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Explicit contracting as a determinant of the linkage between environmental performance and executive compensation

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Abstract

Empirical research in the area of corporate sustainability highlights potential conflicts between corporate financial performance and environmental performance. In such a situation, agency theory arguments applied specifically to the corporate environmental context predict that top management compensation should be *explicitly* linked to environmental performance in order to bring about proper alignment of organizational environmental goals and management incentives.

We test this proposition for a sample of 207 Standard and Poor 500 firms in the US in 1997 who explicitly report in Investor Responsibility Research Council (IRRC) surveys the presence or absence of a contractual link between environmental performance and executive compensation. We find that in firms with an *explicit* linkage between environmental performance and executive contracts, there is some evidence of a significant impact of firm-level environmental performance on CEO compensation levels exists but that no impact exists for firms without an explicit linkage. The linkage we observe holds only for IRRC compliance and spills indices but does not hold for toxic emissions indices of environmental performance.

KEYWORDS: Economic Incentives; Governance; Corporate Environmental Performance

“The compensation committee annually reviews the Chief Executive Officer’s performance in light of previously established goals and objectives, a number of which relate to sustainability performance ...” (Potash Corporation, 2004 GRI Governance Performance Indicators)

“The shareholders request the Board Compensation Committee undertake a special executive compensation review and provide a summary report to investors by Summer 2005. The report shall supplement information in the proxy statement. Questions to be addressed in the review and report shall include...How social and environmental performance is integrated into the formula for executive compensation and whether our corporation’s employee downsizing or outsourcing is considered...” (Amgen Corp, 2005 Shareholder Proposal)

“We recommend that the committee study and report on the following in its review: 1. Ways to link executive compensation more closely to financial performance with proposed criteria and formula. 2. Ways to link compensation to social & environmental corporate performance (e.g. incentives given for meeting or surpassing certain social and financial performance standards; whether adequate steps are taken to clean up toxic sites...” (1999 Shareholder proposal on Executive Compensation and Environmental/Social Performance at General Electric Corp)

The excerpts cited above reflect the obvious interest that corporate boards and stockholders have in linking environmental performance factors to executive compensation. This impression is borne out on a larger scale by responses to IRRC (Investor Responsibility Research Council) surveys of Standard & Poor 500 firms, where a majority of the respondents appear to have such linkages in place.

Some questions naturally arise: Are these linkages theoretically defensible? And if the linkages are adopted, is top executive compensation significantly impacted by environmental performance, or do the linkages serve as a symbolic gesture by corporate boards -- a mere sop to stockholders and other organizational stakeholders?

These are questions that should be of considerable interest to academic researchers, stockholders, executives and directors, paralleling as they do the corresponding study of (and vigorous debate over) the relationship between top executive compensation and corporate financial performance, and to their potential implications for both the conduct of environmental management and policy and for the resulting sustainability performance outcomes.

Our research is an initial attempt to address these questions by empirically modeling and testing the linkage between top executive compensation and corporate environmental

performance in large US firms in the mid-90s. We develop testable hypotheses by primarily drawing on agency theory. We follow the convention by reviewing the relevant literature in developing our theory and hypotheses, then detailing our methods and results. We conclude with a discussion of our findings and suggestions for future research.

THEORETICAL DEVELOPMENT

We begin by asking why would boards of US firms want to explicitly link environmental performance to top executive compensation? We address this question by considering first the benefits of enhanced environmental performance from the board's point of view and then the important role that top executives can play in promoting environmental performance when furnished with appropriate incentives.

Corporate boards' interest in superior environmental performance

It is important to make clear at the outset that superior corporate environmental performance is not necessarily congruent with superior corporate financial performance, and in fact, especially in the short term, can clash with financial performance. Despite some evidence that corporate financial performance may be positively related to environmental performance for large US firms (e.g., Anton, Deltas, & Khanna 2004; Dowell, Hart, & Yeung, 2000; King & Lenox, 2001, Klassen & McLaughlin, 1996), research by Hart & Ahuja (1996), Cordeiro & Sarkis (1997), Sarkis & Cordeiro (2001) and others (see Wagner, Schalteger, & Wehrmeyer, 2001 for a comprehensive review of this debate) demonstrates that especially in the short-term, environmental strategies are costly for firms and lower both actual and expected accounting and financial performance.

Given this lack of congruence, boards that value environmental performance must value it for reasons other than just the financial performance that may flow from it. These reasons include the possibility that boards subscribe to a stakeholder view of the firm, where, in a departure from the conventional assumption in financial economics and agency theory that stockholder interests are paramount, stakeholder interests are seen as being as valid as stockholder interests (Delmas & Toffel, 2004; Donaldson & Preston, 1985; Freeman, 1984; Jones, Wicks & Freeman, 2002; Waddock & Bodwell, 2002)). Separately, it may be the case that boards are interested in advancing organizational legitimacy and its attendant benefits (such as better access to key resources, enhanced reputation, and survival) that institutional theorists (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Tolbert & Zucker, 1996; Scott, 2001; Delmas & Toffel, 2007) point out results from the alignment of social values with corporate values. Such alignment occurs through environmental strategies resulting in outcomes such as reduced environmental harm or more proactive strategies that meet with the approval of societal constituents (Bansal & Clelland, 2004; Oliver 1991; 1997). In addition to these organizational benefits, individual directors also benefit personally, of course, from spillover effects of legitimacy and reputation.

