

CORPORATE GOVERNANCE & THE ENVIRONMENT: BAD
DISCRETION, GOOD DISCRETION, AND ENVIRONMENTAL FIRM
PERFORMANCE

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Carl Joachim Kock

Juan Santaló

Luis Diestre

Instituto de Empresa
Serrano 89 – 2º
28006 Madrid
Spain
carl.kock@ie.edu

Instituto de Empresa
Serrano 89 – 2º
28006 Madrid
Spain
juan.santalo@ie.edu

Instituto de Empresa
Serrano 89 – 2º
28006 Madrid
Spain
luis.diestre@ie.edu

Abstract

This paper brings together the two important topics of corporate environmental management and corporate governance by exploring the impact of various governance mechanisms on the level of environmental performance that is realized by firms. Specifically, we hypothesize that anti-takeover amendments and provisions that restrict managers' personal liability create a sphere of "bad" discretion that allows managers to shirk by underinvesting in potentially financially beneficial levels of environmental performance. On the other hand, we suggest that corporate governance structures that emphasize higher levels of performance pay and lower degrees of monitoring create a degree of "good" discretion that enhances environmental firm performance. We find strong and robust support for these hypotheses in a sample of U.S. manufacturing firms, suggesting that different corporate governance mechanisms can serve as important tools for public policy and corporate board level efforts to enhance environmental performance.

Keywords

Corporate Environmental Performance, Corporate Governance, Managerial Discretion

Corporate governance is traditionally a central issue in strategy research and practice, corporate environmental management is increasingly becoming one. In this paper, we explore the relationship between these two fields by analyzing the effect of corporate governance provisions that change managerial discretion on different measures of firm environmental performance.

While the link between corporate governance mechanisms and firms' financial or stock market performance has been widely studied in the economics and management literature, studies that focus on the direct relationship between corporate governance and different firm strategies or other identifiable managerial actions are comparatively scarce, probably because of the lack of suitable data (but see, e.g., Jenkins & Seiler, 1990; Sanders, 2001). One of the contributions of this paper is therefore to expand the corporate governance literature by using alternative measures of firm strategies, i.e., regarding environmental management, to further explore the link between governance variables and specific strategies.

Our main focus, however, is on contributing to the area of corporate environmental management. Specifically, we show in this paper how different elements of corporate governance either positively or negatively affect corporate environmental performance, and thus identify new potential ways of adjusting a firm's environmental strategy both, from a policy and a managerial or shareholder perspective.

The topic of corporate environmental management and performance is an increasingly important issue that has recently drawn attention from a variety of researchers. Russo & Fouts (1997), for instance, have delivered a resource-based perspective on why environmental activities may be positively related to financial performance (see also Aragón-Correa & Sharma, 2003; Christmann, 2000). Delmas (2001) and Melnyk, Sroufe & Calantone (2003) have shown that such a positive link exists when firms strongly commit themselves to implementing environmental management systems, and several authors (e.g. Hamilton, 1995; Lanoie, Laplante & Roy, 1998; Muoghalu, Robinson & Glascock, 1990; Molloy, Erekson & Gorman, 2002) have found sometimes conflicting results on the question of whether environmental performance and shareholder wealth are positively related.

Some prior work has focused on interactions between governance and environmental issues. Gabel & Sinclair-Desgagné (1993), for example, develop a formal model of what incentives top managers can use to sway lower level managers to engage in pro-active environmental activities. Campbell, Sefcik & Soderstrom (2004) show that firms pay managers for assuming personal risk related to environmental underperformance, and Aragón-Correa, Matías-Reche, & Senise-Barrio (2004) find that firms in which a particular manager has responsibility for environmental issues and furthermore has discretion (which they proxy with "belonging to the firm's dominant coalition") to implement her views, show a higher environmental commitment. In the current paper, we ask a more general question, i.e. what is the effect of specific corporate governance instruments on a firm's overall environmental strategy or eventual level of environmental performance.

Specifically, we build on previous work by Gompers, Ishii & Metrick (2003), who have analyzed the effects of managerial “power.” Using an index (the “G-Index”) that combines various proxies of managerial entrenchment like golden parachutes, poison pills, various other take-over defenses, as well as protection of managers from legal claims (see the Appendix for an explanation of the G-Index), Gompers et al. (2003) find that firms in which managers have more “power” generate significantly less shareholder wealth and systematically under-perform in comparison with those firms in which managers have less power. In this paper, we interpret such managerial power as a specific type of managerial discretion, which indicates to what extent managers are buffered from the repercussions of external violations (e.g., through limiting their personal liability for fines) or internal violations (e.g., golden parachutes reduce the risk of being fired for bad performance). In other words, we focus on the effects on corporate environmental performance of what may be called “bad” discretion – “bad” in the sense that this discretion affords managers with protection even if they fail to perform in the best interest of the firm or its shareholders. Specifically, we suggest that this bad discretion can worsen agency problems, leading managers to use their protection to shirk by not performing tasks related to ensuring an optimal level of environmental performance. Alternatively, protection against external threats of private sanctions if firms fail to live up to environmental standards may lead managers to reduce their environmental activities as well. Either way, we expect – and find – a negative relationship between bad discretion and environmental performance.

Yet, managerial discretion is clearly not always “bad”. To the contrary, a central concept in corporate governance concerns the triangular relationship between monitoring, decentralization (or awarding “discretion” to managers), and pay-per-performance (e.g. Prendergast, 2002). When monitoring is too costly (e.g., because the firm’s business is too complex and managers have therefore better knowledge than shareholders), firms reduce their control on the managerial function and instead rely on incentives to align managerial goals with those of shareholders (Zajac & Westphal, 1994). Essentially, this introduces a positive or “good” type of discretion in the sense that shareholders empower managers to use their information advantage to act on the behalf of shareholders. Particularly, incentives centered around equity-based pay conform to such a notion of providing good discretion, while at the same time not affording managers with the type of protection they enjoy in the presence of bad discretion. A similar concept has recently been applied by Kock & Santaló (2004) in the corporate environmental management framework. They suggest that shareholders may be “environmental laggards” in terms of adhering to a historic, generally negative view of environmental activities as constituting a simple drag on financial performance, while managers, due to their direct exposure to the production process, as well as to pro-environmental claims of outside stakeholders, have a more accurate and acute understanding of the potentially value-generating properties of environmental activities. Supporting their view, they found that firms in which shareholders have relatively more leverage to implement their views (proxied by high levels of monitoring) had lower, while firms with high levels of managerial discretion showed a higher level of environmental performance. In the theory part of our paper we integrate these previous

findings with our focus on bad discretion to present a consistent theory.

In the next section, we review the relevant literature and derive three specific hypotheses. The following section then details the construction of our sample as well as our empirical strategy, which is followed by a discussion of empirical results and some concluding remarks.

THEORY AND LITERATURE REVIEW

In this section we briefly review the main findings of both the environmental management and corporate governance literatures. Building on this extant body of knowledge regarding these two subjects we then derive three specific hypotheses concerning the connection between different measures of managerial discretion and firm environmental performance.

Environmental Management Issues. The topic of corporate environmental management is increasingly becoming an important area of managerial and academic attention. However, this has not always been the case. In fact, we can identify three relatively distinct and roughly historically successive phases of firm responses to environmental issues (e.g. U.S. EPA, 2000; Kock & Santalo, 2004). Initially, accustomed to use the environment as a free source of inputs and deposit for waste materials, firms facing emerging environmental legislation tried to minimize or avoid the costs associated with compliance. Accordingly, they focused on so called “end-of-pipe” solutions like adding filters that created no added value and thus lead to a negative correlation between environmental investments and financial performance (e.g., Jaggi & Freedman, 1992). Later, firms turned to a more pro-active approach that included conducting internal audits and implementing “environmental management systems” (EMS) that, by redesigning entire productive processes, were intended to ensure regulatory compliance while simultaneously improving operating margins by reducing required inputs and productively using by-products. Finally, the most proactive firms are now taking this a step further by going beyond compliance and towards active value creation through environmental strategies that focus on the creation of unique organizational capabilities. Russo & Fouts (1997), for instance, suggest that the environmentally oriented redesign of whole firms can lead to uniquely efficient capabilities that are difficult to match by less environmentally pro-active competitors. Supporting this theory, Russo & Fouts (1997) indeed find higher environmental performance linked to higher financial firm performance (return on assets). Other authors have further theoretically and empirically supported this link and identified important moderators such as external contingencies or pre-existing complementary capabilities (Aragon-Correa & Sharma, 2003; Christman, 2000). Moreover, several studies provide evidence that the introduction of an EMS indeed results in significant benefits for firms by finding, for instance, increases in self-reported levels of competitive advantage (Delmas, 2001), or increases in various measures of corporate performance (Melnyk et al., 2003). Yet, these results occur only if firms do not simply pay lip service to implementing an EMS or focus on simple environmental compliance, but use the process of implementation to form strong relationships with internal and external stakeholders (Delmas, 2001), or maximize organizational involvement by going through the ISO 14000

certification for their EMS (Melnyk et al., 2003). Thus, there is mounting evidence that a relatively high level of environmental performance is not only compatible with, but one potential source of good financial firm performance.

