CORPORATE ENVIRONMENTAL PERFORMANCE AND LOBBYING

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Between 2006 and 2009, firms spent over a billion dollars lobbying on climate-related bills and issues. Such spending is largely perceived as a strategy by industry to oppose regulation. Research has barely begun to investigate how firm-level performance on salient political issues affects corporate political strategy. In this article, we address this issue in the context of the recent climate change policy debate in the United States. We propose a U-shaped relationship between greenhouse gas (GHG) emissions and lobbying expenditures. To test our proposition, our study leverages novel data on firm-level GHG emissions and lobbying expenses aimed specifically at climate change legislation. Our results, based on 1,141 firms from 2006 to 2009, suggest that both dirty *and* clean firms are active in lobbying, which challenges the view of adversarial corporate strategy.

Editor's Comment

The prevailing view is that a salient political issue such as environmental regulation is a threat at the industry level. This suggests that best performers have little interest in the policy outcome, and one would not expect them to lobby. In contrast, the hunch that drives the authors is that the cleanest firms may perceive a more stringent environmental regulation as an opportunity to gain a competitive advantage, which provides an incentive to lobby. The findings of this study have implications for research on corporate political strategy. The authors provide online access to the database—a healthy practice which if spread will benefit the field.

Africa Arino, Action Editor

INTRODUCTION

Scholars agree that political issue salience—the importance of the political issue to the firm—is a primary motivator of corporate political activity (CPA) (Bonardi & Keim, 2005; Hillman, Keim, & Schuler, 2004). A salient political issue, such as social or environmental concerns, is commonly viewed as a threat to business,

TABLE 1
Top Five Climate Lobbying Firms by Year

Company	Sector	Lobbying Expenditure (Million $)	GHG Emissions (Million Tons CO$_2$-e)
Year 2009			
ExxonMobil	Oil and gas	27.43	302.00
General Electric	Industrial goods and services	26.40	31.30
Chevron	Oil and gas	20.82	148.00
ConocoPhillips	Oil and gas	18.07	129.00
Boeing	Industrial goods and services	16.85	11.30
Year 2008			
ExxonMobil	Oil and gas	29.00	306.00
PG&E	Utilities	27.25	4.26
General Electric	Industrial goods and services	18.66	28.60
Southern Company	Utilities	13.98	165.00
General Motors	Automobiles and parts	13.10	66.10
Year 2007			
General Motors	Automobiles and parts	14.28	72.90
General Electric	Industrial goods and services	9.84	35.00
Union Pacific	Industrial goods and services	9.73	9.84
Chevron	Oil and gas	8.95	152.00
Southern Company	Utilities	7.28	158.00
Year 2006			
ExxonMobil	Oil and gas	14.52	329.00
Ford Motor	Automobiles and parts	9.10	66.90
American International Group	Insurance	5.02	3.78
General Motors	Automobiles and parts	4.70	74.90
Honeywell	Industrial goods and services	4.42	9.07

Note. GHG = greenhouse gas.

especially to poor performers wary of government intervention (Bonardi & Keim, 2005; Lyon & Maxwell, 2008). This view is perhaps best exemplified in the environmental policy context, where the prevailing view of corporate political involvement is one of the dirty industries opposing government threats to impose more stringent regulations (Cho, Patten, & Roberts, 2006; Fremeth & Richter, 2011). Such research is consistent with the perception among the general public that the wrong incentives are driving policy decisions at the expense of the public interest (OECD, 2014).

But are industries always united in their opposition to environmentally favorable policies? What about environmentally proactive firms that stand to benefit from policies that penalize their dirtier competitors? Although the existing empirical literature shows dirtier firms are more likely to contribute to political campaigns, there is little if any empirical evidence that cleaner firms are actively pursuing political influence. In this article, we find evidence of a more complex relationship between a firm's performance on a political issue and its motivation to influence

public policy. In particular, we establish a U-shaped relationship wherein both cleaner and dirtier firms vie for favorable political outcomes.

The prevailing view of issue salience as a threat to business at the industry level implies that firms performing well on an issue have little interest in the policy outcome. Indeed, the U.S. Chamber of Commerce spent more than $60 million (the most of any single organization) in 2008 lobbying against climate change legislation.[1] In the same year, one of the highest-polluting utilities, Southern Company, spent an estimated $14 million on climate change lobbying (see Table 1).

A less adversarial view of social and environmental performance and policy, however, emphasizes the opportunity for firms to engage in discourses that aim at setting or redefining environmental standards and regulations by assuming enlarged political co-responsibility (Kamieniecki, 2006; Prakash, 2000; Scherer, Palazzo, & Baumann, 2006); such a view also stresses the opportunity for socially and environmentally proactive firms with strong performance records to leverage new regulations and performance standards to gain competitive advantage over industry rivals (Fremeth & Richter, 2011; Reinhardt, 1999; Vogel,

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Author's voice:
What motivated you to undertake this research? Why is it important to you?

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[1] Lobbying expenditures in this and the following paragraph were calculated using data and methods described in the Data section.

1995). Despite being one of the greenest utilities in the nation, for example, Pacific Gas and Electric (PG&E) spent an estimated $27 million lobbying climate change at the federal level in 2008, the second highest climate lobbying spending of all firms (see Table 1). Meanwhile, the utility has openly supported a cap-and-trade system for carbon emissions, even leaving the U.S. Chamber of Commerce in 2009 due to the Chamber's vociferous opposition to carbon regulation. Notwithstanding diverging performance records and positions on climate change policy, both Southern Company and PG&E were among the most politically active firms during 2007–2009, a time when the likelihood of new climate change legislation was at its highest.

This suggests a strategic incentive for firms on the opposite ends of the environmental performance spectrum to be politically active on environmental issues. Nonetheless, with little exception, the empirical literature has paid scant attention to the relationship between environmental performance and political activity (Cho et al., 2006; Clark & Crawford, 2012; Kamieniecki, 2006). Until recently, empirical studies of CPA have focused mostly on election campaign contributions via political action committees (PACs) as a proxy for political strategies and activity (Brasher & Lowery, 2006; de Figueiredo & Tiller, 2001; Hansen & Mitchell, 2000; Kim, 2008). Lobby expenditures, which are consistently five times larger than PAC contributions, have been markedly absent from empirical studies (de Figueiredo & Cameron, 2009; de Figueiredo & Richter, 2013). This is a concern since there is a dearth of credible evidence that campaign contributions affect political outcomes and mounting evidence that lobbying is the most effective means to influence public policy (de Figueiredo, 2002).

In this study, we use novel, issue-specific lobbying expenditures data, which have only recently become electronically available to the public, to analyze the relationship between environmental performance and political activity. We use data on lobbying produced by the Center for Responsive Politics (CRP), which we coded to obtain climate change lobbying expenditures between 2006 and 2009. Our results, based on 1,141 firms, reveal that both dirty *and* clean firms are active in lobbying, suggesting that while dirty firms lobby to maintain the status quo clean firms view environmental regulation as an opportunity to gain firm-level advantages. Our analysis makes important empirical contributions to the corporate political strategy literature. We look beyond the linear relationship found in existing studies to explain how a firm's environmental performance motivates political activity and find evidence that, in addition to the usual suspects, greener firms are also attempting, and perhaps competing, to influence legislative outcomes. Furthermore, we find that both greener firms as well as dirtier firms are more likely to rely on outside lobbyists rather than in-house lobbyists.

In the ensuing two sections, we review the relevant literature and develop our testable proposition. We then describe our data and analysis methods before presenting the results. Finally, we discuss the implications and limitations of our findings and conclude by suggesting areas for future research.

LITERATURE REVIEW

The corporate political strategy literature, which focuses on the strategies firms use to shape government policy (Baron, 1995; Baysinger, 1984; Hillman et al., 2004; Keim & Baysinger, 1988; Keim & Zeithaml, 1986), has made important strides toward explaining firms' rationales for developing political strategies (Baron, 2010; Hillman & Hitt, 1999; Kamieniecki, 2006). Scholars generally agree that as the salience of a policy debate increases, firms are more likely to become politically active (Clark & Crawford, 2012; Hillman & Hitt, 1999; Hillman et al., 2004; Hojnacki, Kimball, Baumgartner, Berry, & Leech, 2012; Kamieniecki, 2006; Mahoney, 2008; Vogel, 1996). Schuler and Rehbein (1997: 121) define issue salience as "a policy's net impact on the firm's competitive strategies and performance." Getz (1997) suggests that issue salience affects the intensity of CPA, whereas Hillman and Hitt (1999) posit issue salience affects the likelihood that a firm engages in collective action.

Overall, models of CPA have yet to discover how characteristics of the firm relevant to a contested political issue impact issue salience (Kamieniecki, 2006). Conceptualized as exogenous to the individual firm, salience addresses *whether* a policy will affect an industry or set of industries and the magnitude of this impact relative to the impact of other issues. Explaining firm-level variation in political activity is left to organizational factors such as firm size, age, or formalized structures (Hillman et al., 2004) that, independent of a particular issue, affect the propensity and ability to be politically active in general (Schuler & Rehbein, 1997). Drawn from an organizational rather than strategic perspective, these factors do not account for the relationship between a firm's strategies (e.g., exemplary environmental performance) and a particular issue's characteristics.

Considering the significant expansion of environmental laws and regulations and the increased political clout of environmental groups over the past several decades (Rivera, 2010; Vogel, 1995), environmental

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Author's voice:
How did the paper evolve and change as you worked on it?

policy is a promising context in which to investigate the determinants of political activity (Kamieniecki, 2006). Nonetheless, only a small number of studies have empirically examined the relationship between environmental performance and political activity (Delmas & Montes-Sancho, 2010; Hillman et al., 2004; Lyon & Maxwell, 2008; Prakash, 2000; Richter, 2011) and these have produced mixed results. Cho et al. (2006) found that corporate political campaign spending increases as firm-level environmental performance declines and concluded that dirtier firms use political strategies to mitigate policy pressure. Delmas and Montes-Sancho (2010) show in the context of U.S. electric utilities that firms efforts to reduce emissions predicted participation in collective corporate political strategies to voluntarily reduce CO_2 emissions. Clark and Crawford (2012) found evidence of a statistically significant relationship between environmental performance and one political activity tactic (financial incentive) but not another (constituency building). Interestingly, the study found that firms with neither good nor bad performance ratings (i.e., "mixed bag" and "nonstarters") are likely to be more engaged in the financial incentive tactic but found the opposite result for constituency building.

To date, there has been no empirical analysis of how lobbying relates to environmental performance. This might be explained by the fact that lobbying disclosures were not electronically available (or searchable by the public) until after the Lobbying Disclosure Act was amended in 2007. Existing empirical studies of CPA have instead relied primarily on election campaign contributions through PACs (Brasher & Lowery, 2006; de Figueiredo & Tiller 2001; Hansen & Mitchell, 2000; Kim, 2008), which are considered to be a relatively poor indicator political activity (Hansen & Mitchell, 2000; Hansen, Mitchell, & Drope, 2005; Munger, 1988). It is also difficult to link a firm's campaign contribution to a specific political issue, such as environmental policy, as politicians typically run on a diverse platform of issues. Lobbying efforts, in contrast, target specific issues, which must be disclosed along with associated expenditures. Finally, firms devote more resources to lobbying than any other form of political activity (Baron, 2010), typically spending five times more on lobbying than on PAC contributions (de Figueiredo & Richter, 2013) in any given year. The recent electronic availability of lobbying data thus presents an opportunity to advance empirical research into the relationship between environmental performance and political activity.

In summary, considerable scholarly research has been devoted to uncovering the determinants of corporate political behavior. Although there is little disagreement that salience is the primary motivator of political activity, few studies have investigated how salience is modulated by firm-level strategies. As this literature has given very little attention to environmental policy, there is no consensus on how environmental strategies and subsequent performance relate to political activity. Of the few empirical studies that have examined this relationship, to our knowledge none has used lobbying expenditures to measure political activity.

