Divestment or Engagement: The Effect of Green Investors on Corporate Carbon Emissions

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✳ Divestment works: $\beta > 0$

✳ Engagement works: $\beta < 0$

✳ Neither works: $\beta = 0$

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❒ How to measure green ownership?

❒ We focus on an important class of investors: public pension funds.
  ❊ Public pensions control a significant amount of capital, $5.6 trillion in assets by one measure.

❒ pension funds' preferences concerning carbon emissions can be proxied by the political party that controls the fund.
  ❊ Democrats more favorable toward decarbonization than Republicans.

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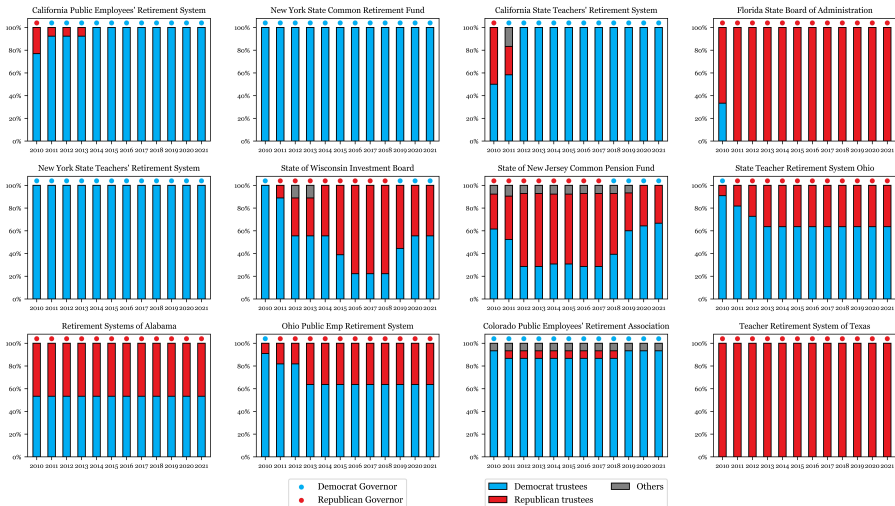 ① Governor of the state.
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② How to identify causal effects? Endogenous portfolio selection?

$$Emissions_{i,t+1} = \alpha + \beta \cdot Green\ Ownership_{i,t} + e_{i,t}$$

Consider: *Firm A is determined to go green regardless of green ownership. CalPERS choose to hold more of firm A.*

❒ CalPERS holds 10% of Firm A's outstanding shares.

❒ CalPERS holds 5% of Firm B's outstanding shares.

Solution: exogenous shock to CalPERS' ownership that is unrelated to emission.

❒ Suppose in 2010, CalPERS get richer, 10% → 11% for Firm A.

❒ Suppose in 2015, CalPERS get poorer, 10% → 9% for Firm A.

Shock: Return of CalPERS's non-equity investment (i.e., private equity, fixed income, real estate, hedge fund, and commodities).

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Aggregate green ownership to the company-year level

❑ The pension holding data we acquire (from 13F) is at the fund-company-quarter level.

❑ For yearly level holding, we take the average of the four quarters.

❑ To aggregate ownership to the company-year level.

$$\%green_{i,y} = \frac{\sum_f shares_{i,f,y} \cdot DEM\ governor_{f,y}}{outstanding\ shares_{i,y}}$$

❋ The numerator is essentially the total number of shares held by green pension funds.

❋ We can replace $DEM\ governor_{f,y}$ with $(DEM\ Trustee\ Ratio)_{f,y}$ if we want to use pensions' board of trustees instead of governors as the greenness measure.

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❒ Inclusion restriction:
  ⁕ pensions have target asset allocation ratios.
  ⁕ If a pension has a very good year in its private equity, then it will rebalance more assets into its public equity.