As such, one of management's duties would be to make the required investments into a high environmental performance of the firm. And, indeed, given managers' involvement in and information about the production process, one would assume that they are likely to perceive environmental efforts as worthwhile investments. Such a tendency only increases when one takes into account the rising stakeholder pressures for a healthier environment that managers face on a daily base. This obviously includes environmental activism by groups such as Greenpeace, who may attempt to hurt environmentally negligent firms with boycotts or other actions (see greenpeace.org). Even more important, however, may be the threat of legal actions, which, at least in the United States, has recently increased quite significantly (Epstein, 1996). In fact, because of recent changes in the execution of U.S. law, managers and executives can be criminally prosecuted as individuals for the actions of their businesses, even if they neither knew about nor had any role in the crime (Berning, 2000). Thus, managers can be sentenced to fines or jail time simply for company violations that occurred on their watches. Convictions of this type are usually based on "public welfare" legislation – according to the U.S. Supreme Court, a "public welfare offense" is a crime for which "a reasonable person should know [that the proscribed activity] is subject to stringent public regulation and may seriously threaten the community's health or safety" (Liparota v. United States, 1985, quoted in Berning, 2000).

That these threats are not just hypothetical is evidenced by the fact that in 1995, environmental enforcement resulted in \$23.2 million in criminal fines and 74 years of prison time, numbers which nearly tripled by 1999, with criminal fines totaling \$61.6 million, and prison time increasing to 208 years (U.S. EPA, 2002). Further, the U.S. Department of Justice (1997) reports that during 1997, 446 defendants were charged with a criminal environmental violation, of which about a quarter were sentenced to a jail term with an average duration of 21.5 months. The courts also ordered 64% of those convicted to pay a fine, with an average value of \$67,416; of these, 22% only paid a fine, 14% also went to prison, and 64% received probation in addition to the fine.

Hence, the potential environment-related legal claims on managers (and their firms), both in financial and imprisonment terms, are real and quite significant. Given that such liability exists even independent of manager's direct or intentional involvement in environmental misdeeds, it is a plausible assumption that these legal claims are likely to encourage managers to push for a relatively high overall level of firm environmental performance in order to alleviate these personal threats.

Yet, there are also reasons for believing that managers will be less than fully inclined to rigorously pursue environmental performance. On one hand, creating a sound and effective corporate environmental strategy, particularly given the findings cited above that only dedicated

implementations of environmental strategies are likely to yield positive financial results, obviously requires a great amount of effort from the manager. From the perspective of agency theory, it is then very likely that the manager will be reluctant to invest this effort. On the other hand, some empirical studies cast doubt on whether environmental investments are actually valued or rewarded by shareholders. Molloy et al. (2002), for instance, find a negative relation between low emissions and stock returns within industries, and conclude that their overall findings suggest “that if investors consider environmental performance at all, they perceive environmental improvements and management as costly, unless made to avoid non-compliance penalties.” Several other studies support this view by finding positive share price reactions primarily for reductions in the likelihood of penalties (e.g., Muoghalu et al., 1990; Hamilton, 1995; Lanoie et al., 1998), although other authors do find directly positive relations between firm environmental performance and share prices (e.g. Hart & Ahuja, 1996). If shareholders indeed undervalue environmental investments, managers may also be dissuaded from investing in this area.

Given these divergent tensions, an important, but so far unanswered question is the effect that different degrees of managerial discretion may have on the propensity of managers to pursue higher or lower levels of environmental performance. To address this issue, the primary focus in this paper is on the effects of various measures of corporate governance mechanisms on a firm’s environmental performance.

Bad Discretion. The first broad category of corporate governance issues that we consider falls under the notion of corporate anti-takeover amendments (from now on “ATA”). By this, we mean different corporate governance statutes that restrict shareholder rights to obstruct potential hostile take-over attempts that in case of success could overthrow the firm’s management team. A large body of literature investigates the effects of the adoption of ATA on corporate performance. This literature has produced two divergent interpretations – a “shareholder interest view”, which suggests that ATA provisions benefit shareholders and a “management entrenchment view”, whose adherents suggest that ATA provisions exacerbate agency problems (see Sundaramurthy, 2000, for a literature review that summarizes arguments and evidence for both views).

Supporters of the “shareholder interests view” stress that ATA provisions can generate an environment where managers find additional motivation to look for shareholder wealth. First, adopting anti-takeover provisions effectively creates a long-term contract between shareholders and the current management team (Knoeber, 1986), which, in turn, encourages managers to make firm-specific human capital investments. Managers not protected against the takeover market may not have the incentive to invest in firm-specific skills if these are not rewarded in the labor market (Sundaramurthy, 2000). Second, managers protected from the market for corporate control may show more willingness to invest in value-creating long-term projects. Stein (1988), illustrates this argument in an elegant theoretical model that shows how managers might rationally behave myopically in the presence of costly information and takeover threats (see also Shleifer & Vishny, 1990). In this setting, markets may undervalue long term projects, whose true

value is only known to managers due to their better access to inside corporate information. Consequently, if managers follow these undervalued long-term projects, the firm may become a takeover target depending on the extent to which corporate raiders are aware of the company's true value. Therefore, managers that do not want to lose their job are likely to avoid undertaking long-term projects, favoring instead short-term gains that lessen the probability of an immediate takeover. This result holds even if long term projects create more value or have a larger net present value than short term projects. Furthermore, the presence of ATA may increase shareholder value by avoiding prisoner dilemma type situations that may arise when bidders make two tiered offers and hope for an uncoordinated response of individual shareholders. In this situation, managerial "veto power" due to ATA allow target firms to present a "cartelized" response to a takeover offer by making potential bidders deal with the target firm management (DeAngelo & Rice, 1983; Harris, 1990). On similar lines, Lipton & Rowe (2002) argue that managers have better information than shareholders about the real long run value of the company. In light of this, managers can add value to the shareholders by rejecting takeover attempts whose offer is inferior to the real long run value of the company. Finally, some provisions that compensate managers in the case of an acquisition of their firm – e.g. golden parachutes – encourage managers to be objective in evaluating takeover bids, rather than focusing on whether their skills will be valued in the merged company (Lambert & Larcker, 1985; Harris, 1990). Wade, O'Reilly & Chandratat (1990), for instance, find that protecting management from job loss consequences (with cash compensation), makes managers less reluctant to accept a bid.

On the other hand, supporters of the "management entrenchment view" take a more traditional agency perspective by suggesting that isolating managers from the market for corporate control allows them to use their protection to shirk by not performing tasks related to increasing corporate performance and to engage in a lax and opportunistic behavior at the expense of shareholders. In essence, the disciplining effect of the market for corporate control, where an outsider may acquire a poorly managed firm and displace its management (Jensen & Meckling, 1976), is potentially thwarted by the adoption of ATA that allow management a free reign over the firm. Thus, from the entrenchment perspective, protecting managers from the market of corporate control unambiguously destroys shareholder's value.

