Private Politics and Environmental Management**

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Abstract

We study determinants and effects of two types of private political actions (PPAs) against S&P 500 companies: environmental boycotts and shareholder proxy proposals. We consider effects on the firms' adoption of environmental management systems (EMS) and the environmental protocol, ISO 14001. We find that PPAs have a significant impact on firms' environmental management decisions and, consistent with Baron (2009), that a company's likelihood of experiencing a PPA is higher if it is a "receptive target" that has a reputation for social responsibility.

Keywords: Environmental management, private politics, boycotts, proxy challenges, corporate social responsibility

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1. Introduction

This paper is motivated by two recent trends in corporate environmentalism. First is the increasing use of private political tools and activism to promote environmental objectives. For example, the number of on-going environmental and animal rights boycotts of companies and organizations grew from twenty-seven at the end of 1990 (National Boycott News, Winter 1992-93) to forty-three in 2011 (www.ethicalconsumer.org). Environmental proxy actions have also been on the rise; the number of environment-related shareholder proposals increased from an average of 26.7 per year in 1988-1990 to 67.3 per year in 2004-6.

Second is the growth in voluntary approaches to pollution management. Increasingly, private sector firms voluntarily adopt environmental management practices not required by regulators. One symptom of this phenomenon is company participation in an expanding array of voluntary pollution control programs. Some programs are government-initiated (such as the Environmental Protection Agency's 33/50 and Green Lights programs). Others are sponsored by private organizations of either activists (such as the Forest Stewardship Council) or industry coalitions (such as Responsible Care) or both (such as the Marine Stewardship Council).

Each of these two trends has, individually, spurred recent academic interest and study. In this paper, we examine both phenomena and links between them for a defined set of large firms (the S&P 500). We focus on two private political tools, environment-related boycotts and shareholder proxy proposals, and three indicators of environmental management. Two indicators are based on adoption of Environmental Management Systems (EMS's) as reported in surveys by the Investor Responsibility Research Center (IRRC); the first is for adoption of *any* EMS (including environmental audit programs and managerial compensation for environmental progress); the second is for adoption of a specific EMS generally cited as the most

comprehensive program among those reported to the IRRC: Total Quality Environmental Management (TQEM).[1] These programs represent industry-sponsored initiatives from the early 1990's. The remaining indicator is for certification under the environmental protocols of the International Organization of Standards, ISO 14001, in the late 1990's and early 2000's. ISO 14001 is a rigorous set of environmental management standards designed and developed in 1996 by the ISO, an international organization of industry and government representatives. Both ISO 14001 and TQEM can be wide-ranging in their effects (Lave, et al., 1997; MPCA, 2009), involving systematic changes to pollution control practices, staffing patterns, audit systems, production processes, and internal operating protocols.

We address two main questions. What determines whether or not a firm is targeted for an environmental boycott or shareholder proxy action? And what effect do these private political actions (PPAs) have on firms' decisions to adopt environmental management practices? The first question concerns *determinants of PPAs*, and the second concerns *effects of PPAs*.

In addressing the first question, we study impacts of regulatory activity, local community considerations, and perhaps most importantly, firms' reputations for being "receptive" or "resistant" targets, on boycott and proxy target selection. Do environmental organizations tend to focus on socially progressive firms, those with reputations for socially responsible conduct, whether due to consumer pressures or managerial preferences? Or do they tend to target less progressive firms with poor reputations for Corporate Social Responsibility (CSR)? Baron (2009) predicts that public interest / non-governmental organizations (NGOs) will tend to target progressive firms that are more responsive to public pressure for environmental improvement.

[1] Total Quality Environmental Management (TQEM) was first introduced in 1992 by the Global Environmental Management Initiative (GEMI), a coalition of 21 companies including IBM, AT&T and Kodak, formed in 1990. TQEM views pollution as a quality defect to be continuously reduced through the development of products and processes that minimize waste generation at source. See www.bsdglobal.com/tools/systems_TQEM.asp.

Such a strategy reflects an NGO concern for *effects* of private politics on environmental conduct, as opposed to publicity, exposure and contributions.

An NGO may also target "receptive" firms in order to claim credit for pro-environmental firm conduct that would occur even absent private political action. However, controlling for a variety of firm attributes – including the reputation for CSR – we find that boycotts are a significant spur to adoption of EMS systems (as reported to the IRRC), but also a significant deterrent to ISO 14001 certification. Surprisingly, even though shareholder proxy proposals are never successful in our data – not one of them passed a vote of the shareholders – we find that these actions are a significant spur to both ISO 14001 and TQEM adoption.

A common theme in these results is that environmental PPAs affect firm-level environmental management decisions. However, the nature of these effects can differ across PPA media (boycotts vs. proxies) and across environmental practices (IRRC-reported practices vs. ISO 14001). Different effects across media may be due to different actors, as well as different levels of intensity and cost of the two types of PPA – both to targeted firms and for targeting organizations. Proxy challenges are predominantly launched by religious organizations, individuals, and investment funds, whereas boycott campaigns that are more costly to wage are predominantly launched by public interest groups that have the resources and skills to organize consumers and communities. Different effects of boycotts on IRRC-reported practices vs. ISO 14001 may be due to evolving views of environmental NGOs toward industry-sponsored environmental management programs from the time of the IRRC surveys (in the early 1990's) to firms' ISO 14001 decisions (between 1996 and 2003 in our data). By the time of the ISO program, anecdotal evidence suggests that NGOs viewed ISO 14001 as not only a "weak sword" (Potoski and Prakash, 2005), but tantamount to "greenwash" (ecologia.org, 2000). If so, environmental boycotts by NGOs might be expected to divert a firm's environmental efforts

away from ISO registration. Religious organizations and investment clienteles behind proxy challenges are likely to be less skeptical of industry-sponsored initiatives (like ISO 14001) and perhaps more pragmatic in their assessment of its potential benefits.

Despite a burgeoning theoretical literature on private politics,[2] we build upon a surprisingly small empirical literature on this subject.[3] Most closely related to our work are Eesley and Lenox (2006) and Lenox and Eesley (2009), who study a range of private political actions, including proxy challenges, letter writing campaigns, boycotts, protests, and civil suits, all with an environmental focus.[4] Both papers study how these different political actions *affect* firms' decisions to accede to the specific demands of the targeting campaign. They find that, for targeted firms, stronger tactics are more effective in achieving firm compliance; letter writing campaigns are more effective than proxy challenges, and boycotts, protests and civil suits are all more effective than letter-writing campaigns. In addition, stronger targeting organizations (for example, NGOs vs. religiously affiliated groups) are more effective in eliciting compliance.

Lenox and Eesley (2009) also study *determinants* of targeting organizations' choices of tactics and determinants of whether – and how many times – a firm in a broad sample of firms was targeted during their 1988-2003 sample period.[5] In the latter estimation, Lenox and Eesley (2009) do not distinguish between the different action types, rather aggregating them into the number of all actions targeted to any given firm. They find that larger firms with larger toxic emissions, and smaller levels of cash that could be used to fight a private political campaign, are

[2] See, for example, Baron (2001, 2009), Feddersen and Gilligan (2001), Besley and Ghatak (2007), Innes (2006).
[3] There are a number of event studies that examine whether boycott announcements lead to negative effects on targets' stock prices. See , for example, King and Soule (2007) and Epstein and Schnietz (2002). The evidence is mixed, but generally supports the hypothesis that boycotts harm stock prices.
[4] Another key paper is Baron, Harjoto and Jo (2011), who study relationships between social pressure, corporate social performance, and corporate financial performance, but do not focus explicitly on determinants and effects of specific private political actions. See also Fernandez-Kranz and Santalo (KL, 2010) and Siegel and Viataliano (SV, 2007), who study how Corporate Social Responsibility (as measured by KLD indices) is affected by industry competitiveness (KL) and the nature of goods for sale (SV).
[5] Lenox and Eesley (2009) consider the overall set of firms in the Compustat dataset, encompassing 3338 firms, 273 of which were targeted for an environmental campaign during their 1988-2003 sample period.

more likely to be targeted for a campaign and, when targeted, to face stronger tactics.

Beyond differences in data, our paper is distinguished in several key ways. First, on the *effects of PPAs*, we study impacts on broader environmental practices of targeted firms, rather than compliance with specific demands of the campaign. For example, the intent of shareholder environmental proxy proposals is not literally to succeed (which they never do); instead, presumably, it is to influence managerial thinking about environmental practices, including the IRRC-reported EMS systems and ISO 14001 that we and others study. Although these indicators are intermediate measures of environmental performance, substantial empirical work documents their effectiveness in achieving ultimate pollutant reductions. For example, two papers (Anton, et al., 2004; Sam, et al., 2009) identify salutary effects of EMS systems (as reported to the IRRC) on firms' toxic pollutant releases. Two others (Arimura, Hibiki, and Katayama, 2008; Potoski and Prakash, 2005) find salutary effects of ISO 14001 registration on environmental performance.[6] In part motivated by this evidence, a number of papers study adoption incentives for IRRC-reported EMS systems (Khanna and Anton, 2002; Anton, et al., 2004; Sam, et al., 2009) and ISO 14001 (King, et al., 2005; Grolleau, Mzoughi, and Thomas, 2007; Delmas and Montiel, 2008, 2009; Gonzalez and Gonzalez, 2008). The key distinction of our study, relative to this literature, is its focus on the effects of private politics.[7]

Second, also on the *effects of PPAs*, we address the potential endogeneity of targeting choices. For example, firms may be targeted with more harmful PPAs when they are more likely to address complaints of the targeting organization, whether or not a PPA is launched. In order

[6] A third paper (King, Lenox, and Terlaak, 2005) finds a negative relationship between past ISO 14001 registration and future environmental performance. However, this conclusion may potentially reflect correlation (with high emission firms having the most to gain from ISO adoption), rather than causation.
[7] To our knowledge, the only paper to incorporate private political variables is Delmas and Montiel (2008) who find mixed effects of a country's number of NGOs on its rate of ISO 14001 certification in a cross-national study.

to impute causal effects of a PPA therefore requires attention to identification. Our identification strategy is discussed in detail in Section 2 below.

Third, on both *effects* and *determinants of PPAs*, we measure impacts of social reputation on a firm's propensity to be targeted for a PPA and to adopt an EMS. In the former (targeting choice) regressions these impacts shed light on Baron's (2009) theory of private political action. In the latter (EMS adoption) regressions, these controls are potentially key drivers of EMS adoption and PPA targeting decisions; their inclusion is therefore crucial to identification of how the latter (PPAs) affect the former (EMS adoption).

Fourth, on *determinants of PPAs*, we focus separately on each type of political tactic, boycotts and proxy proposals, rather than on tactic aggregates (Lenox and Eesley, 2009, Table VII). This distinction enables us to pinpoint distinct drivers of the two actions, which typically involve different players and involve different costs to both targeting organizations and targeted firms. In making this distinction, we find both common and distinct drivers of targeting choices. Both types of action are favored for larger firms with larger market shares, for firms that are more intensively inspected for compliance with Clean Air laws, and for firms with strong reputations for corporate social responsibility (CSR). However, proxy actions are also favored against "resistant targets" with particularly sketchy reputations for CSR and for firms in more competitive industries. Because they are launched at low cost by less adversarial investor clienteles, proxies may be more effective than boycotts in nudging the environmental choices of "resistant targets" and more attractive as a means to call the company's attention to its weak environmental practices. Larger costs of waging boycotts may limit these campaigns to targets which are more likely to respond, namely, "receptive targets" with strong records of CSR.

