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Toxic CEOs, ESG Funds as Watchdogs, and the Labor Market Outcomes

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JEL Classifications: G39, K42, M12, Q50

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Abstract

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1. Introduction

Corporate activities create significant negative environmental externalities. These economic costs can exceed $4.7 trillion a year, are multi-sectoral, and appear through the entire lifecycle of products (Trucost, 2013).[1] Externalities of this scale pose a major risk to business viability and the global economy, yet, corporations have been hesitant to recognize and incorporate such risks into their policies.[2] Recently, several mechanisms have been proposed to address this market failure (e.g., enhanced ESG disclosure (Jouvenot and Kruger, 2021; Tomar, 2022), carbon pricing (Stavins, 2019; Green, 2021), SRIs (Pastor, Stambaugh, and Taylor, 2021; Kruger, Sautner, and Starks, 2020; Azar, Duro, Kadach, and Ormazabal, 2021), and ESG-conscious consumers (Nickerson, Lowe, Pattabhiramaiah, and Sorescu, 2022). However, despite the increased attention about corporate sustainability policies, limited evidence exists about the role of CEO incentives in reducing environmental pollution. In this paper, I examine whether the labor market can prompt CEOs to internalize negative externalities from corporate environmental activities. This is an important question to address, because CEOs are key decision makers within firms (Waldman, Siegel, and Javidan, 2006), and the threat of holding them accountable for their actions can function as an important market-based deterrent to shape corporate environmental behavior.

Specifically, I examine changes in CEO labor market outcomes following corporate environmental misconduct, which creates negative externalities that firms are required by law to prevent. The fact that CEOs often sit on the boards of other firms allows me to analyze both the likelihood of their dismissal as CEOs and the change in the number of their external board memberships as outside directors. The latter effect, ex-post settling up in the labor market, is especially important in situations where the internal governance dynamics waver on punishing CEOs for failure.

[1] A 2010 United Nations study estimates that the world's largest 3,000 firms cause $2.15 trillion worth of environmental damage every year, accounting for 7% of their revenues. Other involved parties including small and private companies contribute an additional $4.45 trillion of environmental costs (UNEPFI, 2010).

[2] According to Pigou (1920), firms should not internalize negative environmental externalities. However, these externalities yet to be fully reflected in asset prices together with the regulatory risk in the transition to a low-carbon economy pose a long-term financial risk (Kruger et al. 2020; Bansal, Ochoa, and Kiku, 2017; Bolton and Kacperczyk, 2021; Hoepner, Oikonomou, Sautner, Starks, and Zhou, 2020; Seltzer, Starks, Zhu, 2020). The value at risk of manageable assets because of climate risk is estimated to be $4.2 trillion (Economist Intelligence Unit, 2015). Further, climate change already shapes economic risks today through the increased frequency and severity of certain extreme weather events (e.g., Addoum, Ng, and Ortiz-Bobea, 2020). This warrants the integration of environmental issues into the long-term value maximization perspective.

I define environmental failure as a violation of environmental laws that eventually results in an enforcement action by the EPA. These enforcements are an ideal laboratory to analyze the labor market-based penalties of environmental misconduct on CEOs because they are clear violations of environmental laws, providing me with an accurate and objective assessment of corporate environmental activities. According to the EPA, they are the most serious environmental violations committed by firms. They cover a wide range of firms, thus, not subject to a media coverage bias, and they have been widely studied in different contexts (Heyes, 2000).

I focus on CEOs because they are in charge of formulating corporate strategy on environmental matters (e.g., Wernicke, Sajko, and Boone, 2022; Davidson, Dey, and Smith, 2019). They make up a significant fraction of corporate boards (Fich, 2005).[3] Prior evidence suggests that CEOs are rewarded with board seats in directorial labor markets due to their reputation, expertise, and performance (e.g., Fahlenbrach, Low, and Stulz, 2010). These directorships are valuable due to their monetary and non-monetary benefits such as prestige, visibility, and influence (Perry and Peyer, 2005; Yermack, 2004).

A priori, it is unclear that firms will discipline CEOs involved in EPA enforcements. The first view is that managers are punished for environmental wrongdoings due to SRI influence and reputational costs. The rise of SRIs, with about $17.1 trillion of assets under management and a focus on ESG matters, has pushed firms to increasingly rely on non-financial ESG metrics in evaluating CEOs (e.g., Cohen, Kadach, Ormazabal, Reichelstein, 2022). Similarly, these investors can press firms for greater labor market penalties imposed on the offending CEOs, regardless of the impact on firm valuations.[4] It is important to note that in such situations, the boards will be inclined to proactively penalize offending CEOs so as to receive SRIs' support in board elections and to protect their environmental reputation (Fama, 1980; Jiang, Wan, and Zhao, 2016; Dikolli, Frank, and Guo, 2022). Moreover, the revelation of environmental misconduct can result in substantial reputational costs to firms in the form of declines in share prices, profitability, and SRI exit (e.g., Klassen and McLaughlin,

[3] About 43% of boards among the Russell 3000 firms include active and former top managers in their capacity as outside directors (see "Corporate Board Practices in the Russell 3000 and S&P 500: 2020," The Conference Board).
[4] For example, in his 2018 letter to CEOs, BlackRock's CEO Larry Fink underlines the ability to manage environmental issues as a signal of CEOs' leadership skills (see https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter).

1996; Flammer, 2015; Kruger, 2015) as well as legal penalties levied by the EPA and courts (Karpoff, Lott, and Wehrly, 2005). As a backstop to these adverse effects, firms can dismiss offending CEOs (Bernile and Jarrell, 2009). Similar arguments apply to the external board seats of offending CEOs.

The second view is that environmental wrongdoings have no impact on CEOs' careers. In the world of Friedman (1970), unless they are related to profit maximization, non-financial outcomes such as environmental violations are irrelevant in evaluating CEOs and directors.[5] The third view is that CEOs of firms involved in environmental wrongdoings experience less adverse career prospects. Shareholders may penalize CEOs who implement environmentally friendly policies, such as environmental abatement measures that are effective at preventing EPA enforcements. This is because adopting environmentally friendly policies can be perceived as a way to extract private benefits by CEOs at the expense of shareholders, such as higher pay, masking poor firm performance, and improving their reputation as environmental leaders (e.g., Bebchuk and Tallarita, 2022; Dai, Gao, Lisic, and Zhang, 2021; Hubbard, Christensen, and Graffin, 2017). Further, CEOs can experience a greater demand for their services on other corporate boards due to the expertise gained through dealing with EPA's regulators.

In order to assess the impact of environmental misconduct on CEO labor market outcomes, I obtain data on historical civil, judicial, and administrative EPA enforcement cases from the Enforcement and Compliance History Online (ECHO) database. I measure the severity of corporate environmental violation by its occurrence and its magnitude measured by the dollar value of federal, state, and local penalties, and complying actions. About 5.1% of firms in the main sample is subject to EPA enforcements, with an average total cost of $177,688 between 2002 and 2020.

I first evaluate if CEOs of firms that violate environmental laws are disciplined within their firms in the form of CEO dismissals. CEO turnover is shown to be an important disciplining mechanism following corporate failures (e.g., see Desai, Hogan, and Wilkins (2006) for earnings

[5] Firms can encourage CEOs to violate environmental laws to the extent the immediate benefits from violations exceed the regulatory and reputational penalties in the short run, or when firms perceive a low probability of being caught by regulators (Atkinson, 2020). At the same time, prior studies suggest that environmentally friendly activities can benefit shareholders by reducing firms' risks (e.g., Albuquerque, Durnev, and Koskinen, 2019; Hoepner et al. 2020), improving profitability and returns (Eccles, Ioannou, and Serafeim, 2014; Dimson, Karakas, and Li, 2015), and increasing customer loyalty (Servaes and Tamayo, 2013).

restatements; Karpoff, Lee, and Martin (2008) for financial misconduct; Efendi, Files, Ouyang, and Swanson (2013) for the option backdating scandal). I find that such CEOs face a greater likelihood of dismissal from their firms. This effect is both statistically and economically significant. The offending CEOs face a 1.8 percentage point higher probability of dismissal, and this corresponds to a 20.6% increase in CEO turnover on average. This higher CEO dismissal propensity reveals significant penalties for managers of firms engaged in environmental misconduct.

Next, I test the disciplinary effects of environmental misconduct in directorial labor markets in the form of the number of external board seats served. The ex-post settling hypothesis of Fama (1980) and Fama and Jensen (1983) suggests that penalties are imposed by the labor market on directors for corporate wrongdoings. Studies scrutinizing corporate misbehavior such as the option backdating scandal, fraudulent activities, and earnings restatements document that directors are punished with fewer external board memberships (e.g., Ertimur, Ferri, and Maber, 2012; Fich and Shivdasani, 2007; Srinivasan, 2005). I find a significant decline in the number of external boards served on by CEOs following environmental misconduct. CEOs lose on average 3.09% of board seats held and this effect accumulates to 7.94% within three years of EPA enforcements. These results suggest that CEOs face further discipline from the directorial labor market in terms of the number of external boards they sit on following the revelation of EPA enforcements.

Examining the timing of these penalties on CEOs, I find that most of the changes in dismissal rates and external board memberships occur after 2010. This is a period marked by the BP oil spill disaster in 2010, the Volkswagen emission test scandal in 2015, the rapid rise of SRIs, and intensified media coverage of environmental issues. The time-varying aspect of these effects is also consistent with the increase in the negative stock market reaction to eco-harmful behavior documented by Flammer (2015). I also find that CEOs that are dismissed following an EPA enforcement are less likely to get another CEO position in a listed firm within three years of dismissal compared to CEOs dismissed for other reasons.

I subject the aforementioned results to a variety of robustness checks including a matched sample analysis using entropy balancing, the use of state-level emission reduction regulation as a shock to EPA enforcement intensity, exclusion of industries with most and least frequent EPA violations,

and an alternative sample that only includes firms subject to an EPA enforcement during the sample period. Results remain robust to these alternative considerations. I also augment the empirical specification throughout the analysis with fixed effects at the firm, state x year, and industry x year levels. The purpose of these fixed effects is to eliminate sources of variation in the main outcome variables other than the EPA enforcement, such as unobserved firm-level heterogeneity, time-varying state-level and industry-level differences in EPA enforcement and regulations.

After documenting the labor market consequences of EPA enforcements to CEOs, I explore two channels through which these effects can occur; shareholder voice and SRIs. The ability of shareholders to replace ineffective directors ensures the proper functioning of the board of directors. Previous research shows that shareholders use votes in director elections to voice their dissatisfaction with directors' performance (e.g., Cai, Garner, and Walkling, 2009; Aggarwal, Dahiya, and Prabhala, 2019). Further, directors of firms involved in the option backdating scandal and financial fraud are penalized in terms of votes withheld (e.g., Ertimur et al. 2012; Brochet and Srinivasan, 2014). In light of these arguments, I test if shareholder voting support is one potential channel thru which CEOs of offending firms are penalized in their external board directorships. I observe significant shareholder dissent in elections of offending CEOs on other boards following EPA enforcements. Following the revelation of the EPA enforcement, shareholder dissent in elections of offending CEOs increases by 1.5 percentage points, which corresponds to a 30.5% increase on average. A nice feature of analyzing director elections is that they constitute an alternative measure of reputational damage. Shareholder dissatisfaction with directors can be observed from the voting patterns even in absence of a director turnover.

