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Abstract

Activist NGOs increasingly oppose industrial projects that have nevertheless been approved by public regulators. To understand this recent rise in NGO activism, we develop a theory of optimal regulation in which a regulated industry seeks to undertake a project that may be harmful to society. On the one hand, public regulation is vulnerable to the influence of the industry, and may approve the project even though it is harmful. On the other hand, an NGO may oppose the project. We characterize the circumstances under which NGO opposition occurs and the circumstances under which this opposition is socially beneficial. The theory is used to explain the role that NGOs have assumed in the last decades, and has implications for the legal status of NGO activism and the appropriate degree of transparency. *JEL* Codes: D02, D74, D82.

I. Introduction

Some NGOs increasingly interfere with industrial decisions. These activist NGOs are consumer associations, environmental groups, and stakeholders' advocacy groups that seek to prevent harmful projects and practices.[1] They often convince firms to "self-regulate" when public regulation seems too lax. For example, companies such as Nike (early 1990s), Citigroup (2004), and HSBC (2012) significantly strengthened their social, environmental, and risk criteria after NGO intervention. Similarly, in 2013, Starbucks offered to pay taxes that it was not legally liable for, and, in 2015, Dunkin' Donuts stopped using potentially toxic nanoparticles allowed by the US Food and Drug Administration.

By "NGO activism," we refer to the militancy of civil society through not-for-profit organizations that are independent of public authorities and special interests.[2] In general, NGO activists do not rely on the public order. They do "private politics," to use the words of Baron (2001): To oppose firms' projects and practices that they disapprove of, they use their private potential to harm these firms. This potential can be achieved in various ways—e.g., boycotts, naming and shaming, cyber-activism, etc.[3] NGOs' rising influence is one of the most significant changes in business over the past four decades (see Doh and Guay [2006], among others). For example, according to the *Covalence Ethical Quote* reputation database, 831 NGOs have levelled more than 18,000 criticisms against companies worldwide between 2002 and 2014.

This paper is an attempt to understand the rising influence of NGO activists. We model a firm that hopes to implement a project requiring the approval of a public regulator. The regulator may be influenced by the industry's interests, and thus may accept

1. A famous example of such opposition is the 1995 Greenpeace-Shell conflict over the dismantlement of the Brent Spar oil platform. Ironically in that case, the option ultimately chosen by the firm under NGO pressure turned out to be worse than the option initially approved by regulators.

2. This definition excludes trade unions, which seek to generate gains for their members.

3. Activists' private nuisance potential sometimes also relies on the public order, as when activists file a lawsuit against a firm.

the firm's project even though it is socially harmful. An NGO may decide to oppose the project on the basis of its own information. NGO involvement impacts both the efficiency of public regulation and the economic performance of the industry. We characterize the conditions under which the NGO effectively opposes the project and the conditions under which this opposition improves social welfare. Our results, therefore, have implications for the legal status of NGO activism: Should governments encourage it, and how?

Baron (2001, 2003) was the first to propose a theory of private politics. He assumes that activists pursue social objectives. Their motivation may arise from moral preferences (Baron [2010]), or from prosocial behavior à la Bénabou and Tirole (2006), and may depend on how well activists subscribe to the issue (Besley and Ghatak [2005]). Baron (2010) shows how NGOs can emerge when socially concerned individuals coordinate their efforts in the spirit of Dixit (2004, Ch. 3) and Tabellini (2008). When firms are targeted by activists, they may "self-regulate" to forestall this opposition and avoid the associated damages.

Recent papers that shed light on the relation between public regulation and private politics are complementary to our research. For example, Maxwell, Lyon, and Hackett (2000) study how firms may self-regulate to avoid a strengthening of regulation inspired by activists. Following Baron (2003) and Baron and Diermeier (2007), we assume instead that NGOs oppose firms directly rather than by lobbying regulators. Indeed, over the period 2002-2014, for example, US-based NGOs' lobbying expenditures amounted to \$2.3 billion, while lobbying expenditures by US-based companies exceeded \$36 billion.[4] One reason is that NGOs cannot match large firms' financial power.[5] Another is that

4. Source: Center for Responsive Politics, available at `https://www.opensecrets.org/lobby`. The above amounts are expressed in constant (2014) dollars; we have used the CPI-U consumer price index of the Bureau of Labor Statistics. To assess NGOs' lobbying expenditures, we have added the expenditures of all non-profit organizations and the expenditures concerning various issues on which NGOs oppose the industry: human rights, the environment, foreign and defense policy, gun control, women's issues, and miscellaneous issues.

5. Baron and Diermeier (2007, p. 600) report a statement by Greenpeace's former head, Paul Gilding, to the *New York Times* (June 2, 2001):

the Internet and social networks have facilitated the dissemination of information and lowered the cost for NGOs of opposing firms (Yu [2005]). Lyon and Salant (2015) show that NGO opposition is likely to reduce industries' subsequent influence on regulation. Finally, Egorov and Harstad (2015) study the dynamics of the conflict between NGOs and firms, in a setup in which the intervention of a benevolent and independent regulator can put an end to such conflicts.

In contrast to the above, our theory allows for the opposition of activists **after** public regulators have approved a firm's project, as illustrated by our introductory examples. A fundamental question is why society relies on NGO opposition when externalities could have been resolved at the outset by public regulation. In our view, this is because the influence of firms on regulators is unavoidable, and can best be counterbalanced by the direct intervention of the public. We also highlight the key role of information asymmetries. As Baron puts it (2003, p. 55), "the activist challenge to the firm begins with the identification of the issue." Large industries' projects are often opaque and/or complex, and, unlike regulators, NGOs have no legal mandate to examine them. For example, Greenpeace significantly overestimated the quantity of oil left in the Brent Spar platform in 1995 (5,000 tons instead of 50), because they had not collected enough samples during their illegal and perilous occupation of the platform.

This paper can be viewed as the continuation of Glaeser and Shleifer's (2003) analysis of the rise of public regulation at the dawn of the twentieth century—see also Shleifer (2012). Glaeser and Shleifer explain the predominance of public regulation over private litigation by the fact that the former proved less vulnerable than the latter in the face

> The smart activists are now saying, "O.K., you want to play markets–let's play." [Lobbying the government] takes forever and can easily be counter-lobbied by corporations. No, no, no. They start with consumers at the pump, get them to pressure the gas stations, get the station owners to pressure the companies and the companies to pressure governments. After all, consumers do have choices where they buy their gas, and there are differences now. Shell and BP Amoco . . . both withdrew from the oil industry lobby that has been dismissing climate change.

of growing industrial stakes. We suggest that during the second half of the twentieth century, the influence of large companies on regulatory decisions continued to increase dramatically. NGO activism has been one way society can rebalance public and private interests—as a complement to, and not a substitute for, public regulation.

NGO activism is reminiscent of Coasian bargaining. According to Coase (1960), the bargaining's appeal is its potential to resolve externalities when transaction costs are low. In this respect, we point to two costs of NGO activism. First, NGO mobilizations and campaigns consume financial and human resources that could be used elsewhere. Second, due to their imperfect information, activists may mistakenly oppose socially beneficial projects. We argue that the Internet and social media have contributed to a decrease in both types of costs.

Whether NGO activism is optimal for society partly depends on the prevailing resistance of public regulation to the influence of the industry. In situations in which industrial interests have the potential to subvert public regulation, the economics of regulation has suggested that more regulation is needed to prevent harmful conduct, not only in developing countries (e.g., Stiglitz [1994]), but also whenever regulatory capture is possible (Laffont and Tirole [1993, Ch. 13]).[6] However, Glaeser and Shleifer (2003) show that when law enforcement is weak, regulation may lead to corruption (see also Djankov et al. [2002]). Similarly, when industry lobbying is intense, regulation enhances, rather than discourages, influence (e.g., Gibson Brandon and Padovani [2011]). Our theory highlights NGOs' possible role in complementing regulation. NGO opposition affects the performance of regulation in two basic ways. First, it renders public regulation less vulnerable to industrial interests, and second, it induces firms to self-regulate by abandoning their most hazardous projects. Yet the appeal of NGO intervention on top of

6. Laffont (2005), however, suggests that regulation be adjusted to the stage of development: Situations of weak law enforcement may require less sophisticated regulatory schemes, and thereby provide weaker incentives (p. 57).

public regulation relies on NGOs' efficiency, in both identifying and opposing the most hazardous projects.