There is abundant empirical literature that tests whether effects of ATA fall into the "shareholder interests" or the "management entrenchment" view (see a complete literature review in Sundaramurthy, 2000, and Bebchuk, 2002). Some studies report a positive effect on abnormal stock returns supporting the "shareholder interests view" (Lambert & Larcker, 1985; Partch, 1987; Cornett & Vetsuypens, 1989), but the majority report a negative effect, which lends support to the "management entrenchment view". Bertrand & Mullinathan (1999) report that the adoption of antitakeover statutes weakened managers' incentives to minimize labor costs. Garvey & Hanka (1999) conclude that antitakeover statutes "allow managers to pursue goals other than maximizing shareholder wealth", while Borokhovich, Brunarski & Parrino (1997) find a positive association between antitakeover corporate protection provisions and total managerial compensation. Finally, Bebchuk, Coates & Subramanian (2003) report a first order negative

effect of takeover defenses on shareholders wealth. They find that those targets of a hostile takeover attempt with larger corporate defense provisions are more likely to remain independent. As a consequence, their shareholders lose significant abnormal returns from the acquisition premium.

More directly related to this paper, Gompers et al. (2003) construct an index of corporate antitakeover protection which summarizes information both from corporate statutes and state antitakeover arrangements. They find that a larger level of ATA is related to lower equity returns, lower profit margins and lower sales growth. Moreover, they find that managers that enjoy a larger level of ATA are more likely to engage in empire-building activities like capital expenditures and corporate acquisitions.

There is further abundant empirical literature that examines R&D and Capital expenditures before and after the adoption of ATA provisions. As Stein (1988) suggests, if ATA shelter managers from takeover risk, firms with a relatively larger presence of ATA should engage more frequently in undervalued long-term projects like R&D investments. However the empirical evidence is ambiguous. There are some studies that report a positive impact of ATA on long-term projects spending such as R&D or capital expenditures (e.g. Pugh, Page & Jahera, 1992). Yet, there is also evidence of the contrary. For instance, Mahoney, Sundaramurthy & Mahoney (1997) report that the number of ATA adopted has a negative impact on the amount of long-term investments (R&D and Capital expenditures) and Meulbroek, Mitchell & Mulherin (1990) find a decrease in R&D over sales following the implementation of ATA. Moreover, Johnson & Rao, (1997) finds no relation between ATA implementation and long-term corporate strategies.

It is precisely in this debate where the specific characteristics of investments that result into a higher level of environmental firm performance can help shed some light on this discussion. As discussed above, there is considerable evidence that a relatively high environmental performance is associated with high financial firm performance. Further, it appears as though shareholders may, at least to a certain extent, currently undervalue such investments. Thus, using environmental performance as a measure of the effects of ATA provides a relatively well specified new test of the competing hypotheses regarding ATA – as environmental performance is a value creating but potentially undervalued firm strategy, observing an increase with the introduction of ATA would speak for a shareholder value view, while a decrease would suggest managerial entrenchment and the use of ATA provisions to shirk on otherwise value creating efforts.

Furthermore, empirical tests of ATA effects on firm strategies have so far focused on central firm activities such as R&D and capital expenditures, whose performance can significantly impact the long term value of a firm and thus materially alter the takeover risk a firm is exposed to. In a sense, the analyzed firm strategies are causally linked to the takeover risk.

Within the managerial entrenchment hypothesis, assuming that managers can shirk when they are protected by ATA is tantamount to suggesting that they can withhold efforts from otherwise value generating projects. Absent ATA, the decrease in firm value associated with not undertaking these investments would be significant enough to invite a takeover bid. A similar argument underlies the shareholder value hypothesis as it applies to encouraging or discouraging certain investment activities. In essence, it is assumed that managers shy away from undervalued investments because the magnitude of these investments would be sufficient to materially affect the takeover risk.

With respect to environmental performance, although we have cited a growing literature that finds positive linkages with financial performance, none of the authors in that field would probably argue that environmental issues are central to a firm's operations, or that financial effects of very good or very bad environmental management are comparable in magnitude to those arising from more fundamental decisions regarding technologies or products. The Pollution Abatement Costs and Expenditures Report (U.S. Census Bureau 1999) shows that total capital expenditures for pollution reduction in the manufacturing industry, account for roughly just a 2.5% of total annual capital expenditures. Thus, we are essentially looking at a strategic issue that in one way does affect financial performance, but that is less likely to be of prime importance in either fostering or avoiding takeovers. Given this characterization, one could be tempted to think that the introduction of ATA, by itself, has negligible effects on such a peripheral strategy. However, we propose that ATA, particularly in the sense of enhancing managerial entrenchment will still have a potent influence on environmental performance. We derive this hypothesis by considering the possibility that the managerial entrenchment view may be broader than currently conceived, in that it creates a "sphere of discretion" that allows managers to be in general more relaxed with respect to potentially value generating but effort-intensive firm strategies and thus simply to withhold such effort (shirking), whether or not the strategies or investments in turn are materially related to takeover threats.

In essence, buffering managers from the consequences of negative performance (e.g. through ATA), increases the manager's discretion to decide whether to engage in value adding projects or simply to avoid effort and shirk. We call this a type of "bad" discretion that is characterized by taking away the pressure to invest effort, without substituting this void with incentives for managers to still work in the firm's (shareholders') best interest. In other words, managers become more powerful because they face fewer control issues, but this power is not channeled to coincide with shareholder interests.

It will be illustrative to recapitulate and consider the tradeoffs managers face in a more explicit way. With respect to undertaking efforts to ensure a high environmental performance of a firm, we have already identified several reasons why managers would be more or less likely to engage in such efforts. On the pro side, we find that external stakeholder pressure may encourage managers to engage in high environmental performance, as that helps to avoid possible fines, jail times or other types of social retributions, or, conversely, helps managers to attain a positive

social prestige. To the degree that environmental performance is positively linked to financial performance – at least in the expectation of managers – incentive structures that allow managers to benefit from increases in firm value also encourage higher environmental performance, as do mechanisms of corporate control. On the con side, we have the significant efforts that are involved in making changes that allow for a high environmental performance, as well as the fear of engaging in investments that may be undervalued.

The introduction of ATA in this context, *ceteris paribus*, reduces the strength of corporate control mechanisms (as the potential impact of the market for corporate control is reduced), which decreases the incentive to engage in high environmental performance. On the other hand, fears of engaging in undervalued investments may likewise be ameliorated, which actually enhances incentives to create a high environmental performance.

This ambivalent situation (which lies at the heart of the discussion between shareholder and entrenchment views) can be resolved with reference to our suggestions regarding the peripheral nature of environmental performance and the potential general discretion that ATA may create. If environmental performance is really only peripheral to takeover threats, then instituting ATA should not change much with respect to how important the undervaluation issue is for managers. Yet, having a general level of discretion or power that frees managers from concerns about value creation (while not having any additional incentives to look for higher performance), we expect that the primary effect will be that effort is conserved. Hence, if we do find that environmental efforts are (negatively) correlated with higher levels of ATA, then, given the peripheral nature of these strategies, it would appear reasonable to conclude that a) there is evidence that ATA create a more general (bad) discretion that allows (and encourages) managers to simply shirk in all their efforts, and b) the management entrenchment hypothesis is supported. Therefore we hypothesize that:

(H1) Firms with managers who are more isolated from the discipline of the market of corporate control (high power/bad discretion) exhibit worse levels of environmental performance.

While ATA affect managerial behavior in the general context of takeover threats, there is a second class of variables that Gompers et al. (2003) consider within their index, i.e., limited liability clauses. These are amendments to the corporate charter that limit or even eliminate manager's personal liability for breaches of the duty of care (Bhagat, Brickley & Coles, 1987). However, such "insurances" do not cover liability involving willful misconduct, bad faith or knowing violation of security laws (see Kaplan & Harrison, 1993, for a deeper analysis of managerial and director liability).

Similar to ATA, proponents of limited liability charter amendments suggest that this provision can have a positive impact on shareholder's wealth for several reasons (see Bhagat et

al., 1987, for a review of these arguments). First, offering such provisions may be necessary to attract and retain competent managers. Second, managers may behave in a conservative manner if they are not protected against personal liability. Further, this limitation in manager's personal liability is not complete, and managers therefore still face the risk of being prosecuted. Finally, even when the manager is not personally liable, she suffers reputation costs. Thus, the existence of such costs may also work as a disciplining mechanism in the presence of limited liability amendments. Skeptics, however, argue that limited liability provisions weaken the effectiveness of lawsuits as a managerial control device (Gompers et al., 2003). Particularly limiting managers' personal liability in suits by shareholders will obviously lower the power of lawsuits to act as a corporate disciplining mechanism.