Second, I examine SRIs as another channel through which CEOs of firms involved in EPA enforcements can be penalized. These institutional investors explicitly link their investment policies to ESG issues. Studies show that they improve firms' ESG ratings (e.g., Dyck, Lins, Roth, and Wagner, 2019; Kim, Wan, Wang, and Yang, 2019), engage privately with their portfolio firms (Kruger et al. 2020; Dimson et al. 2015) and publicly through voting on environmental and social shareholder

proposals (Dikolli et al. 2022).[6] Thus, I conjecture that if SRIs pay attention to environmental matters, their presence should amplify external and internal labor market penalties documented in earlier tests. I find that the number of external directorships of involved CEOs decreases by 7.95% in the year following EPA enforcements for a firm in the top quartile of SRI ownership compared to the one in the bottom quartile of SRI ownership. The likelihood of CEO dismissal and shareholder opposition in director elections are also significantly amplified when SRIs hold a greater share of the firm's equity. These results suggest that SRIs put pressure on CEOs of violating firms following EPA enforcement actions both internally within the firm and externally in the labor market for directorships.

The aforementioned results are robust to alternative measures of EPA enforcement intensity such as the number of EPA cases and the magnitude of the penalty and mitigation costs that firms incur. However, the associated economic effects are smaller. This is in part because monetary penalties imposed on firms for violating environmental law are too small compared to firm size to matter, as argued by several legal scholars (e.g., Stefanutti, 2022), and suggests that the occurrence of the EPA violation is more important than the monetary costs incurred by the firm, underlining the significance of reputational cost of EPA enforcements.

The remainder of the paper is organized as follows. The next section provides an overview of the related literature. Section 3 provides background information on EPA enforcement mechanisms and Section 4 describes the data and the sample. Section 5 reports the baseline results on the consequences of EPA enforcements to CEOs. Section 6 analyzes the role of shareholder support and SRI ownership and Section 7 reports results for an alternative sample. Section 8 concludes.

2. Related Literature

This study contributes to several strands of research. First, it adds to the rapidly growing literature on SRIs. These investors can improve firms' ESG ratings and engage with their portfolio firms (Dyck et al. 2019; Kruger et al. 2020; Dimson et al. 2021; Dikolli et al. 2022). I identify a specific

[6] Several studies show that SRIs are involved in greenwashing, that is, they fall short on their promise of integrating ESG goals to their investment decisions (e.g., Heath, Macciocchi, Michaely, and Ringgenberg, 2022; Kim and Yoon, 2021).

engagement channel of SRIs with firms on environmental matters initiated by the EPA enforcement. I find that the monitoring exerted by SRIs impose significant discipline on CEOs and directors. Thus, one way for SRIs to influence firm environmental behavior is through their disciplining of CEOs and directors involved in environmental misconduct. This is consistent with SRIs' preference on engaging in dialogue with portfolio companies over the threat of exit to influence corporate environmental behavior (Kruger et al. 2020; Broccardo, Hart, and Zingales, 2022). Further, whether SRIs' investment activities are aligned with the stated goal of sustainability is currently under debate (e.g., Brandon, Glossner, Kruger, Matos, and Steffen, 2021; Kim and Yoon, 2021). The involvement of SRIs in punishing the offending CEOs such as voting against their elections on boards of other firms provides an important perspective to this debate.

Second, it is related to the extensive literature studying the consequences of corporate misconduct. CEOs and directors of firms involved in misbehavior such as earnings restatements (Desai et al. 2006; Srinivasan, 2005; Hazarika, Karpoff, and Nahata, 2012), fraudulent activities (e.g., Karpoff et al. 2008; Fich and Shivdasani, 2007), and option backdating (Efendi et al. 2013; Ertimur et al. 2012) are shown to be punished by shareholders in the labor market. An interesting question that remains largely unanswered is whether such penalties extend to firms engaging in environmental misconduct. Unlike the aforementioned examples of corporate misconduct, there are no direct contractual relationships with the defendants in environmental misconduct cases. It is not clear that stakeholders are protected against corporate wrongdoings as well as shareholders by the legal system (Admati and Buchak, 2022). Further, addressing environmental externalities arising from corporate activities has emerged as a priority for some shareholders (e.g., SRIs). In this aspect, two closely related papers are Aharony, Liu and Yawson (2015) and Liu, Aharony, Richardson, and Yawson (2016), which use private litigation cases on antitrust, contractual, environmental, and intellectual property topics from 2000 to 2007, and find that CEO turnover does not increase, and no changes in external directorships occur following environmental lawsuits, respectively.[7]

[7] My results are very different from these two studies, likely due to the measurement of corporate environmental wrongdoing and the sample period. I examine public enforcements that are based on the explicit violation of environmental laws rather than private litigation, some of which can be frivolous. This reduces the concern about the mismeasurement of environmental wrongdoings. Further, I study a substantially longer sample period of 2001 to 2020. The effects I document are mostly noticeable in the later part of my sample period that witnessed the rise of SRIs, and for

The third strand of research this paper contributes to is the mechanisms that direct firms to internalize the costs of, and financial risks from, corporate environmental harm. Several potential mechanisms have been studied in the literature such as enhanced ESG disclosure (e.g., Tomar, 2022), SRIs (e.g., Kruger et al. 2020), and consumers (e.g., Nickerson et al. 2022). The findings of this study imply that holding CEOs responsible for environmental violations can be an effective way to reduce negative externalities from corporate environmental activities.

This study has important policy implications. The finding that EPA enforcements affect CEOs' careers mostly in firms with SRIs points to a bright side of SRIs, that market-based solutions can supplement regulatory actions to encourage more environment friendly corporate behavior. Further, my results imply that the labor market for environmental reputation can be an important mechanism to internalize negative externalities from corporate environmental activities. Without an adverse consequence of environmental failures to key corporate decision makers, similar corporate actions are likely to be repeated. This paper also contributes to the public enforcement literature by showing enforcement of environmental law has repercussions for CEOs' career aspects (e.g., Karpoff et al. 2005; Jackson and Roe, 2009; Hutton, Shu, and Zheng, 2022).

3. Background on EPA Enforcements

Environmental Protection Agency is created in 1970 to consolidate environmental responsibilities of the federal government under one agency. The two most important laws governing EPA are Clean Air Act of 1970 and Clean Water Act of 1972, both passed in well-publicized and bipartisan bills.[8] The Clean Air Act of 1970 directs EPA to set standards for the kinds of toxic air pollutants that can be released into the ambient air. The Clean Water Act of 1972 directs EPA to set standards for the kinds of pollutants that can be released into lakes, streams, and rivers, and it forces

firms with high SRI ownership. Finally, the scope of the analysis is different. I examine not only CEO dismissal and changes in CEOs' external board memberships but the channels through which changes in CEOs' careers can occur, namely shareholder voting and SRI ownership, while exploiting the staggered adoption of state regulations on environment as an exogenous shock to the intensity of public enforcements.

[8] Other prominent pieces of legislation passed by the Congress on governing environmental law and policy are Toxic Substances Control Act, Comprehensive Environmental Response, Compensation, and Liability Act, Endangered Species Act, Marine Protection, Research and Sanctuaries Act, National Environmental Policy Act, and Resource Conservation and Recovery Act.

polluters to get permits to do so. The acts governing environmental law and policy define a specific form of Congressional power that is delegated to EPA. This power is used by EPA to formulate rules, which carry the force of law, and establish a floor for how strictly a pollutant may be regulated. The states can set stricter rules, and the federal and state environmental agencies have overlapping responsibilities regarding enforcement of environmental laws.[9]

A central part of EPA's goal to protect human health and the environment is achieved by enforcing environmental laws.[10] When warranted, EPA takes civil or criminal enforcement actions against violators of environmental laws. There are three types of enforcement actions that EPA can take. Civil administrative actions are non-judicial enforcement actions taken by EPA or a state regulator under its own authority.[11] These actions do not involve a judicial court process, and may be in the form of a notice of violation or a superfund notice letter, or an order (either with or without penalties) directing an individual or a business entity to take action to come into compliance. Civil judicial actions are formal lawsuits. They are filed in court, against individuals or entities that have failed to comply with statutory or regulatory requirements, comply with an administrative order, pay EPA the costs for cleaning up a superfund site, or commit to doing the cleanup work. These cases are filed by the U.S. Department of Justice on behalf of EPA. In civil cases, they are typically filed by the state's attorney general on behalf of the state. Criminal actions can occur when EPA or a state enforces against a company or person through a criminal action. Criminal actions are usually reserved for the most serious violations that are knowingly committed. In these cases, a court conviction can result in fines or imprisonment.

Enforcement results depend on the type of the enforcement. A civil enforcement can result in one of the following three outcomes. First, settlements, which are agreed-upon resolutions to an enforcement case (e.g., install pollution control equipment), are either in the form of consent

[9] An exception is issued to California. California can set tighter standards than the EPA on the Clean Air Act's rules on car tailpipe emissions, and other states can opt into California's stricter rules.

[10] Evidence suggests that enforcement of environmental laws significantly increases compliance, resulting in improvements in environmental quality (Gray and Shimshack, 2020).

[11] States have been given implementation authority for all or most of the major enforcement areas of air, water and hazardous waste, but the EPA and its regional offices can bring enforcement actions themselves. While the EPA complains that states' efforts are either inconsistent or not too strict, the states complain that EPA's policies are too rigid or lax, depending on the state.

agreements/final orders or administrative orders on consent in the case of administrative actions, or in the form of consent decrees signed by all parties to the action and filed in the appropriate court in the case of judicial actions. Second, civil penalties involve monetary assessments due to a violation or noncompliance with the environmental statutes and regulations. Finally, supplemental environmental projects (SEPs) and complying actions can also be part of an enforcement settlement. Most federal actions for failure to comply with the environmental laws are resolved through settlement agreements. As part of a settlement, the violator can voluntarily agree to perform an environmental improvement project to mitigate part of a civil penalty assessed by EPA. These projects are in addition to actions required to correct the violations specified in the settlement. On the other hand, a criminal enforcement can involve either monetary fine, restitution, or incarceration.

4. Data and Sample Construction

I obtain data on civil, judicial, and administrative federal EPA enforcement cases from EPA's enforcement division.[12] The ECHO database reports data on the inspection, violation, and enforcement for the Clean Air Act (CAA), Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA), and also includes Safe Drinking Water Act (SDWA) and Toxics Release Inventory (TRI) data. This dataset provides information on the violator such as its name, location, the date when the enforcement case is filed against the company, the final conclusion date, the violation type as well as the penalties, compliance, and mitigation costs at the facility level.[13] I aggregate all enforcement actions at the parent company level by using the EPA's link file between facilities and their parent companies, and then match them with Compustat and Refinitiv to create the final regression sample.

EPA pursues civil and criminal cases against violators of environmental laws and focuses its enforcement and compliance resources on the most serious environmental violations. Figure 1a shows a decline in the number of environmental civil cases, and no substantial change in the number of

[12] The enforcement data at the facility level are accessible at https://echo.epa.gov. The historical enforcement actions are provided in the EPA's Integrated Compliance Information System (ICIS) within ECHO.
[13] While the type of violation is also available in the EPA database, this information is not feasible to use in my setting because I aggregate the enforcements at the parent firm level, and parent firms can have multiple violations in the same year.

criminal cases. Figure 1b reports the breakdown of the value of EPA enforcement actions over time. Civil and criminal penalties are significant in certain years. The geographical distribution of the enforcement cases is widespread. Figure 2 shows that the enforcements do not cluster in several states.[14]

I use EPA enforcements to proxy for environmental failures for several reasons. They allow me to objectively and accurately assess whether a firm engages in environmental misconduct. They are significant cases of environmental law violations that have been widely studied in different contexts (e.g., Heyes, 2000; Shive and Forster, 2020; Heitz, Wang, and Wang, 2021; Dasgupta, Huynh and Xia, 2021), and they cover a wide range of firms. Such a significant revelation of an environmental failure is central toward identifying the labor market-based penalties of environmental wrongdoings.[15]

I use three variables to proxy for EPA enforcement activities. The first variable measures the presence of an EPA enforcement against the firm in a given year, *Enforce Dummy*. I also use two variables to proxy for the intensity of EPA enforcements. The second variable is *Enforce Case*, the annual number of EPA enforcements a firm is subject to. This is a continuous version of the discrete variable. Finally, *Enforce Penalty* is the dollar amount of the sum of civil and criminal penalties imposed on the firm by the EPA enforcement case per year. I aggregate federal, state, and local penalties. I scale this variable by total assets. I also employ *Enforce Total* as a robustness check, which includes both penalties and other costs (SEPs and complying actions) incurred by the firm and report the results in Table IA.10 in the internet appendix.[16] Following Shive and Forster (2020), I use the first date that the case is reported in ECHO, the filing date, to assign a year to the violation.