Top management's role in obtaining superior environmental performance

At what organizational levels can the linkage between environmental performance outcomes and managerial compensation be reasonably established? Using data from the late 1990s, Russo & Harrison (2005) showed that environmental performance in the US electronics

industry is enhanced when there is a link between environmental performance and managers compensation, but that this finding is true only for facility and not for environmental managers¹.

Focusing on a broader organization level, we submit that the link is especially important for top-level corporate executives for a variety of reasons. First, top-level executives may well view environmental management as only one of many responsibilities assigned to them, and may not necessarily see it as the responsibility deserving of top priority. This observation is especially likely to be the case in firms where stockholder wealth maximization is viewed as paramount, and where the advancement of environmental goals is not fully congruent with stockholder wealth maximization. Second, top executives have significant ability to influence, support, and champion the actual formulation and deployment of environmental initiatives and resources across the organization (Berry & Rondinelli, 1998; Russo & Fouts, 1997; Sharma, 2000), and have control over major legitimatization processes (Suchman, 1995). In general, management support is a critical element of adoption and implementation of innovations in an organization, especially environmental systems (Daily & Huang, 2001; Dechant & Altman, 1994). Frost & Egri (1991) show that organizational innovations may remain stuck at the initial idea stage absent dedicated champions. Top management support can affect environmental management system success by promoting employee empowerment, altering organizational culture, instituting rewards and incentives systems to affect employee behavior, provide training and increase communication throughout the organization. Finally, environmental policies and strategies draw on resources that are tacit and socially complex, thus making them more vulnerable to managerial opportunism (Alvarez & Barney, 2004) that is potentially correctable through appropriate compensation incentives. We turn next to an agency-theory based (Jensen &

¹ Their study did not study compensation systems for top managers.

Meckling, 1976; Davis 2005; Shapiro, 2005) discussion of top management compensation incentives in general and then specifically to compensation incentives for environmental performance.

Incentive compensation in top executive compensation contracts

Agency costs arising from conflicts of interests between managers and stockholders (e.g. over the amount of effort to be exerted, risk to be borne, shirking, perquisites tradeoffs between the pursuit of sales versus profits) can be reduced if managers are provided with appropriate governance (e.g. Davis, 2005; Denis, 2001; Daily, Dalton, & Rajagopalan, 2003) and appropriate incentives through efficient compensation design (Holmstrom, 1979; Baker, Jensen & Murphy, 1988; Jensen & Murphy, 1990; Murphy, 1999; Rosen, 1992). This result occurs when board compensation committees explicitly link executive compensation such as bonuses, stock grants or options to desired financial performance outcomes (such as stock or accounting returns) that benefit the firm's stockholders. Performance outcome-based contracts provide powerful economic incentives relative to behavior-based contracts by raising the personal stake that the executive has in the firm's future performance (Jensen & Murphy, 1990; Sanders & Carpenter, 1998; Gomez-Mejia & Wiseman, 1997).

There is supporting empirical evidence that efficient compensation design leads to specific strategic executive actions that improve firm performance (Henderson & Frederickson, 1996; Sanders & Carpenter, 1998) including strategic change along dimensions such as research and development efforts (Carpenter, 2000) or merger behavior (Sanders, 2001)².

² Incentive-based compensation is problematic in one noteworthy respect: its impact on CEO personal risk (Aggarwal & Samwick, 1999; Garen, 1994; Gray & Cannella, 1997). Incentive-based compensation potentially exposes the CEO to higher levels of *compensation risk* (i.e. the risk that performance-related pay will be lower than expected due to poor performance, some of which may be beyond the agent's control) or to higher levels of *employment risk* (i.e. the risk that CEOs will be fired due to poor performance or due to unforeseen contingencies). Consequently, CEOs are often reluctant to take on too much performance-based compensation (Gray and Cannella, 1997). This reluctance can have adverse impacts of firm performance. Research by Mishra, McConaughy, and

*Incentive compensation for environmental performance*³

The voluminous literature on the pervasiveness and effectiveness of managerial incentive compensation is reviewed by Bebchuk & Fried (2004), Gomez-Mejia & Wiseman (1997), Gomez-Mejia & Barkema (1998), Jensen & Murphy (2004) and Murphy (1999), and arguably the agency perspective (discussed more fully in subsequent sections) has become the dominant model for theoretical and empirical research on executive compensation. Surprisingly, however, given the growth of interest in environmental management systems, strategies and goals over the past two decades, empirical research on executive compensation in an environmental management context has been sparse. The exceptions constitute the theoretical discussions by Gabel & Sinclair-Desgagnes (1993), Lothe, Myrtveit, & Trapani (1999), and Lothe & Myrtveit (2003). These last two authors in particular suggest that insufficient executive effort may be directed to environmental strategies within corporations because of a lack of goal congruence, i.e., because these efforts are not properly rewarded in executive compensation. In the discussion that follows, we explicate and add to their work in developing our hypotheses.

Building on the earlier work of agency theorists (e.g. Holmstrom, 1979; Holmstrom and Milgrom, 1991), Lothe, Myrtveit, & Trapani (1999), and Lothe & Myrtveit (2003) highlight the fact that strategies and actions that further environmental goals potentially conflict with those that further financial goals. Research by Cordeiro & Sarkis (1997) and others (see Wagner, Schalteger, & Wehrmeyer, 2001) demonstrates that at least in the short-term environmental strategies are costly for firms and lower both actual and expected accounting and financial

Gobeli (2000), for example, shows that managerial risk-aversion limits the benefits firms derive from CEO incentive pay and that placing too much risk on the CEO results in lower firm performance. The issue of the conditions under which the provision of incentives to CEOs through compensation is balanced with efficient risk sharing is an important one therefore and will influence our discussion in later sections.