2. Econometric Models

We have two types of dependent variables in this paper, both measured by zero-one

dummy variables for firms in the S&P 500: (1) private political actions (PPAs) (environmental boycotts and shareholder proxy actions), and (2) adoption of environmental management systems (EMS). The PPAs indicate whether a firm is targeted for a PPA in a given year. The EMS variables indicate whether a firm adopted an EMS, defined in three different ways: (1) *any* EMS practice as reported to the IRRC in 1994-95 (variable name: *IRRC-EMS*), (2) TQEM, also as reported to the IRRC (variable name: *IRRC-TQEM*), and (3) registration under ISO 14001 during either 1996-99 (variable name: *ISO96-99*) or 1996-2003 (variable name: *ISO96-03*). The latter two periods reflect early ISO adoption and corresponding longer-run decisions.

2.1. PPA Models

Panel models of PPA targeting are estimated by Random Effects Probit, reflecting an underpinning "target value index" for firm i in time t:

$$PPA^{*}_{it} = \alpha_0 + \beta' X_{it} + v_{it} \quad (1)$$

where $v_{it} = \alpha_i + \varepsilon_{it}$, α_i = unobserved random (normal) firm effect, ε_{it} = random (normal) errors, and X_{it} = vector of time t covariates for firm i; the standard restrictions are assumed to apply.[8] A higher "target value index" leads targeting organizations to launch a PPA against the firm:

$$PPA_{it} = \begin{cases} 1 \text{ if } PPA^{*}_{it} \geq 0 \\ 0 \text{ if } PPA^{*}_{it} < 0 \end{cases} \quad (2)$$

Equations (1)-(2) are estimated by maximum likelihood.

The X_{it} covariates in equation (1) are time-varying when possible, but also include some cross-section indicators. Determinants of PPAs include indicators of firm size, market power, nature of goods produced (whether or not in a final goods market), industry market structure (concentration), intensity of environmental regulation (inspections), pollutant emissions, local

[8] Standard restrictions include: $E(\alpha_i \mid X_{it}) = E(\varepsilon_{it} \mid X_{it}) = 0$, $E(\alpha_{it}\varepsilon_{it} \mid X_{it}) = 0$, $E(\varepsilon_{it}\varepsilon_{js} \mid X_{it}) = 0$ $(j \neq i, t \neq s)$, $E(\alpha_{it}\alpha_j \mid X_{it}) = 0$ $(i \neq j)$.

liability statutes (strict vs. negligence liability), other local circumstances (including socio-economic indicators and a measure of the local environmentalist constituency), and reputation for Corporate Social Responsibility (CSR), as well as industry and year fixed effects.

2.2. EMS Models

Cross-section models of EMS adoption are estimated by Probit, reflecting the underpinning firm i "adoption benefit index,"

$$EMS_i^* = \alpha + \beta' X_i + \gamma B_i + \eta P_i + \varepsilon_i \quad (3)$$

where X_i = vector of firm covariates, B_i = zero-one indicator for whether firm i is targeted for an environmental boycott (over 1988-95), P_i = zero-one indicator for whether firm i is targeted for an environmental proxy action (over 1988-95), and ε_i is a normally distributed error with the usual properties.[9] A higher "adoption benefit index" leads to EMS adoption:

$$EMS_i = \begin{cases} 1 \text{ if } EMS_i^* \geq 0 \\ 0 \text{ if } EMS_i^* < 0 \end{cases} \quad (4)$$

Key variables of interest in equations (3)-(4) are the environmental PPAs, B_i (*Boycott*) and P_i (*Proxy*). To the extent that EMS adoption is viewed by the PPA-targeting community as a progressive, pro-environment firm strategy, we expect that environmental PPAs will promote a targeted firm's adoption of the EMS. The PPA can raise consumer and community awareness of the company's environmental practices, and thereby increase company benefits of desired practices, both in the marketplace for green consumers and for improved public relations. In addition, experiencing a PPA may raise a firm's perceived exposure to NGO scrutiny – and the associated risk of a future PPA; if so, a PPA might increase company incentives for EMS adoption as a strategy to deter future environmental PPAs. However, this logic is reversed if an

[9] Standard properties are: $E(\varepsilon_i \mid X_i) = 0$, $E(\varepsilon_i^2 \mid X_i) = \sigma^2$, and $E(\varepsilon_i \varepsilon_j \mid X_i) = 0$ $(j \neq i)$. Following standard practice, the constant variance assumption is made in estimation, but robust standard errors are constructed.

EMS is not viewed favorably by the PPA-targeting community.

While the foregoing indicates possible causal effects of a PPA on EMS adoption, a key issue in estimating these models is the potential endogeneity of the PPAs, B_i and P_i. Unaddressed, endogeneity would confound the causal interpretation of estimated PPA coefficients in the EMS equation (4). In principle, endogeneity may be due to reverse causation or correlated unobservables. With our PPAs measured over 1988-95 and the *IRRC-EMS* and *IRRC-TQEM* adoption decisions measured for 1994-95, reverse causation is possible if PPA and EMS adoption choices occur at roughly the same time. Estimated PPA effects on EMS adoption could then be biased downwards – if EMS adoption deters PPAs by signaling good environmental performance – or upwards, if EMS adoption promotes PPAs by signaling that the firm is a "receptive target." Alternately, more progressive firms may be more likely to be targeted for an environmental PPA (Baron, 2009) and to adopt an EMS, leading to a problem of correlated unobservables. In this case, estimated PPA effects could be biased upwards.

To address the potential endogeneity of the PPAs, we identify *Boycotts* and *Proxy*, respectively, with the instruments *Other Boycotts* and *Other Proxy*. The instruments are dummy variables that take a value of one if the firm is in an industry that had a non-environmental (non-labor) boycott / proxy. A firm's industry is defined by its primary three-digit SIC code.

Three criteria are relevant to judge the merits of these instruments. First, are the instruments prior to (or contemporaneous with) EMS adoption so that the identifying variation is logically causal? The *IRRC-EMS* / *IRRC-TQEM* indicators are measured for 1994-95, with the TQEM approach only first introduced to the world in 1992 (www.gemi.org). We therefore construct the instruments over the prior period 1988-91 for the *IRRC-EMS* / *IRRC-TQEM* estimations. ISO 14001 was first introduced in 1996; we therefore measure the instruments over 1988-95 for the *ISO96-99* and *ISO96-03* estimations.

Second, are the instruments highly correlated with the environmental *Boycott* and *Proxy* regressors (Stock and Yogo, 2005)? We present evidence that they are.[10] Intuitively, industries reflect a range of attributes that drive PPA targeting decisions, including proximity to consumers, availability of substitutes, and investor clienteles (Smith, 1990).

Third, are the instruments irrelevant to the generating process for EMS adoption, other than via their impact on the environmental PPAs? The most plausible mechanism for confounding correlation – when unobservables drive both non-environmental boycotts and EMS adoption – is the following: If a firm is progressive (or not) for non-environmental issues – making it a potential target for non-environmental PPAs – then perhaps it is also likely to be progressive (or not) for environmental issues and therefore more or less likely to adopt an EMS. To control for this channel of effect (and also measure the impact of firm reputations for Corporate Social Responsibility), we explicitly control for a firm's CSR reputation using KLD data on past socially progressive practices and challenges (excluding environmental issues).[11]

Our estimation strategy uses an instrumental variable method, two-stage residual inclusion (2SRI), sometimes called the control function approach. Unlike standard two stage estimators which use stage 1 fitted values for endogenous regressors, 2SRI has been shown to be consistent in general non-linear models (Terza, et al., 2008). The 2SRI approach involves a first stage estimation of equations for the endogenous regressors that reflects non-linearities in their generating processes. From these estimations, residuals are calculated. The "main" second stage estimation (of the EMS equation in the present case) then includes both the endogenous

[10] A referee suggested alternative instruments that measure PPA intensity by industry. We considered the number of PPAs in the industry per firm, and the number of PPAs in the industry per dollar of Sales. Lamentably, neither performed well in first stage estimations.

[11] Another possible mechanism for endogeneity of the PPA variables is that activists may be more likely to focus environmental and non-environmental boycotts on heavy polluters, and these dirty firms also have more to gain from EMS adoption. However, this potential source of endogeneity is vitiated by our inclusion of lagged pollution outcomes as explanatory variables in our estimation of equations (3)-(4).

regressors and their fitted residuals to correct for potential endogeneity bias.

3. Data and Measurement

Merging financial, environmental and other databases yields a usable sample of 365 S&P 500 firms for our cross-section analyses and 458 firms in the proxy panel (1991-2003). Sample firms are members of the S&P 500 as of 1988 and do not change over our sample intervals.

3.1 Dependent Variables: Private Political Actions

Boycotts. Our boycott data is collected from issues of *National Boycott News* and *Boycott Quarterly* from 1988-1995. From these sources, we identified 129 non-labor boycotts against traded U.S. companies over this period. Among these actions are 55 boycotts related to environmental or animal rights issues against 40 firms in the S&P 500. The specific issues cited include animal testing, forestry practices, rainforest destruction, oil recycling, toxic waste cleanup, dolphin-safe tuna, groundwater contamination, Bovine Growth Hormone, whale captivity, pesticide use, oil drilling and oil spills, ozone-depleting chemicals, cattle grazing, and damaging development. To our knowledge, this is the most comprehensive set of environmental boycott data studied to date, with annual boycott numbers ranging from 16 in 1989 to 36 in 1993.[12] Over 1988-95, 9.3 percent of sample firms were subject to environmental boycotts and 14.3 were in an industry that was subject to a non-environmental (non-labor) boycott.

Proxy Votes. Data on shareholder proxy proposals for firms in the S&P 500 was obtained from Institutional Shareholder Services for the period 1988-2003. The proposals target issues

[12] The numbers of S&P 500 environmental boycotts by year are 16 (1989), 20 (1990), 18 (1991), 19 (1992), 36 (1993), 34 (1994), and 35 (1995). Lenox and Eesley (2009) identify 76 environmental boycotts against traded U.S. companies over 1988-2003 based on newspaper searches. Out of 129 boycotts in our data, we have slightly more environmental boycotts (77) against traded U.S. companies in only the first half of this time period (1988-1995), including 24 on animal rights. 52 other boycotts concern a variety of other social issues, including racial equality, corporate accountability, family values, gay rights, womens rights, gun control, gun rights, abortion, cigarette addiction, human rights in Burma, and product safety. Twelve of the 40 S&P 500 companies experiencing environmental boycotts over our 1988-95 sample period experienced more than one, including three that experienced three boycotts.

ranging from executive compensation to restrictions on investments (avoiding South Africa, for example) to a variety of environment-related actions. Environmental topics include opposition to nuclear power, greenhouse gas controls, reporting requirements and safeguards to avoid oil and chemical spills, endangered species preservation, recycling, investment in renewable energy, genetically modified foods, old growth forests, drilling in the Alaska National Wildlife Refuge, reducing toxic pollution, avoiding chemical pesticides, disclosure of environmental and community hazards, and "smart growth." From 1988-2003, there were 788 environment-related proxy proposals by shareholders of the S&P 500. There are three primary types of filers: religious organizations, socially responsible investment funds, and individuals.

Between 1988-1995, 15.6 percent of our sample firms were targeted for an environmental proxy challenge, while 49.6 percent were targeted for a non-environmental public interest proxy vote. During this period, there were 387 environment-related proxy proposals by S&P 500 shareholders, compared with 55 environment-related boycotts. In our proxy panel (1991-2003), the average *annual* proportion of firms targeted for an environmental proxy is 9.1 percent – roughly the same proportion of our cross-section sample that was subject to an environment-related boycott over the 8-year span 1988-95. These statistics reflect the significantly greater frequency of proxy proposals vs. boycott actions that are much more costly to launch.

