “Prospects for Effective ‘Co-Regulation’” (*see* note 4 above).

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