³ Henceforth, all references to the environment and environmental performance refer to the natural environment.

performance. This lower performance would result in lower executive compensation that is linked to such financial performance. Since (a) top managers actions and strategies are formulated and implemented in response to the incentives furnished through incentive-based compensation, and (b) incentive-based compensation in US firms is typically provided only for financial performance, then in the absence of explicit links to environmental performance measures in compensation contracts, it is an open question whether managers will have sufficient incentive to work to promote goals and strategies with respect to the natural environment.

An important body of work on performance measures in managerial incentive contracts in the formal agency literature is useful in understanding the role of incentives tied to environmental performance. Holmstrom (1979) showed that a particular performance measure should be added to a portfolio of performance measures used for managerial compensation only if the measure provided additional information about managerial actions beyond that provided by other measures already in the portfolio, subject to the cost of the measure and the risk that it imposes on managers.

In the later, more complex Holmstrom & Milgrom (1991) multi-dimensional agency model (also known as the single-agent, multi-task model), the firm's principals (stockholders) are viewed as wanting the agent (manager) to exert effort on two or more distinct and separate tasks as part of the agent's assigned job. Such a situation would arise, for example, when the pursuit of environmental goals involves strategies, actions, and outcomes different from those involved in the pursuit of financial goals. In this situation, the appropriate incentive compensation system for executives needs to go beyond the motivational and risk-sharing functions of the incentive compensation scheme that agency theorists typically focus on to furnish a shaping force in *allocation of agent effort* between these competing tasks.

Specifically, an appropriate incentive compensation system should direct management effort towards the pursuit of environmental goals that may be in conflict with financial goals (e.g., the large initial investments required for equipment and training in a proactive environmental strategy)⁴. In cases where the outcomes of financial goals (reflected in accounting and stock market performance measures) and environmental goals (reflected in environmental performance indicator (EPI) outcomes) conflict with each other, executives who are compensated for the achievement of environmental goals would then be more willing to accept the reduction in compensation that accompanies the simultaneous reduction in financial performance outcomes.

Given on this largely agency theory-based discussion⁵, boards of organizations that wish to promote environmental responsibility should rationally link executive compensation explicitly to *environmental* performance outcomes. Moreover, this linkage, if effective, should result in an observed association between these two variables. This leads to our central hypothesis:

H1: Top executive compensation will be positively related to environmental performance in firms that explicitly link environmental performance factors to top executive compensation.

METHODS

Sample and Data

We hand-code data for environmental efforts and performance measures from the 1996 *IRRC Corporate Environmental Profile*, which compiles data from the IRRC reports on

⁴ Note that if financial goals are perfectly congruent with environmental goals, then there is no inherent conflict.

⁵ Agency theory is not the only relevant theory for performance-based compensation design. It is important to note, as Russo & Harrison (2005) do, that the linkage of compensation with specific goals is also consistent with other organization theories such as goal-setting theory (Locke & Latham, 1990) and avoids Kerr (1975)'s often-cited "folly of rewarding A while hoping for B."

environmental performance, and other relevant data (notably survey data) from Standard & Poor 500 firms based on review of relevant SEC filings, self-reported, and federal data. We restrict our sample to the 207 firms that completed the survey for the IRRC that included the necessary details on environmental policy and reporting, including whether or not environmental performance was a factor in management pay. Our dataset is comparable to other recent research that utilizes this database (e.g. Khanna & Anton, 2002; Anton, Deltas & Khanna, 2004). The IRRC data was merged with data on CEO compensation, firm performance, size, CEO tenure and CEO duality from the Standard & Poor *Execucomp* database for 1997 (in order to relate compensation to past performance). Additional data on ownership and boards was merged from the *CD-Disclosure* database. Missing data on these databases resulted in a sample of 172 firms being used in the final regressions.

Compensation and Firm Size and Performance Measures

Consistent with other research in CEO compensation (e.g. Murphy, 1999; Gomez-Mejia & Barkema, 1998), *total CEO compensation* was measured in 1997 the sum of CEO salary, bonus, other compensation and the value of stock grants and options (valued using the Black-Scholes option pricing formula). CEO compensation was used as a proxy for top executive compensation because of its availability in the corporate proxy statements used in the compilation of the *Execucomp* database, because the CEO and other top executives could reasonably be held accountable for *aggregate* firm environmental measures such as the ones used in this and other studies of environmental performance, and because of the CEO's prominence in championing environmental initiatives⁶. A one-year lag was used between

⁶ The IRRC data from 1996 does not break data down into environmental compensation factors for top executives and lower-level executives. To offset this limitation, however, the data in our sample were also checked where

compensation and the other study variables, to capture the impact of recent past performance on compensation. The ln (natural logarithm) of this variable was used because of skewness in the distribution.

Firm size (measured as the natural logarithm of sales) and prior firm performance, measured by *return on assets* (ROA) and *stock return (one-year)* in 1996 were included. These performance variables are standard in CEO compensation research (e.g., Henderson and Fredrickson, 1996; Murphy, 1999). Since separate analyses were conducted for *relative* (i.e., industry-adjusted) performance measures, these measures were obtained by deducting the industry averages from the firm performance measures. Governance variables that have been shown to influence CEO compensation levels (Carpenter, 2000; Daily, Dalton, & Rajagopalan, 2003; Denis, 2001; Gomez-Mejia & Barkema, 1998; Gomez-Mejia & Wiseman, 1997) were also controlled for in the analyses.

