# The Real Effects of Environmental Activist Investing[†]

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December 2020

**Abstract**

We study the real effects of environmental activist investing. Using plant-level data, we find that targeted firms reduce their toxic releases, greenhouse gas emissions, and cancer-causing pollution. Improvements in air quality within a one-mile radius of targeted plants suggest potentially important externalities to local economies. These improvements come through increased capital expenditures on new abatement initiatives. We rule out alternative explanations of decline in production, reporting biases, and forms of selection, while also providing evidence supporting the external validity of environmental activism. Overall, our study suggests that engagements are an effective tool for long-term shareholders to address climate change risks.

**JEL classification: G23, G34, M14, Q50**

**Keywords**: Activism, Environmental Social and Governance, Socially Responsible Investment, Corporate Social Responsibility, Pensions

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[†]For helpful comments and suggestions, we thank Pat Akey, Sudheer Chava (discussant), Alan Crane, Nuri Ersahin, Mara Faccio (discussant), Vyacheslav Fos (discussant), Michael Gallmeyer (discussant), Nickolay Gantchev, Stuart Gillan, Xin Gu (discussant), Arpit Gupta, Matthew Gustafson (discussant), Amanda Heitz (discussant), Ravi Jagannathan, Wei Jiang, Lisa Kramer (discussant), Ted Loch-Temzelides, Jean-Marie Meier (discussant), Narayan Naik, Kasper Meisner Nielsen, Shivaram Rajgopal, Ryan Riordan (discussant), Ishita Sen, Rik Sen (discussant), Henri Servaes, Sophie Shive, Manpreet Singh, Pablo Slutzky, Sumudu Watugala, James Weston, Qiping Xu, Bohui Zhang (discussant), and seminar participants at the London Business School, Wellington Finance Summit, Rice University (Jones), European Winter Finance Conference, UBC Winter Finance Conference, Asia-Pacific Corporate Finance Online Workshop, Finance in the Cloud IV, Econometric Society World Congress, Summer Research Conference (ISB), European Finance Association (EFA), UNSW Business School, Global Research Alliance for Sustainable Finance and Investment (Columbia), Political Economy of Finance Conference (Booth), Green and Ethical Finance (ADBI), Lone Star Finance Symposium (TAMU), Northern Finance Association (NFA), World Symposium on Investment Research (WSIR), the University of Houston (Bauer), and the FMA Annual Conference. We have also benefited from detailed discussions with Michael Garland, Assistant Comptroller of New York City, and both Hazel Crampton-Hays and Tian Weinberg from the Office of the Comptroller. We thank Sophie Shive and Margaret Forster for sharing their data. We thank Dejan Suskavcevic and Billy Xu for excellent research assistance. Sharma thanks Wheeler Institute for funding.

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*Environmental activism*, which involves shareholders engaging management to improve a firm's environmental impact, has gained popularity among investors (Bauer, Ruof, and Smeets (2019); Dimson, Karakaş, and Li (2015); Hong, Karolyi, and Scheinkman (2020); Krueger, Sautner, and Starks (2020)). With investors further internalizing the negative externalities created by firms, it is essential to understand the real effects this activism has on shareholders, targeted firms, and local economies.

There is limited research studying the real effects of environmental activism on pollution and the environment. On the one hand, there is a mature literature studying how activist shareholders can affect a firm's governance, as well as its financial and operational performance, with an aim of increasing their wealth.[1] On the other hand, there is a growing literature studying investor preferences for socially responsible investments, often reflected by active divestment campaigns.[2] However, between these two literatures, there remains an important gap in the understanding of the willingness and ability of activist shareholders to influence corporate environmental behaviors, the impact of these efforts on local economies, and the negative implications on target firms' financial performance.

This paper fills this gap by documenting the real effects of environmental activist investing on corporate environmental behaviors. It exploits the Boardroom Accountability Project (BAP) in a difference-in-differences specification to estimate the effectiveness of climate-focused engagements. Targeted firms respond by reducing their total toxic releases, production-related emissions, and greenhouse gas emissions. These improvements have positive and important externalities for the local economies. Our evidence suggests that an increase in abatement initiatives, and not changes to production, drive the decline in emissions. A commensurate increase in abatement-related capital expenditures negatively affect the targeted firm's financial performance. Further tests rule out possible reporting biases, issues around selection, and indirect effects as alternative explanations. Finally, we consider the broader implications of our study in the context of the growing interest in environmental activism.

[1] A partial list of studies of activism by pension funds includes those by Nesbitt (1994), Smith (1996), Wahal (1996), Huson (1997), Carleton, Nelson, and Weisbach (1998), and Del Guercio and Hawkins (1999). For surveys of shareholder activism, see Karpoff (2001) and Gillan and Starks (2007).

[2] Empirical evidence on divestment and negative selection include those by Atta-Darkua and Dimson (2019); Becht, Franks, and Wagner (2019); Teoh, Welch, and Wazzan (1999). Theoretical studies of impact investing include those by Broccardo, Hart, and Zingales (2020); Chowdhry, Davies, and Waters (2018); Hart and Zingales (2017); Heinkel, Kraus, and Zechner (2001); Morgan and Tumlinson (2019); Oehmke and Opp (2020).

At its core, this paper provides novel empirical evidence on the trade-off investors face when maximizing stakeholder value. Previous research documents investors' strong preference for sustainability, resulting in them moving away from low-sustainability investments (Hartzmark and Sussman, 2019; Hong and Kacperczyk, 2009). At the same time, this preference for sustainability may come at the cost of lower future expected returns (Barber, Morse, and Yasuda, 2020; Bolton and Kacperczyk, 2020; Riedl and Smeets, 2017). This paper offers a counterpoint, suggesting that investors may maximize their total value through monitoring and engagement (Appel, Gormley, and Keim, 2016; Black, 1990; Broccardo, Hart, and Zingales, 2020). Further, our findings bring nuance to the basic tenet of economic theory that a firm should maximize shareholder value, and they have implications for current debates on the stakeholder primacy model (Bebchuk and Tallarita, 2020; Bhagat and Hubbard, 2020; Friedman, 1970; Hart and Zingales, 2017).

Can environmental activism bring about changes to corporate environmental behaviors? The answer to this question is unclear. On the one hand, improvements in sustainability can have benefits such as valuable product differentiation, insurance against event risk, lower cost of capital, and lower regulatory risk (Albuquerque, Koskinen, and Zhang, 2019; Chava, 2014; Hong and Liskovich, 2015; Servaes and Tamayo, 2013). On the other hand, changes through capital investments may be costly, symptomatic of agency conflicts, and potentially harmful to a firm's business operations (Cheng, Hong, and Shue, 2019; Fowlie, 2010; Lenox and Eesley, 2009). Further, if any changes do come about, it will be necessary to understand the steps undertaken to achieve these changes, to evaluate the costs and benefits of such actions, and to study their impact on the local economy.

We answer these questions by focusing on the activist campaign by the Boardroom Accountability Project (BAP), initiated by the New York City Pension System (NYCPS).[3] The BAP's objective was to provide pensioners a stronger voice in the long-term oversight of portfolio companies. To achieve this, the BAP began submitting proposals, without prior announcement, requesting the inclusion of proxy access bylaws in targeted firms' corporate charters. These proposals posed a credible threat making it difficult for the boards to ignore them. Consistently, they were adopted by firms almost immediately.

[3]Initiated by the NYCPS, the BAP brought together influential investors, including the California Public Employees' Retirement System (CalPERS) and California Teachers' Retirement System (CalSTRS).

This paper focuses on firms targeted by the BAP to reduce their environmental impact, specifically, their contribution to climate change. We use the targeting by the BAP in a difference-in-differences empirical setting to identify the real effects of environmental activism. Our empirical approach compares firms targeted by the BAP to counterfactual firms, identified using propensity score matching, in the same industry and with similar financial and sustainability characteristics. Thus, the within-industry matching controls for aggregate industry-level trends that may affect corporate environmental behaviors.

We use a diverse set of granular databases to provide a comprehensive view of the real effects of environmental activism. Moreover, it allows us to overcome measurement challenges that come with relying on any one data source (Berg, Koelbel, and Rigobon, 2020). From the Environmental Protection Agency (EPA), we use data from the Toxic Release Inventory (TRI), Pollution Prevention (P2), Greenhouse Gas Reporting Program (GHGRP), Integrated Risk Information System (IRIS), and Air Quality System (AQS) program, as well as the agency's Risk-Screening Environmental Indicators (RSEI) model. We also use data from the U.S. Energy Information Agency (EIA). We complement them with other standard databases, including Compustat, Center for Research in Security Prices (CRSP), Institutional Shareholder Services (ISS), and Thomson Reuters' ASSET4 database.

First, we provide evidence that environmental activist investing can affect the environmental performance of targeted firms. Plants of targeted firms respond to campaigns by reducing their total toxic chemical releases, on average, by 13%. Decomposing the source of reductions, we find that active on-site reductions in releases are the predominant drivers of overall improvements. Studying the medium of releases, we find that the improvements arise primarily from reductions in stack-air emissions. Focusing on the type of air emissions, our estimates suggest that plants of targeted firms reduce their greenhouse gas emissions, including methane and nitrous oxide, two of the most lethal greenhouse gases.

Second, we find that these engagements have positive externalities on the local economies around plants of targeted firms. We find that reductions in cancer-causing chemicals drive baseline reductions in toxic releases. Using air quality monitor data within a one-mile radius around targeted plants, we find a significant drop in emissions affecting public health. Further, we use the EPA's modeled estimates to capture the chronic human health risk at the local census block group level. Decomposing the effects, we find that firms reduce their intensity of pollution by managing the toxic concentration and the number of chemicals released. Overall, these results suggest that reductions in emissions around targeting seem to positively impact the local communities near plants of targeted firms.

Third, we show that plants achieve these reductions by focusing on abatement initiatives, rather than changing their production activities. We find evidence that plants of targeted firms adopt operation-related abatement initiatives such as pursuing good operating practices and installing new measures to prevent spills and leaks. Moreover, we find a significant increase in abatement-related capital expenditures among plants of targeted firms. Consistent with these results, disclosures in sustainability reports of targeted firms corroborate that firms make these investments (see Appendix A.1).

To understand whether the increase in costs offsets potential financial benefits in the short-run, we study the investor reaction to the BAP campaign and changes in the targeted firms' financial performance. First, we use an event study around the BAP campaign to understand how investors perceive environmental activism. Focusing on the 10-day window around targeting, we do not find a change in cumulative abnormal returns. We interpret these results as arising from a substitution effect where investors expect improvements to corporate environmental performance benefits to offset the increased costs of new abatement efforts. Second, we find a negative relationship between financial performance and environmental activism, with targeted firms experiencing lower profitability and operational efficiency around such campaigns. We are cautious in interpreting these results as the possible benefits (e.g., new customers, lower cost of capital) may take time to offset the costly investments in abatement technologies.

We perform several additional tests to isolate the effect of environmental activism from alternative explanations. The first test addresses the concern that targeting, irrespective of the specific mandate, indirectly drive emissions reductions. We rule this out by focusing on the subsample of firms (i) targeted by the BAP for non-environmental reasons, (ii) targeted by other investors to include proxy access in their bylaws. The second test assuages concerns that the drop in emissions results from an increase in firms' offshoring production activities by focusing on the subsample of firms (i) in the utility sector where the likelihood to offshore production is low (ii) with low levels of offshoring identified using the textual measure (Hoberg and Moon, 2017). The third test mitigates concerns that plant closures drive the drop in emissions by focusing on the subset (i) of firms where plants have continuously reported emissions throughout the sample period, (ii) excluding plants that do not report any emissions, and (iii) of firms that did not file for Chapter 11. Additional robustness tests address concerns related to: potential reporting biases to the TRI data; alternative definitions and scaling metrics of our dependent variable; sensitivity of estimates to propensity score matching inputs; and possible regulatory concerns at the industry and geographic region, among others. We find robust evidence of a drop in toxic chemical releases across these tests, coming from on-site emissions.

Lastly, we consider the broader implications of our study for other environmental activist campaigns. We conduct external validity tests using other environment-related campaigns initiated by other shareholders and find that our results extend outside of the BAP. Targeted firms respond only in cases where the activist investor has a firm-specific environmental mandate. These results, coupled with our baseline estimates, establish that shareholders can impose their pro-social preferences on firms to improve corporate environmental behaviors.

While our results shed light on the costs and benefits of climate-focused engagements, it comes with important caveats and must be carefully interpreted. First, the setting and the data are not well suited to evaluate the welfare consequences of engagements like the BAP. Such an analysis will need to evaluate the non-pecuniary benefits to stakeholders, investors in its entirety and these benefits may take a longer time to materialize. Second, targeting by the BAP was not random, and hence any policy suggestive of random targeting to achieve environmental change is misguided. Instead, the results should be interpreted as: would the same changes have occurred if the BAP targeted these firms but remained passive in their demands.

This paper contributes to the fast-growing literature focusing on the interplay between finance and the environment. One strand of this research documents the improvements in financial and operational performance through engagements related to sustainability (Dimson, Karakaş, and Li, 2015, 2020; Doidge, Dyck, Mahmudi, and Virani, 2019). Other papers document a positive impact on firm value (Barko, Cremers, and Renneboog, 2018; Dyck, Lins, Roth, and Wagner, 2019). Our work complements these studies by documenting improvements in environmental performance in response to climate-focused engagements and highlights their effectiveness for long-term shareholders to address climate change risks at portfolio firms.

Our paper also contributes to the shareholder activism literature by uncovering the *direct effects* of sustainability campaigns. We complement two concurrent papers (Akey and Appel, 2020a; Chu and Zhao, 2019) that study the externalities of hedge fund activism and find that *indirect effects* whereby changes to a firm's governance structure and operations affect its environmental behaviors. These campaigns involve investors focused on improving the target firm's financial performance in the short-run, and thus any improvements stem from changes in operational efficiency instead of firms undertaking new abatement initiatives. In contrast, we focus on environmental activist campaigns, with our results coming from a *direct channel*, where long-term investors engage management to improve a target's environmental performance. Consistently, our results stem from firms undertaking new abatement initiatives instead of changing their production activities. Moreover, using a more diverse set of microdata, we shed light on the cost-benefit trade-off that firms face when incorporating stakeholders in their decision-making. Overall, these results add to our understanding of long-term investors' willingness and ability to influence a corporation's environmental impact.

More broadly, research has also studied the real effects of hedge fund activism on assets, productivity, labor (Brav, Jiang, and Kim (2010, 2015)), and corporate innovation (Brav, Jiang, Ma, and Tian (2018)). Moreover, activist shareholders play an important role in modern corporate governance by improving firm value (Albuquerque, Fos, and Schroth, 2020; Brav, Jiang, Partnoy, and Thomas, 2008; Gillan and Starks, 2000, 2007). We provide novel evidence about the efficacy of shareholder engagements on corporate environmental behaviors and point to institutional investors' role in improving the sustainability performance of firms.

Lastly, this study also fits into the literature examining the determinants of corporate environmental behaviors. Prior research has focused on the roles of financial constraints (Bartram, Hou, and Kim, 2019; Cohn and Deryugina, 2018; Goetz, 2018; Kim and Xu, 2020), listing status (Shive and Forster, 2020), supply chains (Schiller, 2018), and limited liability (Akey and Appel, 2020b). This study contributes by showing that environmental activism has a significant impact on this behavior. Moreover, our empirical evidence aligns with theoretical research and provides new and important evidence for U.S. pension investing in public equities (Oehmke and Opp, 2020; Ramadorai and Zeni, 2020).

# 1 Boardroom Accountability Project

The New York City Pension System (NYCPS) publicly announced the Boardroom Accountability Project (BAP) on November 4th, 2014.[4] The goal was to hold boards of the portfolio companies accountable to long-term shareholders and give pensioners a voice in oversight concerning board diversity, climate change risks, and employee treatment.[5] The BAP campaign aimed to increase the accountability of board members to shareholders by simultaneously filing proxy access proposals at portfolio firms. These proposals gave long-term shareholders the right to nominate directors on boards, (see Appendix A.2).

While the BAP targeted firms for multiple mandates, we focus on firms targeted for their approach to climate change risks, which was one of their most significant mandates. Accordingly, the BAP campaign mainly targeted carbon-intensive firms because they failed to address climate change concerns adequately.

At the launch of the campaign, the comptroller emphasized this, as follows.

> *"Resolutions were filed at companies where we see risks associated with climate change, board diversity, and excessive CEO pay. Especially when it comes to the environment, business as usual is no longer an option. To effect true change, you need the ability to hold entrenched and unresponsive boards accountable, and that is what we are seeking to do." Stringer (2014)*

Our discussions with the New York City comptroller's office confirmed that the NYCPS did not announce in advance the BAP campaign and the identities of the targeted corporations. In addition, the NYCPS were not active in deliberations or in putting forward resolutions at targeted firms before the campaign. Furthermore, the campaign targeted firms based on their underlying carbon reserves, a proxy for their potential to contribute to climate change, instead of selecting firms based on previous interactions. We also confirm these aspects through Freedom of Infor-

[4]The New York City Pension System is a combination of five funds, namely: the New York City Employees' Retirement System, the Teachers' Retirement System of the City of New York, the New York City Police Pension Fund, the New York City Fire Pension Fund, and the New York City Board of Education Retirement System. NYCPS manages approximately $199 billion in assets under management. As of May 2019, the fund had around 29% of its assets allocated to U.S. public equities and was a long-term shareholder in more than 3,000 U.S. public companies. For more detail, please see New York City Comptroller website.

