How Much Does Negative Public Exposure on Environmental Issues Increase Environmental Performance?

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ABSTRACT

Previous research suggests that companies tend to react against negative media coverage or activists' attacks by self-regulating in the form of increased investments in Corporate Social Responsibility (CSR). But to what extent is this mechanism able to discipline companies? And do companies self-regulate as a short-term response to media criticism, or as a longer-term reputation building mechanism? Answering these questions is critical to better understand how companies consider sustainability practices. In this paper, we use a sample of the 350 largest British companies in terms of markets capitalisation and a dynamic data panel approach to study the impact of negative public exposure in relation to environmental issues on these companies' investments in environmental CSR. We find that only the subsample with the 50% largest companies in the sample respond to the negative public exposure by increasing their environmental performance, while the smaller companies do not. This result, together with the fact that it takes companies two years to achieve a higher environmental performance, is consistent with the idea that firms consider CSR practices as a long-term investment in reputation, as an intangible asset. Indeed, public exposure in the future is more likely and more potentially damaging for larger companies, providing them with more incentives to invest in CSR-mediated reputation insurance. Smaller companies may also fail to have sufficient volume of activity to invest in this reputation insurance fixed cost.

Keywords: corporate reputation, CSR, negative public exposure, news media.

INTRODUCTION

Some environmental accidents that have appeared in the media, such as the Seveso (1976), Bhopal (1984), Chernobyl (1986) and *Exxon Valdez* (1989) accidents, have had a substantial impact on how companies integrate environmental concerns into their strategies (Hoffman & Bansal, 2012). While media exposure can affect corporate environmental strategies, civil society organizations such as NGOs can also have an impact on companies' environmental practices through "bad cop" strategies (Lyon, 2010a) such as the public exposure of companies' poor environmental records. Civil society organizations also regularly use the media to make environmental and social issues salient (Bonardi & Keim, 2005). Moreover, the spread of information technologies has given the media and civil society organizations a huge capacity to disseminate information about the companies' environmental and social records.

Public exposure by the media and civil society organizations in relation to an environmental accident or for a poor environmental record can damage a company's reputation in the eyes of customers, investors, suppliers and employees and negatively affect revenues and financial performance (Baron, 2003; Fombrun, Gardberg, & Barnett, 2000; Kassinis, 2012). Therefore, this negative public exposure should result in the adoption of environmentally responsible measures, in order to repair the company's damaged reputation and/or acquire "reputational capital" able to protect the company from reputational damage in case of additional exposure (Minor & Morgan, 2011). But to what extent is negative public exposure in relation to environmental issues able to promote companies' investments in environmental CSR? And do companies self-regulate in response to negative public exposure as a short-term response to public criticism to repair their damaged reputations or as a longer-term reputation building

mechanism? Answering these questions is critical to better understand the relationship between negative public exposure for environmental accidents or poor environmental records and environmental sustainability, as well as how firms consider sustainability practices.

The purpose of this paper is to provide insights into these questions using a sample that contains the FTSE350 constituents, that is, the 350 largest British firms in terms of market capitalization, and a panel data approach. The disciplinary effect of negative public exposure in the environmental dimension is identified by exploiting the companies' intertemporal variation in the companies' environmental performance and negative public exposure. Intuitively, this means that the estimators used identify the effect by comparing the increase in a company's environmental performance observed when this company has been negatively exposed with the increase exhibited by the same company at another point in time when it has not suffered any negative exposure. The advantage of this approach is that it controls for any time-invariant company-specific characteristic that could contaminate the coefficients, such as the fact successful companies with well-known brands may be more likely to appear in the media and, simultaneously, implement more environmentally-friendly measures. We also control for company-level time-varying characteristics, namely size, cashflow, cash, profitability, leverage and visibility in the media. Moreover, the introduction of time-fixed effects controls for any unobserved time-varying determinants of the environmental performance that affect all the companies in the same fashion. Finally, since public exposure and the increase in environmental performance may both depend on past environmental performance, we also include lags of this variable in the regressors. With the introduction of these lags we end up with a dynamic panel data model. Since the econometric literature shows that the fixed-effects panel data estimates of

dynamic panel data models are biased (Nickell, 1981), we must check the robustness of the results obtained with the classical fixed-effects panel data estimator using the Arellano-Bond estimator (Blundell, Bond, & Windmeijer, 2012).

The contribution of this study to the literature on the determinants of CSR is twofold. First, we provide a clean causal estimate of the effect of negative public exposure for an environmental accident or a poor environmental record on a company's environmental performance. While small companies do not seem to respond to negative public exposure in the environmental dimension, large companies do. In the subsample that contains 50% largest companies, negative public exposure on one given year leads to an average increase of the indicator of overall environmental performance we use in this study, and whose values are between 0 and 100, of approximately 3. Considering that, in this subsample, a company is negatively exposed, on average, one in every four or five years, the effect of negative public exposure on a company's environmental performance over time could be substantial. We also find that the response is not immediate, but that it takes two years for the negative public exposure to result in a higher environmental performance.

Second, we discuss how these findings suggest that, after negative publicity has increased the managers' perceived risk associated with potentially damaging future negative public exposure, one of the main objectives of such responsiveness is to acquire reputation insurance able to protect the company in the future. Indeed, larger companies are more visible than smaller ones and thus at a higher risk to be exposed again. They also have more to lose if they are publicly exposed than smaller ones. Moreover, the absence of smaller companies' responsiveness

suggests that these companies' volume of activity may often be insufficient to invest in the CSR-mediated reputation insurance fixed cost.

NEGATIVE PUBLIC EXPOSURE AND ENVIRONMENTAL PERFORMANCE

Negative Public Exposure

Existing literature in management shows that press diffusion in a country is positively related with the private sector's responsiveness to environmental issues in this country (Dyck & Zingales, 2002) and that media visibility has a positive impact on a company's CSR performance (Nikolaeva & Bicho, 2011; Zyglidopoulos, Carroll, Georgiadis, & Siegel, 2010). The literature also shows that emission reductions were larger for the companies that suffered the largest drops in stockmarket value in 1989 after the information about toxic emissions released by the EPA appeared in the media, regardless of the company's initial level of emissions (Konar & Cohen, 1997). Therefore, negative public exposure in media outlets in relation to an environmental accident or for a poor environmental record may be able to pressure companies to adopt environmentally-responsible measures.

