Who Needs To Be Seen To Be Green? How Reputational Pressure Affects Responses To Climate Change

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Introduction

- There are many political and litigious barriers of regulating industries domestically across different sectors: designing and implementing regulations for change is complex and difficult
- Without regulatory requirements, firms have many reasons not to act on decarbonization.
- Yet, as of 2018, 2,138 firms from 145 countries, amounting to roughly $36.6. trillion USD in revenue, have voluntarily pledged to climate action.

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The CDP

- The CDP is a voluntary semi-regulatory programs that allow firms to disclose information, and receive ratings on their performance.
- As a global disclosure system, the CDP invites firms around the world to be surveyed and submit reports on carbon emissions and internal firm regulations towards climate change on an annual basis.
- Founded in 2000, the CDP is a major private regulatory body with 13,000 companies representing 64% of global market capitalization disclosing to the CDP in 2021.

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The Puzzle

So, the puzzle here is – why do some firms choose to cooperate with these regulatory bodies, and disclose information on their carbon impact?

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The Literature

Demand

- Collective action problem of overcoming free-riding, or a distributive problem whereby decision making in one space or time period affects actors at different points of space or time

Supply

- Regulatory measures aimed at climate change is a type of 'strategic accommodation', or economic interests in regulations

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Overview of Argument

Firms vary in the extent to which they need to appear 'climate-conscious'. Pressure to signal a climate-conscious reputational type is dependent on 1) the institutional structure of the firm, and their sensitivity to consumer audiences, and 2) the extent to which the consumer audience is primed to care about this reputation.

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Institutional structure of the firm

Proximity of the firm to the consumer

- Disclosing information represents a trade-off: positive evaluations are beneficial, however disclosure risks increasing attention of stakeholders and consumers to poor performance.
- B2C firms face higher levels of public scrutiny - submitting to regulatory bodies increases the reputational costs of submitting and receiving a poor performance evaluation.
- H1A. Consumer facing firms will be less likely to disclose to the CDP.

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High Emitters

- The extent to which the firm is cognitively associated with high GHG emissions from consumer audiences
- Higher levels of scrutiny can dissuade firms from submitting to regulatory bodies. However, consumer facing firms that are high-emitters already face negative public scrutiny, and can use CDP scoring to repair their reputation
- H1B. B2C firms that are also high-emitters will be more likely to submit to the CDP score higher on CDP reports than higher than B2B firms

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Failing Grade

- H1C. Following a failing grade from the CDP, firms will be less likely to disclose to the CDP in the future; the effect should be stronger for B2C firms.

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Natural Disasters

Pressure to signal a climate-conscious reputational type is also influenced by 2) the extent to which the consumer audience is primed to care about this reputation.

- Climate-linked disasters trigger awareness of the relative contribution of firms to the adverse state of the climate
- A reputation for being environmentally-conscious is less important in equilibrium where the effects of climate are difficult to tangibly link back to private sector actions, but when the climate conditions are adverse, bad climate policies may garner more attention

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The costs of increased attention on firms environmental performance will exacerbate the deterence effect of disclosing information to avoid negative scrutiny.

- Hypothesis 2a: Firms will be less likely to disclose following a year of high climate-linked natural disasters
- Hypothesis 2b: Firms that do disclose will score higher on CDP evaluations in years that follow a high number of climate-linked natural disasters.

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Hypotheses

Hypotheses

- H2A. Firms will be less likely to disclose following a year of high climate-linked natural disasters
- H2B. Firms that do disclose will score higher on CDP evaluations in years that follow a high number of climate-linked natural disasters.

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Reputational Externalities

Reputational Externalities: a situation where the actions of one agent may damage the reputation of a member agent, thereby reducing overall welfare

A statement from Amoco in 2001 following an Exxon oil spill:

> *"We are still an oil company, and we still have to live with the sins of our brothers. We were doing fine until Exxon spilled all that oil.Then we were painted with the same brush as them."*

- H3. Firms in the oil, gas and mining sector will be more likely to disclose information to the CDP.

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Reputational Cascades

Reputational cascades are "large-scale judgements and movements in which actors begin to believe something, or do something, because of the beliefs or actions of a few early movers".

- In a reputational cascade, actors may act against their preferences in a conformity-rewarding process.
- H4: Firms will be more likely to disclose to the CDP if large-firms within their industry submit the year prior.

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Case Study

Australia is a favourable setting to examine the impact of climate-events and reporting:

- Mandatory carbon reporting (National Greenhouse and Reporting Act, 2007)
- Visible and widespread climate-induced disasters over the last decade, and extreme weather events like flooding and bushfires are frequent.
- Low ranking climate change performance, ranking last behind 193 United Nations member countries in the 2021 SDR.
- Economy is heavily dependent on coal for electricity generation, as well as a major export commodity.