[5]Note that the inclusion of climate risk consideration by the NYCPS is increasing among institutional investors in general, as documented in an extensive survey conducted by Krueger, Sautner, and Starks (2020). As they document, investors' motivations for incorporating climate risks into their decision-making can be financial, nonfinancial, or both. Further, environmental activism campaigns such as the BAP differ from traditional shareholder activism, which solely focuses on improving the financial and operational performance of the targeted firm (Nesbitt, 1994).

mation Act (FOIA) requests and empirical tests.[6] Specifically, our tests rule out an association between carbon reserves and changes in pollutive activities before the campaign. Collectively, these facts suggest that neither anticipation nor the underlying selection criteria drive changes in targeted firms' environmental performance.

We use targeting by the BAP to study the real effects of environmental activist campaigns. Specifically, our empirical strategy compares outcomes for plants of firms targeted by the BAP to plants of similar firms that were not targeted by the BAP. Table 1 provides the summary of activism events by year (Panel A) and industry (Panel B). Out of 181 BAP firm mandates in our sample, 62 relate to environmental concerns. We align the year in our study to coincide with the year of the shareholder vote. Sectors are mutually exclusive, and are defined using the Fama-French twelve industry classification using the Standard Industrial Classification (SIC) codes.

While the firms and the industries targeted by the BAP for environmental reasons are few, this sample is important to study in the context of climate change. In terms of their footprint, the targeted firms contributed to roughly a quarter of the total emissions by all firms in the United States. Moreover, the energy and utility sectors are among the heaviest polluters across all industries (Hockstad and Hanel, 2018; Shive and Forster, 2020). Thus, these industries and the firms targeted by the BAP are crucial to our understanding of the efforts needed to address climate change risk.

Moreover, the BAP posed a credible threat that made it difficult for boards to ignore. First, the BAP was supported by three of the four largest pension funds in the United States (CalPERS, CalSTRS, and the NYCPS). With over $650 billion in assets under management, this group of investors was pivotal when voting on resolutions. Second, the campaign was well-organized. Previous research has pointed out that public pension funds can better coordinate with other shareholders and can garner broad support for their proposals (Gillan and Starks (2000); Levit and Malenko (2011)). In line with this, the BAP and its partners coordinated their engagements and attended the targeted firms' annual general meetings. Third, the BAP can exert pressure

[6]Our ability to understand the target selection process and verify it through empirical tests confers an advantage in constructing appropriate counterfactual firms. This differs from the traditional shareholder activism literature which has relied solely on target selection model to construct the counterfactuals (Akey and Appel, 2020a; Brav, Jiang, Partnoy, and Thomas, 2008; Nesbitt, 1994).

through their voting on other proposals, unrelated to proxy access. Fourth, the NYCPS, in its fiduciary role, has a low propensity to divest from its portfolio firms and makes the NYCPS more likely to engage.[7] Our discussions with the New York City Assistant Comptroller confirms that the NYCPS would need to establish a reasonable basis for divestment in its fiduciary role. As a result, the threat of using proxy access to nominate board members is an effective tool when engaging with firms.

We also infer by revealed preferences that boards saw proxy access proposals as a credible threat. Of the 181 proposals submitted, 167 firms adopted proxy access bylaws, and approximately two-thirds of these firms decided to incorporate proxy access bylaws in their charters without going to the ballot. Moreover, the proposals that went to the ballot passed with majority support of 62%. In comparison, the average shareholder proposal usually receives an average of 34% of votes in favor (Cuñat, Gine, and Guadalupe (2012)). Further, Bhandari, Iliev, and Kalodimos (2020) provides evidence that management resists proxy access at firms, suggesting that they consider such proposals a threat. Therefore, even though the proxy access proposals were nonbinding, their almost immediate adoption bolsters our conjecture that the BAP engagement served as a credible threat.

# 2 Data and Empirical Strategy

## 2.1 Summary of Datasets

Our primary analysis combines data from the BAP with publicly available and commercial databases. We obtain in-depth information on the BAP campaign, the NYCPS portfolio composition, and the list of targeted firms from the Comptroller's office. We hand-merge this data with other standard databases, including Compustat, Center for Research in Security Prices (CRSP), Institutional Shareholder Services (ISS), and Thomson Reuters ASSET4 database.

We use a diverse set of microdata to comprehensively characterize the real effects of environmental activist investing. From the Environmental Protection Agency (EPA), we use plant-level

[7]One exception to this is gun manufacturers. The Assistant Comptroller highlighted, through discussions, that divestment was difficult due to the fiduciary obligations of the funds. To divest from gun manufacturers, the system hired an external consultant to establish a basis for divesting from this industry. Besides, as Krueger, Sautner, and Starks (2020) document, institutional investors prefer engagement over divestment when they consider the impact that climate risks have for their portfolio firms.

data on toxic chemical releases reported under the Toxic Release Inventory (TRI) program and greenhouse gas emissions reported under the Greenhouse Gas Reporting Program (GHGRP). We use historical plant ownership data from an FOIA request to address the issue of changes in ownership with our merge.[8] To identify and characterize the health hazards of chemicals in our analysis, we use the data on the biological impact of chemicals reported under the Integrated Risk Information System (IRIS) program. We also measure the local intensity of pollution by using the EPA's Risk-Screening Environmental Indicators (RSEI) computation methodology. We measure abatement efforts through the data reported under the pollution prevention (P2) program. We capture the potential externalities around plants using outdoor air monitoring reporting to the Air Quality System (AQS) database. We use plant-level information on the output of existing generators and associated environmental equipment at electric power plants provided by the Energy Information Administration (EIA).

## 2.2 Target Selection

To better characterize the BAP's targeting criteria, we engaged in multiple phone calls with the NYC Comptroller's office, submitted an FOIA request, and obtained data on the campaign. Guided by these interactions, we verify the BAP's selection criteria by estimating a multivariate logistical regression that correlates firm characteristics with the likelihood of being targeted for environmental reasons. The sample excludes firms targeted for non-environmental reasons by the BAP. We use a panel of Russell 3000 firms, the benchmark portfolio for the NYCPS, to estimate the following target selection model:

$$\begin{aligned} \mathbb{1}[Environment_i] = \beta_1 \mathbb{1}[Fossil\ Free\ Index_i] + \beta_2 Firm\ Size_{i,t-1} + \beta_3 Market\ to\ Book_{i,t-1} \\ + \beta_4 Returns_{i,t-1} + \beta_5 Profitability_{i,t-1} + \beta_6 Institutional\ Ownership_{i,t-1} \\ + \beta_7 ASSET4\ Score_{i,t-1} + \varepsilon_{i,t}, \end{aligned} \tag{1}$$

where $i$ and $t$ subscripts denote firm and time, respectively. *Environment* is an indicator variable equal to one if targeted by the BAP for environmental reasons in the subsequent year and zero otherwise. We consider the following set of explanatory variables: *Fossil Free Index* is an

[8]We thank Sophie Shive for sharing their data with us (Shive and Forster, 2020).

indicator that takes the value of one if the firm is included in the Fossil Free Index.[9] This index captures the potential carbon emissions content of the reported reserves of these firms. *Firm Size* is the natural logarithm of the book value of assets. *Market-to-book* is defined as the market value of equity plus book value of debt over book value of assets. *Returns* is the stock return in the past 12 months. *Profitability* is the ratio of earnings before interest, taxes, depreciation, and amortization scaled by sales. *Institutional Ownership* is the percentage of outstanding shares held by institutional investors. *ASSET4 Score* is the environmental rating of the individual firm provided by the Thomson Reuters database and is converted to a standardized score for ease of interpretation. We also include Fama-French 12 industry fixed effects and year fixed effects in our specifications.

Estimates of Equation (1) confirms that the targeted firms were larger, on average, and part of the Fossil Free Index (FFI). Figure 1 plots the coefficients of the estimates from the target selection model, while Table IA1 reports estimates from the analysis. These results suggest that the BAP is more likely to target firms that are part of the FFI. These results are consistent with our discussions and material received from the NYCPS, which indicates that a firm's rank on the FFI list was a driver for targeting. Further, our estimates suggest that larger, profitable firms and those with larger institutional ownership have a higher likelihood of being targeted. Notably, firms with better environmental performance, measured by ASSET4 scores, are unrelated to targeting by the BAP.

A plausible concern with the empirical strategy is that being featured on the FFI list proxies for the firms' potential for improvement. Firms with larger reserves may have a greater potential to improve, and hence may already be reducing their pollution even before being targeted. If firms were in the process of improving and the BAP precisely selected these firms, our analysis would overstate the effect of environmental activist campaigns.

We consider this possibility by studying the pre-targeting relationship between carbon reserves and total emissions and find no association. Figure 2 plots carbon reserves against aggregate changes in toxic releases in the period before the targeting by the BAP. The x-axis depicts the

[9]Our conversations with the Assistant Comptroller of the NYCPS indicate that the Fossil Free Index, which measures a firm's carbon impact of reserves, was a driver for selecting firms for their environmental impact. The Carbon Underground 200, compiled and maintained by the Fossil Free Index, identifies the top 100 coal and the top 100 oil and gas publicly traded reserve holders globally, ranked by the potential carbon emissions content of their reported reserves. More information about this index can be found at http://fossilfreeindexes.com/faq/.

total reported carbon reserves in place, a measure of potential to reduce emissions, quantified by the natural logarithm of gigatons of carbon dioxide, $\log(GtCO_2)$. The y-axis depicts the changes in firm-level toxic releases from 2010 and 2014, i.e., before the BAP began targeting firms. We find no relationship between carbon reserves, the basis of targeting, and changes in pollutive activities in the pre-period. This lack of relationship suggests that the potential for improvement does not proxy for actual improvements before targeting and alleviates concerns about the potential for improvements in pollution driving any changes in the emissions we document.

### 2.3 Propensity Score Matching

Guided by the target selection model, we use a propensity score matching approach to identify counterfactual firms similar in terms of observable characteristics. This approach is consistent with the activism literature (Brav, Jiang, and Kim, 2015; Brav, Jiang, Ma, and Tian, 2018). We use the constituents of the Russell 3000 over the same period as our candidate counterfactual firm, which closely matches the holdings of the NYCPS portfolio. We remove firms that were targeted by the BAP for non-environmental reasons from our sample.

The propensity score estimation uses the following variables as matching covariates: firm size, return on assets, market-to-book ratio, and ASSET4 score.[10] We match each firm targeted for environmental reasons by the BAP in year $t$ with another firm not targeted from the same year, within the same Fama-French 12-industry, and with the closest propensity score.[11] The within-industry matching allows us to control for aggregate industry-level trends that might explain any changes in pollutive activities around the campaign that we document. For example, it rules out concerns such as changes in oil prices affecting production activities, which ultimately impacts our outcomes through a different channel than environmental activism.

Studying the characteristics of our matching, we find that the matched pair is statistically indistinguishable along multiple important characteristics when comparing the ex-ante differences between treated and control firms and their plants. Panel B of Table IA2 reports the estimates split by whether the firms are targeted by the BAP or not one year before the targeting. Plants in the treatment and control groups have similar toxic chemical releases, greenhouse gas emissions,

[10]We use the ASSET4 score to capture firms' sustainability performance, see Dyck, Lins, Roth, and Wagner (2019) and cites therein.

[11]Our results are robust to the Fama-French 48-industry classification. See section 5 for more details.

and similar financial characteristics such as profitability and market-to-book ratio. Given the importance of propensity score matching for our analyses, we undertake additional robustness checks, including additional matching covariates, to accurately capture pollutive activity and industry classification. See section 5 for the discussion.

### 2.4 Main Specification

We use a propensity score matched difference-in-differences empirical strategy that compares plants of firms that are targeted by the BAP to plants of a matched control firm within the same industry and similar financial and environmental performance. Specifically, we estimate:

$$Y_{i,c,t} = \beta_1 I\left(Post_{i,t}\right) + \beta_2 I\left(Post_{i,t}\right) I\left(Environment_i\right) + \delta_{ic} + \delta_{ct} + \varepsilon_{i,c,t}, \tag{2}$$

where $c$ indexes a chemical or gas emitted by a plant $i$ at time $t$. We include plant-chemical fixed effects ($\delta_{ic}$) to control for time-invariant heterogeneity at the plant-chemical level. Chemical-year fixed effects ($\delta_{ct}$) control for time-varying trends in specific pollutants. As additional robustness tests, we include industry-year fixed effects, defined using the primary four-digit SIC code for each plant, to control for time-varying heterogeneity at the industry level, and state-year fixed effects to control for heterogeneity in location-specific differences in pollutive activity. $I\left(Post_{i,t}\right)$ variable is a dummy variable and equals one for the firm-year following the first target year of the BAP. We use the first year after the BAP initiation as the pseudo-event year for the matched control firms. $I\left(Environment_i\right)$ is a dummy variable and equals one if the BAP targets the firm for environmental reasons. The primary coefficient of interest is $\beta_2$, which captures the within plant-chemical changes in behaviors following the targeting by the BAP. We cluster standard errors at the firm-year level.[12]

As pollution is a function of productivity, we are careful in specifying our dependent variable, $Y_{i,c,t}$. The extant literature has adopted two approaches: first, Akey and Appel (2020b); Ben-David, Jang, Kleimeier, and Viehs (2020); Ilhan, Sautner, and Vilkov (2020) use the logarithm of emissions without any scaling; second, Shive and Forster (2020) adds structure by scaling emissions by a measure of output. Because there is no consensus on the ideal approach, we

[12]This is robust to alternative clustering at the parent-firm level and a jackknife estimation method.

compute our dependent variable both ways, (i.e., with and without scaling), and show that our results are robust to both specifications.

Our baseline specification normalizes chemical releases by lagged firm-level cost of goods sold. We estimate Equation (2) and use the natural logarithm of one plus the normalized toxic chemical release, $\log\left(1+\frac{Release_t}{COGS_{t-1}}\right)$ as our dependent variable, $Y_{i,c,t}$. We log-transform the ratio to reduce the skewness. In Section 5, we show that our results are robust to alternative scaling choices of $Sales_{t-1}$, $TotalAssets_{t-1}$, and $COGS_t$. Further, in Table IA3, we show that our results are robust to scaling chemical releases by plant-level production which is more closely related to emissions than firm-level measures of output.

# 3 The Real Effects of Environmental Activism

## 3.1 Improvements to Corporate Environmental Behaviors

### 3.1.1 Reduction in Toxic Chemical Releases

We use plant-level data from the EPA to measure the real effects of environmental activism. We uncover specific plant-chemical level changes by matching data from the Toxic Release Inventory (TRI) program provided by the EPA to the set of targeted and matched control firms.[13] The TRI program captures how much of each chemical is released to the environment or managed and includes information about facilities that manufacture, process, or otherwise use these chemicals.

Our specification in Equation 2 relies on the assumption that treatment and control group firms are similar before targeting by the BAP. We confirm that this is indeed the case in Table IA2. However, in our setting, it is plausible that the targeting coincided with the general decline in chemical releases, and that led the BAP to select them in the first place. If so, we would not be able to disentangle the treatment effect of the BAP campaign from selection into targeting by the BAP.

Figure 3 examines the possibility of a downward trend in the differential polluting activity around the BAP campaign. All coefficients are measured relative to the year of targeting by the BAP. Our estimates suggest there are no differential pre-trends in the pollutive activity of plants.

[13] For more information about the TRI, please see EPA.

This absence of pre-trends suggests that the BAP targeting did not, on average, coincide with the differential decline in chemical releases in the pre-period. Moreover, after the targeting, there is a significant and persistent improvement in environmental performance.

Note that our empirical approach matches each targeted firm to a counterfactual firm in the same industry, in the same year, and with similar financial and sustainability characteristics. Given the matching procedure's tightness, it is unlikely that aggregate industry shocks drive the decline in emissions. Moreover, toxic chemical releases by plants of counterfactual firms in the post-period are relatively constant. This absence of changes in releases alleviates concerns of aggregate shocks differentially affecting target and control firms. Overall, evidence from the dynamics of toxic releases assuages concerns about downward pre-trends in pollution coinciding with targeting by the BAP campaign.

We move to a regression framework to estimate the real effects of targeting by the BAP on toxic releases. Estimates in Table 2 suggest that plants of targeted firms, on average, reduced their total toxic chemical releases. The point estimate in column (1) is 0.050, statistically significant at the 1% level. Economically, this represents a decrease of 13% (5.7%) relative to the sample mean (standard deviation). These results provide the first set of evidence of the important effects of environmental activism.

Next, we consider the sources of reduction. In general, there are two ways plants can reduce their emissions. First, they can reduce their total emissions on-site. Second, they can transfer toxic chemicals to a geographically or physically separate facility, off-site. Distinguishing between these two, our estimates in columns (2) and (3) of Panel A suggest that active on-site reductions in chemical releases, instead of off-site disposals, drive the baseline reductions in the total toxic chemical release. In further robustness tests, we find qualitatively similar results when normalizing by other firm-level and plant-level output measures.