3.2 Dependent Variables: Firms' Adoption of Environmental Management Systems

The IRRC Data. During 1994 and 1995, the Investor Responsibility Research Center (IRRC) surveyed all S&P 500 companies concerning their adoption of a variety of environmental management practices (see Anton, et al., 2004). All respondents indicated adoption of at least one key practice, and almost all adopted multiple practices, including written environmental policies and codes of conduct, self-audits to assess compliance with environmental regulations, and/or implementation of a "total quality environmental management" program (TQEM).

TQEM is widely viewed as a comprehensive approach to environmental management. Costs of enacting TQEM are potentially substantial; for example, in a case study of a TQEM program of Eastman Kodak's utilities division, Lave, et al. (1997) indicate that "12% of HS&E (Health, Safety and Environment) staff time was diverted to the program over its first two years." Potential rewards from environmental management are also large; in the Eastman Kodak case, for example, Lave et al. (1997) cite the 1995 company expenditures on U.S. environmental management and waste/pollution prevention activities of $106 million, with TQEM estimated to reduce HS&E oversight cots by 25 to 40 percent.

ISO 14001. ISO 14001 registration data over 1996-2006 is provided by QSU Publishing Co. (www.qsuonline.com). To be registered under ISO 14001, a firm must be certified by a third party auditor for compliance with the environmental standard. Third party audits are rigorous, but there is no obligation for public disclosure of the audit findings. However, for certification, the firm must demonstrate compliance with a series of requirements, including documentation and implementation of an environmental management system (EMS) that "checks" for environmental problems, implements environmental controls and corrective actions for pollutant releases, and involves management review (Arimura, et al., 2008; Gonzalez and Gonzalez, 2008; www.iso.org). Registered participants must periodically review their EMS and update their certification. Costs of ISO 14001 adoption and program maintenance can be substantial. MPCA (2009) estimates initial costs (per facility) of $30,000 to $150,000, and annual costs of maintaining registration of $6,000 to $30,000, depending upon facility size and excluding internal costs. Bansel and Bogner (2002) estimate initial costs of between $10,000 (for small facilities) and $250,000 (for larger ones), while Yirdoe et al. (2003) estimate average initial costs of between 39,000 and 75,000 Canadian dollars. In terms of benefits, both document the effectiveness of ISO 14001 in reducing firms' toxic air releases, solid waste generation, and

wastewater emissions. Despite evidence that ISO 14001 reduces pollutant emissions (Potoski and Prakash, 2005; Arimura, et al., 2008), the program is sometimes labeled "greenwash"– "dirty" firms falsely claiming to be "green" – likely due to its limited enforcement teeth.[13]

3.3 Independent Variables

Firm-level Scale and Financial Indicators. Firms that are larger, more profitable, and "newer" / more versatile are potentially more promising targets of private political action and in a better position to adopt new environmental management systems. We measure a firm's size with its number of employees (*Employees*, a panel variable) or its annual sales revenue (*Sales*, a panel variable).[14] A profitability index is constructed as the ratio of net income to sales (*Profit*, a panel variable). Following Khanna and Damon (1999) (see also Khanna and Anton, 2002), we construct a measure of the age of firm assets as the ratio of gross to net assets (*Age of Assets*, a panel variable); this variable ranges from a value of one – reflecting "newer" assets than have not been depreciated – and higher values that reflect "older" assets that have been substantially depreciated. All four variables are obtained from COMPUSTAT.

Firm-level Environmental Performance and Regulation Indicators. We construct two measures of firm-level environmental performance. Both are based on pollutant emissions reported to the U.S. Environmental Protection Agency's (EPA's) Toxic Release Inventory (TRI). First, we measure each firm's total releases (by weight) of 170 toxic chemicals regulated under the Clean Air Act (CAA) and reported to the TRI throughout our study period (*CAA Emissions*, a

[13] The following quote from ecologia.org (ecologia.org/ems/iso14000/resources/factsheets/iso14000.html, Autumn, 2000) illustrates the perception: "The ISO 14000 standards are not prescriptive and do not provide pollutant targets or limits; because of this flexibility, use of the ISO 14000 standards does not guarantee that an enterprise will pollute less or meet national environmental requirements. However, many enterprises can and do advertise their ISO 14001 certification as an indication of a commitment to better environmental performance. This may lead to corporate "greenwashing," which benefits companies that don't reduce pollution and fails to highlight the achievements of those enterprises that truly are improving their performance through EMS." ISO 14001 is also associated with the much-derided Sustainable Forest Initiative of the logging industry () and examples of bad environmental actors such as RUSAL (www.fao.org/COCREP/ARTICLE/WFC/XII/1017-A5.html, www.boycottrussionaluminum.com).

[14] We use *Employees* to measure scale in the regressions because labor resources can be important to adoption of EMS systems.

panel variable). Second, we measure each firm's releases (by weight) of 143 non-CAA TRI air-related chemicals reported consistently through our study period (*Non-CAA Emissions*, a panel variable).[15] In all estimations, releases are measured with a one-year lag.

To measure the intensity of government environmental enforcement, we use the EPA's Air Facility System (AFS) database to construct the annual number of CAA inspections of a firm's facilities (*Inspect*, a panel variable). To avoid any potential for endogeneity, inspections are measured with substantial lag; for example, in the panel PPA regressions, inspections are measured over the prior 3 to 7 years, while for the EMS regressions they are measured in 1988.

Emissions and inspections can have competing effects on private political action, confounding clear predictions. Higher firm emissions potentially impart larger activist benefits of pro-environment practices, as well as potentially greater intrinsic benefits of targeting the "dirty firm." Government environmental inspections are also likely to raise intrinsic benefits of targeting the firm by elevating the firm's profile as a bad actor. Conversely, high emission firms may be tougher targets, reducing the likelihood of a successful campaign. Higher CAA emissions and inspections also reflect greater regulatory intensity that may reduce the demand for private political action. Higher unregulated non-CAA emissions, in contrast, may raise the scope for private politics to affect environmental management because there is no regulation to compel firm control of these releases.

Effects on incentives for EMS adoption can also be ambiguous. A firm may benefit more from EMS adoption when it is more polluting and subject to more government inspections because there is more to gain from meeting pollution standards and avoiding adverse regulatory actions. However, less-polluting firms may face lower costs of implementing EMS programs.

[15] Toxicity-weighted counterparts are problematic for broad emission aggregates such as ours (see Guerrero and Innes, 2013). We therefore report results using aggregate weights. However, as a robustness check, we also report results using toxicity-weighted counterparts to the two (CAA and non-CAA) emissions measures. We verified our list of CAA-regulated TRI chemicals for potential errors in TRI flags noted by Bui and Kapon (2013, note 5).

Firm-level Indicators for Corporate Responsibility. We use the KLD (Kinder, Lydenberg, and Domini) data to construct two indices that measure a firm's social progressivity in any given year. To our knowledge, KLD is the best available source on firms' pro-social reputations (see Fernandez-Kranz and Santalo, 2010, p. 461). KLD data is available for most S&P 500 companies from 1991 onwards. In the cross-section analyses, we use the 1991 values; for panel analyses, we use the annual KLD values, which reflect lagged performance.

KLD measures firms' social responsibility in terms of strengths (positives) and concerns (negatives) for a number of issue categories. We focus on the *non*-environmental categories, including Community, Diversity, Employee Relations, Product, and Corporate Governance.[16] Each category has a set of zero-one sub-category indicators for strengths and concerns. Restricting attention to the sub-categories that are consistently measured over our sample periods, we construct the two (strength and concern) indices as follows:

$$I_z = \sum_{c=1}^{C} \sum_{i=1}^{s_{cz}} [I_{icz}/s_{cz}] = \text{index for } z = (\text{strengths, concerns}) \qquad (5)$$

C is the number of categories, s_{cz} is the number of subcategories for category cz, and I_{icz} is the zero-one indicator for subcategory icz (for a firm). Because "strengths" represent progressive (internal) policy choices, whereas "concerns" generally represent (external) controversies, the two measures capture distinct characteristics (Baron, et al., 2011; Chatterji, et al., 2009). We present robustness checks using three variants of these two indicators: (1) a simpler composite

[16] We exclude Human Rights because of the sparse nature of the data in this category, and the Environmental category because of the potential for endogeneity. Issues covered by the categories (strengths vs. concerns) include, for Community (charitable giving vs. community investment and local economic impact controversies), Corporate Governance (limited executive compensation and ownership of progressive companies vs. high executive compensation and ownership of socially controversial companies), diversity (women and minority representation in leadership and contracting, strong work/life benefits, and programs for the disabled vs. affirmative action controversies / litigation and demonstrably poor representation of women), employee relations (employee-favorable policies on benefits, health and safety, decision-making, and profit-sharing vs. workforce controversies and health / safety disputes), and product (company reputation for quality, R&D, and service to the economically disadvantaged vs. controversy/litigation concerning product safety, fraudulent advertising, contracting practices, or antitrust).

(simple sums of the I_{icz} indicators in equation (5) above); (2) weighted indices that distinguish between "public" categories (community relations and diversity) and "private" categories (employee relations, corporate governance and product quality) for both strengths and concerns, following Siegel and Vitaliano (SV, 2007),[17] and (3) unweighted analogs (simple sums) for the SV public and private breakdown.

We interpret *KLDStrengths* as a "receptive target" indicator, because it measures the strength of the firm's reputation for social responsibility in non-environmental realms. Similarly, we interpret *KLDConcerns* as a "resistant target" indicator. Firms do not line up exactly as receptive or resistant. Indeed, the correlation between the two KLD variables is close to zero (-0.019 in our cross-section dataset). Most of our sample firms have either strengths or concerns and not both; however, 38 firms (roughly ten percent of our sample) have positive values for both measures, and 17 (about 5 percent of our sample) have values that are close (with no more than .1 difference between them).

Industry and Time Indicators. We include two-digit-level industry controls, the three-digit-level Herfindahl index of industry concentration (*Concentration*, a panel variable constructed from COMPUSTAT), each firm's market share in its 3-digit industry (*Market Share*), and the three-digit-level indicator for whether an industry produces a final good (*FinalGood*).[18] In all panel estimations, we include time fixed effects.

Fernandez-Kranz and Santelo (KS, 2010) identify links between industry competitiveness and the tendencies for Corporate Social Responsibility (CSR), as measured by KLD indicators. They find evidence that heightened competition promotes CSR, which supports the conjecture that CSR is driven by firm efforts to obtain a competitive advantage in contested markets. If

[17] SV also include the environmental and human rights categories under the "public" rubric. We exclude the environmental category to avoid endogeneity and the human rights category due to sparse data (note 16 above).
[18] We are indebted to a referee for suggesting the inclusion of *Market Share*.

firms in competitive industries are more sensitive to CSR reputations (as KS suggest), then they are also likely to be ripe targets for private political action. However, controlling for industry concentration, larger firms with greater market share may nonetheless be the most cost-effective targets of boycott and proxy campaigns; as industry leaders, changing practices of these firms can do more to advance the social objectives of a targeting organization.

Following the logic of KS, firms in more competitive industries may also be more likely to adopt EMS practices as a signal of corporate environmentalism. Conversely, firms in more concentrated industries may anticipate more regulatory and public scrutiny, and accordingly more prone to adopt environmental management practices that enable superior performance. Again, the direction of effect is an empirical question.