Civil society organizations' confrontational strategies are also able to pressure companies to adopt socially- and environmentally-responsible measures (Bansal & Roth, 2000; Eesley & Lenox, 2006; Lenox & Eesley, 2009; Lyon, 2010b). Some well-known companies that have been negatively exposed by NGOs and media outlets in relation to environmental issues have responded by taking into account the public's demands. For example, when Greenpeace occupied the Brent Spar on April 30, 1995, and used the mass media to inspire protests across Northern Europe, within the next two months Shell responded to public pressure by renouncing to its plans

for deep-sea disposal (Bakir, 2005). More recently, in March 2010, Greenpeace launched an attack on Nestlé for the use of unsustainable palm oil from the Indonesian supplier Sinar Mas in its products. Soon after the attack, Nestlé stopped sourcing palm oil from Sinar Mas and sought the help of an external partner, Forest Trust, to assist in its exchanges with Greenpeace and to start auditing its palm oil suppliers (Ionescu-Somers & Enders, 2012). In May 2010 Nestlé also joined the Roundtable for Sustainable Palm Oil. The literature also shows that the number of environmental groups per capita has a positive effect on the reductions in toxic emissions by a state's private sector (Maxwell, Lyon & Hackett, 2010).

Activist campaigns seek to obtain the targeted company's compliance by inflicting harm on companies (Baron & Diermeier, 2007). According to these authors, harm can take a variety of forms: the disruption of operations, lawsuits, boycotts, protests, public criticism, reputational damage and criticism against individual executives. Disruption of operations imposes direct costs on the company, while lawsuits entail legal costs. However, the other forms of harm are only able to impose costs on companies if the public learns about the activist campaign through the media or other public sources of information. Moreover, even the disruption of operations and lawsuits may provide additional benefits to the activist if they are reported by the media, thereby increasing the total amount of harm inflicted to the company. Therefore, most of the time activist campaigns are successful only to the extent that the information reaches the public. Indeed, the sullying of a company's reputation in the media may be one of the most important harms NGOs can inflict on companies (Lyon, 2010a).

Activists rely heavily on the media to make issues salient (Bonardi & Keim, 2005). Indeed, while activists can communicate their negative information directly to the public through

their own publications and websites, it may be more efficient to communicate the information through the news media because it is a low-cost means of information transmission (Baron, 2005) and it is able to reach a larger public. Protests and boycotts that receive no media coverage are likely to be invisible to the broader public and investors (King & Soule, 2007). Since more media attention to a boycott, or an activist campaign, makes the company more likely to respond to the activists' demands (King, 2008), activists often compete for media attention as a strategy for influencing public perception about a corporation (Baron, 2005). The literature also shows that the impact of media coverage of a protest on the company's shareholder value increases with the number of paragraphs written in the press about the protest (King & Soule, 2007). According to another empirical study, it is likely that corporate decision-makers view boycotts as a more serious threat to their reputations than to their sales revenues (King, 2008). In sum, the literature suggests that, whenever a company is targeted by activists, the main driver of change is the reputational damage resulting from public exposure.

Since media tend to target companies that allow the portrayal of a dramatic conflict (Rindova, Pollock, & Hayward, 2006), environmental accidents or poor environmental records are likely to be reported by the media because they easily lend themselves to dramatization. Moreover, Einwiller, Carroll and Korn (2011) show that the public is highly dependent on the media to learn about companies' social and environmental records. They also show that the media tone concerning the information on environmental and social performance is positively correlated with the companies' emotional appeal. Additionally, a survey among the clients of retail chains offering fair trade products in Italy shows that negative social responsibility associations has a stronger influence on product associations than positive ones (Castaldo,

Perrini, Misani, & Tencati, 2009). Indeed, the public's emotional response to bad news is stronger than to good news (Soroka, 2006). In sum, according to the literature, (i) environmental accidents and companies' poor environmental records are likely to appear in the media, (ii) the public relies heavily on public sources of information such as the media and other sources of public information, such as civil society organizations' publications and websites, to learn about the companies' environmental records and (iii) negative news in relation to environmental issues is likely to have a strong impact on the public image of the company. Therefore, negative public exposure in relation to environmental issues can lead to substantial reputational damage.

CSR and Reputation

The adoption of environmentally-responsible measures can be driven by the belief that companies have a moral commitment towards society and that value is created through cooperation with stakeholders, in order to improve everyone's circumstance (Berman, Wicks, Kotha, & Jones, 1999; Freeman, Wicks, & Parmar, 2004). However, CSR is also motivated by the company's concern about its reputation and how it affects its financial performance (Godfrey, Merrill, & Hansed, 2009). Corporate reputation is the "perceptual representation of a company's past actions and efforts and future prospects that describe the company's overall appeal to all its key constituents" (Fombrun, 1996: 72). A good reputation is likely to have a positive impact on corporate financial performance, consumers' perceptions of product quality, employee morale and productivity, as well as on access to capital (Brammer & Pavelin, 2006). Therefore, it is an intangible asset that can confer competitive advantage (Deephouse, 2000). On the other hand, a damaged reputation can negatively affect revenues and profitability, reduce the ability to attract financial capital and talented employees, weaken employee morale and make policymakers and

government agencies more skeptical of the company's future actions (Baron, 2003; Fombrun et al., 2000). Because companies depend on both internal and external actors for critical resources (Kassinis, 2012; Pfeffer & Salancik, 2003), a damaged reputation can negatively affect revenues and profits. Since empirical evidence suggests that a company's higher environmental performance results in a better reputation (Brammer & Pavelin, 2006), when a company has been publicly exposed for an environmental accident or a poor environmental record, the adoption of environmentally-responsible measures can allow this company to repair its damaged reputation.

However, preventing reputational damage in case of future negative exposure may even be a stronger motivation than simply repairing a damaged reputation. Indeed, the literature shows that an increased awareness of the threat of negative public exposure and its consequences on the company's reputation and profitability may be enough for a company to adopt environmentally responsible measures, even if it has not suffered public exposure. Sam and Innes (2008) found that American companies in industries that were more frequently subject to boycotts were also more likely to participate in a voluntary environmental program, even if they had never been themselves the target of a boycott. Another example is the decision of Novartis in 2001 to provide Coartem, an anti-malaria drug, at a cost to patients in the developing world, after multinational giants such as Pfizer and Merck had suffered from accusations that patent and pricing policies made drugs unavailable to people in developing countries who needed them. At the time, the Novartis website mentioned that this measure "was a carefully considered decision on the part of Novartis in weighing its economic responsibilities to shareholders with its societal responsibilities. Intangible benefits - such as reputation, credibility and, ultimately, sustainability - counterbalance any potential loss of revenues" (Spar & La Mure, 2003: 94). Additionally, the

literature shows that the Union Carbide's Bhopal disaster not only led many chemical companies to join the American Chemistry Council's Responsible Care Program, but that joining this program actually benefited its participants in terms of financial performance. Indeed, while the accident led to an increase in the stocks' volatility of chemical companies, the stock volatility of chemical companies that subsequently became members of the American Chemistry Council's Responsible Care Program decreased more than for non-members (Barnett, 2007).