ISSUE SALIENCE, PERFORMANCE, AND CORPORATE POLITICAL ACTIVITY

In this section, we develop a framework to explain political activity as a function of each firm's performance on a political issue (henceforth "issue performance"). Issue performance is the outcome of each firm's management philosophy and strategic choices, and thus an indication of its interest in maintaining the current regulatory order. A firm with poor performance on an issue will likely view regulation as a threat to profitability and wish to preserve the status quo. A firm with exemplary performance, on the other hand, may perceive regulation as an opportunity to engender market conditions that favor good performance.

As such, we posit that the salience of an issue is highest for firms approaching either end of the performance spectrum. Firms with the least interest in the political outcome are those with average performance records, that is, middle-of-the-road performers. Taking this perspective of salience and its relationship to issue performance allows evaluation of how a contested policy's impact—and thus political activity—varies within an industry. Although there are many political issues, we focus on environmental policy as it is of considerable strategic importance to businesses.

Poor Performers

The adversarial relationship between business and government is perhaps most acutely displayed in the environmental context (Rivera, 2010; Vogel, 1996). Business involvement in policy process—especially with regard to social and environmental issues—is largely viewed as a unified force of resistance to government intervention and changes to the status quo (Fremeth & Richter, 2011; Shaffer, 1995), whereas firms that attempt to wield political influence are widely considered to be "evil" (Richter, 2011). The burden of environmental regulation depends on the firm's environmental management strategies, capabilities, and resulting level of performance (Leone, 1986; Reinhardt, 1999). Dirtier firms following a compliance-oriented strategy have an interest in keeping environmental standards as low as possible (Russo & Fouts, 1997). Complying with newly imposed regulations will be costlier for dirty firms than for clean firms (Reinhardt, 1999; Richter, 2011; Vogel, 1995). Indeed, empirical research has shown that poor environmental performance

is associated with increased levels of political activity (Cho et al., 2006). These arguments suggest that environmental regulatory change is salient to poorer performing firms—those with the most to lose if forced to meet higher performance standards—and thus that the salience of an environmental policy issue increases as environmental performance declines (Cho et al., 2006).

Exemplary Performers

However, as the economic theory of regulation has long argued, firms can often obtain private benefits by promoting environmental regulation, which can engender barriers to entry and other sources of competitive advantage (Gruenspecht & Lave, 1989; Peltzman, 1976; Stigler, 1971). New environmental policies create both losers and winners (Leone, 1981; Shaffer, 1995). Firms with greater capabilities for adapting to new legislation or regulation can use public policy strategically to capture firm-specific advantages over competitors (Russo & Fouts, 1997; Shaffer, 1995). Environmental regulation can foster competitive advantage for greener firms that are capable of meeting the newly generated demand (from both regulators and consumers) for environmental quality at a lower cost (Leone, 1981; Reinhardt, 1999). These arguments suggest that the salience of environmental policy also increases as firms become greener.

Middle-of-the-Road Performers

Environmental policy does not just create losers (i.e., poor performers) and winners (i.e., exemplary performers); there are also subsets of firms that are minimally affected. Firms that have taken the middle road with regard to environmental strategy—which have neither poor nor exemplary performance records—have the least at stake in the policy outcome. Without a clear environmental strategy such firms are uncertain about how proposed regulation will affect profitability and thus what side of the issue to be on (Clark & Crawford, 2012). The small benefits these firms may gain from either supporting or opposing regulation are outweighed by the costs. Thus, we would expect that the salience of an environmental policy debate decreases as environmental performance approaches an ambiguous middle ground, which is neither particularly poor nor exemplary.

Summary

Together, these arguments imply a U-shaped relationship between issue salience and performance: salience is highest for both exemplary and poor performers, and lowest for middle-of-the road performers. As salience increases so does political activity (Bonardi, Hillman, & Keim, 2005; Bonardi & Keim, 2005; Clark & Crawford, 2012; Getz 1997; Hillman et al., 2004; Rivera, 2010; Vogel, 1996; Yoffie, 1987). As such, we would expect the relationship between issue performance and political activity to be U-shaped.

METHODS

In this section, we describe the data and methods used to test for a U-shaped relationship between issue performance and political activity. We focus on lobbying, wherein firms directly convey to policy makers information (e.g., political, technical, and economic assessment) that supports their preferred political outcome (Hillman & Hitt, 1999; Rivera, 2010). Scholars also note that firms are most likely to lobby when an issue has become highly politicized and when the debate has focused on several specific policy options (Hillman & Hitt, 1999). Issue performance is examined in the context of climate change environmental performance and measured through greenhouse gas (GHG) emissions.

Data

GHG emissions data were acquired from Trucost. Trucost provides a range environmental performance data for the socially responsible investment community and are increasingly used in peer-reviewed academic research (e.g., Dawkins & Fraas, 2011; Delmas, Etzion, & Nairn-Birch, 2013; Jira & Toffel, 2013; Delmas, Nairn-Birch, & Lim, 2015). Where available, Trucost collects, standardizes, and validates company-reported environmental data from annual reports, corporate websites, and other public disclosures. Where not disclosed publicly, data are calculated from global fuel use or imputed by conducting a detailed sector breakdown of each firm and applying a proprietary input–output economic model based on government census and survey data, industry data and statistics, and national economic accounts. The data cover 2004 through 2008.

We obtained lobbying data from the Center for Responsive Politics (2014). Under the Lobbying Disclosure Act, in-house and outside lobbyists must file quarterly reports describing lobbying activity. These reports

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Author's voice:
What was the most difficult or challenging aspect of this research project and paper?

Author's voice:
Was there anything that surprised you about the findings?
If so, what?

disclose the amount spent on lobbying and describe the issues lobbied.[2] These data are available from the Senate Office of Public Records and the CRP standardizes the data and makes them available to the public. We used 4 years of lobbying data, from 2006 to 2009. This time period allowed our analysis to cover lobbying behavior before the financial crisis and during the height of climate lobbying; the Waxman–Markey Bill passed in the House in June 2009 but was not taken up in the Senate and there have been no major climate bills since.

To determine if lobbying is related to climate change, we searched issue descriptions for keywords ("climate," "global warming," "greenhouse," "GHG," and "GHGs") and bill numbers and names of two major climate bills (the Waxman–Markey Bill and the Lieberman–Warner Bill). If an issue description in a report contained any of the search terms, we coded the entire amount in the report as climate change lobbying. Additionally, if the name of the lobbyist firm was different than the name of the client firm or the client's parent firm (as provide by CRP), we considered that amount to be outside lobbying. We then aggregated lobbying amounts based on each firm's parent firm (or the firm itself if the parent firm was not in our GHG data). The full description of our coding method is available in the Appendix of this article, and we posted the data for download here: http://www.environment.ucla.edu/ccep/lobby.

Data used to construct our control variables were obtained from Compustat, RiskMetrics, and publicly available data on state-level environmental regulations. Merging these disparate data sets covered 1,141 firms, producing 3,194 firm-year observations out of which 460 engaged in climate change lobbying—54 in 2006, 105 in 2007, 141 in 2008, and 160 in 2009.[3] Lobbying is mostly focused on the House of Representatives and the Senate. Of the 460 firm-years that engaged in climate lobbying, 459 (99.8 percent) lobbied both houses of Congress and 1 (0.2 percent) lobbied the House but not the Senate.

Data Analysis

Our model of the determinants of lobbying expenditures is as follows:

$$y_{i,j,t} = \beta_1 GHG_{i,t-1} + \beta_2 GHG^2_{i,t-1} + \alpha \boldsymbol{X_{i,t-1}} + \delta T_t + \theta S_j + \gamma \lambda_{i,t} + \varepsilon_{i,t}$$

where $y_{i,j,t}$ represents lobby expenditures for firm i in sector j in year t, and $GHG_{i,t-1}$ and $GHG^2_{i,t-i}$ are the linear and quadratic GHG emissions variables. $\boldsymbol{X_{i,t-1}}$ is the vector of control variables, T_t represents the year dummy variable (to control for secular changes), S_j represents sector dummy variables (to control for differences across sectors), and $\lambda_{i,t}$ represents the propensity to lobby in a given year. We lag both independent variables and all control variables 1 year behind the dependent variable.

We use the two-step Heckman selection model, which is commonly used with lobbying data in the corporate political strategy and related literature (Brasher & Lowery, 2006; Hansen & Mitchell, 2000; Kim, 2008). As our sample includes only those firms that chose to lobby issues related to climate change, there is a high risk of selectivity. Selectivity is a concern if similar variables are likely to influence participation in the treatment groups (i.e., the decision to lobby) and treatment outcome (i.e., lobbying expenditures). The Heckman methodology controls for this with a two-step process. The first step uses a probit model to estimate, for all firms, the propensity to lobby. The estimate of propensity (i.e., the "hazard rate" or λ) is then included in an ordinary least squares model in the second step, in effect controlling for self-selectivity bias.

To avoid having our identification rely solely on the nonlinearity of the selection equation, we included in the selection equation a dummy variable for whether the firm lobbied on any issue in the previous year. This variable captures whether the firm has an existing relationship with lawmakers and lobbyists. Developing such relationships is a fixed cost. The presence of a relationship affects whether a firm pursues climate lobbying but, once the relationship is established, it does not affect the amount spent on climate lobbying. Thus, satisfies the exclusion restriction: it affects whether a firm chooses to lobby on climate change, but does not affect its climate change expenditure.

Additionally, simultaneity is a potential issue. If a firm simultaneously chooses emissions level and lobbying expenditure, it will be difficult to draw a causal connection as GHG emissions can affect lobbying and lobbying can affect GHG emissions. We believe that GHG emissions are primarily determined by factors such as existing market conditions, technology and capital stock, and management structure, and are thus difficult to change. Therefore, we believe that it is more likely that GHG emissions influence lobbying expenditure than the reverse. Nonetheless, to mitigate the problem, we lag GHG emissions by a year; current-year lobbying cannot influence previous-year emissions.

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[2] Amounts less than $5,000 are reported as $0 and amounts of $5,000 or more are rounded to the nearest $10,000.

[3] The overall sample is limited to 3,194 firm-year observations for which we had Trucost GHG data. The lobbying sample is limited to the 460 observations (out of the 3,194 observations) that had positive climate lobbying expenditures.

Dependent Variables

We construct two dependent variables for the two-step Heckman method. The dependent variable for the first step is a dichotomous variable *Selection* (coded "1" if a firm spent any money on lobbying the issue of climate change and "0" otherwise). The dependent variable for the second stage, *Expenditure*, is the annual amount spent on lobbying the issue of climate change at the federal level in million dollars. As complementary measures of lobbying behavior, we construct three additional variables: (a) the annual amount a firm spends by hiring outside lobbyist firms to engage in climate lobbying, *Outside Expenditure*, (b) the number of outside lobbyist firms the firm employs for climate lobbying, *Outside Lobbyist Firms*, and (c) the percentage of each firm's climate change lobbying expenditures spent on outside lobbyists, *Percent Outside Expenditure.* The latter variable is created by dividing *Outside Expenditure* by *Expenditure*, and multiplying by 100. These additional variables allow us to understand better how firms choose to lobby, whether internally or through outside lobbying firms (Bertrand, Bombardini, & Trebbi, 2014).

