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Rhetoric, Reality, and Reputation: Do CSR and Political Lobbying Protect Shareholder Wealth against Environmental Lawsuits?

Chelsea Liu, Chee Seng Cheong, and Ralf Zurbruegg*

Abstract

We investigate whether firms' corporate social responsibility (CSR) reputations and environmental lobbying efforts protect shareholder wealth in the event of environmental lawsuits. Using a sample of lawsuits filed in United States Federal Courts, we find that firms with superior CSR reputations suffer worse market reactions to environmental allegations. In contrast, lobbying cushions filing-date valuation losses, providing insurance-like protection against lawsuits. Our results are robust to subsample analyses, a falsification test, propensity score matching, and alternative empirical proxies and model specifications.

I. Introduction

Environmental catastrophes, such as BP's Gulf of Mexico oil spill in 2010, highlight the extent to which corporate conduct can harm the environment and deplete shareholder wealth. Firms can manage potential environmental exposure by pursuing corporate social responsibility (CSR) initiatives, or by engaging in political lobbying to influence environmental laws. For example, BP conducted an aggressive green-rebranding campaign prior to its 2010 oil spill to establish its reputation as an environmentally responsible firm (Matejek and Gössling (2014)). Simultaneously, BP wielded considerable power to shape global environmental regulations, as demonstrated by the European Union (EU) abandoning its proposed environmental policies in 2016 after BP threatened to exit the EU market (Neslen (2016)).

*Liu (corresponding author), chelsea.liu@adelaide.edu.au, University of Adelaide Business School; Cheong, chee.cheong@adelaide.edu.au, University of Adelaide Business School; and Zurbruegg, ralf.zurbrugg@adelaide.edu.au, University of Adelaide Business School. We are grateful to Efraim Benmelech, Philip Bond, Paul Brockman, Jean Canil, Ran Duchin, Alex Edmans, Andrea Eisfeldt, Huasheng Gao, Umit Gurun, Jarrad Harford, Alan Hess, Christopher Hrdlicka, Avraham Kamara, Jonathan Karpoff, Sanne Knudsen, Jennifer Koski, Juan Luo, Paul Malatesta (the editor), Sarah McVay, George Mihaylov, Thuc Anh Nguyen, Edward Rice, Stephan Siegel, Avanidhar Subrahmanyam, Victoria Vanasco, Eric Wehrly (the referee), and participants at a seminar presentation at the University of Washington for their helpful comments and discussions.

This study examines the impacts of CSR and lobbying on firm value in the event of environmental lawsuits. Prior studies have documented negative market reactions to environmental violations (Bhagat, Bizjak, and Coles (1998), Karpoff, Lott, and Wehrly (2005)). However, Karpoff et al. find that the magnitude of losses of market value corresponds to the legal penalties incurred by the firms, indicating that no additional reputational penalties are imposed by the capital markets. In this study, we build upon the prior work of Karpoff et al. and examine firm-specific policies, namely CSR and lobbying, in determining firms' stock price reactions to lawsuits alleging environmental infractions.

Recently, corporate environmental responsibility has attracted significant managerial and social attention (Flammer (2013)), but there remains mixed evidence on the economic value of pursuing CSR (Boubakri, El Ghoul, Wang, Guedhami, and Kwok (2016), Kölbel, Busch, and Jancso (2017), and Krüger (2015)). Specifically, debates persist over whether CSR enhances firm value (e.g., Fernando, Sharfman, and Uysal (2017), Ferrell, Liang, and Renneboog (2016), and Koh, Qian, and Wang (2014)), or manifests agency problems that drain shareholder resources and reduce productivity (e.g., Chin, Hambrick, and Treviño (2013), Christensen, Floyd, Liu, and Maffett (2017), Di Giuli and Kostovetsky (2014), and Petrenko, Aime, Ridge, and Hill (2016)). We contribute to the debate by using environmental lawsuits to examine the discrepancy between a firm's *perceived* CSR reputation and *actual* environmental (mis)conduct. Specifically, we argue that the existing environmental reputation of a firm plays an important role in determining the market returns upon environmental lawsuit filings. On the one hand, if the CSR reputation is positively priced by equity investors, any revelation of firm conduct that falls short of expectations will result in negative market updating. Therefore, firms with higher environmental CSR ratings should experience greater capital market penalties if accused of eco-harmful conduct. On the other hand, prior researchers argue that CSR engagement serves to protect firms from negative consequences in the event of alleged infractions (Godfrey, Merrill, and Hansen (2009), Hong and Liskovich (2017), and Koh et al.). Consequently, firms with a better environmental reputation may experience cushioned market reactions to lawsuits. Our evidence supports the first of these competing perspectives. We find that environmental lawsuits have significantly worse valuation impacts on firms with superior CSR scores.

In contrast to CSR, which involves changing firm behavior, lobbying constitutes an alternative strategy "aimed at changing policy proposals to benefit firms and/or industries" (Unsal, Hassan, and Zirek ((2017), p. 411)). Prior literature finds that lobbying builds political capital and increases firm value (Amore and Bennedsen (2013), Cooper, Gulen, and Ovtchinnikov (2010), and Goldman, Rocholl, and So (2009)). In the context of environmental lobbying, Delmas, Lim, and Nairn-Birch (2016) document a U-shaped relationship between a firm's greenhouse gas emissions and lobbying expenditure, indicating that firms with both very high and very low greenhouse gas emissions tend to lobby more on environmental issues. A growing body of literature examines the relationship between lobbying and litigation, finding that lobbying reduces a firm's likelihood of being subject to fraud enforcement actions (Correia (2014), Yu and Yu (2011)) and labor lawsuits (Unsal et al.). However, the role of lobbying in relation to

environmental lawsuits remains unexplored. This leads us to develop our second hypothesis. We argue that lobbying on environmental issues builds political goodwill and provides an insurance-like protection to firms. Given prior evidence that lobbying firms enjoy higher success rates (Unsal et al.) and incur less severe penalties (Correia (2014)) in other types of lawsuit, we expect the market to anticipate similar benefits in the context of environmental lawsuits, resulting in smaller losses of shareholder value upon lawsuit filings.

To test these hypotheses, we use a sample of firms listed on the Standard & Poor's 1500 Index (S&P 1500). We obtain data on environmental CSR ratings from the Kinder, Lydenberg, Domini (KLD) Database, and lobbying data from the Center for Responsive Politics.[1] Specifically, the KLD ratings consist of scores measuring the number of environmental "strengths" and environmental "concerns," which are commonly aggregated into one unitary score to measure environmental reputation (Chava (2014), Servaes and Tamayo (2013), and Werner (2015)). Next, we collect all environmental lawsuits filed in the United States (U.S.) Federal Courts during 2000–2015 against S&P 1500 firms from the Public Access to Court Electronic Records (PACER) database. We follow the event study methodology of Bizjak and Coles (1995), Karpoff, Lee, and Martin (2008), and Gande and Lewis (2009), who use lawsuit filing dates as their key event dates because, arguably, the filing of a lawsuit contains the most significant public release of information concerning an environmental breach. However, we also consider other event dates in our robustness analysis, such as the date of discovery of a violation or scientific testing, if known. We estimate ordinary least squares (OLS) regressions using firms' lagged CSR scores and lobbying efforts to predict the cumulative abnormal returns (CAR) triggered by lawsuit filings.

Our empirical results support both hypotheses relating to CSR reputation and lobbying. First, firms with superior environmental CSR scores incur greater valuation losses upon lawsuit filings. In a univariate test, firms in the high-CSR sample (with industry-adjusted CSR scores above the sample median) experience a negative average filing-date CAR of -1.1% over a 5-day window (which is equivalent to an average loss of \$129.9 million in market value *per day*, given the mean market capitalization of \$59.042 billion in the sample). In contrast, the low-CSR sample (with CSR scores below the sample median) experiences a significantly smaller average loss of -0.2% ($p < 0.05$). In multivariate regressions, environmental CSR scores are negatively associated with filing-date CAR ($p < 0.05$). For every unit increase in CSR score (representing one additional environmental strength or one fewer concern), the average firm experiences 0.3% greater loss of market value during the 5-day window surrounding the litigation filing (equivalent to a loss of \$177 million). We attribute the market updating to the discrepancy between corporate environmental reputation and actual conduct revealed in the lawsuits.

In addition, lobbying is associated with smaller filing-date valuation losses. In a univariate test, the average 5-day filing CAR of -0.2% for the high-lobbying sample (with industry-adjusted lobbying expenditure above the sample median) is significantly better than the average of -1.0% for the low-lobbying sample

[1] Data provided by Center for Responsive Politics at opensecrets.org.

($p < 0.05$). The regression results also show that lobbying expenditure is positively associated with filing-date CAR ($p < 0.01$). For every \$1 million increase in lobbying expenditure, a firm experiences 0.1% less loss of market value during the 5-day window around lawsuit filings (equivalent to an average saving of \$59 million).

Our results are robust to a series of additional analyses. First, we examine changes in institutional investor holdings to corroborate our key findings and find that firms with superior CSR reputations are more likely to incur reductions in institutional fund holdings following lawsuits. Second, we examine media attention attracted by the lawsuits to confirm that the price declines are indeed triggered by the lawsuits rather than other confounding factors. Consistent with our expectation, more high-profile lawsuits are accompanied by greater valuation losses. Moreover, we examine other pre-filing lawsuit-related event dates that may impact our results, including the dates of the discovery of violations, any scientific testing, and the plaintiffs' filing of a Notice of Intention to Sue. The results confirm that our results are robust to potential pre-filing information leakage. Our findings are further confirmed by additional robustness tests, including a falsification test using firms with previously damaged reputations, propensity score matching using accounting and corporate governance controls, different methods for computing CAR, and employing alternative empirical proxies and model specifications.