A *CEO tenure* (as CEO of the firm) variable and controls for *CEO duality* (where the CEO is also the chairman of the board), and *board composition* (proportion of outside directors serving on the board) were utilized since past governance research shows that these variables are possible influences on the board's compensation-setting process. Based on standard agency theory arguments, CEOs who are also chairmen of the board may influence the board to set compensation in a manner more favorable to them, while enhanced board monitoring from outside directors (reflected here by the *proportion of outside directors on the board*) may result in better governance, and thus a more impartial compensation-setting process (Carpenter, 2000).

possible (using a separate IRRC database from 2005 that reports on firms over the 1997-2003 period) to ensure that our included sample firms were ones where top executives were explicitly indicated as having their compensation tied to environmental performance for top executives.

Based on the governance literature cited above, to control for the fact that CEO power is subject to monitoring by various external parties, we included monitoring by institutional owners (represented by the percentage *institutional ownership*) and large outside investors (represented by *five-percent blockholder ownership* of investors owning at least 5% of outstanding stock).

Environmental Performance and Related Measures

Environmental performance was measured using data from IRRC (Investor Responsibility Research Council) The IRRC measures are compiled from both TRI (Toxic Releases Inventory) and firm-level survey data and have been widely used in past research (e.g. Anton, Deltas & Khanna, 2004; Gerde & Logsdon, 2001; Khanna, Quimio, & Bojilova, 1998). The Toxic Release Inventory (TRI) *emissions index* reflects environmental risks related to the total legal releases of approximately 325 toxic chemicals required to be reported to the federal government. This data was scaled by dividing total releases by firm sales to control for production-level differences across firms. The *compliance index* reported by the IRRC is the total dollar amount of penalties incurred by the firm under nine environmental statutes. This number was also scaled by dividing it by firm sales, as was the IRRC *spill index* which was the combined number of chemical and oil spills experienced by the firm. Larger values of these measures indicated poorer environmental performance.

Whether or not the firm employed *environmental performance as a factor in compensation* was coded as a dummy variable based on the IRRC firm survey data.

Models

Tests of H1 (i.e. whether or not top executive pay will be observed to be strongly related to past environmental performance in firms that link natural environment performance factors

explicitly to top executive compensation) were conducted using OLS regression using the model below using the emissions index, IRRC spill index, and IRRC compliance index separately as the main independent variables (one per regression). The entire set of regressions was run three times – once for the entire sample, the next time for the sub-sample of firms where environmental performance was an explicit factor in compensation, and finally for the sub-sample where it was not. This approach resulted in a total of nine separate regressions. This entire set of nine regressions was re-run using the industry-adjusted versions of the firm financial (i.e. return on assets and stock return) and environmental (e.g. emissions, spills, and compliance indices) variables.

$$\begin{aligned} \text{Ln CEO Compensation} = & \\ & b_0 + b_1 (\text{Environmental Performance}) + b_2 (\text{Firm Size}) + \\ & b_3 (\text{Return on Assets}) + b_4 (\text{Stock Return}) + b_5 (\text{CEO Tenure}) \\ & + b_6 (\text{CEO Duality}) + b_7 (\text{Outside Director Ratio}) \\ & + b_8 (\text{Institutional Ownership}) + b_9 (\text{Blockholder Ownership}) + \text{error} \end{aligned}$$

RESULTS

Table 1 presents the means and standard deviations for the full sample and for the sub-samples with and without the link between environmental performance and CEO pay. It also provides the t-tests and significance levels. Table 2 provides the correlation matrix.

-- Insert Tables 1, 2 about here --

Around seventy percent of firms provide the linkage and twenty percent of the sample firms operated in what are considered ‘dirty’ industries (Clark et al, 2000). These variables are comparable to previous research (e.g. Anton et al, 2004). Similarly, the values for the

compensation and firm performance and governance variables are also comparable to past research (e.g. Murphy, 1999; Carpenter, 2000).

The t-tests (the test value is based on a comparison of variable values for firms without the environmental performance-compensation linkage and variable values for firms with this linkage) show that firms *without* the linkage are less likely to operate in dirty industries and are significantly smaller in terms of sales. They also have lower industry-adjusted stock returns, lower spills and compliance indices and (arguably as a consequence of their smaller size) have higher institutional and blockholder ownership.

Table 3 presents the results of the multiple regressions relating CEO compensation to absolute (not relative) values of environmental performance, firm financial performance (i.e. return on assets and stock returns), firm size, and the various governance controls. The results are reported in nine columns. The first three columns report on the results for emissions efficiency as the dependent variable, with the results for the full sample, then for firms with the environmental performance-compensation linkage, and lastly for firms without. The next three columns repeat this pattern for the compliance index, and the final three for the spills index. All regressions have respectable adjusted R^2 values ranging from 39 to 49% explained variance and have significant F statistics.

-- Insert Table 3 about here --

A consistent pattern of results is evident across all three measures of environmental performance: only the full sample and the sub-sample of firms with the environmental performance-compensation linkage have significant associations with the compliance and spills index, with firm size and return on assets, and with CEO tenure. All these variables have the

expected signs⁷. In particular, the negative relationship between the spill index and the compliance index provides partial support for H1 since there is an observed positive relationship between environmental performance and CEO compensation for two of the three environmental performance variables. On the other hand, the sub-sample of firms without the linkage between the environmental performance and CEO compensation had no significant relationship between these two variables. It is interesting to observe that for this sub-sample of no-linkage firms, there appears to be no linkage between the financial performance variable (return on assets) either.

