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Institutional Investors and Corporate Environmental, Social, and Governance Policies: Evidence from Toxics Release Data

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Abstract

This paper studies the role of institutional investors in influencing corporate environmental, social, and governance (ESG) policies by analyzing the relation between institutional ownership and toxic release from facilities to which institutions are geographically proximate. We develop a local preference hypothesis based on the delegated philanthropy and transaction-costs theories. Consistent with the hypothesis, local institutional ownership is negatively related to facility toxic release. The negative relation is stronger for local SRI funds, local public pension funds, and local dedicated institutions. We also find that the relation is more negative in communities that prefer more stringent environmental policies and in communities of greater collective cohesiveness. Local institutional ownership, particularly local ownerships by SRI funds and public pension funds, is positively related to the probability that an ESG proposal is either introduced or withdrawn. The paper sheds light on the drivers behind institutions' ESG engagement and their effectiveness in influencing ESG.

JEL classification: D22; G34; M14

Keywords: Environmental, social, and governance; Corporate social responsibility; Institutional investors; Geographic distance; Toxics Release Inventory

1. Introduction

In 2013, the United Nations Global Compact (UNGC) conducted its third triennial survey of 1,000 CEOs across 103 countries. The survey found that 93% of the responding CEOs regarded environmental, social, and governance (ESG) issues as important to the success of their business, and 69% expected investor interest to be an increasingly important factor in building ESG into their core business. Motivated by the growing importance of ESG and the strong desire of corporate executives for shareholder input, we study the role of institutional investors in influencing corporate ESG. More specifically, we analyze the relation between ownership by local institutional investors and the amount of toxic chemicals released into the environment by the nearby facility using a sample of 3,907 institutional investors from 1994 to 2010.

Our study is distinct from other work on ESG[1] in two important ways: 1) we focus on the environmental aspect of ESG; and 2) the analysis is primarily conducted at the facility, instead of the firm, level. Our approach has numerous advantages. By analyzing the impact of institutional investors on toxic release, we examine a classic example of negative externalities, which according to the traditional theory of the firm, should fall outside the domain of corporate activities. Specifically, institutional investors should refrain from considering corporate environmental issues on the ground that they own a fiduciary duty to their investors to maximize investment return (Darabaris, 2007). Consistent with this notion, anecdotal evidence, including the above-mentioned UNGC surveys, shows that executives have expressed a strong desire for greater shareholder involvement in their consideration of corporate environmental policies. Second, while there is a rich body of work analyzing the impact of various stakeholders such as regulators, non-governmental organizations (NGOs), and consumers on corporate environmental policies, the evidence on the role of investors is scarce (Kassinis and Vafeas, 2006; Delmas and Toffel, 2012). We feel the urgency to fill this literature gap because as the owners of the firm, shareholders are the most influential stakeholders.

[1] For simplicity, this paper uses ESG, corporate social responsibility (CSR), sustainability, ethical investing, and sustainable investing interchangeably (McWilliams and Siegel, 2001; Bénabou and Tirole, 2010; Gillan, Hartzell, Koch, and Starks, 2010). See also the UNGC surveys.

Using facility-level data affords us three additional advantages. First, the facility is where pollution is generated. Thus, using facility-level data permits us to more directly test the delegated philanthropy theory that Bénabou and Tirole (2010) propose to explain the rationales behind the ESG movement. Specifically, one important argument "for asking corporations to behave prosocially is that the desired actions are often not about transferring income to less-favoured populations, but about refraining from specific behaviours, such as polluting the environment" (Bénabou and Tirole, 2010, pages 10-11). Second, facilities exercise significant decision power over their environmental management, including toxic release (Stephan, Kraft, and Abel, 2005), leading to heterogeneous pollution abatement practices across facilities within the same firm.[2] Thus, using facility-level data enables us to more precisely proxy for the intensity of institutional investors' influence by using their physical distance from the facility. Lastly, as investment decisions are made at the sector and firm levels, using facility-level data mitigates endogeneity concerns.

To more purposefully address our research question—whether institutional investors influence facility toxic release—we develop a local influence hypothesis based on the delegated philanthropy theory and the transaction-costs arguments (Coase, 1937 and 1960). The delegated philanthropy theory argues that as alternative responses to market and government failures, firms act prosocially at the demand of their heterogeneous stakeholders (e.g., investors, customers, and employees) because firms incur lower information and transaction costs in doing philanthropy than individuals doing these activities on their own. Drawing from this theory, the local influence hypothesis argues that heterogeneous preferences for facility pollution exist between local and distant institutional investors. Specifically, local institutional investors have a greater incentive than their distant counterparts to pressure facilities to reduce pollution because the former internalize, to a greater degree, the harm of pollution due to emissions of nearby facilities as well as the benefit of social prestige from acting prosocially in a local community. The transaction-costs arguments hold that when markets are inefficient, efficient economic transactions can still take place when transaction

[2] Also see Kassinis and Vafeas (2006) and "Guide to Successful, Sustainable Social Investment, by the International Petroleum Industry Environmental Conservation Association," http://www.ipieca.org/our-work/social/social-investment/

costs (e.g., negotiation costs) are low. Applying this logic, the local influence hypothesis posits that compared to their distant peers, local institutional investors face lower negotiation costs and exert a stronger influence over local facilities in reducing pollution because they possess a greater amount of soft information and tacit knowledge, and have closer social ties with the facility and the local community. Consistent with the local influence hypothesis, we find that local institutional investors (measured as institutions located within 150 miles of the facility) have a significantly negative effect on toxic release by the nearby facility than distant institutional investors, and this result holds in variety of robustness tests.

To provide further evidence for the local influence hypothesis, we examine the relation between local institutional ownership and facility toxic release across institution types. The delegated philanthropy theory argues that firms engage in prosocial behaviors because individuals' preferences are heterogeneous and are inevitably not fully reflected in government policies. The literature shows that institutional investors have heterogeneous preferences in terms of sacrificing pecuniary rewards for social gains and trading off short-term against long-term performance (see, e.g., Aguilera, Williams, Conley, and Rupp, 2006; Hong and Kacperczyk, 2009; Hong and Kostovetsky, 2012). Therefore, the logical extension of the delegated philanthropy theory is that to the extent that institutional investors impact facility toxic release, systematic differences should exist across different types of local institutional investors in their influence over facility toxic release. Consistent with the local preference hypothesis and the existing literature, we find a significantly more negative effect for local socially responsible investing (SRI) funds and local public pension funds than for other types of local institutional investors. We also find some evidence that ownership by local dedicated institutional investors (characterized by a low portfolio turnover rate and more concentrated holdings) is more negatively related to facility toxic release than ownership by their transient counterparts (characterized by a high portfolio turnover rate and more diversified portfolios).

We perform two sets of more stringent tests of the local influence hypothesis. Extending the logic of the delegated philanthropy theory that *firms* engage in prosocial behaviors at the demand of heterogeneous stakeholders, it is reasonable to expect that *local institutional investors* engage in ESG on behalf of their community. This delegation may occur because as a member of the local community, institutional investors have the means and expertise that individual community members and community organizations lack to influence facility behaviors (see, e.g., Bui and Mayer, 2003; Gillan and Starks, 2007; Lee and Lounsbury, 2009). In addition, clients of local institutional investors may reside in the community and request the local institutional investors to act on their behalf to pressure the facility to reduce pollution. To the extent that a community puts a premium on a better environment, efforts exerted to reduce pollution also generate greater image value in that community. Therefore, the local influence hypothesis predicts that local institutional ownership is more negatively associated with facility pollution in communities that prefer more stringent environmental policies. Drawing from the literature, we use four different proxies to gauge this preference of a community and find consistent evidence in support of the local influence hypothesis.

The other more stringent test of the local influence hypothesis is premised on the transaction-costs arguments or to put it more precisely, the recognition that the Coase theorem requires the assumption of zero transaction costs. In "large-number" cases (i.e., when a transaction requires the agreement of a large number of people), the process of direct negotiation and agreement breaks down because coordination costs are so high that people can no longer negotiate their way to efficiency. Following this line of reasoning, the local influence hypothesis predicts that local institutional ownership is more negatively associated with facility pollution in communities of greater collective cohesiveness (i.e., lower coordination costs). Following the literature, we use two empirical proxies to gauge the collective cohesiveness of a community and find consistent evidence in support of the local influence hypothesis.

Lastly, to provide direct evidence for their influence, we study the impact of local institutional investors on the likelihood that an ESG shareholder proposal is introduced or withdrawn. A proposal is frequently withdrawn after its sponsor reaches a compromise with the firm (Viederman, 2002; Buchanan, Netter, Poulsen, and Yang, 2012). Consistent with the overall evidence, we find a positive link between local institutional ownership and the probability that a firm receives a proposal targeting social and environmental issues or such a proposal is withdrawn. Further, this positive relation is stronger if a firm has a higher level of local ownership by SRI funds or public pension funds than if a firm has a higher level of local ownership by other types of institutional investors.

This paper makes four main contributions. First, the paper contributes to the rapidly growing ESG literature. Despite the richness of this literature, evidence on shareholders' role in ESG, particularly their role in influencing corporate environmental policies, is scarce and mixed. Bauer et al. (2013) and Dimson et al. (2015) both use proprietary data from a single institutional investor with a major commitment to ESG and find that the asset manager actively engages in and improves corporate social and environmental policies. Dyck, Lins, Roth, and Wagner (2015) study whether institutional investors improve a firm's environmental and social scores for a large sample of firms from 41 countries. They find that non-U.S. institutional investors' stock holdings, but not those by U.S. institutional investors, are related to the scores. Using a sample of 3,907 U.S. institutional investors, we find that local institutional ownership is significantly and negatively related to facility toxic release. Second, we provide evidence for the delegated philanthropy theory. To the best of our knowledge, Di Giuli and Kostovetsky (2014) is the only study that tests the theory, but their evidence focuses on corporate insiders and other stakeholders as opposed to shareholders. Third, our results shed light on the slow evolution that the environmental regulation in the United States has been undergoing for the past 30 years, moving from command and control strategies towards market-based regulations (Bui and Mayer, 2003). This paper identifies one market mechanism—local institutional investors—that is facilitating the transition. Lastly, this paper contributes to other strands of social science literature such as environmental justice, organizational behavior, and public choice that analyze the relation between corporate environmental actions and the stakeholders. While each literature branch is large, researchers' attention has been squarely on other stakeholders (e.g., regulators, competitors, suppliers, consumers, NGOs, etc.) as opposed to shareholders. This paper provides an important piece of missing evidence and helps address open questions in different fields of studies including why different firms reduce pollution unevenly (Margolis and Walsh, 2003), how social movement shapes corporate behaviors (King and Soule, 2007), and what drives corporations to comply with costly environmental regulation when the enforcement role is limited (Sigman and Stafford, 2010).

2. Related literature and hypotheses development

2.1. Three rationales behind ESG and limited evidence on the delegated philanthropy theory

The exponential growth in the number of firms engaging in ESG has motivated researchers to develop new theories to explain the rationales behind the ESG movement. Bénabou and Tirole (2010) synthesize the CSR literature, define CSR as corporate activities that are about sacrificing profits in the social interest, and propose a delegated philanthropy theory to augment the well-established shareholder value theory and agency theory in explaining the ESG movement. Briefly, shareholder value theory argues that firms pursue CSR because such activities enhance shareholder value, while agency theory argues that corporate executives use shareholders' money to pursue CSR for their own benefit. Shareholder value theory is similar to the enlightened value maximization theory of Jensen (2001), which posits that firm value is maximized in the long run when the interests of shareholders and other stakeholders are aligned.

While ample evidence has been generated for shareholder value theory and agency theory,[3] evidence on the delegated philanthropy theory is limited. To the best of our knowledge, Di Giuli and Kostovetsky (2014) is the only study that tests the theory. Using firm-level CSR ratings of Kinder, Lydenberg, and Domini (KLD), they find that firms have higher CSR scores when they have Democratic rather than Republican founders, CEOs, and directors, and when they are headquartered in Democratic- rather than Republican-leaning states.

2.2. Hypothesis development

To more purposefully investigate the potential role of institutional investors in corporate environmental policies, we develop the local influence hypothesis based on the delegated philanthropy

[3] For a survey of the literature on the relation between ESG and firm performance, please see Orlitzky, Schmidt, and Rynes (2003), Margolis, Elfenbein, and Walsh (2007), Van Beurden and Gössling (2008), Renneboog, Horst, and Zhang (2008), and Kitzmueller and Shimshack (2012). For evidence consistent with Jensen's enlightened value maximization theory, please see Jiao (2010) and Deng, Kang, and Low (2013). Relatedly, a large body of work shows that firms pursue ESG to gain a competitive advantage in the product market (see, e.g., Servaes and Tamayo, 2013; Flammer, 2015). For evidence on agency theory, please see Brown, Helland, and Smith (2006), Barnea and Rubin (2010), Amore and Bennedsen (2016), Ferrell, Liang, and Renneboog (2016), and Petrenko, Aime, Ridge, and Hill (2016).

theory and the transaction-costs arguments. The delegated philanthropy theory (Bénabou and Tirole, 2010) argues that as alternative responses to market and government failures, firms act prosocially at the demand of their heterogeneous stakeholders because firms incur lower information and transaction costs in doing philanthropy than individuals doing these activities on their own and through charitable organizations. The transaction-costs arguments (Coase, 1937 and 1960) hold that in a world of fully defined property rights and zero transaction costs, people can negotiate their way to efficiency when the market outcome is inefficient. According to Coase, transaction costs include search and information costs, haggling over the terms of the contract, and the costs of monitoring and enforcing the contract. Therefore, the delegated philanthropy theory and the transaction-costs arguments are closely related in that information and transaction costs play a prominent role in both concepts. Nonetheless, the two conceptual frameworks offer distinctive guidance for us in developing our hypothesis; the former highlights the drivers behind the heterogeneous preferences within stakeholders, while the latter highlights the drivers behind efficiency in transactions, namely in our case why and when local institutional investors are more effective than their distant peers in influencing facility pollution.

Drawing from the delegated philanthropy theory, we argue that two factors explain the heterogeneous preferences between local and distant institutional investors—internalization of externalities and self-image concerns. The delegated philanthropy theory argues that because preferences are heterogeneous, it is inevitable that some stakeholders' values are not fully reflected in government policies, leading those stakeholders to become social activists. Extending this logic, because they are physically close to a polluting facility, local institutional investors internalize, to a much greater degree, pollution emitted by the facility, leading them to be more willing than distant peers to influence the facility to reduce pollution. The delegated philanthropy theory argues that self-image concerns drive prosocial behaviors because individuals naturally desire to "not only be loved, but to be lovely" (Smith, 1759). Endeavors to reduce local facilities' pollution should create greater image value to local institutional investors than to their distant peers because prosocial actions are more visible in and bring larger immediate benefits to local communities. As Bénabou and Tirole (2010) note, "[g]iving is heavily distorted toward the more visible or memorable targets."

