The Real Effects of Environmental Activist Investing

S. Lakshmi Naaraayanan (LBS), Kunal Sachdeva (Rice),
Varun Sharma (LBS)
2021 SFS North American Cavalcade

Alex von Hafften

UW-Madison

February 8, 2022

Motivation

- Firms can create negative externalities through environmental impacts.

Motivation

- Firms can create negative externalities through environmental impacts.
  - (e.g., toxic chemical release, production emissions, GHG emissions)

Motivation

- Firms can create negative externalities through environmental impacts.
  - (e.g., toxic chemical release, production emissions, GHG emissions)

- *Environmental activism* is shareholders engaging with management about environmental impact of their firm.

Motivation

- Firms can create negative externalities through environmental impacts.
  - (e.g., toxic chemical release, production emissions, GHG emissions)

- *Environmental activism* is shareholders engaging with management about environmental impact of their firm.

- Environmental activism is growing.

Motivation

- Firms can create negative externalities through environmental impacts.
    - (e.g., toxic chemical release, production emissions, GHG emissions)

- *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).

Approach

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

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

Main Results

- Targeted firms reduced emissions.

Main Results

- Targeted firms reduced emissions.
    - Reduce toxic chemical release by average of 13%.

Main Results

- Targeted firms reduced emissions.
    - Reduce toxic chemical release by average of 13%.

- Reduced negative externalities on local populations.

Main Results

- Targeted firms reduced emissions.
  - Reduce toxic chemical release by average of 13%.

- Reduced negative externalities on local populations.

- Due to improved abatement initiatives - not reduced production.

Main Results

- Targeted firms reduced emissions.
  - Reduce toxic chemical release by average of 13%.

- Reduced negative externalities on local populations.

- Due to improved abatement initiatives - not reduced production.

- Abatement hurts the target firms' financial performance.

Related Literature

- Mature literature on shareholder activism affecting corporate governance, financial performance, and operational performance.

Related Literature

- Mature literature on shareholder activism affecting corporate governance, financial performance, and operational performance.
    - Nesbitt (1994), Smith (1996), Wahal (1996), Huson (1997), Carleton, Nelson, and Weisbach (1998), Del Guercio and Hawkins (1999).

Related Literature

- Mature literature on shareholder activism affecting corporate governance, financial performance, and operational performance.
  - Nesbitt (1994), Smith (1996), Wahal (1996), Huson (1997), Carleton, Nelson, and Weisbach (1998), Del Guercio and Hawkins (1999).

- Growing literature on investor preferences for socially responsible investments.

Related Literature

- Mature literature on shareholder activism affecting corporate governance, financial performance, and operational performance.
  - Nesbitt (1994), Smith (1996), Wahal (1996), Huson (1997), Carleton, Nelson, and Weisbach (1998), Del Guercio and Hawkins (1999).

- Growing literature on investor preferences for socially responsible investments.
  - Atta-Darkua and Dimson (2019), Becht et al (2019), Broccardo et al (2020), Chowdry et al (2018), Hart and Zingales (2017), Morgan and Tumlinson (2019), Oehmke and Opp (2020).

Related Literature

- Mature literature on shareholder activism affecting corporate governance, financial performance, and operational performance.
  - Nesbitt (1994), Smith (1996), Wahal (1996), Huson (1997), Carleton, Nelson, and Weisbach (1998), Del Guercio and Hawkins (1999).

- Growing literature on investor preferences for socially responsible investments.
  - Atta-Darkua and Dimson (2019), Becht et al (2019), Broccardo et al (2020), Chowdry et al (2018), Hart and Zingales (2017), Morgan and Tumlinson (2019), Oehmke and Opp (2020).

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

Boardroom Accountability Project (BAP)

- The New York City Pension System initiated BAP on November 4th, 2014.

Boardroom Accountability Project (BAP)

- The New York City Pension System initiated BAP on November 4th, 2014.

- Goal was to hold corporate boards of portfolio companies more accountable to long-term shareholders about certain issues.

Boardroom Accountability Project (BAP)

- The New York City Pension System initiated BAP on November 4th, 2014.

- Goal was to hold corporate boards of portfolio companies more accountable to long-term shareholders about certain issues.
  - Board diversity, climate change risks, employee treatment, and excessive CEO pay.

Boardroom Accountability Project (BAP)

- The New York City Pension System initiated BAP on November 4th, 2014.

- Goal was to hold corporate boards of portfolio companies more accountable to long-term shareholders about certain issues.
  - Board diversity, climate change risks, employee treatment, and excessive CEO pay.

- Without prior announcement, BAP submitted proposals requesting proxy access bylaws be added to targeted firms' corporate charters.