In the next section, we discuss an important fact: The rise of NGO activism has coincided with increased corporate lobbying and regulatory failures. Section III presents a basic model in which public regulation can be influenced by the industry it supervises. Section IV introduces NGO opposition. Section V examines the impact of NGO opposition on public regulation. Section VI studies the vulnerability of public regulation with and without NGO opposition. Section VII examines the circumstances under which (*i*) NGO opposition arises and (*ii*) this opposition contributes to social welfare. Section VIII concludes by drawing implications for the recent rise of NGOs, as well as policy implications about transparency and about the legal status of NGO activism.

Most propositions are proved in the main text; technical proofs are gathered in Appendix B.

II. Lobbying and the Failure of Regulators

The best one can say about the recent performance of public regulators is that it has been mixed. They have failed to prevent catastrophes that could and should have been avoided. For instance, the 2008-2009 global financial crisis caused a significant worldwide recession, and the explosion of the Deepwater Horizon oil-drilling rig in 2010 caused the largest oil spill in history, with disastrous consequences for the environment. Similarly, the Fukushima Daiichi catastrophe in 2011 was the largest nuclear accident since the Chernobyl disaster.

These examples suggest that regulators may have failed to impose adequate standards on the industries they are supposed to monitor. They also indicate a reason for this failure: Industries can subvert their regulators. Indeed, each of the above catastrophes revealed cases of regulatory capture or industry influence—specifically, banking

supervisors prior to the global financial crisis; the US Minerals Management Service, which was responsible for offshore drilling activities in the Deepwater Horizon era; and the Nuclear and Industrial Safety Agency, which regulated the Japanese nuclear sector during the Fukushima catastrophe.

Goldberg and Maggi (1999) show that industries do influence public policies and regulations in their favor. This influence has mostly been documented for the banking sector in the empirical literature that emerged following the global financial crisis. Using disaggregated data, this literature shows that lobbying expenditures, political contributions, and political connections have effectively helped banks favorably distort voting by representatives[7] to obtain laxer regulations and more public support. This, in turn, allows them to take more risks and, ultimately, leads to bigger losses (e.g., Mian, Sufi, and Trebbi [2010]; Igan, Mishra, and Tressel [2011]; Duchin and Sosyura [2012]). In addition, lobbying efforts by individual firms are complementary and are coordinated at the industry level (e.g., Godwin, Ainsworth, and Godwin [2013]). Collective influence also plays an important role, through industry associations such as the US Financial Services Roundtable.

The naive view that expert regulators benignly supervise an industry on behalf of an uninformed and defenseless public has clearly been disproved by the facts. Consequently, the notion of regulatory capture (Stigler [1971]; Buchanan, Tollison, and Tullock [1980]; Laffont and Tirole [1993]) is returning to center stage and is receiving renewed attention in all social sciences (e.g., Carpenter and Moss [2014]).

Public regulators have certainly experienced a golden age. Glaeser and Shleifer (2003) describe and explain the rise of public regulation at the end of the nineteenth and the beginning of the twentieth centuries. This golden age lasted until at least the end of the Progressive Era (Hofstadter [1955]), a period during which "the average American

7. Our paper deals with regulatory agencies rather than lawmakers, for which a slightly different model would be needed.

tended more and more to rely on government regulation, to seek in governmental actions a counterpoise to the power of private business" (p. 233).

Since then, regulators have, to a large extent, lost public trust, as argued by Aghion et al. (2010). Trust barometers further reveal that the public believes that industries are inadequately regulated, and trusts NGOs significantly more than public authorities. According to the 2015 Edelman Trust Barometer, 65% of people surveyed in the US trust NGOs, whereas only 41% trust the federal government.

Accordingly, we suggest that the recent rise of NGO activism is a response to the failure of public regulation. Indeed, over the period 2002-2014 in the US, for example, NGOs' criticisms against companies have been positively associated with prior increases in companies' lobbying expenditures (see the details in Appendix A).

Our view of NGO activism is reminiscent of Galbraith's (1952) notion of "countervailing power" that operates in the public interest, in the face of too-powerful industries: We depart from the naive description of a society in which public regulation alone resolves market failures. Our analysis of NGO activists is also reminiscent of Kofman and Lawarrée's (1993) and Acemoglu and Gietzmann's (1997) analyses of how external auditors could be used by the shareholders of a firm to limit managers' influence on internal auditors. In contrast to the dual-auditor optimal-contracting problem, however, NGO activists cannot be controlled by society through contractual relationships.

III. A Model of Public Regulation with Industry Lobbying

We introduce industry lobbying into an otherwise standard model of public regulation. A single firm, representative of the industry, can undertake some project. For example, the firm may implement a new operational unit or financial technique, release a new consumer product, etc. The project is characterized by its fixed (exogenous) size $q > 0$. It generates both a net private value $vq > 0$ that accrues to the industry and a net external

cost cq that is borne by the rest of society (e.g., consumers or workers).[8] The external cost reflects the fact that a new operational unit, a new product or a new technique may turn hazardous for the environment, for consumers, or for financial stability.

There are two possibilities: Either the project is good or it is bad, depending on whether the private value vq covers or falls short of the external cost cq. Precisely,

$$\begin{cases} \text{with probability } \ p_L, \ \text{ the project is good, as its external cost is low: } \ c = c_L < v; \\ \text{with probability } \ p_H, \ \text{ the project is bad, as its external cost is high: } \ c = c_H > v. \end{cases}$$

The firm would always undertake the project, since it generates a profit $vq > 0$. However, the project may be bad for society (when $c = c_H$). All parameters of the model are publicly known, except for the value of c (c_L or c_H), which is only observed by the regulator. In this context, the regulator is delegated the decision to approve or reject the project, as in the two-tiered regulatory structures of Tirole (1986), Laffont and Tirole (1991), and Laffont (1994).

The original feature of our model is lobbying: The industry can ex ante (i.e., before the external cost is observed by the regulator) influence the preferences of the regulator by making lobbying expenditures $e \geq 0$. In the spirit of Hiriart and Martimort (2012), we assume that lobbying causes the regulator to be biased in favor of the industry. Denoting by $\pi = vq$ and $\mathcal{U} = -cq$, respectively, the firm's profit and the rest-of-society's surplus when the project is undertaken, the total surplus generated by the project is $\mathcal{U} + \pi$.

8. The net private value is the difference between the private revenue and the private cost of the industry. The net external cost is the difference between the social cost (due to health or environmental damages, for example) and the benefit of stakeholders (e.g., consumers or workers) who bear this social cost.

Under the industry's influence, however, the regulator pursues the biased objective[9]

$$\mathcal{V} = \mathcal{U} + \big(1 + \alpha(e)\big)\pi, \tag{1}$$

where the regulatory-bias variable $\alpha(e) \geq 0$ positively depends on the firm's lobbying expenditures $e \geq 0$. We assume a linear influence function

$$\alpha(e) = \frac{e}{i}, \tag{2}$$

where the parameter $i > 0$ should be interpreted as the marginal cost of influence. When $e = 0$, there is no lobbying, and the regulator is not influenced at all: $\alpha(0) = 0$. In that case, the objective (1) coincides with the surplus $\mathcal{U} + \pi$ generated by the project and the regulator allows the project when it is good and rejects it otherwise.

Lobbying takes place when $e > 0$, which leads the regulator to give the extra weight $\alpha(e) > 0$ to the industry's profit relative to the external cost. Sufficient lobbying expenditures can induce the regulator to approve the project not only when it is good, but also when it is bad. In the absence of an NGO, we obtain the following proposition.

Proposition 1 (Regulation with no NGO). In the absence of an NGO,

1. The regulator approves a bad project if and only if

$$\alpha(e) \geq \bar{\alpha} \equiv \frac{c_H - v}{v}; \tag{3}$$

2. Lobbying takes place if and only if

$$\frac{i}{q} \leq \left(\frac{i}{q}\right)^R \equiv \frac{p_H v^2}{c_H - v}. \tag{4}$$

9. The regulator's objective need not integrate the ex ante lobbying expenditures of the industry, which are sunk at the moment of the regulatory decision to accept or reject the project. Those expenditures will, however, be considered later in our analysis of social welfare.

Proof. The regulator approves a bad project if and only if $(1 + \alpha(e))\, v \geq c_H$, which is equivalent to $\alpha(e) \geq \bar{\alpha}$ as given in (3).