Drawing from the transaction-costs arguments, we argue that two factors explain why local institutional investors are more effective than their distant peers in pressuring local facilities to reduce pollution—local information and social ties. Freely available internet-based information like the Toxics Release Inventory (TRI) data that we use to measure the quantity of toxic chemicals released into the environment by a facility has substantially equalized one important advantage of being local—access to information. However, we argue that geographic proximity facilitates the accumulation of one specific type of information—"local" information, which does not travel well over distance. Specifically, being physically close to the facility, local institutional investors can interact more frequently and less costly with facility managers and employees through varied means of communication including face-to-face meetings, on-site inspections, and local environmental activities like Earth Day and community cleanups. These interactions facilitate the collection and processing of soft information and tacit knowledge—hereafter referred to as local information for brevity. The literature characterizes soft information as information not available in the public domain through standard reports, but acquired by personal observation or through personal ties (see, e.g., Argote, McEvily, and Reagans, 2003; Uzzi and Lancaster, 2003; Petersen, 2004); and characterizes tacit knowledge as knowledge specific to an institution that is developed internally, critical to the long-term survivability of the institution, and often only transmitted through face-to-face contact (Coff, Coff, and Eastvold, 2006; Husted, Jamali, and Saffar, 2016). Consistent with this notion, case study evidence shows that a facility is more inclined to adopt new pollution abatement measures during their negotiations with host communities when the community representatives have a basic understanding of the facility's operation and toxic generation process and can judge the tradeoff of the proposed changes (Macey and Susskind, 2003; Allen, Letourneau, and Hebb, 2012). Second, geographic proximity enables local institutional investors to develop stronger social ties with facility managers and employees, thereby empowering them to exert greater influence than their distant peers. Consistent with this argument, a large body of sociological research (see, e.g., Grant, Trautner, and Jones, 2004) finds that local communities provide venues (churches, voluntary associations, barber shops, etc.) for residents to solve mutual problems like pollution, and facilities with stronger social ties to their host communities pollute less.

Anecdotal evidence is also consistent with the idea that local information and social ties play a critical role in pollution abatement. For example, despite the fact that the toxic release problem in Mossville, Louisiana was well-publicized in the national media (see, e.g., Associated Press, CNN, and the 2002 documentary film Blue Vinyl),[4] the Interfaith Center on Corporate Responsibility (ICCR), a coalition of nearly 300 institutional investors, partnered with Mossville Environmental Action Now (MEAN), a local environmental justice advocacy group, to organize in 2009 a group of investors to travel to the region on a fact-finding trip. The group met with local community representatives to assess the environmental and health impacts of the toxic release in the area. In 2010, members of the ICCR submitted three shareholder proposals to ConocoPhillips and PPG Industries, which operate facilities in Mossville (both firms are in our sample). As another example, an SRI fund with an engagement history dating back to the 1970s commented that "we don't often like to engage a company unless we do have some actual contact on the ground with local communities" (Goodman, Louche, Van Cranenburgh, and Arenas, 2014, page 201).

To summarize, building upon the delegated philanthropy theory and the transaction-costs arguments, the local influence hypothesis predicts:

H1: Ownership by local institutional investors is more negatively related to the amount of toxic release by nearby facilities than ownership by distant institutional investors.

The null hypothesis is that local institutional ownership is not related to facility toxic release because corporate environmental policies fall outside the purview of institutional investors. Consistent with this idea, Dyck et al. (2015) find that U.S. institutional investors' stockholdings are not related to firms' environmental and social ratings. A 2013 Financial Times article also reported that in recent years, many firms have "deprioritised" their sustainability ambitions because "there have been more pressing things to worry about, [such as] paying the bills."[5]

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[4] "Mossville Delegation Hopes to Speak to U.N. Negotiators," 31 August 1999, The Associate Press; http://www.cnn.com/2010/HEALTH/02/26/toxic.town.mossville.epa/; https://en.wikipedia.org/wiki/Blue_Vinyl.
[5] "Profits are the Route to Sustainable Business," by Andrew Hill, 23 September 2013, Financial Times.

Institutional investors are not a homogenous group. Extending the delegated philanthropy theory, it stands to reason that systematic differences should exist in the amount of facility toxic release across institution types because heterogeneous institutional investors have different preferences in trading off pecuniary rewards for social gains or short-term versus long-term performance. Specifically, drawing from the literature, we expect that: 1) SRI funds and public pension funds have a stronger preference for ESG than other institutional investors; and 2) dedicated, rather than transient, institutional investors have a stronger preference for ESG.

We expect SRI funds to have a strong preference for ESG given their investment mandates based on ethical and sustainability beliefs (Bialkowski and Starks, 2016). SRI funds are the vanguard in the ESG movement with their roots in screening investment based on religious prohibitions. One of the earliest adopters of SRI was John Wesley (1703-1791), a founder of the Methodist Church in England. He outlined the guidelines of social investing in his sermon "The Use of Money" as not to harm your neighbor through your business practices and to avoid industries like tanning and chemical production, which can harm the health of workers. In recent years, with a desire to accelerate change, some SRI funds like Calvert have changed from the traditional negative-screen approach—avoiding companies that have a negative social and environmental impact—to a best-in-class approach, prodding firms to adopt best ESG practices (Bialkowski and Starks, 2016; Graham, Pagano, and Yang, 2018).[6] Public pension funds have been activists in social investing since the 1970s, when many divested from apartheid South Africa (Munnell and Chen, 2016). The literature establishes that pension funds (see, e.g., Hong and Kacperczyk, 2009; Dimson et al., 2015), particularly public pension funds (see, e.g., Rounds, 2005; Wang and Mao, 2015), tend to be ESG activists because public pension funds have a strong incentive to pursue politically popular agendas (Del Guercio and Hawkins, 1999). As an example, Chidambaran and Woidtke (1999) find that 53% shareholder proposals filed by public pension funds were social and environmental proposals.

[6] "Hydraulic Fracturing Advocacy Yields Wins," 1 April 2014, gives an example of Calvert using the best-in-class approach in affecting firms' environmental policies, https://www.calvert.com/newsArticle.html?article=21080.

Dedicated institutional investors are expected to have a stronger preference for ESG than their transient peers, because the former has a longer investment horizon and is therefore more inclined to support ESG policies that are long-term oriented (Eccles, Ioannou, and Serafeim, 2014). More specifically, in our case, it takes time and effort to accumulate soft information and tacit knowledge as well as build social ties to be effective in influencing facility toxic release. In addition, investment in pollution abatement technologies can be large and typically take years to realize the benefits (e.g., through more efficient production and less regulatory penalties). Thus, a longer investment horizon allows dedicated institutional investors, who are characterized by a low portfolio turnover rate and more concentrated holdings, to maximize the benefits, while minimizing the costs, of exerting influence over facility toxic release. Consistent with these arguments, the survey evidence by McCahery, Sautner, and Starks (2016) shows that long-term institutional investors intervene more intensively than short-term ones.

To summarize, the local preference hypothesis predicts that the relation between local institutional ownership and facility toxic release varies in the following systematic way across institution types:

H2.a: Ownerships by local SRI and local public pension funds are more negatively related to the amount of toxic release by nearby facilities than ownership by other local institutional investors.

H2.b: Ownership by local dedicated institutional investors is more negatively related to the amount of toxic release by nearby facilities than ownership by local transient institutional investors.

Extending the logic of the delegated philanthropy theory that *firms* engage in prosocial behaviors at the demand of heterogeneous stakeholders, it is reasonable to expect that *local institutional investors* engage in ESG on behalf of their community. This delegation may occur because while the local community bears substantial externalities associated with a local plant's pollution, individual community members and community organizations, compared to institutional investors, lack the capacity to process complex toxics release data (Bui and Mayer, 2003) and the means and expertise to influence facility behaviors (see, e.g., Gillan and Starks, 2007; Lee and Lounsbury, 2009). Therefore, as a member of the community, institutional investors may become the voice of the community in influencing the local facility's toxic release. Assuming that their clients reside in the community and prefer less pollution, local institutional investors may also act on the behalf of their clients to pressure the facility in reducing pollution. To the extent that a local community puts a premium on a higher-quality environment, efforts exerted in reducing pollution generate greater image value in that community. Building upon the preceding rationales, the local influence hypothesis predicts that local institutional ownership is more negatively associated with facility toxic release in communities that prefer more stringent environmental policies.

The Coase theorem (1960) holds that externalities can be best resolved by reducing transaction costs so that affected parties can enter into mutually satisfactory bargains. However, the process of direct negotiation and agreement can no longer deliver efficient outcomes when there are large coordination problems. Therefore, the local influence hypothesis predicts that local institutional ownership is more negatively associated with facility toxic release in communities of greater collective cohesiveness.

To summarize, the local preference hypothesis predicts that the relation between local institutional ownership and facility toxic release varies in the following systematic way considering a community's characteristics:

H3.a: Ownership by local institutional investors is more negatively related to facility toxic release in communities that prefer more stringent environmental policies.

H3.b: Ownership by local institutional investors is more negatively related to facility toxic release in communities of greater collective cohesiveness.

3. **Data and sample description**

3.1. Data

We obtain toxics release data from the TRI, a publicly available dataset compiled by the EPA. The TRI contains information on disposal and other releases of over 650 toxic chemicals from more than 50,000 U.S. industrial facilities (including facilities owned by privately held companies) that have reported at least once since the TRI was launched in 1986. "Since its first release in 1989, the TRI data have become the primary measure of a plant's environmental performance" (Prechel and Zheng, 2012, page 958). Because "TRI is the best source of data nationwide on toxic release to the environment" (Natan and Miller, 1998, page 368), numerous research papers have used the TRI data to study corporate CSR activities and performance (see, e.g., Dooley and Lerner, 1994; Maxwell, Lyon, and Hackett, 2000; King and Lenox, 2000 and 2002). In Appendix I, we provide more details for the TRI including data limitations and how our measure of toxic release compares to the more commonly used measure of corporate CSR performance—the KLD ratings.

We merge the TRI data with the National Establishment Time-Series (NETS) Database to obtain facility size, with the CRSP-Compustat Merged Database to retrieve financial and stock price information, and with the Thomson-Reuters Institutional Holdings (13F) Database to obtain institutional ownership. After meeting the necessary data requirement, the final sample consists of 770 unique firms, 5,049 unique facilities, 3,907 unique institutional investors, or 38,483 facility-year observations from 1994 to 2010.

To compute distance, we obtain the zip codes of facility locations from the TRI database and the zip codes of institution locations mainly from the U.S. Securities and Exchange Commission (SEC) Edgar website, supplemented with the websites of institutional managers. We collect the latitude and longitude of the zip codes from the U.S. Census Bureau's Gazetteer Place and Zip Code Database. Following prior research (see, e.g., Coval and Moskowitz, 1999), we calculate the distance (*dist*) between institution *h* and facility *i* as follows:

$$dist_{hi} = r \times \arccos\left\{ \begin{array}{l} \cos(lat_h)\cos(lon_h)\cos(lat_i)\cos(lon_i) \\ + \cos(lat_h)\sin(lon_h)\cos(lat_i)\sin(lon_i) + \sin(lat_h)\sin(lat_i) \end{array} \right\}, \quad (1)$$

where $dist_{hi}$ is the distance in statute miles, *r* denotes the radius of the earth (approximately 3,963 statute miles), and *lat* and *lon* are the latitude and longitude (measured in radians) of institution and facility locations, respectively.

3.2. Sample description

The EPA requires facilities from the manufacturing sector to report TRI data; the requirement was expanded to include seven additional sectors in 1998 (see Appendix I for details). As a result, our sample contains 234 unique four-digit Standard Industrial Classification (SIC) codes. The top five industries (15.9% of the total facility-year observations) are 3312 (Steel Works, Blast Furnaces, and Rolling Mills), 2911 (Petroleum Refining), 3714 (Motor Vehicle Parts and Accessories), 3490 (Miscellaneous Fabricated

Metal Products), and 2011 (Meat Packing Plants). While the TRI data do not cover all the economic sectors, the manufacturing sector is an extremely important sector in an economy (Rynn, 2011). Many studies (see, e.g., Almeida, Campello, and Weisbach, 2004; Alcácer and Chung, 2007; Maksimovic and Phillips, 2008) have used only manufacturing firms in their analyses. Additionally, the eight sectors covered by the TRI likely face the most salient environmental issues,[7] making them the ideal testing ground for addressing our research question, which is the influence of institutional investors on corporate environmental policies.

The average sample facility has 331 employees (median=166). For the TRI universe, a facility with more than 100 employees is considered large (Hanna, 2010; Doshi, Dowell, and Toffel, 2013). The EPA requires facilities with more than 10 full-time employees to report TRI data.[8] The greater representation of larger facilities in our sample results from the data requirement of merging multiple databases. One advantage of having larger facilities in the sample is that small facilities commit more reporting errors due to a lack of resources (Grant and Jones, 2003). To the extent that smaller facilities tend to be locally based and their pollution abatement policies are more responsive to local community demand (Kassinis and Vafeas, 2006; Lee and Lounsbury, 2009), this sample characteristic should bias us against finding a negative relation between local institutional ownership and facility toxic release.

The average sample firm has 6.7 facilities, generated $4.7 billion in net sales in 2010, and has data coverage in Compustat for about 26 years. The mean total institutional ownership is 56.4%, which is consistent with the findings in existing studies (e.g., Hartzell and Starks, 2003). The mean ownership of institutional investors located within 150 miles of a facility is 3.0%, which is in line with the existing literature. For example, Ayer, Ramalingegowda, and Yeung (2011) report a mean local monitoring institutional ownership of 1.4%. Table 1 provides summary statistics for the variables used in regressions for the full sample.

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[7] Dowell, Hart, and Yeung (2000). Also see https://www.epa.gov/toxics-release-inventory-tri-program/2013-tri-national-analysis-comparing-industry-sectors.

[8] The EPA allows for voluntary reporting under EPCRA §313 if a facility does not meet all three threshold criteria but would still like to submit a TRI report.