These results suggest that firms are not substituting to off-site plants but are instead reducing their total emissions. This evidence bolsters the argument that environmental activism, on average, can bring about real changes in corporate environmental behaviors, rather than changing the incentives of firms to substitute pollution either within-firm or across geographies (Bartram, Hou, and Kim, 2019; Ben-David, Jang, Kleimeier, and Viehs, 2020).

#### 3.1.2 Reduction in Plant-Level Air Emissions

We consider the media firms choose to reduce their toxic emissions. Firms can release chemicals through three media: air, water, or ground. The TRI database reports the total toxic chemical release for each category at the plant-chemical level. Given this, we estimate separate regression models for each medium at the plant-chemical level.

Estimates from Panel B of Table 2 suggest that the reductions are primarily coming from the curtailment of air emissions, particularly those associated with production. Column (1) suggests that the reductions in total emissions can be attributed to a significant decrease in stack air emissions. Columns (2) and (3) suggest that changes to fugitive air emissions (related to leaks or uncontrolled emissions) and surface water discharges (discharges to bodies of water) also respond to environmental activism.

#### 3.1.3 Reduction in Greenhouse Gas Emissions

Next, we consider the types of emissions firms choose to reduce. Some chemicals may contribute more significantly than others to climate change, especially greenhouse gas emissions (GHG), which currently accounts for the largest portion of global warming and are known to harm the environment (Althor, Watson, and Fuller, 2016; Caldeira and Brown, 2019; Currie, Davis, Greenstone, and Walker, 2015). In the context of this study, the BAP's campaign focused on firms that failed to address climate change risks adequately, specifically GHGs adequately. Thus, if the engagements succeeded, we would also expect to see a decrease in GHG emissions.

We match GHG emissions data reported under the EPA's Greenhouse Gas Reporting Program (GHGRP) to the set of targeted and matched control firms. Within this data, greenhouse gas emissions are reported in metric tons of carbon dioxide equivalent ($CO_2e$). The data from this program covers plants that, in general, emit 25,000 metric tons or more of $CO_2e$ per year in the United States, roughly 85 percent of the total U.S. GHG emissions from over 8,000 facilities. The GHGRP tracks and verifies relevant information from large GHG emission sources, fuel, and industrial gas suppliers, and $CO_2$ injection sites in the United States on an annual basis.

As before, GHG emissions are a function of productivity and need to be scaled. Following Shive and Forster (2020), to control for a measure of output at the plant-level which is more closely related to emissions than the firm-level measure, we rely on plant-level output data provided by the Energy Information Administration (EIA).[14] Hence, we normalize emissions in metric-tons-$CO_2e$ by plant-level $Output_{t-1}$. Our main empirical specification estimates Equation 2 and uses the log $\left(1 + \frac{Emissions_t}{Output_{t-1}}\right)$ as our dependent variable, $Y_{i,c,t}$.

Estimates from Table 3 suggest that targeted firms, on average, reduce their emissions of lethal greenhouse gases. Interpreted in terms of the standard deviation of their respective dependent variables, column (1) of Table 3 suggests that methane emissions decreased by 7.2%.[15] Similarly, column (2) suggests that carbon dioxide emissions decreased by 6.8% but this is statistically insignificant. Further, column (3) suggests that nitrous oxide emissions decreased by 7%. As evident, these declines in emissions are economically meaningful.

These results are consistent with the BAP's mandate to target firms for inadequately addressing climate risks and with the firm's direct response to environmental activism. Our results highlight that such engagements can improve corporate environmental behaviors. While the BAP did not dictate the nature of specific changes to be implemented, firms actively reduce their total toxic emissions, including those from air emissions, and lower their GHG emissions. These results are important given the significant costs imposed by toxic emissions on health outcomes (Chay and Greenstone, 2003) and worker productivity (Chang, Graff Zivin, Gross, and Neidell, 2016; Graff Zivin and Neidell, 2012).

### 3.2 Real Effects on the Local Economy

We study the potential externalities that the BAP campaign had on the local economies in which the plants of the targeted firms operate. We first characterize the chemicals based on their biological impact and quantify the effects they have on humans. Second, we measure the improvements to air quality near the plants of targeted firms. Third, we quantify the benefits to the local economies by considering the interactive effects between the population, the toxicity of emissions, and dosage.

[14]The EIA provides electricity generation data in survey Form EIA-923 on all U.S. utilities at the generator-level. We aggregate net generation, measured in megawatt hour (MWh) at the plant-level.

[15]The median is zero while the average is close to zero, making percent comparisons to the mean and median difficult.

#### 3.2.1 Biological Impact of Chemicals

We begin our analysis by examining the reduction in the types of chemicals released by plants of targeted firms. While all chemicals reported by the firms to the EPA may be hazardous, some chemicals may be more detrimental to humans than others. Given that firms have some flexibility, the engagements by the BAP could lead them to reduce the use of chemicals that were most harmful to humans. Alternatively, firms might reduce all types of chemical releases, irrespective of the potential harm to humans.

We rely on the Integrated Risk Information System (IRIS) program developed by the EPA to characterize the health hazards of chemicals. Specifically, we use its assessment of major chemicals and the effects resulting from chronic exposure to them, such as the primary systems affected, or tumor sites for cancer linked to chemical exposure (e.g., developmental, respiratory, urinary). We match each chemical in the TRI database to the IRIS database and identify whether a chemical in the TRI database poses potential harm to humans, and then create indicators for particular bodily systems affected by the chemical. Approximately half of the chemical observations in our sample are known to be harmful to humans.

Table 4 presents the results for the sample that consists of harmful chemicals. The estimates from column (1) suggest that the improvements primarily come from reductions in cancer-causing chemicals that affect respiratory systems. These results underline the importance of reduction in air emissions in the previous section. Additional estimates from Table 4 suggest significant reductions in chemicals affecting other body systems. Overall, the analysis indicates that the reductions in the release of cancer-causing chemicals which pose severe threats to humans drive the baseline reductions in pollutive activity.

#### 3.2.2 Improvement in Air Quality Near Plants

Further, we consider the real effects on the air quality around plants of firms targeted by the BAP. We would also expect the air quality to improve near these plants, especially since we find significant reductions in toxic releases and greenhouse gas emissions.

We measure the change in air quality by matching monitors to the plants' locations. We rely on the EPA's air quality system (AQS) database, which records outdoor air quality at more than 80,000 monitoring stations across the United States (Heitz, Wang, and Wang, 2019). The EPA relies on these readings and sets National Ambient Air Quality Standards (NAAQS) for seven pollutants considered harmful to public health and the environment, referred to as criteria pollutants.[16] The key advantage of the AQS data is that it is not self-reported and is free from self-reporting biases. Further, it allows us to attribute targeting of firms and the real effects at the local level.

We follow Currie, Davis, Greenstone, and Walker (2015) and match monitor locations to the plants that are within a one-mile radius. We use daily averages of criteria gases and standardize them to have a mean of zero and standard deviation of one. We estimate separate regression models for each of these gases, because we observe monitor readings for key criteria gases.

The estimates in Table 5 suggest that nearby air monitors detect the air quality improvements at plants of targeted firms. Columns (2) and (3) suggest that both ozone and sulfur dioxide emissions decrease, on average, for plants of targeted firms. Further, column (5) shows a drop in particulates less than 2.5 $\mu m$. These estimates are robust to matching monitors within a 0.75-mile radius or a 1.25-miles radiu.

These results suggest that the air quality in communities close to targeted firms' plants improves significantly. In conjunction with our results on the reduction of total toxic releases, stack air emissions, and greenhouse gas emissions, these results offer compelling evidence that BAP's campaign potentially improved air quality in the local economies.

#### 3.2.3 Reduction in Intensity of Pollution

We consider how the intensity of pollution changes around the local economies of targeted plants. The intensity of pollution depends on the interaction of three factors: (i) the size of the affected population, (ii) the toxicity of pollution, and (iii) the quantity of emissions.

A key observation is that all changes to pollution do not have the same impact on local economies. Plants of targeted firms have choices in what steps they can take to reduce their emissions, and these decisions have important implications for stakeholder value. One possibility is that firms may focus on reducing their emissions' intensity, accounting for the local

[16]These gases are carbon monoxide (CO), lead (Pb), ozone ($O_3$), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), and particulate matter (PM2.5 and PM10). The EPA provides daily averages at parts per million or parts per billion depending on the specific gas.

population, toxicity, and dosage. Alternatively, they may focus on reducing a headline number, such as carbon dioxide emissions, without consideration of the local economy. Additionally, firms targeted by the BAP may choose to reduce pollution closer to New York City, the location of the lead activist investor.

We rely on the EPA's RSEI computation methodology (EPA, 2019a), which calculates a unitless value that accounts for the size of the chemical release, the fate and transport of the chemical through the environment, the size and location of the exposed population, and the chemical's toxicity (Figure 4, Panel B). Re-based to 2010 population levels, we use the RSEI scores aggregated to the census block group level and match it to the location of plants from the TRI database, Figure 5.

Estimates from Table 6 present important evidence that firms decrease their pollution intensity at the local level. Plants of firms targeted by the BAP reduce their local environmental impact, as measured by RSEI scores. Decomposing the score, we find significant reductions in toxic concentrations at the intensive margin. Specifically, we find that firms reduce the number of chemicals released and the total number of releases. These results provide further evidence of positive externalities arising from firms managing the impact of their pollution.

### 3.3 How Are Firms Achieving This Reduction?

We consider the steps taken by plants of targeted firms to improve their environmental behaviors. First, we focus on the waste-management strategies that are of high-impact undertaken by firms to reduce their chemical releases. Second, we consider new abatement initiatives plants undertake to reduce waste production. Lastly, we show that changes to production activities do not drive the decline in pollutive activities.

#### 3.3.1 High-impact Waste Management

To better understand the changes firms make, we adopt the lens of the waste management hierarchy developed by the EPA. This hierarchy ranks environmentally preferred waste-management strategies (Panel A of Figure 4) and acts as a pecking order. The EPA highlights that the most effective management method is the reduction of waste generation, while efforts such as recycling and waste treatment may be less effective.

Estimates in Panel A of Table 7 suggest that targeted firms focus their improvements on the most impactful activities by reducing the total amount of waste produced. Column (1) highlights that the production of waste, the sum of all non-accidental chemical waste generated at a facility, is decreasing.[17] Estimates from column (2) suggest that targeted firms also reduce pollution through less impactful activities, such as recycling and waste treatment, but to a far lesser degree. These results suggest that firms are focusing their efforts towards high-impact waste management strategies in response to environmental activism.

### 3.3.2 New Abatement Initiatives

We also consider whether firms undertake new abatement initiatives to reduce their toxic releases. Specifically, we focus on the abatement initiatives reported to the EPA's pollution prevention (P2) program. This program collects information to track progress in reducing waste generation. Given that we can only examine firms' responses in a short window of three years after targeting by the BAP, we expect efforts to be visible among new and immediate initiatives that the plants undertake to reduce pollution.

Panel B of Table 7 focuses on two of the most common operation-related abatement initiatives. Estimates from column (1) suggest that plants of targeted firms are implementing new spill and leak preventative initiatives. Examples of these initiatives include installing overflow alarms or automatic shut-off valves to prevent spills. Column (2) suggests that firms are also improving their operating practices. For example, plants institute procedures to manage their production schedules efficiently. Our most conservative estimates suggest that new abatement initiatives increase by roughly 30%, relative to the sample mean. In unreported analysis, we examine less common types of abatement. We find evidence of an increase in inventory management efforts. In contrast, estimates for other abatement types are statistically indistinguishable from zero, though such actions are relatively uncommon to begin with.

Further, we focus on plant-level capital expenditures related to abatement efforts such as emission control systems for nitrous oxide and sulfur dioxide. We accomplish this by focusing on

[17] It is the sum of on-site environmental releases (minus quantities from non-routine, one-time events); on-site waste management (recycling, treatment, and combustion for energy recovery); and off-site transfers for disposal, treatment, recycling, or energy recovery EPA (2019b).

utility plants. The key advantage is that the Environmental Information Agency (EIA) provides total plant-level expenditures over time broken down into capital expenditures and expenditures on operation and maintenance. We merge this rich source of data from the EIA with our sample to pin down the exact capital expenditures plants are undertaking in response to environmental activism.

We scale plant-level expenditures by lagged sales for meaningful interpretation and take the ratio's natural logarithm to reduce skewness. To control for differences in EPA regulation by location, we include EPA region-by-year fixed effects. In addition, we include the following plant-level controls that correlate with expenditures: *plant age* and *installed capacity*. Estimates from column (1) of Table 8 suggest that plants increase their total expenditures on abatements, while estimates from column (2) suggest that this increase comes primarily from the increase in capital expenditures instead of expenditures on operations and maintenance. The estimate in column (2) is about three times larger relative to the sample standard deviation. Thus, our evidence suggests that the improvements to corporate environmental behaviors stem from new abatement efforts.

#### 3.3.3 No Changes in Production

A natural alternative explanation is that a reduction in economic activity drives the decline in emissions  firms that produce less mechanically release fewer emissions. Put differently, the reduction in toxic emissions stems from the decline in production in conjunction with increased abatement efforts.

While we do not observe actual production in the data, we consider the production ratio from the TRI database, (Akey and Appel, 2020a), as our main dependent variable. The production ratio, defined for each plant's chemical usage, is the ratio of the quantity of output in any given year relative to the quantity of output in the previous year. An advantage of this measure is that it is output-based and available at a granular level.

We re-estimate Equation 2, and use the plant-chemical level production ratio as our main dependent variable. Estimates from column (1) of Table 9 suggest that growth in production did not change for targeted firms' plants relative to plants of control firms. Next, we consider only plants that consistently report each year since the start of the sample, as this helps us rule out other alternative explanations such as plant closures or minimum reporting requirements that could drive production changes. Column (2) presents estimates from this sub-sample and again finds no change in the production. These results provide the first set of evidence against the change in production at the plant level.

As a second approach, following Akey and Appel (2020a), we construct a proxy for total production by normalizing production to one in the first reporting year.[18] Specifically, we compute normalized production as:

$$CumulativeProduction_{i,c,t} = \prod_{t \neq 1}^{t} 1 \times \frac{QuantityProduced_{i,c,t}}{QuantityProduced_{i,c,t-1}} = \prod_{t \neq 1}^{t} 1 \times Production_{i,c,t}, \qquad (3)$$

We use this as our main dependent variable in Equation 2. Figure 6 suggests that plants of targeted firms do not change their production around the targeting by the BAP. More formally, we find no relationship in the regression framework in column (3) of Table 9. Using the sample of plants that consistently report over our study period, estimates in column (4) again suggest that targeted plants do not change their production. These results indicate that decline in production is unlikely to drive the baseline reduction in total chemical releases.

Overall, the results suggest that the improvements in the environmental behavior of targeted firms' plants stem from an increase in abatement activities rather than a drop in production. These results contrast with and complement two concurrent papers (Akey and Appel, 2020a; Chu and Zhao, 2019) that study the externalities of hedge fund activism. They find that *indirect effects* whereby changes to a firm's governance structure and operations affect its environmental behaviors. Since these campaigns involve investors focused on improving the target firm's financial performance in the short-run, any improvements in their context stem from operational efficiency changes instead of firms undertaking new abatement initiatives. In contrast, we focus on environmental activist campaigns, with our results coming from a *direct channel*, where long-run investors engage management to improve a target's environmental performance.

[18] We replace the missing observations with one when defining this measure.

# 4 Financial Performance of the Targeted Firms

To understand whether the increase in costs offsets potential financial benefits in the short-run, we study the investor reaction to the BAP campaign and changes in the targeted firms financial performance. First, we present evidence of a neutral short-run equity response to the initiation of the BAP campaign, suggesting that investors expected benefits to offset the costs of change. Second, we find that environmental improvements are negatively related to the financial performance of targeted firms. We discuss the plausible caveats for each of these tests and limits to its interpretations.

## 4.1 Short-run Equity Response to the BAP Campaign

We use an event study around the BAP campaign to understand how investors perceive environmental activism. We measure the cumulative abnormal returns to the announcement of the BAP campaign. We focus on the first set of firms targeted for the environmental mandate by the New York City Comptroller's announcement on November $4^{th}$, 2014.

This confers two advantages. First, identifying the exact timing when investors become aware of an activism campaign is a challenge for existing research on shareholder activism.[19] In our setting, focusing on the first set of firms sidesteps this issue. Second, since all firms are affected on the same date, it allows us to cleanly measure any anticipation of expected future engagements on issues related to climate change.[20] Thus, focusing on the first set of firms targeted by the BAP allows us to estimate and attribute the investors' response to environmental activism.

We calculate the cumulative abnormal returns (CARs) to the BAP's environmental campaign using (i) the CAPM, (ii) Fama-French three-factor model, and the (iii) the Fama-French-Carhart model. Focusing on an event window of 10 days around the targeting date, Figure 7 finds a precisely estimated zero returns around targeting, across all models. One interpretation of these results is that investors interpret the benefits of increased sustainability against the costs associated with implementing them, with the change in stock price quantifying for the net effect.