When a company is negatively exposed in the media or in other public sources of information in relation to environmental issues, managers probably become more aware of the potential impact of negative exposure on the company's reputation, leading to an increase in the perceived likelihood of future negative public exposure and the expected magnitude of the damages associated to it. As a result, the expected benefits of an increase in the company's environmental performance as a way to prevent the future development salient issues (Bonardi & Keim, 2005) and to acquire "reputation insurance" that protects the company from reputational damage in case of future negative public exposure (Minor & Morgan, 2011) increase. In other words, the perceived value of CSR as an intangible asset with "insurance-like" property (Godfrey et al., 2009) that provides companies with a "reservoir of social goodwill" (Werther & Chandler, 2005) increases. Godfrey et al. (2009) found that the impact of a negative event that is reported by the media on a company's stockmarket returns is lower for companies that previously engaged in CSR activities than for those who did not. An event study has also shown that companies with a stronger reputation in the domain of CSR experience less decline in their market value when they are deleted from the Calvert Social Index (Doh, Howton, Howton & Siegel, 2010). Moreover, Brammer, Pavelin, & Porter (2009)'s finding that companies with subsidiaries in

countries of concern in terms of political rights and corruption exhibit higher levels of corporate donations also suggests that CSR activities are used by companies as a source of reputation insurance.

The mechanism suggested by Godfrey et al. (2009) relies on the assumption that CSR signals altruistic behaviour to stakeholders, and more generally, to the public. If a company has a good environmental record, stakeholders are more likely to believe that a negative incident in the environmental dimension is due to bad luck or maladroiteness rather than malevolence or lack of commitment to social and environmental issues (Minor & Morgan, 2011). As a result, they may be more lenient in their punishment of the company and the tone of the news coverage might be less critical. Godfrey et al. (2009) results provide empirical support for this mechanism: CSR activities aimed at secondary stakeholders are more effective in preserving financial performance when the company is negatively exposed in the media than CSR activities aimed at the company's trading partners.

Finally, the literature suggests that CSR measures may actually be more effective at acquiring reputational capital than at repairing a damaged reputation. Lamin and Zaheer (2012) found that, while companies' responses to public accusations of sourcing from sweatshops did not have a positive impact on the tone of the media coverage after the accusation, the tone was less negative for companies that had experienced, on average, a larger proportion of news with a positive tone over the year preceding the event, that is, for companies with better reputations.

The timing of the increase in environmental performance that follows negative public exposure can provide insights into the company's motivations for implementing environmentally-responsible measures after negative public exposure. If the objective is to repair a damaged

reputation, the environmentally-responsible measures selected by the managers should lead to an increase in the environmental performance in a relatively short period of time. Longer response times, together with Lamin and Zaheer (2012)'s results, would suggest that acquiring reputation insurance is one of the main drivers of the companies' responsiveness.

Moreover, if the companies' responsiveness to negative public exposure in terms of the adoption of environmentally-responsible measures was driven by the managers' concern for the company's future reputation and the preservation of the company's profitability, larger companies should also be more responsive to negative public exposure than smaller ones. First, larger companies have more visibility in newspapers (Capriotti, 2009), face more stakeholder pressure and are more likely to be the target of an activist campaign (King, 2008, Lenox & Eesley, 2009). Second, the gains (losses) associated to a good (bad) reputation are likely to be more important for larger companies. Therefore, the initial expected probability of negative public exposure and the associated expected reputational damage are higher for larger companies. Assuming that present negative public exposure affects the managers' perceptions, resulting in a certain percentage increase in the expected probability of future negative public exposure and in the expected magnitude of the subsequent reputational damage, as mentioned above, the expected increase in the long-term reputational damage resulting from future exposure should be higher for larger companies than for smaller ones. Indeed, Godfrey et al. (2009) find that, in case of negative public exposure, previous CSR activities are more effective in preserving shareholder value for large firms than for small ones. Therefore, once they have been publicly exposed, managers in larger companies have more incentives to implement environmentally-responsible measures to acquire reputation insurance for the future than in smaller ones. Moreover, if we

consider the cost of implementing these measures as a fixed cost that the company incurs in to acquire reputation insurance, the average fixed cost is lower for larger companies than for smaller ones. In sum, the implementation of environmentally-responsible measures to acquire reputation insurance is more likely to pass the cost-benefit analysis for larger companies.

In the next section, the objective of our empirical study will be twofold. First, we will provide a clean causal estimate of the effect of negative public exposure in the environmental dimension on the companies' enviromental performance. Second, we will provide deeper insights on the motivations' behind the companies' responses to negative public exposure in terms of CSR by evaluating how long it takes for a company to increase its environmental performance after being negatively exposed and whether a company's responsiveness depends on its size.

DATA AND METHODS

Sample

The sample contains the constituents of the FTSE350 stockmarket index on December 31, 2012, that is, the 350 largest companies listed on the London Stock Exchange in terms of market capitalisation. We focus on British companies because the source of the data concerning the negative public exposure, the Corporate Critic database, is a product of the Ethical Research Consumer Association (ECRA), a British not-for-profit, multi-stakeholder co-operative.

Variables

While the dependent variable is the increase in *Environmental Performance*, the company's environmental performance indicator, the explanatory variable is *Negative News*, which captures whether a company has been publicly exposed for environmental accidents or a poor environmental record at least once on a given year. To evaluate the extent to which a company's responsiveness to negative public exposure in the environmental dimension depends on the company size, we use two indicators of size: *Net Sales* and *Assets*, which are also control variables for the size. Other company-level controls that are introduced in the regression models are *Cashflow*, *Cash*, *Profitability*, *Leverage* and *Media Visibility*.

Environmental Performance. The indicator of environmental performance on the last day of each year is retrieved from the Asset4 database (Thomson-Reuters).[1,2] Asset4 provides environmental, social and governance (ESG) information to investors. Over 130 analysts collect publicly available data on 900 data points that capture ESG characteristics of over 3500 companies from these companies, news sources, stock exchange filings, NGOs and the Carbon Disclosure Project. Every answer to each data point goes through a multi-step verification and process control, including data entry checks, automated quality rules and historical comparisons. It is also regularly updated as new public information becomes available. Asset4 analysts then transform this qualitative and quantitative data into consistent units that allow the calculation of

[1] All the information we provide in this section on the Asset4 data draws on public documents found in several Thomson-Reuters websites:
http://cdn1.im.thomsonreuters.com/wp-content/uploads/2012/04/ASSET4-ESG-Data-Factsheet.pdf
http://extranet.datastream.com/News_Events/newweb/JulSep_2011/Infostream_Q3_11_v4.pdf
http://extranet.datastream.com/data/ASSET4%20ESG/documents/ASSET4_ESG_Methdology_FAQ_0612.pdf
as well as from personal communications with Thomson-Reuters' staff in charge of the ESG content.