Firms in "final good" industries are expected to be more prone to consumer action (Smith, 1990; Innes, 2006). In principle, proxy challenges may also be intended to energize consumer audiences and, therefore, more likely for companies in final good industries. However, final good status may alter EMS adoption decisions via its effect on private political action; firms in final good industries may respond *only* to the threat of a PPA and therefore be *less* prone to EMS adoption in the absence of a targeting threat.

State Indicators. For a firm's home (headquarters) State, we include a number of indicators to capture local environmental, socio-economic, and political pressures.[19] First is the per-capita membership in the Sierra Club (*Sierra*, a panel variable). Local environmentalist pressures may lead to an adversarial relationship with resident firms, alienating management and thereby deterring EMS adoption. Alternately, they may increase resident firms' environmental awareness, increasing propensities for EMS adoption. Second are measures of State government

[19] Because a number of our sample firms do not have CAA-regulated facilities, we cannot construct facility-weighted averages of the State measures. To control for the lack of CAA regulation of these firms, we include appropriate industry dummies in our estimations.

expenditures on environmental programs. For this we have the State spending on air quality programs (*Spendaqp*, a 1988 cross-section variable) and, alternately, State spending on natural resources programs (*Nrexp*, a panel variable obtained from annual U.S. Statistical Abstracts). Third are indicators of the environmental liability environment faced by each firm in its home State. For this purpose, we have the zero-one indicator for whether the State has strict (versus negligence) environmental liability (*Strict*, a panel variable obtained from the Environmental Law Institute), and the number of lawyers per capita (*Lawpcap*, a 1988 cross-section variable). Stronger liability exposure (as reflected by strict liability and a larger fraction of lawyers) is likely to deter adoption of EMS systems that can leave audit trails for assignment of environmental liability. Finally, we have three indicators for the overall socio-economic and political environment in a firm's home State, income per capita (*Income*, a panel variable obtained from www.eonomagic.com), the fraction of the population with a completed College education (*Education*), and a zero-one indicator for whether a State has right-to-work statute (*RTW*). The latter two are 1988 cross-section variables.[20]

4. Estimation and Results

Table 1 gives variable definitions and summary statistics, and the Appendix gives a breakdown of our cross-section data by 2-digit industry. We note that 52 percent of our sample firms adopted an IRRC-reported EMS, while 35 percent adopted TQEM (two thirds of the IRRC survey respondents). Over the 1996-2003 period, 15.9 percent of our sample firms registered under the ISO 14001. Most of these firms were late adopters; by the beginning of 2000, 6 percent of our sample of firms had registered under ISO 14001.

Table 2 breaks down summary statistics for several key variables between firms that were (i) subject to an environmental boycott (in 1988-95) or not, (ii) subject to an environmental

[20] We are indebted to John Maxwell and Tom Lyon for providing us with their 1988 cross-section data.

proxy action (in 1988-1995) or not, (iii) IRRC-EMS adopters or not (1994-5), and (iv) ISO 14001 registrants or not (1996-2003). These statistics are suggestive of relationships that we explore much more carefully in the analysis to follow. Specifically, firms that are subject to an environmental boycott are significantly larger (in terms of either the number of *Employees* or *Sales* revenue), with larger pollution levels (*CAA Emissions*), subject to more environmental inspections (*Inspect*), more likely to be either progressive (*KLDStrengths*) or resistant (*KLDConcerns*), and more likely to adopt EMS and TQEM. Proxy targets exhibit similar patterns. EMS and ISO 14001 adopters are also significantly larger (*Employees*/*Sales*), with more inspections on average (*Inspect*) and higher levels of emissions (*CAA Emissions* and *Non-CAA Emissions*). EMS adopters are more likely to be a boycott or proxy target (*Boycott, Proxy*), come from States that have *smaller* environmental constituencies on average (*Sierra*), and exhibit no clear differences in their reputations for corporate responsibility (the KLD variables). ISO 14001 adopters are more likely to be less progressive (*KLDConcerns*).

4.1 The Boycott Equation

Table 3A reports our baseline results from estimation of the *Boycott* equation. We present four panel (random effects Probit) models covering two different sample periods, 1989-1995 and 1991-1995 (when we have KLD data). Models 1-2 use our full unbalanced panel. In the first unbalanced panel (1989-1995), we have 448 firms and 3113 firm-year observations; in the second (1991-1995), we have 381 firms and 1826 firm-year observations. The gaps in our unbalanced panel are due to missing data for some of the variables in some years (mostly KLD and emissions measures) and do not reflect entry and exit into the S&P 500 (for which we control by restricting attention to a common set of firms). However, as a robustness check, we also present estimations using balanced panels in Models 3-4. In the first balanced panel (1989-95), we have 435 firms and 3045 firm-year observations; in the second (1991-95), we have 346

firms and 1730 observations. Table 3B presents two additional robustness checks. In Model 5, we measure the emissions variables with toxicity weighted counterparts to the total weights used in our base estimations. In Models 6-8, we consider three alternative KLD measures of non-environmental Corporate Social Responsibility (CSR).

Our main result from Table 3 is the significant positive effect of the "receptive target" measure, *KLDStrengths*, on the likelihood of boycott. These estimates confirm that NGOs favor progressive firms, perhaps because they are more likely to respond in a positive way to private political actions (Baron, 2009). The magnitude of the estimated effects is noteworthy. Doubling a firm's weighted *KLDStrengths* index (from the mean, representing slightly less than a one-standard-deviation change) is estimated to increase the likelihood of boycott by 98 to 102 percent in the baseline models (of Table 3A), as percentages of the sample mean boycott probability. Corresponding effects of the alternate KLD measures (in Table 3B) range from 72 to 74 percent.

Beyond the KLD effects, Table 3 indicates that firm size is an important driver of boycotts, with the scale measure (*Employees*) positive and significant in all models. The market power indicator (*Market Share*) also has a positive effect that is statistically significant in all but one model. Environmental inspections (*Inspect*) are estimated to promote *Boycotts*, suggesting that boycotts and regulatory scrutiny are complements. This result may reflect NGOs' ability to amplify regulatory oversight with publicity and consumer pressure for desired environmental practices. The *Final Good* variable has a positive estimated effect, but is statistically significant only in the models that exclude the KLD indicators. Producing a final good appears to promote boycotts primarily via its impact on a firm's tendency for CSR. Finally, we find no significant impacts of firm emissions or local environmental constituencies (*Sierra*) on environmental

boycott propensities.[21] Environmental performance appears *not* to be a central driver of NGOs' decisions on targeting of environmental boycotts.

4.2 The Proxy Equation

Table 4 reports estimation results from the shareholder environmental *Proxy* equation. Eight models are presented, all panel (random effects Probit) estimations. The estimations cover the sample period 1991-2003 (when we have KLD data). The first two models (in Table 4A) are estimated with the full unbalanced panel and include one parsimonious specification (without the State covariates) and one more complete specification (with State covariates). The next two models (in Table 4A) are balanced panel analogs. The unbalanced panel contains 458 firms and 4022 firm-year observations. The balanced panel contains 211 firms and 2755 observations. Due to the large loss of sample firms in the balanced panel (from missing observations), we consider the unbalanced panel Model 2 as our "base" specification. For this model, Table 4B presents robustness checks using toxicity-weighted (vs. unweighted) emissions and alternative measures of the KLD indicators.

The *Proxy* estimations give further support for the Baron (2009) hypothesis: "receptive targets" with higher values of the *KLDStrengths* index are favored for private political action. Magnitudes of effect are remarkably stable across models. For example, doubling a firm's weighted *KLDStrengths* index (from the mean) is estimated to raise a firm's likelihood of environmental proxy by 25 to 33 percent of the sample mean proxy probability. In these estimations, the driving component of the *KLDStrengths* variables is the Public (vs. Private/ internal) component of the firm's CSR reputation (Models 7 and 8 in Table 4B).

In contrast to the *Boycott* results, the *Proxy* equation also reveals a sensitivity to the

[21] We considered a variety of alternate specifications for the emission variables, including combined totals of CAA and Non-CAA releases and CAA releases in isolation. None of these specifications yields significant effects of the emission variables on boycott outcomes.

"resistant target" indicator *KLDConcerns*. For example, doubling a firm's weighted *KLDConcerns* index (from the mean) is estimated to raise the firm's probability of an environmental proxy challenge by 23 to 26 percent (of the mean proxy probability). There are two differences between proxies and boycotts that may explain why the former are targeted to low CSR companies and latter are not. First, proxy proposers are investor groups to whom "resistant" targets may be more receptive vis-à-vis NGO adversaries. Second, proxy actions are much less costly to launch. Environmental proxies may therefore by more effective in nudging resistant firms to more environmentally responsible conduct, and also an inexpensive tool to call attention to these firms' poor practices.

Table 4 reveals that proxies are favored for firms that are larger (with more *Employees*), with more market power (*Market Share*), in *Final Good* industries, and more facile (with newer assets, *Age of Assets*).[22] Consistent with arguments of Fernandez-Kranz and Santalo (2010), we estimate that environmental proxies are more likely for firms in competitive industries (with less *Concentration*) who may be more sensitive to their CSR reputations. Finally, as with boycotts, we find that environmental proxies are favored for firms with more government enforcement (*Inspect*), but not significantly affected by environmental performance (*Emissions*) or exposure to local environmental constituencies (*Sierra*).[23]

4.3 The IRRC-EMS and IRRC-TQEM Equations

Tables 5 and 6 present results for the binary (Probit) *IRRC-EMS* and *IRRC-TQEM* estimations, respectively. Our key regressors are the binary private political action (PPA)

[22] It is perhaps surprising that *Final Good* is statistically significant in the unbalanced *Proxy* panel, but not in the corresponding *Boycott* panel. However, marginal effects are proportionally similar in the two estimations; for example, comparing Model 2 of Table 3 (*Boycott*) to Model 2 of Table 4 (*Proxy*), *Final Good* is estimated to raise the boycott probability by 52.0% (of the sample boycott mean in the panel, .0498) and to raise the proxy probability by 55.9% (of sample proxy mean, .0912). Moreover, the enhanced significance of this coefficient in the *Proxy* model is likely due to a greater number of observations and associated increase in precision.

[23] We considered alternate *Emission* measures (note 21) and none was statistically significant.

variables, *Boycott* and *Proxy*. In each Table, we present seven models. Model 1 includes only *Boycott*, not *Proxy*. Model 2 is our "base model" with both *Boycott* and *Proxy*. Models 3-7 provide robustness checks. Models 3-5 estimate with alternate emissions measures (toxicity-weighted sums, in Model 3) and KLD indicators (in Models 4-5).[24] Models 6-7 add the firm-level *non*-environmental boycott and proxy dummies as a falsification exercise; Model 6 controls for the environmental PPAs as well (our *Boycott* and *Proxy* regressors), while Model 7 does not.[25] We expect only a firm's propensity for environmental PPAs to influence firm decisions on environmental practices; therefore, the non-environmental counterparts should not be significant explanators of EMS decisions.