This study contributes to several strands of corporate finance literature. First, we contribute to the literature examining stock market reactions to corporate misconduct (Gande and Lewis (2009), Karpoff et al. (2008), and Karpoff and Lott (1993)). We build upon the only existing study by Karpoff et al. (2005) that empirically examines the magnitude of shareholder wealth losses associated with corporate environmental violations. Our study is distinguishable from that by Karpoff et al. (2005), who focus on lawsuit-specific characteristics (including the direct legal costs associated with each violation). We, in contrast, examine two firm-specific characteristics, preexisting CSR reputations and environmental lobbying efforts, as determinants of the magnitude of lawsuit-induced valuation losses. We provide novel insights into how these corporate policies play significant roles in exacerbating or mitigating the filing-date losses of shareholder wealth.

Second, our findings add to the literature that examines the economic value of pursuing CSR (Boubakri et al. (2016), Hong and Liskovich (2017), Kölbel et al. (2017), and Krüger (2015)). We use environmental litigation as a means to disentangle a firm's *perceived* reputation (as proxied by the CSR score) from its *actual* conduct (as captured by lawsuits). Consistent with the view that CSR is positively valued by capital markets, we find that any revelation of a discrepancy between reputation and reality causes negative market updating.

Third, we contribute to the literature investigating the economic benefits of political lobbying (Amore and Bennedsen (2013), Boubakri, Guedhami, Mishra, and Saffar (2012), Cooper et al. (2010), Faccio (2006), and Goldman et al. (2009)). Particularly, we add to the small but fast-growing body of research on the role of lobbying in reducing legal liabilities (Correia (2014), Unsal et al. (2017), and Yu and Yu (2011)). We conduct the first study that examines the impact of environmental lobbying on shareholder wealth in the event of alleged infractions.

We document that lobbying provides an insurance-like protection to firms against alleged environmental violations, by mitigating the losses of firm value around lawsuit filings. Our findings offer significant practical implications for corporations, executive officers, investors, and policymakers.

The remainder of the paper is organized as follows: Section II reviews the literature and develops the research hypotheses. Section III details the research methodology and sample selection process. Section IV presents the empirical results and Section V concludes.

II. Literature Review and Hypothesis Development

A. CSR and Market Reactions to Lawsuits

Stakeholder theory stipulates that CSR strategies enhance shareholder value through improving stakeholder relationships, thereby harmonizing corporate environmental responsibilities with value-maximization goals (Donaldson and Preston (1995), Porter and van der Linde (1995)). However, prior research has produced mixed empirical evidence on the relationship between CSR and firm value.

On the one hand, superior CSR ratings have been linked to higher market valuation (Boubakri et al. (2016), Edmans (2011), Fernando et al. (2017), and Ferrell et al. (2016)), greater returns from operating and investment activities (Deng, Kang, and Low (2013), Edmans (2012)), easier access to financing (Flammer (2018)), and lower cost of capital (Chava (2014), Hasan, Hoi, Wu, and Zhang (2017), and Heinkel, Kraus, and Zechner (2001)). CSR is also associated with improved stakeholder relations (Du, Bhattacharya, and Sen (2011), Servaes and Tamayo (2013)), productivity (Flammer (2015), Tonin and Vlassopoulos (2015)), innovation (Flammer and Kacperczyk (2016)), and M&A success (Bereskin, Byun, Officer, and Oh (2018), Deng et al.).

On the other hand, other studies find no improvements in firm valuation (Bhandari and Javakhadze (2017), Crilly, Ni, and Jiang (2016)) or poorer financial performance associated with CSR (Di Giuli and Kostovetsky (2014)). Moreover, Lys, Naughton, and Wang (2015) argue that CSR does not *cause* superior firm financial performance; rather, firms that anticipate better future performance signal their expectations through improved CSR engagements. Further, consistent with the view that CSR constitutes a form of agency problem, prior research has linked CSR policies to executive narcissism (Petrenko et al. (2016)), political ideology (Chin et al. (2013), Di Giuli and Kostovetsky, and Gupta, Briscoe, and Hambrick (2017)), and poor manager-shareholder interest alignment (Bhandari and Javakhadze). Overall, the empirical evidence on the economic value of pursuing CSR is far from conclusive.

We posit that *if* corporate environmental reputation is positively valued by capital market participants, then the filing of a lawsuit alleging environmental misconduct should result in negative market updating. However, prior studies have already documented negative market reactions to corporate lawsuits in general (Bhagat et al. (1998), Gande and Lewis (2009), Karpoff et al. (2008), and Karpoff and Lott (1993)) and environmental misconduct in particular (Karpoff et al. (2005)). Specifically, Karpoff et al. (2005) find that the magnitude of valuation losses associated with environmental violations is attributable to direct legal

costs (such as compensation and cleanup costs), and there are negligible reputational penalties captured by additional valuation losses. We build on this existing research by further exploring the heterogeneity amongst accused firms, specifically the differences in their preexisting reputations as environmentally responsible firms, as determinants of the size of the valuation losses triggered by environmental lawsuit filings.

"Greenwashing" is a serious concern in the measurement of CSR scores, which are inherently influenced by self-reported rhetoric and public-relations initiatives (Bansal and Kistruck (2006), Matejek and Gössling (2014)). Therefore, greenwashing might create an overinflated environmental reputation that is divorced from a firm's underlying conduct (Barnett and Salomon (2012), Crilly and Ioannou (2018)). Karpoff (2011) defines reputation as the value accrued to a firm when its stakeholders "offer favorable terms of contract because they believe the firm will not act opportunistically toward them" (p. 363). In the context of environmental CSR, reputational capital could enable a firm to avoid consumer boycotts and access capital from green investors (Flammer (2018), Heinkel et al. (2001)). No prior study has examined the impact of existing environmental reputation on firm valuation in the event of alleged violations.

We fill this gap in the literature by using environmental lawsuits to capture the substantive conduct of corporate social irresponsibility, which may be at odds with a firm's existing CSR reputation. There are two competing hypotheses concerning how CSR can affect market reactions to environmental violations. On the one hand, an environmental lawsuit can reveal the reputational gap between a firm's perceived versus actual environmental performance. Assuming that CSR quality is positively priced by investors (Fernando et al. (2017), Ramchander, Schwebach, and Staking (2012)),[2] such revelations are expected to result in negative market updating. The extent of the price drop should depend on the size of the discrepancy between reputation and conduct, since market participants react only to new information (Ball and Brown (1968)). Therefore, firms with better CSR ratings are expected to experience more adverse market reactions to environmental lawsuits than do firms which are already perceived as poor environmental performers. On the other hand, according to a competing view expressed by Godfrey (2005), CSR is expected to provide an "insurance-like protection" against negative shocks caused by corporate social irresponsibility (CSI), by harnessing the goodwill of stakeholder groups (Godfrey et al. (2009), Koh et al. (2014)). For example, Hong and Liskovich (2017) find evidence in support of this view that firms with better CSR engagements incur more lenient financial penalties for bribing foreign officials than firms with poor CSR. The authors attribute this difference to the leniency of prosecutors towards socially responsible firms. Given these competing perspectives, we specify our first hypothesis as a nondirectional hypothesis as follows:

Hypothesis 1. Environmental CSR scores are significant in predicting capital market reactions to environmental lawsuit filings.

[2]Prior studies show that security analysts serve as an intermediary to impound CSR information into firms' share prices (Ioannou and Serafeim (2015), Luo, Wang, Raithel, and Zheng (2015)).

B. Lobbying and Market Reactions to Lawsuits

Lobbying is a political strategy that enables firms to influence government decision-making (Borisov, Goldman, and Gupta (2016), Unsal et al. (2017), and Yu and Yu (2011)). Political power and connections significantly affect firm value (Igan and Mishra (2014), Jayachandran (2006), Kim, Pantzalis, and Chul Park (2012), and Stanfield and Tumarkin (2018)). Specifically, corporate lobbying is associated with better financial performance (Amore and Bennedsen (2013), Cooper et al. (2010)), easier access to financing (Bradley, Pantzalis, and Yuan (2016), Claessens, Feijen, and Laeven (2008)), lower cost of capital (Ben-Nasr, Boubakri, and Cosset (2012), Boubakri et al. (2012), and Gounopoulos, Kallias, Kallias, and Tzeremes (2017)), lower takeover risk (Cline and Williamson (2017)), and preferential awards of government contracts and investments (Duchin and Sosyura (2012), Goldman, Rocholl, and So (2013)).

In this study, we focus on a firm's lobbying activities on environmental issues, following prior studies that match the nature of lobbying with the types of lawsuits examined (Correia (2014), Unsal et al. (2017), and Yu and Yu (2011)). Lobbying reduces litigation risks associated with securities fraud (Correia (2014), Yu and Yu) and labor disputes (Unsal et al.). In particular, lobbying firms are less likely to be prosecuted by the Securities and Exchange Commission (SEC) (Correia (2014), Yu and Yu), experience delays in fraud detection (Yu and Yu) and, in the event of SEC prosecutions, receive lower monetary penalties (Correia). Similarly, in the context of labor disputes, lobbying firms are more likely to receive favorable litigation outcomes (Unsal et al.). If these benefits of lobbying are anticipated by the market upon lawsuit filings, then lobbying activities should mitigate the loss of shareholder value. Accordingly, we specify our second hypothesis as follows:

Hypothesis 2. Lobbying on environmental issues is associated with less negative capital market reactions to environmental lawsuit filings.