[2] According to a personal communication with Thomson-Reuters staff, each company's ESG scores are calculated for each fiscal year. Each score on a given fiscal year appears in the database on every day of that fiscal year. Since fiscal years do not necessarily coincide with calendar years, collecting the data on the last day of year t guarantees that it does not capture the company's performance in year t-1.

scores in four dimensions (environmental, social, corporate and economic), using and equal-weighted framework and a benchmarking approach. That is, each score on a given year represents the company's performance in that dimension with respect to all the Asset4 constituents (the Asset4 universe) on that year and over a scale that goes from 0 to 100[3]. The Asset4 scores have already been used in other CSR-related studies that rely on cross-section or panel-data approaches (Cheng et al., 2014; Ioannou & Serafeim, 2012; Luo et al., 2014). The indicator we use in this study, *Environmental Performance*, is equal to the Asset4 environmental score. The data are available for 266 companies of the sample within the 2001-2011 period. Sometimes the data on a company is only available for some years. Therefore, the panel data is unbalanced.

Negative News. The 1995-2012 data on negative public exposure in media outlets, as well as in NGOs' and other civil society members' publications and webpages, is retrieved from the Corporate Critic Database (CCD), provided by the ECRA, for each of the 266 companies with available Asset4 data. The ECRA collects data on environmental and social issues related to companies from major British and non-British media outlets, including BBC News, the Financial Times, The Guardian, The Independent, The Observer, The Times and The Telegraph. It also collects information on companies from NGOs and other civil society organization publications and websites, as well as corporate communications and other public sources of information. With this information, the ECRA generates companies' records for each event related to a socially or

[3] Since a company's environmental score is calculated using a benchmarking approach, it is dependent on the environmental performance of all the other constituents in the Asset4 universe. Therefore, a change in the Asset4 universe on a given year could push the environmental score of all the companies in our sample upwards or downwards with respect to the previous year even in the absence of a change in their environmental performance. However, this should not be a problem for our identification strategy. First, the average value of our sample's environmental score is not significantly different between any pair of years within the 2001-2011 period. Second, even if there had been a change in the Asset4 universe that had affected this average, the time-fixed effects introduced in our regression models should control for it.

environmentally-related issue, which ECRA uses to calculate each company's ethical rating (Ethiscore). These records, available in the CCD, allow us to construct $Negative\ News_{it}$, a dummy variable that is equal to unity if company i has been negatively exposed in relation to an environmental accident or for a poor environmental record at least once during year t in the media or in a civil society organization's publication or website, and zero otherwise. Boycott calls related to environmental issues are also included because they are a source of negative public exposure.[4] ECRA does not hold any record related to any kind of issue for 65 companies out of 266. ECRA states that whenever it does not hold records on a company, one can consider that its ethiscore is "OK". Therefore, we assume that these 65 companies have not been publicly exposed in relation to environmental accidents or shortcomings and we attribute 0 to *Negative News*. It should be noted that the results do not change when companies for which ECRA does not hold records are excluded from the sample, because the identification strategy relies exclusively on the intertemporal variation of the data.

Net Sales. Company size may have a positive impact on negative media exposure, as mentioned above. The literature also shows that larger companies tend to have, on average, larger environmental performances (Ioannou & Serafeim, 2012; Jackson & Apostolakou, 2010). Therefore, we introduce the company's annual net sales in billion USD as a control variable. This indicator of size also allows us to evaluate whether a company's responsiveness to negative public exposure in the environmental dimension depends on size. The data are available in the Worldscope database (Thomson-Reuters).

[4] A document with the detailed procedure followed to collect data from the Corporate Critic Database is available upon request.

Assets. The literature has used a company's assets as a control variable that accounts for company size (Lenox & Eesley, 2009) and as a proxy for the amount of resources a company can devote to dedicated legal and public relations staff to push back activists' requests (Eesley & Lenox, 2006). Therefore, in addition to *Net Sales*, we introduce company's total assets in billion USD as a control variable. Whenever we use *Net Sales* to determine whether a company's responsiveness to negative public exposure depends on the company's size, we test the robustness of the results to using *Assets* as an indicator of size instead of *Net Sales*. The data are retrieved from the Worldscope database (Thomson-Reuters).

Cashflow. Company cashflow is a proxy of the availability of funds and accounts for the fact that, regardless of the company's size, investing in CSR may be facilitated by the access to liquid capital (Eesley & Lenox, 2006). On the other hand, cashflow may also capture the excess resources that a company can devote to counteract any disruption costs imposed by negative public exposure, making the company less vulnerable to it (King, 2008). We follow Eesley and Lenox (2006)'s procedure to calculate cashflow: the value of this variable is the income before extraordinary items plus amortization and depreciation, as well as depletion. The data required to calculate this variable, in billion USD, has been retrieved from the Worldscope database (Thomson-Reuters).

Cash. The company's stock of cash is also a proxy of the access to liquid capital (Lenox & Eesley, 2009) and thus it is included in the regression models as a control variable. The data, in billion USD, is available in the Worldscope database (Thomson-Reuters).

Profitability. While profitable companies have more resources for CSR, companies with poor financial performance are more likely to restrict managerial discretion over CSR

expenditures (Adams & Hardwick, 1998). Some studies that use company profitability as an explanatory or a control variable when the dependent variable is an indicator of CSR performance find a positive relationship between the two (Adams & Hardwick, 1998; Ioannou & Serafeim, 2012), while others do not find any significant relationship between them (Brammer et al., 2009; Jackson & Apostolakou, 2010). While profitability may be positively correlated with CSR performance, highly profitable companies may also be more publicly visible and, consequently, more likely to be exposed in the media. Therefore, the annual return on assets is introduced to control for company profitability. The data is retrieved from Worldscope (Thomson-Reuters).

Leverage. High levels of company leverage can constitute a burden upon future returns (Brammer & Pavelin, 2006), while imposing on companies high debt contracting costs, which has a negative impact on the companies' resources available for CSR (Adams & Hardwick, 1998). Moreover, high levels of leverage might put the company at risk of bankruptcy, negatively affect its reputation and, as a result, influence its visibility and likelihood of exposure in the media. Thus, leverage is also introduced as a control variable to account for these potential sources of endogeneity. The value of this variable is the company's debt as a percentage of total assets in a given year. The data are available in the Worldscope database (Thomson-Reuters).

Media Visibility. Even if company size is a proxy for the company's media visibility (Brammer & Millington, 2008), we introduce the number of times a company has appeared in the major English-language publications each year as an additional control for company visibility, regardless of the issue discussed and the tone of the news, which can be positive, negative or

neutral. The data is retrieved from the LexisNexis database selecting the option "exclude share indexes".