4. Empirical results

4.1. Impact of local institutional ownership on facility toxic release

4.1.1. Baseline results

We estimate the following baseline model to test the local influence hypothesis:

$$TR_{ij,t} = \alpha + \gamma localown_{ij,t-1} + \beta_1 facility\_size_{ij,t-1} + \beta_2 facility\_HQ\_distance_{ij,t-1} + \beta_3 REG\_stringency_{k,t-1} + \text{FIRM} + \text{MSA} + \text{FIRM*YEAR} + \text{MSA*YEAR} + \varepsilon_{ij,t}, \quad (2)$$

$TR_{ij,t}$ denotes the natural logarithm of one plus the total quantity of toxic chemicals in pounds released into the environment by a facility *i* of a firm *j* in a given year *t*. *Localown* is our main independent variable of interest, denoting the stock ownership of institutional investors located within 150 miles of the facility. *Facility_size* is the natural logarithm of the number of employees at the facility. Larger facilities produce more and are therefore expected to release a larger quantity of toxic chemicals. *Facility_HQ_distance* is the natural logarithm of the distance in miles between the facility and the firm's headquarters. We include this variable to control for the potential effect of corporate headquarters' policies on facilities' toxic release decision. Pollution abatement processes are chemical and production-specific and therefore the decision control over toxic emission and abatement typically resides with the facility. However, arguments can be made that corporate headquarters play a role in influencing facility toxic release. Specifically, Stephan, Kraft, and Abel (2005) surveyed 1,083 randomly selected facilities (238 facilities responded; the average number of employees per the responding facility in their final sample was 311 with a standard deviation of 714). One survey question was: "How would you characterize your relationship to your corporate headquarters, when it comes to environmental management decisions such as reducing toxic chemical releases?" Of the facilities that responded to the question, 31.1% stated that "[t]he facility has almost complete control over decision-making," 31.5% stated that "[t]his location is the corporate office," and 20.6% stated that "[d]ecisions are shared equally between the corporate office and the facility." Additionally, Landier, Nair, and Wulf (2009) find that divisions closer to corporate headquarters are less likely to face layoffs and this relation is stronger for industries with more soft information and when the manager is more visible in the community. Landier et al.'s results suggest that the distance between the facility and the corporate headquarters may matter in our investigation for potential reasons including: 1) more proximate facilities have easier access to corporate resources to implement pollution control technologies; and 2) the top executives have a greater incentive to reduce pollution of nearby facilities due to image concerns. We obtain data on headquarters locations for the period of 1994–2006 from Compact Disclosure and for the period of 2007–2010 from the CRSP-Compustat Merged Database. $REG\_stringency_{k,t-1}$ is the inverse of the natural logarithm of the total amount of toxic release divided by the total number of employees in four main polluting industries: chemicals, petroleum, pulp and paper, and materials processing for a state k in year t-1. Following Meyer (1995) and King and Lenox (2001), we use this variable to control for the stringency of a state's environmental regulation. $\varepsilon_{ij,t}$ is the error term.

In the baseline model, we include firm FE (*FIRM*), MSA FE (*MSA*), the interaction of *FIRM* and year dummies (*YEAR*), and the interaction of *MSA* and *YEAR* to control for latent factors such as firm and location characteristics. An MSA is a geographical region with a relatively high population density at its core and close economic ties throughout the area. MSAs are defined by the U.S. Office of Management and Budget. We use 2003 U.S. Census Bureau data to obtain the MSA data. In that year, America had 370 MSAs; in our sample, the facilities are dispersed over 316 MSAs. The MSA classification is only available for urban areas. About one-third of our facility-year observations belongs to a rural area. We create a separate rural dummy to capture those observations. For ease of presentation, we refer to these 317 region dummies as MSA FE (316 MSAs plus one rural dummy).[9] Each specification is estimated using the ordinary least squares (OLS) method with robust standard errors accounting for heteroskedasticity and firm-level clustering. Firm-level clustering is used because facilities are nested within firms. (If facility-level clustering is used instead of firm-level clustering, the magnitude of the coefficient estimate of *localown* stays the same, but the *t*-statistic increases (e.g., for column (1) of Table 2, the value increases to 3.57).)

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[9] In untabulated analyses, we performed two robustness tests. In the first test, we assign a rural area the designation of the MSA that is closest to the rural area. In this case, we have 316 geographical-unit dummies. In the second test, we follow Giroud (2013) and classify a rural area in each state as a separate region. In this case, we have 363 geographical-unit dummies (316 MSA dummies plus 47 rural area dummies). Our results hold in both tests.

Table 2 presents the regression results of the baseline model. As column (1) shows, *localown* is significantly and negatively related to the amount of total release of the facility—an increase of one percentage point in *localown* leads to a reduction of 4.69% in the total quantity of toxic chemicals released into the environment. In untabulated results, we use alternative measures of local institutional ownership by measuring the distance between the facility and institutional investors as within 50 miles, 100 miles, and 250 miles; our results remain qualitatively the same. For further robustness, we also run the baseline regression using a dummy variable, which takes the value of one if there is an institutional investor located within 150 miles of the facility. Our results hold using this alternative specification.

For a richer understanding of the relation between *localown* and facility toxic release, we run the baseline regression separately for on-site and off-site releases. Facilities can either choose to treat toxic chemicals on-site or transfer them off-site to be treated at specialized waste management facilities. If proximity indeed matters, we should find a stronger coefficient estimate for *localown* in the on-site regression than in the off-site regression. Consistent with our expectation, *localown* is significantly and negatively related to the amount of on-site release, but is insignificant in the off-site regression. This pattern persists in all of our other results. While we believe that this pattern corroborates the local preference hypothesis, we focus on the results of total toxic release because it facilitates an easier and more tractable interpretation and presentation of the results.

Consistent with our expectation and the prior literature (see, e.g., Grant and Jones, 2003), *facility_size* is significantly and positively related to toxic release, while *REG_stringency* carries a significantly negative sign. *Facility_HQ_distance* enters the regressions of total and on-site releases with a significantly negative sign, suggesting that when a facility is located farther away from the corporate headquarters, it releases a lower quantity of pollution into the environment. Assuming that the pollution amount correlates with production levels,[10] this result is consistent with the idea that firms tend to locate

[10] The result of a simple correlation test is consistent with this conjecture: the correlation coefficient is -0.105 with a one percent significance between *facility_HQ_distance* and *facility_size*.

headquarters close to production to minimize communication and coordination costs (Henderson and Ono, 2008).

To summarize, Table 2 provides strong initial evidence in support of H1–the local preference hypothesis.

4.1.2. Endogeneity checks

We interpret the results in Table 2 as evidence consistent with the local preference hypothesis that local institutional investors influence nearby facilities' pollution abatement policies. An alternative explanation could be that firms' ESG practices influence investors' decisions. For example, institutional investors systematically filter out polluting facilities when forming investment portfolios.[11] It could also be that some latent variables which drive local institutional ownership also drive facility toxic release. In the baseline model, we have taken various steps to mitigate these endogeneity concerns including lagging independent variables by one year and controlling for FIRM FE, MSA FE, FIRM*YEAR FE, and MSA*YEAR FE. For robustness, we conduct four additional endogeneity checks.

Subsample analyses

In the first analysis, we sort the sample each year into three groups based on KLD's rating of a firm's CSR performance. (KLD's CSR score is a composite measure of social, environmental, and governance performance.) If our results are driven by institutional investors systemically screening out firms with polluting facilities instead of exerting influence on facilities to reduce pollution, then we should expect *localown* to have a larger negative coefficient in the subsample with high CSR scores than in the subsample with low CSR scores. As columns (1)-(2) in Table 3 show, *localown* is negatively related to total

[11] We believe that it is still meaningful if investors make investment decisions based on corporate environmental policies even if they do not directly influence the policies because investors' demand for a firm's stock impacts the cost of capital, which should ultimately impact firm behavior (El Ghoul, Guedhami, Kwok, and Mishra, 2011; Chava, 2014).

toxic release with similarly sized coefficients across the subsamples with high and low CSR scores. We find similar results when we sort the sample based on KLD's rating of a firm's environmental performance.

Quasi-natural experiment due to institutional investor mergers

For our second endogeneity check, we exploit a quasi-natural experiment of institutional investor mergers in a difference-in-differences (DID) framework. We identify those facilities as the treatment group if one of their local institutional investors was acquired by a distant institutional investor and thereby experienced an external shock that decreased their *localown*. The control group consists of those facilities that were owned by the same parent company but did not experience any change in the composition of their local institutional investors. By comparing the amount of toxic chemicals emitted by the treatment and control facilities that share the same parent company around the merger event, this identification strategy allows us to better control for the latent firm characteristics that drive institutional investors' investment decisions. Since the merger events concerned investment decisions made by distant institutional investors, the events were likely independent of the treatment facilities but directly impacted the dynamics of those facilities' local institutional investors. Therefore, institutional investor mergers serve as a useful quasi-natural experiment in our effort to provide a portfolio of evidence for the local preference hypothesis.

We estimate the following DID equation first for the full sample period and then for the subsample of facility-year observations five years before and five years after the merger event. We follow the method used in Huang (2016) and He and Huang (2016) in identifying institutional investor mergers. Specifically, we require that: 1) the merger was completed within one year after the initial announcement; 2) the target local institutional investor stopped filing 13F forms within 18 months after the completion of the deal; and 3) the target local institutional investor held the stock of the parent company in its portfolio prior to the merger. After applying these filters, we identified 28 mergers from 1995 to 2008 for our sample.

$$TR_{ij,t} = \alpha + \gamma_1 Treatment{*}Post + \gamma_2 Treatment + \beta_1 facility\_size_{ij,t-1} + \beta_2 facility\_HQ\_distance_{ij,t-1} + \beta_3 REG\_stringency_{k,t-1} + \text{FIRM} + \text{MSA} + \text{FIRM*YEAR} + \text{MSA*YEAR} + \varepsilon_{ij,t}, \quad (3)$$

$TR_{ij,t}$ denotes the natural logarithm of one plus the total quantity of toxic chemicals released into the environment by a facility *i* of a firm *j* in a given year *t*. *Treatment* is an indicator variable that equals one if the facility is in the treatment group and zero if in the control group. *Post* is an indicator variable that takes the value of one if the sample year is after the merger and zero if before the merger. FIRM, MSA, and YEAR denote firm, MSA, and year dummies, respectively. Equation 3 does not include the primary effect of *Post*, because it is absorbed by FIRM*YEAR. The local preference hypothesis predicts $\gamma_1>0$. As columns (1) and (2) in Table 4 show, consistent with the prediction of the local preference hypothesis, *Treatment*Post* carries a significantly positive sign, suggesting that toxic release is higher for the treatment facilities whose local institutional investors were acquired by distant institutional investors than for the control facilities that did not experience any merger event.

Quasi-natural experiment due to facility relocation

In our third endogeneity check, we follow the DID method used in Hasan, Hoi, Wu, and Zhang (2015). We identify facilities that relocated during our sample period. This event serves as a quasi-natural experiment because a facility's relocation decision is likely independent of institutional investors' investment decisions and will cause local institutional ownership to change for that facility. We obtain facility relocation data from NETS. In our full sample of 5,049 facilities (or 38,483 facility-year observations), 4,739 facilities never relocated during our sample period of 1994–2010. Excluding those facilities results in 310 facilities, or 1,938 facility-year observations. To avoid confounding events, we exclude 43 facilities (261 facility-year observations) that relocated more than once during our sample period. To ensure that relocation caused a meaningful change in local institutional ownership (e.g., eliminate cases where facilities relocated to a nearby building), we verify that post-relocation, there is a change in the composition of local institutional investors. This screen eliminates 143 facilities, or 849 facility-year observations. Lastly, to conduct the DID estimation, we exclude the observations from the event year and require facilities to have at least one year of the requisite data before and after the relocation event, which further eliminates 48 facilities or 72 facility-year observations. The final relocation sample consists of 76 facilities, or 756 facility-year observations with 253 from the pre-relocation period and 503 from the post-relocation period.

To purge the potential endogeneity in *localown*, we estimate the following DID equation:

$$TR_{ij,t} = \alpha + \beta_1 {*} Post {*} localown\_increase\_dummy_{ij,t} + \beta_2 {*} localown\_increase\_dummy_{ij,t} + \beta_3 {*} Post + \boldsymbol{X} + \text{FIRM} + \text{YEAR} + \text{MSA} + \varepsilon_{ij,t}, \quad (4)$$

$TR_{ij,t}$ is the natural logarithm of one plus the total quantity of toxic chemicals released into the environment by a facility *i* of a firm *j* in a given year *t*. *Post* is an indicator variable that equals one if the facility-year observation falls into the post-relocation period and zero if the pre-relocation period. *Localown_increase* is a dummy that equals one if local institutional ownership is higher in the post-relocation period than in the pre-relocation period. ***X*** indicates the vector of controls for facility and firm characteristics. We use time-varying firm characteristics instead of FIRM*YEAR FE because of the small sample size. FIRM, YEAR, and MSA denote firm, year, and MSA dummies, respectively. The local preference hypothesis predicts $\beta_1<0$. As column (1) of Table 5 shows, this is indeed our finding: *localown_increase_dummy* post* is significantly and negatively related to facility toxic release, which is consistent with the prediction of the local preference hypothesis that after moving to a location with a higher level of local institutional ownership, a facility emitted a smaller quantity of toxic chemicals into the environment.

Change-on-change analysis

The change-on-change analysis is a popular test that empiricists use to study causal relations (see, e.g., Aggarwal, Erel, Ferreira, and Matos, 2011; Chhaochharia, Kumar, and Niessen-Ruenzi, 2012). Specifically in our case, if institutional investors indeed influence facility pollution abatement practices, changes in *localown* should lead to changes in the amount of toxic release by facilities, whereas the reverse causation is absent (i.e., changes in facility toxic release do not cause changes in *localown*). Because institutional investors likely have a differential impact on facilities that increase toxic release versus facilities that decrease toxic release, we perform the analysis separately for these two groups of facilities.

Panel A of Table 6 reports the regression results of changes in the amount of toxic release on lagged changes in local institutional ownership. Similar to Aggarwal et al. (2011) and Chhaochharia et al. (2012), we include lagged levels of toxic release to account for the mechanical relation that existing levels of toxic release affect the extent of future changes. Consistent with the expectation, changes in local institutional ownership from year *t*-2 to *t*-1 ($\Delta localown_{t-1}$) is significantly and negatively related to changes in the amount of toxic release from year *t*-1 to *t* ($\Delta total\ toxic\ release_t$) for the subsample of facilities that increased toxic release. Consistent with the idea that institutional investors may less intensively monitor those facilities that decrease toxic release as opposed to those facilities that increase toxic release, no significant relation exists between changes in local institutional ownership in year *t*-1 and changes in the amount of toxic release in year *t*. Panel B of Table 6 reports the regression results of changes in local institutional ownership on lagged changes in the amount of toxic release. We find no evidence that changes in the amount of toxic release from year *t*-2 to *t*-1 lead to changes in local institutional ownership from year *t*-1 to *t*. Coefficient estimates of all lagged change variables for toxic release are nil and statistically insignificant.

We acknowledge that despite our efforts, we cannot eradicate the concern of endogeneity because we lack a truly exogenous event or an instrument to design our tests. For example, while the quasi-experiment of institutional investor mergers identifies an event that externally caused local institutional ownership to change, it is possible that the merger decisions made by distant institutional investors correlated with latent factors that drove both local institutional ownership and facility toxic release. Therefore, throughout the paper, we make our inferences based on the statistical association between local institutional ownership and facility toxic release rather than a causal-effect interpretation.

4.1.3. Additional robustness checks

Alternative measures of toxic release

While our measure of the amount of toxic release is consistent with the existing literature, we compute two alternative measures for robustness: residual release and weighted release.