[19] Previous research uses mailing date or filing date of the proxy statement (Gillan and Starks, 2000; Karpoff, Malatesta, and Walkling, 1996). However, these statements may contain other value-relevant information, making it hard to disentangle the effect of activism from other information that the investors become aware of.

[20] A downside of event studies with one event date is that other events on or around the event date may confound the interpretation of results (Campbell, Lo, and MacKinlay, 1997).

### 4.2 Return on Assets, Profitability, Distress Risk

Next, we test whether the improvements to corporate environmental behaviors come at the expense of financial performance. Specifically, we focus on quantifying the net effect of environmental campaigns on the targeted firm's profitability, changes in operational performance, and distress risk.

There are several competing forces that make it unclear what the impact of environmental activism is on financial performance. On the one hand, investor activism can improve the financial, governance, and operational performance of targeted firms (Brav, Jiang, Partnoy, and Thomas, 2008; Nesbitt, 1994). On the other hand, pursuing socially responsible investments can be costly (David Diltz, 1995; Fowlie, 2010; Geczy, Stambaugh, and Levin, 2005). Moreover, the margins of adjustment undertaken by firms may require significant capital expenditures upfront, but the benefits may accrue many years in the future (Starks, Venkat, and Zhu, 2018). Thus, it is unclear whether environmental activism is costly or beneficial to targeted firms and investors.

Estimates from Table 10 suggest a negative relationship between environmental activism and firm performance measures. Focusing on return on assets, a measure of operating efficiency, we find that firms' performance levels are decreasing, on average, for targeted firms. Using profitability as a proxy for financial performance, we again find that targeted firms experience a change after the targeting by the BAP.

We additionally consider the change in downside risk of the firm. Prior research documents that engagement on environmental, social, and governance issues (ESG) may lower a firm's downside risk (Hoepner, Oikonomou, Sautner, Starks, and Zhou, 2019). Given this, we examine whether targeted firms experience a change in distress risk following the BAP campaign. We first consider the firm's z-score, a proxy for the distress risk implied by its accounting statement. Estimates from column (3) of Table 10 suggest no meaningful deterioration in default risk, consistent with Chava (2014). We also consider a market-based measure of default risk by using credit default swap spreads, and again do not find a change in this measure around targeting.

We are careful in interpreting the worsening in firm performance as confirmatory evidence of the substitution between sustainability performance and financial performance. Firms are undertaking capital expenditures upfront, but the benefits from socially responsible investments such as lower funding costs, lower regulatory costs, increased demand for products and services, or reduced litigation risk may take time to materialize.[21] Given this, our short window might be inadequate to capture the net benefits from investments in new technologies in their entirety.

# 5 Robustness Tests

## 5.1 Ruling Out Indirect Effects Driving Our Main Results

### 5.1.1 Does Targeting for Activism Drive the Improvements?

One possibility is that plants of targeted firms respond to targeting, irrespective of the specific mandate of the activism. Such a mechanism would suggest that targeted firms are improving, due to the attention drawn to them by the BAP campaign, and not for the precise issues brought forward by an activist.

We re-estimate our baseline specification for the subsample targeted for non-environmental reasons. These firms were excluded from our sample. Analysis of these firms allows us to examine whether targeting for activism drives the baseline reduction in emissions:

$$Y_{i,c,t} = \gamma_1 I\left(Post_{i,t}\right) + \gamma_2 I\left(Post_{i,t}\right) I\left(Other\, reasons_i\right) + \delta_{ic} + \delta_{ct} + \varepsilon_{i,c,t}, \tag{4}$$

where $I\left(Other\, reasons_i\right)$ is a dummy variable and equals one if the firm is targeted for other mandates by the BAP. These include excessive CEO pay, lack of board diversity, and inadequate political disclosure. The primary coefficient of interest is $\gamma_2$, which represents the *within* plant-chemical change in pollutive activity around targeting for unrelated targeted mandates.

Table IA4 presents estimates of Equation (4). Across columns 1 through 3, we find no evidence of unrelated mandates affecting corporate environmental behaviors. These results suggest that targeting alone by the BAP is not likely driving the treatment effect of environmental activism.

[21]Consistently, anecdotal evidence from XCEL's 2017 10-K filings captures the essence of this argument: "*The precise timing and amount of environmental costs, including those for site remediation and disposal of hazardous materials, are unknown.*"

### 5.1.2 Does Targeting for Proxy Access Drive the Improvements?

Another possibility is that unobserved factors associated with targeting for proxy access may drive these results. If so, the decision to target a firm for proxy access could instead explain the documented improvements brought by environmental activism.

We address this concern by conducting a placebo test that re-estimates our baseline specification for the set of firms targeted for proxy access by investors (other than the NYCPS). We are careful to exclude firms that were targeted by the BAP from this sample. This sample attempts to hold constant unobserved factors that drive the decision to *target* firms for proxy access.

Table IA5 reports the estimates from this exercise. The results suggest that there is no evidence of any effect on environmental behaviors for the placebo sample. This indicates that our results are unlikely to be driven by other unobservable factors whose effect we spuriously attribute to targeting by the BAP.

Taken together, these results suggest that targeting does not indirectly drive the reduction in pollution. Instead, these reductions come from a direct channel whereby environmental activism brings about real changes in corporate environmental behaviors.

## 5.2 Robustness to Potential Reporting Biases in the TRI Database

While we find a robust decline in emissions, one potential concern is that reporting biases to the TRI database might instead drive the documented reduction in emissions (Panel A of Table 2). Firms may strategically misreport to the EPA TRI program and systematically report improvements after being targeted by the BAP. If so, the toxic release results will overstate the effect of environmental activism. Although prior research suggests that reporting biases to the TRI program are unlikely, we undertake additional robustness tests to mitigate such concerns.

Our initial approach is to limit the analysis to the largest plants that emit above-median toxic chemical releases. This sample restriction confers two key advantages. First, these plants are less likely to misreport (Brehm and Hamilton, 1996). Second, it reduces concerns that our results that low levels of pollution are driving these reductions. Estimates in row (8) of Table 11 show that the coefficients remain statistically significant and similar to our baseline estimates for this subsample.

As an additional approach, we reinterpret the evidence from outdoor air quality monitors near the plants of targeted firms (see Section 3.2.2). The key advantage of the AQS data over the TRI data is that it is not self-reported and is free of reporting biases. Our estimates showing a significant decrease in air pollution around the plant of a targeted firm bolsters confidence that the documented decline in emissions is not an artifact of reporting biases.

In light of these concerns, we reiterate several important points put forward by recent research that point out that plants are unlikely to misreport (Akey and Appel, 2020a,b). First, there is an incentive to report toxic releases truthfully, as misreporting to the agency may result in potential criminal penalties Greenstone (2003). Second, the EPA's periodic audits suggest that emission levels were within 3% of their reported levels for most industries (EPA (1998)). Third, there is no penalty for reporting higher levels of emissions. Fourth, misreporting does not stem from intentional evasion but instead typically arises from ignorance (Brehm and Hamilton (1996); De Marchi and Hamilton (2006)). Overall estimates from these robustness tests suggest that the baseline reduction in emissions is not an artifact of reporting biases to the TRI database.

### 5.3 Robustness To Empirical Specification

We perform a battery of robustness tests to provide further confidence in our results estimating the drop in toxic chemical releases at the plant-level (Panel A of Table 2). We report the results of each test in Table 11 with each row presenting the estimates from a separate regression. In all specifications, we find statistically significant and qualitatively similar reductions in on-site toxic chemical releases (refer to column (5) of Table 11).

#### 5.3.1 Alternative Inputs to Propensity Score Matching

We first consider the robustness to alternative inputs to the matching schemes. Panel A of Table 11 presents results from this exercise. We first re-estimate our baseline specification on a propensity score matched sample that uses the pre-target *level* and *trend* of total toxic release as additional matching covariates. Estimates from row (1) and row (2) suggest that these tests are quantitatively similar to our baseline estimates. We also consider an alternative industry classification by using the Fama-French 48 industry classification. Estimates from row (3) again find quantitatively similar results. Together, these results suggest that variation in input choices to the matching approach does not change the magnitude of the estimates significantly.

#### 5.3.2 Ruling Out Alternative Explanations Through Sample Restrictions

One plausible explanation for our results is that plants appear to be reducing their toxic chemicals, but instead are offshoring their production. We alleviate such concerns by focusing on utility firms where electricity generation and transmission is harder to outsource, row (4), and exclude firms that have a high propensity for offshoring using the textual measure introduced by (Hoberg and Moon, 2017), row (5). Across both of these subsamples, the estimates are similar to our baseline estimates for on-site reductions.

We also rule out the possibility that plant closures drive the changes. We re-estimate our baseline specification by excluding firms filing for Chapter 11 during our sample period in row (6), exclude plants reporting zero emissions to alleviate concerns that minimum reporting thresholds drive our results in row (7), and focus on plants that consistently report a positive amount of toxic release to the EPA throughout our sample in row (8). In these subsamples, we again find qualitatively similar results as our baseline estimates. These tests also mitigate concerns about the quality of reporting being affected by the expansion of coverage over time, the inclusion of new industries and chemicals, and changing minimum thresholds for reporting plants. We rule out reporting biases to the TRI data, in row (9), as discussed in subsection 5.2.

#### 5.3.3 Alternative Scaling Metrics

We mitigate concerns regarding the sensitivity of our results to the choice of scaling variable. We present alternative scaling choices in Panel C of Table 11. We first consider firm-level sales in row (10), total assets in row (11), and same-year $COGS_t$ in row (12), respectively. Estimates across the three rows suggest that the results are invariant to the choice of scaling parameter. Row (13) re-estimates our specification without any scaling variable, and again we find qualitatively similar results. Moreover, Table IA6 shows that our results are robust to defining our dependent variable as the share of total releases. In sum, these tests alleviate concerns that the choice of normalizing variable drives the toxic release result.

#### 5.3.4 Ruling Out Regulatory Concerns

A potential concern is that environmental regulations differentially affect treated and control plants based on the nature of their activity or geographic region of operations. If this were the case, our baseline specification would be missing an important factor related to reforms at the state level, (e.g., cap and trade reforms, or subsidies), that would potentially lead to us overstating the response of plants to the activist campaign.

We address this concern in Panel D of Table 11. We control for underlying geographic variation in regulation by including *State* $\times$ *Year*, *Industry* $\times$ *Year*, and *State* $\times$ *Industry* $\times$ *Year* fixed effects in rows (14) through (16), respectively. Further, we also re-estimate our baseline specification by excluding plants located in California, row (17). Estimates from each of these specifications suggest that the underlying local variation in regulation does not drive our results.

#### 5.3.5 Alternative Empirical Specifications

We present alternative empirical specification in Panel E of Table 11. First, we also use a jackknife re-sampling technique to mitigate the possibility that outliers drive our results, row (18). Next, we account for correlation across plants sharing a parent by clustering the standard errors at the parent-firm level, row (19). Further, we consider whether the reductions in total releases are chemical-specific, row (20). Lastly, we also include controls for profitability, as a proxy of firm performance, row (21). Again, across all the specifications, we find that targeted firms' plants reduce their on-site emissions, in column (5).

## 6 Implications and Interpretation

### 6.1 Are These Effects Specific to the BAP?

How generalizable are the results in the broader context of other environmental activism? It is essential to understand whether and how investors can target firms for sustainability mandates to catalyze specific changes to address their vulnerability to climate change.

We conduct external validity tests by collecting all shareholder proposals from the Institutional Shareholder Services (ISS) database submitted to firms over the same period. From this sample, proposals were categorized by hand on whether they related to an environmental mandate. To ensure the veracity of the matches, we relied on two independent research assistants. Using the resulting list of sustainability campaigns, we re-estimate our baseline specification and examine the effectiveness of these campaigns.

Estimates from these tests suggest that targeted firms respond to an activist investor's firm-specific sustainability mandate outside of the BAP. We re-run our baseline specification (Panel A of Table 2) and find similar results: plants of targeted firms, on average, reduced their total toxic chemical releases. Column (1) of Table 12 suggests that targeted firms' plants respond by reducing their total toxic chemical releases. The magnitude is comparable to our baseline, with the estimates suggesting that targeting leads to a decline in chemical releases by 17% relative to the sample mean. Estimates in columns (2) and (3) suggest that the active on-site reductions in chemical releases drive the baseline reductions in the total toxic chemical releases. Thus firms are not substituting to off-site plants but instead reducing their total emissions.

This evidence bolsters the argument in this study that, on average, environmental activism effects real changes in corporate environmental behaviors. Further, these findings complement our baseline results, establishing that activist investors, beyond the BAP, can discipline firms' non-financial characteristics through firm-specific sustainability mandates.

### 6.2 Caveats and Interpretation

Our results come with important caveats and must be carefully interpreted in the context of our setting. Because the BAP did not target firms randomly, any policy prescription suggesting a random targeting of firms to improve their environmental impact is misguided. Instead, the results should be interpreted as the treatment effect on the treated: would the same changes have occurred if the BAP had selected identical target firms but remained passive in its demands? Further, this study does not lend itself to evaluating the welfare consequences of engagements like the BAP. Such an analysis would need to fully evaluate the non-pecuniary benefits for stakeholders, investors, and broader society. Instead, our study provides robust evidence that environmental activism leads to improvements in corporate environmental behaviors.

In light of these caveats, our results provide novel evidence on engagements for sustainability issues that may help overcome collective action problems, whereby engagements can only succeed if there is enough pressure on management. Our evidence suggests that a lead activist may be a necessary catalyst for a successful climate-focused campaign. Moreover, institutional investors' engagements provide a countervailing force to parts of the market that are difficult to monitor and regulate.

In our setting, environmental activists effectively impose their pro-social preferences on firms (Bénabou and Tirole, 2010). In the case of the NYCPS and the BAP, the pension funds' beneficiaries vote for trustees and thus represent their interests and preferences. While serving in a fiduciary role, these funds may also act as preference aggregators for the plans' beneficiaries.

Further, our results directly speak to the research evaluating the importance of proxy access rules. Prior studies have investigated the market's reaction to proxy access rules (Becker, Bergstresser, and Subramanian (2013); Cohn, Gillan, and Hartzell (2016)). More specific to the BAP, studies have evaluated changes in board diversity (Barzuza (2019)) and stock price reactions to the announcement of the BAP campaign (Bhandari, Iliev, and Kalodimos (2020)). Building on this research, our study presents new empirical evidence that proxy access rules, or the threat thereof, may not be sufficient to affect firms along multiple dimensions. Instead, proxy access gives long-term shareholders the ability to monitor and discipline investors effectively.

## 7 Conclusion

This paper documents that environmental activist investing positively affects the sustainability performance of targeted firms. We measure changes in highly detailed plant-level data and provide robust evidence that firms improve their environmental performance in response to activist campaigns. These engagements result in positive externalities to the local economies of targeted plants. Ruling out alternative explanations, we show that the results are most consistent with the benefits of monitoring and the threat of discipline. Overall, our findings have implications for the current debate regarding stakeholder governance and potential strategies for investors to address climate change risks produced by firms.

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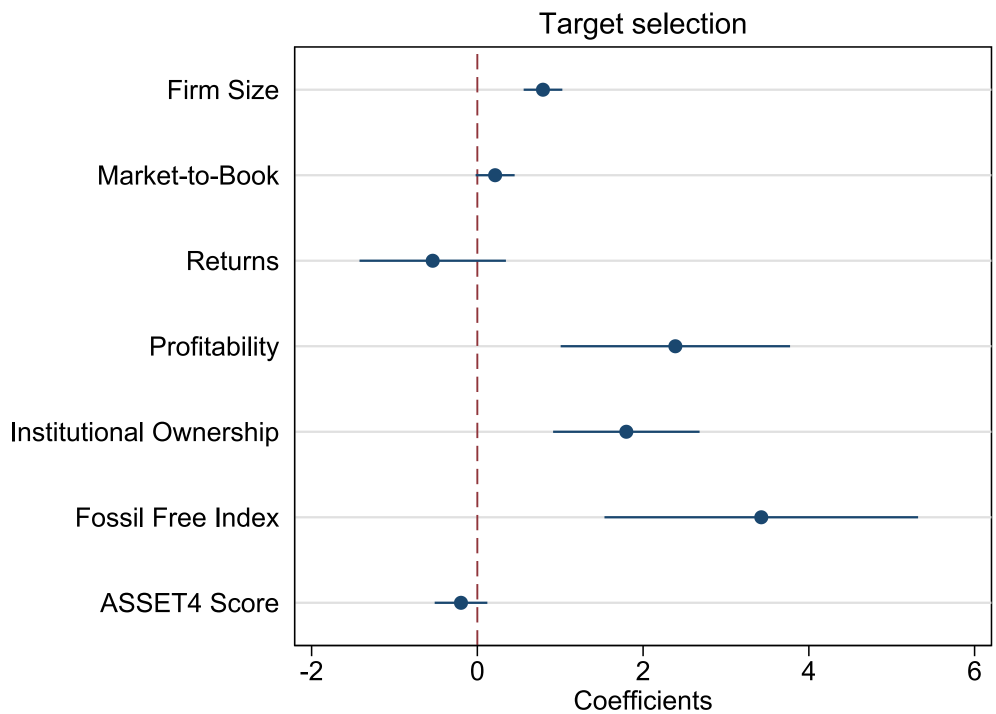



**FIGURE 1: SELECTION INTO THE BOARDROOM ACCOUNTABILITY PROJECT**

This figure plots the coefficients from a multivariate logistical regression relating firm characteristics that correlate with the likelihood of being targeted by the BAP for environmental reasons. *Firm Size* is the natural logarithm of the book value of assets. *Market-to-Book* is the ratio of assets, defined as the market value of equity plus book value of debt over book value of assets. *Returns* is the stock return in the past 12 months. *Profitability* is the ratio of earnings before interest, taxes, depreciation, and amortization scaled by sales. *Institutional Ownership* is the percentage of outstanding shares held by institutional investors. *Fossil Free Index* is an indicator of whether the firm is listed on the Fossil Free Index. *ASSET4 Score* is the standardized environmental score from Thomson-Reuters' ASSET4 database. Data Source: Compustat, Center for Research in Security Prices (CRSP), and Thomson Reuters' ASSET4 database.