Table 1 Panel A shows that enforcement actions are rare. Only 5.1% of firms are subject to EPA enforcements in the sample. The average firm has 0.097 number of EPA enforcements and pays

[14] EPA works to ensure compliance with environmental requirements. It conducts both onsite and offsite (e.g., aerial photography) inspections of facilities to assess compliance with environmental requirements. Inspections tend to focus on facilities likely to be violating EPA laws due to limited budget and time. EPA enforcement is not perfect, as the true noncompliance rates are estimated to be higher than what EPA resources can allow (Giles, 2022).

[15] An alternative method to identify environmental misconduct is to focus on firms with low ratings on the E component of ESG ratings. However, these ratings are criticized in recent studies because they can mismeasure the true extent of corporate ESG activities (Kruger, 2015), and they can diverge significantly across various vendors (Berg et al. 2022). Another alternative is to use news coverage of corporate environmental actions. However, news coverage tends to focus on large firms and newsworthy events, and leads to a subjective determination of the nature and severity of corporate environmental unfriendliness as well as the scope of what counts as a corporate environmental activity.

[16] Complying actions are investments in actions and equipment that violators undertake to reduce pollution and protect the environment as the EPA enforcement cases require.

$5,323 in penalties and $177,688 total costs to satisfy the EPA requirements. The size of monetary penalties imposed by EPA for environmental misconduct is criticized as immaterial to large firms (e.g., Stefanutti, 2022). The average number of external board directorships is 1.196 as reported in Panel A, which is in line with the average number of directorships reported in some prior studies such as 1.19 in Brochet and Srinivasan (2014) and 1.28 in Srinivasan (2005). The average CEO turnover rate is 0.087, which is slightly lower than 10.8% reported in Jenter and Kanaan (2015). The top five industries targeted by EPA enforcements are energy (9.2%), utility (8.5%), chemical (6.6%), retail (5.8%), and machinery (4.9%). Panel B provides an industry breakdown of EPA enforcement activity at the one-digit SIC code level, and Panel C presents changes in EPA enforcement intensity over time.

5. Results

This goal of this paper is to examine the labor market consequences to CEOs of environmental misconduct. To this end, I study two main career outcomes: the consequences to CEOs inside the firm—the probability of CEO dismissal, and outside the firm—the number of external board seats that CEOs sit on.

The empirical specification used to test these outcomes includes firm fixed effects to control for the impact of time-invariant firm-specific determinants of CEO employment opportunities such as the firm's prestige and governance environment. State x year fixed effects are included to control for any state-specific characteristic such as firm location, changes in state regulations, economic activity, political environment, and enforcement intensity. Industry x year fixed effects capture industry growth options, industry trends in governance mechanisms, and enforcement intensity. Finally, year fixed effects are included to control for general time trends in the dependent variable and EPA enforcement intensity such as the EPA budget. The regression specification also includes control variables commonly used in the labor market literature (e.g., Yermack, 2004; Fich and Shivdasani, 2007; Del Guercio et al. 2008; Ertimur et al. 2012).[17] I winsorize all continuous variables at the one

[17] These are the natural logarithm of total assets, the ratio of EBIT to total assets (e.g., Weisbach, 1988), total institutional and inside ownership percentages (e.g., Huson, Parrino, and Starks, 2001), % of outside directors (e.g., Fich and Shivdasani, 2007), in addition to CEO characteristics, namely, the natural logarithm of CEO's age and tenure with the firm, gender, and the number of managerial awards. Definitions of these variables are reported in Table 1 in the appendix.

percent level and use one-year lagged values of time-varying independent variables. Robust standard errors are estimated by double clustering at the state and year levels.

5.1. CEO Dismissals and EPA Enforcements

I first examine whether EPA enforcement intensity affects the propensity to dismiss CEOs. The first three columns of Table 2 report results from testing this hypothesis. The dependent variable in these columns takes on the value of 1 in the year a CEO is dismissed, 0 otherwise. The main variables of interest are the three measures EPA enforcement activity. All columns use the same empirical specification except for the EPA enforcement activity measure. The regression sample encompasses all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020.

Table 2 shows that CEOs are more likely to lose their jobs subsequent to the EPA enforcement action against the firm. Across all three columns, I observe a positive coefficient estimate on the EPA enforcement measures. For example, Column (1) of Table 2 uses *Enforce Dummy*, an indicator variable to denote the occurrence of an EPA enforcement against the firm in the current year. It shows a statistically significant coefficient estimate of 0.018 (t-stats = 2.580). Compared to the unconditional mean of 0.087, this coefficient estimate implies a 20.6% increase in the probability of CEO dismissal following an EPA enforcement action. Further, column (2) reports a coefficient estimate of 0.009 (t-stats = 3.805) for the number of EPA enforcement cases against the firm. Column (3) that uses the ratio of EPA penalties to firm assets, and also reports a statistically significant coefficient estimate (0.002, t = 3.241). The economic magnitude of the change in the CEO turnover propensity is much lower when I use a continuous measure of EPA enforcement intensity compared to the discrete measure. This suggests that the occurrence of the EPA enforcement is likely more important than the associated monetary costs incurred by the firm, highlighting the reputational cost of EPA enforcements. It is also likely that the presence of an EPA enforcement is enough for environmental activist shareholders such as SRIs to act upon. These three columns altogether point to a disciplinary effect following EPA enforcements.

5.2. External Directorships and EPA Enforcements

Next, I test the ex-post settling hypothesis of Fama (1980) and Fama and Jensen (1983) in the context of environmental misconduct. The last three columns of Table 2 report results from this regression specification where I use the number of external board memberships CEOs serve on as the dependent variable. To avoid double-counting the own-firm effects, I exclude the board seat held by the CEO in the firm subject to the EPA enforcement.[18]

Table 2 shows that CEOs hold fewer external board seats following EPA enforcements. Column (4) reports a negative and statistically significant coefficient estimate of -0.037 (t-stats = -2.312) on *Enforce Dummy*, suggesting that CEOs on average hold 3.09% fewer external board directorships in the years following EPA enforcements. This magnitude is smaller than that observed for CEO dismissal, partly because some firms have staggered boards and thus it can take multiple years for the shareholders to be able to replace the director, as I show in the next subsection. The next two columns use the alternative measures of EPA enforcement activity and show statistically significant declines in the total number of external directorships following an EPA enforcement. For example, Column (5) reports a coefficient estimate of -0.033 (t-stats = -4.467) for the number of EPA enforcements, which implies a 2.09% standard deviation decrease in the total number of external board directorships for the offending firm's CEO for one standard deviation increase in the number of enforcements.[19] Overall, Table 2 collectively points to a significant reputational damage to CEOs from EPA enforcements. Not only that the offending CEO is more likely to be dismissed as the CEO but experience fewer external board directorships subsequent to EPA enforcements.

5.3. Dynamic Effects of EPA Enforcements

I next examine the dynamic effects of EPA enforcements on CEOs for two reasons. First, in case of classified boards, the previous tests can underestimate the true effect of environmental failures in labor markets. It may also take longer than one year for shareholders to coordinate for enough

[18] Including such board seats does not alter the results with the exception that the economic effects become stronger.

[19] I do not use a non-linear estimation in Table 2 because (1) non-linear specifications suffer from the incidental parameters problem when the specification includes a large number of fixed effects (Greene, 2004) and (2) OLS estimates are still accurate in such cases where the dependent variable is a count variable (Angrist and Pischke, 2009). The results in Table 2 regarding the number of external board seats are robust to a Poisson estimation as reported in IA.1 in the internet appendix.

support for CEO and director removals. Second, such an analysis can show if the environmental failures have lasting effects.

Table 3 shows that the environmental misconduct influences CEO dismissal propensities only within a year after the revelation of EPA enforcements. On the other hand, the effects on the external board memberships last for up to 3 years. For example, Column (4) reports negative and statistically significant coefficient estimates for two years, the overall economic impact of which sums up to a decline of 6.69% in external board seats for an average firm. Within three years of the EPA enforcement, this effect increases to 7.94%. Thus, the one-year estimates reported in Table 2 severely underestimate the true economic effect of environmental misconduct on the number of external board directorships of involved CEOs.

5.4. Labor Market Consequences of EPA Enforcements over Time

While the regression sample includes the period from 2002 through 2020, the changes in CEO labor market outcomes I document in earlier may vary over time because this period coincides with several major environmental events such as the BP oil spill disaster in 2010, Hurricane Sandy in 2012, the Volkswagen emission test scandal in 2015, a rapid rise of SRI equity ownership since early 2010s, and subsequently an intensified media coverage of environmental issues. Thus, following Dyck et al. (2019), I examine if changes in CEO labor market outcomes differ after the BP oil spill in 2010. I achieve this by dividing the EPA intensity measures into two components, one for the subperiod between 2002 and 2009 and one for the subperiod between 2010 and 2020, and then test whether the EPA intensity coefficient estimates are same across the two subperiods.

Table 4 shows that the significant changes in the CEO dismissal rates and external board memberships of offending CEOs occur primarily after 2010. For example, focusing on the enforcement dummy as the measure of EPA enforcement intensity, I find that the coefficient estimate on the time period between 2002 and 2009 is 0.001 (t-stats = 0.023), and the one on the later time period is 0.026 (t-stats = 3.884) as shown in Column 1. The bottom row of this table shows that the two coefficient estimates are statistically different (p-value = 0.029). Similarly, Column 4 reports a statistically significant coefficient estimate only for the latter time period (-0.086 with a t-stats of -

2.868) where the dependent variable is the number of external board directorships, and the coefficient estimates are statistically different between the two time periods (p = 0.037). The economic effects are accordingly much larger in the second half of the sample period and larger than the economic effects documented in Table 2. For example, the decline in the number of external board directorships goes down by 7.19% in the period between 2010 and 2020 compared to 3.09% for the entire sample period in Table 2. The timing of these effects is consistent with an increased attention to environmental concerns with the BP oil spill disaster and with the rise of SRIs. It is also consistent with the increase in the negative stock market reaction to eco-harmful behavior documented by Flammer (2015).

5.5. Matched Sample Analysis

One potential concern with the results in Table 2 is that they could be driven by observable differences between firms subject to EPA enforcements and those that are not. Thus, I replicate the analysis in Table 2 after I create a matched sample using the entropy balancing approach where I reweight the control observations such that the mean and standard deviation of firm performance, firm size, total institutional and inside ownership, leverage ratio, outside director %, CEO age and the number of awards are highly similar between the two groups of firms. Unlike other matching methods, the entropy balancing method does not require subjective design choices and allows for a larger sample to be retained in the matched sample analysis (Hainmueller, 2012; Shipman, Swanquist, and Whited, 2017). Table IA.2 in the internet appendix shows no statistically significant differences between firm-year observations subject to EPA enforcements and those that are not after entropy balancing.