Independent Variables

Each firm's GHG emissions include all GHG Protocol gases weighted by global warming potential factors and measured as tons of CO_2-equivalent (CO_2-e). We include Scope 1, Scope 2, and Scope 3 emissions as defined by the GHG Protocol—the most commonly used international GHG accounting protocol (Ranganathan, Corbier, Bhatia, Schmitz, Gage, & Oren, 2004). Scope 1 emissions are all GHGs emitted from sources directly owned or operated by the responsible firm; Scope 2 are all indirect emissions resulting from purchased electricity, heat or steam; and Scope 3 emissions are emissions from all other sources. The latter two categories of emissions belong to a firm's supply chain. Adding all the three categories of emissions together we create the variable *GHG Emissions*, which is log transformed to adjust for skewedness and mitigate the influence of outliers. To avoid collinearity with the square-transformed variable, it is also centered. To test the U-shaped relationship a second variable was generated by squaring the log-transformed, centered *GHG Emissions* term. This is labeled *GHG Emissions²*. Finally, for a given GHG emissions value, the balance of direct versus supply-chain emissions may vary across firms. To account for any influence this may have on a firm's lobbying behavior, we construct the variable *Percent Supply-Chain GHG*, which is calculated by dividing the sum of Scope 2 and Scope 3 emissions by *GHG Emissions* and multiplying it by 100.

Control Variables

We control for other factors that affect lobby expenditures. Firms are more likely to participate in CPA when the private benefits are concentrated within a smaller group of firms (Olson, 1965). Thus, we include *Concentration Ratio*, calculated from Compustat as the market share of four largest firms at the three-digit North American Industry Classification System (NAICS) code level. Additionally, shareholders can exert pressure on firms to influence their stance on social and environmental issues (Delmas & Montes-Sancho, 2010; Reid & Toffel, 2009) and political involvement (Schuler & Rehbein, 1997). To account for heterogeneity in shareholder activism we include a binary *Resolutions* variable, which is coded "1" if a firm is targeted by at least one shareholder resolution related to climate change in a given year or "0" otherwise (Reid & Toffel, 2009). Resolutions data were gathered from RiskMetrics.

Scholars note that the political behavior of firms is likely influenced by antecedent state-level political debates and regulatory efforts (Delmas & Montes-Sancho, 2010). This is especially relevant to climate change, as there is considerable variation in each state's stance on the issue (Cragg, Zhou, Gurney, & Kahn, 2012; Delmas & Montes-Sancho, 2011; DeShazo & Freeman, 2007). To account for heterogeneity in state-level regulation, we include three binary variables indicating whether a firm is headquartered in a state that (at the time): (a) has passed climate change legislation (i.e., *California*), (b) is a member of the Regional Greenhouse Gas Initiative (*RGGI*), and (c) has enacted Renewable Portfolio Standards (*RPS*).

We include several financial variables shown in prior research to affect CPA, all of which are constructed using data from Compustat. We construct the variable *Firm Size* as total assets (King & Lenox, 2002). Hillman et al. (2004) note that firms with less debt have greater organizational slack and can afford to lobby more intensely. As such we include the variable *Leverage*, calculated as the ratio of total debt to total assets. Similarly, slack resources are also affected by firm performance. We proxy *Firm Performance* as return on assets (ROA), which we calculate as earning performance interest divided by total assets (King & Lenox, 2002). We also include *Capital Intensity*, capital expenditures divided by total sales, to account for variation in available capital. All financial control variables, other than *Firm Performance*, are log transformed. Additionally, we include sector dummy variables, based on Industrial Classification Benchmark super sectors, and year dummy variables. We also included a variable that satisfies the exclusion restriction, whether the firm had engaged in *Previous-Year Lobbying* (on any issue).

TABLE 2
Climate Change Lobbying Selection (for All) and Expenditure and GHG Emissions (for Climate Lobbying Firm-Years)

| | All | | Climate Lobbying Firm-Years | | | | | | | | |
| | | | Climate Lobbying Expenditure (Million \$) | | | | GHG Emissions (Million Tons CO_2-e) | | | |
	% Lobby	*N*	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
Automobiles and parts	31.82	14	5.67	4.61	0.17	14.28	39.61	26.99	8.55	74.90
Banks	1.50	2	4.26	1.59	3.14	5.39	2.69	0.97	2.00	3.38
Basic resources	41.67	35	1.91	1.90	0.04	7.79	24.82	25.53	2.75	81.60
Chemicals	28.71	29	1.33	1.52	0.08	6.64	15.59	18.05	1.40	68.30
Construction and materials	23.28	17	0.55	0.75	0.04	3.14	2.38	1.41	0.94	5.51
Financial services	3.42	5	1.64	1.24	0.21	3.31	5.40	8.06	0.03	18.30
Food and beverage	16.19	17	1.80	2.82	0.06	9.37	19.63	17.02	3.39	57.30
Health care	1.81	5	2.73	2.63	0.57	6.38	4.50	4.19	1.09	9.65
Industrial goods and services	15.09	75	3.23	4.60	0.01	26.40	8.98	6.78	1.05	35.00
Insurance	5.59	9	3.37	2.71	0.27	8.46	2.09	1.88	0.60	5.64
Media	2.59	3	0.25	0.12	0.14	0.38	0.23	0.21	0.05	0.46
Oil and gas	22.31	56	3.73	6.61	0.03	29.00	55.01	84.82	0.31	329.00
Personal and household goods	8.54	14	1.15	1.89	0.14	7.20	9.58	11.47	1.12	42.60
Real estate	2.24	3	0.30	0.25	0.02	0.49	0.45	0.06	0.39	0.52
Retail	2.98	7	1.70	2.31	0.03	6.59	15.41	22.07	0.32	47.60
Technology	8.58	29	1.40	1.26	0.06	5.07	5.57	5.09	0.12	16.20
Travel and leisure	9.76	12	2.59	2.88	0.31	10.30	19.14	9.82	2.57	31.80
Utilities	60.09	128	1.79	3.20	0.02	27.25	40.49	37.52	0.90	167.00
Total	14.44	460	2.32	3.83	0.01	29.00	25.86	41.05	0.03	329.00

Notes. SD = standard deviation, Min. = minimum, Max. = maximum.

RESULTS

Table 2 displays summary statistics of lobbying expenditures and mean GHG emissions by sector for firms that spent money on climate lobbying, the sample pertinent to our expenditures analysis. We see that firms from almost all sectors of the economy lobbied the issue of climate change at the federal level.[4] The automobiles and parts, basic resources, and utilities sectors appear most active in lobbying, with a high percentage of firm-years engaging in climate lobbying, which is consistent with the expected economic impact of climate change legislation (Reid & Toffel, 2009). Interestingly, firms from sectors less sensitive to carbon regulation, such as banks, financial services, and health care, also lobbied on climate change.

In our sample, 14 percent of the firms lobbied on climate change. The mean estimated annual lobby expenditure per firm across all sectors is approximately \$2.3 million with a relatively high standard deviation (approximately \$3.8 million) and a maximum of \$29 million spent by ExxonMobil in 2008 (see Table 1). As shown in Table 1, the top five lobbying firms exhibit various levels of GHG emissions. For example, Exxon's and PG&E's lobbying expenses are relatively similar in

2008 (\$29 million and \$27.25 million, respectively) but differ greatly in their GHG emissions (306 million tons and 4.26 million tons, respectively).

Figure 1 shows the mean climate lobbying expenditure and mean all-issue lobbying expenditure by sector. Sectors that devote the majority of their lobbying to climate change include: automobiles and parts, basic resources, oil and gas, and utilities.

Figure 2 shows the distribution GHG emissions among firms for the firm-years that engaged in climate lobbying and those that did not. Both distributions look approximately normal but the climate lobbying sample has a higher mean.

Variable descriptions and summary statistics are shown in Table 3, and variable correlations are displayed in Table 4. As expected, the largest positive correlations with lobbying expenditures come from *Firm Size* and *GHG Emissions*. The presence of *Resolutions* is also relatively highly correlated with the dependent variable. The correlation of previous year's lobbying with selection supports its inclusion in the first stage of the Heckman analysis. Overall, no correlations are high enough to raise collinearity concerns.

The results of the two-step Heckman regression analysis with *Expenditures* as the dependent variable are shown in Table 5. Model 1(a) presents the results from the first stage probit estimates for the factors influencing the likelihood of lobbying on climate change issues. *Concentration Ratio* has a positive but insignificant effect on a firm's choice to

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[4] We excluded two sectors (investment instruments and telecommunications) from our analysis as no firms in those sectors performed any climate lobbying at over the time period and dropped out of our analysis in both stages of the Heckman model.

FIGURE 1
Means of all lobbying and climate lobbying expenditure by sector
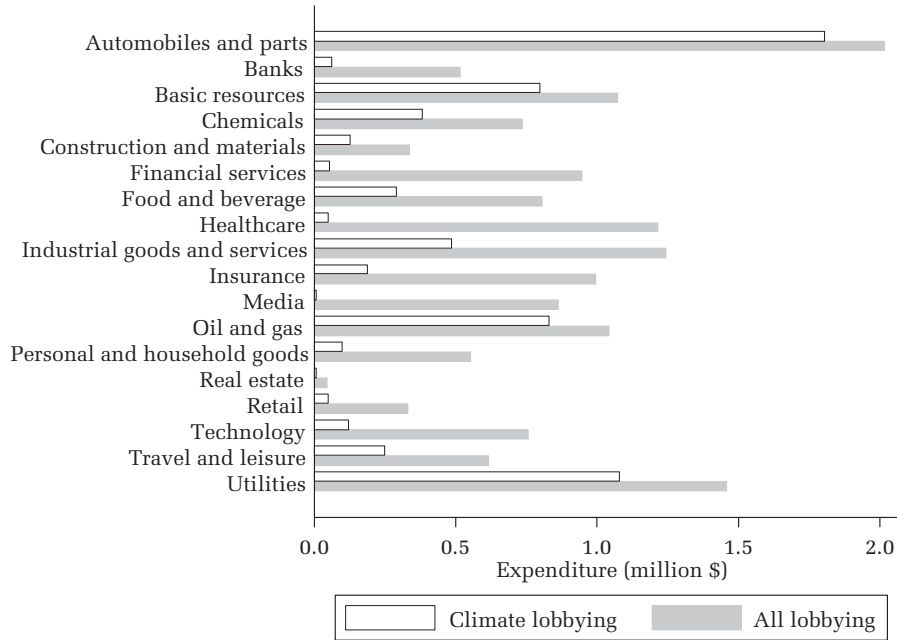

lobby. Nonetheless, the positive coefficient is consistent with Olson's (1965) prediction that firms are more likely to act collectively when the private benefits are concentrated within a smaller group of firms. Similarly, the effect of *Firm Size* is positive but insignificant; it is consistent in its sign with the literature. The high positive coefficient estimated for *Previous Year's Lobbying* suggest that this variable is a good predictor of whether or not a firm will choose to lobby on climate change and is consistent with the literature (Kerr, Lincoln, & Prachi, 2014).

Looking at the three GHG variables, *Percent Supply-Chain GHG* is negative ($p < .01$), whereas the coefficient for *GHG Emissions* is positive and significant. These results suggest that, as expected, a firm's choice to lobby depends on GHG emissions and that this relationship is strongest when emissions come from direct sources.