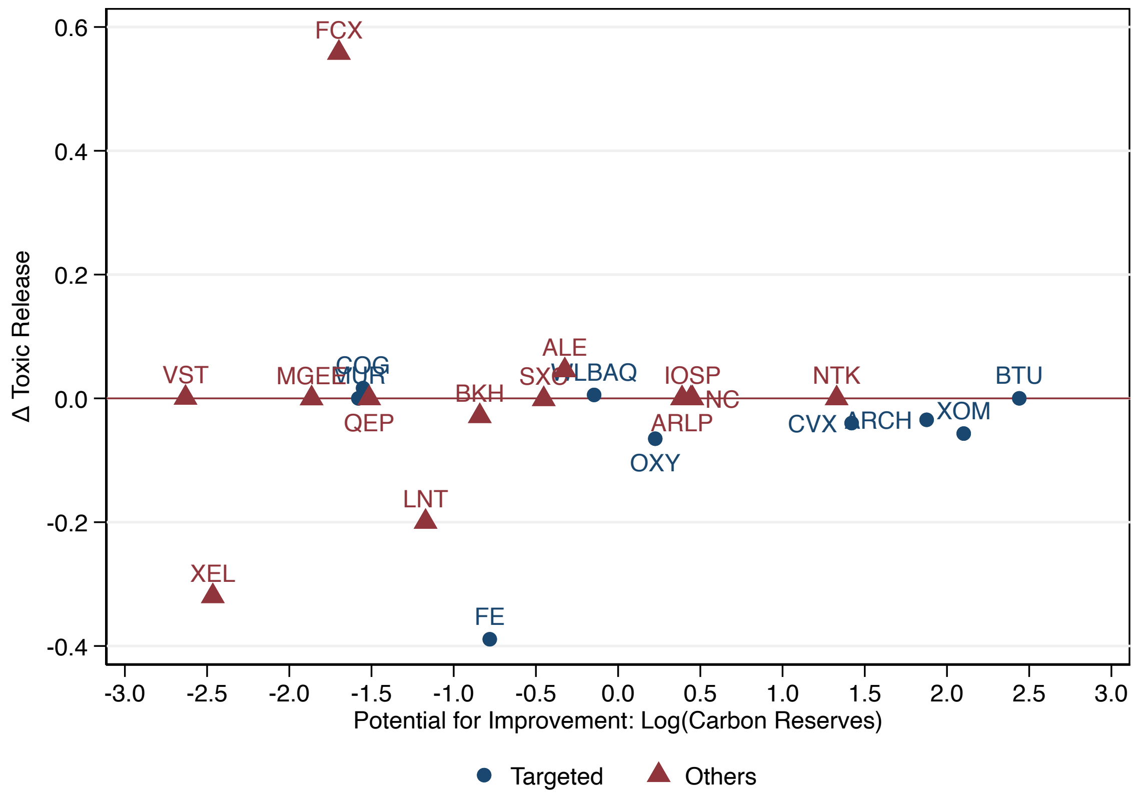



**FIGURE 2: LACK OF RELATIONSHIP BETWEEN POTENTIAL FOR IMPROVEMENTS AND ACTUAL IMPROVEMENTS BEFORE TARGETING**

This figure plots the lack of relationship between the potential for improvements in targeted firms and the change in aggregate toxic chemical releases. The y-axis depicts the change in the total toxic chemical release from 2010 to 2014. The x-axis depicts the natural logarithm of total carbon reserves (in gigatons $CO_2$), as reported in the Fossil Free Index's Carbon Underground Report. The blue circles are firms targeted by the BAP in their first year, and the red triangles are other U.S. public firms in the report. Data Source: Carbon Underground Report and EPA Toxic Release Inventory (TRI).

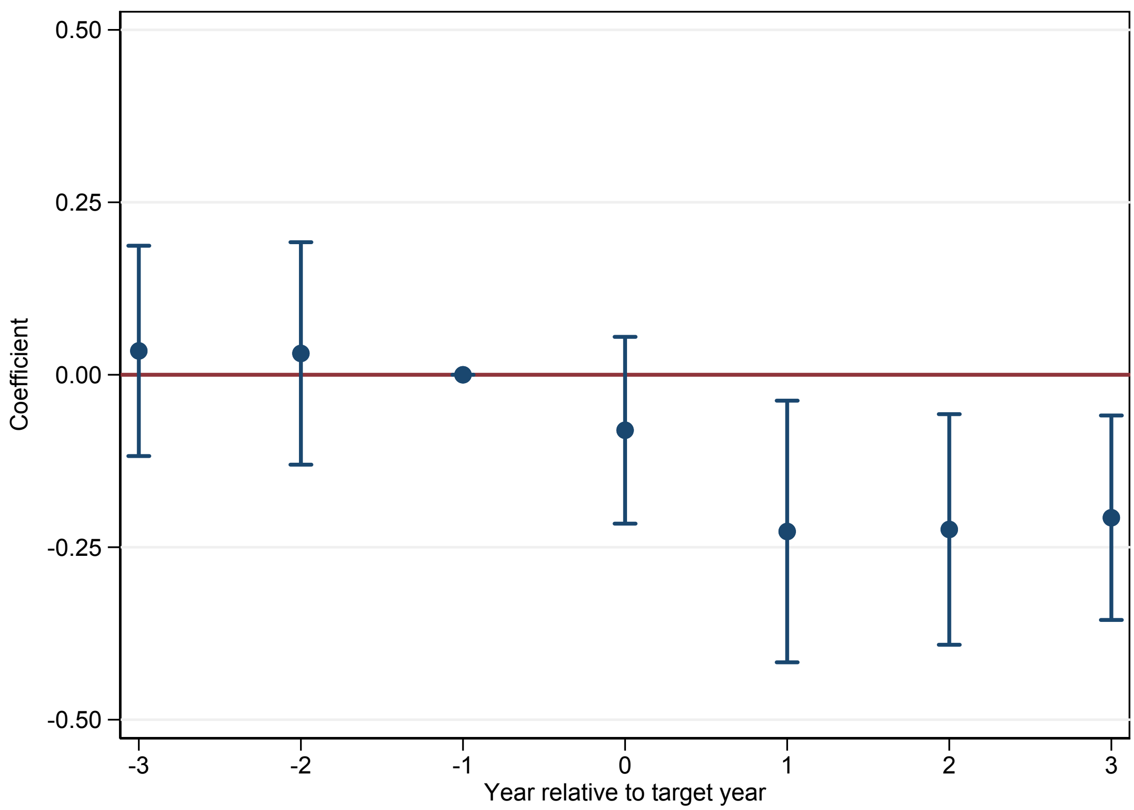
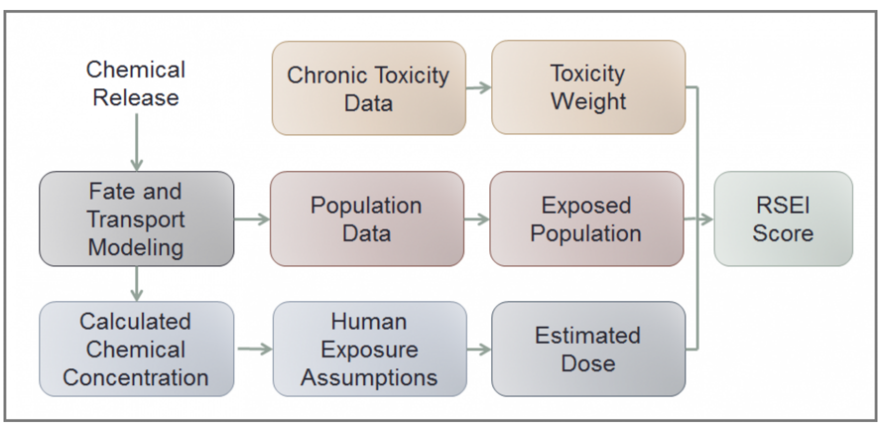



**FIGURE 3: TOXIC CHEMICAL RELEASES AROUND ENVIRONMENTAL ACTIVISM**

This figure plots coefficients from a propensity score matched difference-in-differences specification, where the dependent variable is the natural logarithm of one plus the total toxic release at the plant-chemical-year level. The horizontal axis is in event time relative to the year of the targeting by the BAP. The estimated coefficients and their corresponding 95% confidence intervals correspond to the difference in the toxic chemical releases at plants of targeted firms to the toxic chemical releases at plants of propensity score matched control firms. Data Source: EPA Toxic Release Inventory (TRI).

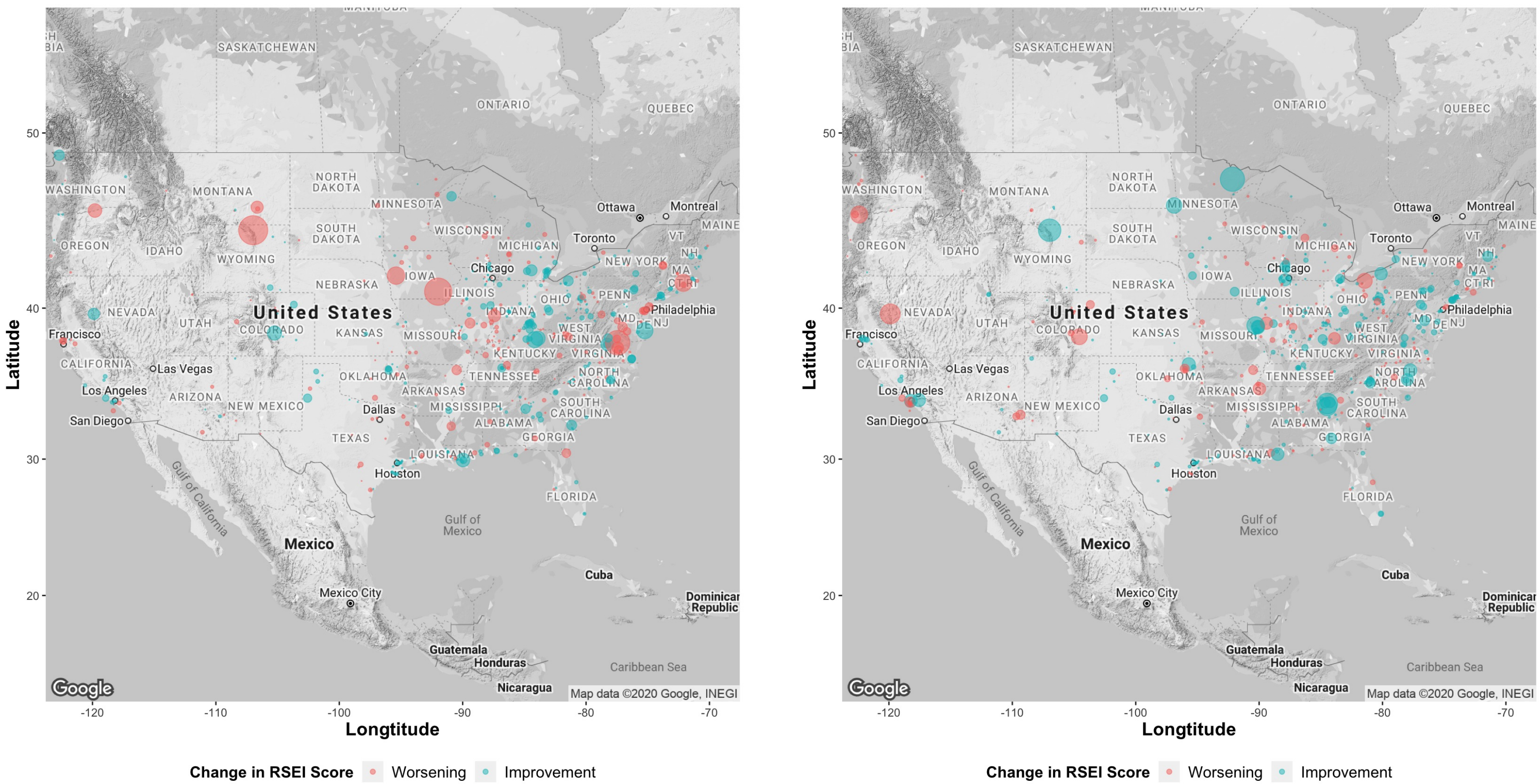

(a) Waste Management Hierarchy




(b) Risk-Screening Environmental Indicators (RSEI) Model

**FIGURE 4: ENVIRONMENTAL CONCEPTS FROM THE EPA**

This figure presents two key environmental concepts used in this paper. Panel A describes the waste management hierarchy, as described by the EPA (2019b), and ranks the management strategies from the most to the least environmentally preferred. Source reduction and reuse refers to reducing waste at the source, and is the most preferred strategy. Recycling/composition refers to activities related to collecting, sorting, and reprocessing items that would otherwise be considered waste. Energy recovery refers to the conversion of non-recyclable waste materials into useable energy. Treatment and disposal refers to the reduction of the volume and toxicity of waste through processing. Panel B describes the Risk-Screening Environmental Indicators (RSEI) Model computation methodology, as described by the EPA (2019a). A unitless value, the RSEI score accounts for (i) the size of the chemical release, (ii) the fate and transport of the chemical through the environment, and (iii) the size and location of the exposed population, and the chemical's toxicity. Source: EPA.




(a) Pre-period

(b) Targeting-period

**FIGURE 5: CHANGES IN RISK-SCREENING ENVIRONMENTAL INDICATORS (RSEI) SCORES**

This figure plots the relative change in RSEI scores at the local census block group level that contain at least one plant of the (i) target firm, or (ii) propensity score matched control firms in the sample. Panel (a) shows changes through the pre-period (2012–2014), and panel (b) shows changes through the targeting-period (2015–2017). The size of the circles represents the change in the score over the periods. The blue circle represents a reduction (improvement) in the RSEI score, whereas the red circle represents an increase (worsening) in the RSEI score. Data Source: EPA Risk-Screening Environmental Indicators (RSEI) Model.