III. Data and Methodology

A. Sample Construction

We collect environmental lawsuit data from the Public Access to Court Electronic Records (PACER) database, which contains all lawsuits filed in U.S. Federal Courts. We follow prior studies and gather lawsuit events directly from Court records (Aharony, Liu, and Yawson (2015), Bhattacharya, Galpin, and Haslem (2007), and Haslem (2005)), rather than from newspaper sources (Flammer (2013), Koh et al. (2014)). Our approach is more suitable for the research questions examined in this study for two reasons. First, our data collection method avoids media bias (Bhattacharya et al.). Second, it allows us to further differentiate lawsuits based on the level of media attention in order to conduct a robustness analysis (as detailed in Section IV.E.1).

To construct the lawsuit sample, we first search for all environmental lawsuits filed between Jan. 1, 2000 and Dec. 31, 2015, generating an initial pool of 13,632 lawsuits. We then match the identities of the first-named lawsuit defendants with our sample firms, which include all 2,881 current and former S&P 1500 firms

with available data from the ExecuComp database. This produces 2,245 matched lawsuits as detailed in Table 1. We exclude abnormally high volumes of lawsuits filed in the same firm-year, including 941 lawsuits against IMC Global Incorporated in 2001, and 143 lawsuits against ExxonMobil Oil Corporation in 2006. We further exclude 87 unconcluded lawsuits and 486 cases with missing firm-year information from the Compustat, Center for Research in Security Prices (CRSP), and KLD databases. Our final sample consists of 588 lawsuit observations.

TABLE 1
Sample Selection

Table 1 outlines the sample selection process for environmental lawsuit observations. Data source: Public Access to Court Electronic Records (PACER).

Sample Selection	No. of Lawsuits
Initial sample	13,632
Less: Lawsuits not related to S&P 1500 firms	−11,387
Lawsuits related to former or current S&P 1500 firms	2,245
Less: Large volumes of lawsuits filed in the same firm-year	
Against IMC Global Incorporated in 2001	−941
Against ExxonMobil Oil Corporation in 2006	−143
	1,161
Less: Unresolved/pending lawsuits	−87
	1,074
Less: Missing firm-year data from Compustat, CRSP, or KLD	−486
Final sample	588

Our sample lawsuits commonly involve claims under the Clean Water Act 1972 (CWA), the Clean Air Act 1963 (CAA), the Comprehensive Environmental Response, Compensation, and Liability Act 1980 (CERCLA), and the Resource Conservation and Recovery Act 1976 (RCRA). Plaintiffs include branches of the U.S. government, such as the federal Environmental Protection Agency (EPA), or private environmental advocates such as the Sierra Club.

Second, we collect data on CSR scores computed by Kinder, Lydenberg, Domini (KLD) from the MSCI ESG KLD database. Our main proxy of interest, CSR, is an aggregated score that equals the total number of environmental "strengths" less the number of "concerns" recorded in the KLD database. A higher value of CSR indicates a superior environmental reputation. We also employ an alternative variable, CSR_CON, which captures only the number of environmental *concerns*. CSR_CON is used in a robustness test, because some researchers argue that CSR strengths and concerns have asymmetric impacts and therefore should not be aggregated into one unitary score (e.g., Kölbel et al. (2017)). A higher value of CSR_CON indicates a *worse* environmental reputation. Both CSR and CSR_CON are lagged by 1 year to capture environmental ratings in year $t-1$. Further, because environmental exposure can vary across industries, we calculate industry-adjusted CSR scores by deducting from the raw CSR scores the industry mean within each 2-digit Global Industry Classification Standard (GICS) code industry.[3] All variables are defined in the Appendix.

[3]Our results remain qualitatively similar if we use raw CSR scores.

Third, we obtain lobbying data from the Center for Responsive Politics. We examine firm-level lobbying expenditure on environmental and superfund (i.e., CERCLA) issues, lagged by 1 year (LOBBY). As environmental lobbying intensity is inherently industry-specific (Schuler, Rehbein, and Cramer (2002)), we create industry-adjusted measures by scaling each firm's lobbying expenditure by the industry mean (within each 2-digit Global Industry Classification Standard code industry). For robustness analysis, we compute an alternative measure of lobbying efforts, LOBBY_REP, which captures the number of lobbyist reports on environmental issues sponsored by the firm in year $t-1$.

B. Regression Model

To test our hypotheses, we employ an event study methodology and estimate ordinary least squares (OLS) regressions using the following model:

$$(1) \qquad \mathrm{CAR}_{i,t}^{j} = \alpha + \beta_1 \mathrm{CSR}_{i,t-1} | \mathrm{LOBBY}_{i,t-1} + \gamma X_{i,t-1} + \varepsilon_{it},$$

where i indexes firms, j indexes each lawsuit event, and t represents each event date. Following prior literature, we examine the filing date of each lawsuit as the key event date (Bizjak and Coles (1995), Gande and Lewis (2009), and Karpoff et al. (2008)). CAR represents the cumulative abnormal returns surrounding lawsuit filings. We estimate normal returns using the market model based on the CRSP value-weighted index over a 200-day estimation period $(-231, -31)$. We then calculate the cumulative abnormal returns (CAR) using 3 alternative event windows, $(0, +1)$, $(-1, +1)$, and $(-2, +2)$. X is a vector of the control variables, including firm-specific characteristics such as size (proxied by the natural logarithm of total assets), profitability (proxied by return on assets), market-to-book ratio, and leverage, as well as a lawsuit-specific factor to capture the size of the demand for damages sought by the plaintiffs; and α is the constant. We also include industry and year fixed effects in all regressions.

IV. Empirical Results

A. Descriptive Statistics

Table 2 reports the industry breakdown of the sample lawsuits using the 2-digit Global Industry Classification Standard (GICS) codes. Column 1 reports the frequency of lawsuits per industry and columns 2 and 3 report the average raw CSR scores and lobbying expenditure within each industry. These industry averages are used to calculate the industry-adjusted variables. As reported in column 1, Industrials is the most frequently sued industry, experiencing 176 lawsuits. It is followed by Energy (170 lawsuits) and Materials (123 lawsuits). As reported in column 2, the Health Care industry has the highest average CSR score (1.000), whereas the Energy industry has the poorest average CSR score (−2.294). In column 3, Energy and Industrials are the top industries ranked by lobbying expenditure, averaging $2.112 and $2.091 million per firm-year, respectively.

These results illustrate that firms in high-litigation industries employ different strategies to manage environmental risks. For example, firms in the Energy industry devote resources to lobbying but not to pursuing CSR, as evidenced by the highest industry-average lobbying expenditure and the poorest industry-average

TABLE 2
Industry Breakdown

Table 2 reports the industry breakdown of the lawsuit sample by 2-digit Global Industry Classification Standard (GICS) code industries. Column 1 reports the lawsuit frequency for each industry. Columns 2 and 3 report the mean raw CSR scores and lobbying expenditure, respectively, within each industry. The raw CSR scores and lobbying expenditure are reported (rather than the industry-adjusted values) for easier interpretation. Industries in which no firm in the sample engages in any lobbying (Information Technology and Real Estate) have an average lobbying expenditure of 0. All variables are defined in the Appendix.

Industry	GICS Industry Code	Lawsuit Frequency 1	CSR_RAW (mean) 2	LOBBY_RAW (mean) ($millions) 3
Energy	10	170	−2.294	2.112
Materials	15	123	−0.821	0.489
Industrials	20	176	−1.284	2.091
Consumer discretionary	25	35	−0.257	0.575
Consumer staples	30	24	0.167	0.756
Health care	35	10	1.000	0.468
Information technology	40	5	0.000	0.000
Utilities	45	14	0.214	0.399
Real estate	50	1	0.000	0.000
Full sample		588	−1.264	1.467

CSR score. In contrast, firms in the Materials industry spend relatively fewer resources on lobbying, but their industry-average CSR score (−0.821) is better than the full-sample average (−1.264).

Table 3 reports the descriptive statistics and correlation matrix for the sample of 588 lawsuit observations included in the baseline regressions. The average CAR is −0.2% over the 2-day event window (0, +1) surrounding lawsuit filings. Similarly, the average filing-date CAR is −0.4% and −0.6% over the 3-day window (−1, +1) and 5-day window (−2, +2), respectively. This indicates that sued firms incur significant losses of shareholder wealth upon lawsuit filings, averaging $118 million over the 2-day period, and $354 million over the 5-day period (based on the mean market capitalization of $59.042 billion in the sample).