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The Data

The Data: CDP

- CDP disclosures/response to invite
- CDP annual scoring (Grades A-F)

Firm Level Data

- Firm Data from Refinitiv Eikon
- Firms classified using NAICS 4 sector codes; and equivalent SIC codes
- Emissions data (direct emissions + intensity) from Cory, Lerner & Osgood (2021).

Data: Natural Disasters

- EMDAT dataset (annual climate-linked disasters)
- Insurance Council of Australia dataset

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Empirical Analysis

Dependent Variable

- Disclosure (dummy)
- Annual Scoring on 'climate change' (A-F, weighted variable 0-1)

Explanatory Variables

- PMP: business-to-consumer or business-to-business
- Emission intensity
- Natural Disaster impact (no. disasters, no. deaths, total number affected, total insurance claims)
- Large-size firms submitting the year prior

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Research Design

- The main statistical analysis consists of a set of 2FE models estimated by ordinary least squares (OLS), probit and fractional logit models.

$$Y_{it} = \gamma_i + \lambda_t + \delta B2C_{it} + X_{it}\beta + \epsilon_{it} \quad (1)$$

- Difference in Difference Estimator to test reporting during high and low climate-disaster years.

$$\sum[\Delta\tau_{ijth}\chi_{ijt}^{high-disaster}] - \sum[\Delta\tau_{ijth}\chi_{ijt}^{lowdisaster}] = \beta^{highdisaster} + \gamma_h^{lowdisaster} \quad (2)$$

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Results

	Dependent variable:			
	Disclosure Dummy			
	OLS		*probit*	
	(1)	(2)	(3)	(4)
Business to Consumer	-0.070*** (0.022)	-0.097** (0.041)	-0.187*** (0.060)	-0.277** (0.138)
ESG Score		0.007*** (0.001)		0.020*** (0.002)
Direct Emissions		-0.001*** (0.0005)		-0.003** (0.001)
Company Market Cap (USD)		0.000*** (0.000)		0.000*** (0.000)
NAICS Sector (Administrative and Support and Waste Management and Remediation Services)		0.495 (0.319)		5.260 (265.000)
NAICS Sector(Agriculture, Forestry, Fishing and Hunting)		0.162 (0.324)		0.418 (278.000)
NAICS Sector (Arts, Entertainment, and Recreation)		0.479 (0.316)		5.230 (265.000)
NAICS Sector (Construction)		0.514* (0.310)		5.190 (265.000)
NAICS Sector (Educational Services)		0.559 (0.375)		5.400 (265.000)
NAICS Sector (Finance and Insurance)		0.598* (0.306)		5.480 (265.000)
NAICS Sector (Health Care and Social Assistance)		0.217 (0.313)		3.360 (265.000)
NAICS Sector (Information)		0.507 (0.335)		5.260 (265.000)
NAICS Sector (Manufacturing)		0.518* (0.307)		5.260 (265.000)
NAICS Sector (Mining, Quarrying, and Oil and Gas Extraction)		0.637** (0.306)		5.570 (265.000)
NAICS Sector (Other Services (except Public Administration))		0.640* (0.336)		5.700 (265.000)
NAICS Sector (Professional, Scientific, and Technical Services)		0.308 (0.314)		4.640 (265.000)
NAICS Sector (Real Estate and Rental and Leasing)		0.695** (0.308)		5.770 (265.000)
NAICS Sector (Retail Trade)		0.783** (0.318)		5.850 (265.000)
NAICS Sector (Transportation and Warehousing)		0.478 (0.309)		5.090 (265.000)
NAICS Sector (Utilities)		0.624* (0.319)		5.590 (265.000)
NAICS Sector (Wholesale Trade)		0.453 (0.310)		5.010 (265.000)
Company Size: Medium		-0.040 (0.043)		-0.064 (0.141)
Company Size: Large		-0.203*** (0.048)		-0.583*** (0.159)
Constant	0.393*** (0.011)	-0.225 (0.312)	-0.272*** (0.029)	-5.970 (265.000)
Observations	2,663	1,377	2,663	1,377
R^2	0.004	0.265		
Adjusted R^2	0.003	0.252		
Akaike Inf. Crit.			3,514.000	1,493.000
Note:				*p<0.1; **p<0.05; ***p<0.01

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Results

Interaction Effect: High Intensity Emitters * B2C Firms (FE)

