

Do Firm-level Climate Change Risks Drive Firm Political Actions in Climate Change?

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Motivation

An intra-industry split on firms' actions in climate politics?



Takeaways

- ⇒ Significant within-industry firm-level climate exposure driving various political actions
 - Overall climate change exposure
 - Regulation exposure
 - Opportunity exposure
 - Physical exposure

Takeaways

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	Lobby	Coalition Favoring/Opposing	Donation
Overall climate change exposure			
Regulation exposure			
Opportunity exposure			
Physical exposure			

Takeaways

- ⇒ Significant within-industry firm-level climate exposure driving various political actions

	Lobby	Coalition Favoring/Opposing	Donation
Overall climate change exposure	+	× / +	×
Regulation exposure	+	× / +	×
Opportunity exposure	+	+ / ×	×
Physical exposure	×	× / ×	×

Existing studies on variations of political actions on climate issues

⇒ On the industrial level:

- Carbon intensity (Meckling, 2015)
- Upstream downstream industries (Cory, Lerner and Osgood, 2021)
- Trade exposure (Genovese, 2019)

⇒ On the firm level:

- Competition for market shares (Kennard, 2020)
- Network effect of transformational leadership (Lerner and Osgood, 2022)
- Ownership condition and time horizon on expected profits (Finnegan and Meckling, 2023)

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- Competition for market shares (Kennard, 2020)
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- Ownership condition and time horizon on expected profits (Finnegan and Meckling, 2023)
- **Our study: firms' revaluation on three aspects of climate change exposures**

Asset revaluation: Stranded or profitable?

Climate change and policy shifts are redefining asset values, leading to political contestations (Colgan, Green and Hale, 2021).

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- 1 Physical Exposure:** Asset stranded due to physical climate hazards
 - Property damaged or productivity limited due to climate hazards
- 2 Regulation Exposure:** Production limited or supported by pending government regulations
 - Coal phase-out
- 3 Opportunity Exposure:** Market and technological opportunities
 - Expanding EV production, technologies for net zero transition

Conceptualization and operationalization from Sautner et al. (2023), "Firm-Level Climate Change Exposure." *The Journal of Finance* .

Firm-level climate change exposures by Sautner et al. (2023)

- Keyword discovery approach:
counting the **frequency of specific climate change bigrams** in a transcript of publicly listed firms' conference earning calls, scaled by the number of total bigrams
- For 12,327 publicly listed firms from 97 industries (NAICS 3-digit classification) from 2001 to 2020

Overall Climate Change

Overall exposure

Risk

Positive sentiment

Negative sentiment

Opportunity

Overall exposure

Risk

Positive sentiment

Negative sentiment

Regulation

Overall exposure

Risk

Positive sentiment

Negative sentiment

Physical Hazards

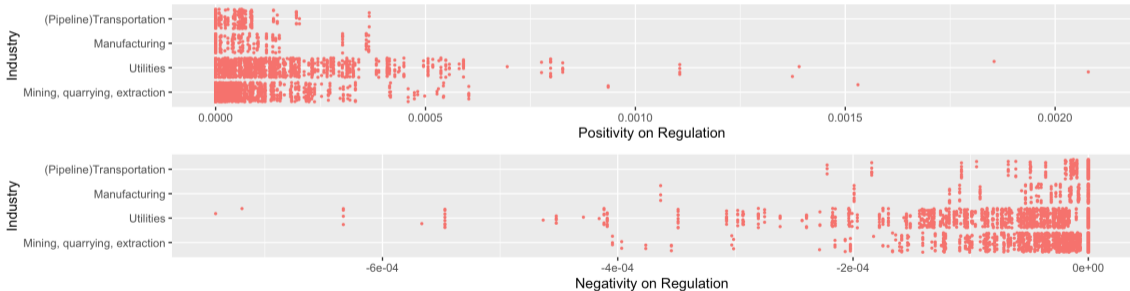
Overall exposure

Risk

Positive sentiment

Negative sentiment

Distribution of sentiments on regulation among firms in energy industries



Lobbying on all climate related issues

- Panel logistic regression
 - Outcome variable: A firm has ever lobbied in the given year or not
 - Key explanatory variables: Overall exposures, risks, sentiments on three aspects of climate change concerns
 - Firm-level controls: Total asset, operating revenues, and profit margin
- Data source: Lobbying records from LobbyView and the Senate archive of LDA reports

Outcome Variable: Political actions

Lobbying on all climate related agenda

	Model 1	Model 2
Climate Change Exposure	0.07*** (0.01)	
Regulation Exposure		0.37*** (0.10)
Opportunity Exposure		0.07*** (0.02)
Physical Exposure		0.05 (0.23)
Firm-level controls	✓	✓
Industry FE	✓	✓
Year FE	✓	✓
Num. obs.	43088	43088
Pseudo R ²	0.33	0.33