TABLE 3
Descriptive Statistics and Correlation Matrix

Table 3 reports the descriptive statistics and Pearson correlation coefficients of the variables included in the baseline regressions. N=588. All variables are defined in the Appendix. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Variables	Mean	Median	Std. Dev.	1	2	3	4	5	6	7	8	9
Dependent Variables												
$CAR_{(0,+1)}$	−0.002	0.000	0.025	1.000								
$CAR_{(-1,+1)}$	−0.004	0.000	0.036	0.765***	1.000							
$CAR_{(-2,+2)}$	−0.006	−0.002	0.043	0.589***	0.778***	1.000						
Independent Variables												
CSR	−1.087	−1.032	1.637	−0.065*	−0.048	−0.010	1.000					
LOBBY	9.020	0.299	16.491	0.083***	0.080**	0.047	−0.220***	1.000				
Control Variables												
DEMAND	0.000	0.000	0.005	−0.027	−0.028	−0.003	0.029	−0.020	1.000			
ln(TA)	10.038	10.182	1.485	0.059*	0.018	0.003	−0.341***	0.499***	−0.112***	1.000		
ROA	0.015	0.014	0.013	0.077**	0.025	0.086***	−0.093**	0.044	−0.005	0.236***	1.000	
MARKET_BOOK	2.469	2.242	1.466	0.036	0.080**	0.118***	0.013	0.038	0.019	0.091***	0.353***	1.000
LEVERAGE	1.964	1.527	2.761	0.055*	0.058*	0.032	0.006	0.196***	−0.008	0.071**	−0.090***	0.412***

The mean industry-adjusted CSR score of −1.087 indicates that firms' average environmental concerns exceed their environmental strengths by approximately 1. No correlation coefficients are above 0.50 or below −0.50 between any

pair of independent variables, indicating that multicollinearity is not an issue in our analyses.[4]

B. Univariate Analysis

Table 4 presents the univariate analysis results. In Panel A, we divide the observations into 2 subsamples based on industry-adjusted CSR scores (CSR). We compare the average filing-date CAR of the high-CSR sample (firms with CSR scores above the sample median) versus a low-CSR sample (firms with CSR scores below the sample median). Firms in the high-CSR sample, on average, experience significantly greater losses of market valuation during the 2-, 3-, and 5-day event windows ($p < 0.05$ or better). This provides preliminary support for Hypothesis 1 by indicating that firms with superior prior environmental reputations, as proxied by high CSR scores, suffer significantly worse market reactions upon lawsuit filings.

TABLE 4
Univariate Analysis

Table 4 reports the univariate analysis results. In Panel A, the sample is divided into subsamples with high corporate social responsibility (CSR) ratings (industry-adjusted CSR scores above the sample median) and with low CSR ratings (below the sample median). In Panel B, the sample is divided into a high-lobbying subsample (with industry-adjusted expenditure above the sample median) and a low-lobbying subsample (below sample median). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Univariate Analysis by Industry-Adjusted CSR Score (Median Split)

	High-CSR Sample			Low-CSR Sample			Difference	
Variables	Mean	Std. Dev.	*N*	Mean	Std. Dev.	*N*	Mean	*p*-Value
$CAR_{(0,+1)}$	−0.005	0.029	270	0.000	0.022	318	−0.006***	(0.006)
$CAR_{(-1,+1)}$	−0.008	0.043	270	0.001	0.027	318	−0.009***	(0.003)
$CAR_{(-2,+2)}$	−0.011	0.050	270	−0.002	0.036	318	−0.009**	(0.019)

Panel B. Univariate Analysis by Industry-Adjusted Lobbying Expenditure (Median Split)

	High-LOBBY Sample			Low-LOBBY Sample			Difference	
Variables	Mean	Std. Dev.	*N*	Mean	Std. Dev.	*N*	Mean	*p*-Value
$CAR_{(0,+1)}$	−0.001	0.021	296	−0.004	0.029	292	0.003	(0.168)
$CAR_{(-1,+1)}$	0.000	0.025	296	−0.008	0.043	292	0.008***	(0.007)
$CAR_{(-2,+2)}$	−0.002	0.033	296	−0.010	0.051	292	0.009**	(0.014)

In Panel B of Table 4, we divide the sample by a median-split using the industry-adjusted lobbying expenditure (LOBBY). We compare the subsamples with high lobbying expenditure (above or equal the sample median) versus low lobbying expenditure (below the sample median). The average filing-date CAR over the (−1, +1) and (−2, +2) windows are significantly worse for the low-lobbying sample than the high-lobbying sample (at the 1% and 5% levels, respectively). Firms in the low-lobbying sample experience, on average, a 0.9% greater price decline during the 5-day window surrounding lawsuit filings, which is equivalent to a loss of $531 million in market capitalization (given the mean sample market capitalization of $59.042 billion). Consistent with Hypothesis 2, these results provide preliminary evidence that lobbying firms suffer smaller valuation losses upon environmental lawsuit filings.

[4]The variance inflation factor (VIF) scores for all our regressions are below 5.

C. Baseline Regression Analysis

Table 5 reports the results from the OLS regressions predicting the filing-date CAR using CSR and lobbying. In models 1–3, we employ industry-adjusted CSR scores (CSR) as the key explanatory variables. Models 4–6 employ industry-adjusted lobbying expenditure (LOBBY), and models 7–9 include both CSR and LOBBY. As reported in model 1, the coefficient of CSR is negative and significant in predicting the 2-day CAR over the (0, +1) window surrounding the lawsuit filings ($p < 0.01$). Similarly, the coefficient of CSR remains negative and significant in models 2–3 when predicting the 3- and 5-day CAR over the (−1, +1) and (−2, +2) windows ($p < 0.01$ and 0.05, respectively). These results indicate that firms with superior perceived environmental reputation, as proxied by the CSR rating, experience greater valuation losses when sued for environmental violations. In models 4–6, the coefficient of LOBBY is positive and significant in predicting CAR over all 3 event windows ($p < 0.01$). These results support Hypothesis 2 by indicating that lobbying expenditure is associated with significantly better market reactions to lawsuit filings.

TABLE 5

CSR, Lobbying, and Market Reactions to Environmental Lawsuits

Table 5 reports the results from ordinary least squares (OLS) regressions estimating the cumulative abnormal returns (CAR) surrounding lawsuit filings during event windows (0, +1), (−1, +1), and (−2, +2). Column 10 reports the standardized coefficients from the regression model in column 7. All variables are defined in the Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CSR			LOBBY			CSR & LOBBY			Standardized Coefficients
	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	Model 7
Variables	1	2	3	4	5	6	7	8	9	10
CSR	−0.002***	−0.003***	−0.003**				−0.002**	−0.003**	−0.003*	−0.144**
	(0.007)	(0.009)	(0.031)				(0.014)	(0.022)	(0.075)	
LOBBY				0.0002***	0.0004***	0.001***	0.0002***	0.0004***	0.001***	0.126***
				(0.006)	(0.000)	(0.000)	(0.010)	(0.000)	(0.000)	
DEMAND	−0.211***	−0.384***	−0.403***	−0.226***	−0.418***	−0.449***	−0.231***	−0.424***	−0.454***	−0.046***
	(0.002)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	
ln(TA)	−0.001	−0.001	−0.001	−0.002*	−0.003**	−0.003*	−0.002**	−0.003**	−0.004**	−0.134**
	(0.231)	(0.508)	(0.677)	(0.087)	(0.040)	(0.059)	(0.028)	(0.011)	(0.023)	
ROA	0.159*	−0.036	0.118	0.140	−0.071	0.075	0.144	−0.065	0.081	0.073
	(0.094)	(0.759)	(0.485)	(0.150)	(0.538)	(0.659)	(0.137)	(0.585)	(0.642)	
MARKET_BOOK	0.001	0.002**	0.004***	0.001*	0.003***	0.004***	0.001*	0.003***	0.005***	0.080*
	(0.121)	(0.021)	(0.005)	(0.075)	(0.007)	(0.001)	(0.070)	(0.007)	(0.001)	
LEVERAGE	−0.000	−0.001**	−0.001*	−0.001	−0.002***	−0.002**	−0.000	−0.002***	−0.002**	−0.048
	(0.637)	(0.026)	(0.088)	(0.352)	(0.006)	(0.017)	(0.427)	(0.009)	(0.022)	
CONSTANT	−0.018	−0.024*	−0.032*	−0.008	−0.002	−0.003	−0.006	0.001	−0.001	–
	(0.132)	(0.088)	(0.092)	(0.528)	(0.906)	(0.880)	(0.628)	(0.971)	(0.959)	
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	588	588	588	588	588	588	588	588	588	588
Adj. R^2	0.066	0.118	0.106	0.064	0.128	0.123	0.074	0.137	0.127	0.074

We then include both CSR and LOBBY in models 7–9 of Table 5. The coefficient of CSR remains negative and significant in predicting CAR over all 3 event windows ($p < 0.05$ in models 7–8 and $p < 0.10$ in model 9). The coefficient of LOBBY remains positive and significant across all models ($p < 0.01$). Using model 7 as an example, we find that a higher CSR rating (by one score) is associated with an additional filing-date valuation loss of 0.2% over the 2-day event window, which is equivalent to an average loss of $118 million. Lobbying can counteract these losses with an average saving of 0.02% of the market value over

the 2-day window. For every additional $1.467 million spent on lobbying (which is captured by the 1-unit change in the variable LOBBY, representing the industry average), firms, on average, experience a multifold saving of $12 million in market value.

We present the standardized coefficients from the model 7 regression in column 10 of Table 5. Standardized coefficients allow us to compare the relative explanatory power of the independent variables by showing the ranking of their comparative importance. The standardized coefficient of CSR is the largest amongst all variables (−0.144). This indicates that CSR ratings constitute the most potent determinant of filing-date returns. Next is firm size (−0.134), as larger firms are more visible and therefore incur greater market reactions when accused of environmental violations. Besides CSR and firm size, lobbying is the next most important predictor (0.126). These standardized coefficients confirm the significant roles of CSR scores and lobbying expenditure in predicting the filing-date market reactions to lawsuits.