Looking at the second stage of the Heckman analysis in Model 1(b), *Concentration Ratio* displays a large and almost significant ($p = .11$) positive effect on lobby expenditures, which indicates that firms from industries where market share is shared by fewer firms

FIGURE 2
Histogram of greenhouse gas (GHG) emissions
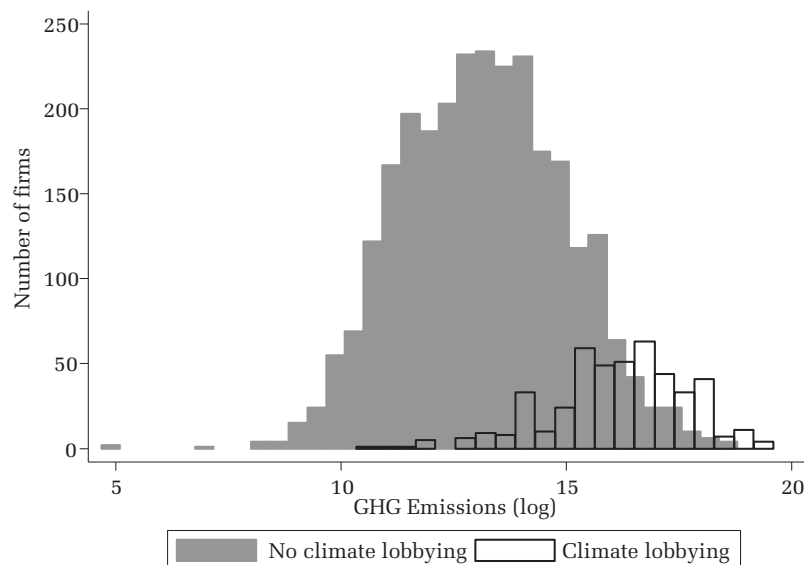
TABLE 3
Summary Statistics

Variable	Variable Description	Mean	SD	Min.	Max.
Expenditure	Total climate change lobbying expenditure (million $); source: CRP	0.33	1.66	0.00	29.00
Outside lobbyist expenditure	Total amount spent on outside climate lobbyists; source: CRP	0.03	0.16	0.00	2.67
Outside lobbyist firms	Number of outside climate lobbyist firms hired; source: CRP	0.20	0.83	0.00	15.00
Percent outside expenditure	Outside climate lobbyist expenditure as a percentage of total climate lobbying expenditure (set at zero if no climate lobbying); source: CRP	3.46	16.01	0.00	100.00
Selection	Firm lobbied on climate change (dummy); source: CRP	0.14	0.35	0.00	1.00
Concentration ratio	Market share of four largest firms in industry based on three-digit NAICS code; source: Compustat	0.38	0.18	0.14	1.00
Leverage	Total debt divided by total assets (logged); source: Compustat	−1.80	1.19	−4.61	0.78
Growth	Annual change in sales ratio (logged); source: Compustat	0.08	0.32	−12.68	1.43
Capital intensity	Capital expenditures divided by total sales (logged); source: Compustat	−2.90	1.0)	−5.88	5.26
Firm performance	ROA; source: Compustat	0.05	0.10	−1.16	0.95
Firm size	Total assets (logged); source: Compustat	8.77	1.47	3.49	14.60
Resolutions	Firm targeted by climate resolution(s) (dummy); source: RiskMetrics	0.05	0.22	0.00	1.00
California	Firm headquartered in California (dummy)	0.13	0.34	0.00	1.00
RGGI	Firm headquartered in a state participating in RGGI (dummy)	0.19	0.39	0.00	1.00
RPS	Firm headquartered in state which has RPS legislation (dummy)	0.69	0.46	0.00	1.00
Percent supply-chain GHG	Percentage of total emissions from supply chain (logged); source: Trucost	4.23	0.66	0.09	4.61
GHG emissions	GHG emissions directly emitted by the firm (tons CO_2-e, logged and centered); source: Trucost	0.00	2.07	−8.91	6.02
GHG emissions^2	Quadratic transformed GHG emissions	4.28	5.57	0.00	79.34
Previous-year lobbying	Firm lobbied on any issue in the previous year (dummy); source: CRP	0.53	0.50	0.00	1.00

Notes. Number of observations = 3,194. SD = standard deviation, Min. = minimum, Max. = maximum, CRP = Center for Responsive Politics, ROA = return on assets, RGGI = Regional Greenhouse Gas Initiative, RPS = Renewable Portfolio Standards, GHG = greenhouse gas.

devote more resources to influence policy (Hansen et al., 2005; Kim, 2008). Although *Firm Size* has no significant effect on the likelihood of lobbying, it shows a relatively large positive effect on lobby expenditures ($p < .01$). Likewise, the positive and significant coefficient estimate for *Resolution* suggests that being targeted by at least one shareholder resolution increases lobbying expenditures by approximately $1.5 million, even though it does not affect the choice to lobby. This is consistent with the literature showing shareholder pressure influencing firm disclosure and political activity (Reid & Toffel, 2009; Schuler & Rehbein, 1997).

The negative relationship between *Leverage* and lobby expenditures at both stages supports the view that firms with less debt have greater organizational slack and can afford to lobby more intensely (Hillman et al., 2004). None of the variables controlling for state- or regional-level climate change policy initiatives are significant, indicating that existing regulation at the subnational level has no significant bearing on a firm's lobbying behavior.[5] Somewhat surprisingly, the

nonsignificant result for *Percent Supply-Chain GHG* indicates that the source of emissions (i.e., direct versus supply chain) does not affect lobbying expenditures.

Supporting our proposition, the quadratic GHG emissions term is positive and highly significant ($p = .02$). The results also show that the complete effect of GHG emissions on lobby expenditures includes a negative linear term ($p = .01$). Holding all other variables constant, the estimated relationship between lobby expenditures and direct greenhouse emissions is represented by the following model:

$$y = \beta_1 x + \beta_2 x^2$$

where x is GHG emissions, β_1 and β_2 are the estimated coefficients for the linear and quadratic terms, respectively. A graphical interpretation of these results, depicting the estimated relationship between GHG emissions and lobby expenditures holding all other factors at their mean, is shown in Figure 3. The graph shows a concave-up parabola with the minimum expenditure corresponding to 0.80 million tons of emissions (logged emission of 13.59). This tells us that expenditures increase as GHG emissions either increase *or* decrease from this value, evidence of a curvilinear relationship between GHG emissions and lobby expenditures. Scatter plots of the GHG emissions and climate lobbying expenditures for the utilities and basic resources industries are shown in Figures A1 and A2, respectively.

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[5] However, note that some of these variables become significant for our regressions with a reduced sample of climate-sensitive and top lobbying sectors. For instance, the California and RGGI variables are positive and significant at the 10% level for the selection equation for climate-sensitive sectors. Regression results for the reduce samples are shown in Models 2 and 3 and discussed later in the article.

TABLE 4
Correlation Matrix

	Expenditure	Outside expenditure	Outside lobbyist firms	Percent outside expenditure	Selection	Concentration ratio	Leverage	Growth	Capital intensity	Firm performance	Firm size	Resolutions	California	RGGI	RPS	Percent supply-chain GHG	GHG emissions	GHG emissions²
Expenditure	1.00																	
Outside expenditure	0.58	1.00																
Outside lobbyist firms	0.58	0.87	1.00															
Percent outside expenditure	0.07	0.41	0.44	1.00														
Selection	0.49	0.46	0.56	0.53	1.00													
Concentration ratio	0.04	−0.01	−0.04	−0.05	−0.06	1.00												
Leverage	0.04	0.06	0.09	0.09	0.12	−0.06	1.00											
Growth	−0.02	0.00	−0.01	0.01	−0.02	−0.01	0.05	1.00										
Capital intensity	0.09	0.12	0.17	0.13	0.19	0.01	0.09	0.12	1.00									
Firm performance	−0.01	0.01	−0.02	−0.04	−0.03	0.05	−0.21	−0.14	−0.02	1.00								
Firm size	0.29	0.18	0.22	0.05	0.29	−0.11	0.25	−0.02	−0.08	−0.12	1.00							
Resolutions	0.28	0.23	0.24	0.03	0.18	0.01	0.08	−0.02	0.07	0.00	0.22	1.00						
California	0.00	−0.03	−0.04	−0.07	−0.06	−0.13	−0.19	0.05	−0.04	−0.02	−0.10	0.01	1.00					
RGGI	0.00	−0.03	−0.05	−0.03	−0.03	−0.03	0.04	−0.06	−0.12	−0.03	0.11	0.00	−0.19	1.00				
RPS	−0.03	−0.05	−0.07	−0.04	−0.05	−0.08	−0.05	0.02	−0.01	0.01	−0.01	0.00	0.26	0.33	1.00			
Percent supply-chain GHG	−0.16	−0.26	−0.40	−0.30	−0.45	0.14	−0.21	−0.01	−0.42	0.06	−0.11	−0.11	0.11	0.11	0.10	1.00		
GHG emissions	0.33	0.30	0.37	0.22	0.51	0.04	0.25	−0.05	0.21	0.06	0.46	0.25	−0.15	−0.08	−0.07	−0.51	1.00	
GHG emissions²	0.35	0.32	0.37	0.12	0.34	−0.13	0.02	0.03	0.07	−0.08	0.14	0.16	−0.03	−0.01	−0.06	−0.33	0.10	1.00
Previous-year lobbying	0.19	0.18	0.22	0.16	0.36	0.03	0.08	−0.06	0.04	0.00	0.37	0.13	−0.04	0.05	−0.03	−0.17	0.42	0.08

Notes. RGGI = Regional Greenhouse Gas Initiative, RPS = Renewable Portfolio Standards, GHG = greenhouse gas.

TABLE 5
Heckman Regression Results for Climate Lobbying Expenditure

Model	1(a)	1(b)	2(a)	2(b)	3(a)	3(b)
Sectors	**All**		**Climate Sensitive**		**Top Lobbying**	
	Selection	**Expenditure**	**Selection**	**Expenditure**	**Selection**	**Expenditure**
Concentration ratio	0.15 (0.80)	2.37 (0.11)	−0.19 (0.85)	5.31* (0.06)	−0.09 (0.85)	3.26** (0.02)
Leverage	−0.14* (0.07)	−0.75** (0.03)	−0.08 (0.63)	−1.93*** (0.00)	0.05 (0.70)	−1.69*** (0.00)
Growth	0.32 (0.23)	−0.86 (0.32)	−0.88 (0.10)	−0.72 (0.60)	−0.54 (0.23)	−0.60 (0.65)
Capital intensity	0.21*** (0.01)	0.09 (0.77)	0.24* (0.10)	−0.33 (0.41)	0.29** (0.02)	−0.59 (0.12)
Firm performance	−0.46 (0.45)	−1.88 (0.33)	−0.28 (0.79)	−3.92 (0.24)	0.77 (0.45)	−4.67* (0.10)
Firm size	0.10 (0.28)	1.64*** (0.00)	0.18 (0.20)	1.54*** (0.00)	0.09 (0.45)	2.43*** (0.00)
Resolutions	−0.08 (0.53)	1.50** (0.01)	−0.07 (0.79)	2.10*** (0.00)	−0.11 (0.65)	1.64*** (0.00)
California	−0.04 (0.88)	0.60 (0.45)	0.72* (0.10)	0.60 (0.50)	0.40 (0.27)	0.46 (0.59)
RGGI	0.15 (0.45)	0.69 (0.42)	0.45* (0.09)	−0.56 (0.41)	0.35 (0.11)	0.32 (0.61)
RPS	0.14 (0.29)	−0.06 (0.82)	0.14 (0.42)	−0.45 (0.32)	−0.06 (0.66)	−0.18 (0.66)
Percent supply-chain GHG	−0.29*** (0.01)	0.06 (0.91)	−0.28 (0.07)	0.03 (0.95)	−0.20 (0.14)	−0.51 (0.20)
GHG emissions	0.42*** (0.00)	−1.01** (0.01)	0.44** (0.03)	−2.26*** (0.00)	0.67*** (0.00)	−2.09*** (0.00)
GHG emissions^2	0.01 (0.56)	0.31** (0.02)	−0.01 (0.77)	0.45*** (0.00)	−0.03 (0.33)	0.38*** (0.00)
Previous-year lobbying	1.37*** (0.00)		1.18*** (0.00)		1.37*** (0.00)	
λ		0.59 (0.44)		0.23 (0.76)		0.50 (0.47)
Observations	3,194	460	697	250	1,089	308

Notes. Sector and year dummy variables included but not shown; bootstrap standard errors clustered at sector level for model 1; *p* values in parentheses. RGGI = Regional Greenhouse Gas Initiative, RPS = Renewable Portfolio Standards, GHG = greenhouse gas.