-- Insert Table 4 around here --

Table 4 repeats the regressions but uses relative performance variables for the financial and environmental performance variables. These variables have been adjusted to display firm performance *relative* to industry performance by deducting the industry average performance for the relevant variable. The adjusted R² values are slightly lower than those in Table 3, ranging from 39 to 42%, and all regressions have significant F statistics. None of the environmental performance variables now have any significance, thus indicating no support for H1 if *relative* environmental performance is used instead of *absolute* performance. Also, similar to Table 3, the return on assets measure of financial performance is significant only in the sub-sample of firms with a linkage between environmental performance and compensation.

DISCUSSION

Our results indicate that even in firms that include environmental performance as an explicit determinant of top executive compensation, CEO compensation is significantly related to environmental performance only for the compliance and spills index but not for the emissions index. Thus, H1 is partially supported. Moreover, these findings hold only when performance is

⁷ Recall that smaller values of the compliance and spills index indicate better environmental performance.

measured in *absolute* firm performance terms (i.e. with no adjustment made for industry referents) and do not hold when *relative* firm performance is considered, i.e. when performance adjusted for industry benchmarks by deducting the average industry performance level

This finding is somewhat consistent with the relative performance evaluation (RPE) literature in CEO compensation research (reviewed in Aggarwal & Samwick, 1999; Murphy, 1999) that finds that CEO compensation is weakly associated at best with industry or market benchmarks of financial performance. Thus, in the case of environmental performance, boards in our sample do not appear to take performance relative to the industry into account. This is surprising, given the variation in environmental performance across industries (e.g. King & Lenox, 2001). However, it is plausible that boards design the environment-performance based parts of compensation contracts for top executives primarily to avoid the risk of corporate and personal lawsuits and other penalties resulting from environmental violations. These lawsuits carry impressive penalties, both in dollar amounts and in possible jail time. Data cited in Karpoff, Lott, & Werhly (2002; 2005) for example, show that the mean (median) fine or damage award for 520 environmental violations that occurred over the 1980-2000 period was \$8.8 (\$1.125) million, and the average forced compliance or remediation cost was \$53.5 (\$10) million, and that between 1983 and 1993, the Department of Justice recorded 911 indictments against individuals and corporations, securing 686 guilty pleas or convictions (Lazarus, 1994). Since these violations are measured in absolute terms (i.e. firms violate compliance thresholds specified as limits), this approach might be a reasonable one from the board's perspective.

The finding of a linkage between absolute levels of compliance and spills indices with CEO compensation still leaves open the question of why no link was found with emissions levels. It is, of course, possible that our emissions measure is too coarse. Alternatively, as Russo

& Harrison (2005) note in the context of plant managers, it might be the case that environmental performance is best measured by means other than TRI emissions, such as the avoidance of spills and other high-profile events. This would be consistent with our findings for spills and compliance indices, especially if the board and managers are primarily concerned with litigation due to environmental violations or with sanctions from investors including socially responsible funds⁸. A related explanation is that many US firms continued to behave reactively rather than proactively in terms of sustainability over the mid-90s, the period of our investigation (Berry & Rondinelli, 1998; Russo & Harrison, 2005).

We must leave open the possibility, however, that environmental and firm performance might not be related (or might be only weakly related) in US firms, even if they claim an explicit linkage between these two variables. Why would this be the case? There is a precedent in the findings of weak links between CEO compensation and firm financial performance measures such as accounting and stock returns (e.g. Jensen & Murphy, 1990; Tosi, Werner, Katz & Gomez-Mejia, 2000⁹), and organizational scholars have devoted considerable attention to explaining these findings. A popular view is that this weak linkage may reflect undue management influence over the board of directors, and especially the compensation committee (see, for example, recent reviews by Bebchuk & Fried, 2004; Denis, 2001; Gomez-Mejia & Wiseman, 1997; Gomez-Mejia & Barkema, 1998; Jensen & Murphy, 2004) or a system of

⁸ The Calvert Fund for example states on their website “...*While we do not exclude companies that have violated environmental statutes, we do exclude companies with recent patterns of substantial environmental fines or violations or significant responsibility for environmental accidents. We look for improvement or reduction of pollution per unit of production....*”

⁹ A seminal study by Jensen & Murphy (1990) showed that on average, CEO wealth changed by \$3.25 per \$1000 of shareholder value, and that the figure was only \$1.85 for large firms in their sample. A later meta-analysis of pay-performance studies by Tosi, Werner, Katz & Gomez-Mejia (2000) showed that firm size accounts for more than 40% of the variance in total CEO pay, while firm performance accounts for less than 5% of the variance, and that pay sensitivities were relatively similar for both changes in size and changes in financial performance, being on the order of 4-5%.

cronyism between managers and directors (Brick, Palmon & Wald, 2006). If managers can influence the board and successfully withstand pressures from outraged stakeholders, risk-averse managers might rationally be expected to pressure the compensation committee to weaken the *effective* relationship between realized compensation and variable (hence risky) financial performance (especially during periods of poor economic performance), and to have a greater portion of compensation be fixed or based on more controllable firm growth.