The influence function (2) gives the minimum expenditures $\bar{e} = i\bar{\alpha}$ that induce the regulator to approve the project when it is bad. The industry is willing to make these expenditures if and only if $i\bar{\alpha}$ is less than the additional expected profit $p_H vq$ due to the approval of the project when it is bad: $p_H vq \geq i\bar{\alpha}$. Substituting (3) in the latter inequality yields (4). ■

The threshold $\bar{\alpha} > 0$ defined in (3) measures the minimum influence that the industry must have to convince the regulator to allow all projects. According to (4), the occurrence of lobbying depends on the parameter

$$\frac{i}{q} > 0,$$

which measures the relative cost of influence, which is adjusted by the size of the project.[10]

In the absence of lobbying, the social surplus generated by the industry is positive because the project is only allowed if it is good ($c = c_L$). We denote this first-best surplus by

$$\mathbb{E}\mathcal{W}_L^R = p_L(v - c_L)q > 0. \tag{5}$$

When the industry effectively lobbies, however, it may not be so. Expected welfare in that case can be written as

$$\mathbb{E}\mathcal{W}_{LH}^R = p_L(v - c_L)q + p_H(v - c_H)q - i\bar{\alpha}, \tag{6}$$

which differs from $\mathbb{E}\mathcal{W}_L^R$ in (5) by its second and third terms, which are both negative. The second term reflects the fact that the project is approved and undertaken even when

10. This is reminiscent of Glaeser and Shleifer's (2003) degree of "law and order," which in their context is the maximum enforceable fine that can be imposed on the firm, adjusted for the project's size.

it is bad. The third term further reduces social welfare by the industry's resources that have been sunk into lobbying.[11] We assume, nevertheless, that the expected social welfare generated by the industry is nonnegative, despite the industry's influence:

$$\mathbb{E}\mathcal{W}_{LH}^{R} \geq 0. \tag{7}$$

This rules out the uninteresting situation in which it would be socially optimal to simply shut down the industry.

IV. NGO Activism

We now introduce an activist NGO; the conditions under which it is effectively active will be established later, in Section VII. We focus on confrontational activists that do not lobby regulators, but directly target the firm's project, as in our introductory examples.

Nature first determines whether the project is good or bad, which is observed by the regulator. In either case, the regulator decides whether to reject or approve it. If the project is not approved, nothing else happens—but if it is approved, activists enter the discourse.[12]

IV.A. NGO-Industry Confrontation

When the project is approved by the regulator, the activists evaluate its external cost and decide whether to oppose it. We rely on Baron's (2012) model of confrontational

11. An alternative view is that lobbyists are "advocates" in the spirit of Dewatripont and Tirole (1999), and contribute by informing regulators—see also Grossman and Helpman (2001) on informational lobbying. We believe that this view fits better with the case of courts or lawmakers than regulators, who are chosen for their expertise.

12. The timing of actions, therefore, assumes that NGO opposition takes place after the regulatory decision whether to reject or approve the project. In some cases, however, NGOs identified potentially hazardous industrial projects that were still on the track for approval—i.e., before they were approved. Public regulation was sometimes sensitive to NGO opposition in these situations—as, for example, when fracking was banned by various US states and European governments, and when the Keystone XL pipeline was canceled. To address those cases, our model would have to be slightly modified.

activism.[13] The activists' opposition consists of two stages: Activists first mobilize, then campaign if needed. No successful campaign can arise without prior mobilization efforts. For example, in the 2004 conflict in which Rainforest Action Network opposed Citigroup, the NGO first committed personnel and earmarked funds to the specific issue posed by environmentally-harmful projects financed by the bank, before demanding that the bank strengthen its environmental standards. In the first stage, the activists mobilize with an intensity $m \geq 0$ against the project. We assume that mobilization efforts m are publicly observable and entail a dead weight loss γm, where $\gamma > 0$ is the marginal cost of mobilizing. When $m = 0$, we say that the activists do not mobilize. In that case, the approved project is ultimately undertaken by the firm.

Facing mobilization, the industry can always self-regulate. Given an intensity of mobilization $m > 0$, the firm decides whether to abandon or continue the project. If the firm abandons the project, nothing else happens.

When the project is opposed but continued by the firm despite the mobilization, the activists launch a campaign against it with the intent to hurt the firm. For example, in its conflict against Citigroup, Rainforest Action Network urged Citigroup cardholders to cut their cards into pieces and mail them to the bank. In the conflict between As You Sow and Dunkin' Donuts, the former ultimately coordinated a hostile shareholder resolution. These actions can take the form of calling for a boycott, mounting a cyber-attack, launching a negative advertisement campaign, lawsuit, shareholder resolution, etc.[14] This is the second stage of the activists' opposition. In addition to the NGO's mobilization efforts, a large variety of factors that are not under the NGO's control determine the success of a campaign. Therefore, a campaign randomly generates a harm

13. This model was inspired by the well-documented conflict in which the NGO Rainforest Action Network opposed Citigroup in 2004 (Baron and Yurday [2004]).

14. Various modes of campaigning, including boycotts, lawsuits, and shareholder resolutions, may sometimes be directed to the news media and amount to harmful advertising. See, for example, Friedman (1999, pp. 181-195) on the effects of boycotts.

$h \geq 0$ to the firm. We assume that h is drawn from a uniform distribution of support $[0, m]$,

$$h \sim U[0, m]. \tag{8}$$

Given the realized harm h, the firm decides whether to concede to the campaign. If the firm does not concede and undertakes the project despite the campaign, it bears the harm h that reduces its profit accordingly. If the firm concedes to the campaign, it is only inflicted a fraction

$$\omega \in (0, 1)$$

of the harm h. That is, conflict always negatively impacts the firm, but less so when it ultimately concedes. In that case, the harm ωh reflects the persistency of campaign damages, such as when society does not immediately forgive the firm after its concession, which causes a loss in terms of reputation or brand value.

The timing of actions is summarized by the game form presented in Figure I. The regulator acts first (after Nature has determined the project's type), then the NGO, and finally the firm. The information set encompassing the NGO nodes represents the fact that the NGO does not observe whether the project is good or not. Solid nodes indicate that the project is ultimately undertaken. Hollow nodes indicate that it is not, either because it has been rejected by the regulator, or because it has been abandoned by the firm. The firm may abandon the project after NGO mobilization, i.e., before a campaign—or, if it continues with the project, after the campaign or not at all. The game is solved backward, so as to select a subgame perfect equilibrium. We start with the firm's decision.

IV.B. The Firm's Decision

We focus on cases where ω is high—that is, campaign damages are highly persistent—to reflect the fact that reputational risk has become a major concern for companies.