Overall, these results support Hypothesis 1 by demonstrating that CSR scores have significant predictive power over market reactions to environmental lawsuits. The results support the view that firms with superior CSR ratings incur worse market reactions to environmental accusations. We attribute this to the discrepancy between market expectations as captured by CSR scores, and the firm's actual environmental misconduct revealed through lawsuits. The stock price consequently updates to incorporate new information about the firm's actual environmental performance, causing a price decline. Second, we document evidence in support of Hypothesis 2. Firms that have spent more resources on lobbying on environmental issues tend to experience smaller declines in market valuation upon lawsuit filings.

D. Changes in Institutional and Active Fund Holdings Surrounding Lawsuits

There is increasing demand from investors for socially responsible or "green" investments (Flammer (2018), Gössling and Buijter (2017)). Our baseline results show significantly worse market reactions to environmental lawsuits against firms with a superior environmental reputation. The downward price pressure can originate from both institutional and retail investors. As we cannot directly observe the actions of retail investors, we explore the actions of institutional investors. Specifically, we examine the changes in institutional holdings, particularly holdings by active investment funds, surrounding environmental lawsuits. We posit that institutional investors have incentives to drop accused firms' stocks from their portfolios following major environmental allegations, especially if the accused firms were previously considered to be environmentally responsible. Given the low frequency of our institutional holdings data, we are unable to provide direct evidence to show that institutional investors' actions cause the price declines around lawsuit filing dates. However, we expect firms with superior environmental reputations to be more likely to experience declines in institutional holdings following lawsuits that reveal a discrepancy between their reputation and conduct.

We collect data on institutional holdings from the Thomson Reuters Eikon database. We calculate the change in the number of common shares in a sued firm held by U.S. institutional investors from the month before to the month after a lawsuit filing, scaled by the total number of shares outstanding in the sued firm. We examine changes in two alternative measures of institutional holdings: holdings by all institutional investors (ΔFUND1) and holdings by active investment funds (ΔFUND2). We then rerun in turn our baseline regressions in equation (1) to predict ΔFUND1 and ΔFUND2 as the dependent variable.

We report the results in Table 6. In model 1, the estimated coefficient of CSR is negative and significant ($p < 0.05$) in predicting ΔFUND1. Furthermore, when we observe the change in active funds' holdings in model 2, the coefficient of CSR remains significant and negative in predicting ΔFUND2 ($p < 0.05$). In contrast, LOBBY is not significant in predicting ΔFUND1 and ΔFUND2 in models 3–4. The CSR coefficients remain negative and significant in models 5–6 after LOBBY is included in the regressions ($p < 0.05$). These results are consistent with the view that institutional investors update their portfolio holdings in response to environmental allegations. Firms with a perceived better CSR reputation are more likely to experience decreases in institutional holdings following lawsuits. Lobbying, on the other hand, does not appear to influence institutional investors. This evidence further supports our main findings by demonstrating that firms with a better environmental reputation are more likely to experience reduced holdings by investment funds following environmental allegations.

TABLE 6

Changes in Institutional and Active Fund Holdings Surrounding Lawsuit Filings

Table 6 reports the results from ordinary least squares (OLS) regressions estimating the changes in U.S. institutional holdings of the sued firms' stocks from the month before to the month after the lawsuit filings. ΔFUND1 measures the changes in holdings by all institutional investors and ΔFUND2 measures the changes in holdings by active funds. Column 7 reports the standardized coefficients from the regression model in column 5. All variables are defined in the Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CSR		LOBBY		CSR & LOBBY		Standardized Coefficients
	ΔFUND1	ΔFUND2	ΔFUND1	ΔFUND2	ΔFUND1	ΔFUND2	Model 5
Variables	1	2	3	4	5	6	7
CSR	−0.001**	−0.001**			−0.001**	−0.001**	−0.127**
	(0.032)	(0.040)			(0.035)	(0.041)	
LOBBY			0.000	0.000	0.000	0.000	0.018
			(0.561)	(0.642)	(0.761)	(0.851)	
DEMAND	−0.007	−0.049	−0.124	−0.156	−0.015	−0.054	−0.001
	(0.982)	(0.856)	(0.668)	(0.557)	(0.961)	(0.843)	
ln(TA)	−0.002**	−0.001**	−0.001*	−0.001	−0.002**	−0.002*	−0.162**
	(0.013)	(0.019)	(0.074)	(0.107)	(0.036)	(0.058)	
ROA	−0.079	−0.049	−0.080	−0.050	−0.080	−0.050	−0.064
	(0.423)	(0.611)	(0.415)	(0.606)	(0.421)	(0.610)	
MARKET_BOOK	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.130**
	(0.017)	(0.024)	(0.021)	(0.031)	(0.018)	(0.026)	
LEVERAGE	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000	−0.074
	(0.273)	(0.662)	(0.213)	(0.543)	(0.266)	(0.649)	
CONSTANT	0.002	0.000	0.003	0.001	0.003	0.001	–
	(0.829)	(0.970)	(0.800)	(0.955)	(0.761)	(0.918)	
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	505	505	505	505	505	505	505
Adj. R^2	0.050	0.034	0.041	0.025	0.048	0.032	0.048

E. Robustness Analyses

1. Media Attention Analysis

To verify our findings in relation to Hypothesis 1, we examine media attention attracted by the lawsuits, to confirm that the changes in firm value are caused by the lawsuits and not by other unrelated factors. The news media constitute a crucial source of information about a firm (Gurun (2016)) and negative news coverage can significantly affect firm value (Gurun and Butler (2012)). If, as shown in our baseline results, firms with better CSR reputations experience greater valuation losses upon lawsuit filings, then we should expect the size of the valuation loss to be moderated by the level of media attention attracted by a lawsuit. Greater media attention should strengthen the relationship between CSR reputations and filing-date price declines, because more media coverage increases investor awareness of the allegations and triggers stronger market reactions (Dawkins and Fraas (2010), Flammer (2013), Hamilton (1995), and Zyglidopoulos, Georgiadis, Carroll, and Siegel (2012)). In addition, media attention itself can be driven by the impact that a lawsuit is having on firm value. Media attention therefore provides a lawsuit-specific moderator that enables us to verify that the market reactions relate directly to the lawsuits examined.

We measure media attention by observing the number of newspaper articles related to a lawsuit during the litigation period. For each lawsuit, we search the Factiva News database using the following keywords: i) plaintiff name, ii) defendant (company) name, and iii) any one of the following words: "lawsuit," "litigation," "litigate," "sue," "sued," "court," "toxic," "hazardous," "pollution," "pollute," or "environmental clean up." We restrict the date of the newspaper articles from 15 calendar days before the lawsuit filing date to 15 days after the lawsuit termination date. We record the total number of newspaper articles returned by each search and create the media attention variable, FACTIVA. We then divide our lawsuit sample into 2 subsamples based on the level of media attention. The high-media attention sample includes lawsuits where the number of Factiva news articles is above the sample median and the low-media attention sample includes lawsuits attracting news articles below the sample median.

We rerun the regressions in Table 5 using each subsample in turn. Models 1–3 of Table 7 report the results using the high media attention subsample, while models 4–6 report the results using the low-media attention subsample. Within the high-media attention subsample, the CSR coefficient is significant and negative in predicting CAR ($p < 0.05$ in models 1 and 2 and $p < 0.10$ in model 3). Similarly, the coefficient of LOBBY remains positive and significant ($p < 0.05$ or better). In contrast, for the low-media attention subsample, the CSR coefficient is no longer significant, while the LOBBY coefficient remains positive and significant ($p <$ 0.10, 0.05, and 0.01 in models 4–6, respectively).

Taken together, these results show that media attention is an important moderator in the relationship between CSR reputation and market reactions to environmental lawsuits. Consistent with expectations, when lawsuits attract high media attention, sued firms with superior CSR reputations experience worse filing-date market reactions, whereas this relationship is insignificant when the lawsuits

TABLE 7
Media Attention Subsample Analysis

Table 7 reports the results from the subsample analyses, by reestimating the baseline regressions in Table 5 using 2 subsamples with high versus low media attention. The high-media attention subsample comprises lawsuits that attract a high number of news articles (above or equal the sample median), whereas lawsuits in the low-media attention subsample attract a low number of news articles (below the sample median). All variables are defined in the Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	High Media Attention Subsample			Low Media Attention Subsample		
	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$
Variables	1	2	3	4	5	6
CSR	−0.004**	−0.004**	−0.004*	−0.001	−0.002	−0.001
	(0.015)	(0.043)	(0.053)	(0.561)	(0.256)	(0.542)
LOBBY	0.0003**	0.001***	0.001**	0.0002*	0.0004**	0.001***
	(0.045)	(0.008)	(0.013)	(0.076)	(0.036)	(0.003)
DEMAND	−0.305***	−0.448***	−0.359**	0.363	−0.034	−1.121
	(0.006)	(0.000)	(0.021)	(0.268)	(0.950)	(0.332)
ln(TA)	−0.004***	−0.004**	−0.004	−0.001	−0.003	−0.005**
	(0.007)	(0.023)	(0.142)	(0.558)	(0.203)	(0.049)
ROA	0.214	0.053	0.384	0.092	−0.171	−0.183
	(0.233)	(0.794)	(0.164)	(0.433)	(0.290)	(0.420)
MARKET_BOOK	0.003**	0.003**	0.004*	0.001	0.004**	0.006***
	(0.024)	(0.040)	(0.064)	(0.408)	(0.026)	(0.008)
LEVERAGE	−0.000	−0.002	−0.002*	−0.001	−0.002**	−0.002
	(0.751)	(0.146)	(0.088)	(0.315)	(0.021)	(0.165)
CONSTANT	0.005	0.014	−0.006	−0.017	−0.013	0.008
	(0.759)	(0.496)	(0.834)	(0.341)	(0.553)	(0.816)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	289	289	289	299	299	299
Adj. R^2	0.119	0.162	0.204	0.019	0.077	0.047

attract low media attention. These results further confirm that our baseline results relating to valuation losses are robust and not spurious.