The Identification Strategy

Since our objective is to evaluate whether company i's negative media exposure related to environmental issues is a driver of the increase in the environmental performance, the model should be:

$$\begin{aligned} \textit{Environmental Performance}_{it} - \textit{Environmental Performance}_{i,t-1} = \\ = \alpha + \beta \ \textit{Negative News}_{i,t-1} + \delta \ X_{i,t-1} + \mu_i + \eta_t + \varepsilon_{it} \end{aligned} \qquad \text{(I)}$$

where $\textit{Environmental Performance}_{it}$ is company i's environmental performance in year t and $\textit{Negative News}_{it}$ is a dummy variable equal to unity if company i has been negatively exposed concerning an environmental issue at least once in year t and zero otherwise. $X_{i,t}$ is a column vector that contains all the control variables (*Net Sales*, *Assets*, *Cashflow*, *Cash*, *Profitability*, *Leverage* and *Media Visibility*). Companies at a higher risk of suffering environmental accidents may be more likely to implement environmentally responsible measures and, simultaneously, to be exposed in the media in relation to environmental issues. Therefore, company-fixed effects (μ_i) should be included in the model to control for any company-level time-invariant characteristic that might be simultaneously correlated with environmental performance and negative exposure (or any other of the right-hand side variables). Finally, time-fixed effects (η_t)

control for any time-varying characteristic that, in each year, affects the environmental performance of all the companies in the same fashion.

However, since the increase in environmental performance can depend on previous environmental performance, we need to introduce past values of this variable in the regressors. It should be noted that *Negative News*$_{i,t-1}$ and profitability may also depend on past environmental performance. Indeed, while low levels of environmental performance in previous years may have attracted the attention of media and civil society organizations, high levels of environmental performance in the past may have made the firm more profitable in the present. Thus, the introduction of lags of *Environmental Performance* controls for any potential bias in the estimated coefficients that could be due to the correlation of past environmental performance with both the increase in environmental performance and any of the right-hand side variables.

Since we want to determine whether the company's response to negative public exposure in terms of an increase of environmental performance is immediate or not, we must also add additional lags of *Negative News* to Model (I). This modification also allows us to control for a potential source of endogeneity: the increase in environmental performance and *Negative News*$_{i,t-1}$, as well as the financial performance, could depend on the company's negative public exposure in previous years, that is, in t-k with $k \geq 2$. First, the main hypothesis is that past negative media exposure affects the company's environmental responsiveness. Second, the amount of news coverage devoted to a company's particular attribute is positively related to the proportion of the public who define the company by this attribute (Carroll & McCombs, 2003). Therefore, companies that have acquired a negative reputation through previous negative exposure may be more likely to be negatively exposed again. Indeed, the literature shows that activists are more

likely to target firms that have already been targeted in the past (King, 2008; King & Soule, 2007). Third, since negative exposure can generate reputational damage, it might lead to a lower financial performance (Fombrun et al., 2000).

Therefore, the coefficients of interest are the β_k in the model:

$$\begin{aligned} Environmental\ Performance_{it} - Environmental\ Performance_{i,t-1} = \alpha + \\ \gamma\ Environmental\ Performance_{i,t-1} + \sum_{j=2}^{J} \theta_j\ Environmental\ Performance_{i,t-j} + \\ \sum_{k=1}^{K} \beta_k\ \ Negative\ \ News_{i,t-k} + \delta\ \ X_{i,t-1} + \mu_i + \eta_t + \varepsilon_{it} \end{aligned} \qquad \text{(II)}$$

where $J \geq 2$ and $K \geq 1$. The classic fixed-effects estimation procedure relies on a transformation of the regression model in which the individual's average of each variable is substracted from that variable. Such a transformation allows the analyst to eliminate the fixed-effects term μ_i from the regression model and, as a result, to estimate the coefficients of interest. When this transformation is applied to Model (II), on the right hand side of the equation there are two terms, $\left(Environmental\ Performance_{i,t-1} - \overline{Environmental\ Performance_{\iota}}\right)$ and $(\varepsilon_{it} - \bar{\varepsilon}_{\iota})$, that are correlated. These terms are correlated because the $\overline{Environmental\ Performance_{\iota}}$ and $\bar{\varepsilon}_{\iota}$, which are the individual averages of $Environmental\ Performance_{it}$ and ε_{it}, respectively, are correlated by construction. This problem emerges because Model (II) is actually a dynamic panel model, as shown if we transform Model (II) into:

$$Environmental\ Performance_{it} = \alpha + \sum_{j=1}^{J} \theta_j\ Environmental\ Performance_{i,t-j} + \sum_{k=1}^{K} \beta_k\ Negative\ News_{i,t-k} + \delta\ X_{i,t-1} + \mu_i + \eta_t + \varepsilon_{it} \quad \text{(III)}$$

where J,K ≥ 1 and $\theta_1=1+\gamma$.[5] In dynamic panel data models, the fixed-effect estimates of the coefficients of the dependent variable's lags is inconsistent (Blundell et al., 2012). Indeed, in models with only one lag of the dependent variable, Nickell (1981) proved mathematically that the fixed-effects estimate of the coefficient of the lagged dependent variable is downwards biased. While the literature does not provide insights on the extent to which the estimates of the other variables' coefficients are biased, the Arellano-Bond estimator uses a GMM procedure that provides consistent estimates for dynamic panel data models (Blundell et al., 2012; Cameron & Trivedi, 2005).[6] The Arellano-Bond estimation procedure cannot be applied to Model (II), but can be applied to Model (III), which is a transformation of Model (II) that displays the level of Environmental performance on the left-hand side. While we run all the regressions using Model (III), it should be noted that the coefficient estimates for all the lags of *Negative News* and the control variables represent the marginal effects of these variables on the increase in environmental performance.

[5] Since we exploit exclusively the intertemporal variation of the data, the fixed-effect estimates of Model (III)'s coefficients of the lags of *Negative News* and the control variables are exactly the same than the fixed-effects estimates obtained with Model (II), except for *Environmental Performance* at t-1.

[6] In the Arellano-Bond estimation procedure, company fixed effects are removed from Model (III) by applying a first-differences transformation. The OLS estimation procedure of the first-differences model leads to inconsistent estimates because on the right hand side of the first-differences model (*Environmental Performance*$_{i,t-1}$-*Environmental Performance*$_{i,t-2}$) is correlated with (ε_{it}-$\varepsilon_{i,t-1}$). The Arellano-Bond estimator solves this problem with a panel GMM estimation procedure that uses the adequate lags of the dependent variable and the first differences of all the other regressors as instruments for the first-differences equation.

Finally, to determine whether a company's responsiveness to negative public exposure in the environmental dimension depends on the company's size, we introduce interaction terms of past values of *Negative News* and *Net Sales* (or *Assets*). If larger companies tend to be more responsive, the estimated coefficients for the interaction terms should be positive and significantly different from 0. We additionally test the effect of size on responsiveness by separating the sample into two subsamples according to the median size and running regression Model (III) for each of the subsamples.

RESULTS AND DISCUSSION

Table 1 reports the descriptive statistics of the variables. The probability of negative public exposure of one company in one given year between 1995 and 2012 and in relation to environmental issues is 9%. If only the subsample of 258 companies for which there is a full set of data is considered, the means of the variables do not differ significantly from the means of the whole sample.