Hence, while introducing limited liability policies eliminates a managerial control device, it may also lead to positive effects by decreasing managerial risk-aversion or increasing the possibility of finding and retaining competent managers. The general question of whether limited liability provisions increase or decrease a firm's value therefore depends on which of these effects dominates (Bhagat et al., 1987).

In the case of environmental performance, however, the various effects described above tend to work in the same direction. First, the loss of a corporate control mechanism – similar to the concepts discussed with regard to ATA – may enhance “bad” discretion by increasing managers' ability to shirk in general and thus also to avoid efforts related to environmental performance. Yet, while limitations on liability may enhance managers' incentives to undertake various potentially risky investments (in the sense that undertaking them could trigger shareholder or stakeholder lawsuits), in the case of environmental performance the relationship is quite the opposite. As discussed above, since current legislation makes managers personally responsible for environmental damages caused by firms' negligence, we should expect that absent limited liability clauses managers would prefer a rather high level of environmental performance just to minimize the probability that they incur these personal responsibilities. Hence, introducing limited liability clauses, while not protecting managers from potential prison terms, will tend to reduce the amount of financial risk managers are exposed to in this regard and thus tilt the manager's incentive structure away from expending efforts on environmental performance. In essence, by shielding managers from adverse consequences of negligence, limited liability clauses – at least in the context of environmental performance – add to the level of “bad discretion”. We therefore hypothesize:

(H2) Firms that have adopted limited liability clauses (bad discretion) exhibit worse environmental performance than those without such provisions.

Good Discretion. In the discussion of the first hypothesis, we have proposed the existence of “bad” managerial discretion. Here, we contrast this “bad” discretion with a different type of discretion that obtains as close monitoring is substituted for a higher degree of incentive pay. In these instances, discretion is also increased, as the reduced degree of monitoring affords

managers with more degrees of freedom in terms of strategic choice. Yet, this discretion is of a “good” type since increasing delegation and substituting close monitoring by financial incentives could actually increase value instead of decreasing it as happens with the “bad” type of managerial discretion we have treated above.

In fact, the shareholder interest view with respect to ATA or limited liability provisions seems to fail to take into account that just offering more discretion without a simultaneous increase in incentives (incentive alignment) is unlikely to shift managerial actions towards more value generation for shareholders if that involves additional efforts. Rather, just adopting ATA or limited liability clauses simply removes threats from the managers, without replacing these threats with targeted incentives to shift or increase efforts. In essence, with respect to the tradeoffs regarding the decision to engage in a high level of environmental performance (or other investment decisions) that we have developed above, we are suspecting a reasonably strong interaction between the elements of “incentives” and the “undervaluation” issue. Introducing ATA when incentives are high, may indeed encourage managers to engage in undervalued investments – absent the potentially negative consequence of becoming a takeover target, following their private information regarding rent generating investments is in this case likely to indeed maximize these managers’ overall utility as they stand to benefit from the long term positive financial effects of executing such investments. Yet, if there are no targeted incentives, then taking away the control of the takeover market does not result in any imminently obvious incentive for managers to actually expend the effort required for engaging in higher environmental performance (or, for that matter, other effort intensive strategic actions). Here, managerial utility is likely maximized by simply not undertaking these efforts.

In this context, it is appropriate to consider what Brickley, Smith & Zimmerman (2001) call the three building blocks of any organizational architecture: the decision right assignment (discretion), the reward system (i.e., the level and structure of compensation) and the evaluation system (monitoring). These building blocks are intrinsically interconnected since they are jointly determined to maximize organizational performance. For instance, larger degrees of on-the-job discretion should optimally be associated with higher degrees of pay-per-performance financial incentives and also with a lower extent of monitoring. Following this general framework, Prendergast (2002) has developed a formal model that focuses on the distinction between instances in which a principal tells an agent what to work on and situations in which the agent is given discretion over the activities he or she spends time on. Prendergast’s model predicts a positive relation between delegation of tasks from the principal to the agent and the use of pay-per-performance compensation schemes as the efficient way to boost the agent’s effort. This larger degree of delegation is equivalent to a lower degree of control by the principal. In this paper, it is precisely this optimally chosen lower degree of control or larger degree of delegation that we refer to as “good” discretion.

We apply the Prendergast (2002) / Brickley (2001) framework to the principal-agent model between shareholders and managers in order to distinguish between two different types of

firms that both have a priori equally efficient ways of addressing the principal-agent problem between managers and shareholders (i.e., a reasonable tradeoff between monitoring and incentives that minimizes agency problems), but that differ with respect to the level of “good” discretion that they provide for managers. On one hand, we can identify corporations in which shareholders allow for such “good” managerial discretion by voluntarily delegating more tasks to the managers who are both less monitored and have larger pay-per-performance compensation plans. On the other hand, corporations in which shareholders hold more control/delegate less and managers are consequently monitored more closely and paid with a lesser relative importance of pay-per-performance plans, will offer lower or negligible levels of “good” discretion. In the following, we analyze how firm environmental performance is likely to vary across firms that are ruled by either of these two alternative corporate governance structures that provide for more or less “good” managerial discretion.

Specifically, we have earlier discussed that shareholders may not necessarily be aware of the value generating properties of environmental strategies and therefore undervalue such strategies, whereas managers, due to their direct exposure to the firm's technological opportunities as well as a more direct exposure to stakeholder groups demanding high levels of environmental performance, may have a more acute and accurate knowledge of the potential value generating attributes of environmental performance. If environmental performance is indeed an investment myopically undervalued by the shareholders while managers are aware of its real value, managers that enjoy a high level of “good” discretion will be able to implement environmentally enhancing strategies with less difficulty than managers that run the company with a lesser degree of “good” discretion. Offering “good” discretion that is aligned with financial incentives in this case allows managers to execute undervalued strategies that they believe are in the long term financial interest of the firm and thus, given the financial incentive structure they are facing, also their own interest. By contrast, if the firm's governance structure offers low levels of “good” discretion, and therefore provides for a correspondingly high ability of shareholders to directly implement their views, it is likely that shareholders may simply direct managers not to engage in strategies they believe to be of low value, including those investments necessary to achieve a high environmental performance. In this latter case, it is actually not so much the tradeoff of efforts and rewards regarding a particular strategy that sways managerial behavior, but a more direct interference by shareholders. Therefore we hypothesize that:

(H 3) High levels of incentive pay (larger degree of good managerial discretion) will be associated with better firm environmental performance, while high levels of monitoring (lower degree of good managerial discretion) will exhibit lower levels of firm environmental performance.

METHODS AND DATA

We have built our sample by crossing corporate information from three different datasets. We rely on data from the Investor Responsibility Research Center (IRRC) for variables on firm environmental performance, and corporate governance rules that isolate managers from the discipline of corporate control and limit their personal liability. For environmental performance, IRRC aggregates plant level filings collected by the U.S. Environmental Protection Agency in the “toxic release inventory” on type and amount of waste production, as well as treatment type, into firm level data. The IRRC also provides information on fines and penalties for environmental violations. Since IRRC data is mostly reported on a mandatory basis (firm pollution data), or reflects factual outcomes (penalty data), this data provides a reasonably objective quantitative measure of firm environmental performance. For corporate governance rules, IRRC compiles information about corporate governance provisions like supermajority rules to approve takeovers or golden parachutes and state laws that make it a priori more difficult for hostile takeover attempts to succeed, or for the firm to replace its top management team. Finally we use information about the size and composition of the corporate board also from IRRC.

The rest of firm and executive compensation characteristics are obtained from Compustat and ExecuComp, respectively. We restrict our sample to those firms that report activity in SIC codes between 2000 and 3999 since the requirement of information disclosure is stricter for those activities included in these manufacturing industries. Furthermore, due to data limitations that occur as we merge information from our different datasets, our sample is restricted to the two years of 1998 and 2000. Data at our disposal regarding firm environmental performance is contained in the 1988-2001 bracket since IRRC only provides environmental information up to the year 2001. In addition, IRRC corporate governance variables are available only for 1990, 1993, 1995, 1998, 2000 and 2002. Finally, board of directors data is available for the 1996-2002 period. Therefore the only two years for whom we have Corporate Governance, Environmental performance and Board of Directors data are 1998 and 2000. In the following, we detail how the specific variables used in our analysis have been constructed.