Table 5 presents the results from this matched sample analysis. Consistent with the baseline analysis, I note that the coefficients on the EPA enforcement intensity measures are statistically significant across all columns, suggesting that CEOs are more likely to be dismissed and also experience a decline in their external board directorships following EPA enforcements. The economic effects of changes in labor market outcomes increase, as shown by the larger magnitudes on the coefficients. For example, Column 1 reports a coefficient estimate of 0.035 compared to 0.018 in Table 2. Overall, the matched sample along with the various fixed effects suggests that observable differences between the EPA and non-EPA observations do not drive the results. However, a

remaining concern is that my findings could be driven by omitted unobservable factors not controlled for in the empirical specification. To address this concern, I augment the analysis with an identification test as detailed below.

5.6. State Policies on Emission Standards and Enforcement

Endogeneity can arise in my setting because the likelihood of being targeted by the EPA can be related to firm fundamentals and omitted variables that also jointly determine CEO labor market outcomes. For example, poor firm performance is shown to increase CEO dismissal rates (e.g., Huson et al. 2001). The CEO of a poorly performing firm can attempt to increase profits in the short-run by circumventing investments required by the EPA so as to minimize this dismissal risk. This empirical concern can show up as a positive relationship between CEO turnover and EPA enforcements even though the poor firm performance at least partially drives this effect.[20]

To more precisely capture the impact of EPA enforcement activities on CEO labor market outcomes, I use an exogenous source of change in enforcement frequency and severity. Specifically, I take advantage of the cap-and-trade program of California passed in 2011 and implemented in 2013. California is the only state in the U.S. with a mandatory cap-and-trade program that covers the majority of firms with high GHG emissions across industries. This program sets a statewide limit on GHG emissions for regulated entities, including power plants, electricity imports, and large industrial plants. Distributers of transportation fuels and natural gas are also required to comply. This program also sets absolute limits and high standards for emissions, and establishes more effective enforcement mechanisms. It comes with mechanisms to track, verify, and enforce compliance through the use of compliance instruments, and has significant violation penalties (Schmalensee and Stavins, 2017).

[20] Another example is that the political environment at the federal and state levels can influence the frequency of EPA enforcements. For example, Gulen and Myers (2022) show that the battleground status of a state can affect the EPA's enforcement activities. The regression specification used in my paper fully captures effects of state-level political environment by employing state x year fixed effects. Further, political connections and lobbying efforts (Heitz et al. 2021) can influence EPA activities. To the extent political preferences of firms do not vary over time, these effects are captured by firm fixed effects.

Given this action is exogenously imposed by the state and due to climate-change concerns, it has the potential to address the issue of endogeneity in the relation between CEO labor market outcomes and the EPA enforcement propensity. This identification strategy relies on the assumption that the EPA enforcement frequency and severity increase after California implements this program, and that this action is orthogonal to firm fundamentals such as financial performance. For the first concern, the state action not only involves higher environmental standards related to emissions and stiffer penalties, but also can signal the beginning of a new period of stricter state enforcement of environmental laws. Table IA.3 in the internet appendix shows that the EPA enforcement frequency and the penalties imposed at the state-year level increase following the implementation of the cap-and-trade program within five years of the implementation. For the second concern, this action is not at the discretion of firms, and thus its passage is unlikely to be related to firm fundamentals, and it is also unlikely to be an initiative that firms would generally lobby for its passage.

Table 6 reports results from this estimation. The key variable of interest is the interaction term between *State Action* and the EPA enforcement intensity measures. *State Action* denotes California's state-level environmental action, which equals one in the years after the regulation is implemented, and zero otherwise.[21] The first two columns show statistically significant coefficient estimates on the interaction terms, suggesting that CEO turnover increases following the EPA enforcement more so in California where stricter environmental regulations are adopted. Similarly, CEOs experience a steeper decline in the number of external board directorships following the implementation of the state initiative on emissions. For example, Column (4) reports a coefficient estimate of -0.067 (t-stats = -1.954), suggesting that CEOs hold 5.6% fewer external board memberships. Column (6) portrays a similar pattern of statistically significant coefficient estimate. Overall, Table 6 shows that the previously reported results are not fully driven by endogeneity issues, and the labor market penalties imposed on CEOs become more pronounced when the firm is subject to a greater intensity of state actions.

5.7. Supplemental Tests

[21] Note that *State Action* is dropped as it is fully captured by the state x year fixed effects.

In this section, I report results from four supplemental tests and evaluate the sensitivity of the main results to various robustness checks. Starting with the supplemental tests, I first show in Table 7 that in general, the career related effects of EPA enforcements do not extend to other top executives such as COOs and CFOs, in line with the central role of CEOs in taking charge of corporate policies.

Second, the offending CEOs are much less likely to be offered a CEO position at a comparable publicly traded firm within three years following the dismissal, as reported in Table 8. Further, the CEOs who were previously dismissed following an EPA enforcement are significantly much less likely to land on a similar CEO job in the future compared to CEOs dismissed for other reasons. Column 1 shows that CEOs are 18.5% less likely to become a CEO of another publicly traded firm within three years of dismissal if the dismissal was following an EPA enforcement. This compares to a 11.5% lower likelihood of being offered a CEO position if the dismissal was due to another reason. The difference between these two coefficient estimates is statistically different as reported in the last row of the Table (p-value = 0.017). Later columns show that such differences do not exist for the probability of being hired as a COO or a CFO within three years of the dismissal as CEO. Thus, the effects do not extend to the other top executive titles, suggesting that CEOs are the main executives penalized by their firms' environmental wrongdoings. This result is consistent with Efendi et al. (2013), who find that the CEOs displaced following the option backdating scandal are less likely to be rehired at comparable positions.

Third, I examine total CEO compensation around EPA enforcements, and find no robust changes in CEO pay, as reported in Table IA.4 in the internet appendix. Finally, I examine if the labor market consequences of EPA enforcement actions are different between the serial violators of environmental laws and other violators. Some violations may be accidental, and thus, may be less costly to the involved CEOs. I use the initial violations as a proxy for accidental violations. The results reported in Table IA.5 show that only the later EPA enforcement actions are penalized. The CEO dismissal rates, changes in the number of external directorships, and shareholder support in elections all take place for the later violations of environmental laws.

In terms of the additional robustness checks, first, I test whether the results are sensitive to excluding firms in industries with the most violations (utility firms) and with the least violations

(financial firms) and report the results in Table IA.6 in the internet appendix. Next, I control for the corporate ESG profile as reported in Table IA.7,[22] and the presence of other types of corporate misconduct as reported in Table IA.8.[23] I also repeat the main tests using only firms with CEOs younger than the age of 65, as older CEOs may be more likely to retire voluntarily from their CEO and board posts instead of being dismissed by the firm (Table IA.9). Further, I use the total cost of EPA enforcement, *EPA Total*, as an alternative measure of EPA enforcement intensity (Table IA.10). Across all these tests, I find robust evidence that the CEOs of firms engaged in EPA enforcements experience a higher likelihood of CEO turnover and a significant decline in their external board directorships.[24]

6. Potential Mechanisms of the Labor Market Effects

Having documented the labor market consequences to CEOs, in this section I attempt to identify the channels through which these effects can occur. In particular, I examine the role of shareholder voting in directorial elections and the presence of SRIs separately and jointly around the EPA enforcement actions.

6.1. The Role of Shareholder Voting in Directorial Elections

The ability of shareholders to replace ineffective directors is one of the most important aspects of corporate governance. This ensures the proper functioning of the board of directors and helps align the interests of shareholders and the board of directors. Consistent with this argument, Cai et al. (2009)

[22] The sample size drops significantly to about 16,000 firm-year observations due to the unavailability of ESG ratings for a large number of firms.

[23] These corporate misconduct events are the option backdating scandal, earnings restatements, corporate bankruptcy, dividend cuts, and acquisitions, all of which are shown by the prior studies to affect labor market outcomes for CEOs and directors. I obtain data on the option backdating scandal from the Wall Street Journal (see https://www.wsj.com/public/resources/documents/info-optionsscore06-full.html), data on earnings restatements from Audit Analytics, and data on bankruptcy, de-listings, and acquisitions from Capital IQ.

[24] I also examine the stock market reaction to the revelation of EPA enforcement activity. Panel A of Table IA.11 shows a significant decline in abnormal stock returns by about 0.35% and 0.96% within 2 and 10 days around the revelation of EPA enforcements where I use the four-factor model as in Carhart (1997) to estimate the abnormal returns. The long event windows might be more suitable in my setting because of the several days of lag between the EPA enforcement revelation and its coverage by the media. The sample size in this analysis becomes small due to missing daily returns data for some firms. Panel B uses these abnormal returns as another measure of EPA enforcement intensity and shows that the labor market outcomes for CEOs are related to the cumulative abnormal returns in the longer event window of (-10, +10), but this result is not robust to the shorter event window of (-2, +2).

find that shareholder votes in director elections respond to director performance, and Aggarwal et al. (2019) find that shareholder support at director elections affects director turnover propensity and penalties in the directorial labor market. More closely related to my study is Ertimur et al. (2012), who study the reputational penalties emanating from the option backdating scandal. They find that compensation committee members are penalized in terms of votes withheld when up for election. Further, Brochet and Srinivasan (2014) find less shareholder support in director elections when firms are involved in financial fraud.[25] Following these studies, I examine if shareholders voice their dissatisfaction with the offending CEOs in their elections to other boards as directors.

To test this conjecture, I obtain data on director elections from ISS Voting Analytics database. Focusing on agenda items related to director elections, I then extract director names from the ballot item description field and match to BoardEX dataset by director last name, CUSIP, and year. The resulting sample size for the regression analysis contains about 137,000 director-firm-year observations between 2003 and 2020.[26] Table 1 shows the average shareholder opposition is 4.91%, compared to the average of 5.86% reported in Aggarwal et al. (2019) and 5.5% in Ertimur et al. (2012). I also create a dummy variable based on shareholder disapproval rates greater than 10% as an additional proxy for shareholder voting patterns.

Table 9 presents regression estimates of the impact of EPA enforcements on shareholder voting on CEOs' elections to other boards as directors. Because firms have multiple directors, I include director fixed effects in addition to firm, state x year, and industry x year fixed effects employed in the previous tables. This ensures a perfect control of time-invariant director characteristics such as talent, gender, and education. Column 1 reports a coefficient estimate of 0.015 (t-stats = 4.820) on the existence of EPA enforcements against the firm, suggesting that shareholders increase their opposition to the elections of offending CEOs to their boards as directors. The shareholder opposition is also economically significant, a 30.5% increase in opposition for an average firm. Opposition also increases significantly with EPA enforcement intensity as reported in the next two columns. I also find a statistically significant and positive coefficient estimate on the shareholder dissent dummy variable as

[25] Further, Fischer, Gramlich, Miller, and White (2009) show that shareholder vote approval in director elections predicts stock price changes around management turnover announcements. Del Guercio et al. (2008) find that firms targeted by vote-no campaigns receive less shareholder support for their directors.
[26] Voting Analytics data are available only after 2002.

reported in the final three columns. For example, Column 4 reports a coefficient estimate of 0.082 on the EPA dummy variable, which is both statistically and economically significant.

As a whole, these results suggest that CEOs of offending firms receive significantly less voting support on elections to other boards. This finding complements the previously documented decline in external board memberships for these CEOs in two ways. First, this is another reputational cost to the CEO of firms involved in environmental misconduct. Such CEOs are penalized in the labor market by lower shareholder support in elections to other firms' boards. Second, voting at board elections can explain the loss of external directorships for the offending CEOs as prior research shows that shareholder support in board elections predicts director turnover (Aggarwal et al. 2019).