  *$p < .1$
 **$p < .05$
***$p < .01$

Our analysis thus far includes all economic sectors. However, in sectors with minimal carbon intensity, such as financial services and insurance, a firm's motivation to influence climate change policy likely has less to do with firm-level environmental performance than other factors that are difficult to measure and are thus not included in our model (e.g., downstream emissions or increased likelihood of catastrophic weather events). To minimize the potential for any of these factors to influence the regression results, we repeat the above analysis but restrict our sample to sectors most sensitive to climate change regulation. This includes the five most polluting sectors based on average emissions for each sector (for both climate lobbying and nonlobbying firms): automobiles and parts, basic resources, food and beverage, oil and gas, and utilities. The results using the restricted sample space are displayed in Model 2 of Table 5; the number of observations is reduced from 460 to 250.

Additionally, firms in regulated sectors have the most to gain from CPA as they are most affected by regulations (Hadani & Schuler, 2013) and we expect the U shape to be more pronounced in these sectors. Although it is difficult to determine which sectors are most affected by legislation that was not passed, the amount of lobbying might be a good proxy. Thus, we carried out a similar robustness test for the top five sectors that had the highest mean climate lobbying

expenditure (see Model 3 of Table 5): automobiles and parts, basic resources, industrial goods and services, oil and gas, and utilities. The results for both subsample analyses corroborate our initial findings.

As an additional robustness test, we ran a fixed effects regression model on the 210 firms that lobbied in at least 1 year during the time period. The results confirm that, controlling for any unobservable time-invariant firm characteristics, the relationship between GHG emissions and climate lobbying is still U-shaped. Results of this regression are available from the authors.

Table 6 shows the results for the same Heckman analysis and robustness tests using the three complementary measures of climate lobbying behavior: *Outside Expenditures*, *Outside Lobbyist Firm*, and *Percent Outside Expenditures*. The first stage results for all three measures are in Model 4(a). Looking at Models 4(b), 5, and 6, the coefficient of the quadratic term in each is highly significant ($p < .05$), confirming the proposed U-shaped relationship. The robustness tests for various subsamples, presented in the Appendix, corroborate these results.

Of the three complementary measures of lobbying behavior, the results in Model 6 provide particularly interesting insight into the relationship between environmental performance and lobbying behavior. First, the high significance and magnitude of the negative coefficient for *Firm Size* indicates that

FIGURE 3
Graph of relationship between greenhouse gas (GHG) emissions and lobbying expenditure
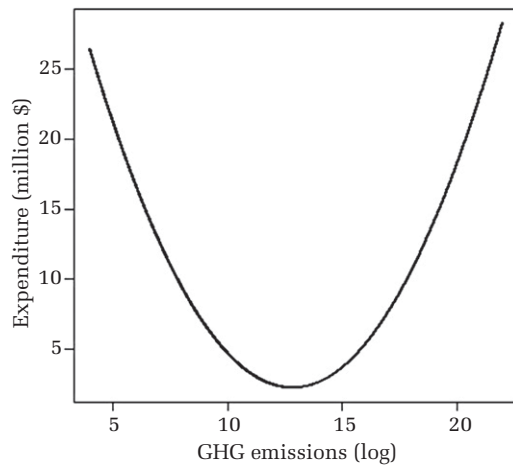
smaller firms devote less of their lobbying expenditures to outside lobbyists than do their larger counterparts. This can be explained by the fact that outside lobbyists have higher expertise than in-house lobbyist and are, therefore, more expensive (Bertrand et al., 2014). Second, the significant quadratic terms suggests that as the issue of climate change becomes more salient (whether via exemplary or poor environmental performance) the percentage of lobbying expenditures going to outside firms increases. Not only do firms on either end of the performance spectrum spend the most on lobbying, but they also seem to have a preference for hiring outside lobbying firms rather than keeping things in-house. One possible explanation for this relationship could be that, similar to hiring consultants for their expertise, outside firms are hired as specialists when an issue such as climate change is of paramount importance to a firm.

In summary, the results corroborate our proposed relationship. All else equal, the likelihood of lobbying increases as a firm's GHG emissions increase. This is consistent with prior research that suggests highly polluting firms become politically active to avoid costly regulation (Cho et al., 2006). However, a firm's GHG emissions exhibit a curvilinear relationship with lobbying intensity, implying that the firms devote increasing resources to influence environmental policy as they approach either end of the environmental performance spectrum. The curvilinear relationship is found not only with lobbying expenditures, but also with three additional, complementary measures of lobbying behavior. Not only are the dirtiest and cleanest firms spending the most but they are also more reliant on outside lobbyist firms to influence policy makers.

DISCUSSION AND CONCLUSION

Our results strongly support our proposed U-shaped relationship between issue performance and political activity. In the context of climate regulation policy, we find that firms on opposite ends of the environmental performance spectrum spend the most lobbying policy makers, whereas the middle-of-the-road performers—firms with neither exemplary nor particularly poor performance records—spend the least. Below, we discuss the theoretical and empirical implications of these findings to the corporate political strategy literature.

Although it is widely accepted that greater political issue salience increases political activity, relatively little attention has been devoted to unpacking this concept at the firm level. Prior research has largely viewed salience as external to the firm, which varies across issues and/or time. Furthermore, scholars have largely viewed increased issue salience as detrimental to a firm's profitability. This perspective is particularly evident in the context of environmental policy, where politically active firms are assumed to be unanimously opposed to environmental regulation. It follows from this view that green firms have little incentive to participate in the public policy process.

A small body of the theoretical work and anecdotal evidence indicate, however, that more stringent environment standards can give greener firms an advantage vis-à-vis their competitors. This suggests variation in issue salience across firms for a given issue and motivates this study to conceptualize and measure issue salience as a variable at the firm level. Using novel data on lobbying expenditures aimed at a specific environmental policy issue, we show that firms with increasingly good or bad performance spend more to influence the outcome of a contested environmental policy issue. Although confirming the stereotype that dirtier firms are more politically active, our findings suggest that greener firms are also vying for political influence. More generally, our results suggest that the salience of a given political issue can provide both potential advantages or disadvantages depending on whether the firm's strategies increase or decrease performance on the issue, respectively.

We study lobbying, a political tactic that has received surprisingly little attention in the empirical corporate political strategy literature. To the authors' knowledge, this is the first study to examine the relationship between environmental performance and lobbying. Focusing on environmental policy in general and climate change specifically, we also address a

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Author's voice:
How did you get access to
your data or site?

TABLE 6
Heckman Results for Measures of Outside Climate Lobbying

Model Dependent Variable	4(a) Selection	4(b) Outside Expenditure	5 Outside Lobbyist Firms	6 Percent Outside Expenditure
Concentration ratio	0.15 (0.80)	0.19 (0.31)	0.89* (0.10)	−9.69 (0.62)
Leverage	−0.14* (0.07)	0.03 (0.48)	0.14 (0.32)	8.92 (0.12)
Growth	0.32 (0.23)	0.10 (0.26)	0.63* (0.06)	15.16* (0.07)
Capital intensity	0.21*** (0.01)	0.05 (0.15)	0.25** (0.04)	−0.12 (0.98)
Firm performance	−0.46 (0.45)	0.42 (0.34)	0.68 (0.56)	−17.19 (0.49)
Firm size	0.10 (0.28)	−0.02 (0.64)	0.07 (0.57)	−13.61** (0.01)
Resolutions	−0.08 (0.53)	0.13* (0.07)	0.61* (0.07)	−4.22 (0.34)
California	−0.04 (0.88)	0.10 (0.12)	0.19 (0.42)	0.07 (0.99)
RGGI	0.15 (0.45)	0.06 (0.59)	−0.02 (0.90)	6.78 (0.22)
RPS	0.14 (0.29)	−0.03 (0.35)	−0.05 (0.75)	0.60 (0.83)
Percent supply-chain GHG	−0.29*** (0.01)	0.04 (0.61)	−0.37** (0.02)	−5.41 (0.18)
GHG emissions	0.42*** (0.00)	−0.03 (0.61)	−0.32 (0.22)	−6.28 (0.35)
GHG emissions^2	0.01 (0.56)	0.03*** (0.01)	0.18*** (0.01)	1.72** (0.04)
Previous-year lobbying	1.37*** (0.00)			
λ		0.13*** (0.01)	0.61*** (0.01)	4.69 (0.47)
Observations	3,194	460	460	460

Notes. Sector and year dummy variables included but not shown; bootstrap standard errors clustered at sector level; *p* values in parentheses. RGGI = Regional Greenhouse Gas Initiative, RPS = Renewable Portfolio Standards, GHG = greenhouse gas.

*$p < .1$
**$p < .05$
***$p < .01$

class of political issues that have considerable material implications for business and a specific issue that is widely considered as salient. To achieve this, we create and analyze a novel data set that merges multiple years of GHG emissions and lobbying expenditures specifically targeting the issue of climate change.

We develop several measures of lobbying to account not only for lobbying expenditures, but also for the form of lobbying. We found that the U-shaped relationship between environmental performance and lobbying holds for all the forms of lobbying we examined. Interestingly, greener as well as dirtier firms were more likely to favor lobbying through outside lobbyists rather than in-house lobbyists. This result might seem surprising since one might anticipate that firms faced with increased issue salience firms might want to decrease the potential transactional hazards related to outside lobbying. In a different context, de Figueiredo and Tiller (2001) show that transactional hazards affect the quantity and organization of lobbying. However, some anecdotal evidence indicates that firms might not want to expose their lobbying position and might use outside lobbyists to promote their agenda without having their name associated with the issue. This might be the case not only for dirtier firms fighting climate change regulation but also for greener firms operating in industries that are otherwise united against climate change regulation. Furthermore, with increased issue salience, lobbyist expertise might become even more valuable to firms. Lobbyists' legislative and technical expertise, as well as personal connections to politicians, are relevant assets in defining their job and outside lobbyists are more

likely to have the relevant connections and expertise than in-house lobbyists (Bertrand et al., 2014). In-house lobbyists have been portrayed as watching the day-to-day activity of the Congress to identify potential issues of interest and call in specialist outside lobbyists as needed. Such day-to-day monitoring might not require as much expertise or as many connections and in-house lobbyists might not be equipped to handle some issues that are very salient to their employers. This would explain why firms with high or low issue performance prefer to rely on the expertise of outside lobbyists.

Scholars have argued that the current theory on lobbying tends to be focused on the amount of lobbying that occurs and has largely omitted the options firms have to organize their lobbying (de Figueiredo & Tiller, 2001). Our research shows that studying empirically how firms organize their lobbying, whether internally or externally, is a particularly interesting area to pursue with this new data.

Although we focus on environmental performance, our findings are potentially generalizable to performance in other issues. For instance, firms that rely heavily on minimum-wage employees might oppose increasing the minimum wage, whereas their competitors that do not rely on minimum-wage employees (perhaps because they have automated their production process) might seek an increase in the minimum wage, which would give them a competitive advantage. Similarly, firms that are very dependent on high-skilled immigrant labor may support increasing H1-B visa quotas, whereas firms that are less reliant on immigrant labor might seek a competitive advantage

in maintaining or reducing H1-B visa quotas. Finally, firms that rely on imports might support free-trade agreements while their competitors that are less reliant on imports might lobby against free trade agreements to maintain competitiveness.

Before highlighting avenues for future research, it is prudent to note several limitations of our study. Although our results suggest that lobbying firms desire competing policy outcomes, this is inferred indirectly from environmental performance. Greater confidence in this inference could be gained from a more direct measure of each firm's stance on climate change legislation; however, firms are currently not legally obligated to report this information in their lobbying disclosures (OECD, 2014). Fortunately, voluntary efforts to improve transparency are beginning to address this data gap. The CDP (formerly the Carbon Disclosure Project), an organization that works to disclose GHG emissions of major corporations and is backed by more than 750 institutional investors representing more than $90 trillion in assets, recently added a section to their annual questionnaire asking companies to disclose their lobbying positions on climate change. Pairing this information with the publicly available climate-change-specific lobbying data provided by this study could open up promising avenues of empirical research. Following a recent call for environmental ratings to reflect CPA (Schendler & Toffel, 2011), for example, these data could be used to supplement or complement ratings that have traditionally focused on operational impacts and ignored the indirect impact of firms' political activity weakening or strengthening public environmental policy. Furthermore, while we address simultaneity as best as we can with the existing data, it is nonetheless possible that firms simultaneously determine both GHG emissions and lobbying. Future research could use instrumental variables or introduce larger lags between GHG emissions and lobbying to address simultaneity.