	Dependent variable:	
	Disclosure Dummy	
	(1)	(2)
B2C_Dumy	0.060 (0.099)	-0.806*** (0.285)
intensity	-0.352*** (0.135)	-2.210*** (0.313)
ESG		0.005*** (0.001)
company_sizemedium		-0.140*** (0.050)
company_sizesmall		-0.205*** (0.059)
B2C_Dumy:intensity	0.180 (0.321)	1.555*** (0.471)
Observations	2,650	1,377
R^2	0.004	0.068
Adjusted R^2	-0.171	-0.073
Note:		*p<0.1; **p<0.05; ***p<0.01

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Results

Difference-in-Difference OLS models

	Dependent variable:		
	Disclosure Dummy:lead	Disclosure Dummy:lead	
	(1)	(2)	(3)
treated_Dis	0.089*** (0.024)		
time1	0.168*** (0.017)		
did_dis	-0.223*** (0.030)		
treated_TA		0.028 (0.018)	
time2		0.103*** (0.016)	
did_affected		-0.159*** (0.025)	
treated_insured			0.102*** (0.024)
time3			0.151*** (0.016)
did_insured			-0.218*** (0.031)
Constant	0.596*** (0.009)	0.600*** (0.012)	0.600*** (0.008)
Observations	4,809	4,809	4,809
R^2	0.022	0.016	0.019
Adjusted R^2	0.021	0.015	0.018
Note:			*p<0.1; **p<0.05; ***p<0.01

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Results

Difference-in-Difference OLS models

	Dependent variable:		
	Company Score		
	(1)	(2)	(3)
treated_Dis	-0.034*** (0.013)		
time1	-0.242*** (0.009)		
did_dis	0.201*** (0.016)		
treated_TA		-0.066*** (0.010)	
time2		-0.207*** (0.008)	
did_affected		0.139*** (0.014)	
treated_insured			-0.040*** (0.013)
time3			-0.248*** (0.009)
did_insured			0.168*** (0.016)
Constant	0.266*** (0.005)	0.318*** (0.007)	0.272*** (0.004)
Observations	4,808	4,808	4,808
R^2	0.131	0.122	0.152
Adjusted R^2	0.130	0.122	0.152
Note:			*p<0.1; **p<0.05; ***p<0.01

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Results

Effect of Early Movers on Sector-Level Disclosure (Year & Firm Two-Way Fixed-Effects)

	Dependent variable:	
	Disclosure Dummy	
	OLS	*panel linear*
	(1)	(2)
large_submitted	0.371*** (0.049)	0.469*** (0.043)
ESG	0.004*** (0.001)	0.003*** (0.001)
B2C_Dumy	-0.024 (0.037)	-0.367 (0.243)
naics_sector_name.xAdministrative and Support and Waste Management and Remediation Services	-0.061 (0.289)	
naics_sector_name.xAgriculture, Forestry, Fishing and Hunting	0.002 (0.297)	
naics_sector_name.xArts, Entertainment, and Recreation	-0.034 (0.290)	
naics_sector_name.xConstruction	-0.159 (0.287)	
naics_sector_name.xEducational Services	0.157 (0.335)	
naics_sector_name.xFinance and Insurance	-0.067 (0.284)	
naics_sector_name.xHealth Care and Social Assistance	-0.196 (0.289)	
naics_sector_name.xInformation	0.166 (0.307)	
naics_sector_name.xManufacturing	-0.186 (0.283)	
naics_sector_name.xMining, Quarrying, and Oil and Gas Extraction	-0.106 (0.285)	
naics_sector_name.xOther Services (except Public Administration)	-0.151 (0.305)	
naics_sector_name.xProfessional, Scientific, and Technical Services	-0.040 (0.286)	
naics_sector_name.xReal Estate and Rental and Leasing	-0.144 (0.286)	
naics_sector_name.xRetail Trade	-0.141 (0.297)	
naics_sector_name.xTransportation and Warehousing	-0.173 (0.286)	
naics_sector_name.xUtilities	0.166 (0.289)	
naics_sector_name.xWholesale Trade	-0.059 (0.287)	
company_market_cap_usd	-0.000 (0.000)	
Constant	0.494* (0.285)	
Observations	1,405	1,377
R^2	0.178	0.107
Adjusted R^2	0.166	-0.025
Note:	*p<0.1; **p<0.05; ***p<0.01	

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Conclusion

- Sets up a probabilistic explanatory model of firm behaviour in self-regulating on climate change
- Findings show that self-regulation confers reputational benefits and competitive advantages to some industry groups, while harming others and deterring action
- Priming may have a negative effect on transparency
- Reputation does not occur in a vacuum - reputation has a 'group dyanmic' effect

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