The Real Effects of Environmental Activist Investing

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- *Environmental activism* is shareholders engaging with management about environmental impact of their firm.
- Environmental activism is growing.
- What are the real effects of environmental activism on targeted firms and their environmental impacts?

Approach

- Naaraayanan et al (2021) evaluates the effects of the Boardroom Accountability Project (BAP).

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- They use a difference-in-differences specification to estimate the effectiveness of climate-focused engagements.

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- Due to improved abatement initiatives - not reduced production.
- Abatement hurts the target firms' financial performance.

Related Literature

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- This paper fills gap on how shareholders can influence corporate environmental behavior, impacts on local populations, and implications on financial performance.

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- These proposals posed a credible threat that long-term shareholders could nominate directors to the boards.
- Naaraayanan et al (2021) focus on firms targeted based on environmental reasons.

Data

Description	**Source**
Targeted firms	BAP
Standard firm-level data	Compustat, CRSP, ISS, ASSET4
Plant-level emissions data	TRI and GHGRP from EPA
Plant ownership	FOIA request
Local pollutant intensity	RSEI from EPA
Outdoor air quality	AQS
Plant-level electric output	EIA

Target Selection

Estimate probability of selection as target firm using logit regression:

$$P(Environment_i) = \Lambda(\beta_1 \mathbb{1}(FossilFree_i) + \beta_2 Firm\ Size_{i,t-1} + \beta_3 Market\ to\ Book_{i,t-1} + \beta_4 Returns_{i,t-1} + \beta_5 Profitability_{i,t-1} + \beta_6 Institutional\ Ownership_{i,t-1} + \beta_7 ASSET4\ Score_{i,t-1})$$

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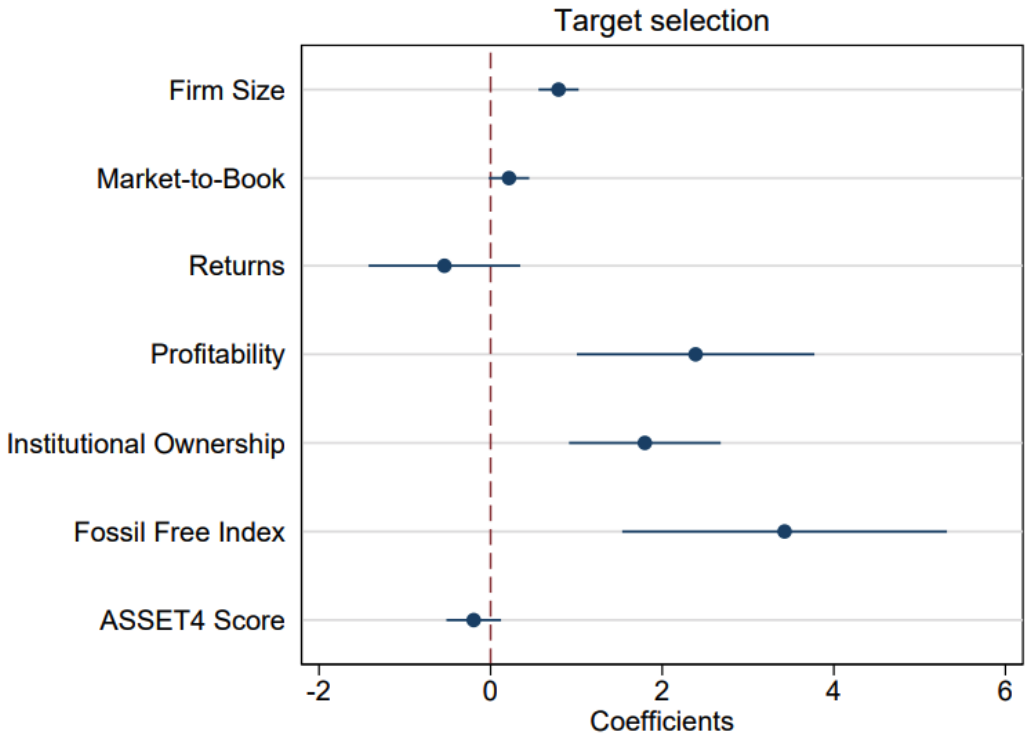
- $ASSET4\ Score_{i,t}$ is environmental rating by Thomson Reuters

Target Selection Results



Propensity Score Matching

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- Within industry matching controls for aggregate industry-level trends (e.g., changes in oil prices).