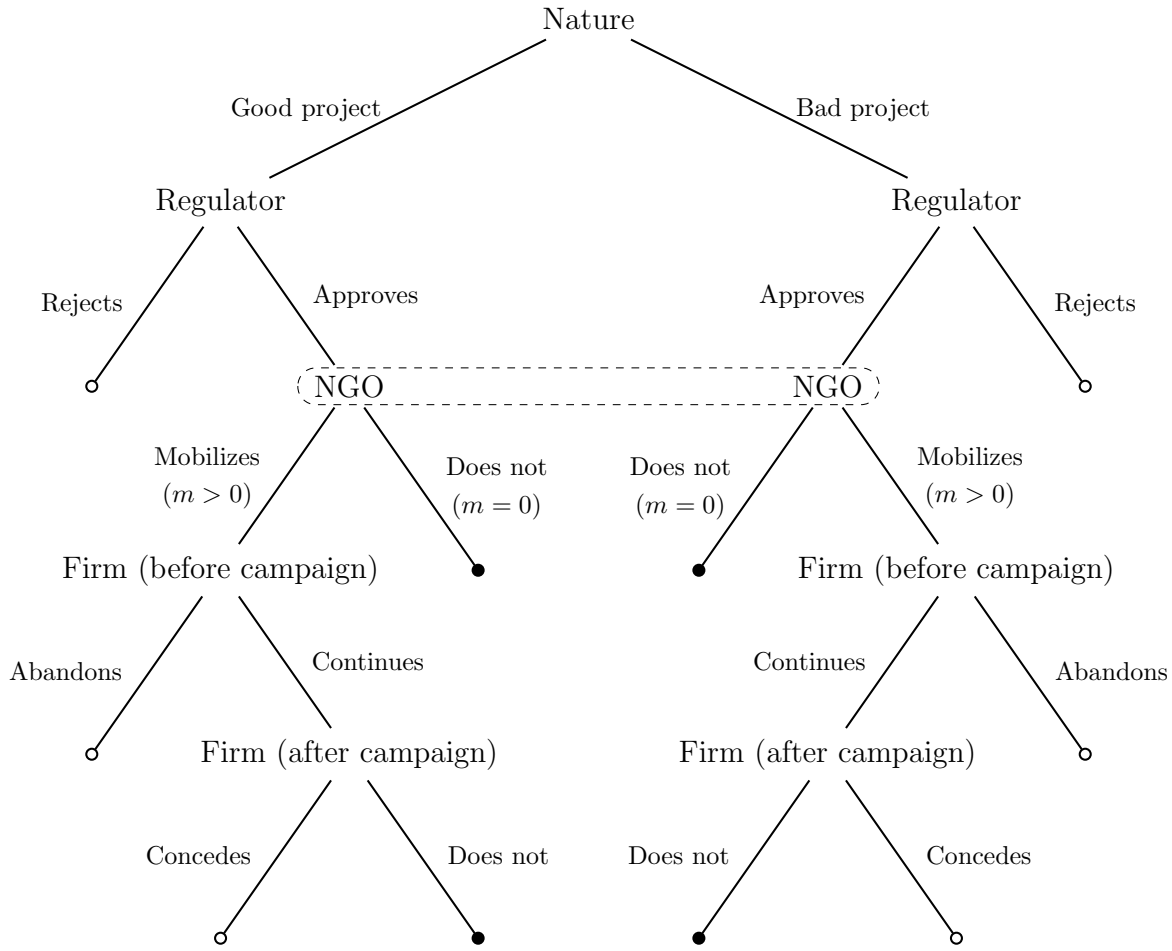


Figure I: Game form

As *The Economist* (January 22, 2004, Special Report on Risk) puts it, "The biggest risk any company faces is the loss of its good name, and you cannot insure against that." Interestingly, the special report adds that "some of the most vigorous wreckers of reputations have been NGOs." Even in the eventuality of a concession, therefore, a conflict with activists may be prohibitively costly in terms of both reputation and brand value.[15]

15. *The Economist*'s special report continues: "Greenpeace and Friends of the Earth now routinely picket and boycott firms of whose practices they disapprove, such as Nestlé, Esso and Shell. Companies that do business in poor countries (e.g., Nike) are liable to find themselves charged with running sweatshops."

Assumption 1 (Campaign damages persistency). Campaign damages are sufficiently persistent:

$$\omega \geq \frac{1}{2}. \tag{9}$$

Under this assumption, the following proposition is obtained.[16]

Proposition 2 (Effectiveness of NGO opposition). The firm does not concede in the last stage, after an NGO campaign. There are two possible cases, depending on the intensity of NGO mobilization:

1. If $m < \bar{m} \equiv 2vq$, the firm does not abandon the project, irrespective of the harm caused by the campaign;
2. If $m \geq \bar{m}$, the firm abandons the project in the first stage, following the NGO mobilization.

Proof. The firm concedes to the NGO at the campaign stage if and only if $vq - h < -\omega h$. At the mobilization stage, the expected profit that accrues to the firm if it continues is thus

$$\mathbb{E}\pi = \frac{1}{m}\int_0^m \max(vq - h, -wh)\ dh, \tag{10}$$

to be compared with $\pi = 0$ if it abandons. In particular, $\mathbb{E}\pi \geq (1/m)\int_0^m (vq - h)\ dh = vq - m/2$, which is positive when m is lower than

$$\bar{m} \equiv 2vq. \tag{11}$$

This validates the first part of the proposition.

Assume that $m \geq \bar{m} = 2vq$. Since $\omega \geq 1/2$ by Assumption 1, (10) implies $\mathbb{E}\pi \leq I \equiv (1/m)\int_0^m \max(vq - h, -h/2)\ dh$. But $I = (1/m)[\int_0^{2vq}(vq - h)\ dh - \int_{2vq}^m (h/2)\ dh]$, where

16. The model accommodates the case of low persistent damages. In that case, mobilizations of intermediate intensities ultimately lead to a campaign of random success, which renders the analysis significantly more tedious.

the first integral is zero; hence $I \leq 0$. It follows $\mathbb{E}\pi \leq 0$ in that case, establishing the second part of the proposition. ■

Thus Assumption 1 implies that activist campaigns never occur in equilibrium; this compels our analysis of the NGO-industry confrontation to focus on the industry's self-regulation in the face of activists' mobilization. The resulting game form is represented in Figure II. This focus is not only simplifying, but also highlights the empirically most important facet of NGO activism. Admittedly, mobilizations do not always suffice, such that firms sometimes concede to activists' requests after harmful campaigns have been carried out.[17] Nevertheless, those campaigns are only the tip of the iceberg; in many more cases, although less noticeable, firms proactively self-regulate in front of a latent mobilization of NGO activists, to avoid the eventuality of harmful campaigns (e.g., Baron [2003, p. 36]).

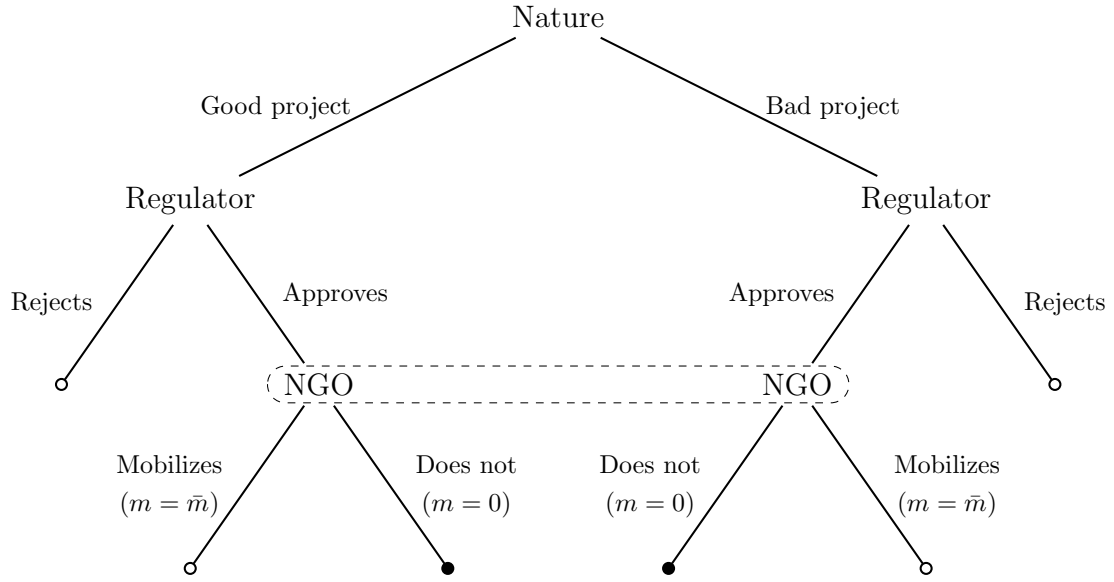


Figure II: Reduced game form after two steps of backward induction

17. As already mentioned, this was the case, for instance, in the 2004 conflict between Rainforest Action Network and Citigroup, in the 2012-2013 conflict between UK Uncut and Starbucks, and in the 2015 conflict between As You Sow and Dunkin' Donuts. In fact, the most famous examples of NGO activism involve a campaign—for example, a boycott—because such conflicts are the most noticeable manifestation of NGO opposition.

We now characterize activists' optimal choice to mobilize or not against the firm's project.

IV.C. The NGO Decision

We relax Baron's (2012) assumption that the activists maximize social welfare. Instead, we assume that they pursue the following objective, which is biased against the firm's profit:

$$\mathcal{X} = \mathcal{U} + (1-\beta)\Pi - \gamma m, \tag{12}$$

where the bias parameter $\beta \geq 0$ captures the activists' radicalism in a manner symmetric with the regulator's bias α in favor of the industry's profit π.

According to Proposition 2, the NGO's optimal strategy is either not to mobilize ($m = 0$), in which case the project is undertaken, or to mobilize with the minimum effective intensity $\bar{m} = 2vq$ needed to induce the project's abandonment. In the first case $\mathcal{X} = [(1-\beta)v - s]\, q$, while $\mathcal{X} = -2\gamma vq$ in the second. It follows that the NGO opposes the project if and only if its assessment $\mathbb{E}^N(c)$ of the external cost c satisfies

$$\mathbb{E}^N(c) \geq \bar{s} \equiv (1 + 2\gamma - \beta)v. \tag{13}$$

Otherwise, there is no mobilization and the project is undertaken.

In expression (13) of the NGO's opposition threshold, $2\gamma - \beta$ plays a role similar to that of its counterpart α for the regulator in Section III. This effective NGO bias is decreasing in β and increasing in γ. Thus opposition becomes more likely as the NGO becomes more radical and mobilizations become less costly.

We also do away with Baron's (2012) assumption of complete information. Here, the assessment of the external cost c by the activists depends on both their perception of the

regulator's behavior and the (imperfect)[18] information at their disposal. We represent the latter as the following noisy signal on c

$$s = c + \sigma\varepsilon, \tag{14}$$

where ε is the realization of a random noise with zero mean, density $f(\varepsilon)$, and cumulative distribution function $F(\varepsilon)$. We assume that f is symmetric and single peaked at $\varepsilon = 0$. We also assume that $\log(f)$ is strictly concave, implying the standard property that a higher signal s indicates that a bad project is more likely. In (14),

$$\sigma > 0$$

measures the "opacity" of the industry: A higher parameter σ reflects less transparency, and, therefore, less precise information available to the activists.