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Robust using firm-level fixed effect

Lobbying on all climate related agenda

	Model 1
Regulation positive stance	0.57*** (0.15)
Regulation negative stance	0.49* (0.23)
Opportunity positive stance	0.17*** (0.04)
Opportunity negative stance	-0.08 (0.09)
Physical positive stance	0.02 (0.49)
Physical negative stance	1.04 (0.78)
Firm-level controls	✓
Industry FE	✓
Year FE	✓
Deviance	6764.59
Num. obs.	53495

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 2: Effect of different sentiments on lobbying

	Model 1
Regulation risk	1.69** (0.58)
Opportunity risk	0.25 (0.18)
Physical risk	0.76 (2.58)
Firm-level controls	✓
Industry FE	✓
Year FE	✓
Deviance	5660.65
Num. obs.	53482

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 3: Effect of risk concerns on lobbying

Lobby: Cap-and-trade bill

- Data source: Lobbying records on **the American Clean Energy and Security Act**
- Cross-sectional logistic regression
- Outcome variable: The firm has ever lobbied on the Act in the 111th Congress session
- Key explanatory variables: Overall exposures, risk perceptions
- Firm-level controls: Total assets, operating revenues, profit margin, and headquarters location (US or not)

Outcome Variable: Political actions

Lobby: Cap-and-trade bill

	Model 1	Model 2
Climate Change Exposure	0.34*** (0.02)	
Regulation Exposure		1.26*** (0.20)
Opportunity Exposure		0.56*** (0.04)
Physical Exposure		-0.76 (0.64)
Firm-level controls	✓	✓
Num. obs.	6094	6094

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 4: Effect of exposures on lobbying on cap-and-trade bill

	Model 1
Regulation risk	15.08*** (2.17)
Opportunity risk	5.06*** (1.12)
Physical risk	-70.26*** (21.31)
Firm-level controls	✓
Industry FE	✓
Num. obs.	6094

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 5: Effect of risk concerns on cap-and-trade bill

Ad hoc coalitions

- Data source: joining coalitions as "*outside*" lobbying by Cory, Lerner, and Osgood (2021)
- Cross-sectional Poisson regression
- Outcome variable: count of coalitions favoring/opposing climate change actions
- Key explanatory variables: the averages of exposures from all available years
- Firm-level controls: Total assets, operating revenues, profit margin, and headquarters location (US or not)

Ad hoc coalitions

	All coalitions	All coalitions
Overall exposure	0.03** (0.01)	
Regulation exposure		0.63* (0.26)
Opportunity exposure		0.00 (0.04)
Physical exposure		-4.36 (3.28)
Firm-level controls	✓	✓
Industry FE	✓	✓
Num. obs.	6389	3936
Pseudo R ²	0.28	0.36

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 7: Effect of exposures on joining coalitions

Ad hoc coalitions

	Favoring	Opposing
Regulation negative stance	0.52 (0.97)	3.22** (1.23)
Regulation positive stance	0.96 (0.77)	-0.32 (0.59)
Opportunity negative stance	0.05 (0.10)	-0.72 (0.61)
Opportunity positive stance	0.15*** (0.05)	0.27 (0.06)
Physical negative stance	-1.05* (0.51)	-1.34 (5.23)
Physical positive stance	0.45 (0.80)	-6.35 (3.85)
Firm-level controls	✓	✓
Industry FE	✓	✓
Num. obs.	6346	3936
Num. groups: NAICS_3	70	27
Pseudo R ²	0.28	0.43

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Campaign donation to federal candidates from different parties

- Panel linear regression
- Sample: Firms in **energy sectors** from 2002 to 2020
- Outcome variable: the difference of two-party giving to candidates' 527 committees by the firm in the given year (Finnegan and Meckling, 2023 working paper)
 - Donations to all GOP candidates - Donations to all Democrat candidates

Outcome Variable: Political actions

Campaign donation to federal candidates from different parties

	Model 1	Model 2
Overall exposure	1.44 (1.59)	
Regulation exposure		9.09 (7.45)
Opportunity exposure		1.78 (2.32)
Physical exposure		-2.14 (1.74)
Firm-level controls	✓	✓
Year FE	✓	✓
Clustered SE on firm level	✓	✓
Num. obs.	46750	46750
R ² (full model)	0.04	0.04
R ² (proj model)	0.01	0.01
Adj. R ² (full model)	0.04	0.04
Adj. R ² (proj model)	0.01	0.01

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 10: Campaign donation to 527 committees