The Tables report p-values for the identifying instruments in first stage (Probit) estimations for *Boycott* and *Proxy*, respectively.[26] The instruments generally perform well in the sense that they are highly correlated with the endogenous regressors. We also test for exogeneity of the potentially endogenous regressors (*Boycott* and *Proxy*); in most cases, we reject the null of exogeneity at a five percent level.[27]

From Tables 5 and 6, we have a number of findings. First, environmental boycotts have a positive and significant effect on the likelihood of both EMS and TQEM adoption. The size of these effects is noteworthy. If subject to an environmental boycott, a firm's likelihood of EMS adoption is increased by an estimated 54 to 58 percent; for TQEM adoption, the effect is 69 to 71

[24] Models with unweighted Public/Private KLD indicators perform similarly to the weighted counterparts of Model 5.
[25] We thank a referee for suggesting these checks.
[26] The p-values are for the test statistics for the null hypothesis of zero coefficients on the identifying instruments in the first stage estimations. Note that in all cases, our equations are exactly identified, so over-identifying restrictions tests (Hansen or Sargan, for example) cannot be done.
[27] In the Table 6 *IRRC-TQEM* estimations, an additional econometric issue arises: We only observe TQEM adoption if an IRRC survey was returned. By estimating this equation using data on all firms – both those that returned surveys and those that did not – we are implicitly estimating the joint probability of TQEM adoption and survey return. If all TQEM adopters returned surveys, this will yield consistent estimates of the TQEM adoption probability. If not, we have a sample selection model. We estimated Heckman models of the *IRRC-TQEM* equation that account for sample selection, only one of which converged. In this estimation, coefficient estimates are almost identical to those without the selection correction, supporting the premise that TQEM adopters respond to surveys.

percent. In both cases, the estimated magnitudes are strikingly stable across models.

Higher estimated impacts of *Boycott* on TQEM adoption – vs. EMS adoption – may seem puzzling at first blush, as the *IRRC-EMS* indicator equals one if a firm either adopts TQEM *or* adopts another EMS practice *or* both. However, in decomposing the impacts on *IRRC-EMS*, *Boycott* has four component effects: (1) it raises the likelihood of TQEM adoption (Table 6); (2) we expect it also to raise the likelihood of adoption for other EMS practices; (3) the effect in (1) is reduced to the extent that new adopters of TQEM already implement another EMS; and (4) the effect in (2) is reduced to the extent that new adopters of other EMS practices already implement TQEM. Table 6 estimates effect (1), while Table 5 estimates the sum of effects (1)-(4). The *difference* between the estimated effects (going from Table 6 to Table 5) represents the sum of effects (2)-(4), which has no clear sign even with a positive effect (2).

Second, environmental proxy challenges have positive estimated effects on TQEM adoption, but not overall EMS adoption. The TQEM effects are generally weakly significant and quite stable across models. Surprisingly, given the weak nature of proxy challenges, the size of estimated Proxy effects is quite large in the TQEM equation, increasing estimated adoption probabilities by 45 to 65 percent. Combined, the positive effect of proxies on TQEM and the null effect on IRRC-EMS suggest that environmental proxies promote TQEM adoption primarily for firms that *already* do some type of voluntary environmental management *other than* TQEM. For these firms, costs of the incremental TQEM program – on top of other practices in place (such as environmental policies and audit programs) – are likely to be smaller; as a result, the small nudge from proxy challenges that impose rather little cost on targeted firms may be sufficient to prompt these firms to upgrade their environmental programs to the more widely

recognized "gold standard" of TQEM. [28]

Third, in the *IRRC-EMS*, *IRRC-TQEM* and ISO 14001 estimations to follow, we find a significant negative effect of the *FinalGood* variable on the likelihood of program adoption. This robust result suggests that the presence of private political activity leads firms that have the potential to be direct targets, because they are final good producers, to await signals of private political action before they adopt the environmental management programs that we study.

Fourth, regressive firms that have higher values of the *KLDConcerns* index are less likely to adopt an EMS (Table 5). Perhaps more surprising, progressive firms that have higher values of the *KLDStrengths* index are also less likely to adopt both EMS and TQEM (Tables 5 and 6). Like final good producers, progressive firms appear to await private political action before sinking resources in environmental management systems.

Fifth, both the EMS and TQEM adoption models pass the "falsification" checks in Models 6-7. Firms targeted for *non-environmental* boycotts or proxies are not estimated to be significantly different in their likelihood of EMS or TQEM adoption (see coefficients on *Non-Environmental Boycott* and *Proxy*).

The *IRRC-EMS* estimations of Table 5 reveal a number of other results. Firms with larger home state environmental constituencies (as measured by *Sierra*) are less likely to adopt EMS. This suggests an adversarial relationship between local environmental constituencies and local firm managers that deters voluntary EMS adoption, rather than a positive effect of environmental constituencies due to an improved environmental awareness of local firms. However, firms with larger unregulated (non-CAA) pollutant emissions are more likely to adopt EMS. This suggests that firms tend to use some voluntary EMS practice to address pollution

[28] We also estimated EMS/TQEM models that include interactions between the *FinalGood* / *Sierra* / *Market Share* variables and *Boycott / Proxy* to assess whether consumer or environmental pressure or firm market power enhance the effect of the PPAs. The interactions are generally insignificant.

issues that are not subject to regulation. Finally, consistent in all the EMS models are negative effects of strict environmental liability and lawyers per capita. These results suggest that liability considerations deter EMS adoption, most likely because these environmental management approaches can provide documentation for potential environmental liability.

4.4 The ISO 14001 Registration Equation

Table 7 reports results for the ISO 14001 estimations. We report our base model for both the "early adoption" period (1996-99, Model 1) and the full adoption period of our sample (1996-2003, Model 2). Several robustness checks are presented: alternate emissions measures (Model 3), alternate KLD measures (Models 4 and 5), and falsification checks (Models 6-7).

p-values for first stage test statistics on significance of the identifying instruments (the non-environmental industry-level PPA dummies) are indicated at the bottom of each reported estimation; in almost all cases, the instruments perform well, with p values generally less than one percent. Tests of exogeneity of the private political regressors are also reported; in all cases other than Model 1, we reject the null of exogeneity at a ten percent level.

Although environmental PPA's (*Boycott* and *Proxy*) are not found to have a significant impact on early adoption of ISO 14001 (during 1996-99), an environmental boycott is estimated to have a significant negative impact on longer-run ISO adoption (over 1996-2003) in all models. Estimated magnitudes of effect are quite stable across models, indicating reductions in ISO adoption probabilities of 26 to 31 percent. Conversely, an environmental proxy challenge is estimated to raise longer-run ISO adoption probabilities by 46 to 76 percent (Models 2-5).

The negative effect of boycotts on ISO adoption does not imply that NGOs target firms for the purpose of deterring their adoption of ISO 14001. Indeed, the environmental boycotts in our sample were prior to the launch of ISO 14001 in 1996, and none were targeted to this program. However, our results suggest that firms perceive ISO adoption as a practice that will

not be rewarded by the community of environmental NGOs, perhaps due to negative NGO commentary on ISO 14001 during the program's early years. However, we stress that ours is an empirical paper and we remain agnostic on the precise mechanisms underpinning the results.

Beyond the key PPA effects, a number of the ISO 14001 estimation results are consistent with those for *IRRC-EMS* adoption (Table 5). In both cases, *Final Good* and lawyers per capita (*Lawpcap*) have significant negative effects on adoption, while unregulated toxic emissions (*Non-CAA Emissions*) have a significant positive effect. Regulated toxic air emissions (*CAA Emissions*) have negative effects on adoption in both equations, but the effects are only statistically significant in the ISO model. Like *IRRC-EMS*, ISO 14001 appears to be a mechanism to address unregulated pollution in the market for green reputation, while adoption is deterred by prospects for establishing a roadmap to liability.

Other results from the ISO estimation are distinct. For example, firms with higher numbers of environmental inspections (*Inspect*) and in more concentrated industries (*Concentration*) are more likely to adopt ISO 14001. Neither attribute has a discernable impact on *IRRC-EMS*. For ISO 14001, firms in more concentrated industries and subject to more regulatory scrutiny anticipate greater benefits of adoption in potential regulatory relief and public relations. This conclusion need not be at odds with Fernandez-Kranz and Santalo (2010) who argue that more competitive industries have greater propensities for Corporate Social Responsibility (CSR). If ISO 14001 is not viewed favorably by the community of environmental NGOs (as suggested by boycott effects on ISO adoption), firms in more competitive industries – seeking competitive advantages in CSR – may not be inclined to adopt the ISO protocol.

5. Summary and Conclusion

Table 8 summarizes the estimation results from our six equations, two for the determinants of the private political variables (*Boycott* and *Proxy*) and three for determinants of

environmental management decisions (*IRRC-EMS*, *IRRC-TQEM*, and *ISO96-03*). The two central conclusions from these estimations are: (1) Private political actions (PPAs) have a significant impact on environmental management; and (2) consistent with Baron's (2009) theory of private politics, environmental PPAs are more likely to be launched against receptive targets with reputations for pro-social conduct. Both conclusions are broadly robust across a number of alternative model specifications, including different measures of outcomes (boycotts vs. proxies, *IRRC-EMS* vs. *IRRC-TQEM* vs. ISO 14001) and exogenous data.

Our results shed some light on the respective roles of the different varieties of pressure for corporate environmentalism: regulation, liability, and private politics. We find little direct effect of government environmental inspections on the EMSs that we study, with the exception of ISO 14001. However, we find some evidence that regulation spurs PPAs (Table 8) and we also know from prior work that regulation promotes participation in government-sponsored voluntary pollution reduction programs (VPRs) (Innes and Sam, 2008). Both PPAs and VPRs are, in turn, precursors to EMS adoption as reported to the IRRC (Table 8 and Sam, et al., 2009). Regulation is expected to promote PPAs both because inspections alert activists to environmental trouble and because firms subject to regulatory scrutiny are more receptive targets with added motive (addressing regulatory pressure) to respond to PPAs by adopting environmental management programs. Our results are consistent with this expectation in the early 1990's.

Liability appears to be important in driving EMS adoption incentives. However, *stronger* environmental liability – captured in our analysis by strict vs. negligence liability and a larger number of lawyers per capita – acts as a *deterrent* to these programs. EMS adoption almost always involves an environmental self-auditing program that provides a documentary roadmap for potential assignment of liability; when the liability threat is greater, it is therefore expected that incentives for this documentation are reduced. We find evidence of this effect in our broad

EMS measure (but not TQEM) and in our ISO14001 estimations.

At one level, our results suggest a salutary role for private politics in the promotion of corporate environmentalism. Environmental boycotts are effective instruments for the promotion of *IRRC-EMS* programs, and environmental proxy actions are effective instruments for the promotion of ISO 14001 and TQEM adoption. Moreover, both boycotts and proxies are favored for progressive firms that have an activist-friendly reputation to protect and are more likely to respond to activist pressure. Combined, these results suggest that activists consider the *impact* of their activities on corporate behavior when selecting the firms that they target.

However, this rosy picture of PPA effects is clouded by some of our other results. First, firms that are more susceptible to consumer or NGO pressure appear to wait for a signal of this pressure before they adopt EMSs. When pressured, firms respond, but absent pressure, they are less likely to adopt. This conclusion is suggested by negative effects of our *FinalGood* and CSR indicator (*KLDStrengths*) variables on adoption of environmental management programs, combined with their positive effects on the likelihood of PPAs. Second, we find that boycotts deter ISO 14001 adoption, despite substantial evidence that this program is effective in reducing toxic pollution and solid waste (Potoski and Prakash, 2005; Arimura, et al., 2008). Finally, we find that home state Sierra Club membership is negatively related to both EMS adoption as reported to the IRRC, and early adoption of ISO 14001. Stronger local environmental constituencies appear to have an alienating effect on firms' EMS decisions.

Whether for good or bad, private politics are important determinants of corporate environmental conduct. With tightening government budgetary constraints and growing public sensitivity to environmental issues, this mechanism for corporate social responsibility promises to be increasingly central to corporate environmental performance.