Difference-in-Differences Specification

Use difference-in-differences specification to compare plants of targeted firms to plants of a matched control firm:

$$Y_{i,c,t} = \beta_1 \mathbb{1}(Post_{i,t}) + \beta_2 \mathbb{1}(Post_{i,t}) \mathbb{1}(Environment_i) + \delta_{i,c} + \delta_{c,t} + \varepsilon_{i,c,t}$$

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$\implies$ β_2 is coefficient of interest.

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- $\delta_{i,c}$ and $\delta_{c,t}$ are plant-chemical and chemical-time FEs, respectively.

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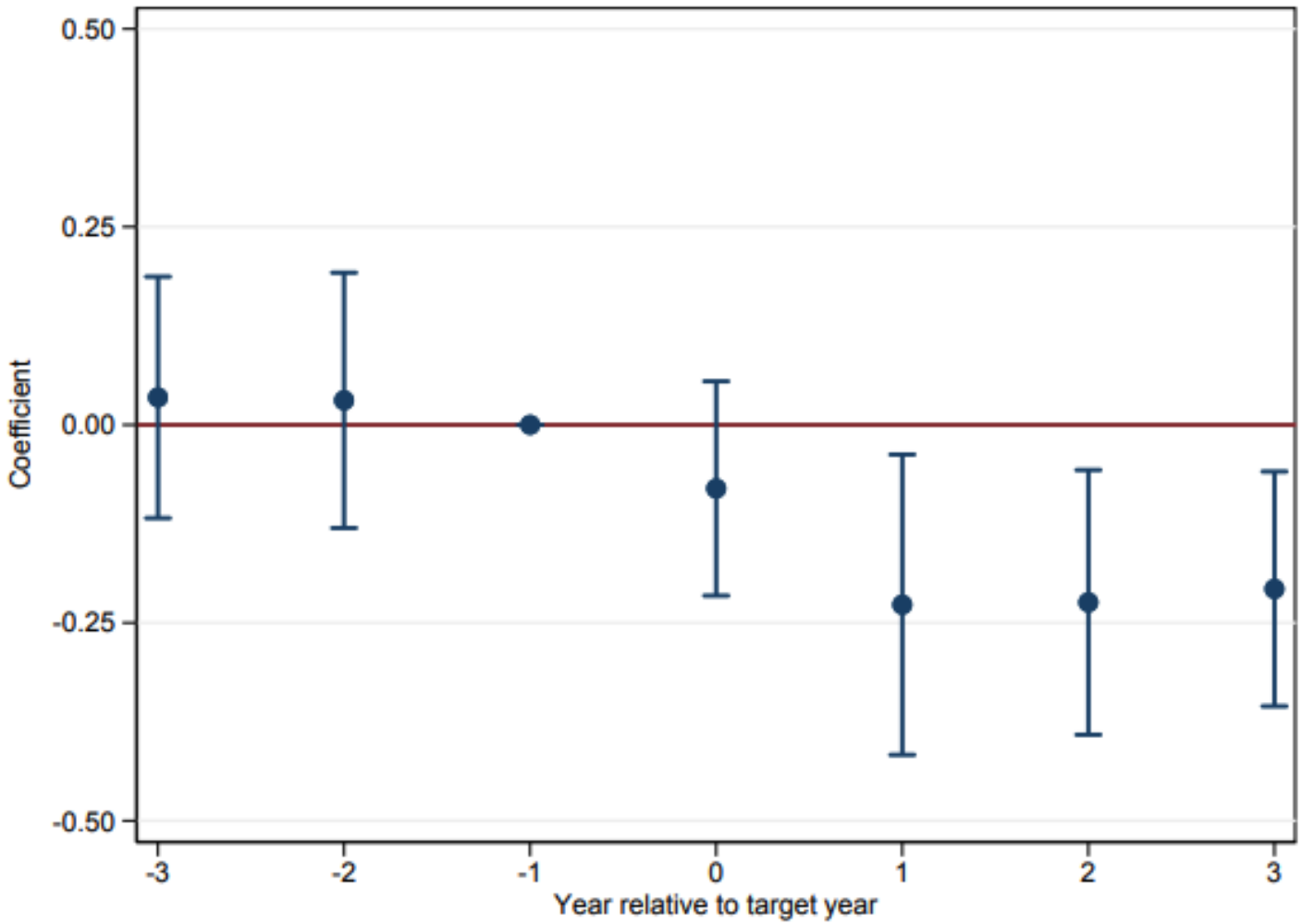
Reduction in Toxic Chemical Release

$$Y_{i,c,t} \equiv \log\left(1 + \frac{Emission_{i,c,t}}{COGS_{i,t}}\right)$$



Reduction in Toxic Chemical Release

Dependent variable	Panel A: Toxic chemical release		
	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