6.2. The Role of Socially Responsible Investors

In this section, I examine the role of SRIs in disciplining CEOs involved in EPA enforcements. SRIs aim to integrate ESG concepts into their investment strategies using a variety of methods including activism, and positive and negative screening (e.g., Kruger et al. 2020; Dimson et al. 2021). Thus, SRIs likely focus on corporate environmental activities more than other shareholders do. In the context of my paper, they may press firms for greater penalties imposed on the CEOs and directors involved in environmental misconduct given their significant power and resources to influence corporate behavior, as assets under their management are estimated to be about $17.1 trillion as of 2020, which is explicitly linked to ESG issues. Panel A of Table 1 reports that the average SRI equity ownership is 11.8% for the SRI measure based on being signatories to the United Nations Principles for Responsible Investment (UN PRI) and 18.7% for the SRI measure based on the average ESG ratings.

The literature on SRIs focuses on whether their investment activities are aligned with the stated goal of sustainability. Consistent with these goals, SRI funds are found to improve firms' ESG ratings and engage with their portfolio firms (Dyck et al. 2019; Kim et al. 2019; Dasgupta et al. 2021). However, there is also evidence that SRIs fall short of their promise on ESG goals, often referred to as greenwashing (e.g., Heath et al. 2022; Kim and Yoon 2021). ESG-oriented institutional investors aim to improve corporate environmental behavior by engaging in dialogue with portfolio companies on ESG issues instead of exiting (e.g., Kruger et al. 2020) and via voting on environmental and social

shareholder proposals (e.g., Dikolli et al. 2022). I use two distinct ways to identify SRIs. These are based on being signatories to UN PRI and on the average ESG ratings of investors' constituent firms. I focus on results from the first classification in the main tables and report results on the latter classification in Table IA.12 in the internet appendix. As with the other independent variables, both of these environmental activism measures are constructed as of the year prior to an EPA enforcement to ensure that SRIs do not change their holdings as a response to the EPA enforcement. The construction of these variables is explained in detail in the internet appendix.

In order to examine the potential effects of SRIs on disciplining CEOs, I use an interaction term between SRI ownership and the EPA enforcement activity. If SRIs play any important role, the impact of EPA enforcement activity documented in earlier tests should amplify external and internal penalties on CEOs of firms engaging in environmental wrongdoings.[27] Results from this estimation are reported in Table 10. The first three columns show results on the propensity to dismiss the CEOs involved in EPA enforcements as the dependent variable. SRI ownership is significantly related to the likelihood of CEO dismissal across all three measures of EPA enforcement measures. Thus, they seem to play an important role in dismissal rates of CEOs involved in environmental misconduct. For example, the coefficient estimate of 0.073 (t-stats = 2.403) in Column 1 implies that the likelihood of CEO dismissal following an EPA enforcement action increases by about 17.04% for a firm in the top quartile of SRI ownership compared to the one in the bottom quartile of SRI ownership. The next three columns show robustly that the number of external board memberships decreases with EPA enforcement intensity and SRI ownership. For example, Column 4 shows a coefficient estimate of -0.468 (t-stats = -3.201) on the enforcement dummy. This implies that the number of board seats of CEOs following an EPA enforcement action declines by about 7.95% for a firm in the top quartile of SRI ownership compared to the one in the bottom quartile of SRI ownership.

In the last three columns, I examine the voting patterns of SRIs in elections of CEOs of violating firms on their external board directorships. I find that shareholder support in these elections decreases with the magnitude of SRI ownership. For example, Column 7 shows a positive and

[27] It is important to note that I control for institutional ownership in my tests to ensure the results are not due to a general effect of monitoring by institutional investors (Chen, Dong, and Lin, 2020).

statistically significant coefficient estimate of 0.063 (t-stats = 2.353) on the interaction term between EPA enforcement dummy and SRI ownership percentage. This suggest that CEOs receive 26.12% less support from shareholders following an EPA enforcement action when their firm is in the top quartile of SRI ownership compared to the case in the bottom quartile of SRI ownership. Thus, one of the channels through which SRIs affect labor market outcomes appears to stem from their voting activities on director elections. This is in line with Dikolli et al. (2022) on the SRIs' support on environmental shareholder proposals. Overall, these results suggest that SRIs respond to a corporate violation of environmental laws negatively, in the sense that they discipline CEOs of firms subject to EPA enforcements through fewer external board directorships and a higher likelihood of CEO dismissal. This behavior of SRIs also signals that they do not engage in greenwashing.[28]

These tests answer the question of whether SRIs participate in taking disciplinary actions against the CEOs of firms involved in environmental misconduct. SRIs can also adopt an investment strategy where they select firms with superior environmental profiles (e.g., Heath et al. 2022), which would show up as a negative relationship between SRI ownership and future EPA violations in my setting. To test this conjecture, I regress the EPA enforcement intensity measures on the one-year lagged values of SRI ownership and find no robust supportive evidence, as shown in Table IA.14.

7. Considering Only Firms with EPA Enforcements

Throughout the paper, I focus on the large sample of all U.S. firm-year observations from BoardEX with an identifiable top executive from 2002 to 2020. As an alternative sample, in this subsection I report results from the main tests using only firms that have been subject to an EPA enforcement as an internal validity check. These results are reported in Table 11. Panel A presents results from the baseline regressions. It shows that CEOs are more likely to be dismissed in the aftermath of EPA enforcements, and the economic magnitudes are similar to or larger than those reported in previous tables. For example, Column 1 shows a coefficient estimate of 0.022 (t-stats =

[28] These results are robust to controlling for other governance mechanisms. Table IA.13 reports results from tests where I include additional interaction terms for inside ownership, board independence, and non-SRI institutional ownership. It rules out that the results are driven by other governance mechanisms as the coefficient estimates on SRI ownership remain robust.

3.649), which translates to a 25.28% increased likelihood of dismissal. Similar results are reported across other columns where the dependent variables are the number of external board directorships and voting opposition, respectively.

Panel B reports results involving SRI ownership with this alternative sample. It shows that the results from Panel A are amplified in presence of SRIs. CEOs are more likely to be dismissed, experience greater declines in external board directorships, and receive less shareholder support in director elections when SRIs own a greater share of the firm's equity. Thus, SRIs continue to play an important role in disciplining CEOs involved in environmental misconduct in this alternative sample. Overall, Table 11 shows that the previously reported results are robust to considering firms that have ever been subject to an EPA enforcement throughout the sample period.

8. Conclusion

EPA enforcements constitute a serious violation of environmental laws, and accordingly, they represent negative corporate environmental externalities. Despite the recent interest in mechanisms mitigating environmental harm caused by corporate actions, little is known about the role of CEO incentives. If the goal is to better understand the reasons behind why firms (fail to) adopt certain environmental programs, we must understand the incentives of key decision makers such as CEOs leading the firms. Holding CEOs responsible for the environmental failures in the labor market can be an effective way to align CEOs' interests with the environmental goals of the society. In this paper, I examine the career consequences of environmental misconduct to CEOs. This ex-post settling up as hypothesized by Fama (1980) and Fama and Jensen (1983) can provide incentives for CEOs to take more environmentally friendly policies ex-ante.

I document that the labor market imposes significant monetary and non-monetary costs on the CEOs violating environmental laws in the form of a loss of compensation, reputation, prestige and power due to the dismissal from the CEO position and external board memberships. These effects occur solely in recent years. The channels through which these effects occur are shareholder support in directorial elections and ownership by SRIs. Altogether, these results suggest that CEOs are

penalized for environmental failures. This is important because without an adverse consequence of environmental misbehavior to key corporate decision makers, similar corporate actions are likely to be repeated. The results also provide evidence that SRIs are associated with greater disciplinary actions taken against offending CEOs, which points to a bright side of these investors. SRIs as a market-based solution can supplement EPA enforcements as regulatory actions to encourage firms to improve environmental performance.

A limitation of this study is that it cannot address the potential impact on the labor market outcomes of environmentally friendly actions. The labor market effects from a negative outcome (i.e., EPA enforcements as examined in this study) may not be same as the effects from encouraging a positive outcome (i.e., investing in green energy). Another limitation by design is that it focuses on illegal corporate actions that create negative environmental externalities (i.e., EPA enforcement actions). However, firms can also take legally allowed actions that create negative environmental externalities. These questions, which complement my study, can be answered by future research.

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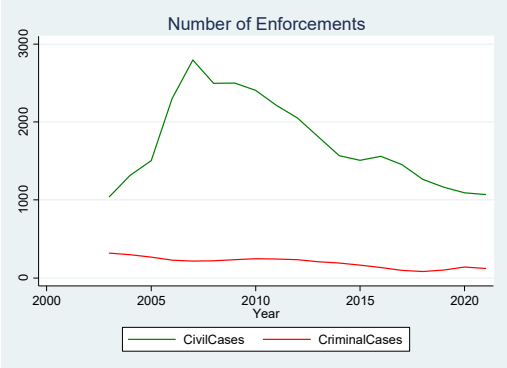
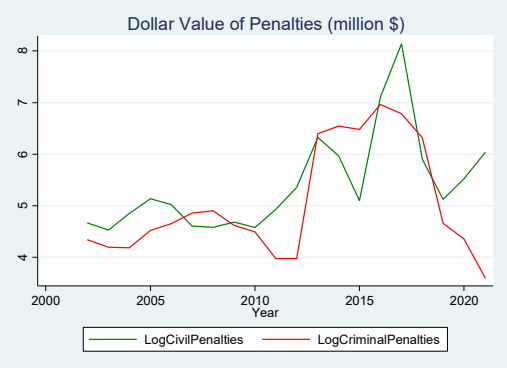


(a) Number of Enforcements



(b) Dollar Value of Penalties

Figure 1. These figures display EPA enforcement statistics over time. Figure 1a reports the total number of civil and criminal enforcement cases, and Figure 1b reports the natural logarithm of the dollar value of environmental violation penalties. The two-year moving averages of the time series are applied to smooth the data. Source: EPA Division of Enforcement.

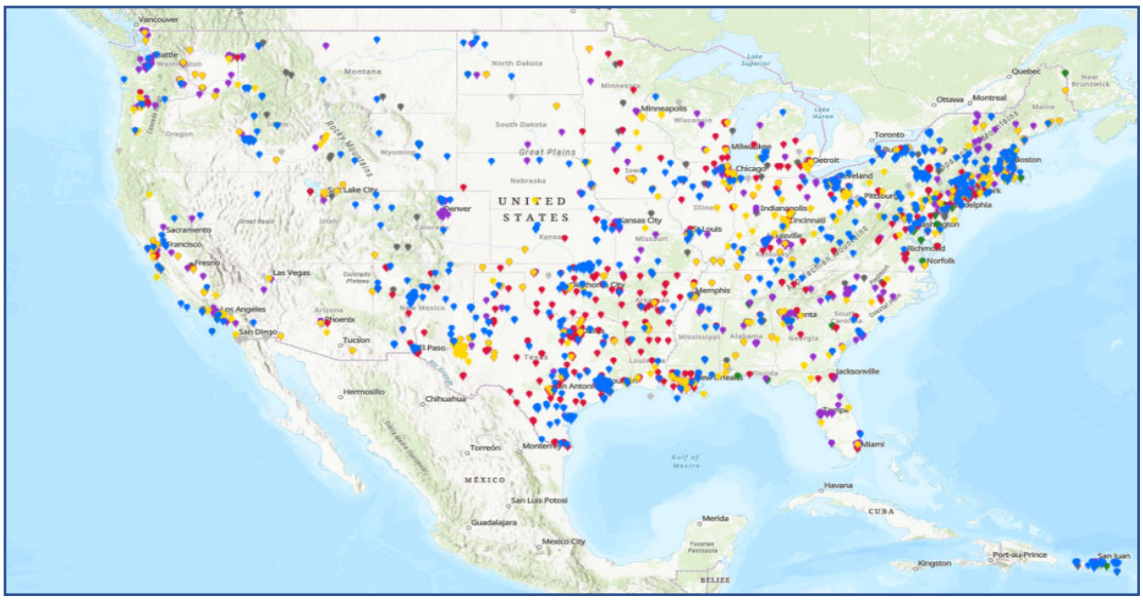


Figure 2. This figure displays the geographical distribution of the EPA enforcement cases by major enforcement area. Blue, yellow, red, and purple squares represent water, air, waste, and chemical related enforcement areas, respectively. Source: 2021 EPA annual enforcement report.