Environmental Measures. Firms in SIC codes 2000 to 3999 (entire manufacturing sector) are required by the U.S. EPA to report emissions for a considerable number of toxic chemical emissions (the current TRI toxic chemical list contains 582 individually listed chemicals in 30 categories) into the air, the water or the ground, once they exceed certain minimum thresholds. We construct our first measure of firm environmental performance as the natural logarithm of the total amount of toxic chemical waste¹ produced by a firm in a given year. This magnitude is a rather raw measure of (negative) firm environmental performance, whose most important drawback is that simply adding pounds of toxic materials will implicitly assign equal weights to chemicals with potentially huge differences in toxicity. For instance, releasing a pound of mercury into a river would surely produce an environmental catastrophe while releasing a pound of lead into the atmosphere has comparatively negligible environmental effects. While

we are aware of this important flaw, two reasons compel us to use this measure of firm environmental performance. One is data availability, as the IRRC provides total toxic chemical waste at the firm level without disaggregating it into its different chemical components. Furthermore, this magnitude has been used in prior studies on Corporate Environmental Management (e.g. Molloy, Erekson & Gorman, 2002, Konar & Cohen, 2001, Hart & Ahuja 1996, King & Lenox, 2001 and Campbell et al., 2004)) as a firm environmental performance measure and using it we provide comparability with such previous studies.

As our second firm environmental performance measure we use the monetary value of the environmental fines a firm received in a given year normalized by total firm year sales. In our opinion, this figure is a better measure of firm environmental performance as it does not have the important flaw identified above regarding the use of total toxic waste. According to the current environmental legislation, the total amount of an environmental fine should be a function of the environmental damages that the firm behavior has caused either by action or omission and therefore we can more safely assume a direct connection between “bad” firm environmental performance and total amount of fines paid.

However, this second measure of firm environmental performance exhibits some problems of its own. If a company has a worse environmental performance than its competitor but still performs well enough to just barely comply with legal requirements, we will not be able to observe any difference in its relative environmental performance since the amount of fines paid will be the same, i.e., zero, in both cases. Hence, following this argument, using the total amount of fines identifies variations in firm environmental performance *only* for those companies that are such bad environmental performers that they do not even comply with legal requirements. Consequently, we will identify exclusively movements on the left-tail of the environmental performance distribution. However, the proportion of firms in our sample that have been convicted of at least one violation is a substantial 24.5%, indicating that there is enough variability on our dependent variable to perform meaningful statistical tests.

Corporate Governance Variables. With the first set of governance variables we intend to measure those firm characteristics that by causing managerial entrenchment may result in an increase in managerial slack or “bad discretion”. Specifically, the first measure we use is the Corporate Governance index (GINDEX) that has been computed by Gompers et al. (2003). This index aggregates information from corporate statutes by adding one point for each corporate governance provision that restrict shareholder rights to obstruct potential hostile take-over attempts that in case of success could overthrow the firm management team. We provide a more detailed explanation about the procedure followed to construct this variable in the appendix.

The GINDEX was designed to measure “managerial power”, which is a much wider concept than what we have called “bad discretion.” This could potentially bias our empirical results or lead us to capture the effects of different concepts like decentralization or “good” discretion. We try to avoid these problems by using a more precise second measure of “bad”

managerial discretion for which we isolate a more refined subset of the corporate provisions aggregated in the GINDEX. More precisely, we consider only those corporate provisions that explicitly increase managerial on the job protection and that belong to a so-called “protection group” in the classification done by Gompers et al. (2003).

This protection group contains six provisions designed to insure managers against job-related liability or to compensate them following a termination. These provisions include compensation plans, golden parachutes, executive severance agreements, indemnification contracts, by-law indemnification and limitations on manager’s liability. The first three increase manager’s economic benefits in case of displacement. The last three either reduce manager’s liability up to the minimum level that is legally possible in case of a lawsuit against the company, or indemnifies managers from certain legal expenses and judgments resulting from lawsuits pertaining to their conduct. Accordingly, this index, PROTECTION, measures the level of economic protection managers have against negative consequences that may arise when failing to meet internal or external scrutiny.

Finally, we focus on a single type of corporate provisions – the limitations on manager’s liability – to measure the effect of isolating executives from legal risks associated to the performance of its managerial function. We proxy managerial liability, LL, by a dummy equal to one if managers have their liability explicitly protected by a corporate provision clause.

In the second set of governance variables we try to proxy for “good managerial discretion.” As discussed in the theory section, we follow Kock & Santaló (2004) in considering elements of corporate governance that allocate a high degree of decision rights or real authority to managers while simultaneously linking such discretion with incentives that encourage managers to maximize firm value, as providing “good discretion”. We approach the measurement of these effects by focusing on the relative weighting of monitoring and (equity-based) incentives within a firm’s corporate governance system. First, as discussed in the theory part, we follow Prendergast (2002) in assuming that the pay-per-performance intensity will be related to the degree of real authority allocated to the managerial function. We proxy for the pay-per-performance intensity with the ratio of annual equity based pay divided by total annual managerial compensation in the variable INCENTIVE. We compute equity based pay adding the Black-Scholes value of new stock options plus the value of restricted stock grants, while the total managerial compensation is simply the total sum of all fixed and variable compensation received by a firm’s CEO.

While this variable captures managerial discretion to choose firm strategies and simultaneously the incentive to apply such discretion to “good ends” – i.e. in the interest of shareholders – we also include a second measure to assess the relative weight of monitoring versus incentives. Particularly since the discussion above has suggested that environmental performance is likely to be “undervalued” by shareholders, a measure that assess the relative strength of monitoring, and thus a curtailing of managerial discretion and a corresponding increase in the discretion or ability of shareholders to more directly implement their own views,

would offer a second measure of managerial discretion with respect to environmental strategies. Specifically, we use as a second, negative proxy of “good discretion” the ratio of independent board directors over total number of board directors as a measure of shareholder monitoring intensity. Independent directors are defined by IRRC as those that are neither currently company executives, former employees, business relations with the company, nor CEO relatives. We assume that this variable, INDEPENDENT, will be positively related to how close shareholders will be following and particularly conditioning managerial decision making.

Controls. Total toxic waste will likely be function of total firm size since firms with larger volumes of production could mechanically be characterized by larger waste emissions. With this in mind, we control in our regressions by the natural logarithm of total firm assets (SIZE). Also, environmental performance measures could present systematic variations across industries due to different industry technologies and regulations. We try to avoid any potential estimation-bias due to systematic industry variation by inserting industry dummies in all our specifications. Ideally, we would like to control by industry at the most disaggregated four-digit SIC code level. Yet, our sample size only allows for controls at the two-digit SIC code level and we include a total of 20 industry dummies. However, since we restrict our sample to include only manufacturing companies – SIC codes between 2000 and 3999 – we do not believe that this constitutes a serious problem. Finally, we include a year dummy to control for any systematic time variation in our data. Table I displays descriptive statistics for all variables in our final sample, which consists of 903 observations.

Model Specification. We assume that the arguments developed in the theory section imply a simple linear functional form between environmental performance and “good” or “bad” managerial discretion variables. Thus we hypothesize that for firm i at year t the following function holds:

$$EP_{it} = \beta X_{it} + \beta_2 BD_{it} + \beta_3 GD_{it} + u_{it} \quad (1)$$

Where **EP** is firm environmental performance, **BD** represent bad discretion, **GD** accounts for good discretion, **X** are other observed firm variables that may influence firm environmental performance, and include as well both, industry and year dummies, and **u** accounts for any remaining unobserved firm characteristics that may also affect firm environmental performance.