This estimate represents a decrease of 13 % relative to the sample mean emission.

Reduction in Pollution

Results generally hold across types of pollutants:

- β_2 is negative for total and on-site chemical release and insignificant for off-site. No evidence of moving chemicals off-site.

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- β_2 is negative for most GHG emissions (methane and nitrous oxide; insignificant for carbon dioxide).

Reduction in Negative Environmental Externalities

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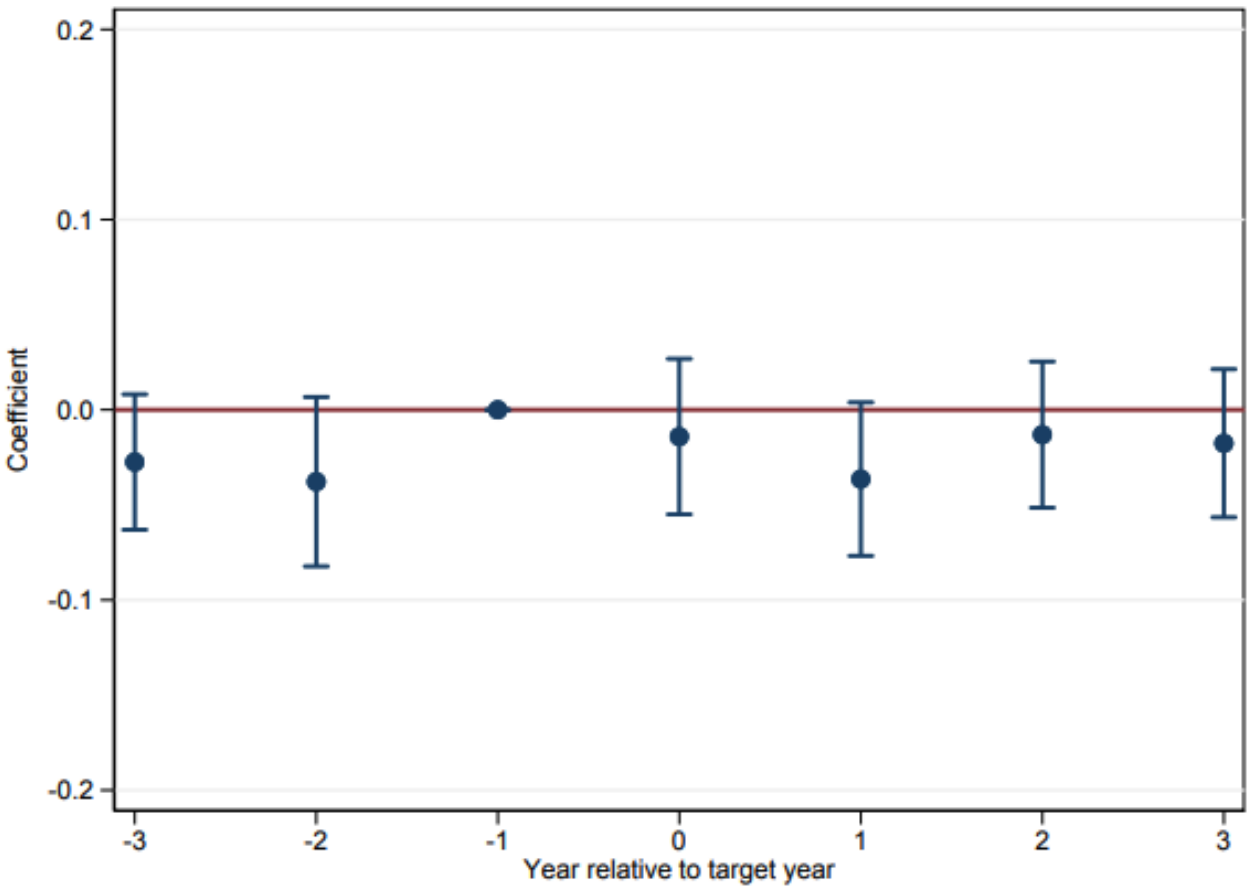
- Evidence that reductions near population centers are significant.