Boardroom Accountability Project (BAP)

- The New York City Pension System initiated BAP on November 4th, 2014.

- Goal was to hold corporate boards of portfolio companies more accountable to long-term shareholders about certain issues.
  - Board diversity, climate change risks, employee treatment, and excessive CEO pay.

- Without prior announcement, BAP submitted proposals requesting proxy access bylaws be added to targeted firms' corporate charters.

- These proposals posed a credible threat that long-term shareholders could nominate directors to the boards.

Boardroom Accountability Project (BAP)

- The New York City Pension System initiated BAP on November 4th, 2014.

- Goal was to hold corporate boards of portfolio companies more accountable to long-term shareholders about certain issues.
  - Board diversity, climate change risks, employee treatment, and excessive CEO pay.

- Without prior announcement, BAP submitted proposals requesting proxy access bylaws be added to targeted firms' corporate charters.

- 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:

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

- $\mathbb{1}(Environment_i)$ equals one if the BAP targets firm i.

Target Selection

Estimate probability of selection as target firm using logit regression:

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

- $\mathbb{1}(Environment_i)$ equals one if the BAP targets firm i.
- $\mathbb{1}(FossilFree_i)$ equals one if firm i within top 100 coal and top 100 oil and gas publicly traded reserve holders.

Target Selection

Estimate probability of selection as target firm using logit regression:

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

- $\mathbb{1}(Environment_i)$ equals one if the BAP targets firm i.
- $\mathbb{1}(FossilFree_i)$ equals one if firm i within top 100 coal and top 100 oil and gas publicly traded reserve holders.
- $Firm\ Size_{i,t}$ is log book asset of firm i in year t.

Target Selection

Estimate probability of selection as target firm using logit regression:

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

- $\mathbb{1}(Environment_i)$ equals one if the BAP targets firm i.
- $\mathbb{1}(FossilFree_i)$ equals one if firm i within top 100 coal and top 100 oil and gas publicly traded reserve holders.
- $Firm\ Size_{i,t}$ is log book asset of firm i in year t.
- $Market\ to\ Book_{i,t}$ is market equity plus book debt over book assets.

Target Selection

Estimate probability of selection as target firm using logit regression:

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

- $\mathbb{1}(Environment_i)$ equals one if the BAP targets firm i.
- $\mathbb{1}(FossilFree_i)$ equals one if firm i within top 100 coal and top 100 oil and gas publicly traded reserve holders.
- $Firm\ Size_{i,t}$ is log book asset of firm i in year t.
- $Market\ to\ Book_{i,t}$ is market equity plus book debt over book assets.
- $Returns_{i,t}$ is stock return in past 12 months.

Target Selection

Estimate probability of selection as target firm using logit regression:

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

- $\mathbb{1}(Environment_i)$ equals one if the BAP targets firm i.
- $\mathbb{1}(FossilFree_i)$ equals one if firm i within top 100 coal and top 100 oil and gas publicly traded reserve holders.
- $Firm\ Size_{i,t}$ is log book asset of firm i in year t.
- $Market\ to\ Book_{i,t}$ is market equity plus book debt over book assets.
- $Returns_{i,t}$ is stock return in past 12 months.
- $Profitability_{i,t}$ is EBITDA over sales.

Target Selection

Estimate probability of selection as target firm using logit regression:

$$P(\text{Environment}_i) = \Lambda(\beta_1 \mathbb{1}(\text{FossilFree}_i) + \beta_2 \text{Firm Size}_{i,t-1}$$
$$+ \beta_3 \text{Market to Book}_{i,t-1} + \beta_4 \text{Returns}_{i,t-1}$$
$$+ \beta_5 \text{Profitability}_{i,t-1} + \beta_6 \text{Institutional Ownership}_{i,t-1}$$
$$+ \beta_7 \text{ASSET4 Score}_{i,t-1})$$

- $\mathbb{1}(\text{Environment}_i)$ equals one if the BAP targets firm i.
- $\mathbb{1}(\text{FossilFree}_i)$ equals one if firm i within top 100 coal and top 100 oil and gas publicly traded reserve holders.
- $\text{Firm Size}_{i,t}$ is log book asset of firm i in year t.
- $\text{Market to Book}_{i,t}$ is market equity plus book debt over book assets.
- $\text{Returns}_{i,t}$ is stock return in past 12 months.
- $\text{Profitability}_{i,t}$ is EBITDA over sales.
- $\text{Institutional Ownership}_{i,t}$ is % of shares held by institutional investors.