Both of the proxies for firm environmental performance that we use are censored variables in the sense that we are only able to observe them when they surpass certain undesirable environmental performance levels. For total toxic waste, the current environmental legislation requires firms to disclose their total amount of waste emissions *only* if they surpass certain thresholds. As a result, 31.3% of our sample are observations with a value of zero for total waste emissions. Similarly, only 24.5% of firms in our sample show non-zero values for total environmental fines. Methodologically, this implies that we have to estimate (1) using a Tobit

procedure in all of our specifications. As usual when having censored dependent variables, we hypothesize that EP is an unobserved latent variable while we indeed observe EP^* that satisfies $EP^* = EP$ if and only if EP is larger than a certain threshold while $EP^* = 0$ if EP is equal or lower than the specified threshold. Accordingly, we estimate (1) using a Tobit procedure for which we have assumed that the error term u follows a Normal distribution.

RESULTS

In Table 2, we report the results of estimating equation (1) using total toxic waste emissions as the proxy for firm environmental performance. We run a pooled data regression using a Tobit to account for the fact that there is a large number of observations with total waste emissions equal to zero. In all specifications, those variables associated with “bad” managerial discretion or equivalently with larger managerial isolation from the discipline of the market of corporate control are negatively correlated with firm environmental performance. Specifically, the results show that firms with a larger GINDEX or with more managerial-on-the-job-protection release more total toxic waste into the environment. The same is true for the variable LL that proxies for the limitation of manager’s personal liability. On the other hand, variables that proxy for “good” managerial discretion seem to improve firm environmental performance. Those firms that pay their managerial team with a larger percentage of equity based pay emit less total toxic waste, while those firms that monitor the managerial function more closely through a larger percentage of outsiders in the board of directors – and therefore provide less “good” managerial discretion – emit larger amounts of total waste. All results are significant (although for PROTECTION only marginally).

In Table 3 we reproduce the same regressions as in Table 2 (again utilizing a Tobit procedure to account for the censored distribution of environmental fines) but with the dollar value of total environmental fines normalized by firm sales as the dependent variable. The results are qualitatively the same as before. Variables associated with “bad” managerial discretion decrease firm environmental performance, as higher values of GINDEX, larger managerial on the job protection, and limited liability provisions in particular, statistically significantly increase the amount of environmental fines paid by the corporation. As above, variables associated with “good” managerial discretion increase firm environmental performance as more managerial equity-based pay decreases the amount of environmental fines (although this estimate fails to reach significance) while more shareholder monitoring significantly increases the amount of firm environmental penalties. Overall, these findings provide strong empirical evidence in support of our hypotheses H1 to H3. All managerial discretion variables display the predicted sign and are statistically significant and different from zero. Moreover, these results hold across two different measures of firm environmental performance. We therefore conclude that not only is there a significant link between corporate governance mechanisms and firm environmental performance, but that we can also isolate the effects of “bad” and “good” managerial discretion.

However, as it is customary in any empirical work, we ought to exercise prudence in our

conclusions. Specifically, in order to demonstrate that we are not assigning causality to a series of spurious correlations, we have designed some additional tests, which address the most common technical and endogeneity problems that are associated with this type of pooled cross sectional datasets

Robustness Tests. One area of concern is that our corporate governance variables that measure either “good” or “bad” managerial discretion may have a relatively low degree of across time variability. Corporate governance provisions or the composition of the board of directors are not easy to change and it is therefore reasonable to think that they usually do not vary for relatively long periods of time. This fact could question the validity of our results since we are using as two independent observations those corresponding to the same firm in year 1998 and year 2000. If corporate governance variables do not change across time, observations belonging to the same firm will not be independent and therefore the standard deviations of the coefficients we have reported in Table 3 could be biased downward. As a result in Table 2 and Table 3 we could be reporting an inexistent statistical significance of our managerial discretion variables.

We try to control for this problem by using a different approach. Instead of running a pooled data regression in a two year period as before, we compute for each firm the average across time of the values of all dependent and independent variables. Note that proceeding in this manner ignores the across time variation and we are left with just a single observation for each firm in our sample. In applying this procedure, we include only those firms for which we have observations in both, 1998 and 2000, and exclude those who were only present in either one of the two years. This results in a sample size decrease from 903 individual annual observations in the original sample to 416 two-year-averaged data points.

In Table 4 we replicate the previous Tobit regressions using this new averaged firm-level sample. With very few exceptions, our results still hold within this new specification. GINDEX, the proportion of outsiders in the board of directors, and limited liability clauses still significantly negatively affect firm environmental performance, independently of whether we use environmental fines or total waste as the dependent variable. Further, the proxies for “good” discretion – INDEPENDENT and INCENTIVES – maintains the same patterns of signs on their links to both dependent variables, and roughly the same pattern of significances as observed before. Finally, also the subset of GINDEX that measures more precisely managerial-on-the-job protection still seems to negatively affect firm environmental performance in both cases although its effect is not statistically significant when using total toxic waste as dependent variable. Altogether we interpret Table 4 as a proof that our results are robust to misspecifications that may have arisen by the low degree of time variability of our Corporate Governance variables.

Another potential problem that could question the interpretation of our empirical results may arise because of the always present endogeneity problem. In our model, we are capturing a correlation between “bad” corporate governance measures and “bad” firm environmental performance. One may suspect that this correlation could be caused by an unobserved firm

characteristic causing both. For example, lazy managers or managers of lower quality may be more likely to work in firms with more ATA protection, while simultaneously also be more likely to underperform and thus to lower their firm environmental performance. If this or another missing variable indeed play an important role, the correlations we have reported could be spurious. With this in mind, we have designed an additional test that excludes the possibility that unobserved firm level variables interfere with our conclusions. Specifically, we focus only on corporate governance provisions that are explicitly mandated by state laws, which by definition do not depend on firm characteristics but rather on the given state in which the corporate headquarter is located. Accordingly, we redefine the index to include only occurrences of the following types of state laws: Antigreenmail, Business Combination, Cash-out, Directors' duties, Fair price and Control Share Acquisition Law. We then use this state law index as an instrument of bad managerial discretion. Note that to avoid statistical problems due to the use of group level data (firms with headquarters located in the same state will unavoidably have the same value corresponding to the state law provision variable) we cannot replicate exactly the same firm level analysis as before, but have to aggregate our variables to the state level. This drastically reduces the degrees of freedom in our sample and eliminates all identification coming from inter-firm variability. To avoid further biases due to differences in industry composition across states we choose only a single industry "Electronic & Other Electrical Equipment (excluding Computer Equipment)" corresponding to the two digit SIC code 36. We have 136 firm level observations across all of the 17 states of our original sample.

Table 5 displays the results for these state level regressions. Note that given the reduced new sample size, 34, we are forced to restrict our analysis to only the corporate governance state law variable for which we indeed have variation across states. For total toxic wastes the results we find are the same as we have shown previously in Table 2. States with laws that increase the "bad" type of managerial discretion perform worse environmentally. This is robust evidence that the results in Table 2 are not driven by unobserved firm characteristics. For total environmental fines, however, we are not able to find any statistically significant result, likely this might be due to the reduced number of degrees of freedom and variability in this new sample since we are eliminating all inter-firm sources of variation.

CONCLUSION

This paper has aimed to contribute to a better understanding of two important issues. On one hand, we have highlighted the effects that distinct corporate governance choices have on an increasingly sensitive area of corporate strategy, i.e. environmental activities. On the other hand, we have aimed at adding to the literature on corporate governance by contrasting the effects of different types of managerial discretion – bad and good – on strategic firm decisions.

The empirical results provide a high level of robust support for our specific hypotheses and show that managerial discretion is of considerable importance in shaping firm approaches to dealing with the environment. Not surprisingly, "bad" discretion appears to allow managers to

shirk away from the rather complex task of enhancing a firm's environmental performance levels. More surprising, however, may be that what may be considered an agency issue at first (in the sense that managers may underperform shareholders' environmental expectations), turns out to be an issue of "powerful" managers (those with bad discretion) delivering lower performance than "empowered" managers (those with good discretion), with shareholders apparently standing on the sidelines.

These findings have strong implications for environmental policies at the board and public level. An incidental implication of our robustness check was that states with laws fostering managerial entrenchment show worse environmental performance. Clearly, policy makers have to weight these results in their overall considerations regarding the institution of laws protecting the status quo of public corporations. Since these are important decisions that need to be made with the interest of large stakeholder groups with diverging interests (e.g. employees fearing for their jobs during takeovers, citizens increasingly demanding a cleaner environment) in mind, more empirical research into the link between state laws, corporate governance, and environmental performance appears to be of high current value.