The notion of an *effective* relationship is an important one. In the mid-90s, an important stream of research in the management area began to show that CEO performance-based compensation might result from a mix of substantive (e.g. performance-driven) and symbolic forces. Westphal & Zajac (1994) and Zajac & Westphal (1995) studied hundreds of the largest US corporations over two decades and found that a substantial proportion were likely to adopt but *not* actually use (or to use only in a limited fashion) long-term incentive performance plans, especially if the firms had powerful CEOs or poor prior performance. This was also especially likely for later adopters of these performance plans, who sought to benefit from the legitimacy that they conveyed, without actually having to expose CEOs to compensation risk.

A similar situation might well prevail in the context of environmental performance links to top executive compensation. Faced with pressures for legitimacy in a world where environmental issues are increasingly thrust into the forefront, with specific pressures for such compensation linkages from activist shareholders and social investing funds, and concerns over corporate and personal lawsuits for environmental violations, compensation committees might respond by explicitly making environmental performance a factor in top executive compensation

and rest satisfied with this gesture¹⁰. Once the factor is in place, then, given the complexity and non-transparency of assessing and measuring environmental performance, managers might be able to subvert the actual process of measurement and assessment of performance to their benefit by weakening their effective linkage to compensation.

This interpretation of our results may be seen as compatible with recent evidence on corporate “greenwashing” (see, e.g., work by Boiral, 2007; Lyon & Maxwell, 2006; Ramus & Montiel, 2005) in the context of environmental management. As Chatterji, Levine, & Toffel (2007) note, companies can enhance their environmental image either by actually working to minimize their impact on the environment through sound environmental management practices, or by merely giving the appearance of doing so (e.g. by marketing and other efforts). Moreover, stakeholders might find it difficult to distinguish between these two approaches (Lyon and Maxwell, 2006). Empirically, as evidence of greenwashing, Ramus & Montiel (2005) found that the actual implementation of environmental policies delineated in environmental policy statements varied greatly between industry sectors. Similarly, Boiral (2007) studied nine ISO 14001 certified Canadian organizations and found that adopting the ISO 14001 standard tended to lead to ceremonial behavior intended to superficially show that the certified organizations conformed to the standard.

We believe that our study is important in that it is one of the first to highlight the important aspect of explicit compensation incentives within the corporate governance context at the corporate level of analysis. There is virtually no published empirical research that

¹⁰ An interesting parallel is with the finding by Russo & Harrison (2005) that their sample of electronic firms did not experience reduced emissions with ISO 14001 certification. One conjecture that they advance for these findings is that the certification might have been employed to provide cover for poor emissions performance by appearing to take steps in the right direction (p. 568).

investigates the role of corporate governance and incentives in an environmental management context. Our study also fits in with recent research on the efficacy of corporate environmental practices that uses the same IRRC survey data and covers the same time period of the mid- 1990s (e.g. Khanna & Anton, 2002; Anton, Deltas & Khanna, 2004). However, we hasten to add that ours is only one early attempt at investigating the role top executive compensation plays in corporate sustainability efforts, and that this research area would benefit from future extensions.

As an example of these extensions, researchers could deploy finer-grained analyses from more in-depth studies of smaller samples of firms provide in terms of teasing out explanatory variables that are now buried in our regression models error terms¹¹. As mentioned earlier, future research would also benefit from re-testing our model with alternative measures of environmental performance, given the wide variety of possible environmental goals (Epstein, 1996; Iintich, Soderstrom, & Thomas, 1998), or by employing multiple levels of analysis that control for industry type (e.g. “clean” versus “dirty” industries). The model could also be tested in different periods, perhaps contrasting our results with results from periods of greater corporate environmental proactivism, or benefiting from the stronger statistical power provided by panel data modeling approaches. Finally, researchers might want to delineate the contingencies that lead some firms to engage in the use of compensation linkages symbolically rather than substantively. We hope that other researchers will be able to use our “piece of the puzzle” to arrive someday at a coherent picture of the whole.

¹¹ We view as intriguing, for example, our finding that firms that do not link environmental performance to executive compensation also do not have any statistically significant observed link between compensation and financial performance. Is it possible that these firms have CEOs that have successfully co-opted the compensation committee to minimize their compensation risk? Are there other reasonable explanations? For example, Denis, Hanouna, & Sarin (2005) report that executive options have a significant association with securities fraud. Could it

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be that some boards are concerned that a compensation link might goad managers to engage in fraudulent reporting? If so, what conditions make this more likely?

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Table 1: Descriptive Statistics

Variable	Full Sample (N=207)		Firms without EP-Pay Link (N=62)		Firm with EP-Pay Link (N=145)		T-tests for Firms without v/s with EP-Pay Link
	Mean	SD	Mean	SD	Mean	SD	T value
Use of Environmental Performance Factor in Executive Compensation (Y=1; N=0)	0.70	0.46	0.00	0.00	1.00	0.00	
Ln CEO Compensation	8.11	1.11	7.97	0.93	8.17	1.18	-1.15
Firm Size (Ln of Firm Sales)	8.72	1.10	8.38	1.04	8.87	1.10	-2.81 **
Return on Assets	5.05	6.49	5.45	8.00	4.88	5.72	0.55
Stock Return (1 year)	18.70	30.71	18.29	37.46	18.89	27.35	-0.12
Industry-adjusted Return on Assets	1.79	7.77	0.88	9.11	2.19	7.09	-1.05
Industry-adjusted Stock Return	-15.13	49.27	-27.70	74.42	-9.55	31.24	-2.33 **
Efficiency Index (IRRC)	1.03	3.06	0.54	1.23	1.24	3.55	-1.51
Spills Index (IRRC)	1.27	2.57	0.60	1.86	1.55	2.77	-2.47 **
Compliance Index (IRRC)	45.96	140.56	20.64	45.73	56.79	164.26	-1.70 *
Industry-adjusted Efficiency Index (IRRC)	0.03	2.43	-0.06	0.96	0.07	2.83	-0.33
Industry-adjusted Spills Index (IRRC)	-0.12	1.61	0.03	1.26	-0.18	1.74	0.85
Industry-adjusted compliance Index (IRRC)	2.95	83.02	-3.86	39.95	5.87	95.68	-0.77
CEO Tenure	6.60	10.94	7.29	13.60	6.30	9.58	0.56
CEO Duality (Y=1; N=0)	0.79	0.41	0.76	0.43	0.79	0.41	-0.49
Outside Director Proportion	0.78	0.16	0.78	0.14	0.79	0.17	-0.47
Institutional Ownership	59.22	18.74	64.40	15.76	56.96	19.53	2.63 **
Five-Percent Blockholder Ownership	19.01	17.62	23.11	14.85	17.24	18.46	2.19 **