Insert Table 1 about here

The first and the second column in Table 2 report the coefficient estimates of Model (III). Column (1) and (2) report the estimated coefficients obtained with the fixed-effects and the Arellano-Bond estimator, respectively. The estimated value for Model (III)'s θ_1 is always below one, regardless of the estimator we use. Since $\theta_1=1+\gamma$, Model (II)'s γ must be negative, that is, higher levels of environmental performance lead, on average, to lower increases in this performance. This is consistent with the literature's findings that environmental CSR is a

resource with decreasing marginal returns (Flammer, 2013) and that poor performers in the environmental dimension appear to be more likely to take action to increase environmental performance (King & Lenox, 2000; Lyon & Maxwell, 2004).

Insert Table 2 about here

The comparison of the coefficient estimates of the first lag of environmental performance in columns (1) and (2) shows that the fixed-effects estimate of the coefficient of the lagged dependent variable is downwards biased, as expected (Nickell, 1981). The results also suggest that there might also be a downwards bias in the fixed-effect estimated coefficients of the *Negative News* lags. While the standard errors associated with these estimates do not allow us to conclude that these coefficients are downwards biased, we rely on the Arellano-Bond estimator for all the other models tested in Table 2.

The results in Column (2) show that negative public exposure in the environmental dimension is a shock that disciplines the company, leading to an increase in the environmental performance two years after the negative public exposure. While it may take some time for companies to implement environmentally-responsible measures, the fact that the increase is not immediate is consistent with the view that the implementation of environmentally-responsible measures goes beyond repairing a damaged reputation and aims at acquiring "reputation insurance" . Column (2)'s estimates are robust to the addition of the present value and the forward lag of *Negative News*, as shown by Column (3)'s results. Indeed, the estimated coefficients of *Negative News* at t and t+1 are not significantly different from zero, which is consistent with the absence of omitted variables that might affect both negative public exposure

in relation to environmental issues and the company's environmental performance. Therefore, the results suggest that column (2) should be the benchmark model.[7,8]

In Table 2, columns (4) to (6) explore the effect of company size on its responsiveness to negative public exposure for an environmental accident or a poor environmental record. To that end, we add to column (2)'s model a second lag of the net sales, as well as the interaction terms of *Negative News* and *Net Sales* at t-1 and t-2 and report the results in column (4). We repeat the procedure with *Assets* instead of *Net Sales* and report the results in column (5). Finally, column (6)'s model contains the second lag of both *Net Sales* and *Assets*, as well as all the interaction terms introduced in columns (4) and (5). None of the interaction term estimates is significantly different from zero, suggesting that a company's responsiveness to negative public exposure in the environmental dimension does not increase (or decrease) with the company's size. Finally, it should be noted that in columns (2) to (6) the Sargan test p-value does not reject the null hypothesis that the overidentifying restrictions are valid, which suggests that the Arellano-Bond instruments are truly exogenous. Moreover, the p-values of the Arellano-Bond test of order 2 show that, as expected, there is no correlation between $(\varepsilon_{it} - \varepsilon_{i,t-1})$ and $(\varepsilon_{i,t-2} - \varepsilon_{i,t-3})$.

Eesley and Lenox (2006) found that the likelihood that a company that had been targeted by secondary stakeholders within the United States responded positively to the activist's demand decreased with increasing company assets. They suggested that a company with a larger asset base has more resources to push back the stakeholders' demands. While companies with larger

[7] Moreover, when a third lag of *Environmental Performance* is added to Column (2)'s model, the coefficient of this additional lag is not significantly different from 0 and the coefficient of *Negative News* at t-2 is positive and significantly different from zero.

[8] The results are also robust to replacing *Net Sales*, *Assets*, *Cashflow*, *Cash* and *Media Visibility* with their respective natural logarithms. Additionally, they are robust to replacing the net sales with the market capitalization, which was retrieved from Datastream (Thomson-Reuters).

asset bases may have more resources to push back specific secondary stakeholders' demands when confronted with proxy votes or costly lawsuits, which constitute 79% of the secondary stakeholders' actions in Eesley and Lenox (2006)'s sample, our results suggest that, on average, more assets and/or cash do not make British companies less responsive to negative public exposure. It should be noted that negative public exposure can be related to different types of activists' actions, including protests and boycotts, but that activists can also expose a company without making clear demands and that negative public exposure can also be unrelated to an activist campaign. Moreover, even if an activist campaign that is publicized is associated to one or more demands, the adoption of environmentally-responsible measures that eventually lead to an increase in environmental performance in order to acquire "reputation insurance" may not be directly related to activists' demands.

It should also be noted that the panel data results in Table 2 suggest that a temporary increase in the company's assets leads has a negative impact on *Environmental Performance*, regardless of whether the company has been negatively exposed or not. When a company's resources and managerial attention are focused on growing by investing in assets, these resources are not available to implement socially- and environmentally-responsible measures. In other words, when companies are growing, they have less resources to invest in the CSR-mediated reputation insurance intangible asset.

We perform an additional test of the effect of company size on its responsiveness to negative public exposure in the environmental dimension by splitting the sample into two subsamples according to the median size in terms of net sales and running the benchmark regression model for the subsamples, using both the fixed-effects and the Arellano-Bond

estimator. The results, reported in Table 3, show that the disciplinary effect of negative public exposure is exclusively driven by the 50% largest companies in the sample. These companies are much more likely to be exposed at least once in a given year than the smaller ones, as the average values of *Negative News* at t-2 for the two subsamples reported at the bottom of the table show. It should also be noted that the results at the bottom of the Table 3 show that larger companies have, on average, higher environmental performances than smaller companies, which is consistent with the literature (Ioannou & Serafeim, 2012; Jackson & Apostolakou, 2010). If the sample is split according to the median value of *Assets* instead of *Net Sales*, the results we obtain are similar.

Insert Table 3 about here

To sum up, while a company's responsiveness to negative public exposure in the environmental dimension does not seem to increase steadily with the company's size, as the results for the interaction terms in Table 2 suggest, a large company is more likely to be exposed than smaller companies. Contrarily to what happens with its smaller counterparts, this company's negative public exposure results, two years afterwards, in a value of *Environmental performance*, which is between 0 and 100, that is 3 units above the value it would have exhibited in the absence of such exposure (Table 3). Taking into account that each company in the subsample that contains the 50% largest ones is exposed, on average, one in every four or five years[9], the overall impact of negative public exposure in relation to environmental issues on the company's environmental performance is non-negligible.

[9] The average annual likelihood of negative public exposure in the subsample of the largest companies is 0.22 (Table 3), which means that a company is publicly exposed, on average, one in every 4.5 years.

While increasing size does not lead to increasing responsiveness to negative public exposure in the environmental dimension, the results are consistent with our hypotheses that once a company has reached a certain size, (i) the increase in the expected benefits from acquiring reputation insurance that results from the negative public exposure they have suffered becomes large enough and (ii) the company is able to afford the CSR-mediated reputation insurance fixed cost. An alternative explanation for a positive effect of size on the company's responsiveness to negative public exposure is that larger companies have more resources for CSR. However, if this was the case, we would have observed that reponsiveness increases gradually with size. With a fixed-effects estimation procedure we found that the coefficient of *Negative News* at t-2 for the first quartile was 2.91, with a level of confidence of 97%, while for the second quartile it was 2.36, with a level of confidence of 80%.[10] These results, together with the lack of responsiveness to negative public exposure of the subsample that contains the 50% smallest companies, suggest that reality is closer to a situation in which companies only invest in CSR-mediated reputation insurance once they have reached a certain size, rather than a situation in which a increasing size results in an increasing availability of resources to implement environmentally-responsible measures.