Similarly, corporations are increasingly facing external challenges for a better environmental performance, be it through the Kyoto Protocol, stronger enforcement of criminal laws, or customer pressure. At the same time, mounting evidence suggests that firms that show a large degree of dedication to environmental affairs may also improve their bottom lines. While in the discussion above we have called environmental performance a "peripheral issue", in all likelihood that characterization is only appropriate in a current or historical sense. The developments recounted immediately above are rather likely to shift the concern for the environment more into the center-stage of strategies for companies aiming to be successful in the future. Hence, not only public policy makers, but also directors in charge of setting corporate policies may derive clues for shaping an environmentally oriented corporate governance structure for their firms from our results. Our findings and these implications clearly demonstrate the potentially high value of further research that explores the effects that various corporate governance provisions can have on the increasingly important area of corporate environmental management.

Our study also adds to the already considerable literature on corporate governance provisions, ATA, as well as the issue of different types of discretion. Using a currently somewhat peripheral firm strategy, with reasonably well specified characteristics, has allowed us to design a new test of the shareholder interest and managerial entrenchment theories. As we have argued above, if environmental performance, as a currently peripheral issue, is indeed affected by ATA, we would suspect that this is because these provisions (and the related issue of limited liability) provide a general sphere of "bad" discretion – freed from a significant element of control (i.e. the market for corporate control), managers appear to develop a taste for shirking on potentially financially beneficial, but effort-intensive tasks. Making the tradeoffs managers face with respect to environmental efforts explicit has facilitated our analysis and also allowed us to develop the

difference between such “bad” discretion, and “good” discretion. Key is, rather simplistically, that affording managers with more degrees of freedom in their tasks is only likely to further firm or shareholder interests if the additional effort that a manager may need to invest (by, e.g., now being able to execute an otherwise undervalued investment), is balanced by the additional rewards that the manager is likely to receive as a result. In addition, there also appears to be an intuitive difference between provisions that simply “take away” potential punishments and thus create more freedom for managers to act without fear of negative consequences if they fail to perform well, and discretion that is awarded in the explicit shift between monitoring and providing managers with incentives.

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APPENDIX

This appendix describes each of the anti-takeover amendments used as components of the Governance Index (G-Index) as constructed by Gompers, Ishii and Metrick (2003). The description of each provision is given below and all are identical to the ones used in Gompers et al. (2003). For constructing the index, a value of 1 is added for every provision that applies to a specific firm that restricts shareholder's rights or increases managerial power. There are 28 total provisions listed. Four of them are both at the state and firm level, for these cases one point is added to the index if the firm is covered under the firm-level provision, the state law, or both and zero if the firm is covered by none of them.

Antigreenmail and Antigreenmail laws. Greenmail refers to a transaction between a large shareholder and a company in which the shareholder agrees to sell his stock back to the company, usually at a premium, in exchange for the promise not to seek control of the company for a specified period of time. Antigreenmail provisions prevent such arrangements unless the same repurchase offer is made to all shareholders or approved by a shareholder vote.

Blank Check preferred stock is stock over which the board of directors has broad authority to determine voting, dividend, conversion, and other rights.

Business Combination laws impose a moratorium on certain kinds of transactions (e.g., asset sales, mergers) between a large shareholder and the firm, unless the transaction is approved by the Board of Directors.

Bylaw and Charter amendment limitations limit shareholders' ability to amend the governing documents of the corporation.

Control-share cash-out laws enable shareholders to sell their stakes to a "controlling" shareholder at a price based on the highest price of recently acquired shares. This works in a similar manner as a fair-price provision (see below) extended to nontakeover situations.

A **Classified Board** is one in which the directors are placed into different classes and serve overlapping terms. Since only part of the board can be replaced each year, an outsider who gains control of a corporation may have to wait a few years to gain control of the board.

Compensation Plans with changes-in-control provisions allow participants in incentive bonus plans to cash out options or accelerate the payout of bonuses if there should be a change in control.

Director indemnification Contracts are contracts between the company and particular managers and directors indemnifying them from certain legal expenses and judgments resulting from lawsuits pertaining to their conduct.

Control-share Acquisition laws (see Supermajority, below).

Cumulative Voting allows a shareholder to allocate his total votes in any manner desired, where the total number of votes is the product of the number of shares owned and the number of directors to be elected. By allowing them to concentrate their votes, this practice helps minority shareholders to elect directors.

Directors' Duties and **Directors' Duties laws** are provisions that allow directors to consider constituencies other than shareholders when considering a merger. These constituencies may include, for example, employees, host communities, or suppliers.

Fair-Price and **Fair-Price laws** provisions limit the range of prices a bidder can pay in two-tier offers. They typically require a bidder to pay to all shareholders the highest price paid to any shareholder during a specified period of time before the commencement of a tender offer, and do not apply if the deal is approved by the board of directors or a supermajority of the target's shareholders.

Golden Parachutes are severance agreements that provide cash and non-cash compensation to senior executives upon an event such as termination, demotion, or resignation following a change in control. They do not require shareholder approval.

Director Indemnification uses the bylaws, charter, or both to indemnify officers and directors from certain legal expenses and judgments resulting from lawsuits pertaining to their conduct.

Limitations on manager's liability are charter amendments that limit managers' personal liability to the extent allowed by state law.

Pension Parachutes prevent an acquirer from using surplus cash in the pension fund of the target to finance an acquisition.

Poison Pills provide their holders with special rights in the case of a triggering event such as a hostile takeover bid. If a deal is approved by the board of directors, the poison pill can be revoked, but if the deal is not approved and the bidder proceeds, the pill is triggered.

Under a **Secret Ballot** (also called **confidential voting**), either an independent third party or employees sworn to secrecy are used to count proxy votes, and the management usually agrees not to look at individual proxy cards.

Executive Severance agreements assure high-level executives of their positions or some compensation and are not contingent upon a change in control (unlike Golden or Silver Parachutes).

Silver Parachutes are similar to Golden Parachutes in that they provide severance payments upon a change in corporate control, but differ in that a large number of a firm's employees are eligible for these benefits.

Special Meeting limitations either increase the level of shareholder support required to call a special meeting beyond that specified by state law or eliminate the ability to call one entirely.

Supermajority requirements for approval of mergers are charter provisions that establish voting requirements for mergers or other business combinations that are higher than the threshold requirements of state law.

Unequal Voting rights limit the voting rights of some shareholders and expand those of others. Under **time-phased voting**, shareholders who have held the stock for a given period of time are given more votes per share than recent purchasers.

Limitations on action by Written Consent can take the form of the establishment of majority thresholds beyond the level of state law, the requirement of unanimous consent, or the elimination of the right to take action by written consent. Such requirements add extra time to many proxy fights, since bidders must wait until the regularly scheduled annual meeting to replace board members or dismantle takeover defenses.

TABLE 1: Descriptive statistics for the final sample

	N	MEAN	STD	MAX	MIN
LOGARITHM OF TOXIC MATERIALS TOTAL EMISSION¹	903	9.28	6.78	20.4	0
LOG OF TOXIC MATERIALS TOTAL EMISSION (no zeros)	620	13.5	3.09	20.4	.69
VIOLATIONS²	903	8.45	49.97	885.4	0
VIOLATIONS (No zeros)	221	34.5	96.55	885.4	.0005
LL³	903	.53	.50	1.00	0
PROTECTION⁴	903	1.77	1.12	5.00	0
GINDEX⁵	903	9.28	2.75	16.00	2.00
INDEPENDENT⁶	903	.63	.18	1.00	0
INCENTIVE⁷	903	.43	.29	1.00	0
SIZE⁸	903	7.31	1.45	12.6	3.60

¹ Logarithm of the total emission of toxic materials, that includes the amount (lbs.) of transferred & released materials, together with the amount (lbs.) of recovered & recycled materials, for a particular year.

² VIOLATIONS is the sum (\$ value) of the fines a firm received in a year divided by sales (in MM\$).

³ Dummy variable showing whether managers have charter amendments that limit his personal liability for breaches of the duty of care. Data published by IRRC.