The amount of toxic release is a function of both the nature of a firm's business and its efforts in reducing pollution. Simply put, it is unreasonable to expect a grocery store to emit similar quantities of toxic release as a paper and pulp facility. Although the inclusion of firm fixed effects mitigates this concern, it is instructive to examine whether local institutional investors have any effect on firms' efforts to reduce toxic release given the nature of the business. To proxy a firm's pollution abatement efforts, we follow King and Lenox (2002) and calculate *residual release*, which is the amount of total toxic release minus the predicted amount of toxic release (*predicted release*). We estimate the following model to obtain *predicted release*:

$$TR_{it}= \alpha_{mt} + \beta_{1mt} facility\_size_{i,t-1} + \beta_{2mt}(facility\_size_{i,t-1})^2 + \varepsilon_{it}\,, \qquad (5)$$

TR_{it} denotes the natural logarithm of one plus the total quantity of toxic chemicals released into the environment by a facility i in industry m in year t; *facility_size* is the natural logarithm of the number of employees at the facility; and ε_{it} is the error term. For model stability, we require regressions to have at least 20 observations, reducing the sample size from 38,483 to 31,428 facility-year observations. We use the estimated coefficients, $\hat{\alpha}_{mt}$, $\hat{\beta}_{1mt}$, and $\hat{\beta}_{2mt}$, to obtain *predicted release* for each facility based on its size, three-digit SIC industry, and year. Column (1) of Appendix III reports the results of the baseline model when we use *residual release* as the dependent variable. Consistent with our earlier findings, local institutional ownership is significantly and negatively related to *residual release*. We find it reassuring that *REG_stringency* retains the significantly negative sign, but *facility_size* and *facility_HQ* distance are no longer significant.

As the toxicity of each chemical varies, we follow King and Lenox (2000) and calculate the weighted sum of toxic release by weighing each chemical by the inverse of its Reportable Quantity (RQ). The EPA developed substance-specific RQ, requiring immediate reporting to authorities should a listed substance be released into the environment in an amount beyond its RQ. For example, for highly toxic chemicals like arsenic, the RQ is one pound, while relatively benign chemicals like methanol have an RQ of 5,000 pounds.[12] Therefore, RQ proxies for the toxicity or the environmental harm of each chemical. As column 2 of Appendix III shows, our results hold using this alternative measure of toxic release.

Other tests

Column (3) of Appendix III reports the baseline regression after we add the additional control of *localown_HQ*, which is the ownership of institutional investors located within 150 miles of the corporate headquarters. We perform this robustness check to control for the possibility that institutional investors influence facility toxic release via the channel of corporate headquarters. More specifically, corporate headquarters have the ultimate authority to allocate the necessary resources to facilities to implement pollution abatement policies. In this light, the closer institutional investors are to the corporate headquarters, the potentially easier it is for them to access the top executives of the firm and push for desired corporate-wide policies. To give a piece of anecdotal evidence, between 1993 and 2011, ICCR members addressed 35 social, environmental, and governance issues with Walmart through shareholder resolutions and/or dialogues. In 2005, an ICCR member, the Northwest Coalition for Responsible Investment (NWCRI), formed a dialogue team to meet with Walmart at its headquarters each quarter concerning its social issues. In July 2010, they met with Walmart's CEO along with a dozen other executives for a day. These visits are easier to complete if institutional investors are proximate to the headquarters.[13] As column (3) of Appendix III shows, *localown_HQ* is insignificant, while *localown* continues to be significantly negative (*p*-value<0.01). For additional robustness (results not tabulated to conserve space), we exclude the observations (7,952) where facilities are located within 150 miles of the headquarters to better purge the headquarters effect. Under this specification, the coefficient estimate of *localown* is -6.972 with a 1% significance, while *localown_HQ* continues to be insignificant.

[12] We collect the RQ data for each chemical from the website of the U.S. Department of Energy (http://homer.ornl.gov/rq/index.cfm).
[13] http://www.ipjc.org/programs/11NWCRIAnnualReportWeb.pdf.

To control for the possibility that EPA offices are heterogeneous in their intensity in enforcing environmental regulations and the heterogeneities correlate with *localown*, we conduct several robustness checks. Specifically, the EPA has three headquarters and ten regional offices across the country. Headquarters hosts a multitude of program offices, some of which provide essential functional support for the EPA such as human resource management and technology services, while others develop goals, policies and guidelines, perform oversight, and provide assistance for the regional offices. Regional offices are responsible for implementing EPA programs within their states and in some cases, territories. In the first robustness check, we use the location of the three EPA headquarters and ten regional offices to create a dummy variable, *EPA_dummy*, which takes the value of one if the zip code of any of the three EPA headquarters and ten regional offices is within 150 miles of the facility and zero otherwise. As column (4) of Appendix III shows, our results hold after we include *EPA_dummy* in the baseline regression. In the second robustness check, we include in the baseline regression EPA fixed effects based on the location of the ten EPA regional offices. We do not control for the fixed effects of the three EPA headquarters because their territories cover the entire country. In the third robustness check, we include in the baseline model the EPA fixed effects (FE) and EPA*YEAR FE. Our results hold in these robustness tests. (Results are not tabulated to conserve space.)

In the baseline regression, we use FIRM FE and FIRM*YEAR FE to control for time-varying firm characteristics. For more robustness, we follow the literature (see, e.g., Arora and Cason, 1995; Dimson et al., 2015; Hong, Kubik, and Scheinkman, 2012; McWilliams and Siegel, 2000; Servaes and Tamayo, 2013), explicitly controlling for firm characteristics that potentially impact facility toxic release. As column (5) of Appendix III shows, our result holds in this check.

In another robustness check, we obtain effluent violation data from the Integrated Compliance Information System-National Pollutant Discharge Elimination System (ICIS-NPDES) database. The motivation behind this test is to use a different database other than the TRI data and deploy a different measure of facility environmental performance other than emission quantity to test the impact of local institutional investors. While the ICIS-NPDES was created in 1972 by the Clean Water Act and therefore provides a long time series dating back to 1974, the database only covers water violations. Consequently, after merging the ICIS-NPDES data with our sample, we only have 4,433 facility-year observations left.[14] Column (6) of Appendix III reports the baseline model when the dependent variable is the logarithm of one plus the number of effluent violations. Consistent with our overall results, *localown* is significantly and negatively related to the frequency that a facility commits effluent violations.

In untabulated analysis (to conserve space), we investigate whether our results are sensitive to changes in the TRI data, including the 1998 addition of seven additional sectors, chemical additions, changes to chemical reporting thresholds, and changes in reporting forms. Our results are not sensitive to these changes. To mitigate the concern of reporting errors in the TRI data, we also run the baseline regression for only core chemicals. Core chemical groups exclude any chemicals that were added to or removed from the TRI list during our sample period. The idea is that using core chemical groups ensures that there were consistent reporting requirements for chemicals in the analysis across all reporting years. In addition, routine inspections and audits should work more effectively in ensuring accurate reporting for the core chemical groups. Our results hold in this robustness check. In another robustness check, we exclude electric utilities from our analysis. This test is to mitigate the concern that electric utilities are special because they face a higher level of regulation than other industries and they tend to be large emitters. In the raw TRI database, the industry sector of Electric Utilities accounted for 5.33% of the total observations. After meeting requisite data requirements, the number of the observations from Electric Utilities in our sample is less than 100. Our results hold after excluding these observations from the sector of Electric Utilities. Although the baseline regression controls for the stringency of state environmental regulation, for more robustness, we re-run the baseline model excluding facilities located in California and New York as their environmental regulations are quite different from other states.[15] Our results also hold using this alternative specification.

[14] In this light, the ICIS-NPDES is similar to other databases such as the National Emissions Inventory (NEI) and the Enforcement and Compliance History Online (ECHO) database in that they pale in comparison to the TRI in terms of the breath, length, and reliability of facility-level environmental performance data.
[15] http://www.stpub.com/environmental-state-differences-summaries-and-checklists-online.

4.2. Impact of local institutional investors by institution type

Table 7 reports the regression results from testing H2. H2.a predicts that ownerships by local SRI and local public pension funds are more negatively related to the amount of toxic release from nearby facilities than ownership by other local institutional investors. H2.b predicts that ownership by local dedicated institutional investors is more negatively related to facility toxic release than ownership by local transient institutional investors. We run separate regressions for each institution type for ease of illustration as well as to avoid multicollinearity.[16] We use data from SocialFunds to identify SRI funds (Edmans, 2011). We obtain the classification of dedicated versus transient institutional investors as well as data on public pension funds from Bushee's website.[17] We obtain hedge fund manager information from the Lipper/TASS hedge fund databases. We match each hedge fund by name with the Thomson-Reuters Institutional Holdings (13F) Database. Our matching process follows the approach of Brunnermeier and Nagel (2004).

As Panel A of Table 7 shows, we find strong evidence in support of H2.a. Ownerships by local SRI funds (*localown_SRI*) and local public pension funds (*localown_Public pension fund*) are significantly and negatively related to the amount of facility toxic release. Further, coefficient equity tests reject the null that their coefficient estimates equal that of ownership by other types of institutional investors (*localown_NonSRI_NonPensionFund*). These results are consistent with the existing literature that some SRI funds and public pension funds have taken an active-ownership strategy in recent years, actively engaging corporations to adopt environmental and social initiatives (see, e.g., Rounds, 2005; Bauer et al., 2013; Dimson et al., 2015). For a more complete picture, we also compute ownership by local hedge funds and regress facility toxic release on this variable (*localown_Hedge fund*). Compared to other types of institutional investors like SRI funds and pension funds, hedge funds tend to have a shorter investment

[16] For example, the correlation between *localown_SRI* and *localown_NonSRI_NonPensionFund* is 0.374 (*p*-value<0.001), between *localown_Public pension fund* and *localown_NonSRI_NonPensionFund* is 0.251 (*p*-value<0.001), between *localown_Hedge fund* and *localown_NonSRI_NonPensionFund* is 0.493 (*p*-value<0.001), and between *localown_DED* and *localown_TRA* is 0.464 (*p*-value<0.001).

[17] http://acct3.wharton.upenn.edu/faculty/bushee/IIvars.html.

horizon (Bratton and Wachter, 2010) and are less constrained by social norms in making investment decisions (Hong and Kacperczyk, 2009). In addition, compared to other asset managers like those employed at SRI funds and pension funds, hedge fund managers have strong incentives to pursue top investment returns because of their pay structure (Brav, Jiang, Partnoy, and Thomas, 2008). These characteristics of hedge funds suggest that they may exert less influence on a facility's toxic release practices because the link between corporate environmental policies and firm value is unclear (Grewal, Serafeim, and Yoon, 2016). As column (4) shows, the coefficient estimate of *localown_Hedge fund* is smaller in magnitude compared to that of *localown_SRI* and *localown_Public pension fund* and is statistically insignificant. This pattern complements Hong and Kacperczyk (2009), which finds that sin stocks have higher expected returns than otherwise comparable stocks and are less held by norm-constrained institutions such as pension plans as compared to natural arbitrageurs such as hedge funds.

As Panel B of Table 7 shows, we have weak evidence in support of H2.b. Consistent with H2.b, ownership by dedicated local institutional investors (*localown_DED*) is significantly and negatively related to toxic release, while ownership by transient local institutional investors (*localown_TRA*) is insignificant. However, the coefficient equity test fails to reject the null that the coefficient estimates of *localown_DED* and *localown_TRA* are equal.

4.3. Does the impact of local institutional investors vary with community characteristics?

Table 8 reports the regression results from testing H3.a, which predicts that ownership by local institutional investors is more negatively related to facility toxic release in communities that prefer stricter environmental policies. To proxy for this community characteristic, we use four proxies—the ratio of Democratic over Republican voters, the ratio of religious adherents, the ratio of people above age 65 or less than age 18, and the ratio of the female population. The literature (see, e.g., Hong and Kostovetsky, 2012; Di Giuli and Kostovetsky, 2014) shows that that Democratic-leaning rather than Republican-leaning people are more inclined to support social and environmental causes. Given the prominent role of faith in social investing, we expect communities with a larger number of religious adherents to have a stronger preference for stricter environmental policies (see, e.g., Perez and Soydemir, 2010; Borgers, Derwall, Koedijk, and Ter Horst, 2015). Elderly people and children are more vulnerable to pollution than the general population (see, e.g., Kahn, 2002; Beder, 2013). Prior work shows that females often play a championship role in promoting environmental causes (Freudenberg and Steinsapir, 1991; Bear, Rahman, and Post, 2013). Velte (2016) also finds that female leadership is positively related to firms' ESG performance. Following the literature (see, e.g., Earnhart, 2004; Kassinis and Vafeas, 2006), we use county-level data to capture a community's characteristics. The ratio of Democratic to Republican voters is the ratio of county-level votes for the Democratic presidential candidate to those for the Republican presidential candidate during the presidential election each four years. We collect the voting data from Dave Leip's Atlas of U.S. Presidential Elections (http://uselectionatlas.org). The ratio of religious adherents is a county-level adjusted rate of religious adherents per 1000 population in 2000 (Finke and Scheitle, 2005). We obtain the adherence data from the Association of Religion Data Archive. Since the data is collected every decade, we use the 2000 data as 2000 falls in the middle of our sample period (1994–2010). We obtain annual county-level data on age and gender from http://www.census.gov/support/USACdataDownloads.html. To discriminate between communities that prefer more stringent environmental policies, we sort the sample into terciles based on the value of the four empirical proxies. H3.a predicts that *localown* is more negative for the subsample in the top tercile of the four ratios. As Table 8 shows, we find some evidence in support of H3.a. Specifically, while *localown* consistently enters all the regressions with a negative sign, it is only statistically significant in the regressions for communities that prefer more stringent environmental policies. However, the coefficient equality test fails to reject the null that the coefficient estimates of *localown* are the same across subsamples with high and low values of the ratio of Democratic to Republican voters, the ratio of religious adherents, and the ratio of the female population; and it rejects the null with marginal significance for the ratio of people older than age 65 or younger than age 18.

Table 9 reports the regression results from testing H3.b, which predicts that ownership by local institutional investors is more negatively related to facility toxic release in communities of greater collective cohesiveness. Following the literature (see, e.g., Hamilton, 1993; Derezinski, Lacy, and Stretesky, 2003;

Grant, Trautner, Downey, and Thiebaud, 2010), we employ two empirical proxies to gauge the collective cohesiveness in a community: county-level voter turnout rates and the ratio of Caucasians over the total population. The voter turnout rate is the total votes cast in a county in a general election over the total population in the county, collected from Dave Leip's Atlas of U.S. Presidential Elections (http://uselectionatlas.org). The annual data on the Caucasian population come from http://www.census.gov/support/USACdataDownloads.html. Similarly to testing H3.a, we sort the sample into terciles based on the value of the two ratios to discriminate between communities that have a greater versus a lesser collective cohesiveness. H3.b predicts that *localown* is more negative for the sample ranked in the top tercile based on the empirical proxies (i.e., high values of voter turnout rates or the ratio of the Caucasian population). We find reasonably strong evidence in support of H3.b. *Localown* consistently enters all the regressions with a negative sign and is only statistically significant in the regressions for communities that have a higher degree of collective cohesiveness. Further, for both proxies, the coefficient equality test rejects the null that the coefficient estimates of *localown* are the same across the subsamples of communities with greater versus lower collective cohesiveness.