Table 3's estimates for *Assets* also suggest that when one of the large companies is focusing on economic growth, that is, when we observe a temporary increase in the company's assets, it probably invests less in environmental CSR than in the absence of growth, regardless of whether the company is publicly exposed for an environmental accident or a poor environmental record, which is consistent with the idea that reputation insurance is an intangible asset. Indeed,

[10] The Arellano-Bond estimation procedure could not be applied to the first and the second quartile of the sample in terms of *Net Sales*, due to the size of the subsamples, which was too small to apply this procedure.

the largest companies' fixed-effects estimate for *Assets* is negative and significantly different from zero. While the Arellano-Bond estimate for *Assets* in Table 3's last column is not significantly different from zero, its value is negative. Table 3's estimates also suggest that a temporary increase in the smaller companies' cashflow probably leads to more investments in environmental CSR, suggesting that cashflow is a crucial resource for the implementation of environmentally responsible measures in small companies. Existing literature already showed that firm cashflow is positively associated with the companies' compliance with activists' demands (Eesley & Lenox, 2006; King, 2008). This study's results suggest that this is only the case for smaller companies and that large companies generally have enough cashflow to face the implementation of environmentally-responsible measures.

CONCLUDING REMARKS

In this study we examine the effect of negative public exposure for an environmental accident or a poor environmental record, either in the media and/or in civil society organizations' publications and websites, on the companies' environmental performance. Negative public exposure at least once in a given year leads a company to exhibit, two years afterwards, an environmental performance score, whose values are between 0 and 100, that is 3 units above the value it would have had in the absence of such exposure. The effect is only observed for the 50% largest companies in the sample, which tend not only to exhibit higher environmental scores than smallest companies, but are also more likely to suffer negative public exposure in relation to environmental issues. The effect of negative public exposure on one given year on the largest companies' environmental performance score, together with the fact that each of these companies in this subsample is exposed, on average, one in every four or five years, suggests that this effect

is non-negligible. Moreover, our results also suggest that CSR is more efficient in terms of environmental sustainability in societies where the press is free and the civil society is protected by democratic rights. Indeed, in democratic environments, the diffusion of information through the media and civil society's organizations and websites contributes to the public sphere's functions of "warning system with sensors that, though unspecialized, are sensitive throughout society", as well as to the problematization of societal issues (Habermas, 1996: 359).

The fact that it takes two years to observe the increase in environmental performance and that only the largest companies respond to public negative exposure is consistent with the view that when the company's size is large enough, the implementation of environmentally responsible measures to acquire reputation insurance provides enough expected future benefits, in terms of protecting the company from future negative exposure, to pass the cost-benefit analysis. It is also consistent with the view that CSR-mediated reputation insurance can be conceptualized as a fixed cost that only large companies are able to afford.

It should be noted that while we find that large companies tend to respond to negative media exposure in the environmental dimension by adopting environmentally-responsible measures, the managers of some of these companies may prefer not to do so. The literature suggests that if the costs of complying with the public and/or the activist's demands after negative media exposure are higher, managers are less likely not to comply with these demands (Lenox & Eesley, 2009; Spar & La Mure, 2003). Companies may also engage in more publicly visible and/or cheaper types of CSR measures that allow them to signal social and environmental responsibility, without addressing the issue the company has been exposed for (Chen, Patten, & Roberts, 2007). An ambitious CSR positioning may also increase the likelihood that negative

corporate events are publicized in the media and invite private politics (Baron, 2003; Luo, Meier, & Oberholzer-Gee, 2012). Finally, demonstrating social and environmental responsiveness may not be credible in some industries, such as tobacco, nuclear energy, and weapons manufacture, where negative perceptions are particularly strong (Brammer & Pavelin, 2004).

One of the limitations of this study is that it is focused on British companies. Indeed, CSR performance is dependent on country-specific characteristics (Ioannou & Serafeim, 2012; Jackson & Apostolakou, 2010). Yu's (2005) economic model shows that high levels of public environmental awareness leads resource-constrained NGOs to substitute lobbying the government for public persuasion through the media. This suggests that in countries with high levels of concern for environmental issues and high NGO density, companies are more likely to be negatively exposed for poor environmental records. Moreover, in countries where clients, investors and other stakeholders are more sensitive to environmental issues, managers also have more incentives to respond to public criticism by becoming more environmentally responsible, in order to avoid the negative consequences of reputational damage. Therefore, in countries with high levels of concern for environmental issues, not only is the risk of negative exposure in relation to environmental issues higher, but managers are also more likely to respond to this public exposure. As a result, in these countries, the disciplinary effect of being negatively exposed for a poor environmental record should be higher than in countries where the concern for environmental issues is low. However, further research is needed to evaluate the impact of country-level characteristics on the companies' responsiveness to negative public exposure by the media or by civil society organizations in terms of environmental CSR.

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TABLE 1

Descriptive statistics of the variables

Variable	Number of Observations	Mean	Standard Deviation	Minimum Value	Maximum Value
Environmental Performance	1935	62.60	26.74	9.56	97.18
Negative News	6264	0.09	0.29	0.00	1.00
Net Sales	5095	4.52	17.72	0.00	293.30
Assets	5124	18.09	111.54	0.00	2394.57
Cashflow	4940	0.48	1.98	-20.39	26.49
Cash	4800	0.28	1.04	0.00	20.96
Profitability	4907	7.35	11.70	-127.76	185.33
Leverage	5072	21.12	19.76	0.00	206.38
Media Visibility	5076	288.63	1502.68	0.00	60631.00

TABLE 2

The disciplinary effect of negative public exposure in relation to environmental issues