The following assumption rules out the less interesting case of an "extremist" NGO that would mobilize in the same way regardless of whether the project is good or bad.

Assumption 2 (Non-extremist NGO).

1. If the NGO were perfectly informed—as when σ tends to zero—it would oppose the project when it is bad:

$$\bar{s} < c_H; \tag{15}$$

2. If it were not informed at all—as when σ tends to the infinity—it would not oppose any project:

$$p_L c_L + p_H c_H < \bar{s}. \tag{16}$$

If instead $\bar{s} > c_H$, the NGO would remain inactive even if it perfectly knew that the project was bad. Moreover, if the prior expected cost $p_L c_L + p_H c_H$ was higher than $\bar{s}$, the

18. As already mentioned, NGOs have, unlike regulators, incomplete access to the information necessary to evaluate c—e.g., the 1995 Greenpeace-Shell conflict.

NGO would systematically oppose the project even if it had no information at all. Note that (16) implies

$$\bar{s} > c_L; \tag{17}$$

i.e., a perfectly informed NGO would not oppose a good project.

In a subgame perfect Bayesian equilibrium, the NGO's perception of the regulator's behavior is rational. When the regulator only accepts good projects, activists correctly infer that an accepted project is good and do not mobilize against it ($m = 0$), regardless of their signal. When the regulator accepts the project irrespective of whether it is good or bad, the activists assess the external cost c by using the probabilities that the project is good ($c = c_L$) or bad ($c = c_H$), conditional on s. By Bayes' rule, these probabilities are

$$P(c = c_j|s) = \frac{p_j f(\frac{s-c_j}{\sigma})}{p_L f(\frac{s-c_L}{\sigma}) + p_H f(\frac{s-c_H}{\sigma})},\ j = L, H, \tag{18}$$

where $f\left((s-c)/\sigma\right)$ gives the likelihood that the activists' signal will be s, conditional on the project's having an external cost c. Therefore, the NGO mobilizes if and only if

$$\mathbb{E}(c|s) = P(c = c_L|s)c_L + P(c = c_H|s)c_H \geq \bar{s}. \tag{19}$$

By the assumption that f is log-concave, the conditional expectation $\mathbb{E}(c|s)$ is strictly increasing with the signal s. It follows that NGO mobilization takes place if and only if the signal s is larger than the effective opposition threshold $\hat{s}$ defined by

$$\mathbb{E}(c|s = \hat{s}) = \bar{s}. \tag{20}$$

The effective opposition threshold $\hat{s}$, which results from the activists' Bayesian inference, differs from its perfect-information counterpart $\bar{s}$ defined in (13). In particular, (18) and (19) make clear that $\mathbb{E}(c|s)$ and, therefore, $\hat{s}$ depend on σ. We define the latter as the

following function:

$$\hat{s} \equiv \hat{s}(\sigma).$$

Figure III shows the conditional expectation $\mathbb{E}(c|s)$ as a function of s and the resulting opposition threshold $\hat{s}(\sigma)$, for various degrees of opacity σ. When the signal s is the mean cost $(c_L + c_H)/2$, it is not informative: In that case, it can be verified that $\mathbb{E}(c|s)$ takes the value of the prior expected cost $p_L c_L + p_H c_H$, regardless of σ. When σ tends to the infinity—i.e., in absence of information—$\mathbb{E}(c|s)$ takes the value $p_L c_L + p_H c_H$ irrespective of s. In that case, Assumption 2—that $p_L c_L + p_H c_H < \bar{s}$—implies that $\hat{s}(\sigma)$ does not exist. For finite values of σ, $\mathbb{E}(c|s)$ increases and becomes steeper around $(c_L + c_H)/2$ as σ decreases and tends to 0. Assumption 2 implies that $\hat{s}(\sigma)$ is always greater than $(c_L + c_H)/2$ and that it increases with σ.

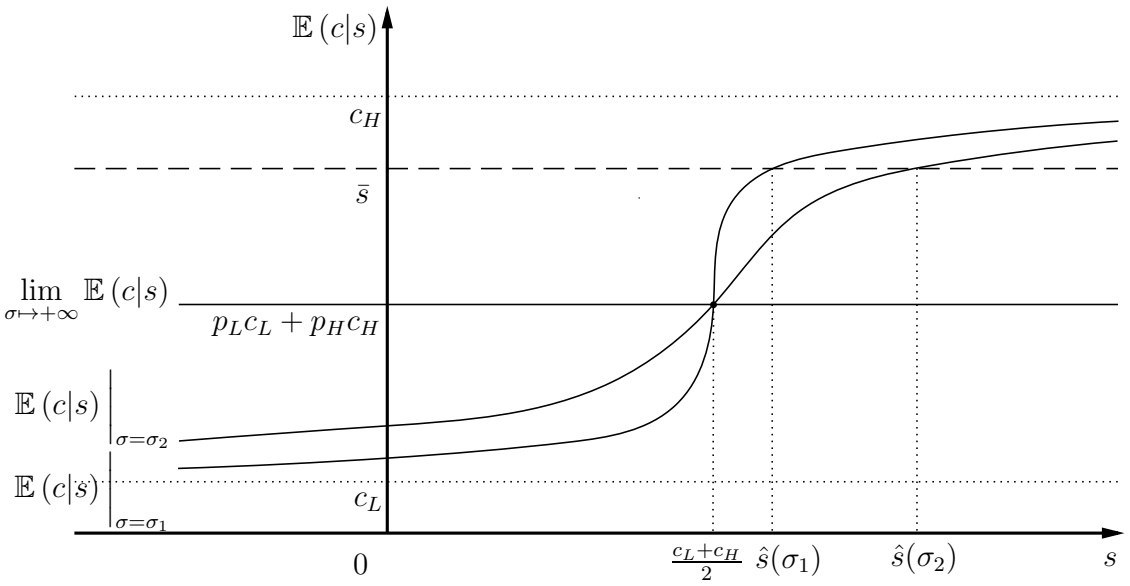


Figure III: Activists' assessment of the external cost for various degrees of transparency: $0 < \sigma_1 < \sigma_2$

In this context, it follows that the NGO opposes bad projects with probability

$$\Phi_H(\sigma) \equiv 1 - F\left(\frac{\hat{s}(\sigma) - c_H}{\sigma}\right) = F\left(\frac{c_H - \hat{s}(\sigma)}{\sigma}\right), \tag{21}$$

and good ones with probability

$$\Phi_L(\sigma) \equiv 1 - F\left(\frac{\hat{s}(\sigma) - c_L}{\sigma}\right) = F\left(\frac{c_L - \hat{s}(\sigma)}{\sigma}\right), \tag{22}$$

where $c_L < c_H$ implies that, for all σ,

$$0 \leq \Phi_L(\sigma) < \Phi_H(\sigma). \tag{23}$$

The NGO is less likely to oppose a project when it is good than when it is bad. In this representation of NGO opposition, the probability $1 - \Phi_H(\sigma)$ that the NGO does not oppose a bad project and the probability $\Phi_L(\sigma)$ that it opposes a good one correspond, respectively, to type-I and type-II errors in statistical hypothesis testing.

The results of this section are summarized by the following proposition.

Proposition 3 (NGO opposition).

1. If the regulator rejects bad projects, the NGO never mobilizes.
2. If the regulator approves all projects, regardless of whether they are good or bad, the NGO mobilizes (and induces the firm to abandon its project) with probability $\Phi_H(\sigma)$ given in (21) when the project is bad, and probability $\Phi_L(\sigma) < \Phi_H(\sigma)$ given in (22) when it is good.
3. As σ increases and the industry becomes less transparent, the NGO mobilization probability $\Phi_H(\sigma)$ decreases; $\Phi_L(\sigma)$ is single peaked.

   The proof is presented in Appendix B. $\Phi_L(\sigma)$ and $\Phi_H(\sigma)$ are depicted in Figure IV.

   The next section examines how NGO opposition affects public regulation.