Appendix

Table 1. Variable Definitions

Variable Name	Definition
EPA Enforcement Outcomes	
Enforce Dummy	A dummy variable that equals one for firms subject to an enforcement action in a given year, zero otherwise. Source: ECHO database.
Enforce Case	The number of enforcement actions a firm is subject to in a given year. Source: ECHO database.
Enforce Penalty	The ratio of the dollar value of federal, state, and local penalties to total assets, where assets are measured in $millions. It is set to zero for firms without an enforcement action. Source: ECHO database.
Enforce Total	The ratio of the dollar value of federal, state, and local penalties, injunctive reliefs, and supplemental environmental projects to total assets, where assets are measured in $millions. It is set to zero for firms without an enforcement action. Source: ECHO database.
Labor Market Outcomes	
# External seats	Total number of outside directorships held by each CEO annually in listed firms. It excludes the board seat held by the CEO in the firm subject to the EPA enforcement. Source: BoardEx.
CEO dismissal	A dummy variable that equals one if the CEO is dismissed in the current year, zero otherwise. Source: BoardEx.
Opposition	The percentage of shareholder votes cast against or abstained in director elections. It is defined as (votes against + votes abstain) / (votes against + votes abstain + votes for). Source: Voting Analytics and BoardEx.
Opposition dummy	A dummy variable that equals one if the percentage of shareholder votes cast against or abstained is greater than or equal to 10%. Source: Voting Analytics and BoardEx.
Firm characteristics	
SRI (UN PRI based) %	Percentage of shares owned by institutional investors that are signatories to UN PRI. See the internet appendix for details about the construction of this variable. Source: 13F filings and UN PRI webpage at the link https://www.unpri.org/signatories.
SRI (ESG rating based)	Percentage of shares owned by SRIs, where activist is defined based on the average environmental rating of the portfolio firms. See the internet

	appendix for details about the construction of this variable. Source: 13F filings and Refinitiv.
EBIT ratio	Ratio of EBIT to total assets.
Log Assets	Natural logarithm of the book value of total assets in $ millions.
Board independence %	Ratio of the number of outside directors to board size.
Institutional ownership %	Percentage of shares owned by institutional investors. Source: 13F filings.
Inside ownership %	Percentage of shares owned by family and employees. Source: Refinitiv.
Director characteristics	
Log Age	Natural logarithm of the CEO (director) age. Source: BoardEx.
Log Tenure	Natural logarithm of the number of years the CEO (director) spent in the CEO (director) role. Source: BoardEx.
Female	Gender of the CEO (director). Source: BoardEx.
Number of awards	The number of business-related awards the CEO (director) is given. Source: BoardEx.
Log CEO compensation	Natural logarithm of the CEO's total compensation. Source: BoardEx.
Other characteristics	
State Action	A dummy variable that equals one if the firm is located in California in the post-implementation period of the mandatory and comprehensive cap-and-trade program. Source: various legal publications.

Table 1. Descriptive Statistics

This table reports descriptive statistics for the main variables used in the analysis. The sample includes all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables.

Panel A. Variables used in the analysis

Variable Name	Mean	Median	Std Dev
Enforce Dummy	0.051	0.000	0.219
Enforce Case	0.097	0.000	0.495
Enforce Penalty	0.253	0.000	1.834
Enforce Total	0.392	0.000	2.843
# External seats	1.196	1.000	0.782
CEO dismissal	0.087	0.000	0.282
Opposition	0.049	0.019	0.078
Opposition dummy	0.137	0.000	0.344
SRI % (UN PRI based)	0.118	0.034	0.153
SRI % (ESG rating based)	0.187	0.019	0.280
Board independence %	0.817	0.857	0.102
Inside ownership %	0.044	0.000	0.127
Institutional ownership %	0.593	0.651	0.324
Log Assets	6.711	6.709	2.101
EBIT ratio	0.003	0.053	0.566
Log CEO age	4.011	4.025	0.146
Log Tenure	2.173	2.322	1.025
Female	0.033	0.000	0.179
Number of awards	0.037	0.000	0.363
Log CEO compensation	7.016	6.975	0.690

Panel B. Distribution of average EPA enforcement intensity by industry

Industry Name	Enforce Dummy	Enforce Case	Enforce Penalty	Enforce Total
Agriculture, Forestry, And Fishing	0.0123	0.0123	0.0761	0.3310
Construction	0.0267	0.0554	0.1496	0.2435
Finance, Insurance, And Real Estate	0.0018	0.0024	0.0042	0.0042
Manufacturing	0.0751	0.1432	0.4469	0.6668
Mining	0.0911	0.2006	0.4836	0.7397
Retail Trade	0.0608	0.0937	0.1778	0.3220
Services	0.0089	0.0109	0.0350	0.0614
Transportation, Communications, Electric, Gas, And Sanitary Services	0.1268	0.2591	0.3782	0.6827
Wholesale Trade	0.0576	0.1067	0.2791	0.3955

Panel C. Distribution of average EPA enforcement intensity over time

Year	Enforce Dummy	Enforce Case	Enforce Penalty	Enforce Total
2002	0.0719	0.1507	0.3138	0.4909
2003	0.0784	0.1683	0.3332	0.4631
2004	0.0488	0.0941	0.2263	0.3781
2005	0.0455	0.0840	0.2288	0.3969
2006	0.0545	0.1001	0.2786	0.4162
2007	0.0483	0.0960	0.2579	0.4315
2008	0.0518	0.0994	0.3036	0.4900
2009	0.0473	0.0934	0.2943	0.4415
2010	0.0568	0.1074	0.3488	0.5147
2011	0.0544	0.1018	0.2804	0.4681
2012	0.0574	0.1089	0.2826	0.4470
2013	0.0536	0.0996	0.3232	0.5306
2014	0.0523	0.1012	0.2149	0.2980
2015	0.0498	0.0962	0.2345	0.3560
2016	0.0490	0.0895	0.2218	0.3182
2017	0.0521	0.0928	0.2056	0.3007
2018	0.0393	0.0757	0.1832	0.2619
2019	0.0369	0.0741	0.1921	0.2925
2020	0.0440	0.0808	0.1818	0.2754

Table 2. Labor Market Consequences of EPA Enforcements to CEOs

This table presents regression estimates of the labor market consequences of EPA enforcements to CEOs. The sample includes all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020. The dependent variable is the probability of CEO dismissal in Columns 1-3 and the total number of external board directorships held by each CEO in Columns 4-6. The total number of seats excludes the board seat held by the CEO in the firm subject to the EPA enforcement. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy	0.018**			-0.037**		
	[2.580]			[-2.312]		
Enforce Case		0.009***			-0.033***	
		[3.805]			[-4.467]	
Enforce Penalty			0.002***			-0.005***
			[3.241]			[-3.361]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664
R-squared	0.227	0.227	0.227	0.727	0.727	0.727

Table 3. Dynamic Effects of EPA Enforcements

This table presents regression estimates of the changes in the probability of CEO dismissal and external board seats within three years following EPA enforcements. The sample includes all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020. The dependent variable is the probability of CEO dismissal in Columns 1-3, and the total number of external board directorships held by each CEO in Columns 4-6. It excludes the board seat held by the CEO in the firm subject to the EPA enforcement. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**		
	Enforce Dummy	**Enforce Case**	**Enforce Penalty**	**Enforce Dummy**	**Enforce Case**	**Enforce Penalty**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
T+1	0.018**	0.009***	0.002***	-0.040**	-0.032***	-0.005***
	[2.754]	[3.793]	[3.172]	[-2.270]	[-4.160]	[-3.487]
T+2	0.004	0.008	0.001	-0.040**	-0.028***	-0.004*
	[0.421]	[1.580]	[1.279]	[-2.359]	[-4.752]	[-1.989]
T+3	-0.004	-0.004	0.000	-0.015	-0.009	-0.003**
	[-0.359]	[-0.724]	[0.287]	[-1.585]	[-1.502]	[-2.314]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,110	47,110	47,097	47,110	47,110	47,097
R-squared	0.228	0.228	0.228	0.726	0.726	0.726

Table 4. Labor Market Consequences of EPA Enforcements Over Time

This table presents regression estimates of the labor market consequences of EPA enforcements to CEOs over time. The dependent variable is the probability of CEO dismissal in Columns 1-3 and the total number of external board directorships held by each CEO in Columns 4-6. It excludes the board seat held by the CEO in the firm subject to the EPA enforcement. The EPA intensity measures are divided into two components, one for the subperiod between 2002 and 2009 and one for the subperiod between 2010 and 2020. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
(a) 2002-2009	0.001	-0.001	-0.001	0.027	0.009	0.001
	[0.023]	[-0.085]	[-0.811]	[0.785]	[0.535]	[0.356]
(b) 2010-2020	0.026***	0.010**	0.003***	-0.086**	-0.066***	-0.009***
	[3.884]	[2.377]	[4.695]	[-2.868]	[-5.200]	[-3.414]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664
R-squared	0.227	0.227	0.227	0.727	0.727	0.727
p-value for (a) = (b)	0.029	0.001	0.037	0.022	0.023	0.001

Table 5. Labor Market Consequences of EPA Enforcements to CEOs: Matching Sample Analysis

This table presents regression estimates of the labor market consequences of EPA enforcements to CEOs in a matched sample. Entropy balancing is used to match the sample of firms subject to EPA enforcements to those without an EPA enforcement based on the following characteristics: the natural logarithm of total assets, the ratio of EBIT to total assets, the ratio of debt to total assets, board independence percentage, inside and total institutional ownership percentage, the natural logarithm of CEO's age and the number of awards in a given year. The dependent variable is the probability of CEO dismissal in Columns 1-3 and the total number of external board directorships held by each CEO in Columns 4-6. It excludes the board seat held by the CEO in the firm subject to the EPA enforcement. Results are reported separately for each of the three EPA enforcement intensity measures. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy	0.035***			-0.050*		
	[3.496]			[-1.972]		
Enforce Case		0.014**			-0.045***	
		[2.205]			[-4.105]	
Enforce Penalty			0.002**			-0.006**
			[2.211]			[-2.756]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,636	47,636	47,636	47,636	47,636	47,636
R-squared	0.356	0.356	0.356	0.749	0.749	0.749

Table 6. Labor Market Consequences of EPA Enforcements around State Initiatives

This table presents regression estimates of the impact of the state emission-related initiatives on the labor market consequences of EPA enforcements to CEOs. The sample includes all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020. State Action is an indicator variable equaling one in the years after the California's mandatory cap-and-trade program is implemented for firms located in California, and zero otherwise. The dependent variable is the probability of CEO dismissal in Columns 1-3 and the total number of external board directorships held by each CEO in Columns 4-6. It excludes the board seat held by the CEO in the firm subject to the EPA enforcement. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy x State Action	0.107**			-0.067*		
	[2.580]			[-1.954]		
Enforce Case x State Action		0.043**			0.007	
		[2.347]			[0.428]	
Enforce Penalty x State Action			0.009			-0.014**
			[1.673]			[-2.352]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664
R-squared	0.227	0.227	0.227	0.727	0.727	0.727