We acknowledge that our proxies for community characteristics are subject to the usual caveats of empirical proxies. As traits of communities are interdependent, different empirical proxies may capture the same community characteristic, or one empirical proxy may capture multiple community characteristics. For example, Republican voters tend to be more religious; the Caucasian ratio can correlate with income and education levels. Nonetheless, we believe that these two additional tests are useful in helping us gain a richer understanding of institutional investors' role in shaping environmental policies.

4.4. Evidence from shareholder proposals

While engagement by institutional investors with their portfolio companies can take many forms including letter writing, phone calls, meetings, proxy actions, and selling shares, most of these engagement actions are done behind-the-scenes and thus are unobservable to an outsider and difficult to acquire for a broad sample of firms.[18] One reason behind the preference for the behind-the-scenes engagement is that it is more effective in instigating change than the more public forms such as publicly criticizing a firm or taking legal action. This rationale is consistent with the survey evidence in McCahery et al. (2016) and the theoretical model by Levit (2014) who shows that if an activist's information becomes public, the activist loses credibility and the ability to influence the manager's actions. Additionally, this tactic appears to have been gaining popularity in recent years. For example, since 1987, the California Public Employees' Retirement System (CalPERS) has published an annual focus list of poorly performing companies with the goal to, through public pressure, engage firms and ultimately realize better stock performance. In 2010, CalPERS abandoned the "name-and-shame" approach in favor of private negotiations because the latter is more effective in engaging firms and effecting desired changes.

In this section, we analyze shareholder proposals—one of the few observable engagement activities—to provide evidence for the channel of shareholder engagement. Specifically, we study the impact of local institutional investors on the likelihood that a firm receives an ESG proposal and the likelihood that an ESG proposal is withdrawn. A proposal is frequently withdrawn because the proposal sponsor has reached an agreement with the firm (Viederman, 2000; Buchanan et al., 2012). For this analysis, we merge our sample with Institutional Shareholder Services' (ISS) Shareholder Proposal Database from the WRDS platform. A proposal is classified as an ESG proposal if ISS designates the proposal Resolution Type "Socially Responsible Initiative (SRI)" and zero otherwise. Examples of ESG proposals include reports on political donations and policy and reports on financial risks related to climate change. The shareholder proposal data are available from 1997 onward. After meeting the necessary data requirement, we have 1,186 (589) firm-year observations for the period of 1997 to 2010 to estimate the probability that an ESG proposal is introduced (withdrawn).

[18] For a "behind-the-scenes" look at private ESG engagements, please see Carleton, Nelson, and Weisbach (1998), Becht, Franks, Mayer, and Rossi (2009), Bauer et al. (2013), and Dimson et al. (2015). These studies provide valuable insights into ESG activism by securing proprietary data from one activist fund. McCahery et al. (2016) surveyed 143 institutional investors, who are mostly very large and with a long-term focus. They provide direct evidence for how those investors intervene behind-the-scenes in governance issues.

To get firm-level local institutional ownership (*Agg. Localown*), we sum local institutional ownership of all the facilities owned by a firm without duplication. Following the literature (see, e.g., Chhaochharia et al., 2012), we use a logistic model and control for firm size, firm age, ROA, the market-to-book ratio, leverage, and sales growth to estimate the impact of local institutional investors on the likelihood that an ESG proposal is introduced or withdrawn. In Table 7 Panel A, we find that local ownerships by SRI funds and public pension funds are more significantly and negatively related to facility toxic release than local ownership by other types of institutional investors. Therefore, we also run the logit model and compare the effect of local SRI funds and local public pension funds to other types of local institutional investors in terms of this direct measure of shareholder engagement. Similarly to *Agg. Localown*, we sum local ownerships by SRI funds (*Agg. Localown_SRI*), public pension funds (*Agg. Localown_Public pension fund*), and other types of institutional investors (*Agg. Localown_NonSRI_NonPensionFund*) of all the facilities owned by a firm without duplication.

Columns (1)-(4) of Table 10 report the estimation results when the dependent variable is a dummy variable that takes the value of one if a firm receives an ESG proposal. Consistent with the overall evidence, local institutional ownership (*Agg. Localown*) is significantly and positively related to the probability that an ESG proposal is introduced (column 1). In corroboration with Table 7 Panel A, *Agg. Localown_SRI* and *Agg. Localown_Public pension fund* are more significantly and positively related to the likelihood that a firm receives an ESG proposal than *Agg. Localown_NonSRI_NonPensionFund*. Columns (5)-(8) report the estimation results when the dependent variable is a dummy variable that takes the value of one if an ESG proposal was withdrawn as described under Other Status by ISS and zero otherwise. We find similar results for the probability that an ESG proposal is withdrawn. Specifically, local institutional ownership (*Agg. Localown*) is significantly and positively related to the probability of withdrawal, and local ownerships by SRI funds and public pension funds are more significantly and positively related to the probability of withdrawal than local ownership by other types of institutional investors.

5. Conclusion

In the past two decades, corporations have come under enormous pressure to be socially responsible. However, questions remain as to whether institutional investors care about sustainability issues, and if they do, whether they have any influence on corporate environmental, social and governance (ESG) policies. To address these questions, we analyze the relation between the ownership of local institutional investors and the amount of toxic chemicals released into the environment by the nearby facility for a sample of 3,907 institutional investors from 1994 to 2010. By focusing on this unique segment of ESG—the pollution aspect of corporate environmental policies, we aim to grasp the tension behind the debate of whether institutional investors should engage corporations in ESG. Pollution represents a classic example of negative externalities and therefore corporate pollution abatement practices should fall outside the domain of corporate activities.

We develop and test the local preference hypothesis based on the economic theory of transaction costs (Coase, 1937 and 1960) and the recent theoretical advancement in the ESG literature—the delegated philanthropy theory that Bénabou and Tirole (2010) propose to explain the exponential movement of ESG over the past two decades. We find a portfolio of evidence in support of the local preference hypothesis. Specifically, local institutional ownership is consistently and negatively related to facility toxic release. This negative relation is stronger for local SRI funds and local public pension funds than for other types of local institutional investors. There is some evidence that local ownership by dedicated institutional investors is more negatively related to facility toxic release than that by their transient counterparts. Local institutional ownership is more negatively associated with facility pollution in communities that prefer more stringent environmental policies and in communities of greater collective cohesiveness. Lastly, we find a positive link between local institutional ownership and the probability that an ESG proposal is either introduced or withdrawn. This positive relation is also stronger for local SRI funds and local public pension funds than for other types of local institutional investors.

In their concluding remark, Bénabou and Tirole (2010) note on page 15: “While the invisible hand of the market and the more visible one of the state have been the objects of much research, we still know little about the decentralized correction of externalities." This paper enhances our understanding of the role of institutional investors in ESG by developing and testing the local preference hypothesis, which highlights the drivers behind the heterogeneous preferences among institutional investors for corporate environmental issues (i.e., internalization of externalities and self-image concerns) and the conditions under which institutional investors are more effective in influencing corporate environmental issues—when they possess a greater amount of soft information and tacit knowledge, have closer social ties with the firm and the local community, and face lower coordination costs. The 2013 UNGC survey reports that 85% of the CEOs surveyed demand clearer government policies and market signals to support corporate sustainability initiatives. Our results suggest that institutional investors have the potential to play an important role in sending the market signal to the firm.

Appendix I: The Toxics Release Inventory (TRI) database

Overview:

The TRI was established by Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and was later expanded by the Pollution Prevention Act of 1990. Facilities with ten or more employees that produce or use an above-a-threshold amount of chemicals on the EPA's substance list are required to report annual quantities of on-site toxic release to various media and the quantities of off-site transfers. The term "release" was created by Congress to describe the portion of toxic waste that is discharged directly into the environment. The TRI data were first collected in reporting year (calendar year) 1987 and released in 1989. Prior to the TRI, no record of toxic emission existed. TRI data are submitted annually to the EPA and are made available to the general public two years after the data are reported due to the limitations of staff resources to process the data.

Data quality:

"Since its first release in 1989, the TRI data have become the primary measure of a plant's environmental performance" (Prechel and Zheng, 2012, page 958) and are used extensively by environmental activists, regulators, ESG ratings agencies, and academics. Researchers have shown that the data provide a valid and reliable means of measuring corporate toxic emissions and have been subject to a high degree of scrutiny (see, e.g., Arora and Cason, 1995; Hamilton, 1995; Grant et al., 2010). For example, Natan and Miller (1998, page 368) note that "TRI is the best source of data nationwide on toxic release to the environment." As another example, in a 2006 joint letter, Dr. M. Granger Morgan, then Chair of the EPA Science Advisory Board, and Dr. Maureen Cropper, then Chair of the SAB Environmental Economics Advisory Committee, wrote [emphasis added]: "TRI data are widely used to evaluate changes in facility and firm environmental performance, to conduct risk assessments of changes in toxic release levels, and to conduct spatial analyses of toxic hazards. The TRI data provide *the only reliable* source of longitudinal data for this type of research. Over 120 scholarly articles have been published using the Toxics Release Inventory data to address a wide range of public health, economic and social science issues."[19]

Limitations:

Although the TRI has been widely accepted as the best available source of data for measuring a facility's toxic release, like any other database, it has limitations. First, the TRI data are self-reported by facilities, not the actual measurement of toxic release. Therefore, it is subject to reporting noise, errors, and potential manipulation. An example of reporting noise can be a change in estimation method, which may reduce the amount reported, even though the physical amount of the toxic chemical released did not change. An example of a reporting error can be forgetting to fill in the amount for a chemical. Electronic data entry has significantly reduced this error, as the submitter will not be prompted to the next webpage unless all entries have been filled. Similar to any other reporting, such as financial statements reporting, TRI reporting can be manipulated. However, scholars argue that routine environmental audits can substantially reduce the incentive to misreport (Arora and Cason, 1995). To ensure accurate reporting, the EPA has also implemented a series of policies and initiatives including providing reporting training and helplines to facilities, conducting data quality checks before as well as after the data are released to the public, conducting on-site inspections, and taking enforcement actions. It is important to note that smaller firms and firms reporting in the earlier years, when the TRI was first implemented, are more likely to misreport due to a lack of resources and experience. Our sample period starts in 1994, the sixth year after the TRI data were first released. Our sample consists of larger facilities, which should be under greater scrutiny and pressure to report accurate data. These characteristics of our sample should mitigate the concern of TRI reporting errors for this study.

Second, the TRI does not cover all the economic sectors or all chemicals. The TRI includes only the manufacturing sector and the seven sectors added in 1998: metal mining, coal mining, electric utilities, chemical wholesale distributors, petroleum bulk storage/terminals, hazardous waste management facilities, and solvent recovery facilities. The TRI generally records releases that are not regulated and may not include all the chemicals identified as

[19] https://nepis.epa.gov/Exe/ZyPDF.cgi/P100JNO9.PDF?Dockey=P100JNO9.PDF.

toxic by other environmental legislation or government agencies. Despite this data limitation, it is not obvious to us that our results are thereby biased or cannot be generalized to other industry sectors.

Third, the TRI provides information on the quantity of a toxic chemical released from a facility, but not all the information necessary to answer questions about health risks. However, following the literature, we use the TRI data and calculate an alternative measure of toxic release that takes into consideration the potential health risks of a chemical. Specifically, we follow King and Lenox (2000) and calculate the weighted sum of toxic release by weighting each chemical by its toxicity. As column (2) of Appendix III shows, our results hold when we use this alternative measure of toxic release. We do not use weighted toxic release as our main measure because the norm of the literature is to use the unweighted measure (i.e., the log transformation of the simple summation plus one) (Doshi, Dowell, and Toffel, 2013). One shortcoming of using weighted toxic release is that toxicity weights are frequently missing, which is mostly due to a lack of information needed to generate a toxicity weight.

Correlation with the KLD scores:

Another popular proxy for ESG performance is the KLD rating. The KLD rating is a cumulative score based on KLD's assessment of a firm's CSR performance in seven broad categories: community relations, corporate governance, employee relations, diversity, environment, human rights, and product quality and safety. KLD considers emissions of toxic chemicals in TRI reports when rating a firm's environmental performance. In untabulated analysis, we aggregate facility-level toxics release data to firm-level, and study the correlation between the KLD scores and our toxic release measures. We find that the overall KLD score is significantly and negatively correlated with the natural logarithm of one plus the amount of total, on-site, and off-site toxic release. The correlation coefficient is the highest for on-site toxic release (coefficient=-0.072), followed by total toxic release (coefficient = -0.058) and off-site toxic release (coefficient = -0.017). The KLD environmental score is also significantly and negatively correlated with the natural logarithm of one plus the amount of total, on-site, and off-site toxic release. The correlation coefficient is the highest for on-site toxic release (coefficient=-0.199), followed by total toxic release (coefficient=-0.172) and off-site toxic release (coefficient=-0.063). Therefore, while our toxic release measure is significantly correlated with the KLD scores, the coefficient magnitude is small, suggesting that the former conveys a substantially large proportion of information not covered by the latter. It is also worth noting that compared to KLD, the TRI has the important advantage of being freely available to the public.

Appendix II: Variable description

This appendix provides variable definitions and computations. In parentheses, capitalized, and in italics, we also provide the mnemonics associated with each Compustat variable.