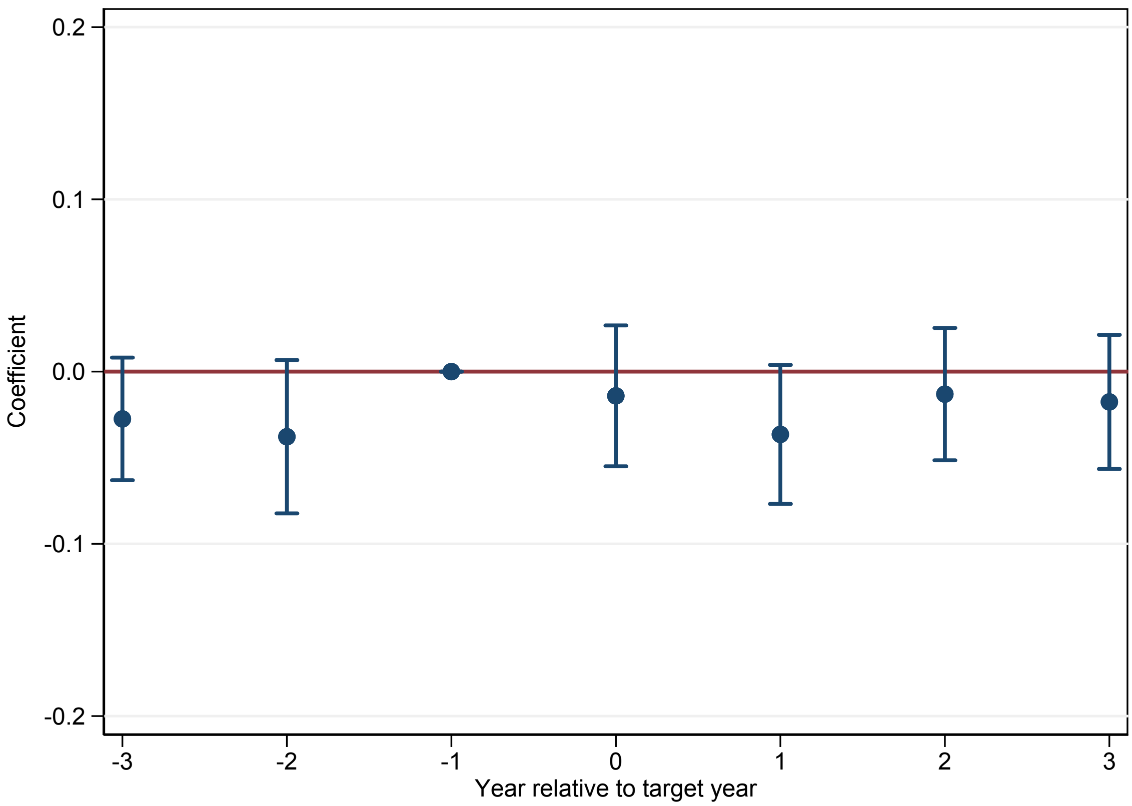
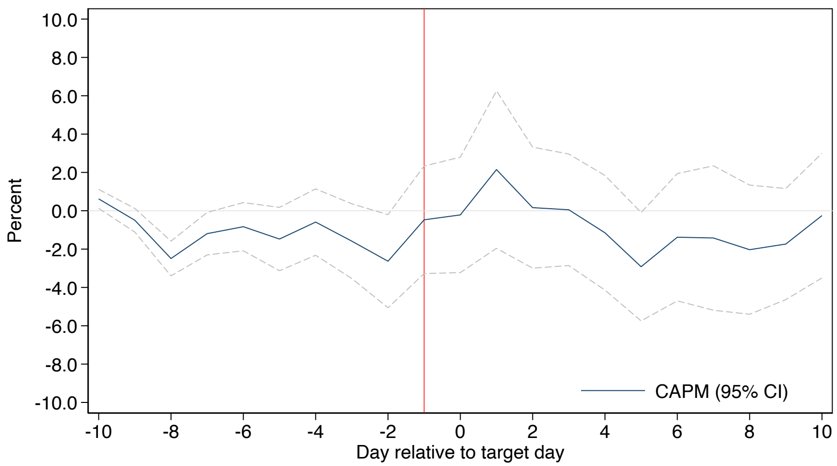
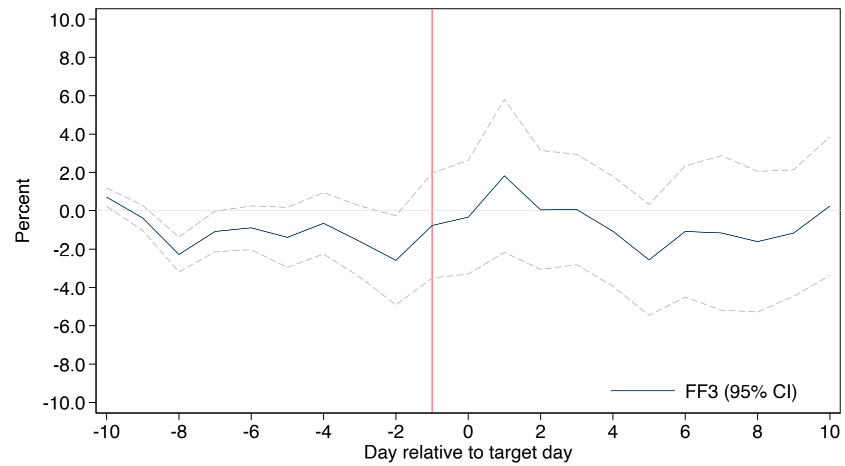



**FIGURE 6: PRODUCTION AROUND ENVIRONMENTAL ACTIVISM**

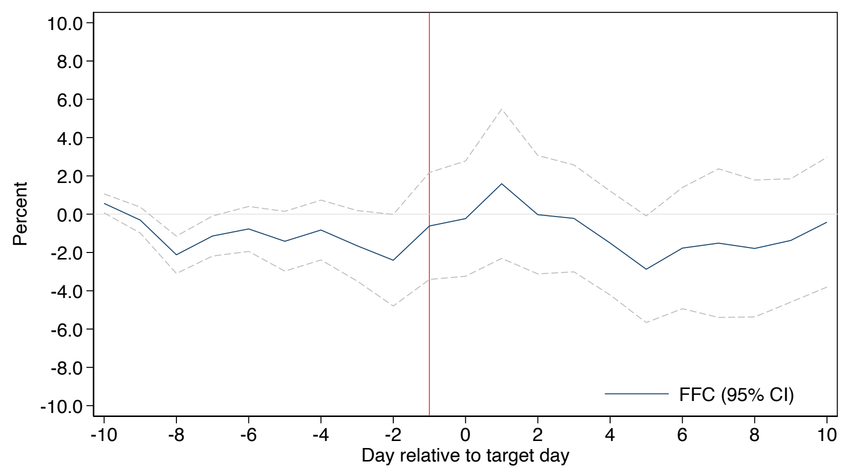
This figure plots coefficients from a propensity score matched difference-in-differences specification, where the dependent variable is normalized production, defined as the quantity of output in any given year relative to the quantity of output in the first year in our sample at the plant-chemical-year level. The horizontal axis is in event time relative to the year of the targeting by the BAP. The estimated coefficients and their corresponding 95% confidence intervals correspond to the difference in the production at plants of targeted firms compared to the production at plants of propensity score matched control firms. Data Source: Data Source: EPA Toxic Release Inventory (TRI).




(a)




(b)




(c)

**FIGURE 7: STOCK PRICE REACTIONS TO THE BAP CAMPAIGN**

This figure plots the -10 to +10 day cumulative abnormal returns (CARs) and their corresponding 95% confidence intervals for the firms that were targeted for environmental reasons on November 6, 2014, by the BAP. Panel A plots the CARs computed using a capital asset pricing model, and panel B plots the CARs computed using the Fama-French three-factor model. Panel C plots the CARs computed using the Fama-French-Carhart model. Data Source: Center for Research in Security Prices (CRSP).

## TABLE 1: SUMMARY OF ACTIVISM EVENTS: FIRMS TARGETED BY THE BAP

This table provides a summary of activism events undertaken by the Boardroom Accountability Project (BAP) initiated by the New York City Pension System (NYCPS). Panel A reports the events by fiscal year while panel B reports the events by industry using Fama-French 12 industrial classification. We identify activism events through publicly available data from the Boardroom Accountability Project. Specifically, we identify whether firms are targeted for their inadequate redressal of climate change risk (*Environment*) or if they are targeted for other reasons (*Others*) which include excessive CEO pay, lack of board diversity, inadequate political disclosure, and adherence to labor standards. We use the fiscal year a firm is first targeted by the BAP as our event year and adjust for double-counting across categories. Sectors are mutually exclusive, and defined using the Fama-French twelve industry classification using SIC codes.

| | **Panel A: By year** | | |
|---|---|---|---|
| First Year of Event | # of Firms | Environment | Others |
| 2015 | 75 | 33 | 42 |
| 2016 | 26 | 7 | 19 |
| 2017 | 57 | 20 | 37 |
| 2018 | 23 | 2 | 21 |
| Full Sample | 181 | 62 | 119 |

| | **Panel B: By industry** | | |
|---|---|---|---|
| | # of Firms | Environment | Others |
| Consumer Nondurables | 3 | 0 | 3 |
| Consumer Durables | 5 | 1 | 4 |
| Manufacturing | 7 | 0 | 7 |
| Energy | 30 | 27 | 3 |
| Chemicals and Allied Products | 6 | 0 | 6 |
| High Tech | 26 | 2 | 24 |
| Tele and Communications | 3 | 0 | 3 |
| Utilities | 25 | 22 | 3 |
| Wholesale and Retail | 19 | 5 | 14 |
| Healthcare, Medical Equipment, and Drugs | 10 | 0 | 10 |
| Finance | 32 | 1 | 31 |
| Other | 15 | 4 | 11 |
| Full Sample | 181 | 62 | 119 |

## TABLE 2: REAL EFFECTS OF ENVIRONMENTAL ACTIVISM: PLANT-LEVEL EVIDENCE

This table reports the impact of environmental activism on toxic chemical releases. The regressions compare toxic chemical releases at plants of targeted firms to toxic chemical releases at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. Panel A reports toxic chemical releases by the location of release, i.e., on-site and off-site while panel B reports toxic chemical releases disaggregated by the medium of release, i.e., air and water. The dependent variable is the natural logarithm of one plus the release scaled by previous years' cost of goods sold. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI).

| | **Panel A: Toxic chemical release** | | |
|---|---|---|---|
| Dependent variable | Log(1+Release/COGS $_{t-1}$) | | |
| | Total | On-site | Off-site |
| | (1) | (2) | (3) |
| Post | 0.003 | 0.006 | 0.005 |
| | (0.043) | (0.038) | (0.011) |
| Post × Environment | -0.050*** | -0.059*** | 0.005 |
| | (0.019) | (0.015) | (0.007) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.82 | 0.83 | 0.73 |
| Observations | 59,983 | 59,983 | 59,983 |

| | **Panel B: Medium of release** | | |
|---|---|---|---|
| Dependent variable | Log(1+Release/COGS $_{t-1}$) | | |
| | Stack air | Fugitive air | Surface water discharges |
| | (1) | (2) | (3) |
| Post | 0.012 | 0.006* | 0.001 |
| | (0.015) | (0.003) | (0.002) |
| Post × Environment | -0.036*** | -0.007*** | -0.002** |
| | (0.008) | (0.002) | (0.001) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.81 | 0.77 | 0.73 |
| Observations | 59,983 | 59,983 | 59,983 |

## TABLE 3: ENVIRONMENTAL ACTIVISM AND GREENHOUSE GAS EMISSIONS

This table reports the impact of environmental activism on greenhouse gas emissions. The regressions compare greenhouse gas emissions at plants of targeted firms to greenhouse gas emissions at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. The dependent variable is the natural logarithm of one plus the emissions scaled by previous years' output at the plant-level as reported to the Energy Information Administration (EIA). The emissions are broken down by greenhouse gas type: *Methane* (column 1), *Nitrous oxide* (column 2), and *Carbon dioxide* (column 3). *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Plant* × *Gas* and *Gas* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Greenhouse Gas Reporting Program (GHGRP) and Energy Information Administration (EIA).

| Dependent variable | Log(1+Emissions/Output $_{t-1}$) | | |
|---|---|---|---|
| | Methane | Nitrous oxide | Carbon dioxide |
| | (1) | (2) | (3) |
| Post | 0.002* | 0.002 | 0.002 |
| | (0.001) | (0.001) | (0.015) |
| Post × Environment | -0.003** | -0.002* | -0.015 |
| | (0.001) | (0.001) | (0.015) |
| Plant × Gas fixed effects | Yes | Yes | Yes |
| Gas × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.39 | 0.33 | 0.76 |
| Observations | 11,039 | 11,039 | 11,039 |

## TABLE 4: BIOLOGICAL IMPACT OF CHEMICALS

This table reports the impact of environmental activism on toxic chemical release based on its potential harm to humans. The regressions compare chemical release at plants of targeted firms to chemical release at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. The dependent variable is the natural logarithm of one plus the total toxic chemical release scaled by previous years' cost of goods sold. Each column subsets the sample based on whether the chemicals are classified by the EPA's IRIS database as harmful to human health and breaking it down by the biological system they affect. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Integrated Risk Information System (IRIS).

| Dependent variable | Log(1+Release/COGS $_{t-1}$) | | | | | |
|---|---|---|---|---|---|---|
| System affected | Respiratory | Developmental | Nervous | Hematologic | Urinary | Hepatic |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Post | 0.073 | 0.033** | 0.028* | 0.026* | 0.046 | 0.015 |
| | (0.106) | (0.016) | (0.016) | (0.015) | (0.031) | (0.009) |
| Post × Environment | -0.076*** | -0.035** | -0.028* | -0.024* | -0.023 | -0.019* |
| | (0.022) | (0.014) | (0.015) | (0.013) | (0.015) | (0.010) |
| Plant × Chemical fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.92 | 0.88 | 0.92 | 0.90 | 0.91 | 0.95 |
| Observations | 5,632 | 3,600 | 7,761 | 2,920 | 3,235 | 2,248 |

## TABLE 5: AIR QUALITY MEASURED BY AIR MONITORING STATIONS

This table reports the impact of environmental activism on air quality within one-mile of the plants of the targeted firms as measured by the EPA's air monitoring stations. The dependent variable is the standardized values of carbon monoxide (column 1), ozone (column 2), sulfur dioxide (column 3), nitrogen dioxide (column 4), and particulate matter <2.5 um (column 5) present in the areas around control and treated plants. *Environment* is a dummy variable indicating whether the plant belongs to the firm that was targeted by the BAP for environmental reasons. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Year* and *Plant* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Clean Air Act.

| Dependent variable | Daily Average Measurement | | | | |
|---|---|---|---|---|---|
| | Carbon monoxide | Ozone | Sulfur dioxide | Nitrogen dioxide | Particulate matter <2.5 $\mu$m |
| | (1) | (2) | (3) | (4) | (5) |
| Post | 0.079* | -0.383 | -0.097 | 0.163* | -0.083 |
| | (0.044) | (0.376) | (0.089) | (0.091) | (0.095) |
| Post $\times$ Environment | 0.084 | -0.135** | -0.228*** | -0.015 | -0.179*** |
| | (0.148) | (0.061) | (0.082) | (0.034) | (0.060) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes |
| Plant fixed effects | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.22 | 0.13 | 0.26 | 0.40 | 0.18 |
| Observations | 32,767 | 27,769 | 85,556 | 26,864 | 47,778 |

## TABLE 6: REDUCTION IN LOCAL POPULATIONS' EXPOSURE TO TOXICITY

This table reports the impact of environmental activism on the local populations' exposure to the toxicity of the chemical releases. The regressions compare the toxicity at census blocks of plants of the targeted firms to the census blocks of Russell 3000 Index firms in a propensity score matching difference-in-differences empirical setup. The dependent variables are the standardized values of the total score (column 1), toxic concentration (column 2), number of chemicals (column 3), and number of releases (column 4). The RSEI Score is a model implied risk-weighted measure of all chemicals and emissions released, as provided by the EPA. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Year* and *Census Block* fixed effects and are estimated using ordinary least squares (OLS) using standard errors clustered at the block level. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Risk-Screening Environmental Indicators (RSEI) Model.

| Dependent variable | Total score | Toxic Concentration | Number of Chemicals | Number of Releases |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Post × Environment | -0.197* | -0.257** | -0.255** | -0.295** |
| | (0.114) | (0.117) | (0.129) | (0.130) |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Census Block fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.06 | 0.07 | 0.08 | 0.14 |
| Observations | 3,040 | 3,040 | 3,040 | 3,040 |

## TABLE 7: SOURCES OF REDUCTION AND PREVENTATIVE EFFORTS

This table reports the sources of reduction and preventative efforts undertaken by firms around environmental activism. The regressions compare these efforts at plants of targeted firms to sources of reduction and preventative efforts undertaken at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. Panel A reports the waste-management steps undertaken broken down by their impact, and panel B reports the preventative initiatives undertaken to reduce waste production broken down by categories, as provided by the EPA. The dependent variable in panel A is the natural logarithm of one plus the chemical release scaled by previous years' cost of goods sold. The release is broken down based on EPA's classification of production-related waste as *high impact* (column 1) and treatment works and recycling as *low impact* (column 2). The dependent variable in panel B is the natural logarithm of one plus the number of initiatives undertaken by the plants. The initiatives are grouped based on EPA's classification: *Spill and Leak Prevention* (column 1) and *Good Operating Practices* (column 2). *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. $^{***}$, $^{**}$, $^{*}$ denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI) and Pollution Prevention (P2).

| | **Panel A: Sources of reduction** | |
|---|---|---|
| Dependent variable | Log (1+ Release/COGS $_{t-1}$) | |
| | **High impact** | **Low impact** |
| | (1) | (2) |
| Post | 0.050 | 0.006 |
| | (0.055) | (0.007) |
| Post × Environment | -0.121$^{***}$ | -0.011$^{***}$ |
| | (0.031) | (0.003) |
| Plant × Chemical fixed effects | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes |
| $R^2$ | 0.83 | 0.74 |
| Observations | 59,983 | 59,983 |

| | **Panel B: Abatement efforts** | |
|---|---|---|
| Dependent variable | Log (1 + Number of initiatives) | |
| Initiative | Spill prevention | Operations |
| | (1) | (2) |
| Post | -0.002 | -0.009$^{*}$ |
| | (0.002) | (0.005) |
| Post × Environment | 0.006$^{**}$ | 0.004$^{*}$ |
| | (0.003) | (0.002) |
| Plant × Chemical fixed effects | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes |
| $R^2$ | 0.92 | 0.91 |
| Observations | 42,065 | 42,065 |

## TABLE 8: ABATEMENT EXPENDITURES

This table reports abatement expenditures for plants of targeted and matched control firms around the environmental activism campaign. The regressions compare expenditures as a fraction of firms' previous year cost of goods sold at plants of targeted firms to expenditures at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Plant* and *EPA region* × *Year* fixed effects and are estimated using ordinary least squares (OLS). We also include plant-level controls that correlate with expenditures such as: *Plant age* and *Installed capacity*. Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: Energy Information Administration (EIA).