⁴ Index to proxy the level of manager's protection against bad performance consequences using 5 governance rules. See Gompers et al. (2003) and text for information about the construction of this index

⁵ Index to proxy the level of manager's "power" using data about 24 governance rules published by IRRC. See Gompers et al. (2003) and text for information about the construction of this index

⁶ Percentage of independent directors over the total number of directors. Three categories were used: insider, affiliate (former employees, business relations with the company or relatives to the CEO) and independent.

⁷ Percentage of equity pay in terms of stock options Black-Scholes value and restricted stock grants over total annual compensation. Constructed using Compustat variables: (RSTKGRNT + BLK_VALU) / TDC1

⁸ Logarithm of assets (DATA6 variable of Compustat database)

TABLE 2: Impact of managerial discretion on firm's total emission of toxic materials

TOBIT model using LOGARITHM OF TOXIC MATERIALS TOTAL EMISSION as dependent variable for a total sample of 903 observations for years 1998 and 2000 and industries within SICs 2000 and 3999. Total emission of Toxic Materials includes amount of transferred & released materials, together with the amount of recovered & recycled materials. We select NORMAL distribution for failure time. We use several control variables: SIZE, YEAR DUMMIES (only one dummy since the data is for 1998 and 2000) and INDUSTRY DUMMIES (for 2-digit SIC codes). We evaluate whether introducing critical variables into the model leads to a significant increase of the maximum likelihood ratio. We test the introduction of independent variables INDEPENDENT and INCENTIVE (second column), into the model that only contains control variables (first column). Then, we test the introduction of each of the three critical variables (third, fourth and fifth columns) into the model that contains control variables and independent variables INDEPENDENT and INCENTIVE (second column).

Dep. Variable	LOGARITHM OF TOXIC MATERIALS TOTAL EMISSION				
INTERCEPT	-14.2*** (2.34)	-17.6*** (2.39)	-19.2*** (2.39)	-17.6*** (2.38)	-16.8*** (2.37)
GINDEX	-	-	.40*** (.11)	-	-
PROTECTION	-	-	-	.41^ (.23)	-
LL	-	-	-	-	1.96*** (.52)
INDEPENDENT	-	6.48*** (1.45)	4.98*** (1.47)	6.27*** (1.45)	6.03*** (1.44)
INCENTIVE	-	-4.24*** (.91)	-4.06*** (.90)	-4.13*** (.91)	-3.79*** (.91)
SIZE	2.50*** (.18)	2.56*** (.19)	2.45*** (.19)	2.47*** (.19)	2.34*** (.19)
N	903	903	903	903	903
Log Likelihood	-2334.3	-2315.3	-2306.2	-2313.7	-2308.3
LR (χ^2 Test)	-	19.0**	9.1**	1.6	7.0**

^<.1, *<.05, **<.01, ***<.001

TABLE 3: Impact of managerial discretion on firm's \$ value of environmental penalties

TOBIT model using VIOLATIONS as dependent variable for a total sample of 903 observations for years 1998 and 2000 and industries within SICs 2000 and 3999. VIOLATIONS is the sum (\$ value) of the fines a firm received in a year divided by sales (in MM\$). We have selected a NORMAL distribution for failure time. We use several control variables: YEAR DUMMIES (only one dummy since the data is for 1998 and 2000) and INDUSTRY DUMMIES (for 2-digit SIC codes). We evaluate whether introducing critical variables into the model leads to a significant increase of the maximum likelihood ratio. We test the introduction of independent variables INDEPENDENT and INCENTIVE (second column), into the model that only contains control variables (first column). Then, we test the introduction of each of the three critical variables (third, fourth and fifth columns) into the model that contains control variables and independent variables INDEPENDENT and INCENTIVE (second column).

Dep. Variable	VIOLATIONS				
INTERCEPT	-698 (564777)	-756 (565666)	-784 (566377)	-767 (565773)	-761 (565441)
GINDEX	-	-	4.39* (2.01)	-	-
PROTECTION	-	-	-	10.3* (4.74)	-
LL	-	-	-	-	30.2** (10.8)
INDEPENDENT	-	96.7** (30.4)	78.3* (31.2)	87.7** (30.5)	83.3** (30.5)
INCENTIVE	-	-7.10 (18.8)	-7.82 (18.8)	-7.67 (18.8)	-6.81 (18.8)
N	903	903	903	903	903
Log Likelihood	-1555.2	-1550.0	-1547.6	-1547.6	-1546.0
LR (χ^2 Test)	-	5.2^	7.6**	7.6**	9.2**

^<.1, *<.05, **<.01, ***<.001

TABLE 4: Impact of managerial discretion on environmental performance: Robustness check

TOBIT model using LOGARITHM OF TOXIC MATERIALS TOTAL EMISSION and VIOLATIONS as dependent variables for a total sample of 418 observations calculated as the average values of all dependent and independent variables for those firms which were present both years (1998 and 2000). Total emission of Toxic Materials includes amount of transferred & released materials, together with the amount of recovered & recycled materials. VIOLATIONS is the sum (\$ value) of the fines a firm received in a year divided by sales (in M\$). We select NORMAL distribution for failure time. We use several control variables: SIZE (only when using total waste as dependent variable), YEAR DUMMIES (only one dummy since the data is for 1998 and 2000) and INDUSTRY DUMMIES (for 2-digit SIC codes).

Dep. Variable	LOGARITHM OF TOXIC MATERIALS TOTAL EMISSION			VIOLATIONS		
	INTERCEPT	-19.7*** (3.20)	-18.4*** (3.19)	-17.6*** (3.17)	-459 (567598)	-447 (597091)
GINDEX	.35** (.13)	-	-	3.50* (1.59)	-	-
PROTECTION	-	.34 (.31)	-	-	9.15* (3.78)	-
LL	-	-	1.74* (.71)	-	-	21.8* (8.52)
INDEPENDENT	5.83** (2.10)	7.14*** (2.05)	6.89*** (2.04)	45.7^ (25.6)	53.1* (24.9)	51.4* (24.9)
INCENTIVE	-6.40*** (1.46)	-6.60*** (1.48)	-6.13*** (1.48)	-25.2 (17.2)	-26.7 (17.2)	-25.1 (17.2)
SIZE	2.54*** (.25)	2.56*** (.26)	2.43*** (.26)	-	-	-
N	418	418	418	418	418	418
Log Likelihood	-	-	-	-	-	-
	1069.7	1073.0	1070.6	931.6	931.1	930.7

^<.1, *<.05, **<.01, ***<.001

TABLE 5: State-level regressions

OLS model using the state average of both, LOGARITHM OF TOXIC MATERIALS TOTAL EMISSION and VIOLATIONS, as dependent variables. The sample includes 34 observations for years 1998 and 2000 (17 observations/states each year) only for industries between 3600 and 3699 SIC codes (Electronic & Other Electrical Equipment (excluding Computer Equipment)). Total emission of Toxic Materials includes amount of firms' transferred & released materials, together with the amount of recovered & recycled materials. VIOLATIONS is the sum (\$ value) of the fines a firm received in a year divided by sales (in MM\$). We use several control variables: SIZE (only when using state-average total waste as dependent variable) and YEAR DUMMIES (only one dummy since the data is for 1998 and 2000).

Dep. Variable	STATE AVERAGE LOGARITHM OF TOXIC MATERIALS TOTAL EMISSION	STATE AVERAGE VIOLATIONS
INTERCEPT	-25.1 *** (4.78)	.248 (.513)
STATE PROVISIONS ⁹	1.20 ** (.43)	.048 (.152)
STATE FIRMS SIZE ¹⁰	4.15 *** (.66)	-
N	34	34
R ²	60.34%	0.81%

[^]<.1, *<.05, **<.01, ***<.001

⁹ Index containing six concrete anti-takeover measures imposed by state law. Data published by IRRC. See Gompers et al. (2003) and text for information about the construction of this index

¹⁰ State average of the logarithm of assets (DATA6 variable of Compustat database) for industries between 3600 and 3699 SIC codes (Electronic & Other Electrical Equipment (excluding Computer Equipment)).

NOTES

ⁱ We have also replicated the empirical analysis using the natural log of toxic materials transfers and releases that exclude from total waste those materials that are treated and recycled. Results do not change and are available upon request from the authors.