Target Selection

Estimate probability of selection as target firm using logit regression:

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

- $\mathbb{1}(Environment_i)$ equals one if the BAP targets firm i.
- $\mathbb{1}(FossilFree_i)$ equals one if firm i within top 100 coal and top 100 oil and gas publicly traded reserve holders.
- $Firm\ Size_{i,t}$ is log book asset of firm i in year t.
- $Market\ to\ Book_{i,t}$ is market equity plus book debt over book assets.
- $Returns_{i,t}$ is stock return in past 12 months.
- $Profitability_{i,t}$ is EBITDA over sales.
- $Institutional\ Ownership_{i,t}$ is % of shares held by institutional investors.
- $ASSET4\ Score_{i,t}$ is environmental rating by Thomson Reuters

Target Selection Results
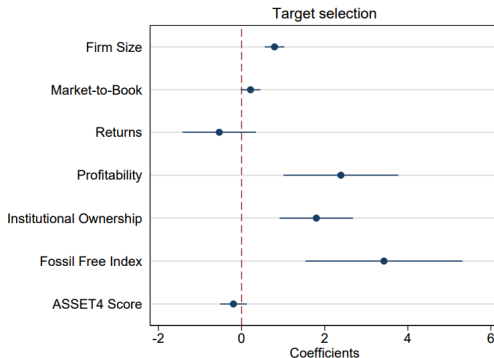
Target selection

Propensity Score Matching

- Estimate propensity of being targeted by BAP from logit regression.

Propensity Score Matching

- Estimate propensity of being targeted by BAP from logit regression.

- Match each targeted firm in industry j and year t with the untargeted firm in industry j and year t with the closest propensity score.

Propensity Score Matching

- Estimate propensity of being targeted by BAP from logit regression.

- Match each targeted firm in industry j and year t with the untargeted firm in industry j and year t with the closest propensity score.

- 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:

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

- $Y_{i,c,t}$ is the outcome associated with chemical or gas c emitted by a plant i at time t.

$\implies \beta_2$ is coefficient of interest.

Difference-in-Differences Specification

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

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

- $Y_{i,c,t}$ is the outcome associated with chemical or gas c emitted by a plant i at time t.
- $\mathbb{1}(Post_{i,t})$ equals one for plant-years following BAP targeting.

$\implies \beta_2$ is coefficient of interest.

Difference-in-Differences Specification

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

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

- $Y_{i,c,t}$ is the outcome associated with chemical or gas c emitted by a plant i at time t.
- $\mathbb{1}(Post_{i,t})$ equals one for plant-years following BAP targeting.
- $\mathbb{1}(Environment_i)$ equals one if the BAP targets the firm.

$\implies \beta_2$ is coefficient of interest.

Difference-in-Differences Specification

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

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

- $Y_{i,c,t}$ is the outcome associated with chemical or gas c emitted by a plant i at time t.
- $\mathbb{1}(Post_{i,t})$ equals one for plant-years following BAP targeting.
- $\mathbb{1}(Environment_i)$ equals one if the BAP targets the firm.
- $\delta_{i,c}$ and $\delta_{c,t}$ are plant-chemical and chemical-time FEs, respectively.

$\implies \beta_2$ is coefficient of interest.

Reduction in Toxic Chemical Release

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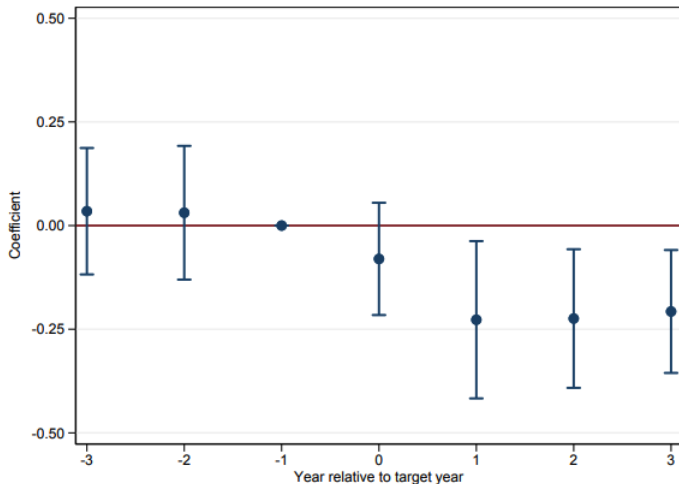
Reduction in Toxic Chemical Release

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.

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.

- β_2 is negative for stack air (intended release), fugitive emissions (leaks), and surface water discharges.

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.

- β_2 is negative for stack air (intended release), fugitive emissions (leaks), and surface water discharges.