| Dependent variable | Log(1+Expenditures/COGS $_{t-1}$) | | |
|---|---|---|---|
| | Total | Capital | Operations & Maintainence |
| | (1) | (2) | (3) |
| Post | -0.005* | -0.006** | 0.000 |
| | (0.003) | (0.003) | (0.000) |
| Post × Environment | 0.007** | 0.007** | 0.000 |
| | (0.003) | (0.003) | (0.000) |
| Plant controls | Yes | Yes | Yes |
| Plant fixed effects | Yes | Yes | Yes |
| EPA region × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.59 | 0.55 | 0.65 |
| Observations | 1,161 | 1,161 | 1,161 |

## TABLE 9: RULING OUT DECLINE IN PRODUCTION

This table examines changes in production around the targeting by the BAP. The regressions compares the growth (level) of production at plants of targeted firms to growth (level) of production at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. The dependent variable is the production ratio (columns 1 and 2) and normalized production (columns 3 and 4). Production ratio is defined as the quantity of output in any given year relative to the quantity of output in the previous year. Normalized production is a proxy for total production and is defined as the quantity of output in any given year relative to the quantity of output in the first year in our sample. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI).

| Dependent variable | Production ratio | | Normalized production | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Post | 0.014 | 0.040 | 0.001 | 0.021 |
| | (0.042) | (0.041) | (0.021) | (0.022) |
| Post × Environment | -0.001 | -0.012 | -0.001 | -0.005 |
| | (0.018) | (0.017) | (0.011) | (0.010) |
| Plant × Chemical fixed effects | Yes | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes | Yes |
| Sample | All | Continuous Reporting | All | Continuous Reporting |
| $R^2$ | 0.25 | 0.16 | 0.25 | 0.18 |
| Observations | 40,704 | 27,849 | 40,704 | 27,849 |

## TABLE 10: ENVIRONMENTAL ACTIVISM AND FIRM PERFORMANCE

This table reports the impact of environmental activism on firms' financial performance. The regressions report the change in firm performance of targeted firms around environmental activism by the BAP. The dependent variable in column 1 is, *Return on assets*, defined as the net income (NI) scaled by total assets (AT) while in column 2, the dependent variable is, *Profitability*, defined as earnings before interest, taxes, depreciation, and amortization (OIBDP) scaled by sales (SALE). To capture distress risk, column 3 reports changes to *Altman's Z-score*, defined as (3.3 $\times$ Pre-tax income + Sale + 0.6 $\times$ Market Value of Equity + 1.4$\times$ Retained Earnings + 1.2 $\times$ (Current Assets - Current Liabilities)) scaled by assets (AT). *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. All regressions include *Year* and *Firm* fixed effects and are estimated using ordinary least squares (OLS) using standard errors clustered at the firm level. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: Compustat and Center for Research in Security Prices (CRSP).

| Dependent variable | Return on Assets | Profitability | Altman's Z-score |
|---|---|---|---|
| | (1) | (2) | (3) |
| Post | -0.037* | -0.057* | -0.353 |
| | (0.021) | (0.033) | (0.225) |
| Year fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.28 | 0.30 | 0.69 |
| Observations | 499 | 499 | 477 |

# TABLE 11: ROBUSTNESS CHECKS

This table provides further robustness around our main specification (Panel A of Table 2). The test are organised around five dimensions: alternative inputs to propensity score matching (Panel A), ruling out alternative explanations (Panel B), alternative scaling metrics (Panel C), ruling out regulatory concerns (Panel D), and alternative empirical specifications (Panel E). Row 1 reports the results after including the pre-target level of toxic emissions as an additional matching covariate. Row 2 includes the change in pre-target toxic chemical releases as an additional matching covariate. Row 3 reports the results where matching is done at Fama-French 48 classification. Row 4 restricts the sample to utility firms and emissions are scaled by previous years output at the plant-level. Row 5 reports the results for a regression where we exclude firms that are in top quartile in terms of offshoring. Row 6 reports the results for a regression where we exclude firms that that filed for Chapter 11. Row 7 reports the results where we exclude plants that do not emit regulated pollutants. Row 8 restricts the sample to plants that report to the EPA consistently since 2010. Row 9 restricts the sample to plants with above-median releases. Row 10 reports results with emissions scaled by previous years sales. Row 11 reports results with emissions scaled by previous years total assets. Row 12 reports results with emissions scaled by current years COGS. Row 13 reports results without normalizing the dependent variable. Row 14 reports results with the inclusion of *State* × *Year* fixed effects. Row 15 reports results with the inclusion of *Industry* × *Year* fixed effects. Row 16 reports results with the inclusion of *State* × *Industry* × *Year* fixed effects. Row 17 reports the results for a regression where we exclude firms and plants that are based in the state of California. Row 18 reports results with jackknifing re-sampling technique to rule out the disproportionate influence of outlier data points. Row 19 reports results with standard errors clustered at the parent-firm level. Row 20 reports results with aggregated data at plant-level and only includes *Plant* and *Year* fixed effects. Row 21 reports results after inclusion of controls for firm performance, namely *Performance* and *Post* × *Performance*. All regressions (except row 20) include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects, not reported for brevity and are estimated using ordinary least squares (OLS). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.



| | Toxic chemical release | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | | | On-site | | | Off-site | | |
| | Post | Post × Env | Obs. | Post | Post × Env | Obs. | Post | Post × Env | Obs. |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| **Panel A: Alternative Inputs to Propensity Score Matching** | | | | | | | | | |
| (1) Additional covariate: Chemical release$_{t-1}$ | -0.003 | -0.042** | 49,552 | -0.006 | -0.050*** | 49,552 | -0.003 | 0.012 | 49,552 |
| | (0.053) | (0.020) | | (0.047) | (0.016) | | (0.014) | (0.008) | |
| (2) Additional covariate: ΔChemical release$_{t-2,t-1}$ | -0.001 | -0.042** | 49,472 | -0.004 | -0.050*** | 49,472 | -0.000 | 0.012 | 49,472 |
| | (0.053) | (0.020) | | (0.047) | (0.016) | | (0.014) | (0.008) | |
| (3) Industry: Fama-French 48 classification | 0.015 | -0.053*** | 56,912 | 0.013 | -0.061*** | 56,912 | 0.007 | 0.004 | 56,912 |
| | (0.044) | (0.019) | | (0.039) | (0.015) | | (0.011) | (0.007) | |

Continued...

| | Toxic chemical release | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | | | On-site | | | Off-site | | |
| | Post | Post × Env | Obs. | Post | Post × Env | Obs. | Post | Post × Env | Obs. |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| **Panel B: Ruling Out Alternative Explanations** | | | | | | | | | |
| *Offshoring concerns* | | | | | | | | | |
| (4) Utility firms | 0.029* | -0.030** | 15,558 | 0.024 | -0.026** | 15,558 | 0.003 | -0.003 | 15,558 |
| | (0.016) | (0.013) | | (0.015) | (0.012) | | (0.003) | (0.002) | |
| (5) Exclude high offshoring firm | -0.003 | -0.063* | 36,576 | 0.003 | -0.082*** | 36,576 | 0.002 | 0.012 | 36,576 |
| | (0.047) | (0.035) | | (0.039) | (0.028) | | (0.014) | (0.014) | |
| *Plant closures* | | | | | | | | | |
| (6) Exclude firms that filed for Chapter 11 | 0.026 | -0.069*** | 57,447 | 0.018 | -0.070*** | 57,447 | 0.015 | -0.004 | 57,447 |
| | (0.042) | (0.015) | | (0.038) | (0.013) | | (0.010) | (0.005) | |
| (7) Exclude zeroes | 0.121 | -0.056*** | 34,507 | 0.110 | -0.057*** | 33,497 | 0.102* | -0.038*** | 12,212 |
| | (0.096) | (0.015) | | (0.091) | (0.015) | | (0.060) | (0.012) | |
| (8) Plants continuously reporting | 0.099 | -0.078*** | 27,192 | 0.078 | -0.073*** | 27,192 | 0.025 | -0.009 | 27,192 |
| | (0.088) | (0.018) | | (0.077) | (0.017) | | (0.020) | (0.007) | |
| *Reporting biases* | | | | | | | | | |
| (9) Large plants: Above-median releases | 0.138 | -0.067*** | 29,160 | 0.121 | -0.066*** | 29,160 | 0.025 | -0.007 | 29,160 |
| | (0.108) | (0.018) | | (0.099) | (0.017) | | (0.023) | (0.008) | |
| **Panel C: Alternative Scaling Metrics** | | | | | | | | | |
| (10) $\text{Sales}_{t-1}$ | 0.004 | -0.049*** | 59,983 | 0.008 | -0.057*** | 59,983 | 0.004 | 0.004 | 59,983 |
| | (0.033) | (0.017) | | (0.029) | (0.013) | | (0.009) | (0.006) | |
| (11) $\text{Total Assets}_{t-1}$ | 0.028 | -0.052*** | 57,510 | 0.019 | -0.049*** | 57,510 | 0.011*** | -0.004** | 57,510 |
| | (0.021) | (0.010) | | (0.022) | (0.010) | | (0.004) | (0.002) | |
| (12) $\text{COGS}_t$ | -0.025 | -0.027 | 59,976 | -0.021 | -0.039*** | 59,976 | 0.003 | 0.007 | 59,976 |
| | (0.037) | (0.019) | | (0.034) | (0.015) | | (0.011) | (0.007) | |
| (13) No scaling | 0.822** | -1.410*** | 59,983 | 0.706* | -1.291*** | 59,983 | 0.237 | -0.324** | 59,983 |
| | (0.412) | (0.315) | | (0.371) | (0.274) | | (0.171) | (0.141) | |

Continued...

| | Toxic chemical release | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | | | On-site | | | Off-site | | |
| | Post | Post × Env | Obs. | Post | Post × Env | Obs. | Post | Post × Env | Obs. |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| **Panel D: Ruling Out Regulatory Concerns** | | | | | | | | | |
| (14) State-year fixed effects | 0.066 | -0.076*** | 59,983 | 0.066 | -0.073*** | 59,983 | 0.003 | -0.006 | 59,983 |
| | (0.046) | (0.022) | | (0.041) | (0.018) | | (0.009) | (0.008) | |
| (15) Industry-year fixed effects | -0.029 | -0.033* | 59,912 | -0.020 | -0.046*** | 59,912 | -0.001 | 0.010 | 59,912 |
| | (0.050) | (0.019) | | (0.045) | (0.014) | | (0.013) | (0.008) | |
| (16) State-industry-year fixed effects | 0.056 | -0.064*** | 59,888 | 0.047 | -0.048*** | 59,888 | 0.010 | -0.020*** | 59,888 |
| | (0.044) | (0.014) | | (0.038) | (0.014) | | (0.010) | (0.005) | |
| (17) Excluding California | 0.022 | -0.073*** | 54,223 | 0.014 | -0.074*** | 54,223 | 0.016 | -0.004 | 54,223 |
| | (0.043) | (0.016) | | (0.039) | (0.014) | | (0.010) | (0.005) | |
| **Panel E: Alternative Empirical Specifications** | | | | | | | | | |
| (18) Jackknife estimation | 0.003 | -0.050 | 59,983 | 0.006 | -0.059** | 59,983 | 0.005 | 0.005 | 59,983 |
| | (0.050) | (0.031) | | (0.043) | (0.026) | | (0.016) | (0.013) | |
| (19) Clustering: Parent-firm | 0.003 | -0.050 | 59,983 | 0.006 | -0.059** | 59,983 | 0.005 | 0.005 | 59,983 |
| | (0.054) | (0.034) | | (0.046) | (0.028) | | (0.016) | (0.012) | |
| (20) Aggregation at the plant-level | 0.116 | -0.545*** | 4,742 | 0.074 | -0.322*** | 4,742 | -0.012 | 0.022 | 4,742 |
| | (0.187) | (0.137) | | (0.106) | (0.075) | | (0.059) | (0.048) | |
| (21) Controlling for firm performance | 0.061 | -0.069** | 57,512 | 0.044 | -0.063*** | 57,512 | 0.024** | -0.007 | 57,512 |
| | (0.051) | (0.016) | | (0.044) | (0.015) | | (0.012) | (0.006) | |

## TABLE 12: EXTERNAL VALIDITY

This table reports the impact of environmental activism on toxic chemical releases for the sample of firms targeted outside of the BAP. The regressions compare toxic chemical releases at plants of targeted firms to toxic chemical releases at plants of Russell 3000 Index firms in a difference-in-differences empirical setup. We exclude the firms targeted by the BAP from this sample. The table reports toxic chemical releases by the location of release, i.e., on-site and off-site. The dependent variable is the natural logarithm of one plus the release scaled by previous years' cost of goods sold. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the firm was targeted for environmental reasons, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. $^{***}$, $^{**}$, $^{*}$ denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI) and ISS Shareholder Proposals database.

| Dependent variable | Log(1+Release/COGS $_{t-1}$) | | |
|---|---|---|---|
| | Total | On-site | Off-site |
| | (1) | (2) | (3) |
| Post | 0.020 | 0.022 | -0.004 |
| | (0.019) | (0.017) | (0.006) |
| Post × Environment | -0.073$^{**}$ | -0.078$^{**}$ | 0.007 |
| | (0.034) | (0.032) | (0.007) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.75 | 0.77 | 0.69 |
| Observations | 146,616 | 146,616 | 146,616 |

# INTERNET APPENDIX

## The Real Effects of Environmental Activist Investing

## TABLE IA1: TARGET SELECTION

This table reports the coefficients from a multivariate logistic regression relating firm characteristics that correlate the likelihood of being targeted by the BAP for environmental reasons. The sample consists of all Russell 3000 Index firms from 2010 to 2013. The dependent variable is an indicator variable equal to one if the firm was targeted by BAP for environmental reasons. *Firm Size* is the natural logarithm of the book value of assets. *Market-to-book* is the ratio of assets, defined as the market value of equity plus book value of debt over book value of assets. *12-month trailing returns* is the stock return in the past 12 months. *Profitability* is the ratio of earnings before interest, taxes, depreciation, and amortization scaled by sales. *Institutional ownership* is the percentage of outstanding shares held by institutional investors. *Fossil Free Index* is an indicator if the firm is listed on the Fossil Free Index list. *ASSET4 score* is the standardized environmental score from Thomson-Reuters' ASSET4 database. All regressions include industry (Fama-French 12 classification) fixed effects and standard errors are clustered at the firm-level. $^{***}$, $^{**}$, $^{*}$ denote significance at the 1%, 5%, and 10% level, respectively. Data source: Compustat, Center for Research in Security Prices (CRSP), Thomson Reuters 13F, and ASSET4 databases.

| Dependent variable | $1_{Environment}$ | | | |
|---|---|---|---|---|
| | Coefficient | Odds ratio | Coefficient | Odds ratio |
| | (1) | (2) | (3) | (4) |
| Firm Size | 0.788$^{***}$ | 2.199$^{***}$ | 0.792$^{***}$ | 2.208$^{***}$ |
| | (0.232) | (0.509) | (0.232) | (0.513) |
| Market-to-Book | 0.220 | 1.246 | 0.215 | 1.239 |
| | (0.204) | (0.254) | (0.207) | (0.257) |
| Returns | -0.539 | 0.583 | -0.538 | 0.584 |
| | (0.345) | (0.201) | (0.389) | (0.227) |
| Profitability | 2.378$^{*}$ | 10.782$^{*}$ | 2.390$^{*}$ | 10.908$^{*}$ |
| | (1.264) | (13.628) | (1.270) | (13.854) |
| Institutional Ownership | 1.768$^{**}$ | 5.856$^{**}$ | 1.798$^{**}$ | 6.037$^{**}$ |
| | (0.727) | (4.257) | (0.748) | (4.516) |
| Fossil Free Index | 3.403$^{**}$ | 30.057$^{**}$ | 3.426$^{**}$ | 30.758$^{**}$ |
| | (1.410) | (42.369) | (1.433) | (44.078) |
| ASSET4 Score | -0.199$^{*}$ | 0.820$^{*}$ | -0.197 | 0.821 |
| | (0.120) | (0.099) | (0.124) | (0.102) |
| Year fixed effects | No | No | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Observations | 1,006 | 1,006 | 1,006 | 1,006 |