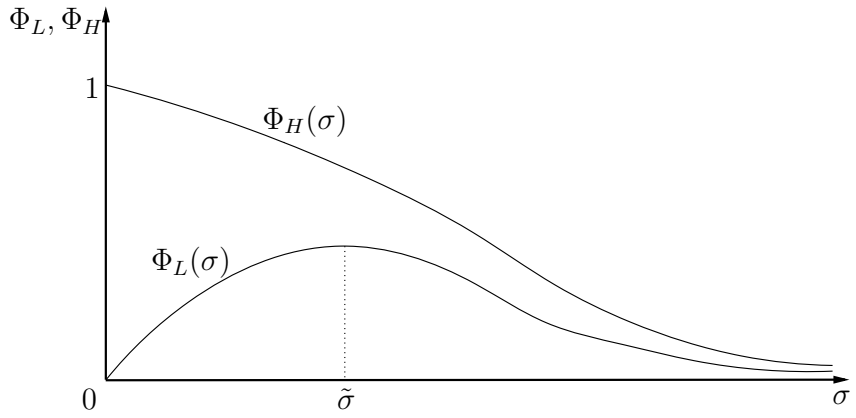


Figure IV: Probability of NGO opposition to good and bad projects

V. Public Regulation with NGO Opposition

Moving one step further back in the sequence of actions summarized in Figure II, we now consider the regulator's decision whether to reject the project when it is bad. If it does, this will be correctly anticipated by activists and NGO mobilization will never occur; in that case, the first-best outcome is realized. In contrast, if the regulator decides to approve the project when it is bad, the NGO will mobilize against the project with probability $\Phi_H(\sigma)$ given in (21).

On the one hand, the regulator does not internalize the cost of NGO mobilizations.[19] Therefore, the minimum influence threshold $\bar{\alpha}$ required for the regulator to accept a bad project is the same as in Section III, regardless of the presence of activists. On the other hand, however, the presence of an NGO reduces the stakes of lobbying. Indeed, the industry anticipates that, if a bad project were accepted, it might ultimately be abandoned with probability $\Phi_H(\sigma) > 0$ due to NGO opposition.

19. The analysis would not be modified in any fundamental way under the alternative assumption that the regulator internalized the social cost of NGO mobilizations, or incurred a private reputational cost due to mobilizations. In that case, the regulator would be more reluctant to approve a bad project and require a higher influence intensity from the industry.

Proposition 4 (Regulation and lobbying with NGO opposition). In the presence of an NGO, lobbying takes place if and only if

$$\sigma \geq \sigma^{RN}\left(\frac{i}{q}\right) \equiv \Phi_H^{-1}\left(1-\left(\frac{i}{q}\right)\frac{c_H - v}{p_H v^2}\right). \tag{24}$$

Proof. In the presence of an NGO, in the same way as without an NGO, the regulator approves a bad project if and only if $(1-\Phi_H(\sigma))\left((1+\alpha(e))\,v - c_H\right) \geq 0$ with $\Phi_H(\sigma) < 1$, which is equivalent to $\alpha(e) \geq \bar{\alpha}$, as per (3). The industry is willing to bear the minimum effective lobbying expenditure $\bar{e} = i\bar{\alpha}$ if and only if it is covered by the additional expected profit $(1-\Phi_H(\sigma))\,p_H vq$ due to the approval of a bad project: $(1-\Phi_H(\sigma))p_H vq \geq i\bar{\alpha}$. Substituting $\bar{\alpha}$ from (3) and rearranging, the condition becomes

$$\Phi_H(\sigma) \leq 1 - \left(\frac{i}{q}\right)\frac{c_H - v}{p_H v^2}, \tag{25}$$

where $\Phi_H(\sigma)$ is a decreasing bijective function which takes values in $(0,1)$. Furthermore, $\Phi_H(\sigma)$ is independent of i/q.[20] It follows that (25) is equivalent to the condition expressed in (24). It can be verified that the function σ^{RN} is continuously increasing and takes values from $\lim_{i/q \mapsto 0} \sigma^{RN}(i/q) = 0$ to $\lim_{i/q \mapsto (i/q)^R} \sigma^{RN}(i/q) = +\infty$, where $(i/q)^R$ is defined in (4). For $i/q \geq (i/q)^R$, $\sigma^{RN}(i/q)$ does not exist. ■

The result of Proposition 4 is illustrated in Figure V in the $(i/q,\sigma)$ plane. It shows that the threshold function $\sigma^{RN}(i/q)$ exhibits an asymptote at level $(i/q)^R$, the lobbying threshold in the absence of an NGO. Indeed, when σ is infinitely high—i.e., without information—there is no NGO opposition, so that lobbying takes place under the same condition whether there is an NGO or not.

In the absence of lobbying, there is no NGO opposition, so the social surplus generated

20. Since both revenues and costs are proportional to the size of a project, the relative cost of influence i/q affects neither the influence threshold $\bar{\alpha}$ that induces the regulator to accept bad projects nor the opposition probability functions Φ_L and Φ_H.

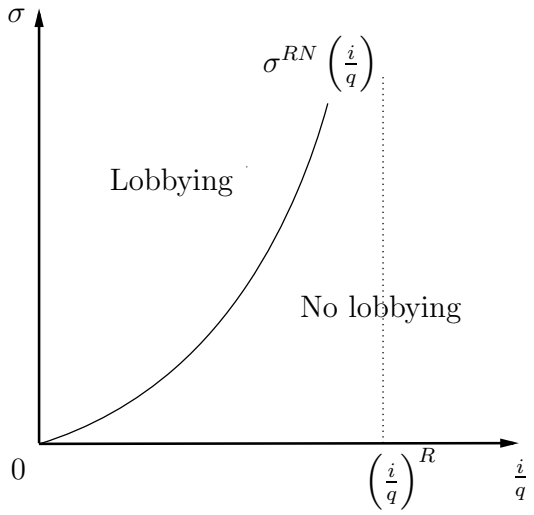


Figure V: Occurrence of industry lobbying in the presence of an NGO

by the industry is the first-best level, as in (5):

$$\mathbb{E}\mathcal{W}_L^{RN} = \mathbb{E}\mathcal{W}_L^{R} = p_L(v - c_L)q > 0. \tag{26}$$

When the industry lobbies effectively, however, expected welfare becomes

$$\begin{aligned} \mathbb{E}\mathcal{W}_{LH}^{RN} &= p_L\left[(1 - \Phi_L(\sigma))\,(v - c_L) - \Phi_L(\sigma)2v\right]q \\ &+ p_H\left[(1 - \Phi_H(\sigma))\,(v - c_H) - \Phi_H(\sigma)2v\right]q - i\bar{\alpha}. \end{aligned} \tag{27}$$

In the same way as in Section III, we rule out the uninteresting situation in which it would be socially optimal to simply shut down the industry by assuming[21]

$$\mathbb{E}\mathcal{W}_{LH}^{RN} \geq 0. \tag{28}$$

21. In some cases, however, industry projects were banned only because they were meeting NGO opposition. This was especially evident when France banned GMO cultivation in 2014: The decision was justified by the opposition of the public, as demonstrated by opinion polls and by activists' destruction of experimental GMO fields (*Reuters*, May 5, 2014, available at `http://www.reuters.com/article/2014/05/05/france-gmo-idUSL6N0NR2MZ20140505`).

The next section characterizes the occurrence of lobbying with and without an NGO.

VI. Relative Cost of Influence, Transparency, and Occurrence of Industry Lobbying

In this section, we examine the circumstances under which industry lobbying takes place with and without an NGO. According to Propositions 1 and 4, the occurrence of lobbying depends on both the relative cost of influence and the degree of transparency in the industry. The following corollary is obtained.

Corollary 1 (Occurrence of lobbying).

1. For high relative costs of influence $i/q > (i/q)^R$, lobbying never takes place—i.e., regardless of whether there is an NGO or not.
2. For low relative costs of influence $i/q \leq (i/q)^R$ and
   (a) Low degrees of transparency $\sigma \geq \sigma^{RN}(i/q)$, the industry always lobbies;
   (b) High degrees of transparency $\sigma < \sigma^{RN}(i/q)$, the industry lobbies in the absence of an NGO, and does not otherwise.

Proof. The corollary immediately results from Proposition 1 (without an NGO) and its counterpart Proposition 4 in the presence of an NGO. Its formulation highlights that there are only three possible situations. This is because, as already explained in Section V, for $i/q \geq (i/q)^R$, $\sigma^{RN}(i/q)$ does not exist. ■

Corollary 1 shows that the presence of an NGO limits the occurrence of industry lobbying, as is illustrated in the $(i/q,\sigma)$ plane in Figure VI.