Asset Class	PERF A	PERF B	PERF C	LRF	JRF	JRF II
Public Equity	50%	50%	50%	22%	—	52%
Private Equity	8%	8%	8%	—	—	—
Fixed Income	28%	28%	28%	49%	—	32%
Real Assets	13%	13%	13%	—	—	—
Liquidity	1%	1%	1%	—	100%	—
Inflation	—	—	—	16%	—	5%
REITs	—	—	—	8%	—	8%
Commodities	—	—	—	5%	—	3%
Total	100%	100%	100%	100%	100%	100%

(CalPERS 2021)

First stage Regressions

❏ The first stage regression is at the fund-firm-year level.

$$\%\Delta shares_{f,i,y+1} = \beta_0 + \beta_1 \cdot RET\_OTHER_{f,t} + \varepsilon_{f,i,y}$$

	(1)	(2)	(3)
Return on other investments	1.30***	2.98***	2.45***
	(0.34)	(0.37)	(0.35)
Constant	0.20***		
	(0.01)		
F-stats	14.8	64.1	49.6
Observations	49,991	49,991	49,726
Fixed Effects	None	Year	Year×Company

❏ Interpretation: A one percentage point increase in a pension's return
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$$\%\Delta emission_{i,t+s} = \beta_1 \cdot \%\widehat{green}_{i,t} + \beta_2 \cdot \%\widehat{nongreen}_{i,t} + \gamma_i + \gamma_t + e_{i,t}$$

| | (1) | (2) | (3) | (4) |
	One year	Two years	Three years	Four years
$\%\widehat{green}_{i,t}$	-3.03***	-3.89***	-5.45***	-5.33***
	(0.83)	(1.10)	(1.39)	(1.66)
$\%\widehat{nongreen}_{i,t}$	1.69	1.76	-0.88	-2.17
	(1.19)	(1.76)	(2.27)	(3.03)
N	25,749	21,986	18,423	15,201
Clusters	2,990	2,642	2,309	1,996

Results are robust to:

☐ $\Delta emission_{i,t+s}$: change in levels. $\Delta emission_{i,t+s}$ as a dummy variable.

☐ Year fixed effect only. No fixed effects.

☐ Non-instrumented ownership.

☐ Green fund defined by party of governor, or textual measure in annual reports.

☐ Standard errors clustered at the company level. Bootstrapping SE.

Main Result: Effect of Green Ownership on GHG Emissions

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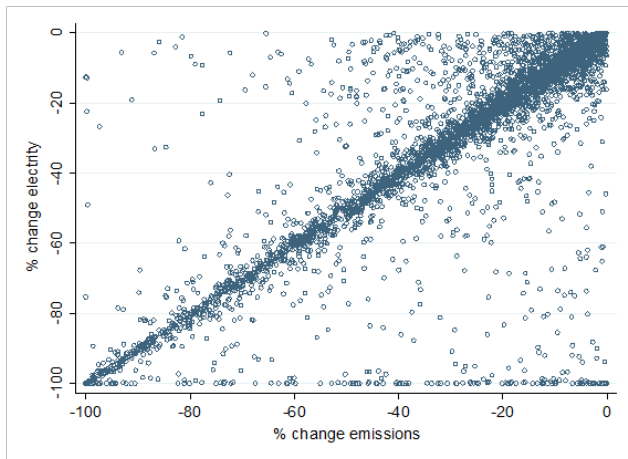- ❐ Standard errors clustered at the company level. Bootstrapping SE.

How do companies achieve decarbonization?

① **Scale and Composition.** Companies cut output in response to investor pressure.

   ❋ We can test this hypothesis by using a sub-sample of facilitates that produce electricity.

② **Technique.** Introducing new technologies such as carbon capture.

   ❋ We can look at whether the number of green patents increases.