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Table 1. Selected Summary Statistics

Variable Name	Variable Definition		
BOYCOTT CROSS-SECTION (1988-1995)		Mean	Std. Dev.
Boycott	Environmental boycott dummy = 1 if a firm is boycotted in 1988-95, 0 otherwise	0.0931	0.2910
EMS	Binary = 1 if the firm adopts EMS in 1994-1995, 0 otherwise	0.5178	0.5003
TQEM	Binary = 1 if the firm adopts TQEM in 1994-1995, 0 otherwise	0.3480	0.4770
ISO 14001 (1996-03)	Binary = 1 if the firm adopts ISO 14001 in 1996-2003, 0 otherwise	0.1589	0.3661
Proxy (1988-95)	Environmental proxy dummy = 1 if a firm has proxy challenge in 1988-95, 0 otherwise	0.1562	0.3635
Employees	Number of firm employees (1000s), annual	38.2676	66.2050
Sales	Sales of firm ($100 million), annual	6.0532	11.3583
Profit	Net Income/sales	0.0715	0.0630
Concentration	Herfindahl index of industry concentration, 3-digit SIC, annual	0.1661	0.1327
Market Share	Market share of a firm in 3-digit SIC, annual	0.1354	0.1670
Age of Assets	Ratio of gross to net assets, annual	1.0471	0.0214
Final Good	Binary = 1 if firm sells a final product, 0 otherwise	0.3644	0.4819
Inspect	Number of CAA inspections of firm, annual	4.1397	10.0324
CAA Emissions	Firm emissions of TRI CAA chemicals (millions lbs.), annual*	0.9587	3.6283
Non-CAA Emissions	Firm emissions of TRI Non CAA chemicals (millions lbs.), annual*	0.1689	0.7489
Sierra	Sierra club membership in firm's home state (per 1000 population), annual	2.2875	1.5246
KLD Strengths	KLD strengths (weighted), annual	0.1893	0.2458
KLD Concerns	KLD concerns (weighted), annual	0.0822	0.1744
Income	Average per capita income in firm home state, annual	15241.8	2337.76
Strict	Binary = 1 if firms' home state has a strict liability statute, annual	0.7452	0.4363
Educ	Percentage of college degrees in firm home state, 1988	20.9206	3.3610
RTW	Binary = 1 if firms' home state has a right-to-work statute, 1988	0.3041	0.4607
Spendaqp	State expenditures on air quality programs in firms' home state, $ million, 1988.	1.2737	0.7408
Lawpcap	Number of lawyers per 1000 population in firms' home state, 1988	3.2170	0.9961
PROXY PANEL (1991-2003)			
Proxy	Environmental proxy dummy = 1 if a firm has proxy challenge, 0 otherwise, annual	0.0912	0.2880
Sales	Sales of firm ($100 millions), annual	10.9611	19.9719
Nrexp	Home state expenditures on natural resource programs, $ million, annual	0.5689	0.6502
KLDStrengths	KLD strengths (weighted), annual	0.3158	0.3101
KLDConcerns	KLD concerns (weighted), annual	0.3049	0.3249

No. of Obs.: Cross-Section 365, Panel 4022. *Sample statistics for TRI emitters.

Table 2. Summary Statistic Comparisons

	BOYCOTTED FIRMS (N=34)		**NON-BOYCOTTED FIRMS** (N=331)		**t-stat (difference)**
	Mean	Std. dev.	Mean	Std. dev.	
Employees	99.257	152.520	31.883	45.262	2.5476**
Sales	20.431	25.542	4.576	7.320	8.471***
Inspect	10.471	17.224	3.489	8.763	3.940***
CAAEmissions	3.320	7.002	0.716	2.998	4.069***
NonCAAEmissions	0.578	1.879	0.127	0.497	3.392***
Sierra	2.367	1.570	2.279	1.522	0.315
KLDStrengths	0.378	0.296	0.170	0.232	4.856***
KLDConcerns	0.163	0.238	0.074	0.165	2.877***
TQEM	0.529	0.507	0.329	0.471	2.343*
EMS	0.676	0.475	0.502	0.501	1.949*
ISO (96-03)	0.147	0.359	0.160	0.367	-0.198
	EMS ADOPTER (N=189)		**NON-EMS ADOPTER** (N=176)		**t-stat (difference)**
Employees	44.184	75.735	31.620	53.354	1.843*
Sales	7.279	14.326	4.736	6.671	2.148**
Inspect	6.852	11.800	1.227	6.579	5.568***
CAAEmissions	1.749	4.815	0.110	1.036	4.422***
NonCAAEmissions	0.316	1.051	0.011	0.104	3.956***
Sierra	2.119	1.357	2.469	1.671	-2.209**
KLDStrengths	0.177	0.242	0.202	0.249	-0.984
KLDConcerns	0.087	0.181	0.077	0.168	0.580
Boycott	0.122	0.328	0.063	0.243	1.949*
Proxy (1988-95)	0.201	0.401	0.108	0.311	2.462**
	PROXY VOTE (N=57)		**NO PROXY VOTE** (N=308)		**t-stat (difference)**
Employees	85.744	123.634	29.354	43.646	6.208***
Sales	15.870	23.438	4.236	5.617	7.643***
Inspect	13.035	18.701	2.494	6.175	7.874***
CAAEmissions	4.190	8.082	0.361	1.181	7.916***
NonCAAEmissions	0.504	1.192	0.107	0.617	3.741***
Sierra	2.176	1.484	2.308	1.533	-0.600
KLDStrengths	0.292	0.311	0.170	0.227	3.479***
KLDConcerns	0.133	0.202	0.073	0.168	2.402**
TQEM	0.561	0.501	0.308	0.463	3.743***
EMS	0.667	0.476	0.491	0.501	2.462**
ISO (96-03)	0.246	0.434	0.143	0.350	1.954*
	ISO 14001 ADOPTER (N=58)		**ISO 14001 NON-ADOPTER** (N=307)		**t-stat (difference)**
Employees	62.624	109.841	33.632	53.468	1.9504*
Sales	10.241	21.506	5.262	7.960	3.098***
Inspect	10.914	17.979	2.860	7.012	5.858***
CAAEmissions	2.363	5.004	0.693	3.248	3.257***
NonCAAEmissions	0.461	0.990	0.114	0.680	3.279***
Sierra	2.277	1.465	2.290	1.538	-0.058
KLDStrengths	0.188	0.237	0.190	0.248	-0.052
KLDConcerns	0.128	0.214	0.073	0.165	2.205**
Boycott	0.086	0.283	0.094	0.293	-0.198
Proxy (1988-95)	0.241	0.432	0.140	0.348	1.954*

Table 3. Boycott Equation (1988-1995)
A. Base Regressions

	Panel (Random Effects) Probit			
	Complete (Unbalanced) Panel		Balanced Panel	
	1989-95	1991-95	1989-95	1991-95
	Model 1	Model 2	Model 3	Model 4
	Marg Effect	Marg Effect	Marg Effect	Marg Effect
Employees	3.6e-04 (3.37)***	4.1e-04 (2.07)**	3.6e-04 (2.04)**	5.2e-04 (1.79)*
Profit	0.1881 (1.11)	0.1382 (0.69)	0.1144 (0.67)	0.1349 (0.56)
Concentration	-0.1512 (-0.88)	-0.3047 (-1.37)	-0.1599 (-0.96)	0.0054 (0.02)
Market Share	0.2927 (2.75)***	0.4207 (2.59)***	0.2946 (2.35)**	0.2244 (1.22)
Final Good	0.1068 (3.05)***	0.0259 (0.67)	0.0845 (2.09)**	0.0114 (0.22)
Inspect[+]	0.0011 (3.84)***	9.7e-04 (2.39)**	0.0011 (3.34)***	0.0013 (2.50)**
CAA Emissions[++]	-2.05e-04 (-0.76)	-5.88e-04 (-1.04)	-3.22e-04 (-0.86)	-7.07e-04 (-0.99)
Non-CAA Emissions[++]	2.83e-04 (0.38)	-2.09e-04 (0.12)	1.54e-03 (0.96)	1.20e-03 (0.54)
Sierra	8.7e-04 (0.09)	0.0037 (0.24)	-0.0046 (-0.33)	-0.0030 (-0.15)
KLDStrengths	---	0.1532 (3.55)***	---	0.1892 (3.20)***
KLDConcerns	---	-0.0091 (-0.20)	---	-0.0291 (-0.52)
Education	0.0347 (2.60)***	0.0273 (1.78)*	0.0260 (2.03)**	0.0338 (1.68)*
No. of Groups	448	381	435	346
No. of Obs.	3113	1826	3045	1730
LogLikelihood	-230.44	-184.11	-232.98	-166.69
Mean Dep Var	0.03919	0.04984	0.04007	0.05029

Dependent Variable: Boycott. Robust z statistics reported in parentheses. All Models include the additional State covariates: Strict, Spendaqp, Lawpcap, Income, and RTW, none significant except in Model 1. Marginal effects at average. *,**,*** indicate significant at a (two-sided) 10%, 5%, and 1% level.

[+] Inspect measures CAA inspections in the three to seven years prior (in the panel).

[++] Emissions are measured in 1989 (in the cross-section) and in the prior year (in the panel).

Table 3. Boycott Equation (1988-1995) (continued)
B. Alternate Emissions and KLD Measures

	Panel (Random Effects) Probit			
	Tox. Weighted Emissions	Unweighted KLD St. & Conc.	Weighted KLD Public/Private	Unweighted KLD Public/Priv
	Model 5	Model 6	Model 7	Model 8
	Marg Effects	Marg Effects	Marg Effects	Marg Effects
Employees	3.50e-04 (1.72)*	3.60e-04 (1.98)**	4.73e-04 (2.30)**	4.06e-04 (1.99)**
Profit	0.1487 (0.74)	0.1570 (0.78)	0.1441 (0.70)	0.1316 (0.65)
Concentration	-0.2968 (-1.35)	-0.2847 (-1.27)	-0.3089 (-1.36)	-0.3033 (-1.34)
Market Share	0.4079 (2.53)**	0.4314 (2.65)***	0.4198 (2.54)**	0.4271 (2.59)***
Final Good	0.0299 (0.77)	0.0279 (0.71)	0.0211 (0.54)	0.0219 (0.56)
Inspect	9.44e-04 (2.27)**	9.18e-04 (2.26)**	0.0010 (2.46)**	0.0010 (2.43)**
CAA Emissions	-1.25e-06 (-0.40)	-5.69e-04 (-1.00)	-5.62e-04 (-0.98)	-5.65e-04 (-0.99)
Non-CAA Emissions	-1.49e-05 (-0.70)	9.84e-04 (0.61)**	9.96e-05 (0.06)	2.51e-04 (0.15)
Sierra	0.0033 (0.21)	0.0036 (0.24)	0.0041 (0.27)	0.0048 (0.31)
KLD Strengths Public	0.1504 (3.52)***	0.0278 (3.28)***	0.2116 (4.16)***	0.0411 (4.16)***
KLD Strengths Private			-0.0403 (-0.41)	-0.0010 (-0.47)
KLD Concerns Public	-0.0046 (-0.10)	0.0051 (0.38)	-0.0842 (-0.96)	-0.0023 (-0.08)
KLD Concerns Private			0.0156 (0.26)	0.0032 (0.20)
Educ	0.0260 (1.66)*	0.0275 (1.80)*	0.0285 (1.85)*	0.0277 (1.80)*
No. of Obs.	1826	1820	1826	1826
No. of Groups	381	380	381	381
LogLikelihood	-184.27	-184.63	-181.19	-181.72

Dep. Var.: Boycott. Marginal effects at average. Robust z statistics in parentheses. Models mimic Table 3A, Model 4, except for the Emissions variables in Model 7, and except for the KLD variables in Models 8-10. Model 7 uses toxicity weighted emissions and weighted KLD Strengths and Concerns. Models 8-10 use alternative KLD indices and unweighted emission aggregates. Emissions measures are for the prior year. All Models include the additional State covariates: Strict, Spendaqp, Lawpcap, Income, and RTW, none significant. Industry and year effects included in all Models. *,**,*** indicate significant at 10%, 5%, and 1%..

