

Voluntary agreements to improve environmental quality: Are late joiners the free riders?

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Voluntary agreements to improve environmental quality (VAs)

- Engage firms and regulatory agencies to improve environmental performance
- Associate private benefits with the voluntary provision of public good
 - Enhance firm reputation
 - Technical assistance
 - Help prevent regulations
- 300 VAs in Europe, 200 in the US
- Examples: Wastewise, Climate Challenge...

Climate Challenge 1995-2000

- US DOE & Electric utility industry
- Firms committed to
 - Reduce, avoid or sequester greenhouse gas emissions
 - Report annually their achievement and activities
- Potential benefits
 - an effective voluntary effort may negate the need for legislation or regulation”
 - “emission reductions could possibly be used for ‘credit’ against future mandatory requirements.”

VAs and the collective action problem

- In VAs benefits are available to all regardless of their personal contributions
- Free riding might be particularly salient in VAs because most of them lack explicit penalties to sanction free riders.
- Reservations about VAs' effectiveness:
 - firms may pursue these collaborative strategies as merely symbolic actions ...

Symbolic vs Substantive cooperation

Participation

In voluntary agreement

Non Participation in voluntary agreement

Symbolic cooperation:

“ceremonial conformity”
decoupling of participation with actual performance improvement:
no environmental performance improvement

Substantive cooperation

Change in environmental performance after participation in VA

Research question

- Since most of these VAs lack explicit measures to sanctions firms that are only undertaking symbolic action, how can these programs effectively encourage cooperation?
- Why and when will firms provide public goods within VAs?
- Under what conditions will a firm undertake substantive cooperation within a VA and how will this vary over time?

Our main thesis

- Incentives/private benefits of participation vary over time and are shaped by the institutional environment
- There is a difference in cooperative behavior between early and late entrants within the VA because private incentives vary with the timing of joining collective action

Empirical issues associated with studying effectiveness

- Need to be able to control participants with a group of non-participants
- Need to evaluate environmental performance, often limited environmental performance data available
- Need to obtain longitudinal data to study evolution over time
- In our study we have information on environmental performance for participants and non participants and information over time

Climate Change political context

- Regulatory Threat?
 - Climate Change Action Plan (CCAP), where President Clinton announced the nation's commitment to reducing U.S. emissions of greenhouse gases to their 1990 levels by the year 2000.
- Incentives outlined by DOE
 - Regulatory benefits: “an effective voluntary effort may negate the need for legislation or regulation” or that “emission reductions could possibly be used for ‘credit’ against future mandatory requirements.”
- Industry position
 - Tom Kuhn, president of the Edison Electric Institute (1996) :
“Our industry has demonstrated that a vigorous, voluntary approach toward curbing greenhouse gas emissions is the way to go. We will continue to put these programs in place while opposing government and international mandates that would cost the U.S. economy thousands of jobs. Utilities have met the challenge and are continuing their leadership role in working with the government to find creative and effective ways to improve the environment.”

H1 Political pressure

- Firms' participation as a signal of "good intention," resulting in a potential future reduction of their level of enforcement
- Firms subjected to a higher level of political and regulatory pressure have more incentives to enroll in a VA and to do it early if its individual benefits outweigh the costs of organizing the collective effort

H1. Early participants in the Climate Challenge Program are subjected to higher political pressure than late joiners and non-participants

H2 Links with the industry association

- Trade associations play an important role in facilitating collective action
 - Information
 - Normative pressure

H2. Early participants in the Climate Challenge Program are more likely to be members of the industry trade association than late joiners and non-participants

H3 Firm's past environmental effort

- If a firm has already been successful at reducing its emissions, it is more likely to join the program early (to get credit for its efforts).

H3. Late joiners of the Climate Challenge Program are less likely than late joiners and non-participants to have undertaken efforts to reduce their emissions prior to the start of the program

H4 Substantive vs Symbolic collaboration

- Because of these different incentives and pressures:

H4. Late joiners are more likely to cooperate symbolically while early joiners are more likely to cooperate substantively within the Climate Challenge Program.

Sample & Data

- Sample: 133 Investor-owned US utilities
 - 61% of US generation & 75% of CO2 emissions emitted by the electricity sector. [Years 1995-2000]
 - 82 firms participate in CCP
- Data came from several public sources
 - FERC Form 1, on which utilities report “everything”.
 - U.S. Environmental Protection Agency (EPA), Clean Air Market programs website.
 - U.S. Department of Energy, Climate Challenge website.
 - League of Conservation Voters, Sierra Club, DSIRE, etc.