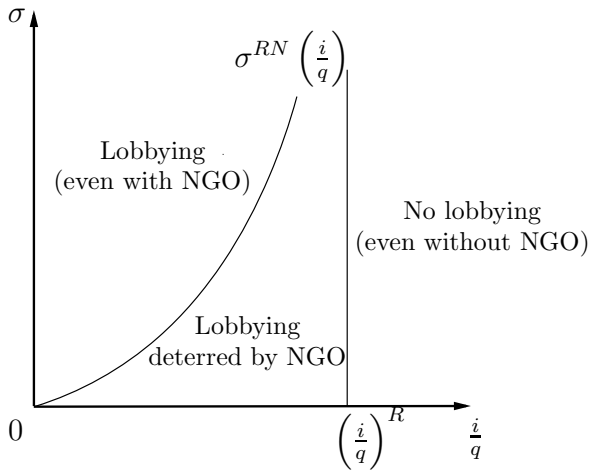


Figure VI: Occurrence of industry lobbying with and without an NGO

VII. Endogenous NGO Entry and Welfare Analysis

VII.A. Endogenous NGO Entry

Sections III and V examined the performance of an industry with and without an NGO. We now endogenize the NGO's entry decision.[22] When the NGO enters, activists dedicate resources to the monitoring of the industry's project and, based on the information they collect, decide whether to oppose this project in the way described above.

We assume that the NGO enters when the change in the activists' (biased) valuation of expected welfare $\mathbb{E}\mathcal{X}$ caused by the presence of the NGO strictly exceeds some entry cost that we normalize to zero. Therefore, we compare $\mathbb{E}\mathcal{X}$ in the presence and absence of the NGO in the industry, in the three situations identified in Corollary 1.

Consider first the situation in which industry lobbying never takes place and the regulator only approves the project when it is good. In this case, there is no NGO opposition, even in the presence of the NGO, as per Proposition 4. With or without the

22. The coordination of individual activists and the NGO's formation are beyond the scope of this paper.

NGO, the valuation of expected welfare by activists is the first-best level

$$\mathbb{E}\mathcal{X}_L^R = \mathbb{E}\mathcal{X}_L^{NR} = p_L\left[(1-\beta)v - c_L\right]q. \tag{29}$$

NGO entry, therefore, would not improve the welfare valuation $\mathbb{E}\mathcal{X}$ of activists.

Second, consider the situation in which industry lobbying only induces the approval of a bad project in the absence of the NGO. In that case, Proposition 1 implies that the activists' perceived expected welfare is

$$\mathbb{E}\mathcal{X}_{LH}^R = p_L\left[(1-\beta)v - c_L\right]q + p_H\left[(1-\beta)v - c_H\right]q, \tag{30}$$

which is lower than the first-best welfare valuation (29) because the second term in (30) is negative. Therefore, the NGO's entry causes a change $\mathbb{E}\mathcal{X}_L^{RN} - \mathbb{E}\mathcal{X}_{LH}^R > 0$. In that case, the activists always enter.

Third, consider the situation in which the industry lobbies the regulator regardless of the NGO's presence. In the absence of the NGO, the activists' valuation of expected welfare is given by (30), which is to be compared with their welfare valuation in the presence of NGO opposition. By Propositions 2 and 3, this valuation is

$$\begin{aligned}\mathbb{E}\mathcal{X}_{LH}^{RN} &= p_L\left[(1-\Phi_L(\sigma))\left((1-\beta)v - c_L\right) - \Phi_L(\sigma)2v\right]q \\ &+ p_H\left[(1-\Phi_H(\sigma))\left((1-\beta)v - c_H\right) - \Phi_H(\sigma)2v\right]q.\end{aligned} \tag{31}$$

Analysis of the difference $\mathbb{E}\mathcal{X}_{LH}^{RN} - \mathbb{E}\mathcal{X}_{LH}^R$ yields that the NGO always enters in that case—see the proof in Appendix B. The above results are summarized by the following proposition.

Proposition 5 (Endogenous NGO entry and industry lobbying). The activist NGO enters if and only if $0 < i/q \leq (i/q)^R$—i.e., whenever the industry lobbies in its absence.[23]

VII.B. NGO-induced Welfare Improvement

The question arises whether the entry decision of the NGO activists analyzed in the previous subsection contributes to improve welfare. Indeed, there are two differences between the objective pursued by the NGO $\mathcal{X} = \mathcal{U} + (1-\beta)\pi - \gamma m$ and social welfare

$$\mathcal{W} = \mathcal{U} + \pi - \gamma m - i\alpha. \tag{32}$$

First, the activists' valuation of the surplus generated by the industry is biased against the industry's profit by the parameter $\beta \geq 0$. Second, activists do not internalize that the industry's resources are sunk into lobbying.

To address the welfare impact of the NGO's entry, it is useful to first establish the circumstances under which this entry deters industry lobbying. We do so in the following corollary.

Corollary 2 (NGO's deterrence of lobbying). NGO entry deters industry lobbying if and only if $\sigma < \sigma^{RN}(i/q)$—i.e., whenever the information at its disposal is sufficiently precise.

Proof. The corollary immediately results from the combination of Corollary 1 and Proposition 5. ■

We now examine the impact on welfare of the NGO's entry decision. When industry lobbying never takes place and the regulator only approves the project when it is good, the first-best outcome is realized despite the fact that the NGO does not enter. Expected

23. It should be clear from Corollary 1, however, that NGO entry does not necessarily deter lobbying.

social welfare in that case is given by (26), which would not be improved by the NGO's entry.

When industry lobbying is deterred by the NGO's entry, the first-best welfare level (26) is restored: Indeed, the mere presence of the NGO is sufficient in that case, and NGO mobilization is not needed: The NGO's entry is always desirable.

Finally, when industry lobbying takes place regardless of whether there is an NGO or not, expected social welfare $\mathbb{E}\mathcal{W}_{LH}^{R}$ without an NGO, as given in (6), is to be compared with its counterpart $\mathbb{E}\mathcal{W}_{LH}^{RN}$ in the presence of an NGO, as given in (27). Analysis of the difference yields the following proposition.

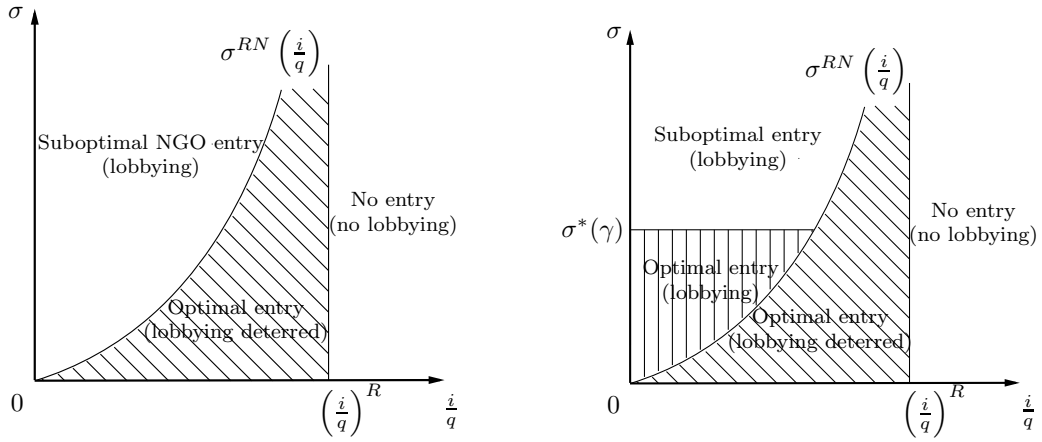
Proposition 6 (NGO entry and welfare improvement).

1. NGO entry always improves social welfare when it deters industry lobbying.
2. When it does not deter lobbying, NGO entry improves welfare if
   (a) Mobilizations are not too costly: $\gamma < \bar{\gamma} \equiv \frac{c_H - v}{2v}$;
   (b) There is enough transparency in the industry.

The proof of Proposition 6 is presented in Appendix B. Its result is represented in Figure VII. In the right-hand panel, the cost of NGO mobilization is sufficiently low ($\gamma < \bar{\gamma}$): There exists a threshold degree of opacity $\sigma^*(\gamma)$ below which the NGO's entry is optimal despite the fact that it does not deter industry lobbying.

In environments favorable to the industry's influence, the involvement of NGO activists may become optimal for society for two reasons. First, NGOs tend to deter industry lobbying. Thus, in the presence of an NGO, regulation is less vulnerable to the industry's influence. Second, even when the industry's influence is unavoidable, activists directly oppose industrial projects.

Yet NGO opposition is a costly way to fight an industry's influence on its regulation, not only because NGO-industry conflicts are socially costly, but also because NGOs



(a) High mobilization cost: $\gamma \geq \bar{\gamma}$ (b) Low mobilization cost: $\gamma < \bar{\gamma}$

Figure VII: Optimality of NGO entry

sometimes pick the wrong target. When an NGO becomes more efficient and when its information improves, however, it chooses better targets and reaches them in a less costly way. In that context, Proposition 6 demonstrates that NGO opposition has the potential to improve the existing regulatory system.