## TABLE IA2: SUMMARY STATISTICS

The table presents the descriptive statistics for the sample. Panel A reports the key statistics at the plant-chemical or plant-gas level or firm-level for the pooled sample across all years in our sample. The sample spans 2010 to 2018. Panel B tests the difference between plants of firms targeted by the BAP for environmental reasons and plants of propensity score matched Russell 3000 Index control firms in the year before the NYCPS targeted a firm following main estimating equation. *Firm Size* is the natural logarithm of the book value of assets. *Profitability* is the ratio of earnings before interest, taxes, depreciation, and amortization scaled by sales. *Market-to-book* is the ratio of assets, defined as the market value of equity plus book value of debt over book value of assets. *Environment score* is the standardized environmental score from Thomson-Reuters' ASSET4 database. Toxic chemical release data are from the EPA Toxic Release Inventory (TRI) database, greenhouse gas emissions data are from the EPA Greenhouse Gas Reporting Program (GHGRP), environment score is from Thomson Reuters' ASSET4 database, and firm-level data are from Compustat and Center for Research in Security Prices (CRSP). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

| | **Panel A: Plant and firm characteristics, pooled sample** | | | |
|---|---|---|---|---|
| | N | Mean | Median | Std. dev |
| | (1) | (2) | (3) | (4) |
| Log(1+Release/COGS $_{t-1}$) | 59,983 | 0.391 | 0.001 | 0.886 |
| Log(1+ On-site release/COGS $_{t-1}$) | 59,983 | 0.342 | 0.000 | 0.833 |
| Log(1+ Off-site release/COGS $_{t-1}$) | 59,983 | 0.048 | 0.000 | 0.264 |
| Log(1+ Methane/Output $_{t-1}$) | 11,039 | 0.001 | 0.000 | 0.043 |
| Log(1+ Nitrous oxide/Output $_{t-1}$) | 11,039 | 0.002 | 0.000 | 0.040 |
| Log(1+ Carbon dioxide/Output $_{t-1}$) | 11,039 | 0.099 | 0.000 | 0.379 |
| Log (Firm assets) | 921 | 9.498 | 9.453 | 1.109 |
| Profitability | 921 | 0.098 | 0.098 | 0.137 |
| Market-to-book | 921 | 0.994 | 0.822 | 0.545 |
| Environment score | 921 | 0.002 | -0.024 | 0.918 |

| | **Panel B: Targeted vs. non-targeted in the year before targeting** | | |
|---|---|---|---|
| | Non-targeted | Targeted | Difference |
| | (1) | (2) | (2) - (1) |
| Log(1+Release/COGS $_{t-1}$) | 0.358 | 0.437 | 0.079 |
| Log(1+ On-site release/COGS $_{t-1}$) | 0.317 | 0.382 | 0.065 |
| Log(1+ Off-site release/COGS $_{t-1}$) | 0.043 | 0.054 | 0.011 |
| Log(1+ Methane/Output $_{t-1}$) | -0.003 | 0.007 | 0.009 |
| Log(1+ Nitrous oxide/Output $_{t-1}$) | -0.002 | 0.007 | 0.009 |
| Log(1+ Carbon dioxide/Output $_{t-1}$) | 0.087 | 0.122 | 0.035 |
| Log (Firm assets) | 9.463 | 9.955 | 0.493* |
| Profitability | 0.130 | 0.122 | -0.009 |
| Market-to-book | 1.043 | 1.014 | -0.029 |
| Environment score | -0.561 | -0.156 | 0.405 |

## TABLE IA3: ROBUSTNESS: SCALING BY PLANT-LEVEL OUTPUT

This table reports the impact of environmental activism on toxic chemical releases. The regressions compare toxic chemical releases at plants of targeted firms to toxic chemical releases at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. Panel A reports toxic chemical releases by the location of release, i.e., on-site and off-site while panel B reports toxic chemical releases disaggregated by the medium of release, i.e., air and water. The dependent variable is the natural logarithm of one plus the release scaled by previous years' output at the plant-level as reported to the Energy Information Administration (EIA). *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI) and Energy Information Administration (EIA).

| | **Panel A: Toxic chemical release** | | |
|---|---|---|---|
| Dependent variable | Log(1+Release/Output $_{t-1}$) | | |
| | Total | On-site | Off-site |
| | (1) | (2) | (3) |
| Post | 0.029* | 0.024 | 0.003 |
| | (0.016) | (0.015) | (0.003) |
| Post × Environment | -0.030** | -0.026** | -0.003 |
| | (0.013) | (0.012) | (0.002) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.61 | 0.61 | 0.77 |
| Observations | 15,558 | 15,558 | 15,558 |

| | **Panel B: Medium of release** | | |
|---|---|---|---|
| Dependent variable | Log(1+Release/Output $_{t-1}$) | | |
| | Stack air | Fugitive air | Surface water discharges |
| | (1) | (2) | (3) |
| Post | 0.008 | 0.000 | -0.001 |
| | (0.005) | (0.000) | (0.001) |
| Post × Environment | -0.011** | -0.000 | 0.000 |
| | (0.004) | (0.000) | (0.001) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.45 | 0.22 | 0.16 |
| Observations | 15,558 | 15,558 | 15,558 |

## TABLE IA4: DOES TARGETING FOR ACTIVISM DRIVE THE REAL EFFECTS?

This table reports results examining the impact on firms targeted for other reasons by the BAP on their release of toxic chemicals. The regressions compare the toxic releases at plants of targeted firms to toxic release at plants of RUSSELL 3000 Index firms in a difference-in-differences empirical setup. The dependent variable is the natural logarithm of one plus the release scaled by previous years' cost of goods sold. The table presents toxic chemical releases by the location of release, i.e., on-site and off-site. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Other reasons* is an indicator variable equal to one if the BAP targets the firm for other reasons not related to climate change or environment, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI).

| Dependent variable | Log(1+Release/COGS $_{t-1}$) | | |
|---|---|---|---|
| | Total | On-site | Off-site |
| | (1) | (2) | (3) |
| Post | -0.034 | -0.004 | -0.029*** |
| | (0.024) | (0.018) | (0.010) |
| Post × Other reasons | 0.008 | 0.021 | -0.014 |
| | (0.028) | (0.024) | (0.011) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.77 | 0.79 | 0.73 |
| Observations | 96,877 | 96,877 | 96,877 |

## TABLE IA5: CHANGES IN CHEMICAL RELEASE AROUND PROXY ACCESS TARGETING

This table reports results examining the impact of targeting firms for proxy access on their release of toxic chemicals. The regressions compare the toxic releases at plants of targeted firms to toxic release at plants of RUSSELL 3000 Index firms in a difference-in-differences empirical setup. We remove all the firms that were targeted by the BAP from this sample. The table presents toxic chemical releases by the location of release, i.e., on-site and off-site. The dependent variable is the natural logarithm of one plus the release scaled by previous years' cost of goods sold. *Post* is an indicator variable equal to one for all years after the target year (pseudo-target year), and zero otherwise. *Proxy access target* is an indicator variable equal to one if the firm is targeted by investors to adopt a proxy access proposal, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI), ISS Shareholder Proposals database, and SEC filings.

| Dependent variable | Log(1+Release/COGS $_{t-1}$) | | |
|---|---|---|---|
| | Total | On-site | Off-site |
| | (1) | (2) | (3) |
| Post | 0.021 | 0.004 | 0.022 |
| | (0.045) | (0.020) | (0.029) |
| Post × Proxy access target | -0.052 | -0.005 | -0.030 |
| | (0.040) | (0.019) | (0.027) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.75 | 0.77 | 0.69 |
| Observations | 146,616 | 146,616 | 146,616 |

## TABLE IA6: ROBUSTNESS TO ALTERNATIVE DEFINTIONS

This table reports the robustness to alternative definitions of the dependent variable. The regressions compare toxic chemical releases at plants of targeted firms to toxic chemical releases at plants of Russell 3000 Index firms in a propensity score matched difference-in-differences empirical setup. Panel A reports results, where the dependent variable is chemical releases aggregated by the medium of release and panel B, reports results where the dependent variable is the share of total chemical release. In panel A, the dependent variable is the natural logarithm of one plus the toxic chemical release scaled by previous years' cost of goods sold and in panel B, the dependent variable is the share ot total chemical release. *Total* is the aggregate across all types of emissions, such as ground, air, and water. *Ground*, consists of waste disposed into underground injection wells, landfills, or spills and leaks released to land. *Air* consists of stack air emissions (e.g., through a vent or duct) and fugitive emissions (e.g., evaporative losses). *Water* consists of releases to streams and other bodies of water. *Post* is an indicator variable equal to one for all years after the activism event year (pseudo-event year), and zero otherwise. *Environment* is an indicator variable equal to one if the BAP targets the firm for environmental reasons, and zero otherwise. All regressions include *Plant* × *Chemical* and *Chemical* × *Year* fixed effects and are estimated using ordinary least squares (OLS). Standard errors are clustered at the firm-year level and are robust to heteroscedasticity. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively. Data source: EPA Toxic Release Inventory (TRI).

| | **Panel A: Aggregated by medium of release** | | | |
|---|---|---|---|---|
| Dependent variable | Log(1+Release/COGS $_{t-1}$) | | | |
| | Total | Air | Ground | Water |
| | (1) | (2) | (3) | (4) |
| Post | 0.003 | 0.014 | 0.000* | 0.001 |
| | (0.043) | (0.018) | (0.000) | (0.001) |
| Post × Environment | -0.050*** | -0.042*** | -0.000 | -0.002*** |
| | (0.019) | (0.009) | (0.000) | (0.001) |
| Plant × Chemical fixed effects | Yes | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes | Yes |
| $R^2$ | 0.82 | 0.80 | 0.62 | 0.72 |
| Observations | 59,983 | 59,983 | 59,983 | 59,983 |

| | **Panel B: Share of total releases** | | |
|---|---|---|---|
| | Air | Ground | Water |
| | (1) | (2) | (3) |
| Post | 0.145*** | 0.000 | 0.006*** |
| | (0.042) | (0.000) | (0.002) |
| Post × Environment | -0.188*** | -0.000 | -0.007*** |
| | (0.039) | (0.000) | (0.002) |
| Plant × Chemical fixed effects | Yes | Yes | Yes |
| Chemical × Year fixed effects | Yes | Yes | Yes |
| $R^2$ | 0.70 | 0.62 | 0.63 |
| Observations | 59,983 | 59,983 | 59,983 |

## Appendix A.1 Excerpts From Sustainability Reports

This table summarizes various ways firms report that they are improving their environmental impact. These are collected from each firm's sustainability reports.

| Company | Action |
|---|---|
| AES Corporation | • The primary reason for a decrease in NOx emissions since 2015 is fuel conversion projects, decommissioning and the sell-down of several fossil fuel-fired units.<br>• Diverse emission reduction projects or low-carbon energy installations were implemented or started implementation for over 1.5 million metric tons of estimated annual CO2e reductions. |
| Chevron Corporation | • We have developed internal country-specific plans to minimize gas flaring, and we are a member of the World Bankled Global Gas Flaring Reduction Partnership.<br>• Chevron flares and vents natural gas for safety and operational purposes and in areas where pipelines or other gas transportation infrastructure and utilization alternatives do not exist. We are working to reduce natural gas flaring and venting and the resulting GHG emissions. |
| ConocoPhillips | • NCG co-injection technology to reduce GHG emissions while reducing operating cost goal to validate technology on commercial scale on full lifecycle reduce GHG 15% in reservoirs affected by thief zones<br>• In 2018, our total gross operated GHG emissions, in CO2 equivalent terms, were approximately 20.3 million tonnes, a decrease of about 1.4%, or 0.3 million tonnes, from 2017 |
| CONSOL Energy Inc. | • Scope 1 emissions related to our current and our former parent companys coal assets have decreased by approximately 50%.<br>• Our scope 2 emissions decreased by 12% compared to 2016 levels, and by 26% compared to 2015 levels |
| Devon Energy Corporation | • We also use green completions to capture produced gas during completions and well workovers following hydraulic fracturing.<br>• Where flaring is unavoidable, we install monitoring equipment to help ensure the gas is properly destroyed rather than vented.<br>• In recent years, Devon has implemented new technologies and upgraded our existing operations to reduce methane emissions from production sites. Since 2011, we've replaced high-bleed natural gas pneumatic controllers on hundreds of wells in Wyoming, Oklahoma, New Mexico, and Texas, and we no longer use them on new wells.<br>• Spill prevention procedures at our facilities with storage tanks include secondary containment, nearly full tank alarms, and offsite monitoring equipment with the ability to shut in facilities remotely. |

| Company | Action |
| --- | --- |
| Duke Energy Corporation | • Since 2005, decreased carbon dioxide (CO2) emissions by 31 percent, sulfur dioxide emissions by 96 percent and nitrogen oxides emissions by 74 percent. |
| EOG Resources | • Reduced our methane intensity rate and our methane emissions as a percentage of our natural gas produced in 2018 by 46 percent and 45 percent<br>• In 2018, our GHG intensity rate slightly increased by 1 percent, primarily due to increased operational activity and an increase in our emissions intensity associated with combustion sources. |
| EQT Corporation | • Our total energy consumption across facilities was 49,277 GJ, a 5% decrease from 2016. Our direct energy usage in 2017 totaled 18,905 GJ and was primarily generated by natural gas<br>• In 2017, 100% of EQTs completions operations were flare-less and we used green completions technology for 100% of completed wells. |
| Freeport-McMoRan Copper & Gold Inc. | • FMCs total GHG emissions in 2018 were 4.9 million metric tons compared to 5 million metric tons the year prior. |
| Hess Corporation | • We have reduced our absolute Scope 1 and 2 equity emissions from 10.8 million tonnes of CO2e to 3.9 million tonnes, or 64 percent<br>• On an intensity basis, we have reduced our cumulative flaring intensity by 41 percent through 2018, compared with our 2014 baseline. While our flaring intensity remained essentially flat between 2017 and 2018, we are still on track to achieve our 50 percent reduction target by 2020.<br>• The number of non-hydrocarbon spills decreased by 9 percent in 2018 compared with 2017, and the volume of spills decreased by 80 percent. |
| Marathon Oil Corporation | • Over the last five years, our methane emissions intensity has declined by 31%, largely due to our internal goal of eliminating the routine use of high-bleed pneumatic controllers, which we met ahead of schedule.<br>• Recorded a global spill volume reduction of 8%. |

| Company | Action |
| --- | --- |
| Noble Energy, Inc. | • Our global direct greenhouse gas emissions decreased by 6.4 percent year over year in 2018.<br>• Methane intensity (total methane emitted expressed as a percentage of natural gas production) decreased in 2018 as a result of divesting Gulf of Mexico and Southwest Royalties assets as well as operational improvements. Intensity was 0.09 percent compared to 0.13 percent in 2017. |
| Occidental Petroleum Corporation | • Using the most recent data, from 2016 to 2017, Occidentals sum of direct and indirect GHG emissions (Scope 1 + Scope 2) decreased more than 3 percent year-over-year (16.0 to 15.5 million tonnes CO2e).The decrease in combined Scope 1 and 2 emissions was primarily due to decreases in CO2e emissions associated with our chemical segments power consumption.<br>• From 2016 to 2018, Occidental reduced gas flaring emissions intensity by approximately 17 percent at its EOR plants in the Permian Basin. |
| Pioneer Natural Resources Co. | • Our vapor recovery strategy allows Pioneer to capture potential facility emissions and recover these high-value gases as part of our product offerings.<br>• Pioneer is testing two innovative approaches to monitoring methane emissions in its operations: 1) aerial methane monitoring, which provides field-wide survey capabilities, and 2) continuous methane monitoring, which detects leaks at the facility level. |
| PPL Corporation | • As part of LG&E and KU's ongoing emissions reduction efforts, the companies use GPS and fleet monitoring software to control idling and optimize routes for their vehicle fleet. The utilities continue to seek out opportunities to use plugin hybrid electric vehicles when costs are favorable. Since 2015, PPL Electric has been working to reduce Sulfur Hexafluoride (SF6) gas emission through predictive analytics. |
| Southern Company | • Without any regulatory mandates, our systems total annual GHG emissions in 2018 of 102 million metric tons of CO2 equivalent (CO2e), were approximately 35 percent (54 million metric tons) lower than 2007 levels<br>• We have mitigated more than 3.3 million metric tons of CO2e from the atmosphere. These reductions are the result of aggressive investment in programs like those targeting pipeline replacement to improve the safety and performance of our natural gas system. |

## Appendix A.2 BAP and Proxy Access

Institutional investors have long called for the ability to nominate directors to the corporate ballot—proxy access—but have historically faced opposition (Funds (2015)). The Securities and Exchange Commission (SEC) approved a universal proxy access rule (Exchange Act Rule 14a-11) in August 2010. This rule was to allow shareholders holding greater than 3% of a firm's outstanding shares for more than three years, collectively, to nominate board candidates via the firm's proxy materials.

In 2011, the U.S. Court of Appeals overturned this rule, saying that the SEC had acted "arbitrarily and capriciously". Although the Court of Appeals vacated this new rule on procedural grounds, it did not vacate a provision within the Dodd-Frank Financial Reform Act, enabling shareholders to start requesting proxy access mechanisms through shareholder resolutions (Holly Gregory and Holland (2019)).

Against this backdrop, many institutional investors did not resort to proxy access as a means of external governance and instead preferred voting to raise their concerns. Before 2015, only 15 U.S. companies had adopted proxy access. This number saw a significant increase after 2015, when the NYC Comptroller and the NYCPS launched their Boardroom Accountability Project (BAP), which targeted a set of firms in their portfolio. By the end of 2018, more than 150 targeted firms had adopted a proxy access bylaw. As of 2019, most of S&P 500 companies had adopted them too, some voluntarily, and others as a result of shareholder resolutions.

Starting in 2014, the Boardroom Accountability Project was led by the NYCPS. The BAP brought together influential investors, including California Public Employees Retirement System (CalPERS) and California Teachers Retirement System (CalSTRS), with total assets under management exceeding $650 billion. The proxy access proposals submitted by the Comptroller closely mirrored the rules previously enacted by the SEC.

The BAP submitted proxy access proposals requesting new bylaws that permitted shareholders who collectively held 3 percent of the company for at least three years to nominate up to 25 percent of the board using the company's proxy materials. Using these proxy access proposals over several years, the BAP pursued very specific social mandates, and we focus on firms that were targeted by the BAP to reduce their environmental impact.