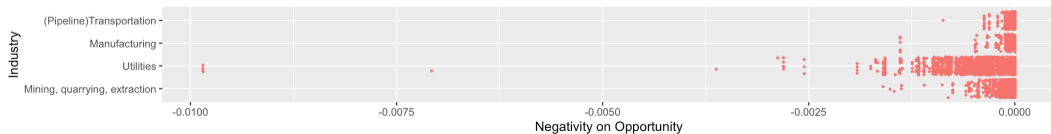
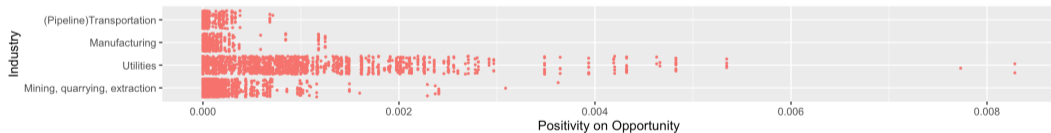
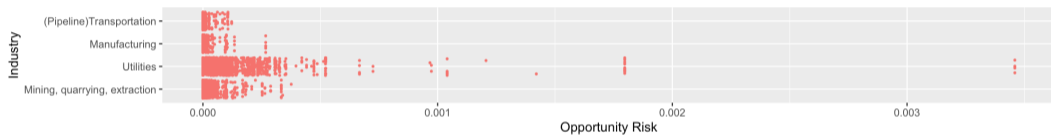
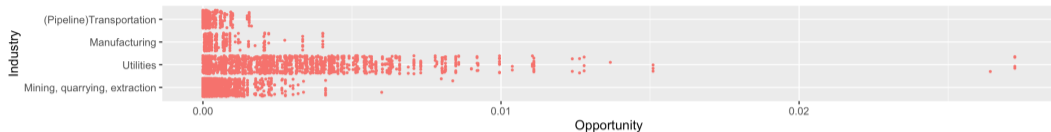
Takeaways and Discussion

- Regulation exposure (negativity, risks) and opportunity (positivity) largely drive political actions.
- Null effects of physical exposure
- Donation
 - The purpose of donation
 - Recipients? through what channel?
 - Does climate politics follow the money?
- Heterogeneity effects on firms from different states?

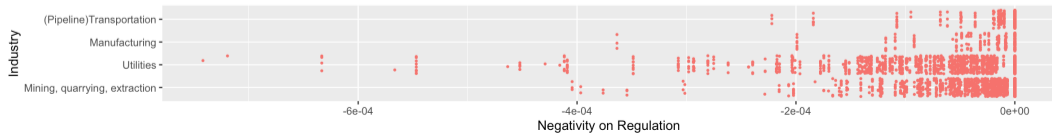
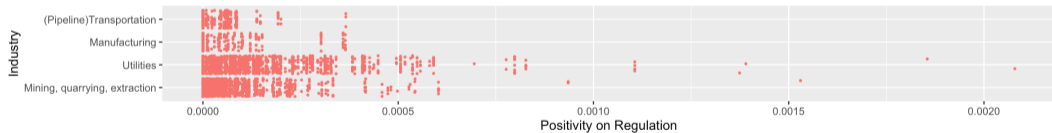
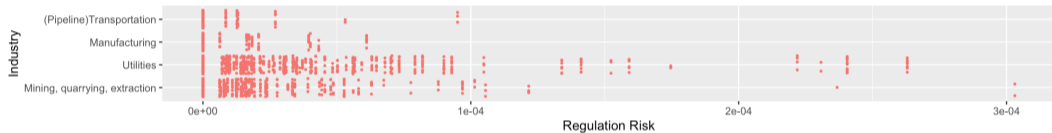
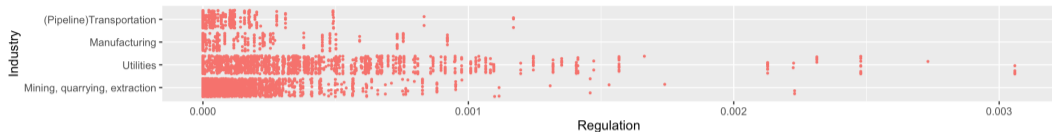
Supplementary slides

- Firm variation on regulation and opportunity exposure [link](#)
- Descriptive statistics of variables on exposure [link](#)
- Descriptive statistics of firm level controls [link](#)
- Lobby (search keywords) [link](#)
 - Anti-protest lobby [link](#)
- Coalitions joined by firms within the same industry [link](#)
- Donation through PACs [link](#)

Distribution of concerns on opportunity among firms in energy industries



Distribution of concerns on regulation among firms in energy industries



Descriptive statistics

For 12,327 publicly listed firms from 97 industries (NAICS 3-digit classification) from 2001 to 2020

	Climate	Opportunity	Regulation	Physical risk
Min	0.00000	0.0000	0.00000	0.00000
1st Qu	1 0.09482	0.0000	0.00000	0.00000
Median	0.31029	0.0000	0.00000	0.00000
Mean	1.04653	0.3242	0.05201	0.01404
3rd Qu	0.81697	0.1552	0.00000	0.00000
Max	74.85876	52.2599	10.22222	7.01232

(The values presented in this slide are multiplied by 10^3 for demonstration.)