2. Falsification Test Using Subsequent Lawsuits Following CSR Downgrades

To further verify our findings in relation to Hypothesis 1, we conduct a falsification test using a subsample of firms with a previously damaged environmental reputation. If our baseline finding is true in that investors react to revelations of any discrepancy between environmental reputation and conduct, it follows that if a firm's true environmental performance has already been exposed through previous litigation, which has damaged its reputation (as evidenced by a prior CSR downgrade), then no discrepancy remains to be corrected by subsequent lawsuits. Consequently, the relationship between CSR and filing-date market reactions should not be observed in any subsequent lawsuits.

To test this prediction, we identify a subsample of firms that have experienced i) at least one previous environmental lawsuit during the sample period, and ii) a decline in CSR rating since the previous lawsuit. We then isolate *subsequent* lawsuits filed against these firms with a damaged environmental reputation. We conduct a falsification test by reestimating our baseline regressions using this subsample. We do not expect to find any significant relationship between CSR ratings and filing-date CAR within this subsample. As reported in Table 8, consistent with our expectation, the key independent variable CSR is not significant in predicting filing-date CAR.

3. Potential Information Leakage Preceding Lawsuit Filings

As a robustness test, we explore the possibility that market participants have preemptive information about impending lawsuits preceding their actual filing, by

TABLE 8

Falsification Test: Subsequent Lawsuits Following CSR Score Downgrades

Table 8 reports the results from a falsification test, by reestimating the baseline regressions in Table 5 using a subsample of lawsuits filed against firms that have experienced previous declines in CSR ratings following prior environmental lawsuits. All variables are defined in the Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CSR			LOBBY			CSR & LOBBY		
	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$
Variables	1	2	3	4	5	6	7	8	9
CSR	0.001	0.003	0.001				0.001	0.003	0.001
	(0.856)	(0.573)	(0.864)				(0.854)	(0.565)	(0.866)
LOBBY				−0.000	−0.000	0.000	−0.000	−0.000	0.000
				(0.937)	(0.757)	(0.917)	(0.931)	(0.734)	(0.922)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	103	103	103	103	103	103	103	103	103
Adj. R^2	0.199	0.145	0.130	0.199	0.140	0.130	0.189	0.135	0.119

examining market reactions to pre-filing events related to a lawsuit. We identify lawsuit-related events preceding the filing date as recorded in the lawsuit complaint.[5] These events include the alleged date of violation(s), the date of any scientific testing to confirm the violation(s), and the date on which the plaintiff(s) filed a Notice of Intention to Sue (also known as a Notice of Intent) or Notice of Violations warning the defendant of their intention to initiate the lawsuit. We argue that the filing date is the most momentous event in the lifecycle of a lawsuit. The issue of a Notice of Intent or Notice of Violations reveals the possibility of an upcoming lawsuit, and is therefore the most newsworthy pre-filing event. We employ event-study methodology and compute CAR surrounding each pre-filing event using windows (−1, 0), (−1, +1), and (−2, +2). We then calculate our dependent variable of interest, PREFILE_FILE_CAR, by aggregating the CARs surrounding all individual pre-filing events *and* the lawsuit filing.[6] We also calculate an alternative variable, NOTICE_FILE_CAR, which represents the aggregated CAR around the lawsuit filing date and the issue date of any Notice of Intent or Notice of Violations.[7]

We rerun our baseline regression to predict PREFILE_FILE_CAR and NOTICE_FILE_CAR in turn. The results are reported in Panels A and B of Table 9, respectively. The estimated coefficients and statistical significance of the key independent variables remain substantively similar to those reported in Table 5. These results indicate that our findings relating to CSR and lobbying are robust, after taking into account any potential information leakage that causes market participants to anticipate lawsuit filings.

[5] A complaint is a legal document filed to initiate a lawsuit, which outlines the plaintiff(s)' cause(s) of action. The lawsuit complaints are obtained from the PACER database.

[6] If no pre-filing event dates are available, we treat the pre-filing aggregated CAR as 0 and observe only the filing-date CAR for that lawsuit observation.

[7] If no notice of intent or notice of violation is filed before a lawsuit is initiated, or if the filing date of the notice cannot be identified in the lawsuit complaint, we treat the notice-date CAR as 0 and only include the filing-date CAR for that lawsuit.

TABLE 9

Robustness Tests:
Controlling for Potential Information Leakage Preceding Lawsuit Filings

Table 9 reports the results from ordinary least squares (OLS) regressions estimating the aggregated cumulative abnormal returns (CAR) surrounding lawsuit filings and other pre-filing lawsuit-related events over windows (0, +1), (−1, +1), and (−2, +2). In Panel A, PREFILE_FILE_CAR is calculated by aggregating the CAR surrounding all pre-filing events and the lawsuit filing date. In Panel B, NOTICE_FILE_CAR is calculated by aggregating the CAR surrounding the filing date of the plaintiff(s)' Notice of Intention to Sue (Notice of Intent) or Notice of Violations and the lawsuit filing date. All variables are defined in the Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Aggregated CAR for All Pre-Filing Lawsuit Events and Lawsuit Filing

	CSR			LOBBY			CSR & LOBBY		
	PREFILE_FILE_CAR(0,+1)	PREFILE_FILE_CAR(−1,+1)	PREFILE_FILE_CAR(−2,+2)	PREFILE_FILE_CAR(0,+1)	PREFILE_FILE_CAR(−1,+1)	PREFILE_FILE_CAR(−2,+2)	PREFILE_FILE_CAR(0,+1)	PREFILE_FILE_CAR(−1,+1)	PREFILE_FILE_CAR(−2,+2)
Variables	1	2	3	4	5	6	7	8	9
CSR	−0.003**	−0.004**	−0.003*				−0.003**	−0.003**	−0.003
	(0.013)	(0.015)	(0.093)				(0.019)	(0.027)	(0.163)
LOBBY				0.0002**	0.0004***	0.001***	0.0002*	0.0004***	0.001***
				(0.039)	(0.003)	(0.004)	(0.056)	(0.005)	(0.005)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	588	588	588	588	588	588	588	588	588
Adj. R^2	0.042	0.079	0.068	0.038	0.083	0.079	0.047	0.091	0.081

Panel B. Aggregated CAR for the Filing of Notice of Intent / Notice of Violations and Lawsuit Filing

	NOTICE_FILE_CAR(0,+1)	NOTICE_FILE_CAR(−1,+1)	NOTICE_FILE_CAR(−2,+2)	NOTICE_FILE_CAR(0,+1)	NOTICE_FILE_CAR(−1,+1)	NOTICE_FILE_CAR(−2,+2)	NOTICE_FILE_CAR(0,+1)	NOTICE_FILE_CAR(−1,+1)	NOTICE_FILE_CAR(−2,+2)
Variables	1	2	3	4	5	6	7	8	9
CSR	0.002***	−0.003***	−0.003**				−0.002**	−0.003**	−0.003*
	(0.008)	(0.008)	(0.036)				(0.015)	(0.020)	(0.085)
LOBBY				0.0002***	0.0004***	0.001***	0.0002***	0.0004***	0.001***
				(0.006)	(0.000)	(0.000)	(0.009)	(0.000)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	588	588	588	588	588	588	588	588	588
Adj. R^2	0.066	0.119	0.108	0.064	0.129	0.126	0.074	0.137	0.130

4. The Fama–French Estimation Models

We then employ different estimation methods to recalculate the cumulative abnormal returns surrounding lawsuit filings, by using the Fama–French (1993) 3-factor model (CAR_FF3) and the Carhart (1997) 4-factor model with momentum (CAR_FF4). We reestimate the baseline regressions to predict these alternative dependent variables. As reported in Panel A of Table 10, the estimated coefficients and statistical significance of the key independent variables, CSR and LOBBY, remain consistent with the baseline results in Table 5 when predicting CAR_FF3. Similarly, in Panel B of Table 10, the coefficient of CSR remains significant in predicting CAR_FF4 over the (0, +1) and (−1, +1) event windows ($p < 0.05$), while LOBBY also remains significant and positive in predicting CAR across all models ($p < 0.05$ or better). These results confirm our findings.