Note: Bold-faced variables are significantly different across subsamples.

Table 2 – Correlations

	1	2	3	4	5	6	7	8	9	10	11	
Environmental Perf. a Factor in Exec Compensation (Y=1; N=0)	1	1.00										
Ln CEO Compensation	2	0.04	1.00									
Firm Size (Ln of Firm Sales)	3	0.18	0.58	1.00								
Return on Assets	4	-0.03	0.39	0.24	1.00							
Stock Return (1-year)	5	-0.08	0.23	0.31	0.26	1.00						
Industry-adjusted Return on Assets	6	0.07	0.30	0.11	0.84	0.17	1.00					
Industry-adjusted Stock Return	7	0.16	0.10	0.11	0.15	0.48	0.15	1.00				
Efficiency Index	8	0.11	0.00	-0.08	-0.03	-0.11	0.01	0.00	1.00			
Spills Index	9	0.15	-0.19	-0.01	-0.06	-0.01	0.00	0.12	0.09	1.00		
Compliance Index	10	0.12	-0.31	-0.18	-0.21	0.00	-0.15	0.07	0.36	0.47	1.00	
Industry-adjusted Efficiency Index	11	0.02	-0.04	-0.01	-0.05	0.01	-0.13	-0.02	0.84	-0.02	0.27	1.00
Industry-adjusted Spills Index	12	-0.06	0.01	0.08	0.08	0.01	0.06	0.00	-0.08	0.59	0.00	-0.04
Industry-adjusted Compliance Index	13	0.04	-0.06	-0.07	-0.07	-0.03	-0.09	-0.01	0.42	0.08	0.62	0.40
CEO Tenure	14	-0.06	0.05	-0.10	0.02	-0.08	-0.02	-0.06	-0.03	-0.06	0.04	0.01
CEO Duality (Y=1; N=0)	15	0.03	0.00	0.06	0.02	0.06	-0.02	0.00	0.05	0.04	0.06	0.08
Outside Director Proportion	16	-0.02	0.06	0.00	0.06	0.07	0.01	0.03	0.04	0.03	0.02	0.03
Institutional Ownership	17	-0.19	-0.07	-0.26	0.11	0.01	0.07	-0.08	0.11	0.05	-0.01	0.05
Five-Percent Blockholder Ownership	18	-0.19	-0.10	-0.27	-0.02	-0.03	-0.06	-0.18	0.04	0.10	-0.03	-0.02
			12	13	14	15	16	17	18			
Industry-adjusted Spills Index	12	1.00										
Industry-adjusted Compliance Index	13	0.06	1.00									
CEO Tenure	14	0.01	0.06	1.00								
CEO Duality (Y=1; N=0)	15	0.00	0.02	-0.04	1.00							
Outside Director Proportion	16	0.08	0.02	-0.02	0.06	1.00						
Institutional Ownership	17	-0.03	-0.07	-0.13	0.13	0.03	1.00					
Five-Percent Blockholder Ownership	18	0.09	-0.07	0.02	0.04	0.07	0.32	1.00				

NOTE: Correlations above 15 or below -15 (in bold) are significant at the 5% level.

Table 3
Regression Results for Absolute Performance Levels using TRI Emissions, Spills and Compliance Data
(Dependent Variable: Ln CEO Compensation)