We also note that a considerable amount of political spending occurs through industry trade associations, such as the U.S. Chamber of Commerce or the American Petroleum Institute (Bebchuk & Jackson, 2013). Although such trade associations are required to report their lobbying spending, they are not required to disclose each member-firm's contribution to the trade association's lobbying budget and strategy. Thus, we could not account for it in our study. Future research could examine firms' choices to contribute to such associations and coordination of political strategy between trade associations and their members.

Additionally, future research could investigate the relationship between issue salience, issue performance, and other forms of CPA such as corporate disclosure, which has been described as complementary to lobbying (Cho et al., 2006; Hillman & Hitt, 1999; Delmas & Montes-Sancho, 2010; Delmas, Montes-Sancho, & Shimshack, 2010). By disclosing information related to environmental strategies and performance, dirty firms can either demonstrate to stakeholders that they are clean (e.g., through greenwashing) (Delmas & Burbano, 2011; Lyon & Maxwell, 2011) or their intention to mitigate environmental harm and actions taken to this end (Clark & Crawford, 2012; Kolk & Pinkse, 2007).

Other research avenues include a better understanding of the returns of lobbying for different levels of issue performance. Recent research shows that firms' political investments are negatively associated with market performance and cumulative political investments worsen both market and accounting performance (Hadani & Schuler, 2013). It would be interesting to examine how such results differ when taking into account issue performance. A more dynamic analysis of lobbying might also explain when these returns are more favorable (Kerr et al., 2014). For example, Rivera (2010) argues that business responses to public policy are likely to display an inverted U-shaped relationship with protective policy development; increasing in resistance as the process moves from initiation to selection and then decreasing in resistance during mid-implementation, eventually moving to cooperation and beyond compliance. Further research could investigate lobbying behavior during these different phases for firms experiencing greater political issue salience.

There also needs to be further investigation into the particular conditions under which business groups succeed and fail in influencing public policy, and how much lobbying efforts impact agenda setting and policy making in the executive, legislative and judicial branches at the federal, state, and local government (Kamieniecki, 2006). For example, Kamieniecki (2006) provided a comprehensive investigation of several case studies of corporate influence on agenda building and environmental policy making since 1970 and concluded that lobbying activities of businesses can have an enormous impact on the nation's effort to protect the environment and natural resources.

One might also explore how organizational characteristics mediate the relationship between environmental performance and corporate political strategy. These include how differences in organizational functions (Delmas & Toffel, 2008; Hoffman, 2001), firms' capabilities, resources, ownership structure (Darnall & Edwards, 2006; Sharma, 2000; Sharma & Vredenburg, 1998), board size (Kassinis & Vafeas, 2002), corporate identity and managerial

discretion (Sharma, 2000), and the characteristics of individual managers (Bansal & Roth, 2000; Cordano & Frieze, 2000).

Finally, while our research focused on the United States, further research should study the relationship between corporate environmental performance and firm involvement in global environmental and ethics standards, which are often used to complement efforts by legislation to better address social and environmental issues (Gilbert & Rasche, 2007; Rasche & Esser, 2006; Scherer & Smid, 2000).

REFERENCES

Bansal, P., & Roth, K. 2000. Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43: 717–736.

Baron, D. P. 1995. Integrated strategy: Market and nonmarket components. *California Management Review*, 37: 47–65.

Baron, D. P. 2010. *Business and its environment* (6th ed.). Upper Saddle River, NJ: Prentice Hall.

Baysinger, B. D. 1984. Domain maintenance as an objective of business political activity: An expanded typology. *Academy of Management Review*, 9: 248–258.

Bebchuk, L. A., & Jackson, J. J., Jr. 2013. Shining light on corporate political spending. *Georgetown Law Journal*, 101: 923–967.

Bertrand, M., Bombardini, M., & Trebbi, F. 2014. Is it whom you know or what you know? An empirical assessment of the lobbying process. *American Economic Review*, 104: 3885–3920.

Bonardi, J. P., Hillman, A. J., & Keim, G. D. 2005. The attractiveness of political markets: Implications for firm strategy. *Academy of Management Review*, 30: 397–413.

Bonardi, J. P., & Keim, G. D. 2005. Corporate political strategies for widely salient issues. *Academy of Management Review*, 30: 555–576.

Brasher, H., & Lowery, D. 2006. The corporate context of lobbying activity. *Business and Politics*, 8: 1–23.

Center for Responsive Politics. 2014. *Lobbying data*. http://www.opensecrets.org/resources/create/data.php. Accessed August 12, 2014.

Cho, C. H., Patten, D. M., & Roberts, R. W. 2006. Corporate political strategy: An examination of the relation between political expenditures, environmental performance, and environmental disclosure. *Journal of Business Ethics*, 67: 139–154.

Clark, C. E., & Crawford, E. P. 2012. Influencing climate change policy: The effect of shareholder pressure and firm environmental performance. *Business & Society*, 51: 148–175.

Cordano, M., & Frieze, I. H. 2000. Pollution reduction preferences of U.S. environmental managers: Applying Ajzen's theory of planned behavior. *Academy of Management Journal*, 43: 627–641.

Cragg, M. I., Zhou, Y., Gurney, K., & Kahn, M. E. 2012. Carbon geography: The political economy of congressional support for legislation intended to mitigate greenhouse gas production. *Economic Inquiry*, 51: 1640–1650.

de Figueiredo, J. M. 2002. Lobbying and Information in Politics. *Business and Politics*, 4: 125–129.

de Figueiredo, J. M., & Cameron, C. M. 2009. *Endogenous cost lobbying: Theory and evidence.* Paper presented at the 4th Annual Conference on Empirical Legal Studies, Los Angeles, California.

de Figueiredo, J. M., & Richter, B. K. 2013. *Advancing the empirical research on lobbying*. Working Paper No. 19698, National Bureau of Economic Research, Cambridge, MA.

de Figueiredo, J. M., & Tiller, E. H. 2001. The structure and conduct of corporate lobbying: How firms lobby the Federal Communications Commission. *Journal of Economics & Management Strategy*, 10: 91–122.

Darnall, N., & Edwards, D., Jr. 2006. Predicting the cost of environmental management system adoption: The role of capabilities, resources, and ownership structure. *Strategic Management Journal*, 27: 301–320.

Dawkins, C., & Fraas, J. W. 2011. Coming clean: The impact of environmental performance and visibility on corporate climate change disclosure. *Journal of Business Ethics*, 100: 303–322.

Delmas, M. A., & Burbano, V. C. 2011. The drivers of greenwashing. *California Management Review*, 54: 64–87.

Delmas, M. A., Etzion, D., & Nairn-Birch, N. 2013. Triangulating environmental performance: What do corporate social responsibility ratings really capture? *Academy of Management Perspectives*, 27: 255–267.

Delmas, M. A., & Montes-Sancho, M. J. 2010. Voluntary agreements to improve environmental quality: Symbolic and substantive cooperation. *Strategic Management Journal*, 31: 575–601.

Delmas, M. A., & Montes-Sancho, M. J. 2011. U.S. state policies for renewable energy: Context and effectiveness. *Energy Policy*, 39: 2273–2288.

Delmas, M., Montes-Sancho, M. J., & Shimshack, J. P. 2010. Information disclosure policies: Evidence from the electricity industry. *Economic Inquiry*, 48: 483–498.

Delmas, M. A., Nairn-Birch, N., & Lim, J. 2015. Dynamics of environmental and financial performance: The case of

greenhouse gas emissions. ***Organization & Environment***, 28: 374–393.

Delmas, M. A., & Toffel, M. W. 2008. Organizational responses to environmental demands: Opening the black box. ***Strategic Management Journal***, 29: 1027–1055.

DeShazo, J. R., & Freeman, J. 2007. Timing and form of federal regulation: The case of climate change. ***University of Pennsylvania Law Review***, 155: 1499–1561.

Fremeth, A. R., & Richter, B. K. 2011. Profiting from environmental regulatory uncertainty: Integrated strategies for competitive advantage. ***California Management Review***, 54: 145–165.

Getz, K. A. 1997. Research in corporate political action: Integration and assessment. ***Business & Society***, 36: 32–72.

Gilbert, D. U., & Rasche, A. 2007. Discourse ethics and social accountability: The ethics of SA 8000. ***Business Ethics Quarterly***, 17: 187–216.

Gruenspecht, H. K., & Lave, L. B. 1989. The economics of health, safety, and environmental regulation. In R. Schmalensee & R. D. Willig (Eds.), ***Handbook of industrial organization***, 2: 1507–1550. Amsterdam, the Netherlands: North-Holland.

Hadani, M., & Schuler, D. A. 2013. In search of El Dorado: The elusive financial returns on corporate political investments. ***Strategic Management Journal***, 34: 165–181.

Hansen, W. L., & Mitchell, N. J. 2000. Disaggregating and explaining corporate political activity: Domestic and foreign corporations in national politics. ***American Political Science Review***, 94: 891–903.

Hansen, W. L., Mitchell, N. J., & Drope, J. M. 2005. The logic of private and collective action. ***American Journal of Political Science***, 49: 150–167.

Hillman, A. J., & Hitt, M. A. 1999. Corporate political strategy formulation: A model of approach, participation, and strategy decisions. ***Academy of Management Review***, 24: 825–842.

Hillman, A. J., Keim, G. D., & Schuler, D. 2004. Corporate political activity: A review and research agenda. ***Journal of Management***, 30: 837–857.

Hoffman, A. J. 2001. Linking organizational and field-level analyses: The diffusion of corporate environmental practice. ***Organization & Environment***, 14: 133–156.

Hojnacki, M., Kimball, D. C., Baumgartner, F. R., Berry, J. M., & Leech, B. L. 2012. Studying organizational advocacy and influence: Reexamining interest group research. ***Annual Review of Political Science***, 15: 379–399.

Jira, C. F., & Toffel, M. W. 2013. Engaging supply chains in climate change. ***Manufacturing & Service Operations Management: M & SOM***, 15: 559–577.

Kamieniecki, S. 2006. ***Corporate America and environmental policy: How often does business get its way?*** Stanford, CA: Stanford University Press.

Kassinis, G., & Vafeas, N. 2002. Corporate boards and outside stakeholders as determinants of environmental litigation. ***Strategic Management Journal***, 23: 399–415.

Keim, G., & Baysinger, B. 1988. The efficacy of business political activity: Competitive considerations in a principal-agent context. ***Journal of Management***, 14: 163–180.

Keim, G. D., & Zeithaml, C. P. 1986. Corporate political strategy and legislative decision making: A review and contingency approach. ***Academy of Management Review***, 11: 828–843.

Kerr, W. R., Lincoln, W. F., & Prachi, M. 2014. The dynamics of firm lobbying. ***American Economic Journal. Economic Policy***, 6: 343–379.

Kim, J. H. 2008. Corporate lobbying revisited. ***Business and Politics***, 10: 3.

King, A., & Lenox, M. 2002. Exploring the locus of profitable pollution reduction. ***Management Science***, 48: 289–299.

Kolk, A., & Pinkse, J. 2007. Multinationals' political activities on climate change. ***Business & Society***, 46: 201–228.

Leone, R. A. 1981. ***Government regulation of business: Developing the managerial perspective***. Boston, MA: Division of Research, Harvard Business School.