5. Alternative Proxies for CSR and Lobbying

To further support the robustness of our findings, we employ a series of alternative proxies for CSR and lobbying in our regression models. First, we use

TABLE 10

Robustness Tests: Fama–French and Carhart Estimation Models

Table 10 reports the results from ordinary least squares (OLS) regressions estimating filing-date cumulative abnormal returns (CAR) computed using the Fama–French (1993) 3-factor model (Panel A) and Carhart (1997) 4-factor model with momentum (Panel B) for event windows (0, +1), (−1, +1), and (−2, +2). All variables are defined in the Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CSR			LOBBY			CSR & LOBBY		
Panel A. Fama–French (1993) 3-Factor Model									
	$CAR\_FF3_{(0,+1)}$	$CAR\_FF3_{(-1,+1)}$	$CAR\_FF3_{(-2,+2)}$	$CAR\_FF3_{(0,+1)}$	$CAR\_FF3_{(-1,+1)}$	$CAR\_FF3_{(-2,+2)}$	$CAR\_FF3_{(0,+1)}$	$CAR\_FF3_{(-1,+1)}$	$CAR\_FF3_{(-2,+2)}$
Variables	1	2	3	4	5	6	7	8	9
CSR	−0.003***	−0.004***	−0.003**				−0.002**	−0.003***	−0.003*
	(0.006)	(0.004)	(0.036)				(0.012)	(0.009)	(0.082)
LOBBY				0.0002***	0.0004***	0.001***	0.0002**	0.0004***	0.001***
				(0.008)	(0.001)	(0.000)	(0.012)	(0.001)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	584	584	584	584	584	584	584	584	584
Adj. R^2	0.072	0.120	0.105	0.069	0.126	0.122	0.080	0.136	0.126
Panel B. Carhart (1997) 4-Factor Model with Momentum									
	$CAR\_FF4_{(0,+1)}$	$CAR\_FF4_{(-1,+1)}$	$CAR\_FF4_{(-2,+2)}$	$CAR\_FF4_{(0,+1)}$	$CAR\_FF4_{(-1,+1)}$	$CAR\_FF4_{(-2,+2)}$	$CAR\_FF4_{(0,+1)}$	$CAR\_FF4_{(-1,+1)}$	$CAR\_FF4_{(-2,+2)}$
Variables	1	2	3	4	5	6	7	8	9
CSR	−0.002**	−0.003**	−0.003*				−0.002**	−0.003**	−0.002
	(0.028)	(0.019)	(0.087)				(0.047)	(0.038)	(0.175)
LOBBY				0.0002**	0.0004***	0.001***	0.0002**	0.0004***	0.001***
				(0.010)	(0.001)	(0.000)	(0.015)	(0.002)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	584	584	584	584	584	584	584	584	584
Adj. R^2	0.055	0.101	0.099	0.056	0.110	0.118	0.062	0.116	0.120

an alternative proxy for CSR reputation, CSR_CON, that captures only the number of environmental *concerns*, in lieu of the baseline variable CSR, which represents the aggregated number of environmental *strengths* minus *concerns*. This enables us to address the potential issue that environmental CSR "strengths" and "concerns" have asymmetric impacts on firms and therefore should not be aggregated into one unitary score (e.g., Flammer (2013), Kölbel et al. (2017), and Krüger (2015)). We adjust CSR_CON by the industry average within each 2-digit GICS code industry. A higher value of CSR_CON indicates a greater number of concerns and a worse environmental reputation. As reported in Panel A of Table 11, consistent with our results in Table 5, CSR_CON is significantly, positively associated with CAR in models 1–3 ($p < 0.01$). When LOBBY is included in the regressions in models 4–6, the coefficients of CSR_CON remain positive and significant ($p < 0.05$ or better), with a similar economic magnitude to the results reported in Table 5.

Second, we employ a different set of CSR ratings from an alternative data source, Thomson Reuters ASSET4 ESG database, which covers S&P 500 firms

TABLE 11

Robustness Tests: Alternative Proxies for CSR and Lobbying

Table 11 reports the results from robustness tests using alternative proxies for CSR reputations and lobbying. Panel A reports the results from ordinary least squares (OLS) regressions that employ an alternative CSR measure, CSR_CON, which captures the number of environmental *concerns* only. Panel B reports the results from OLS regressions that employ CSR_MONITOR, which represents an alternative CSR rating sourced from Thomson Reuters ASSET4 database. Panel C reports the results from OLS regressions that employ an alternative proxy for lobbying activities, LOBBY_REP, which captures the industry-adjusted number of lobbyist reports on environmental issues sponsored by the firm. All variables are defined in the Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CSR | LOBBY			CSR & LOBBY		
	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$
Variables	1	2	3	4	5	6
Panel A. Alternative Proxy for CSR Using CSR Concerns						
CSR_CON	0.003***	0.005***	0.006***	0.003***	0.004***	0.005**
	(0.002)	(0.003)	(0.002)	(0.006)	(0.010)	(0.011)
LOBBY				0.0002**	0.0004***	0.001***
				(0.017)	(0.001)	(0.001)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	588	588	588	588	588	588
Adj. R^2	0.073	0.126	0.117	0.079	0.141	0.135
Panel B. Alternative Source of CSR Ratings Using ASSET4 Data						
CSR_MONITOR	−0.003	−0.003**	−0.005**	−0.003	−0.003**	−0.005**
	(0.175)	(0.034)	(0.031)	(0.172)	(0.026)	(0.033)
LOBBY				−0.000	0.001**	−0.000
				(0.805)	(0.180)	(0.887)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	312	312	312	312	312	312
Adj. R^2	0.023	0.006	0.041	0.020	0.006	0.038
Panel C. Alternative Proxy for Lobbying Using Number of Reports						
LOBBY_REP	0.0004	0.001***	0.001***	0.0003	0.001***	0.001***
	(0.142)	(0.000)	(0.004)	(0.279)	(0.001)	(0.007)
CSR				−0.002***	−0.003**	−0.003*
				(0.009)	(0.019)	(0.058)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	588	588	588	588	588	588
Adj. R^2	0.055	0.119	0.109	0.066	0.128	0.113

and provides a variety of scores measuring different aspects of a firm's environmental CSR. The score relating to emission monitoring ("whether the company monitors its emission reduction performance") is a priori expected to be the most important aspect of a firm's environmental CSR, because self-monitoring constitutes a vital component of environmental law enforcement under U.S. legislation.[8] Firms are required to regularly monitor and report their emission outputs to ensure compliance and harsh penalties are imposed for fraudulent reporting or tampering with the monitoring process. In contrast, other aspects of CSR reported in ASSET4, such as the presence of an environmental policy or "a public commitment from a senior management or board member," do not carry the same legal significance as emission monitoring and are more superficial and susceptible to greenwashing (Bansal and Kistruck (2006), Matejek and Gössling (2014), and Zyglidopoulos et al. (2012)). Therefore, we use the emission monitoring score to compute our explanatory variable, CSR_MONITOR. The raw score provided by

[8]These include the *Clean Water Act 1972*, the *Clean Air Act 1963*, and the *Resource Conservation and Recovery Act 1976*.

ASSET4 ranges from 0 to 100. A higher value indicates a superior environmental quality. We lag CSR_MONITOR by 1 year and scale the raw scores by the industry mean within each 2-digit GICS industry.

We rerun our baseline regression models using CSR_MONITOR to predict filing-date CAR. This requires using a smaller subsample of 312 lawsuits, which encompasses only S&P 500 firms with available data from ASSET4. The results are reported in Panel B of Table 11. Consistent with our baseline results, CSR_MONITOR is significantly, negatively associated with CAR over the $(-1, +1)$ and $(-2, +2)$ windows in models 2 and 3 ($p < 0.05$). The coefficient of CSR_MONITOR remains negative and significant in models 5 and 6 after LOBBY is included in the regressions ($p < 0.05$). These results further corroborate our findings in Table 5, by confirming that a superior CSR reputation is associated with greater losses of shareholder value triggered by environmental lawsuit filings. These results from the robustness test demonstrate that this observed relationship is not sensitive to the type of environmental CSR rating employed in the analysis.

Third, we employ an alternative proxy for corporate lobbying efforts, LOBBY_REP, which measures the industry-adjusted number of lobbyist reports sponsored by a firm in year $t-1$, in lieu of lobbying expenditure (LOBBY). As reported in Panel C of Table 11, the coefficient of LOBBY_REP is positive and significant in predicting CAR over the $(-1, +1)$ and $(-2, +2)$ windows in models 2 and 3 ($p < 0.01$). Further, when CSR is included as an additional explanatory variable, the coefficients of LOBBY_REP remain positive and significant in models 5 and 6 ($p < 0.01$). The coefficient of CSR is also negative and significant ($p < 0.01$, 0.05, and 0.10 in models 4–6, respectively). These results further confirm the robustness of our findings.

6. Lawsuit Merit Proxied by Outcomes

We further control for lawsuit merit as proxied by outcomes, because some lawsuits are frivolous and others are meritorious. We include an additional independent variable, DISMISSED, which equals 1 if the lawsuit is subsequently dismissed by the court (indicating low merit), and 0 otherwise. After controlling for lawsuit outcomes, in untabulated results, the economic magnitude and statistical significance of our key independent variables remain unchanged from those reported in Table 5.

7. Propensity Score Matching

One alternative explanation is that our results may be driven in part by firms' corporate governance quality. However, including corporate governance control variables leads to a significant rise in multicollinearity (VIF scores approaching 5). We deal with this issue by employing propensity score matching (PSM) analysis, while acknowledging that this reduces our sample size.