Table 4. Proxy Equation (1991-2003)
A. Base (Random Effects Probit) Estimations

	Unbalanced Panel		Balanced Panel	
	Model 1	Model 2	Model 3	Model 4
	Marg Effects	Marg Effects	Marg Effects	Marginal Effects
Employees	2.68e-04 (2.96)***	2.85e-04 (3.13)***	2.79e-04 (2.61)***	2.85e-04 (2.66)**
Profit	0.090 (1.28)	0.096 (1.37)	0.054 (0.46)	0.067 (0.57)
Age of Assets	0.682 (1.70)*	0.687 (1.71)*	0.126 (0.24)	0.275 (0.53)
Concentration	-0.250 (-2.54)**	-0.250 (-2.54)**	-0.215 (-1.90)*	-0.218 (-1.92)*
Market Share	0.249 (3.14)***	0.244 (3.06)***	0.198 (2.17)**	0.207 (2.28)**
Final Good	0.048 (2.53)**	0.051 (2.65)**	0.007 (0.31)	0.012 (0.52)
Sierra	2.090 (1.28)	1.970 (1.17)	2.590 (1.36)	2.580 (1.33)
Inspect	4.03e-04 (1.96)*	4.50e-04 (2.18)**	4.16e-04 (1.80)*	5.09e-04 (2.18)**
CAA Emissions	4.15e-04 (1.24)	3.97e-04 (1.19)	5.79e-04 (1.70)*	5.79e-04 (1.70)*
Non-CAA Emissions	7.79e-04 (0.64)	7.37e-04 (0.61)	-1.62e-03 (-0.91)	-1.51e-03 (-0.86)
KLD Strengths	0.089 (3.60)***	0.093 (3.70)***	0.087 (2.70)***	0.085 (2.61)***
KLD Concerns	0.077 (3.48)***	0.078 (3.54)***	0.077 (2.64)***	0.080 (2.71)***
Educ	---	0.012 (1.82)*	---	0.010 (1.00)
Income	---	-0.020 (-2.21)**	---	-0.021 (-1.51)
State Covariates	No	Yes	No	Yes
No. of Obs.	4022	4022	2755	2755
No. of Groups	458	458	211	211
LogLikelihood	-949.32	-945.92	-761.64	-758.65
Mean Dep. Var.	0.0912	0.0912	0.1100	0.1100

Dep. Var.: Proxy. Robust z statistics reported in parentheses. Additional State Covariates are Strict, RTW, Nrexp, and Lawpcap, none significant. Industry and year effects included in all Models. Marginal effects at average. Estimation method: Random Effects Probit. Inspect measures CAA inspections in the three to seven years prior. Emissions measures are for the prior year.

Table 4. Proxy Equation (1991-2003) (continued)
B. Alternate Emissions and KLD Measures

	Tox. Weighted Emissions	Unweighted KLD St. & Conc.	Weighted KLD Public/Private	Unweighted KLD Public/Priv
	Model 5	Model 6	Model 7	Model 8
	Marg Effects	Marg Effects	Marg Effects	Marg Effects
Employees	2.96e-04 (3.24)***	2.80e-04 (3.13)***	2.79e-04 (3.07)**	2.76e-04 (3.07)***
Profit	0.096 (1.36)	0.100 (1.41)	0.106 (1.48)	0.107 (1.49)
Age of Assets	0.718 (1.78)*	0.683 (1.70)*	0.755 (1.87)*	0.738 (1.83)*
Concentration	-0.253 (-2.55)**	-0.243 (-2.48)**	-0.246 (-2.49)**	-0.242 (-2.46)**
Market Share	0.248 (3.09)***	0.241 (3.03)***	0.241 (3.03)***	0.240 (3.01)***
Final Good	0.051 (2.64)***	0.050 (2.60)**	0.050 (2.61)***	0.049 (2.57)***
Sierra	1.940 (1.16)	1.840 (1.15)	1.900 (1.12)	1.900 (1.12)
Inspect	5.46e-04 (2.90)***	4.23e-04 (2.06)**	4.66e-04 (2.26)**	4.46e-04 (2.16)**
CAA Emissions	1.35e-06 (1.49)	3.99e-04 (1.20)	4.13e-04 (1.24)	4.12e-04 (1.24)
Non-CAA Emissions	3.38e-06 (0.40)	7.27e-04 (0.60)	6.05e-04 (0.50)	6.40e-04 (0.53)
KLD Strengths Public	0.095 (3.77)***	0.018 (3.82)***	0.114 (3.59)***	0.021 (3.61)***
KLD Strengths Private			0.067 (1.49)	0.014 (1.42)
KLD Concerns Public	0.075 (3.42)***	0.026 (3.95)***	0.031 (0.87)	0.012 (0.95)
KLD Concerns Private			0.115 (3.73)***	0.032 (3.92)***
Educ	0.012 (1.85)*	0.012 (1.83)*	0.012 (1.83)*	0.012 (1.86)*
Income	-0.021 (-2.24)**	-0.020 (-2.21)**	-0.021 (-2.25)**	0.021 (-2.26)**
State Covariates	Yes	Yes	Yes	Yes
No. of Obs.	4022	4022	4022	4022
No. of Groups	458	458	458	458
LogLikelihood	-946.08	-943.86	-943.98	-942.77

Dep. Var.: Proxy. Robust z statistics reported in parentheses. Additional State Covariates are Strict, RTW, Nrexp, and Lawpcap, none significant. Marginal effects at average. Model 5 uses weighted KLD Strengths and Concerns. Models 6-8 use unweighted emissions measures. Industry and year effects included in all Models.

Table 5. IRRC-EMS Adoption Equation

		Base Models		Alternative Specifications			Falsification Exercises	
		Boycott Only	Boycott + Proxy	Tox Wted Emissions	Unwghted KLD	Wtd KLD Pub/Priv		
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
		Marg Eff	Marg Eff	Marg Eff	Marg Eff	Marg Eff	Marg Eff	Marg Eff
Environment Boycott (binary)		0.543 (2.63)***	0.547 (2.63)***	0.551 (2.61)***	0.565 (2.85)***	0.554 (2.74)***	0.582 (2.10)**	---
Environment Proxy (binary)		---	-0.055 (-0.16)	0.111 (0.30)	0.019 (0.06)	0.134 (0.42)	-0.152 (-0.37)	---
Non-Environ. Boycott (binary)		---	---	---	---	---	-0.242 (-1.14)	-0.037 (-0.18)
Non-Environ. Proxy (binary)		---	---	---	---	---	0.059 (0.62)	0.026 (0.35)
Employees		-3.44e-04 (-0.39)	-3.20e-04 (-0.35)	1.41e-04 (0.15)	-3.18e-04 (-0.34)	-5.52e-04 (-0.60)	7.13e-05 (0.05)	-1.54e-03 (-1.13)
FinalGood		-0.187 (-2.55)**	-0.191 (-2.51)**	-0.214 (-2.80)***	-0.189 (-2.49)**	-0.188 (-2.49)**	-0.205 (-2.55)**	-0.147 (-2.10)**
Inspect		0.017 (1.17)	0.018 (1.23)	0.003 (0.19)	0.017 (1.18)	0.016 (1.15)	0.018 (1.28)	0.017 (1.60)
CAA Emissions		-1.31e-03 (-0.61)	-1.14e-03 (-0.49)	1.27e-04 (2.42)**	-1.56e-03 (-0.65)	-2.35e-03 (-0.98)	-6.14e-04 (-0.22)	-1.1e-03 (-0.51)
Non-CAA Emissions		9.12e-02 (2.71)***	9.12e-02 (2.70)***	8.96e-04 (0.76)	8.93e-02 (2.60)***	9.12e-02 (2.67)***	8.85e-02 (2.76)***	0.101 (2.70)***
Sierra		-0.079 (-2.70)***	-0.079 (-2.68)***	-0.081 (-2.59)***	-0.078 (-2.66)***	-0.081 (-2.78)***	-0.076 (-2.57)***	-0.079 (-2.66)***
KLD Strengths	Public	-0.414 (-1.99)**	-0.422 (-2.01)**	-0.395 (-1.89)*	-0.101 (-2.30)**	-0.472 (-1.70)*	-0.449 (-1.95)*	-0.103 (-0.67)
	Private					-0.399 (-1.10)		
KLD Concerns	Public	-0.543 (-2.45)**	-0.545 (-2.47)**	-0.499 (-2.32)**	-0.157 (-2.49)**	-0.263 (-0.73)	-0.597 (-2.65)***	-0.526 (-2.57)***
	Private					-0.836 (-2.42)**		
RTW		-0.199 (-1.43)	-0.199 (-1.42)	-0.280 (-1.83)*	-0.206 (1.47)	-0.216 (-1.54)	-0.233 (-1.59)	-0.157 (-1.21)
Lawpcap		-0.193 (-1.98)**	-0.191 (-1.83)*	-0.231 (-2.23)**	-0.200 (-1.92)*	-0.211 (-2.01)**	-0.190 (-1.82)*	-0.227 (-2.47)**
Strict		-0.181 (-1.71)*	-0.179 (-1.65)*	-0.215 (-2.01)**	-0.180 (-1.65)*	-0.186 (-1.73)*	-0.178 (-1.61)	-0.253 (-2.62)***
1st St Inst Test: Boycott (p-val)		0.005***	0.005***	0.006***	0.007***	0.011**	0.067*	---
1st St Inst Test: Proxy (p-val)		---	0.000***	0.000***	0.000***	0.000***	0.001***	---
Exog Test (p-val)		0.019**	0.058*	0.044**	0.031**	0.029**	0.136	---
LogLikelihood		-131.14	-131.02	-133.16	-130.84	-129.22	-130.78	-148.97
No. of Obs.		365	365	365	365	365	365	365

Dep Var: EMS adoption/response (0-1). Mean Dep Var: 0.5178. Robust z-statistics in parentheses. All equations include Industry effects, and the additional covariates, Profit, Age of Assets, Concentration, Market Share, Educ, Income, and Spendaqp, none significant. All Models estimated by 2SRI (Probit) with Environmental Boycott and Environmental Proxy treated as endogenous. Identifying instruments are industry-level (3-digit SIC) dummies for a non-environmental boycott and proxy (respectively) in 1988-91. Emissions are measured with unweighted totals except in Model 3. KLD variables are measured with weighted Strengths and Concerns except in Models 4-5. 1st Stage instrument tests give p-values for identifying instruments in the respective 1st stage estimations.