Leone, R. A. 1986. ***Who profits: Winners, losers, and government regulation***. New York, NY: Basic Books.

Lyon, T. P., & Maxwell, J. W. 2008. Corporate social responsibility and the environment: A theoretical perspective. ***Review of Environmental Economics and Policy***, 2: 240–260.

Lyon, T. P., & Maxwell, J. W. 2011. Greenwash: Corporate environmental disclosure under threat of audit. ***Journal of Economics & Management Strategy***, 20: 3–41.

Mahoney, C. 2008. ***Brussels versus the beltway: Advocacy in the United States and the European Union***. Washington, DC: Georgetown University Press.

Munger, M. C. 1988. On the political participation of the firm in the electoral process: An update. ***Public Choice***, 56: 295–298.

OECD. 2014. ***Lobbyists, governments and public trust, Volume 3: Implementing the OECD principles for transparency and integrity in lobbying.*** Paris, France. OECD Publishing.

Olson, M. 1965. ***The logic of collective action: Public goods and the theory of groups***. Cambridge, MA: Harvard University Press.

Peltzman, S. 1976. Toward a more general theory of regulation. ***Journal of Law & Economics***, 19: 211–240.

Prakash, A. 2000. ***Greening the firm: The politics of corporate environmentalism***. Cambridge, UK: Cambridge University Press.

Ranganathan, J., Corbier, L., Bhatia, P., Schmitz, S., Gage, P., & Oren, K. 2004. ***The greenhouse gas protocol: A corporate accounting and reporting standard***. Washington, DC: World Business Council for Sustainable Development and World Resources Institute.

Rasche, A., & Esser, D. E. 2006. From stakeholder management to stakeholder accountability. ***Journal of Business Ethics***, 65: 251–267.

Reid, E. M., & Toffel, M. W. 2009. Responding to public and private politics: Corporate disclosure of climate change strategies. ***Strategic Management Journal***, 30: 1157–1178.

Reinhardt, F. 1999. Market failure and the environmental policies of firms: Economic rationales for "beyond compliance" behavior. ***Journal of Industrial Ecology***, 3: 9–21.

Richter, B. K. 2011. ***'Good' and 'evil': The relationship between corporate social responsibility and corporate political activity.*** Working paper. http://ssrn.com/abstract=1750368. Accessed September 10, 2011.

Rivera, J. E. 2010. ***Business and public policy: Response to environmental and social protection processes***. New York, NY: Cambridge University Press.

Russo, M. V., & Fouts, P. A. 1997. A resource-based perspective on corporate environmental performance and profitability. ***Academy of Management Journal***, 40: 534–559.

Schendler, A., & Toffel, M. 2011. The factor environmental ratings miss. ***MIT Sloan Management Review***, 53: 17–18.

Scherer, A. G., Palazzo, G., & Baumann, D. 2006. Global rules and private actors: Toward a new role of the transnational corporation in global governance. ***Business Ethics Quarterly***, 16: 505–532.

Scherer, A. G., & Smid, M. 2000. The downward spiral and the US model principles—Why MNEs should take responsibility for the improvement of world-wide social and environmental conditions. ***Management International Review***, 40: 351–371.

Schuler, D. A., & Rehbein, K. 1997. The filtering role of the firm in corporate political involvement. ***Business & Society***, 36: 116–139.

Shaffer, B. 1995. Firm-level responses to government regulation: Theoretical and research approaches. ***Journal of Management***, 21: 495–514.

Sharma, S. 2000. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. ***Academy of Management Journal***, 43: 681–697.

Sharma, S., & Vredenburg, H. 1998. Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. ***Strategic Management Journal***, 19: 729–753.

Stigler, G. J. 1971. The theory of economic regulation. ***Bell Journal of Economics and Management Science***, 2: 3–21.

Vogel, D. 1995. ***Trading up: Consumer and environmental regulation in a global economy***. Cambridge, MA: Harvard University Press.

Vogel, D. J. 1996. The study of business and politics. ***California Management Review***, 38: 146–165.

Yoffie, D. 1987. Corporate strategy for political action: A rational model. In A. A. Marcus, A. M. Kaufman, & D. R. Beam (Eds.), ***Business strategy and public policy: Perspectives from industry and academia***: 92–111. New York, NY: Quorum Books.

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APPENDIX A

TABLE A1
Heckman Results for Measures of Outside Climate Lobbying for Climate-Sensitive Sectors

Model	1(a)	1(b)	2	3
Dependent Variable	Selection	Outside Expenditure	Outside Lobbyist Firms	Percent Outside Expenditure
Concentration ratio	−0.19 (0.85)	−0.24 (0.50)	0.88 (0.60)	−66.97** (0.02)
Leverage	−0.08 (0.63)	0.10 (0.19)	0.50 (0.16)	20.01*** (0.00)
Growth	−0.88 (0.10)	0.11 (0.53)	0.74 (0.35)	12.53 (0.34)
Capital intensity	0.24* (0.10)	0.01 (0.80)	0.10 (0.66)	−15.70*** (0.00)
Firm performance	−0.28 (0.79)	1.28*** (0.00)	2.91 (0.14)	−13.70 (0.67)
Firm size	0.18 (0.20)	0.01 (0.85)	0.22 (0.35)	−6.62* (0.09)
Resolutions	−0.07 (0.79)	0.20*** (0.00)	0.94*** (0.00)	−5.10 (0.34)
California	0.72* (0.10)	0.14 (0.21)	0.36 (0.49)	11.87 (0.17)
RGGI	0.45* (0.09)	−0.09 (0.29)	−0.39 (0.33)	1.90 (0.78)
RPS	0.14 (0.42)	−0.03 (0.59)	−0.10 (0.71)	3.39 (0.44)
Percent supply-chain GHG	−0.28* (0.07)	0.05 (0.37)	−0.32 (0.23)	−13.23*** (0.00)
GHG emissions	0.44** (0.03)	−0.13 (0.11)	−0.96** (0.01)	−25.26*** (0.00)
GHG emissions^2	−0.01 (0.77)	0.05*** (0.00)	0.26*** (0.00)	3.62*** (0.00)
Previous-year lobbying	1.18*** (0.00)			
λ		0.14 (0.14)	0.51 (0.23)	10.93 (0.12)
Observations	697	250	250	250

Notes. Sector and year dummy variables included but not shown; *p* values in parentheses. RGGI = Regional Greenhouse Gas Initiative, RPS = Renewable Portfolio Standards, GHG = greenhouse gas.

*p < .1
**p < .05
***p < .01

TABLE A2
Heckman Results for Measures of Outside Climate Lobbying for Top Lobbying Sectors

| Model	4(a)	4(b)	5	6
Dependent Variable	Selection	Outside Expenditure	Outside Lobbyist Firms	Percent Outside Expenditure
Concentration ratio	−0.09 (0.85)	0.12 (0.47)	0.55 (0.49)	−8.74 (0.53)
Leverage	0.05 (0.70)	0.13** (0.03)	0.41 (0.14)	22.00*** (0.00)
Growth	−0.54 (0.23)	0.16 (0.30)	0.72 (0.33)	8.46 (0.51)
Capital intensity	0.29** (0.02)	0.01 (0.89)	0.06 (0.79)	−12.57*** (0.00)
Firm performance	0.77 (0.45)	1.11*** (0.00)	2.20 (0.16)	−3.46 (0.90)
Firm size	0.09 (0.45)	0.01 (0.84)	0.23 (0.25)	−10.90*** (0.00)
Resolutions	−0.11 (0.65)	0.17*** (0.00)	0.73*** (0.01)	−3.56 (0.47)
California	0.40 (0.27)	0.17* (0.09)	0.34 (0.47)	11.79 (0.15)
RGGI	0.35 (0.11)	0.02 (0.82)	−0.15 (0.67)	5.54 (0.36)
RPS	−0.06 (0.66)	−0.07 (0.13)	−0.20 (0.38)	0.98 (0.81)
Percent supply-chain GHG	−0.20 (0.14)	0.03 (0.50)	−0.40* (0.07)	−10.90*** (0.01)
GHG emissions	0.67*** (0.00)	−0.11 (0.15)	−0.81** (0.02)	−21.89*** (0.00)
GHG emissions^2	−0.03 (0.33)	0.04*** (0.00)	0.23*** (0.00)	3.46*** (0.00)
Previous-year lobbying	1.37*** (0.00)			
λ		0.05 (0.51)	0.29 (0.44)	6.51 (0.34)
Observations	1,089	308	308	308

Notes. Sector and year dummy variables included but not shown; *p* values in parentheses. RGGI = Regional Greenhouse Gas Initiative, RPS = Renewable Portfolio Standards, GHG = greenhouse gas.
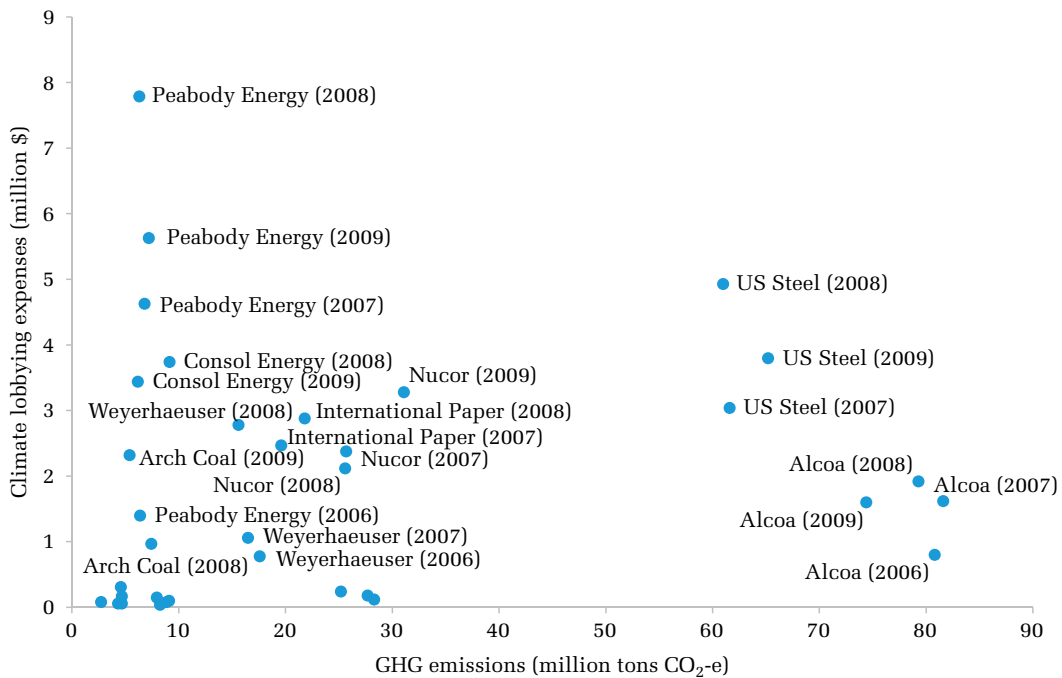
*p < .1
**p < .05
***p < .01