In the matching process, we first compute a dummy variable, CSR_MED, which equals 1 if the industry-adjusted CSR score is above or equal to the sample median, and 0 otherwise. We then proceed to match observations in the high-CSR sample (i.e., CSR_MED = 1) with those in the low-CSR sample (i.e., CSR_MED = 0) using propensity scores, which are derived by estimating a probit

regression that predicts CSR_MED.[9] We use lobbying expenditure, accounting controls (size, performance, leverage, and market-to-book ratio), and additional corporate governance variables (Bebchuk, Cohen, and Ferrell's (2009) E-Index, board independence, and block holdings) as covariates.[10] Second, we compute a dummy variable, LOBBY_MED, which equals 1 if the lobbying expenditure is above or equal to the sample median amongst lobbying firms, and 0 otherwise. Like the aforementioned procedure, we then compute the propensity scores by estimating a probit regression, where LOBBY_MED is the dependent variable and the covariates include CSR scores, accounting variables, and corporate governance variables. We match each observation from the high-lobbying subsample with an observation from the low-lobbying sample based on the propensity scores.

Table 12 reports the results from the regressions estimated using the propensity score-matched samples. Despite a drop in observations, the coefficient of CSR_MED remains negative and significant at the 1% level in models 2 and 3 and at the 10% level in model 1. Similarly, the coefficient of LOBBY_MED is positive and significant at the 1% and 5% levels in models 4 and 5, respectively. These results confirm that firms with a superior environmental reputation experience worse market reactions to lawsuits, whereas higher lobbying expenditure is associated with mitigated filing-date valuation losses.

TABLE 12
Propensity Score Matching

Table 12 reports the results from ordinary least squares (OLS) regressions estimating the cumulative abnormal returns (CAR) surrounding lawsuit filings during event windows (0, +1), (−1, +1), and (−2, +2) by employing propensity score matched samples based on CSR_MED (reported in models 1–3) and LOBBY_MED (reported in models 4–6), respectively. All variables are defined in Appendix. *p*-values in parentheses are based on a 2-tailed test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CSR_MED			LOBBY_MED		
	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(0,+1)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$
Variables	1	2	3	4	5	6
CSR_MED	−0.005*	−0.010***	−0.011***			
	(0.064)	(0.003)	(0.010)			
LOBBY_MED				0.009***	0.010**	0.009
				(0.009)	(0.017)	(0.146)
Accounting control variables	Yes	Yes	Yes	Yes	Yes	Yes
Corporate governance control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	322	322	322	176	176	176
Adj. R^2	0.090	0.114	0.122	0.088	0.088	0.070

V. Conclusion and Future Research Directions

This study examines the role of corporate environmental reputation and lobbying efforts in protecting firm value in the event of environmental lawsuits. Using a hand-collected sample of environmental litigation, we document novel findings. First, firms with a superior existing CSR rating suffer a more severe decline in firm value in response to environmental lawsuit filings. Prior research

[9] We use a nearest neighbor matching process with no replacement.

[10] E-Index represents Bebchuk et al.'s (2009) Entrenchment Index. Board independence is the proportion of independent directors relative to all directors on the board. Block holdings is calculated as the percentage of shares in a firm held by block holders. All variables are lagged by 1 year.

finds that investors positively price CSR quality in a firm's valuation (Fernando et al. (2017)). Consistent with this evidence, we show that when firms are accused of environmental misconduct, greater negative market updating occurs if the firms are previously perceived to be environmentally responsible. Second, firms with greater lobbying expenditure on environmental issues experience smaller valuation losses upon lawsuit filings. This reflects the market's expectation that political capital can mitigate the economic losses associated with lawsuits. Our results offer significant insights to corporate executives, investors, and regulators.

Our findings make several contributions to the existing literature. We contribute to the ongoing investigation of the penalties for corporate misconduct by bridging this body of literature with the CSR literature. Specifically, we find novel evidence that CSR reputation plays a significant role in determining the valuation losses triggered by environmental lawsuits. In addition, our evidence adds to the lobbying literature by documenting the role of lobbying activities in safeguarding shareholder wealth in the event of environmental lawsuits. Finally, we contribute to the literature examining the economic value of pursuing CSR by offering indirect evidence that CSR quality is positively priced by stock market participants.

We also discuss the scope for future research. While this study focuses on the immediate valuation impacts of the revelation of any gap between environmental reputation and conduct, such a revelation can also have multi-faceted implications for corporate decision making and long-term valuation. For example, after a firm's environmental reputation is damaged by a lawsuit, financial analysts may revise their recommendations concerning the sued firm's stock. Additionally, revelations of corporate environmental misconduct may also prompt shareholder activism targeting the firm's environmental policies and performance. These questions provide interesting avenues for exploration in future research.

Appendix. Variable Definitions

The Appendix provides the definitions of all variables employed in the empirical analyses in this study.

Dependent Variables

CAR: Cumulative abnormal returns calculated based on the CRSP value-weighted index over a 200-day estimation period $(-231, -31)$ using the market model. $CAR_{(0,+1)}$ is estimated over a 2-day event window $(0, +1)$, where $t=0$ is the day of the lawsuit filing. $CAR_{(-1,+1)}$ and $CAR_{(-2,+2)}$ are estimated over a 3-day event window $(-1, +1)$ and a 5-day event window $(-2, +2)$, respectively.

CAR_FF3: Cumulative abnormal returns calculated using the same methodology as CAR above, with the exception that the Fama–French (1993) 3-factor model is used when estimating normal returns.

CAR_FF4: Cumulative abnormal returns calculated using the same methodology as CAR above, with the exception that the Carhart (1997) 4-factor model with momentum is used when estimating normal returns.

ΔFUND: Changes in the number of common shares in a firm held by U.S. institutional investors from the month before to the month after the lawsuit filing, scaled by the firm's total number of common shares outstanding. Specifically, ΔFUND1 measures the changes in holdings by all institutional investors, and ΔFUND2 measures the changes in holdings by active funds.

NOTICE_FILE_CAR: Aggregated cumulative abnormal returns surrounding the lawsuit filing date and the filing date of any Notice of Intention to Sue or Notice of Violations by the plaintiff(s) prior to the lawsuit filing, if the latter date is reported in the lawsuit complaint. Each CAR is calculated using the same methodology as previously explained in relation to CAR.

PREFILE_FILE_CAR: Aggregated cumulative abnormal returns surrounding the lawsuit filing date and other identifiable pre-filing event(s) related to the lawsuit, including the date of the discovery of violations, the date of any scientific testing, and the date of the filing of the Notice of Intention to Sue or Notice of Violations by the plaintiff(s), as recorded in the lawsuit complaint. Each CAR is calculated using the same methodology as previously explained in relation to CAR.

Independent Variables of Interest

CSR: Industry-adjusted environmental CSR score in year $t-1$ based on the Kinder, Lydenberg, Domini (KLD) ratings, calculated as the aggregated number of environmental strengths less the number of environmental concerns, adjusted by deducting the industry mean within each 2-digit Global Industry Classification Standard (GICS) code industry.

CSR_CON: Industry-adjusted number of environmental concerns recorded by KLD in year $t-1$, adjusted by deducting the industry mean within each 2-digit GICS code industry.

CSR_MED: Dummy variable which equals 1 if the industry-adjusted CSR score for year $t-1$ is above or equal the sample median, and 0 otherwise.

CSR_RAW: Raw (unadjusted) environmental CSR score in year $t-1$ based on KLD ratings, calculated as the aggregated number of environmental strengths less the number of environmental concerns.

CSR_MONITOR: Industry-adjusted CSR emission monitoring score (out of 100) in year $t-1$ based on Thomson Reuters ASSET4 ESG ratings, which relates to a firm's monitoring of its emission reduction performance, scaled by the industry mean within each 2-digit GICS code industry.

LOBBY: Industry-adjusted lobbying expenditure on environmental and superfund issues in year $t-1$ ($millions), scaled by the industry mean within each 2-digit GICS code industry.

LOBBY_MED: Dummy variable which equals 1 if the industry-adjusted lobbying expenditure in year $t-1$ is above or equal the sample median amongst lobbying firms, and 0 otherwise.

LOBBY_RAW: Raw (unadjusted) lobbying expenditure on environmental and superfund issues in year $t-1$ ($millions).

LOBBY_REP: Industry-adjusted number of lobbyist reports on environmental and superfund issues sponsored by the firm in year $t-1$, scaled by the industry mean within each 2-digit GICS code industry.

Control Variables

DEMAND: The amount of monetary compensation demanded by the plaintiff(s) in the lawsuit, scaled by firm's total assets.

DISMISSED: Dummy variable equals 1 if the lawsuit is terminated by dismissal, and 0 otherwise.

FACTIVA: Number of news articles related to a lawsuit, generated by conducting the following keyword search in the Factiva database: "Firm (Defendant) Name," "Plaintiff

Name," and one of the lawsuit/environmental keywords ("lawsuit" or "litigation" or "litigate" or "sue" or "sued" or "court" or "toxic" or "hazardous" or "pollution" or "pollute" or "environmental clean up"), dated from −15 days before the lawsuit filing date to +15 days after the lawsuit termination.

FACTIVA_MED: Dummy variable equals 1 if the number of Factiva news articles is above the sample median, and 0 otherwise.

LEVERAGE: Financial leverage proxied by debt-to-asset ratio in year $t-1$, calculated as the book value of total liabilities divided by the book value of total assets.

ln(TA): Firm size proxied by the natural logarithm of total assets of the firm in year $t-1$.

MARKET_BOOK: Market-to-book ratio in year $t-1$, calculated as the market capitalization divided by the book value of total equity.

ROA: Firm performance proxied by return on assets, calculated as the net income (loss) divided by total assets in year $t-1$.

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