Table 7. Labor Market Consequences of EPA Enforcements to Other Senior Managers

This table presents regression estimates of the labor market consequences of EPA enforcements to COOs and CFOs. The sample includes all firm-year observations from BoardEX with an identifiable COO and CFO, respectively, and where the top manager does not jointly run the company as a CEO. The dependent variable is the probability of dismissal in Columns 1-3 and the total number of external board directorships held in Columns 4-6. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Chief Operating Officers						**Chief Financial Officers**					
	Dismissal Probability			**External Board Seats**			**Dismissal Probability**			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Enforce Dummy	0.033*			-0.069			0.009			-0.025		
	[2.131]			[-1.636]			[0.630]			[-1.163]		
Enforce Case		0.002			-0.023			0.011			-0.019**	
		[0.192]			[-0.988]			[1.411]			[-2.146]	
Enforce Penalty			-0.001			0.002			0.002			-0.001
			[-0.377]			[0.355]			[1.215]			[-0.307]
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,668	5,668	5,668	5,668	5,668	5,668	14,391	14,391	14,391	14,391	14,391	14,391
R-squared	0.491	0.491	0.491	0.875	0.875	0.875	0.320	0.320	0.320	0.817	0.817	0.817

Table 8. The Probability of Being Rehired as a CEO

This table presents regression estimates of the probability of being hired as a top executive within three years of being dismissed as the CEO of the firm subject to an EPA enforcement. The sample includes all U.S. firm-year observations from BoardEX with an identifiable top executive from 2002 to 2020. The dependent variable is the probability of being a CEO in Column 1, a COO in Column 2, a CFO in Column 3, and either a CEO, COO, or a CFO in Column 4. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Hired as CEO	**Hired as COO**	**Hired as CFO**	**Hired as Either**
Variables	**(1)**	**(2)**	**(3)**	**(4)**
(a) Previously dismissed – EPA offender	-0.185***	-0.032	-0.113***	-0.330***
	[-8.401]	[-1.053]	[-7.351]	[-8.792]
(b) Previously dismissed – other reason	-0.115***	-0.050***	-0.110***	-0.276***
	[-5.712]	[-5.987]	[-8.570]	[-13.827]
Firm-specific control variables	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes
Observations	64,343	64,343	64,343	64,343
R-squared	0.103	0.105	0.058	0.066
p-value for (a) = (b)	0.017	0.554	0.859	0.224

Table 9. Shareholder Voting and Labor Market Consequences of EPA Enforcements

This table presents regression estimates of the impact of EPA enforcements on shareholder voting on CEOs' elections to the board. The sample includes all U.S. firm-year-director election observations from BoardEX that are matched to Voting Analytics by director name from 2003 to 2020. Voting Analytics data are available after 2002. The dependent variable is the fraction of votes cast against in director elections in Columns 1-3 and a dummy variable that equals one whenever the shareholder dissent is 10% or higher in Columns 4-6. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as director, firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Voting Opposition %			**Voting Opposition Dummy**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy	0.015***			0.082***		
	[4.820]			[3.367]		
Enforce Case		0.001**			0.022**	
		[2.622]			[2.375]	
Enforce Penalty			0.004***			0.007**
			[2.962]			[2.841]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	137,664	137,664	137,664	137,664	137,664	137,664
R-squared	0.492	0.492	0.492	0.438	0.438	0.438

Table 10. SRIs and Labor Market Consequences of EPA Enforcements

This table presents regression estimates of the impact of SRIs on the labor market consequences of EPA enforcements to CEOs. The SRI variable used in this table is the UN PRI signatory based SRI. The dependent variable is the probability of CEO dismissal in Columns 1-3, the total number of external board directorships held by each CEO in Columns 4-6, and the fraction of votes cast against in director elections in Columns 7-9. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as director, firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**			**Voting Opposition %**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Enforce Dummy x SRI	0.073**			-0.468***			0.063**		
	[2.403]			[-3.201]			[2.353]		
Enforce Case x SRI		0.029**			-0.234***			0.017*	
		[2.134]			[-2.981]			[1.749]	
Enforce Penalty x SRI			0.011***			-0.035**			0.008**
			[4.387]			[-2.262]			[2.220]
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	No	No	No	No	No	No	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664	137,664	137,664	137,664
R-squared	0.227	0.227	0.227	0.727	0.727	0.727	0.493	0.493	0.493

Table 11. Alternative Sample: Firms with EPA Enforcements

This table presents regression estimates for only firms that have been subject to an EPA enforcement. The regression specification includes time-varying firm and director specific control variables as well as director, firm, state-year, and industry-year fixed effects. Panel A reports results from the baseline regressions where the changes in CEO dismissal rates, the number of external board directorships, and voting opposition are the dependent variables in Columns 1-3, 4-6, and 7-9, respectively. Panel B reports results from the role of SRIs in these dependent variables in this alternative sample. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A. Baseline estimates

	CEO Dismissal Probability			**External Board Seats**			**Voting Opposition %**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Enforce Dummy	0.022***			-0.042**			0.014***		
	[3.649]			[-2.636]			[4.377]		
Enforce Case		0.010***			-0.036***			0.004***	
		[3.431]			[-5.634]			[3.112]	
Enforce Penalty			0.002**			-0.005***			0.001**
			[2.733]			[-2.878]			[2.573]
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	No	No	No	No	No	No	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,896	8,896	8,896	8,896	8,896	8,896	42,854	42,854	42,854
R-squared	0.294	0.294	0.294	0.679	0.680	0.680	0.486	0.486	0.486

Panel B. The role of SRIs

	CEO Dismissal Probability			External Board Seats			Voting Opposition %		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Enforce Dummy x SRI	0.072*			-0.334*			0.072**		
	[2.023]			[-2.075]			[2.631]		
Enforce Case x SRI		0.031**			-0.181*			0.019*	
		[2.513]			[-1.844]			[2.064]	
Enforce Penalty x SRI			0.011***			-0.026*			0.010**
			[4.053]			[-1.768]			[2.586]
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	No	No	No	No	No	No	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,896	8,896	8,896	8,896	8,896	8,896	42,854	42,854	42,854
R-squared	0.294	0.294	0.294	0.680	0.681	0.680	0.486	0.486	0.486

INTERNET APPENDIX

This appendix provides results from various robustness tests used to supplement the main results and additional supplementary text. The contents of the appendix are as follows.

Construction of SRI Ownership (supplement to Table 10)

IA.1. Poisson Estimation of the External Board Directorships (supplement to Table 2)

IA.2. Matching Diagnostics (supplement to Table 5)

IA.3. State Actions and EPA Enforcement Intensity (supplement to Table 6)

IA.4. CEO Compensation Following EPA Enforcements

IA.5. First Enforcement versus Later Enforcements

IA.6. Excluding Industries with the Most and Least EPA Violations

IA.7. Controlling for ESG ratings

IA.8. Controlling for Other Types of Corporate Misconduct

IA.9. Excluding Older CEOs

IA.10. Total Cost of EPA Enforcement as an Additional Proxy

IA.11. Market Reaction to EPA Enforcements and Changes in Labor Market Outcomes

IA.12. SRIs and Labor Market Consequences of EPA Enforcements: ESG Rating based SRI Holdings (supplement to Table 10)

IA.13. SRIs and Labor Market Consequences of EPA Enforcements: Other Channels (supplement to Table 10)

IA.14. SRIs and EPA Enforcement Intensity (supplement to Table 10)

Construction of SRI ownership

For the first SRI measure, I use data on investors self-identified as committed to environmental protection. In particular, I consider funds that are signatories to UN PRI as environmentally active (e.g., Dyck et al. 2019; Liang, Sun, and Teo, 2022; Kim and Yoon, 2021). These funds' main pledge is to adhere to incorporate ESG issues into their investment policies.[1] The UN PRI lists the names and self-pledge dates since April 2006. I manually match the investors in the UN PRI list with institutional investors in Refinitiv's 13F filings using investor name, and then compute the sum of shareholdings of these investors in every firm and quarter separately using 13F filings. Table 1 shows that such institutional investors hold on average 11.8% of firms' free floated shares.

For the second measure, I rely on the ESG rating profiles of constituent firms of institutional investor portfolios, as in Hwang, Titman, and Wang (2021) and Cao, Titman, Zhan, and Zhang (2022). I use the environmental rating of each firm from Refinitiv database, and compute the value-weighted environmental rating of portfolio firms. I then rank all institutional investors by the average ESG rating and consider an investor to be environmentally active if it is in the top quartile of investors on an annual basis. In the final step, I calculate the sum of shareholdings of these investors in every firm and quarter separately using Refinitiv institutional holdings data. Table 1 shows that such institutional investors hold on average 18.7% of firms' free floated shares.

[1] The UN PRI is an international organization that is among the leading proponents of incorporating ESG factors into fund and corporate decision-making. The self-pledge allows the fund to signal to the public it is committed to responsible investment. The full list of signatories is available at https://www.unpri.org/signatories.

Table IA.1. Poisson Estimation of the External Board Directorships

This table presents Poisson regression estimates of the labor market consequences of EPA enforcements to CEOs. The sample includes all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020. The dependent variable is the total number of external board directorships held by each CEO. It excludes the board seat held by the CEO in the firm subject to the EPA enforcement. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	**(1)**	**(2)**	**(3)**
Enforce Dummy	-0.060**		
	[-2.555]		
Enforce Case		-0.045***	
		[-4.019]	
Enforce Penalty			-0.008***
			[-3.160]
Firm-specific control variables	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes
Observations	44,962	44,962	44,962
Pseudo R2	0.109	0.109	0.109

Table IA.2. Matching Diagnostics

This table presents the matching diagnostics for the matched sample analysis in Table 5. Entropy balancing is used to match the sample of firms subject to EPA enforcements to those without an EPA enforcement based on the following characteristics: the natural logarithm of total assets, the ratio of EBIT to total assets, the ratio of debt to total assets, board independence percentage, inside and total institutional ownership percentage, the natural logarithm of CEO's age and the number of awards in a given year. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Before Entropy Balancing				After Entropy Balancing			
	EPA firms		Control firms		EPA firms		Control firms	
Variables	**Mean**	**Variance**	**Mean**	**Variance**	**Mean**	**Variance**	**Mean**	**Variance**
Log (total assets)	8.704	2.990	6.603	4.265	8.704	2.990	8.704	2.990
EBIT/total assets	0.085	0.025	-0.001	0.336	0.085	0.025	0.085	0.025
Leverage	1.059	12.030	0.618	7.440	1.059	12.030	1.059	12.030
Board independence %	0.856	0.007	0.815	0.011	0.856	0.007	0.856	0.007
Inside ownership %	0.018	0.007	0.045	0.017	0.018	0.007	0.018	0.007
Institutional ownership %	0.715	0.054	0.586	0.107	0.715	0.054	0.715	0.054
Log (CEO age)	4.023	0.013	4.010	0.022	4.023	0.013	4.023	0.013
# Awards	0.086	0.245	0.034	0.126	0.086	0.245	0.086	0.245