How are firms reducing pollution?

No evidence of firms reducing production.



Dependent variable is usage of chemical c in t relative to usage of chemical c in first year of the sample.

How are firms reducing pollution?

Firms increased abatement efforts.

	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

These estimates represent a 30% increase in abatement initiatives relative to the sample mean.

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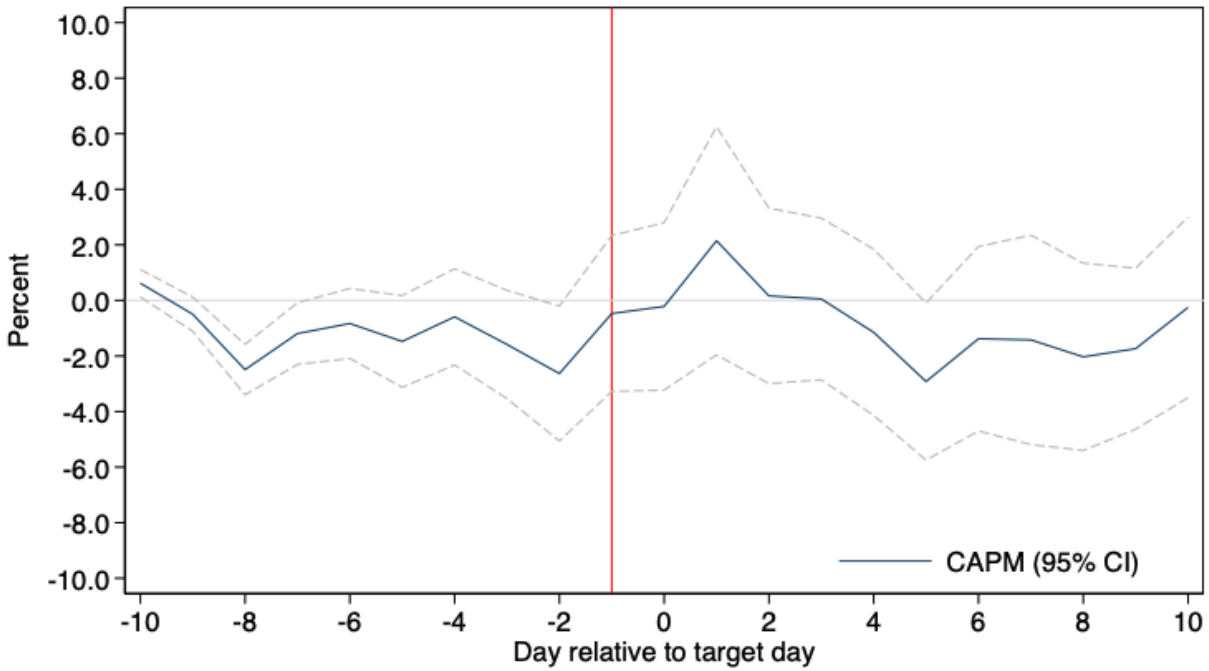
- Negative relationship between environmental improvements and financial performance.

Neutral Equity Response

No change in cumulative abnormal returns around announcement date.



Interpretation: Investor perceive the benefit of increased sustainability balance the higher costs.

Negative Financial Performance

Targeted firms saw

- Lower return on assets

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

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- Robustness: Try synthetic control instead of propensity score matching.

Weaknesses (con't)

- Some skepticism about applicability of propensity score matching.

	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

$$Median(\log(1 + Release/COGS)) = 0$$
$$\implies Median(Release) = 0$$
$$\implies \text{Half the sample has no emissions}$$

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- Summary statistics from appendix:

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- How to evaluate net benefits of environmental activism?
- How to think about agency conflicts regarding environmental impacts between shareholders and management?
- What are the impacts on firms targeted for non-environment reason by the BAP?
  - E.g. Did board diversity change at firms targeted for a lack of diversity?