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

Reduction in Negative Environmental Externalities

- Fewer emissions of chemical associated with respiratory, developmental, nervous system, hematologic (blood-related), and hepatic (liver-related) damage to humans.

Reduction in Negative Environmental Externalities

- Fewer emissions of chemical associated with respiratory, developmental, nervous system, hematologic (blood-related), and hepatic (liver-related) damage to humans.

- Improvements in air quality (less ozone, sulfur dioxide and particulate matter) around plants.

# Reduction in Negative Environmental Externalities

- Fewer emissions of chemical associated with respiratory, developmental, nervous system, hematologic (blood-related), and hepatic (liver-related) damage to humans.

- Improvements in air quality (less ozone, sulfur dioxide and particulate matter) around plants.

- Evidence that reductions near population centers are significant.

How are firms reducing pollution?

No evidence of firms reducing production.
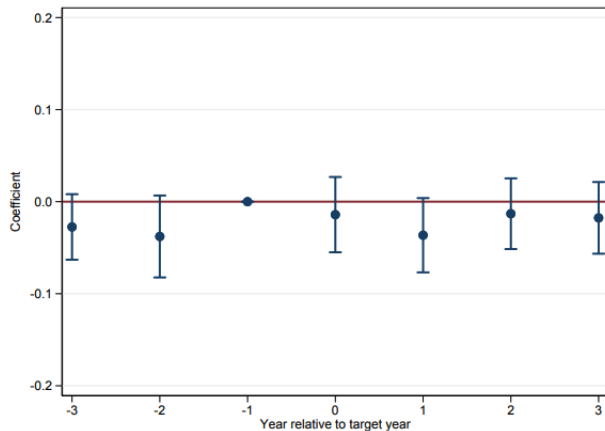
Dependent variable is usage of chemical c in t relative to usage of chemical c in first year of the sample.

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.

Do the increased abatement costs potential financial benefits in the short-run?

Naaraayanan et al (2021) document two financial outcomes for firms targeted by BAP.

- Neutral equity response.

Do the increased abatement costs potential financial benefits in the short-run?

Naaraayanan et al (2021) document two financial outcomes for firms targeted by BAP.

- Neutral equity response.
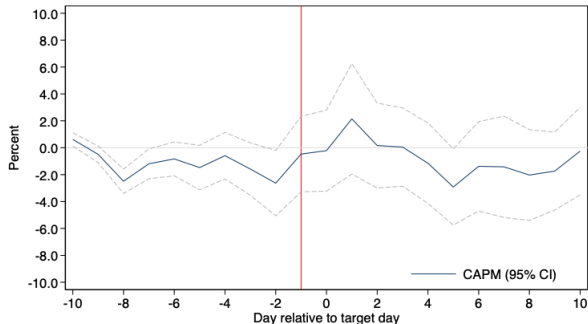- Negative relationship between environmental improvements and financial performance.

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	

Negative Financial Performance

Targeted firms saw

- Lower return on assets
- Lower profitability (proxy for financial performance)

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

Negative Financial Performance

Targeted firms saw

- Lower return on assets
- Lower profitability (proxy for financial performance)
- No change to Z-score (proxy for distress risk)

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

Weaknesses

- Their approach estimates the treatment effect on the treated.

Weaknesses

- Their approach estimates the treatment effect on the treated.

- They discuss effects on "local economies" a lot, but they're focus is pollution effects on local populations. Not evaulating at local economic outcome...

Weaknesses

- Their approach estimates the treatment effect on the treated.

- They discuss effects on "local economies" a lot, but they're focus is pollution effects on local populations. Not evaualing at local economic outcome...

- Need model to evaluate the net benefits (how to evaluate non-pecuniary benefits).

Weaknesses

- Their approach estimates the treatment effect on the treated.

- They discuss effects on "local economies" a lot, but they're focus is pollution effects on local populations. Not evaualing at local economic outcome...

- Need model to evaluate the net benefits (how to evaluate non-pecuniary benefits).

- 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

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

Weaknesses (con't)

- Some skepticism about applicability of propensity score matching.

- Summary statistics from appendix:

	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

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

New Questions

- All results (pollution, financial performance) are all short-term. What are longer-term effects?

New Questions

- All results (pollution, financial performance) are all short-term. What are longer-term effects?

- How to evaluate net benefits of environmental activism?

New Questions

- All results (pollution, financial performance) are all short-term. What are longer-term effects?

- How to evaluate net benefits of environmental activism?

- How to think about agency conflicts regarding environmental impacts between shareholders and management?

New Questions

- All results (pollution, financial performance) are all short-term. What are longer-term effects?

- 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?

New Questions

- All results (pollution, financial performance) are all short-term. What are longer-term effects?

- 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?