Controls

	Total Assets	Operating Revenue	Profit Margin
1	Min. : 0	Min. :-13547.0	Min. :-99.97
2	1st Qu.: 377	1st Qu.: 213.1	1st Qu.: 0.95
3	Median : 1645	Median : 882.0	Median : 7.52
4	Mean : 20751	Mean : 5471.2	Mean : 7.78
5	3rd Qu.: 6570	3rd Qu.: 3474.2	3rd Qu.: 16.74
6	Max. :4309351	Max. :523964.0	Max. :100.00

The units for assets and revenues are in million/US dollar.

Lobby

Climate change lobby search keywords:

climate change|global warming|climate action|greenhouse emission|paris agreement|carbon emission|clean energy|greenhouse gas|carbon tax|renewable energy|renewable|green technology and their variations

How many firms have ever lobbied: 394 out of 11202 public listed firms

Lobbying on anti-protest bills

- Panel logistic regression
- Sample: firms from energy industries
- $Lobbied_{it}$: Dummy variable if the firm has ever lobbied on related bills in the given year
- Bills including "(protest(?:s|ed|ing|or|ers)?|riot(?:s|ed|ing)?|unrest|assembl(?:y|ies))"

Lobbying on anti-protest bills

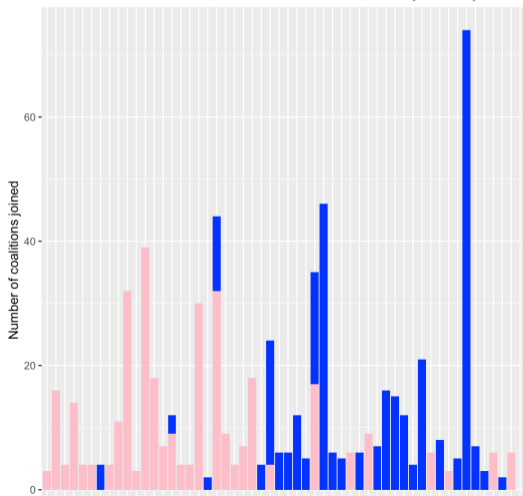
	Model 1
Negativity on regulation	-6552.16** (2229.80)
Regulation risk	-4623.33 (6440.32)
Opportunity risk	-470845.56 (82739421.98)
Negativity on opportunity	-347.92 (1022.63)
Total asset	0.00 (0.00)
Operating revenue	0.00 (0.00)
Profit margin	0.01 (0.06)
Log Likelihood	-15.16
Deviance	30.31
Num. obs.	1414

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

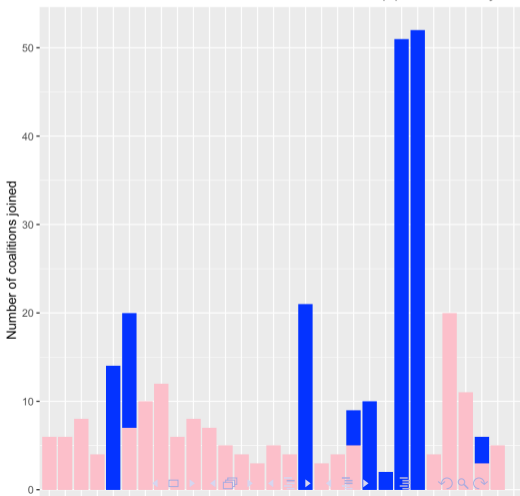
Table 4: Effects of exposures on anti-protest bills lobbying

Distribution of coalitions

Distribution of coalitions on both sides of firms in utility industry



Distribution of coalitions on both sides of firms in pipeline industry



Campaign donation from business PACs to candidate PACs

	All sectors	Energy sectors only
Negativity on regulation	66.91 (46.47)	94.69 (59.17)
Negativity on Opportunity	-10.60 (22.29)	2.19 (23.12)
Physical risk	-84.66 (92.42)	108.35 (101.20)
Firm-level controls		
Num. obs.	60869	9662
Num. groups: NAICS.3	66	4
Num. groups: year	5	5

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 6: Effect of exposures on campaign donation