	All Firms	Firms with EP-Pay Link	Firms without EP-Pay link	All Firms	Firms with EP-Pay Link	Firms without EP-Pay link	All Firms	Firms with EP-Pay Link	Firms without EP-Pay link
Environmental Performance Measure:	Emissions Efficiency	Emissions Efficiency	Emissions Efficiency	Compliance Index	Compliance Index	Compliance Index	Spills Index	Spills Index	Spills Index
Intercept	2.285 *** (.788)	2.729 *** (.956)	1.644 (1.442)	2.607 *** (.782)	3.058 ** (.949)	1.854 (1.485)	2.250 ** (.774)	2.716 ** (.930)	1.664 (1.458)
Environmental Performance	.021 (.021)	.017 (.022)	.071 (.079)	-.001 ** (.000)	-.001 ** (.000)	-.001 (.002)	-.063 *** (.024)	-.073 *** (.027)	.001 (.054)
Firm Size (Ln of Sales)	.575 *** (.069)	.496 *** (.087)	.595 *** (.119)	.544 *** (.069)	.459 *** (.086)	.588 *** (.121)	.581 *** (.068)	.498 *** (.085)	.597 *** (.120)
Return on Assets	.041 *** (.011)	.079 *** (.016)	.009 (.013)	.035 *** (.011)	.079 *** (.017)	.010 (.013)	.038 *** (.010)	.074 *** (.016)	.009 (.013)
Stock Return	.001 (.002)	-.001 (.003)	-.001 (.003)	.001 (.002)	.000 (.003)	-.001 (.003)	.001 (.002)	-.000 (.003)	-.001 (.003)
CEO Tenure	.011 * (.006)	.019 ** (.009)	.006 (.008)	.011 * (.006)	.020 ** (.009)	.005 (.008)	.010 * (.006)	.018 ** (.009)	.005 (.008)
CEO Duality	-.138 (.160)	.041 (.211)	-.181 (.239)	-.104 (.158)	.089 (.207)	-.232 (.242)	-.127 (.158)	.091 (.205)	-.204 (.248)
Outside Director Ratio	.450 (.446)	.145 (.494)	1.633 (1.096)	.485 (.437)	.190 (.484)	1.599 (1.108)	.504 (.437)	.199 (.480)	1.672 (1.109)
Institutional Ownership	.003 (.004)	.007 (.005)	-.000 (.007)	.003 (.004)	.007 (.004)	.000 (.008)	.004 (.004)	.007 (.005)	.000 (.008)
Blockholder Ownership	.002 (.004)	-.002 (.005)	.003 (.007)	.002 (.004)	-.002 (.005)	-.001 (.002)	.004 (.004)	.000 (.005)	.003 (.007)
<i>Adjusted R²</i> <i>F(Prob)</i>	.425 13.46 (.000)	.472 10.91 (.000)	.396 4.86 (.000)	.415 11.65 (.000)	.449 11.79 (.000)	.494 4.77 (.000)	.445 14.60 (.000)	.459 12.23 (.000)	.385 4.69 (.000)

NOTES: Standard Errors in Parentheses. Higher Index and Efficiency Scores indicate poorer environmental performance.

Significance levels, based on two-tailed tests: * p < .10 ** p < .05 *** p < .01

Table 4
Regression Results for Relative Performance Levels using TRI Emissions, Spills and Compliance Data
(Dependent Variable: Ln CEO Compensation)

	All Firms	Firms with EP-Pay Link	Firms without EP-Pay link	All Firms	Firms with EP-Pay Link	Firms without EP-Pay link	All Firms	Firms with EP-Pay Link	Firms without EP-Pay link
Environmental Performance Measure:	Relative Emissions Efficiency	Relative Emissions Efficiency	Relative Emissions Efficiency	Relative Compliance Index	Relative Compliance Index	Relative Compliance Index	Relative Spills Index	Relative Spills Index	Relative Spills Index
Intercept	1.930 ** (.760)	1.762 * (.916)	1.857 (1.400)	1.916 (.761)	1.736 * (.916)	1.917 (1.426)	1.866 ** (.763)	1.602 * (.921)	1.902 (1.414)
Relative Environmental Performance	.002 (.026)	.004 (.028)	.085 (.099)	.000 (.001)	.000 (.001)	-.001 (.002)	-.029 (.039)	-.052 (.046)	.034 (.078)
Firm Size (Ln of Sales)	.616 *** (.065)	.611 *** (.080)	.582 *** (.115)	.617 *** (.065)	.614 *** (.080)	.579 *** (.116)	.620 *** (.065)	.623 *** (.081)	.582 *** (.115)
Relative Return on Assets	.034 *** (.009)	.056 *** (.013)	.009 (.011)	.034 *** (.008)	.056 *** (.013)	.009 (.112)	.034 *** (.008)	.057 *** (.012)	.009 (.011)
Relative Stock Return	.001 (.001)	.001 (.003)	-.000 (.001)	.001 (.001)	.001 (.003)	-.000 (.001)	.001 (.001)	.001 (.003)	.000 (.001)
CEO Tenure	.012 ** (.006)	.019 ** (.009)	.007 (.007)	.012 ** (.006)	.019 ** (.009)	.007 (.007)	.012 ** (.006)	.019 ** (.009)	.006 (.008)
CEO Duality	-.124 (.161)	.057 (.216)	-.220 (.239)	-.126 (.161)	.051 (.216)	-.216 (.242)	-.122 (.160)	.078 (.215)	0.198 (.243)
Outside Director Ratio	.523 (.444)	.348 (.496)	1.615 (1.099)	.522 (.443)	.342 (.495)	1.606 (1.109)	.551 (.444)	.404 (.495)	1.604 (1.107)
Institutional Ownership	.005 (.004)	.007 (.005)	.000 (.007)	.005 (.004)	.007 (.005)	-.000 (.007)	.005 (.004)	.006 (.005)	-.000 (.007)
Blockholder Ownership	.004 (.004)	.002 (.005)	.003 (.007)	.004 (.004)	.002 (.005)	.002 (.008)	.004 (.004)	.002 (.005)	.002 (.008)
<i>Adjusted R²</i> <i>F(Prob)</i>	.396 13.62 (.000)	.416 10.44 (.000)	.394 4.83 (.000)	.397 13.63 (.000)	.417 10.47(.000)	.385 4.69 (.000)	.398 13.72 (.000)	.423 10.69 (.000)	.387 4.71(.000)

NOTES: Standard Errors in Parentheses. Higher Index and Efficiency Scores indicate poorer environmental performance.

Significance levels, based on two-tailed tests: * p < .10 ** p < .05 *** p < .01