Variable Name	Variable Description
Panel A: Toxic release variables	
Total toxic release	The natural logarithm of one plus the amount of *total* release of toxic chemicals in pounds of a facility
On-site toxic release	The natural logarithm of one plus the amount of toxic release in pounds *at* the location of a facility
Off-site toxic release	The natural logarithm of one plus the amount of toxic release in pounds *off* the location of a facility
Weighted toxic release	The natural logarithm of one plus the amount of toxic release in pounds of a facility, weighting each chemical by the inverse of its Reportable Quantity (RQ)
Residual release	The difference between *total toxic release* (defined as above) and the predicted amount of total toxic release that we estimate based on facility size, the three-digit SIC code, and year, following King and Lenox (2002).
Panel B: Variables of institutional investors	
Localown	Equity ownership of institutional investors located within 150 miles of the facility
Totalown	Total institutional ownership of the firm
Localown_SRI	Equity ownership of socially responsible investing (SRI) funds located within 150 miles of the facility. We identify SRI funds using the data source of SocialFunds (Edmans, 2011).
Localown_Public pension fund	Equity ownership of public pension funds located within 150 miles of the facility. We obtain the identities of public pension funds from Bushee's website, http://acct3.wharton.upenn.edu/faculty/bushee/IIvars.html.
Localown_NonSRI_ NonPensionFund	Equity ownership of institutional investors located within 150 miles of the facility, excluding local ownerships by SRI funds and public pension funds
Localown_DED	Equity ownership of dedicated institutional investors as defined in Bushee (2001) located within 150 miles of the facility. Identities of dedicated institutions come from Bushee's website, http://acct3.wharton.upenn.edu/faculty/bushee/IIvars.html.
Localown_TRA	Equity ownership of transient institutional investors as defined in Bushee (2001) located within 150 miles of the facility. Identities of transient institutions come from Bushee's website, http://acct3.wharton.upenn.edu/faculty/bushee/IIvars.html.
Localown_HQ	Equity ownership of institutional investors located within 150 miles of the corporate headquarters. We obtain headquarters data for the period of 1994–2006 from Compact Disclosure and for the period of 2007–2010 from the CRSP-Compustat Merged Database.
Agg. Localown	Sum of local institutional ownership—*localown*—of all the facilities owned by a firm without duplication
Agg. Localown_SRI	Sum of local ownership by SRI funds—*localown_SRI*—of all the facilities owned by a firm without duplication
Agg. Localown_Public pension fund	Sum of local ownership by public pension funds—*localown_Public pension fund*—of all the facilities owned by a firm without duplication
Agg. Localown_nonSRI _nonPublic pension fund	Sum of local ownership by institutional investors that are not SRI funds or public pension funds—*localown_nonSRI_nonPublicFund*—of all the facilities owned by a firm without duplication
Panel C: Variables of firm characteristics	
Facility_size	The natural logarithm of the number of employees at a facility (from the National Establishment Time-Series (NETS) Database)
Firm_size	The natural logarithm of firm total assets (*AT*)

Firm_age	The natural logarithm of the number of years since the firm was included in the Compustat database
Slack	The ratio of cash plus short-term investments (*CH+IVST*) to total assets (*AT*)
Leverage	The ratio of long term debt (*DLTT*) plus debt in current liabilities (*DLC*) to total assets (*AT*)
R&D/sales	The ratio of R&D expenses to sales (*XRD*)/(*SALE*), set to zero if missing
AD/sales	The ratio of advertising expenses to sales (*XAD*)/(*SALE*), set to zero if missing
HHI	Herfindahl-Hirschman index, computed as the sum of squared market shares based on sales of a firm's three-digit SIC industry
ROA	Return on assets, which is computed as the ratio of earnings before extraordinary items (*IB*) to total asset (*AT*)
Market-to-book ratio	The market value over the book value of common equity (*CSHO**PRCC_F*/*CEQ*)
Sales_growth	$((SALE_t\text{-}SALE_{t-1})/SALE_t)$
%CEO ownership	Percent of CEO stock ownership (from EXEUCOMP)
Panel D: Other variables	
Facility_HQ_distance	The natural logarithm of the distance in miles between a facility and the firm's headquarters
REG_stringency	A measure of the stringency of a state's environmental regulation. Following Meyer (1995) and King and Lenox (2001), we construct this variable as the inverse of the natural logarithm of the total amount of toxic release divided by the total number of employees in four main polluting industries: chemicals, petroleum, pulp and paper, and materials processing for a state. A higher value of *REG_stringency* indicates greater stringency.
EPA dummy	An indicator variable that takes the value of one if any of the three EPA headquarters and ten regional offices is within 150 miles of the facility and zero otherwise
Effluent violations	The natural logarithm of one plus the number of effluent violations

Appendix III: Additional robustness check

This table reports the OLS estimation results. The unit of analysis is facility year. The main independent variable of interest is stockholdings by institutional investors located within 150 miles of the emitting facility (*localown*). Variable definitions and descriptions are provided in Appendix I. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

Dependent variable =	Residual release	Weighted release	Total toxic release			Effluent violations
	(1)	(2)	(3)	(4)	(5)	(6)
Localown	-4.419**	-1.911**	-4.839***	-4.143**	-3.349**	-3.366**
	(-2.47)	(-1.98)	(-2.77)	(-2.43)	(-2.55)	(-1.91)
Localown_HQ			1.535			
			(1.30)			
EPA_dummy				-0.524**		
				(-1.98)		
Facility_size	-0.019	0.452***	0.660***	0.660***	0.609***	-0.002
	(-0.39)	(10.08)	(8.31)	(8.37)	(9.63)	(-1.11)
Facility_HQ_distance	-0.046	-0.083**	-0.119**	-0.118**	-0.108**	0.002
	(-0.85)	(-2.05)	(-2.31)	(-2.28)	(-2.40)	(0.54)
REG_stringency	-9.735***	-7.401**	-11.360***	-11.291***	-6.543***	-0.106
	(-3.23)	(-2.51)	(-3.40)	(-3.43)	(-3.55)	(-0.86)
Firm_size					0.006	
					(0.07)	
Firm_age					-0.214	
					(-1.08)	
Slack					0.094	
					(0.26)	
Leverage					0.206	
					(0.76)	
R&D / sales					-3.439	
					(-1.12)	
AD / sales					-9.440	
					(-1.14)	
HHI					-0.233	
					(-0.44)	
FIRM FE	YES	YES	YES	YES	YES	YES
MSA FE	YES	YES	YES	YES	YES	YES
FIRM×YEAR FE	YES	YES	YES	YES	NO	YES
MSA×YEAR FE	YES	YES	YES	YES	NO	YES
Year FE	NA	NA	NA	NA	YES	NA
Observations	31,428	38,483	38,483	38,483	42,585	4,433
Adj. R-squared	0.096	0.311	0.358	0.358	0.421	0.407

References

Aggarwal, R., Erel, I., Ferreira, M., Matos, P., 2011. Does governance travel around the world? Evidence from institutional investors. *Journal of Financial Economics* 100, 154-181.

Aguilera, R.V., Williams, C.A., Conley, J.M., Rupp, D.E., 2006. Corporate governance and social responsibility: A comparative analysis of the UK and the US. *Corporate Governance: An International Review* 14(3), 147-158.

Alcácer, J., Chung, W., 2007. Location strategies and knowledge spillovers. *Management Science* 53(5), 760-776.

Allen, R., Letourneau, H., Hebb, T., 2012. Shareholder engagement in the extractive sector. *Journal of Sustainable Finance & Investment* 2(1), 3-25.

Almeida, H., Campello, M., Weisbach, M.S., 2004. The cash flow sensitivity of cash. *Journal of Finance* 59(4), 1777-1804.

Amore, M.D., Bennedsen, M., 2016. Corporate governance and green innovation. *Journal of Environmental Economics and Management* 75, 54-72.

Argote, L., McEvily, B., Reagans, R., 2003. Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management Science* 49(4), 571-582.

Arora, S., Cason, T. 1995. An experiment in voluntary environmental regulation: Participation in EPA's 33/50 program. *Journal of Environmental Economics and Management* 28, 271-86.

Ayers, B., Ramalingegowda, S., Yeung, P.E., 2011. Hometown advantage: The effects of monitoring institution location on financial reporting discretion. *Journal of Accounting and Economics* 52 (1): 41-61.

Barnea, A., Rubin, A., 2010. Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics* 97, 71-86.

Bauer, R., Clark, G.L., Viehs, M., 2013. The geography of shareholder engagement: Evidence from a large British asset manager. ECCE working paper: Maastricht University and Oxford University.

Bear, S., Rahman, N., Post, C., 2010. The impact of board diversity and gender composition on corporate social responsibility and firm reputation. *Journal of Business Ethics* 97(2), 207-221.

Bebchuk, L., Cohen, A., Ferrell, A., 2009. What matters in corporate governance. *Review of Financial Studies* 22, 783-827.

Becht, M., Franks, J., Mayer, C., Rossi, S., 2010. Returns to shareholder activism: Evidence from a clinical study of the Hermes UK Focus Fund. *Review of Financial Studies* 23(3), 3093-3129.

Beder, S., 2013. Environmental principles and policies: An interdisciplinary introduction. Routledge.

Bénabou, R., Tirole, J., 2010. Individual and corporate social responsibility. *Economica* 77, 1-19.

Bialkowski, J., Starks, L.T., 2016. SRI funds: Investor demand, exogenous shocks and ESG profiles. Working Paper.

Borgers, A., Derwall, J., Koedijk, K., Ter Horst, J. 2015. Do social factors influence investment behavior and performance? Evidence from mutual fund holdings. *Journal of Banking & Finance* 60, 112-126.

Bratton, W., Wachter, M., 2010. The case against shareholder empowerment. *University of Pennsylvania Law Review* 158, 653-728.

Brav, A., Jiang, W., Partnoy, F., Thomas, R., 2008. Hedge fund activism, corporate governance, and firm performance. *Journal of Finance* 63(4), 1729-1775.

Brown, W.O., Helland, E., Smith, J.K., 2006. Corporate philanthropic practices. *Journal of Corporate Finance* 12(5), 855-877.

Brunnermeier, M.K., Nagel, S., 2004. Hedge funds and the technology bubble. *Journal of Finance* 59(5), 2013-2040.

Buchanan, B., Netter, J., Poulsen, A., Yang, T., 2012. Shareholder proposal rules and practice: Evidence from a comparison of the United States and United Kingdom. *American Business Law Journal* 49, 739-803.

Bui, L.T., Mayer, C.J., 2003. Regulation and capitalization of environmental amenities: Evidence from the toxic release inventory in Massachusetts. *Review of Economics and Statistics* 85(3), 693-708.

Bushee, B., 2001. Do institutional investors prefer near term earnings over long-run value? *Contemporary Accounting Research* 18, 207-246.

Carleton, W., Nelson, J., Weisbach, M., 1998. The influence of institutions on corporate governance through private negotiations: Evidence from TIAA-CREF. *Journal of Finance* 53, 1335-1362.

Chava, S., 2014. Environmental externalities and cost of capital. *Management Science* 60, 2223-2247.

Chhaochharia, V., Kumar, A., Niessen-Ruenzi, A., 2012. Local investors and corporate governance. *Journal of Accounting and Economics* 54, 42-67.

Chidambaran, N.K., Woidtke, T., 1999. The role of negotiations in corporate governance: Evidence from withdrawn shareholder-initiated proposals. Unpublished Working Paper, Tulane University and Texas A&M University.

Coase, R.H., 1937. The nature of the firm. *Economica* 4(16), 386-405.

Coase, R.H., 1960. The problem of social cost. *Journal of Law and Economics* 3, 1-44.

Coff, R.W., Coff, D.C., Eastvold, R., 2006. The knowledge-leveraging paradox: How to achieve scale without making knowledge imitable. *Academy of Management Review* 31(2), 452-465.

Coval, J., Moskowitz, T., 1999. Home bias at home: Local equity preference in domestic portfolios. *Journal of Finance* 54, 2045-2073.

Darabaris, J., 2007. *Corporate Environmental Management*. CRC Press.

Del Guercio, D., Hawkins, J., 1999. The motivation and impact of pension fund activism. *Journal of Financial Economics* 52(3), 293-340.

Delmas, M.A., Toffel, M., "Institutional Pressures and Organizational Characteristics: Implications for Environmental Strategy." *The Oxford Handbook of Business and the Natural Environment*, Bansal, Pratima, and Andrew Hoffman Eds. Oxford: Oxford University Press, 2012.

Deng, X., Kang, J.K., Low, B.S., 2013. Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics* 110, 87-109.

Derezinski, D.D., Lacy, M.G., Stretesky, P.B., 2003. Chemical accidents in the United States, 1990–1996. *Social Science Quarterly* 84(1), 122-143.

Di Giuli, A., Kostovetsky, L., 2014. Are red or blue companies more likely to go green? Politics and corporate social responsibility. *Journal of Financial Economics* 111, 158-180.

Dimson, E., Karakaş, O., Li, X., 2015. Active ownership. *Review of Financial Studies* 28(12), 3225-3268.

Dooley, R., Lerner, L., 1994. Pollution, profits, and stakeholders: The constraining effect of economic performance on CEO concern with stakeholder expectations. *Journal of Business Ethics* 13, 701-711.

Doshi, A.R., Dowell, G.W.S., Toffel, M.W., 2013. How firms respond to mandatory information disclosure. *Strategic Management Journal* 34(10), 1209-1231.

Dowell, G., Hart, S., Yeung, B., 2000. Do corporate global environmental standards create or destroy market value? *Management Science* 46(8), 1059-1074.

Dyck, I.J.A., Lins, K.V., Roth, H.F., Wagner, H.F., 2015, Do institutional investors drive corporate social responsibility? International evidence. Working paper, available at SSRN 2708589.

Earnhart, D., 2004. The effects of community characteristics on polluter compliance levels. *Land Economics* 80(3), 408-432.

Eccles, R., Ioannou, I., Serafeim, G., 2014. The impact of corporate sustainability on organizational processes and performance. *Management Science* 60(11), 2835-2857.

Edmans, A., 2011. Does the stock market fully value intangibles? Employee satisfaction and equity prices. *Journal of Financial Economics* 101, 621-640.

El Ghoul, S., Guedhami, O., Kwok, C., Mishra, D., 2011. Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance* 35, 2388-2406.

Ferrell, A., Liang, H., Renneboog, L., 2016. Socially responsible firms. *Journal of Financial Economics* 122(3), 585-606.

Finke, R., Scheitle, C.P., 2005. Accounting for the uncounted: Computing correctives for the 2000 RCMS data. *Review of Religious Research*, 5-22.

Flammer, C., 2015. Does product market competition foster corporate social responsibility? Evidence from trade liberalization. *Strategic Management Journal* 36, 1469-1485.

Freudenberg, N., Steinsapir, C. 1991. Not in our backyards: The grassroots environmental movement. *Society & Natural Resources* 4(3): 235-245.

Gillan, S., Hartzell, J.C., Koch, A., Starks, L.T., 2010. Firms' environmental, social and governance (ESG) choices, performance and managerial motivation. Unpublished working paper.

Gillan, S., Starks, L.T., 2007. The evolution of shareholder activism in the United States. *Journal of Applied Corporate Finance* 19(1), 55-73.

Giroud, X., 2013. Proximity and investment: Evidence from plant-level data. *Quarterly Journal of Economics* 128(2), 861-915.

Goodman, J., Louche, C., Van Cranenburgh, K.C., Arenas, D., 2014. Social shareholder engagement: The dynamics of voice and exit. *Journal of Business Ethics* 125, 193-210.

Graham, S., Pagano, M., Yang, T., "Understanding ESG Ratings and ESG Indexes." *Handbook of Finance and Sustainability*, Sabri Boubaker, Douglas Cummings, and Duc Khuong Nguyen, Eds. Edward Elgar, forthcoming 2018.

Grant, D., Jones, A.W., 2003. Are subsidiaries more prone to pollute? New evidence from the EPA's Toxics Release Inventory. *Social Science Quarterly* 84 (1): 162-173.

Grant, D., Trautner, M.N., Downey, L., Thiebaud, L. 2010. Bringing the polluters back in environmental inequality and the organization of chemical production. *American Sociological Review* 75(4), 479-504.

Grant, D., Trautner, M. N., Jones, A. W., 2004. Do facilities with distant headquarters pollute more? How civic engagement conditions the environmental performance of absentee managed plants. *Social Forces* 83(1), 189-214.

Grewal, J., Serafeim, G., Yoon, A.S., 2016. Shareholder activism on sustainability issues. Working paper, available at SSRN 2805512.

Hamilton, J.T., 1993. Politics and social costs: Estimating the impact of collective action on hazardous waste facilities. *RAND Journal of Economics* 24(1), 101-125.

Hamilton, J.T., 1995. Pollution as News: Media and stock market reactions to the Toxics Release Inventory data. *Journal of Environmental Economics and Management* 28, 98-113.

Hanna, R., 2010. US environmental regulation and FDI: Evidence from a panel of US-based multinational firms. *American Economic Journal: Applied Economics* 2(3), 158-189.