Empirical challenges

- Decision to participate in the program is likely to be influenced by the same observed and unobserved factors that determine emissions
- Two-stage estimation model that determines simultaneously the outcome of the program participation (here CO2 emission rate) and the determinants of a firm's participation decision
- In the first stage, we wanted to predict not only the probability of participation in the VA, but also to differentiate early and late joiners

Stage 1: participation in program

- In the first stage, we use a multinomial logit model to predict the type of participant as a categorical variable representing three groups:
 - (i) non-participant
 - (ii) late joiner
 - (iii) early joiner (member of the initial meeting of the program in 1995)

Stage 2: performance evaluation

- In the second stage, we used the predicted values of the different types of participation to test whether they explain reductions in emissions.

$$\text{Change in CO}_2\text{rate} = \left(\frac{\text{CO}_2\text{emissions}_t}{\text{Generation}_t} \right) - \left(\frac{\text{CO}_2\text{emissions}_{t-1}}{\text{Generation}_{t-1}} \right)$$

Independent variables

VARIABLES	DESCRIPTION
H1 Political pressure	League of Conservation Voters (LCV) : Environmental Scores of the members of the US House Representatives and Senate (0-100)
	Regulatory Expenses Annual amount of regulatory expenses paid by the firm
H2 Trade association	Trade association membership (Edison Electric Institute)
H3 Environmental effort	Environmental effort: Expenses that a firm spends for environmental purposes. Source FERC

Controls

VARIABLES	DESCRIPTION
Productive efficiency	Annual Productive Efficiency Index (0-1) using DEA: <u>Output Factors</u> : Low (residential+commercial), industrial, sales for resale. <u>Input Factors</u> : Labor cost, Plant Value, Production expenses, Transmission Expenses, Distribution expenses, Sales Expenses, Administrative Expenses, Purchases in Mwh. Source FERC
Number of subsidiaries	Proxy for the size of the utility
Big player	# of times that a firm is among the top four sellers in a state
State's environmt employees	# of State's environmental employees from Environmental Council of the States (ECOS)
Sierra Club	Number of paying membership of Sierra Club per 1000 state residents Sierra Club
State's dirtiness	State's toxic emissions / land area

Dependent variable	Late joiners	Early Joiners	Early Joiners
Reference group	Non-participants	Non-participants	Late Joiners
Regulatory expenses		+	+
League of Conserv Voters	+	+	+
State's envir employees	+	-	-
Sierra Club	+	-	-
State's pollution	-	+	+
Trade association's member	+	+	+
Productive efficiency	+	+	+
Environmental effort	-	+	+
% of generation from fossil fuel	-	-	-
Visibility / Big player	-	+	+
Number of subsidiaries	+	+	+
Observations	633	633	633
% correctly classified	78.80%		

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Dependent variable: Changes in CO ₂ rates (CO ₂ rate _t - CO ₂ rate _{t-1})	Random GSL	Random GSL
Probability of Participation	-	
Probability of Participation (late joiners)		+
Probability of Participation (early joiners)		-*
Change in percentage of gen from fossil fuel	+**	+**
Change in the number of operating plants	+**	+**
Environmental Effort	+	-
Year of installations (average)	-+	-+
Merger process with electric utility	-	-
Merger process with gas utility	+	+
Information disclosure	+	-
Renewable standard portfolio	-	-
Observations	633	633
R-squared	0.14	0.21

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Findings

- Firms were more likely to enter the program **early** if they
 - experienced a a higher level of political pressure,
 - were part of the trade association
 - were more visible,
 - more efficient,
 - and had already undertaken environmental efforts...
- Symbolic collaboration was more likely with later entrants than with early entrants.
- Late entrants free rode on the efforts of early joiners
- Late joiners that engaged only in symbolic collaboration could potentially endanger the overall effectiveness of the VA

Conclusion

- Our research identifies conditions that trigger different types of collaborative behavior
 - Symbolic and substantive collaboration within VA, and non-participation in the VA
 - Non-participants were significantly different from symbolic participants
- Our findings also challenges some of the findings of previous literature
 - that found a positive link between the quality of early adopters and subsequent adoption
 - Here the quality of early adopters does not guaranty the quality of late joiners

Policy implications

- VAs might not be an effective tool if it they are associated with no sanctions for free riders
- Importance of political pressure to push for reductions
- However, would VAs with sanctions attracts firms to participate?
- VAs with various incentives according to various levels of performance?