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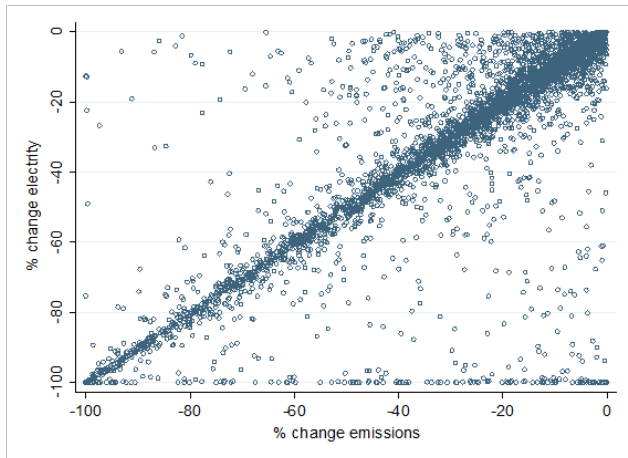
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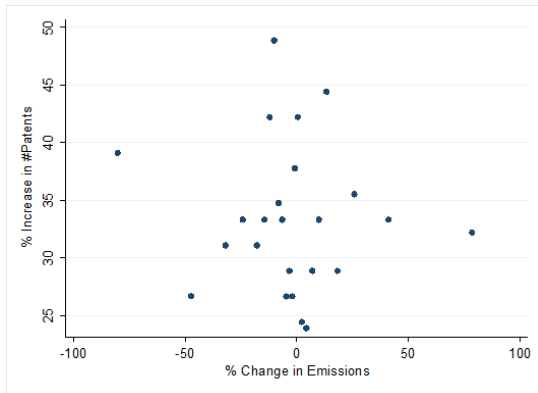
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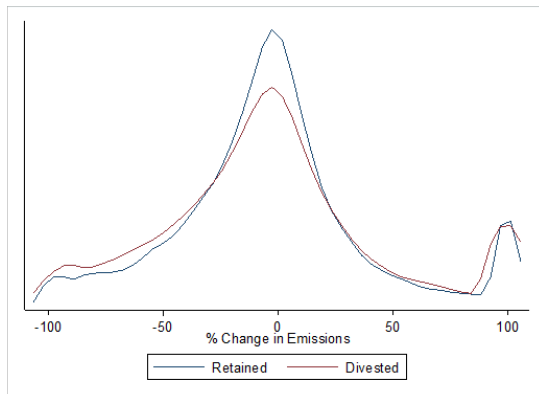   adaptation against climate change."
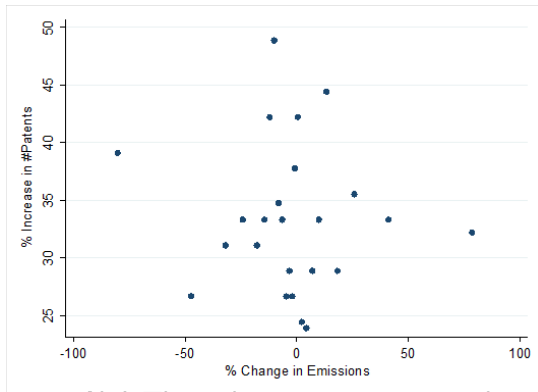
■ So the answer is No! The reduction in emissions does not come from
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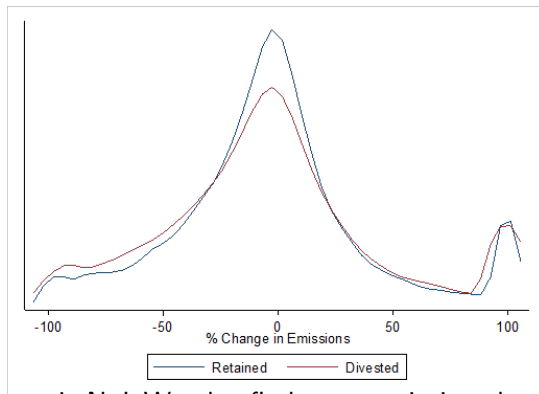
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■ So the answer is No! We also find no associations between green ownership and divesting.

① **Scale and Composition.** Companies cut output.

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Summary of Evidence:

❑ Reduction in electricity output tracked emission reductions almost one-to-one on average.

❑ No evidence that companies with more green owners were more likely to file green patents.

❑ Little evidence of greenwashing. No evidence of switching to other toxic chemicals.

➡ Companies cut their emissions mainly by reducing output.

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① **Responsive managers.** Corporate managers seek to maximize investor utility (Hart and Zingales, 2017).

② **Pressure.** Investors apply pressure by voting against uncooperative managers and supporting shareholder proposals.

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Evidence:

❑ Bigger effect of green ownership from *active* than *nonactive* funds.

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- ❒ Engagement works; divestment is counterproductive.
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- ❒ Engagement works because of "persuasive" engagement by green investors, not so much through adversarial actions.

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