Hartzell, J., Starks, L., 2003. Institutional investors and executive compensation. *Journal of Finance* 58, 2351-2374.

Hasan, I., Hoi, C. K.S., Wu, Q., Zhang, H., 2015. Social capital and debt contracting: Evidence from bank loans and public bonds. *Journal of Financial and Quantitative Analysis,* forthcoming.

He, J., Huang, J., 2016. Product market competition in a world of cross-ownership: Evidence from institutional blockholdings. *Review of Financial Studies* forthcoming.

Henderson, J.V., Ono, Y., 2008. Where do manufacturing firms locate their headquarters? *Journal of Urban Economics* 63(2), 431-450.

Hong, H., Kacperczyk, M., 2009. The price of sin: The effects of social norms on markets. *Journal of Financial Economics* 93, 15-36.

Hong, H., Kostovetsky, L., 2012. Red and blue investing: Values and finance. *Journal of Financial Economics* 103(1), 1-19.

Hong, H., Kubik, J., Scheinkman, J., 2012. Financial constraints on corporate goodness. NBER working paper.

Huang, J. 2016. Shareholder coordination, corporate governance, and firm value. University of Illinois at Urbana-Champaign working paper.

Husted, B.W., Jamali, D., Saffar, W., 2015. Near and dear? The role of location in CSR engagement. *Strategic Management Journal* 37, 2050-2070.

Jensen, M., 2001. Value maximization, stakeholder theory, and corporate objective function. *Journal of Applied Corporate Finance* 14, 8-21.

Jiao, Y., 2010. Stakeholder welfare and firm value. *Journal of Banking & Finance* 34, 2549-2561.

Kahn, M., 2002. Demographic change and the demand for environmental regulation. *Journal of Policy Analysis and Management* 21, 45-62.

Kassinis, G., Vafeas, N. 2006. Stakeholder pressures and environmental performance. *Academy of Management Journal* 49(1), 145-159.

King, A., Lenox, M., 2000. Industry self-regulation without sanctions: The chemical industry's responsible care program. *Academy of Management Journal* 43, 698-716.

King, A., Lenox, M., 2001. Does it really pay to be green. *Journal of Industrial Ecology* 5, 105-116.

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

King, B.G., Soule, S.A., 2007, Social movements as extra-institutional entrepreneurs: The effect of protests on stock price returns. *Administrative Science Quarterly* 52(3), 413-442.

Kitzmueller, M., Shimshack, J., 2012. Economic perspectives on corporate social responsibility. *Journal of Economic Literature* 50, 51-84.

Landier, A., Nair, V.B., Wulf, J., 2009. Trade-offs in staying close: Corporate decision making and geographic dispersion. *Review of Financial Studies* 22(3), 1119-1148.

Lee, M.D., Lounsbury, M., 2009. Social movement activism and corporate environmental performance: Direct action, community norms and organizational heterogeneity. Unpublished manuscript.

Levit, D., 2014, Soft shareholder activism. Working paper, Wharton School, available at SSRN 1969475.

Macey, G.P., Susskind, L., 2003. "Using dispute resolution techniques to address environmental justice concerns: Case studies," prepared by the Consensus Building Institute for the U.S. E.P.A. Office of Environmental Justice, https://www.epa.gov/sites/production/files/2015-09/documents/case-study-report_adr_in_ej.pdf.

Maksimovic, V., Phillips, G., 2008. The industry life cycle, acquisitions and investment: Does firm organization matter? *Journal of Finance* 63(2), 673-708.

Margolis, J.D, Elfenbein, H., Walsh, J., 2007. Does it pay to be good? A meta-analysis and redirection of the relationship between corporate social and financial performance. Harvard University working paper.

Margolis, J.D., Walsh, J.P., 2003. Misery loves companies: Rethinking social initiatives by business. *Administrative Science Quarterly* 48(2), 268-305.

Maxwell, J., Lyon, T., Hackett, S., 2000. Self-regulation and social welfare: The political economy of corporate environmentalism. *Journal of Law & Economics* 43, 583-617.

McCahery, J.A., Sautner, Z., Starks, L.T., 2016. Behind the scenes: The corporate governance preferences of institutional investors. *Journal of Finance* 71(6): 2905-2932.

McWilliams, A., Siegel, D., 2000. Corporate social responsibility and financial performance: Correlation or misspecification? *Strategic Management Journal* 21, 603-609.

McWilliams, A., Siegel, D., 2001. Corporate social responsibility: A theory of the firm perspective. Academy of *Management Review* 26, 117-127.

Meyer, S. 1995. The economic impact of environmental regulation. *Journal of Environmental Law and Practice* 3, 4-15.

Munnell, A.H., Chen, A., 2016. New Developments in Social Investing by Public Pensions (No. ibslp53).

Natan, T.E., Miller, C.G., 1998. Are toxic release inventory reductions real? *Environmental Science & Technology* 32 (15), 368A-374A.

Orlitzky, M., Schmidt, F., Rynes, S., 2003. Corporate social and financial performance: A meta analysis. *Organization Studies* 24, 403-441.

Perez, L.D., Soydemir, G., 2010. Faith-based and sin portfolios. *Managerial Finance* 36 (10), 876-885.

Petersen, M.A., 2004. Information: Hard and soft. Unpublished manuscript, Northwestern University.

Petrenko, O.V., Aime, F., Ridge, J., Hill, A., 2016. Corporate social responsibility or CEO narcissism? CSR motivations and organizational performance. *Strategic Management Journal* 37(2), 262-279.

Prechel, H., Zheng, L. 2012. Corporate characteristics, political embeddedness and environmental pollution by large U.S. corporations. *Social Forces* 90(3), 947-970.

Renneboog, L., Horst, J., Zhang, C., 2008. Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking & Finance* 32, 1723-1742.

Rounds, C.E., Jr. "Social Investing Threatens Public Pension Funds, Charitable Trusts and the Social Security Trust Fund." *Pension Fund Politics: The Dangers of Socially Responsible Investing*, John H. Entine ed., American Enterprise Institute, 2005.

Rynn, J. 2011. "*Six Reasons Manufacturing is Central to the Economy,*" Roosevelt Institute, last accessed 5 January 2017 http://rooseveltforward.org/six-reasons-manufacturing-central-economy/

Servaes, H., Tamayo, A., 2013. The impact of corporate social responsibility on firm value: The role of customer awareness. *Management Science* 59, 1045-1061.

Sigman, H., Stafford, S.L., 2010. Management of hazardous waste and contaminated land. Working paper, available at SSRN 1721801.

Smith, A., 1759. The Theory of Moral Sentiments. Penguin.

Stephan, M., Kraft, M.E., Abel, T.D., 2005. Information politics and environmental performance: The impact of the Toxics Release Inventory on corporate decision making. *Annual Meetings of the American Political Science Association. Washington, DC*. 2005.

Uzzi, B., Lancaster, R., 2003. Relational embeddedness and learning: The case of bank loan managers and their clients. *Management Science* 49(4), 3838-399.

Van Beurden, P., Gössling, T., 2008. The worth of values: A literature review on the relation between corporate social and financial performance. *Journal of Business Ethics* 82, 407-424.

Velte, P., 2016. Women on management board and ESG performance. *Journal of Global Responsibility* 7(1), 98-109.

Viederman, S., 2002. Community organizing and shareholder activity. European Policy Forum, London.

Wang, Y., Mao, C. X., 2015. Shareholder activism of public pension funds: The political facet. *Journal of Banking & Finance* 60, 138-152.

Table 1
Summary statistics

This table provides summary statistics for the variables used in the regression analyses for the full sample (i.e., 3,907 institutional investors, 5,049 unique facilities, and 770 unique firms) from 1994 to 2010. To mitigate the concern of extreme outliers, we use the natural log transformation for large positive numbers (i.e., the toxic release variables, *facility_size*, *firm_size*, *firm_age*, and *facility_HQ_distance*), while winsorizing the other variables at 1% at both tails. See Appendix II for variable definitions and descriptions.

	N	Mean	Std.	Min	Max
Panel A: Toxic chemical releases at facility					
Total toxic release	38,483	6.803	4.573	0.000	19.842
On-site toxic release	38,483	5.858	4.740	0.000	19.842
Off-site toxic release	38,483	2.809	4.045	0.000	17.546
Residual release	31,428	-0.029	3.631	-8.427	7.425
Weighted release	38,483	2.836	3.202	0.000	11.903
Panel B: Institutional ownership					
Localown	38,483	0.030	0.067	0.000	0.642
Totalown	38,483	0.564	0.280	0.000	1.000
Localown_SRI	38,483	0.002	0.009	0.000	0.145
Localown_Public pension fund	38,483	0.001	0.003	0.000	0.045
Localown_NonSRI_NonPensionFund	38,483	0.026	0.057	0.000	0.307
Localown_Hedge fund	38,483	0.001	0.003	0.000	0.053
Localown_DED	38,483	0.004	0.016	0.000	0.120
Localown_TRA	38,483	0.006	0.016	0.000	0.121
Localown_HQ	38,483	0.117	0.113	0.000	0.592
Panel C: Other variables					
Facility_size	38,483	4.951	1.444	0.000	9.903
Facility_HQ_distance	38,483	5.921	1.572	0.000	8.411
REG_stringency	38,483	0.155	0.030	0.111	0.274
Firm_size	38,483	7.798	1.575	-1.528	12.269
Firm_age	38,483	3.124	0.857	0.693	4.094
Slack	38,483	0.067	0.094	0.000	1.047
Leverage	38,483	0.288	0.167	0.000	0.949
R&D/Sales	38,483	0.016	0.027	0.000	0.236
AD/Sales	38,483	0.005	0.014	0.000	0.114
HHI	38,483	0.194	0.158	0.031	1.000
ROA	38,483	0.149	0.069	-0.312	0.574
Market-to-book ratio	38,483	2.734	2.191	0.415	16.142
Sales_growth	38,483	0.072	0.208	-0.591	1.249

Table 2
Impact of local institutional ownership on toxic release

This table reports the regression results of the baseline model (Equation 2), which employs the OLS method to estimate the effect of local institutional ownership (*localown*) on the amount of toxic release from a facility. The unit of analysis is facility year. The dependent variables are the natural logarithm of one plus the amount of total (*total*), on-site (*on-site*), and off-site (*off-site*) releases of toxic chemicals by the facility. The main independent variable of interest is equity ownership of institutions located within 150 miles of the facility that releases the toxic chemicals into the environment. Variable definitions and descriptions are provided in Appendix II. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

	Dependent variable = Toxic release		
	Total	On-site	Off-site
	(1)	(2)	(3)
Localown	-4.690***	-4.023**	-1.270
	(-2.73)	(-2.27)	(-1.02)
Facility_size	0.660***	0.637***	0.435***
	(8.32)	(7.81)	(7.49)
Facility_HQ_distance	-0.118**	-0.151***	-0.006
	(-2.29)	(-2.72)	(-0.11)
REG_stringency	-11.400***	-9.717***	-5.680*
	(-3.41)	(-2.68)	(-1.78)
FIRM FE	YES	YES	YES
MSA FE	YES	YES	YES
FIRM FE × YEAR FE	YES	YES	YES
MSA × YEAR FE	YES	YES	YES
Observations	38,483	38,483	38,483
Adj. R-squared	0.358	0.368	0.254

Table 3
Endogeneity check: Subsample analyses

This table reports the OLS estimation results from regressing the amount of total toxic release from a facility on local institutional ownership. The unit of analysis is facility year. We rank each observation into three groups based on a firm's yearly CSR or environmental scores obtained from the KLD database. *High* (*Low*) denotes the top (bottom) group. The dependent variable is the natural logarithm of one plus the total amount of toxic release by the facility (*total toxic release*). The main independent variable of interest is equity ownership of institutional investors located within 150 miles of the facility that releases the toxic chemicals into the environment (*localown*). Variable definitions and descriptions are provided in Appendix II. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

	Dependent variable = Total toxic release			
	CSR scores		Environmental scores	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
Localown	-6.989***	-7.618**	-4.834*	-10.588**
	(-3.10)	(-2.50)	(-1.80)	(-2.60)
Facility_size	0.588***	0.541***	0.821***	0.454***
	(4.48)	(6.01)	(7.83)	(3.18)
Facility_HQ_distance	-0.135*	-0.192**	-0.132	-0.282**
	(-1.77)	(-2.59)	(-1.43)	(-2.32)
REG_stringency	-7.731	-20.834***	-6.321	-31.864***
	(-1.38)	(-2.98)	(-1.04)	(-4.81)
FIRM FE	YES	YES	YES	YES
MSA FE	YES	YES	YES	YES
FIRM FE × YEAR FE	YES	YES	YES	YES
MSA × YEAR FE	YES	YES	YES	YES
Observations	6,716	6,388	6,500	4,836
Adj. R-squared	0.311	0.326	0.345	0.312
Coefficient equality test: Localown	(1) = (2)		(3) = (4)	
T-statistics	-0.17		-0.72	
(*p*-value)	(0.87)		(0.47)	

Table 4
Endogeneity check: Quasi-natural experiment due to institutional investor mergers

This table reports the DID estimation results, assessing the relation between local institutional ownership and facility toxic release using the quasi-natural experiment of institutional investor mergers. The unit of analysis is facility year. The dependent variable is the natural logarithm of one plus the total amount of toxic release by the facility (*total toxic release*). The main independent variable of interest is *Treatment***Post*. *Treatment* is an indicator variable that equals one if the facility is in the treatment group and zero if in the control group. We classify a facility into the treatment group if an institutional investor located within 150 miles of the facility was acquired by a distant institutional investor (i.e., located outside the 150-mile radius of the facility). The control group includes those facilities that were owned by the same parent company but did not experience any change in the composition of local institutional investors. *Post* is an indicator variable that takes the value of one if the sample year is after the merger event and zero if before the merger. Definitions and descriptions for other variables are provided in Appendix II. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

		Dependent variable = Total toxic release	
		Full sample	[-5, 5] year window
	Predicted sign	(1)	(2)
Treatment * Post	(+)	1.345**	1.441**
		(2.15)	(2.13)
Treatment		-0.622	-0.760
		(-0.79)	(-0.97)
Facility_size		1.162***	1.250***
		(10.74)	(10.29)
Facility_HQ_distance		0.105	0.263*
		(0.92)	(1.91)
REG_stringency		-9.031	-11.864
		(-1.31)	(-1.41)
FIRM FE		YES	YES
MSA FE		YES	YES
FIRM×YEAR FE		YES	YES
MSA×YEAR FE		YES	YES
Observations		5,909	3,479
Adj. R-squared		0.402	0.403

Table 5
Endogeneity check: Quasi-natural experiment due to facility relocation

This table reports the DID estimation results, assessing the relation between local institutional ownership and facility toxic release using the quasi-natural experiment of facility relocation. The unit of analysis is facility year. The dependent variable is the natural logarithm of one plus the total amount of toxic release by the facility (*total toxic release*). The main independent variable of interest is *localown_increase_dummy*post*. *Localown_increase_dummy* is a dummy variable that equals one if the local institutional ownership (*localown*) is higher in the post-relocation period than in the pre-relocation period. *Post* is an indicator variable that takes the value of one, if the facility-year observation falls into the post-relocation period and zero if the pre-relocation period. We define *localown* as stockholdings by institutional investors located within 150 miles of the emitting facility. Definitions and descriptions for other variables are provided in Appendix II. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