VARIABLES	(1) Fixed-effects	(2) Arellano-Bond	(3) Arellano-Bond	(4) Arellano-Bond	(5) Arellano-Bond	(6) Arellano-Bond
Environmental Performance at *t-1*	0.20***	0.37***	0.36***	0.37***	0.36***	0.36***
	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Environmental Performance at *t-2*	0.011	0.12***	0.11***	0.12***	0.12***	0.12***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Negative News at *t+1*			1.73			
			(2.23)			
Negative News at *t*			1.33			
			(1.75)			
Negative News at *t-1*	0.27	1.68	2.21	2.44	2.35	2.48
	(1.44)	(1.43)	(1.52)	(1.52)	(1.50)	(1.52)
Negative News at *t-2*	1.91*	3.11**	3.66***	3.13**	2.67**	2.84**
	(0.98)	(1.24)	(1.26)	(1.41)	(1.34)	(1.45)
Negative News at *t-3*	-0.92	-0.88	-0.33	-0.85	-0.92	-0.91
	(1.26)	(1.51)	(1.54)	(1.52)	(1.51)	(1.52)
Net Sales at *t-1*	-0.04	-0.01	-0.00	0.10	0.03	0.08
	(0.03)	(0.06)	(0.06)	(0.09)	(0.07)	(0.08)
Net Sales at *t-2*				-0.01		0.02
				(0.07)		(0.08)
Negative News at *t-1* × Net Sales at *t-1*				-0.14		-0.05
				(0.10)		(0.12)
Negative News at *t-2* × Net Sales at *t-2*				-0.01		-0.08
				(0.08)		(0.11)
Assets at *t-1*	-0.11***	-0.11***	-0.11***	-0.10***	-0.10***	-0.10***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Assets at *t-2*					-0.05	-0.04
					(0.03)	(0.03)
Negative News at *t-1* × Assets at *t-1*					-0.05	-0.04
					(0.04)	(0.06)
Negative News at *t-2* × Assets at *t-2*					0.03	0.05
					(0.03)	(0.03)
Cashflow at *t-1*	-0.16	-0.00	-0.02	-0.08	-0.22	-0.19
	(0.25)	(0.22)	(0.21)	(0.23)	(0.27)	(0.28)
Cash at *t-1*	0.21	0.34	0.31	0.21	0.13	0.13
	(0.29)	(0.67)	(0.67)	(0.64)	(0.69)	(0.68)
Profitability at *t-1*	0.11**	0.099	0.097	0.10	0.11	0.11
	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Leverage at *t-1*	-0.12***	-0.06	-0.05	-0.06	-0.06	-0.06
	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Media Visibility at *t-1*	0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	60.99***	33.11***	33.04***	38.12***	33.68***	39.26***
	(3.08)	(4.90)	(4.90)	(5.07)	(5.07)	(5.19)
Observations	1,336	1,106	1,106	1,106	1,106	1,106
R-squared	0.21					
Number of companies	227	211	211	211	211	211
Sargan Test p-value		0.50	0.53	0.47	0.49	0.46
Arellano-Bond test p-value (order2)		0.63	0.59	0.63	0.64	0.64

Notes: **While the regressions were run with *Environmental Performance at t* as the left-hand side variable, all the coefficients represent the marginal effects of the variables on the increase in *Environmental Performance*, except for the coefficient of *Environmental Performance at t-1* (for a detailed explanation, see pp. 21-22).** The unit of observation is the company. The estimator used (either fixed-effects or Arellano-Bond) is specified at the top of each column. Time- and company-fixed effects are included in all the models. The Sargan test null hypothesis is that the overidentifying restrictions are valid. The Arellano-Bond test null hypothesis is that there is no second order autocorrelation of the first-differenced error terms. Below each coefficient robust standard errors are reported in brackets. In column (1) the standard errors are also clustered by company. * $p < .10$ ** $p < .05$ *** $p < .01$

TABLE 3

The dependence of the disciplinary effect of negative public exposure in relation to environmental issues on company size (indicator of size: *Net Sales*)

VARIABLES	Complete sample		50% smallest companies		50% largest companies	
	Fixed-effects estimator	Arellano-Bond estimator	Fixed-effects estimator	Arellano-Bond estimator	Fixed-effects estimator	Arellano-Bond estimator
Environmental Performance at *t-1*	0.20***	0.37***	0.22***	0.23**	0.18***	0.36**
	(0.03)	(0.05)	(0.05)	(0.11)	(0.05)	(0.15)
Environmental Performance at *t-2*	0.01	0.12***	0.01	0.05	0.00	0.16*
	(0.03)	(0.04)	(0.04)	(0.06)	(0.04)	(0.086)
Negative News at *t-1*	0.27	1.68	-3.19	0.77	0.80	1.55
	(1.44)	(1.43)	(2.91)	(2.76)	(1.73)	(1.69)
Negative News at *t-2*	1.91*	3.11**	-1.40	1.88	2.63**	3.15**
	(0.98)	(1.24)	(1.96)	(1.50)	(1.11)	(1.60)
Negative News at *t-3*	-0.92	-0.88	-1.95	2.33	-0.51	-1.81
	(1.26)	(1.51)	(2.70)	(2.93)	(1.44)	(1.75)
Net Sales at *t-1*	-0.04	-0.01	4.63	5.42	-0.03	0.05
	(0.03)	(0.06)	(4.96)	(4.65)	(0.03)	(0.05)
Assets at *t-1*	-0.11***	-0.11***	-0.32	0.37	-0.09***	-0.04
	(0.03)	(0.03)	(0.75)	(0.68)	(0.02)	(0.04)
Cashflow at *t-1*	-0.16	-0.00	4.58***	3.02***	-0.43	-0.14
	(0.25)	(0.22)	(1.09)	(1.00)	(0.39)	(0.27)
Cash at *t-1*	0.21	0.34	0.097	-5.12	0.30	0.49
	(0.29)	(0.67)	(7.40)	(6.74)	(0.32)	(0.64)
Profitability at *t-1*	0.11**	0.10	-0.09	-0.06	0.18**	0.19*
	(0.05)	(0.07)	(0.06)	(0.06)	(0.09)	(0.11)
Leverage at *t-1*	-0.12***	-0.06	-0.04	-0.03	-0.17***	-0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.08)
Media Visibility at t-1	0.00	-0.00	0.00*	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	60.99***	33.11***	51.31***	46.21***	71.29***	36.67***
	(3.08)	(4.90)	(11.4)	(15.3)	(4.79)	(9.42)
Observations	1,336	1,106	530	425	806	806
R-squared	0.21		0.29		0.19	
Number of companies	227	211	103	88	124	124
Sargan Test p-value		0.50		0.67		0.80
Arellano-Bond test p-value (order 2)		0.64		0.07		0.65
Average value of Environmental Performance	62		50		71	
Average value of Negative News at *t-2*	0.13		0.04		0.22	

Notes: **While the regressions were run with *Environmental Performance at t* as the left-hand side variable, all the coefficients represent the marginal effects of the variables on the increase in *Environmental Performance*, except for the coefficient of *Environmental Performance at t-1* (for a detailed explanation, see pp. 21-22).** The unit of observation is the company. The estimator used (either fixed-effects or Arellano-Bond) is specified at the top of each column. Time- and company-fixed effects are included in all the models. The Sargan test null hypothesis is that the overidentifying restrictions are valid. The Arellano-Bond test null hypothesis is that there is no second order autocorrelation of the first-differenced error terms. Below each coefficient robust standard errors are reported in brackets. When the fixed-effect estimator is used, the standard errors are also clustered by company. The average values reported at the bottom of the table correspond to the 2001-2011 period.
* $p < .10$ ** $p < .05$ *** $p < .01$