Table 6. TQEM Adoption Equation

		Base Models		Alternative Specifications			Falsification Exercises	
		Boycott Only	Boycott + Proxy	Tox Wted Emissions	Unwghted KLD	Wtd KLD Pub/Priv		
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
		Marg Eff	Marg Eff	Marg Eff	Marg Eff	Marg Eff	Marg Eff	Marg Eff
Environment Boycott (binary)		0.711 (2.45)**	0.697 (2.21)**	0.694 (2.15)**	0.713 (2.33)**	0.698 (2.23)**	0.691 (1.35)	---
Environment Proxy (binary)		---	0.532 (1.86)*	0.650 (2.46)**	0.543 (1.92)*	0.455 (1.71)*	0.426 (1.23)	---
Non-Environ. Boycott (binary)		---	---	---	---	---	-0.147 (-0.84)	-0.030 (-0.19)
Non-Environ. Proxy (binary)		---	---	---	---	---	0.056 (0.65)	0.053 (0.79)
Employees		1.43e-03 (1.67)*	9.39e-04 (1.05)	7.07e-04 (0.79)	1.08e-03 (1.22)	1.08e-03 (1.21)	2.75e-04 (0.20)	-3.3e-04 (-0.67)
FinalGood		-0.264 (-3.71)***	-0.228 (-3.03)***	-0.209 (-2.72)***	-0.225 (-2.97)***	-0.241 (-3.19)***	-0.226 (-2.85)***	-0.170 (-2.44)**
Inspect		0.003 (0.45)	-0.002 (-0.37)	-0.006 (-0.86)	-0.002 (-0.41)	6.6 e-05 (0.01)	-5.0e-04 (-0.08)	0.001 (0.51)
CAA Emissions		2.29e-03 (1.03)	4.28e-04 (0.22)	3.56e-06 (0.52)	3.71e-04 (0.19)	2.94 e-04 (0.15)	8.6 e-04 (0.37)	9.74e-04 (1.20)
Non-CAA Emissions		-7.58e-03 (-1.34)	-3.89e-03 (-0.69)	1.23e-05 (1.06)	-3.89e-03 (-0.70)	-6.30e-03 (-1.11)	3.88e-03 (-0.61)	-3.2e-03 (-1.58)
Sierra		-0.018 (-0.62)	-0.014 (-0.48)	-0.013 (-0.45)	-0.017 (-0.45)	-0.017 (-0.59)	0.012 (-0.41)	-0.006 (-0.57)
KLD Strengths	Public	-0.327 (-1.56)	-0.401 (-1.91)*	-0.451 (-2.13)**	-0.102 (-2.29)**	-0.562 (-2.00)**	-0.366 (-1.57)	-0.046 (-0.79)
	Private					0.223 (0.64)		
KLD Concerns	Public	-0.207 (-1.14)	-0.213 (-1.14)	-0.280 (-1.42)	-0.075 (-1.34)	0.235 (0.88)	-0.274 (-1.35)	-0.059 (-0.85)
	Private					-0.650 (-2.10)**		
Lawpcap		-0.068 (-0.77)	-0.120 (-1.32)	-0.142 (-1.58)	-0.118 (-1.31)	-0.097 (-1.08)	-0.126 (-1.38)	-0.032 (-1.00)
Strict		-0.090 (-0.86)	-0.132 (-1.24)	-0.159 (-1.51)	-0.134 (-1.25)	-0.118 (-1.12)	-0.141 (-1.30)	-0.139 (-1.48)
1st St Inst Test: Boycott (p-val)		0.005***	0.005***	0.006***	0.007***	0.011**	0.067*	---
1st St Inst Test: Proxy (p-val)		---	0.000***	0.000***	0.000***	0.000***	0.001***	---
Exog Test (p-val)		0.026**	0.012**	0.006***	0.013**	0.026**	0.167	---
LogLikelihood		-154.32	-152.78	-152.36	-152.41	-152.42	-151.27	-177.66
No. of Obs.		365	365	365	365	365	365	365

Dep Var: TQEM Adoption (0-1). Mean Dep Var: 0.348. Robust z-statistics in parentheses. All equations include Industry effects, and the additional covariates, Profit, Age of Assets, Concentration, Market Share, Educ, Income, and Spendaqp, none significant. All Models estimated by 2SRI (Probit) with Environmental Boycott and Environmental Proxy treated as endogenous. Identifying instruments are industry-level (3-digit SIC) dummies for a non-environmental boycott and proxy (respectively) in 1988-91. Emissions are measured with unweighted totals except in Model 3. KLD variables are measured with weighted Strengths and Concerns except in Models 4-5. 1st Stage instrument tests give p-values for identifying instruments in the respective 1st stage estimations.

Table 7. ISO 14001 Registration Equation

		Base Models		Alternate Specifications: 1996-2003			Falsification Exercises (1996-2003)	
		1996-1999	1996-2003	Tox. Wtd. Emissions	Unweight. KLD	Wtd. KLD Pub./Priv.		
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
		Marg Eff.	Marg Eff.	Marg Eff.	Marg Eff.	Marg Eff.	Marg Eff.	Marg Eff.
Environment Boycott (binary)		-0.161 (-1.32)	-0.306 (-2.76)***	-0.299 (-2.70)***	-0.305 (-2.66)***	-0.259 (-1.63)	-0.331 (-1.97)**	---
Environment Proxy (binary)		0.663 (1.58)	0.765 (2.80)***	0.464 (1.65)*	0.751 (2.80)***	0.576 (2.17)**	0.544 (1.66)*	---
Non-Environ. Boycott (binary)		---	---	---	---	---	0.109 (0.73)	-0.026 (-0.22)
Non-Environ. Proxy (binary)		---	---	---	---	---	0.071 (0.99)	0.663 (1.44)
Employees		5.93e-04 (1.55)	9.46e-04 (2.03)**	9.81e-04 (1.83)*	9.57e-04 (2.06)**	1.13e-03 (1.88)*	1.22e-03 (1.49)	1.46e-03 (2.19)**
Concentration		0.645 (1.97)**	0.794 (2.86)***	0.691 (2.44)**	0.794 (2.84)***	0.752 (2.71)***	0.820 (2.92)***	0.587 (2.29)**
FinalGood		---+	-0.161 (-2.80)***	-0.184 (-3.22)***	-0.164 (-2.84)***	-0.173 (-2.83)***	-0.170 (-2.83)***	-0.162 (-3.30)***
Inspect		2.69e-03 (0.92)	8.99e-03 (2.50)**	0.011 (2.47)**	9.12e-03 (2.51)**	0.011 (3.18)***	0.011 (3.25)***	0.008 (2.92)***
CAA Emissions		-7.02e-04 (-0.88)	-2.63e-03 (-3.36)***	-3.19e-06 (-0.71)	-2.58e-03 (-3.32)***	-2.76e-03 (-3.30)***	-2.5e-03 (-2.92)***	-9.4e-04 (-1.38)
Non-CAA Emissions		6.61e-03 (2.54)**	9.15e-03 (3.34)***	-9.02e-06 (-1.32)	9.12e-03 (3.33)***	8.08e-03 (2.84)***	8.69e-03 (2.82)***	4.35e-03 (1.51)
Sierra		-0.055 (-1.72)*	-7.56e-03 (-0.32)	-9.95e-03 (-0.44)	-8.09e-03 (-0.34)	-9.70e-03 (-0.42)	-4.95e-03 (-0.21)	3.93e-03 (0.00)
KLD Strengths	Public	0.090 (0.58)	0.184 (1.12)	0.236 (1.43)	0.036 (1.06)	-0.122 (-0.51)	0.231 (1.28)	0.068 (0.63)
	Priv.					0.662 (2.57)***		
KLD Concerns	Public	0.047 (0.38)	0.116 (0.83)	0.181 (1.26)	0.027 (0.66)	0.323 (1.56)	0.125 (0.88)	0.138 (1.04)
	Priv.					-0.130 (-0.52)		
Education		0.017 (0.81)	0.042 (1.74)*	0.048 (2.08)**	0.042 (1.75)*	0.046 (2.00)**	0.050 (1.87)*	0.026 (1.15)
RTW		-0.131 (-2.18)**	-0.234 (-3.05)***	-0.217 (-2.79)***	-0.233 (-3.05)***	0.346 (-3.20)***	-0.244 (-2.83)***	-0.182 (-2.24)**
Lawpcap		-0.095 (-1.66)*	-0.170 (-2.28)**	-0.144 (-1.97)**	-0.166 (-2.25)**	-0.138 (-2.01)**	-0.160 (-2.16)**	-0.105 (-1.69)*
1st St Inst Test: Boycott (p-val)		0.005***	0.005***	0.006***	0.007***	0.011**	0.067*	---
1st St Inst Test: Proxy (p-val)		0.005***	0.005***	0.007***	0.005***	0.004***	0.018**	---
Exog Test		0.164	0.004***	0.024**	0.004***	0.059*	0.059*	---
LogLikelihood		-34.92	-88.00	-90.22	-88.15	-85.99	-86.39	-122.94
No. of Obs.		365	365	365	365	365	365	365

Dep Var: ISO Registration (0-1). Mean Dep Var (ISO96-03): 0.1589. Robust z-statistics in parentheses. All equations include Industry effects, and the additional covariates, Profit, Age of Assets, Market Share, Income, Strict,, and Spendaqp, none significant (except Spendaqp in Model 1). All Models estimated by 2SRI (Probit) with Env. Boycott and Env. Proxy endogenous. Identifying instruments are industry-level (3-digit SIC) dummies for a non-environmental boycott and proxy in 1988-91. Emissions measured with unweighted totals except in Model 3. KLD variables measured with weighted Strengths / Concerns except in Models 4-5.
+ Final Good dropped in Model 1 due to collinearity.

Table 8. Summary of Results

A) Determinants of Environmental Boycotts and Proxies

	Boycott	Proxy
Employees	+	+
Final Good	+?	+?
Concentration	0	-
Market Share	+?	+
Inspect	+	+
Emissions	0	0
Sierra	0	0
KLDStrengths	+	+
KLDConcerns	0	+
Education	+	+?
Income	0	-?

B) Determinants of Environmental Management

	EMS	TQEM	ISO 14001 1996-2003
Boycott	+	+	-
Proxy	0	+	+
Employees	0	0	+
Concentration	0	0	+
Market Share	0	0	0
Final Good	-	-	-
CAA Emissions	0	0	-
Non-CAA Emissions	+	0	+
Sierra	-	0	0
Inspect	0	0	+
KLDStrengths	-	-	0
KLDConcerns	-	0	0
Strict	-	0	0
Lawpcap	-	0	-

+, - indicate consistent signs with significant coefficients in multiple models. Question marks indicate that the effects are insignificant in multiple models. "0" indicates no consistent and significant sign of effect.

Appendix Table: 2-Digit Industries in Sample

Industry	SIC Code	Sample Proportion
Chemicals and Allied Products	28	0.0849
Industrial and Commercial Machinery and Computer Equipment	35	0.0712
Electric, Gas and Sanitary Services	49	0.0658
Depository Institutions	60	0.0575
Electronic and Other Electrical Equipment and Components	36	0.0521
Transportation Equipment	37	0.0521
Insurance Carriers	63	0.0438
Instruments; Photographic, Medical & Optical Goods; Clocks	38	0.0438
Food and Kindred Products	20	0.0438
Paper and Allied Products	26	0.0356
Business Services	73	0.0329
Printing, Publishing and Allied Industries	27	0.0329
Communications	48	0.0301
Oil and Gas Extraction	13	0.0301
Coal Mining	33	0.0301
Petroleum Refining and Related Industries	29	0.0219
Fabricated Metal Products	34	0.0164
Other (less than 1.5%)	*	

*10, 15,16, 21,22,23,23,25, 29, 30, 31, 32, 34, 39, 40,45, 50, 51, 52, 53, 54, 55, 56, 57, 58,59, 61,62,64,70,72,75,78,79,80,99