Table IA.3. CEO Compensation Following EPA Enforcements

This table presents regression estimates of the change in total CEO compensation following EPA enforcements. The sample includes all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020 and with compensation data. The dependent variable is the natural logarithm of total CEO pay in Columns 1-3, and the natural logarithm of direct CEO pay in Columns 4-6. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Log (Total CEO Pay)			Log (Direct CEO Pay)		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy	0.022			-0.015		
	[0.783]			[-0.476]		
Enforce Case		0.021**			0.004	
		[2.176]			[0.344]	
Enforce Penalty			0.001			0.001
			[0.681]			[0.361]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,330	8,330	8,330	8,393	8,393	8,393
R-squared	0.746	0.746	0.746	0.737	0.737	0.737

Table IA.4. State Actions and EPA Enforcement Intensity

This table presents regression estimates of the impact of state actions on the labor market consequences of EPA enforcements to CEOs within five years of the implementation. The dependent variable is each of the three EPA enforcement intensity measures aggregated at the state-year level. State action denotes California's cap-and-trade mandatory policy, which equals one in the years after the regulation is implemented in 2013, and zero otherwise. The regression specification includes year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Enforce Dummy	**Enforce Case**	**Enforce Penalty**
Variables	**(1)**	**(2)**	**(3)**
State action	3.180***	6.055***	27.364***
	[5.259]	[4.783]	[8.687]
Year FEs	Yes	Yes	Yes
Observations	670	670	670
R-squared	0.006	0.005	0.017

Table IA.4. Initial EPA Enforcement Actions versus Other EPA Enforcement Actions

This table presents regression estimates of the labor market consequences of first versus later EPA enforcement actions to CEOs. The dependent variable is the probability of CEO dismissal in Columns 1-3, the total number of external board directorships held by each CEO in Columns 4-6, and the fraction of votes cast against in director elections in Columns 7-9. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as director, firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**			**Voting Opposition %**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Initial Enforce Dummy	0.022			0.048**			0.005		
	[1.349]			[2.433]			[1.145]		
Other Enforce Dummy	0.016**			-0.076***			0.022***		
	[2.119]			[-4.241]			[4.640]		
Initial Enforce Case		0.004			0.019			0.000	
		[0.517]			[1.000]			[0.226]	
Other Enforce Case		0.010**			-0.044***			0.001	
		[3.759]			[-7.999]			[0.672]	
Initial Enforce Penalty			0.003			0.001			0.000
			[1.679]			[0.332]			[0.359]
Other Enforce Penalty			0.001**			-0.007***			0.002**
			[2.473]			[-4.399]			[2.661]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	No	No	No	No	No	No	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664	137,664	137,664	137,664
R-squared	0.227	0.227	0.227	0.727	0.727	0.727	0.492	0.492	0.492

Table IA.5. Excluding Industries with the Most and Least Frequent EPA Violations

This table presents regression estimates from replicating results in Table 2 after excluding industries with the most and least frequent EPA violations (utility firms and financial firms, respectively). The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Exclude utility firms						**Exclude financial firms**					
	Dismissal Probability			**External Board Seats**			**Dismissal Probability**			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Enforce Dummy	0.021**			-0.044**			0.018***			-0.034**		
	[2.817]			[-2.681]			[2.948]			[-2.322]		
Enforce Case		0.010***			-0.035***			0.010***			-0.032***	
		[4.479]			[-3.834]			[5.442]			[-4.501]	
Enforce Penalty			0.002***			-0.005***			0.002***			-0.005***
			[3.188]			[-3.242]			[3.437]			[-3.301]
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43,326	43,326	43,326	43,326	43,326	43,326	36,834	36,834	36,834	36,834	36,834	36,834
R-squared	0.228	0.228	0.228	0.729	0.729	0.729	0.231	0.231	0.231	0.713	0.713	0.713

Table IA.6. Controlling for ESG ratings

This table presents regression estimates from replicating results in Table 2 after controlling for ESG ratings. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Control for ESG ratings					
	Dismissal Probability			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy	0.026**			-0.038*		
	[2.228]			[-1.783]		
Enforce Case		0.017***			-0.035***	
		[5.573]			[-3.734]	
Enforce Penalty			0.003*			-0.006**
			[1.954]			[-2.291]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,024	16,024	16,024	16,024	16,024	16,024
R-squared	0.330	0.330	0.330	0.780	0.780	0.780

Table IA.7. Controlling for other types of corporate misconduct

This table presents regression estimates from replicating results in Table 2 after controlling for other types of corporate misconduct. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Dismissal Probability			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy	0.018**			-0.038**		
	[2.332]			[-2.244]		
Enforce Case		0.009***			-0.033***	
		[2.935]			[-3.950]	
Enforce Penalty			0.002**			-0.005***
			[2.476]			[-3.319]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664
R-squared	0.227	0.227	0.227	0.728	0.728	0.728

Table IA.8. Excluding older CEOs

This table presents regression estimates from replicating results in Table 2 after excluding CEOs older than the age of 65. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Dismissal Probability			**External Board Seats**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Enforce Dummy	0.013**			-0.040**		
	[2.118]			[-2.277]		
Enforce Case		0.008**			-0.037***	
		[2.862]			[-4.129]	
Enforce Penalty			0.002**			-0.005**
			[2.472]			[-2.820]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	41,503	41,503	41,503	41,503	41,503	41,503
R-squared	0.233	0.233	0.233	0.722	0.722	0.722

Table IA.9. Labor Market Consequences of EPA Enforcements to CEOs: Total Cost of EPA Enforcements

This table presents regression estimates of the labor market impact of the total cost of EPA enforcements to CEOs. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Dismissal Probability	**External Board Seats**	**Voting Opposition**
Variables	**(1)**	**(2)**	**(3)**
EPA Total	-0.003**	0.001***	0.001**
	[-2.831]	[3.267]	[2.299]
Firm-specific control variables	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
Director FEs	No	No	Yes
State x Year FEs	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes
Observations	47,664	47,664	137,664
R-squared	0.727	0.227	0.492

Table IA.10. Market Reaction to Revelation of EPA Enforcement Actions and Consequences to CEOs

This table presents results from an event study analysis around the revelation of EPA enforcement actions. Panel A reports the average cumulative abnormal returns (CARs) along with the test statistics within 10 days and 2 days around the revelation. The four-factor model (Fama and French 3 factors plus momentum as in Carhart (1997)) is used to estimate the abnormal returns. Panel B reports results from the changes in CEO labor market outcomes following the revelation of EPA enforcement actions and how the changes are related to the CARs. The regression specification in Panel B includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A. Market Reaction to Revelation of EPA Enforcement Actions

	Average CAR	Signrank Test (p-value)	% Negative CAR	No of Observations
Variables	**(1)**	**(2)**	**(3)**	**(4)**
CAR (-10, +10)	-0.961%*** [-2.876]	0.017	51.42%	1,159
CAR (-2, +2)	-0.357%** [-2.543]	0.019	52.80%*	1,159

Panel B. Consequences of EPA Enforcement Actions to CEOs

	CAR (-10, +10)			CAR (-2, +2)		
	Dismissal Probability	External Board Seats	Voting Opposition	Dismissal Probability	External Board Seats	Voting Opposition
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
CAR	0.133	0.312*	-0.084*	0.221	1.085**	-0.050
	[1.531]	[1.891]	[-2.061]	[0.714]	[2.403]	[-0.434]
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	No	No	Yes	No	No	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	45,874	45,874	137,664	45,874	45,874	137,664
R-squared	0.233	0.729	0.492	0.729	0.233	0.492

Table IA.11. SRIs and Labor Market Consequences of EPA Enforcements: ESG Rating Based SRI Holdings

This table presents regression estimates of the impact of SRIs on the labor market consequences of EPA enforcements to CEOs. The SRI variable is based on the average ESG ratings of investee firms. The dependent variable is the probability of CEO dismissal in Columns 1-3, the total number of external board directorships held by each CEO in Columns 4-6, and the fraction of votes cast against in director elections in Columns 7-9. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as director, firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			**External Board Seats**			**Voting Opposition %**		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Enforce Dummy x SRI	0.014			-0.238***			0.032**		
	[0.529]			[-3.140]			[2.475]		
Enforce Case x SRI		0.008***			-0.117***			0.009*	
		[3.042]			[-3.008]			[2.042]	
Enforce Penalty x SRI			0.005			-0.019**			0.005**
			[0.356]			[-2.320]			[2.461]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	No	No	No	No	No	No	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664	137,664	137,664	137,664
R-squared	0.227	0.227	0.227	0.727	0.727	0.727	0.494	0.494	0.494

Table IA.12. SRIs and Labor Market Consequences of EPA Enforcements: Other Channels

This table presents regression estimates of the impact of inside ownership, board independence, and non-SRI institutional ownership on the labor market consequences of EPA enforcements to CEOs. The dependent variable is the probability of CEO dismissal in Columns 1-3, the total number of external board directorships held by each CEO in Columns 4-6, and the fraction of votes cast against in director elections in Columns 7-9. Results are reported separately for each of the three EPA enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as director, firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	CEO Dismissal Probability			External Board Seats			Voting Opposition %		
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Enforce Dummy x Inside ownership	0.052			-0.244			0.098		
	[1.035]			[-1.024]			[1.106]		
Enforce Dummy x Board independence	0.262***			0.098			0.000		
	[4.281]			[0.464]			[0.011]		
Enforce Dummy x non-SRI	0.117**			0.138			0.101*		
	[2.136]			[0.796]			[1.794]		
Enforce Dummy x SRI	0.128***			-0.380**			0.109**		
	[4.427]			[-2.616]			[2.527]		
Enforce Case x Inside ownership		0.049			-0.151			0.030	
		[1.727]			[-1.111]			[0.923]	
Enforce Case x Board independence		0.096***			-0.081			-0.000	
		[3.500]			[-0.785]			[-0.001]	
Enforce Case x non-SRI		0.043*			0.165*			0.043**	
		[1.944]			[1.906]			[2.800]	
Enforce Case x SRI		0.048***			-0.149*			0.038**	
		[3.347]			[-2.044]			[2.804]	
Enforce Penalty x Inside ownership			0.009			-0.064***			0.014**
			[0.998]			[-2.916]			[2.160]
Enforce Penalty x Board independence			0.004			-0.018			-0.008
			[0.585]			[-0.905]			[-0.488]
Enforce Penalty x non-SRI			0.004			0.022*			0.005
			[0.705]			[2.000]			[0.764]
Enforce Penalty x SRI			0.012***			-0.020			0.010**
			[3.095]			[-1.394]			[2.281]
Firm-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Director FEs	No	No	No	No	No	No	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State x Year and Industry x Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,664	47,664	47,664	47,664	47,664	47,664	137,664	137,664	137,664
R-squared	0.227	0.227	0.227	0.727	0.727	0.727	0.494	0.494	0.494

Table IA.13. SRIs and EPA Enforcement Intensity

This table presents the relation between SRI holdings and the subsequent EPA enforcement activities. The sample includes all U.S. firm-year observations from BoardEX with an identifiable CEO from 2002 to 2020. The dependent variable is each of the three enforcement intensity measures. The regression specification includes time-varying firm and director specific control variables as well as firm, state-year, and industry-year fixed effects. Table 1 in the Appendix provides variable definitions. I winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by double clustering at the state and year levels. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

	Enforce Dummy	**Enforce Case**	**Enforce Penalty**
Variables	**(1)**	**(2)**	**(3)**
SRI	-0.021	-0.053**	-0.082
	[-1.486]	[-2.287]	[-0.708]
Firm-specific control variables	Yes	Yes	Yes
CEO-specific control variables	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
State x Year FEs	Yes	Yes	Yes
Industry x Year FEs	Yes	Yes	Yes
Observations	45,707	45,707	45,707
R-squared	0.557	0.677	0.376

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