FIGURE A1
Scatter plot of GHG emissions and climate lobbying expenditures for the utilities sector
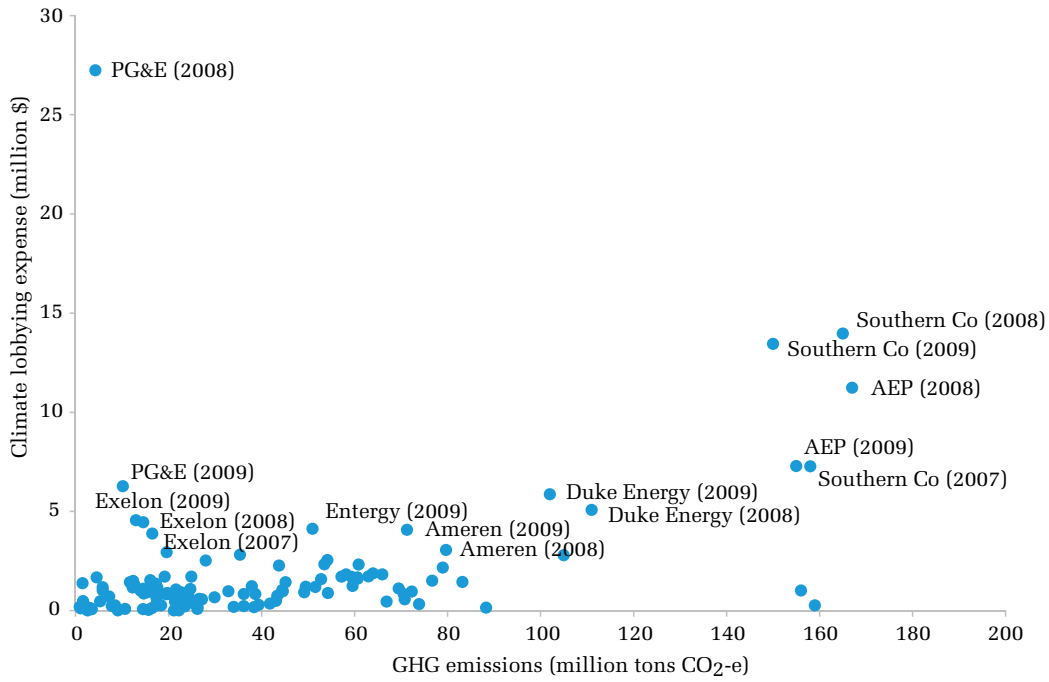
FIGURE A2
Scatter plot of GHG emissions and climate lobbying expenditure for the basic resources sector

APPENDIX B

DATA CODING

Data on corporate lobbying are available online from the Senate Office of Public Records (Secretary of the Senate and Clerk of the House of Representatives, 2013). The Center for Responsive Politics (CRP), which runs the Open Secrets website, provides a more accessible version of the data that has standardized organization names and identifies the parent company of the firms as well as variable descriptions (CRP, 2014a; b). We chose to use the CRP dataset as it is richer and easier to work with. The CRP data required clean up: some observations were split across multiple lines and delimiters were sometimes inconsistent, but it was not a common occurrence. We describe below how we coded the data for use in this article.

There are two kinds of lobbyist: lobbyist firms (which earn income from and lobby on behalf of clients) and in-house lobbyists (which incur lobbying expenditures). The Lobbying Disclosure Act requires both to file reports every quarter. Before 2008, the reports were required semiannually. These reports contain information of lobbying income or expenditure, general issue areas, and more detailed descriptions of specific issues.

Lobbyist firms must file a separate report for each client detailing income from the client. Organizations employing in-house lobbyist file one report for all lobbying activities detailing expenditure. This amount includes employee compensation, office overhead, and payment to lobbyist firms. If the organization pays membership dues to another organization, its reported lobbying expenditure must also include the portion of membership dues that goes toward lobbying. Thus, the expenditure reported by an organization that hires in-house lobbyists should be more than the total of the reported income of lobbyist firms that have it as a client. All amounts of less than $5,000 are reported as < $5,000 and coded as $0 and amounts of $5,000 or more are rounded to the nearest $10,000.

Reports must include one or more general issue areas lobbied chosen from a list of 79 issue areas. For instance, the five most popular issue areas in 2008 were: budget/appropriations, taxation/internal revenue code, health issues, defense, and energy/nuclear. Each issue area listed in the report is accompanied by a more specific description of the issue. For instance, a report may list a general issue area as environmental/superfund, and further elaborate its specific lobbying issue by naming the bills lobbied, "S. 2191, America's Climate Security Act of 2007." Alternatively, it may give a brief description of issues, for example, "Contact with members of Congress and congressional staff with regard to proposed climate change legislation."

To determine whether lobbying pertains to climate change, we searched through the issue descriptions for key words, bill numbers, and bill names. The key words we searched for were "climate," "global warming," "greenhouse," "GHG," and "GHGs." Additionally, we included the more prominent climate bills: the Waxman–Markey Bill (in 2009–2010) and the lesser known Lieberman–Warner cap-and-trade bill (2007–2008). Before 2007, climate bills were less prominent. For the Waxman–Markey Bill, we searched for terms: "H.R. 2454," "Waxman–Markey," "American Clean Energy and Security Act," and "ACES." For the Lieberman–Warner Bill: "S. 2191," "S. 3036," and "Lieberman–Warner." Both S. 2191 and S. 3036 were iterations of the Lieberman–Warner Bill. We did not search for the name of the bill, "America's Climate Security Act," because our keyword search for "climate" would have picked that up.

We designed a relatively flexible algorithm to determine whether a word, phrase, or bill number was contained in the issue description that minimized false positives and false negatives. For instance, in searching for H.R. 6, the algorithm would have to pick up all its variations (e.g., "HR6," "H R 6," "H.R. 6," and "hr6") but not "H.R. 60." To make this easier, we first standardized the issue descriptions. We first replaced all nonalphanumeric characters with spaces to avoid issues with punctuation. We also replaced all white space characters, such as tabs and carriage returns, with a space. To correct likely typographic errors, we inserted a space any time a letter was adjacent to a number. For instance, "HR6House Energy Bill" would become "HR 6 House Energy Bill." Finally, we replaced every instance of double spaces with single spaces, eliminated leading and trailing white space, and converted the issue description to lower case. This made issue descriptions into one long line in which each word was separated by one space.

We minimized false positives by requiring a full word match. For example, if we were looking for H.R. 6, we needed to distinguish "HR6," from "HR60." To do that, we split our issue description along spaces to get a list of words, and required a complete match for the word. For instance, the sentence "we lobbied on HR6 and HR60" would become a list of six words. The algorithm would produce a match on the fourth word (HR6) but not the sixth word (HR60), because it requires the full word to match.

Next, we ensured that the algorithm would be able to handle different spacing. For instance, we need to be able to recognize "HR6," "HR 6," and "H R 6." Consider a two-word phrase "HR 6"; we searched for two-word phrases in two steps. In the first step, we searched for pairs of adjacent words that produced an exact match: "we lobbied

on HR6 and HR 6" would produce a hit on the sixth word but not the fourth word. In the second step, we then also searched for the two-word phrase combined into one word, "HR6," which would produce a hit on the fourth word. The search for the three-word phrase "H R 6," proceeded similarly: we searched for three adjacent words that produced exact matches, then performed two-word searches on the two possibilities "HR 6" and "H R6," and finally performed a single word search on "HR6." Note that this still requires the individual words to be intact: a search for "H R 2454" would not produce a hit on the term "HR 24 54"; this was done to avoid false positives.

Finally, to ensure that search terms and bill numbers were complete, we examined a sample of the data to find typical names. For instance, the Waxman–Markey Bill, American Clean Energy and Security Act is often abbreviated as ACES. Senate bills are usually denoted by a preceding "S.," but searching through the data revealed that they are also preceded by "S.B.," "Sen.," "Senate Bill," and "S. R." Similarly, house bills are most often denoted by "H.R.," but are also sometimes denoted by "H.R. Bill," "H.," "H.B.," and "House Bill."
False positives are possible, although we visually inspected the data and adjusted our algorithm. For example, "climate" might not refer to climate change; similarly, "Waxman–Markey" might refer to a different bill also sponsored by Representatives Waxman and Markey. We did not see any such examples, but that remains a possibility and it would be prohibitively time consuming to check every single entry.

False negatives from typographical errors might also be an issue because lobbyists likely find filling in the reports to be a hassle. For instance, "climte" almost certainly means "climate" but would not be picked up by our search. Fortunately, the search terms and bills occur in clusters, mitigating the problem: for instance, "s. 2191, america's climte security act of 2007," would not match "climate" but would still match "S. 2191."

If we found the search term in the issue description, then entire amount (for the quarter to which the report refers) is coded as climate lobbying amount. This likely overestimates the amount spent on climate lobbying as organizations often lobby on multiple issues. However, it was the most consistent method. It is impossible to isolate the climate lobbying amount from other lobbying. Assuming a proportion is also difficult because the organizations vary widely in how they report their lobbying issues areas and describe specific issues. We also considered relying on organizations that only lobby on climate issues; however, because many organizations lobby on multiple issues, this method would have severely limited our sample size. The climate lobbying amount for each year is added up for each organization. The lobbying amount by subsidiaries is added to the lobbying amount of its parent (as identified by the CRP). If the subsidiary's parent company did not exist in our greenhouse gas database but the subsidiary itself did, used the subsidiary's amount.

The CRP also codes the data to prevent double counting. Double counting can happen if the organization files more than one report for the same quarter. Double counting might also happen if the organization employs in-house and outside lobbyists, and both file reports. (Recall that organizations that employ in-house lobbyists are required to report total expenditure, including expenditures paid to outside lobbyists.) Finally, double counting can occur when the parent files a report that includes its subsidiaries' expenditures and its subsidiaries also file reports. The CRP identifies such cases and codes them to prevent double counting, and we relied on the CRP's coding.

To code whether the lobbyist is an outside (instead of in-house) lobbyist firm, we compared the name of the registrant with the name of the client and the name of its parent company. If the name of the registrant was not equal to either its client or its client's parent company, we considered those as outside lobbyists. With the coding for outside lobbyists, we use the same method as before to determine outside climate lobbying amount.

Open Secrets Data Description

TABLE B3
Description and Use of Center for Responsive Politics Variables

Variable	CRP Definition	How We Used the Variable
File: lob_lobbying.txt		
Uniqid	Corresponds to a particular report from SOPR	Used as an identifier when merging lobbying data and to double check original SOPR reports
Registrant	Standardized registrant	Party that filed the report; combined with client and ultorg variables to identify whether lobbyist was in-house
Client	Standardized client	Party that registrant is lobbying on behalf of
Ultorg	Parent company to the client	Used to determine how much a firm spent lobbying (by aggregating data on parent company) and to merge with other data
Amount	Lobbying income/expenditures	Used to determine how much a firm spent lobbying on any issue; combined with issue coding to determine how much a firm spent on climate lobbying

TABLE B3
(Continued)

Variable	CRP Definition	How We Used the Variable
Use	To indicate if this report should be used or ignored. The general method is to use the latest report	Used to avoid double counting when more than one report is filed by the same registrant in one quarter
Ind	To indicate if the amount on this report should be included to calculate industry totals	Used to avoid double counting (a) when the firm employs in-house and outside lobbyists and both file reports and (b) when the parent files a report that includes its subsidiaries' expenditures and its subsidiaries also file reports
Year	The year	Used to merge with other data
File: lob_agency.txt		
Uniqid	Corresponds to a particular report from SOPR	Used as an identifier when merging lobbying data and to double check original SOPR reports
Agency	The government agency lobbied	Used to identify which agency was lobbied
File: lob_issue.txt		
Uniqid	Corresponds to a particular report from SOPR	Used as an identifier when merging lobbying data and to double check original SOPR reports
Specific issue	The specific issue	Used issue description to code whether lobbying was considered climate lobbying

Notes. CRP = Center for Responsive Politics, SOPR = Senate Office of Public Records.

DATA CODING REFERENCES

Center for Responsive Politics. 2014a. *Lobbying data*. http://www.opensecrets.org/resources/create/data.php. Accessed August 12, 2014a.

Center for Responsive Politics. 2014b. *Opensecrets data definitons for lobbying data*. http://www.opensecrets. org/resources/datadictionary/Data%20Dictionary%20lob_lobbying.htm. Accessed August 12, 2014.

Secretary of the Senate and Clerk of the House of Representatives. 2013. *Lobbying disclosure act guidance*. http://lobbyingdisclosure.house.gov/ldaguidance.pdf. Accessed November 17, 2014.