		Dependent variable = Total toxic release
	Predicted sign	(1)
Localown_increase_dummy * Post	(-)	-1.135*
		(-1.97)
Post		1.037
		(1.30)
Localown_increase_dummy		-4.536***
		(-8.74)
Facility_size		-0.065
		(-0.30)
Facility_HQ_distance		0.567***
		(5.52)
REG_stringency		-2.200
		(-0.44)
Firm_size		-0.294
		(-1.22)
Firm_age		0.676
		(0.68)
Slack		-0.986
		(-0.70)
Leverage		1.241
		(0.89)
R&D / sales		-7.456
		(-0.68)
AD / sales		-41.364
		(-1.62)
HHI		-0.091
		(-0.04)
FIRM, YEAR, and MSA FE		YES
Observations		756
Adj. R-squared		0.798

Table 6
Endogeneity check: The change-on-change analysis

This table reports the OLS estimation results. The unit of analysis is facility year. The main variables of interest are the lagged changes in local institutional ownership (*$\Delta localown_{t-1}$*) and the changes in the natural logarithm of one plus the total amount of toxic release (*$\Delta total\ toxic\ release_{t-1}$*). The sample is divided into facilities that increased toxic release from year *t*-1 to year *t* (*Positive change*) and facilities that decreased toxic release from year *t*-1 to year *t* (*Negative change*). Variable definitions and descriptions are provided in Appendix II. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

Panel A:

Dependent variable =	ΔTotal toxic release$_t$	
	Positive change	Negative change
	(1)	(2)
ΔLocalown$_{t-1}$	-1.612**	-0.659
	(-1.99)	(-0.68)
Total toxic release$_{t-1}$	-0.279***	0.036***
	(-11.74)	(2.87)
ΔFacility_size$_{t-1}$	0.012	-0.022
	(0.24)	(-0.59)
ΔREG_stringency$_{t-1}$	4.312	-9.914
	(0.59)	(-1.38)
FIRM FE	YES	YES
MSA FE	YES	YES
FIRM FE × YEAR FE	YES	YES
MSA × YEAR FE	YES	YES
Observations	9,309	11,643
Adj. R-squared	0.309	0.038

Panel B:

Dependent variable =	ΔLocalown$_t$	
	Positive change	Negative change
	(1)	(2)
ΔTotal toxic release$_{t-1}$	0.000	0.000
	(1.29)	(1.60)
Localown$_{t-1}$	-0.308***	-0.325***
	(-3.14)	(-4.29)
ΔFacility_size $_{t-1}$	-0.001	0.001
	(-0.91)	(0.96)
ΔREG_stringency$_{t-1}$	0.029	-0.010
	(0.63)	(-0.18)
FIRM FE	YES	YES
MSA FE	YES	YES
FIRM FE × YEAR FE	YES	YES
MSA × YEAR FE	YES	YES
Observations	7,978	10,117
Adj. R-squared	0.138	0.196

Table 7
Impact of local institutional investors on toxic release, discriminating between institution types

This table reports the OLS regression results from estimating the effect of equity ownership by different types of local institutional investors on the amount of toxic chemicals released into the environment by the nearby facility. The unit of analysis is facility year. The dependent variable is the natural logarithm of one plus the total amount of toxic release by the facility (*total toxic release*). In Panel A, the main independent variables of interest are local ownerships by SRI funds (*localown_SRI*), public pension funds (*Localown_Public pension fund*), and other institutional investors that are not SRI funds or public pension funds (*Localown_NonSRI_NonPensionFund*). *Localown_Hedge fund* denotes local ownership by hedge funds. In Panel B, the main independent variables of interest are local ownership by dedicated (*Localown_DED*) and transient (*Localown_TRA*) institutional investors. Local ownership is defined as equity ownership by institutional investors located within 150 miles of the facility that releases the toxic chemicals into the environment. Variable definitions and descriptions are provided in Appendix II. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

Panel A: Evidence from local SRI funds and local public pension funds vs. other local institutional investors

	Dependent variable = Total toxic release			
	(1)	(2)	(3)	(4)
(S) Localown_SRI	-20.427***			
	(-2.59)			
(P) Localown_Public pension fund		-36.867**		
		(-2.32)		
(N) Localown_NonSRI_NonPensionFund			-4.912**	
			(-2.25)	
Localown_Hedge fund				-4.942
				(-0.28)
Facility_size	0.662***	0.663***	0.661***	0.663***
	(8.34)	(8.34)	(8.32)	(8.33)
Facility_HQ_distance	-0.102*	-0.102*	-0.118**	-0.102*
	(-1.93)	(-1.93)	(-2.28)	(-1.93)
REG_stringency	-11.783***	-11.846***	-11.528***	-11.915***
	(-3.53)	(-3.54)	(-3.45)	(-3.54)
FIRM FE	YES	YES	YES	YES
MSA FE	YES	YES	YES	YES
FIRM×YEAR FE	YES	YES	YES	YES
MSA×YEAR FE	YES	YES	YES	YES
Observations	38,483	38,483	38,483	38,483
Adj. R-squared	0.357	0.357	0.357	0.356
Coefficient equality test:	(S)=(N)	(P)=(N)		
T-statistics	1.99	2.62		
(*p*-value)	(0.05)	(<0.01)		

Panel B: Evidence from dedicated vs. transient institutional investors

	Dependent variable = Total toxic release	
	(1)	(2)
(D) Localown_DED	-9.799**	
	(-2.34)	
(T) Localown_TRA		-8.118
		(-1.57)
Facility_size	0.662***	0.662***
	(8.33)	(8.30)
Facility_HQ_distance	-0.101*	-0.105**
	(-1.93)	(-2.01)
REG_stringency	-11.628***	-11.751***
	(-3.46)	(-3.50)
FIRM FE	YES	YES
MSA FE	YES	YES
FIRM×YEAR FE	YES	YES
MSA×YEAR FE	YES	YES
Observations	38,483	38,483
Adj. R-squared	0.357	0.356
Coefficient equality test:	(D)=(T)	
T-statistics	0.32	
(*p*-value)	(0.75)	

Table 8

Impact of local institutional investors, conditioned on a community's proclivity toward stricter environmental policies

This table reports the OLS regression results from estimating the effect of local institutional ownership on the amount of toxic chemicals released into the environment by the nearby facility, partitioning the sample based on whether the facility is located in a community that prefers stronger environmental policies. The unit of analysis is facility year. The dependent variable is the natural logarithm of one plus the total amount of toxic release by the facility (*total toxic release*). The main independent variable of interest is the equity ownership of institutional investors located within 150 miles of the facility (*localown*) that releases the toxic chemicals into the environment. For each regression, we rank the observations into three groups based on county-level proxies for a community's proclivity toward stricter environmental policies. *High* and *Low* denote top and bottom terciles, respectively. The Democrat/Republican ratio is the ratio of votes for the Democratic presidential candidate over votes for the Republican presidential candidate during the presidential election every four years. The religious adherence ratio is the adjusted rate of religious adherents per 1000 population recorded in 2000. The age>=65 and <=18 ratio is the annual ratio of people above age 65 or younger than 18 years of age over the total population in a county. The female ratio is the annual ratio of females over the total population in a county. Variable definitions and descriptions are provided in Appendix II. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

	Dependent variable = Total toxic release							
	Democrats / republicans ratio		Religious adherence ratio		Age>=65 and <=18 ratio		Female ratio	
	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Localown	-5.936***	-4.390	-7.901***	-3.625	-9.243**	-1.351	-5.564**	-3.427
	(-2.68)	(-1.17)	(-2.96)	(-1.01)	(-2.48)	(-0.66)	(-2.47)	(-0.88)
Facility_size	0.836***	0.723***	0.867***	0.670***	0.854***	0.553***	0.719***	0.704***
	(7.99)	(5.62)	(5.52)	(4.69)	(6.16)	(6.21)	(6.67)	(6.80)
Facility_HQ_distance	-0.204***	-0.103	-0.018	-0.104	-0.058	-0.081	-0.119	-0.060
	(-2.60)	(-1.07)	(-0.12)	(-0.76)	(-0.44)	(-0.95)	(-1.02)	(-0.54)
REG_stringency	-17.009***	0.739	-11.297	-14.948**	-8.562	-17.206*	-6.485	-18.848**
	(-2.91)	(0.14)	(-1.60)	(-2.04)	(-1.64)	(-1.86)	(-1.05)	(-2.29)
FIRM FE	YES	YES	YES	YES	YES	YES	YES	YES
MSA FE	YES	YES	YES	YES	YES	YES	YES	YES
FIRM FE × YEAR FE	YES	YES	YES	YES	YES	YES	YES	YES
MSA × YEAR FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	10,811	11,250	10,888	10,562	11,004	10,430	11,125	10,728
Adj. R-squared	0.362	0.340	0.339	0.407	0.352	0.378	0.326	0.373
Coefficient equality test: Localown	(1)=(2)		(3)=(4)		(5)=(6)		(7)=(8)	
T-statistics	0.26		1.04		1.80		0.55	
(*p*-value)	(0.79)		(0.30)		(0.07)		(0.58)	

Table 9
Impact of local institutional investors, conditioned on a community's collective cohesiveness

This table reports the OLS regression results from estimating the effect of local institutional ownership on the amount of toxic chemicals released into the environment by the nearby facility, partitioning the sample based on whether the facility is located in communities of greater collective cohesiveness. The unit of analysis is facility year. The dependent variable is the natural logarithm of one plus the total amount of toxic release by the facility (*total toxic release*). The main independent variable of interest is the equity ownership of institutional investors located within 150 miles of the facility (*localown*) that releases the toxic chemicals into the environment. For each regression, we rank the observations into three groups based on county-level proxies for a community's collective cohesiveness. *High* and *Low* denote top and bottom terciles, respectively. The voter turnout rate is the total votes cast in a general election over the total population in a county. The Caucasian ratio is yearly total number of Caucasians over the total population in a county. Variable definitions and descriptions are provided in Appendix II. Each regression includes a constant. *t* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

	Dependent variable = Total toxic release			
	Voter turnout		Caucasian ratio	
	High	Low	High	Low
	(1)	(2)	(3)	(4)
Localown	-8.298***	-1.595	-7.685**	-4.195
	(-3.12)	(-0.37)	(-2.53)	(-1.27)
Facility_size	0.613***	0.674***	0.832***	0.762***
	(5.70)	(4.64)	(7.58)	(5.51)
Facility_HQ_distance	-0.139	-0.095	-0.250**	-0.062
	(-1.40)	(-0.84)	(-2.28)	(-0.53)
REG_stringency	-12.081**	-8.541	-9.797*	-2.598
	(-2.13)	(-1.42)	(-1.66)	(-0.42)
FIRM FE	YES	YES	YES	YES
MSA FE	YES	YES	YES	YES
FIRM FE × YEAR FE	YES	YES	YES	YES
MSA × YEAR FE	YES	YES	YES	YES
Observations	10,990	11,231	11,652	10,953
Adj. R-squared	0.350	0.372	0.358	0.387
Coefficient equality test: Localown	(1) = (2)		(3) = (4)	
T-statistics	1.68		1.78	
(*p*-value)	(0.09)		(0.08)	

Table 10
Impact of local institutional ownership: Evidence from shareholder proposals

This table reports the regression results from estimating a logistic model, relating equity ownership by local institutional investors to the likelihood that an ESG proposal is introduced or withdrawn. The dependent variable in columns (1)-(4) is a dummy variable that takes the value of one if a firm receives a socially responsible initiative (SRI) proposal, as designated by ISS, and zero otherwise. The dependent variable in columns (5)-(8) is a dummy variable that takes the value of one if an SRI-designated proposal is withdrawn. The main independent variables of interest are aggregated firm-level equity ownership by institutional investors located within 150 miles of the firm's facilities that release toxic chemicals into the environment (*Agg. Localown*), by local SRI funds (*Agg. Localown_SRI*), by local public pension funds (*Agg. Localown_Public pension fund*), and by other local institutional investors that are not SRI funds or public pension funds (*Agg. Localown_NonSRI_NonPensionFund*). Variable definitions and descriptions are provided in Appendix II. Industry FE are created based on 2-digit SIC codes. Reported coefficients are marginal effects. Each regression includes a constant. *z* statistics are shown in parentheses. Standard errors are adjusted for heteroskedasticity and firm-level clustering. ***, **, and * indicate significance levels of less than 1%, 5%, and 10%, respectively, based on a two-tailed test.

Dependent variable =	*Prob* (a firm receives an ESG proposal) =1				*Prob* (an ESG proposal is withdrawn) =1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agg. Localown	0.196**				0.064**			
	(1.98)				(1.99)			
(S) Agg. Localown_SRI		2.436**				1.285**		
		(2.40)				(2.54)		
(P) Agg. Localown_			5.249*				2.027**	
Public pension fund			(1.86)				(2.37)	
(N) Agg. Localown_				0.215*				0.198**
NonSRI_NonPensionFund				(1.76)				(2.09)
Firm_size	0.063***	0.070***	0.060***	0.062***	-0.081**	-0.081**	-0.068**	-0.075**
	(2.97)	(3.39)	(2.85)	(2.92)	(-2.56)	(-2.58)	(-2.35)	(-2.48)
ROA	0.837***	0.865***	0.869***	0.831***	0.407	0.333	0.912	0.835
	(3.02)	(3.01)	(3.21)	(3.03)	(0.59)	(0.49)	(1.31)	(1.24)
Firm_age	0.002	-0.008	0.012	0.006	0.068	0.056	0.057	0.057
	(0.05)	(-0.19)	(0.30)	(0.16)	(1.18)	(0.98)	(1.01)	(0.98)
Market-to-book ratio	-0.004	-0.004	-0.005	-0.004	0.007	0.009	0.007	0.008
	(-0.49)	(-0.47)	(-0.73)	(-0.54)	(0.67)	(0.81)	(0.64)	(0.76)
Leverage	0.173	0.164	0.169	0.179	0.362	0.379	0.436	0.459
	(0.99)	(0.97)	(0.95)	(1.00)	(1.23)	(1.31)	(1.51)	(1.58)
Sales_growth	-0.021	-0.004	-0.010	-0.023	0.270**	0.290**	0.280**	0.295**
	(-0.22)	(-0.04)	(-0.10)	(-0.24)	(2.10)	(2.33)	(2.13)	(2.22)
Year & industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,186	1,186	1,186	1,186	589	589	589	589
Pseudo R-squared	0.098	0.102	0.098	0.097	0.170	0.175	0.180	0.181
Coefficient equality test		(S)=(N)	(P)=(N)			(S)=(N)	(P)=(N)	
Z-statistics		-2.35	-1.85			-2.00	-2.00	
(*p*-value)		(0.02)	(0.07)			(0.05)	(0.05)	