This theory holds that public regulation becomes vulnerable to the industrial stakes both because (*ı*) the relative cost of influence declines and (*ıı*) economic activity grows. In either case, NGO activists may enter. When NGOs are sufficiently efficient and transparency allows them to be sufficiently well informed, activism against industrial projects is warranted. Our theory highlights the fundamental importance of transparency. Activists may only fulfill their role of countervailing the industry's influence if they have access to information of a sufficient quality to distinguish a bad project from a good one.

VIII. Concluding Remarks on the Rise of NGO Activism

Our theory can be used to explain the increasing involvement of NGOs in several industries over the past few decades. In a nutshell, our view is that the size and value of industrial projects (and thus the stakes of lobbying) have grown dramatically, while the

cost of influence has not increased in most countries (and probably decreased in some). Public regulation has thus become more vulnerable. At the same time, conditions have favored NGOs' efficiency, such as the rise of communication technologies and the resulting dissemination of information. As a result, NGOs have increasingly sought to oppose the hazardous projects of industries that are difficult to regulate.

VIII.A. The Rising Scale of Projects, and the Resulting Influence of the Industry on Public Regulation

In Western countries, firms have typically grown in size rapidly in the last three decades. More and more, multinational conglomerates operate in oil and energy production, banking, retailing, food production, new technologies, etc. This is mainly because technology accelerated economies of scale and increased entry costs (Bollard, Klenow, and Li [2014]; Mueller, Ouimet, and Simintzi [2015]), thereby "allowing the biggest firms to get bigger unhindered by competition" (*The Economist*, March 14, 2015). In developing countries, businesses have grown in size both because of economic development and because super big companies emerged from state capitalism.

At the same time, industrial projects have grown bigger, whether in size or valuation, and their potential external damages have scaled up accordingly. For example, outcomes such as the Deepwater Horizon explosion, the Fukushima disaster, and the global financial crisis became catastrophes because the units involved were of record size. It is remarkable that the Deepwater Horizon rig was drilling the deepest oil well in history, and that the Fukushima Daiichi nuclear power plant was one of the 15 largest power stations in the world. Furthermore, when businesses are interconnected, as in the banking sector, firm size is more critical than ever, because interconnection magnifies the social damages of misconduct.

Glaeser and Shleifer (2003) show that public regulation was the optimal way for

society to regulate business in Western countries between the start of the Progressive Era, and, roughly, the Second World War. However, the progressive program could not keep its promises in the face of today's enormous stakes. The contemporary era instead sees Western governments under the thumb of super-big multinationals and not in a position to impose adequate standards on them. In some sectors, businesses are so powerful that they manage to effectively distort regulation incentives with enormous political contributions, ubiquitous lobbying efforts, occasional corruption, or more complex and subtle forms of influence. This has been the case of energy regulation in many instances, but also of the regulation of the banking sector and the food and drugs industries worldwide.

VIII.B. The Rising Efficiency of NGO Activism

When governments and regulators have failed to impose adequate standards for powerful businesses, NGOs have gotten increasingly effective at mobilizing to address such failures. For example, our analysis already mentioned the effective opposition to Nike's outsourced production management, Citigroup's project funding, HSBC's risk management, TransCanada's and Shell's energy-related projects, Starbucks's tax-avoidance scheme, and Dunkin's Donuts's use of chemicals. Opposition to super-big corporations and projects seems inherent to the rise of NGOs, both because big businesses are typically suspected of causing the greatest harm, and because they are more vulnerable to reputational risks.

Another remarkable change that has characterized the last few decades is the emergence of the Internet and associated communication technologies (ICT hereafter). As Joseph Nye (2004) points out, the ICT revolution has dramatically accelerated the rise of NGOs. According to our theory, there are two important aspects: information quality and mobilization efficiency. First, the ICT revolution has facilitated NGOs' ability to identify issues to oppose. Indeed, information is increasingly being disseminated at the

global level about everything and, *a fortiori*, about industrial projects and their regulatory treatment. To sum up, in the words of *The Economist* (January 22, 2004), "The Internet [has] greatly improved transparency. Corporate secrets are becoming ever harder to keep." Baron (2003, pp. 34-35) illustrates the changes in NGO strategies that resulted from the ICT revolution. For example, he describes environmental activists' rapid circulation of information released by the Environmental Protection Agency. Similarly, an essay by the head of a NASA research institute was circulated in 2011, which informed NGOs about the Keystone XL pipeline's being on the track for approval. Second, the ICT revolution greatly improved the ways in which the public can be mobilized through social media, as well as NGOs' ability to coordinate their efforts through networks. This is well illustrated by recent mobilizations, such as the opposition to TransCanada's exploratory drilling in Québec in 2014.

VIII.C. NGO Activism as a Response to Recent Changes

According to our theory, therefore, the economy has moved, over the last few decades, in the southwest direction in the diagrams in Figure VII. On the one hand, in the face of greater industrial stakes, public regulation has become more susceptible to pressure from industry to approve hazardous projects. In our model, this means a fall in the relative cost of influence i/q. On the other hand, NGO activism has benefitted from improved communication technologies and gotten increasingly better at targeting harmful projects. This means a fall in the parameter σ measuring opacity. Our theory, therefore, suggests that the involvement of NGO activists was a response to the recent changes described above.

The remaining question is whether this response was legitimate from the perspective of society as a whole. For example, Joseph Nye (2004) considers that the rise of NGO opposition has contributed to social progress. Improved communication technologies have

not only generated more transparency, but also favored activists' efficiency in opposing targeted projects. This means a fall in the cost of mobilization γ: The economy would have moved from the diagram on the left in Figure VII to the diagram on the right, and in the southwest direction in the latter. In that context, NGO opposition was more likely to be socially optimal as σ decreased, for two reasons. On the one hand, NGOs became better at detecting the most hazardous projects. On the other hand, with more transparency, NGOs became more effective at deterring industry lobbying. For example, over the period 2002-2014 in the US, NGOs' criticisms have been negatively associated with companies' subsequent lobbying expenditures (see the details in Appendix A).

Thus our theory tells that the rise of NGO activism is socially optimal if the joint decrease in σ and γ has been sufficiently marked. Another possible change in the same direction is that NGOs are likely to become less radical over time—that is, to exhibit a lower β. On the one hand, NGOs can be expected to attract, at first, the most radical activists, and, with time, less radical ones. On the other hand, NGOs have increasingly been competed with each other to mobilize the public. The need to mobilize a larger part of the public can be expected to lead NGOs to increasingly align their objectives with social welfare.

The conjecture that NGO activists have become less radical can be illustrated by the example of the Environmental Defense Fund (EDF), a famous advocacy group whose net assets have increased by more than 50% over the past four years. EDF's rapid growth relies on sponsors' contributions, mostly from its more than 1,000,000 members. The most well-known characteristic of EDF is its use of science, economics, and law to propose the most appropriate changes. Created in 1967—and, in 1975, the first environmental group to hire economists—EDF has been called "America's most economically literate green campaigners" (*The Economist*, August 31, 1991).

VIII.D. Other Possible Policy Responses

Ahead of more vulnerable public regulation, our theory suggests other responses besides NGO activism that could contribute to social progress. The first and most obvious would be to strengthen regulation's ability to resist industry influence by increasing the cost of influence i. This is, for example, the message of the Tobin Project initiative and of Carpenter and Moss's (2014) book, which calls for more attention to how the influence of special interests can be limited. Especially in reaction to the global financial crisis, the call for the prevention of capture found a particular echo in the US policy arena in 2009-2010, with the creation of new agencies under the 2010 Dodd-Frank bill. The question still arises, however, how agencies should be designed to increase their independence (see, for example, the measures suggested by Sheng [2012, p. 157]). Indeed, as shown by Gibson Brandon and Padovani (2011), strengthened regulation—as per the Dodd-Frank bill—has led to an increase in lobbying efforts by the US banking industry. Their finding is consistent with our theory: Starting from an environment highly favorable to the industry's influence, an increase in i that is not sufficient to deter lobbying only increases influence expenditures $i\bar{\alpha}$. Our theory suggests, therefore, that the Dodd-Frank bill's intent to strengthen regulation resistance has not been sufficiently strong to be effective.

The second response would be to increase transparency in regulatory affairs, which amounts to decreasing σ. NGOs often call for more transparency. US environmentalists, for example, backed legislation by which the EPA must make information about chemical emissions public across the country. Similarly, in states in which fracking is approved by regulation, anti-fracking activists have often demanded, with some success, that the fluids injected underground be disclosed. The idea that transparency must be improved has also found a particular echo in the debate on financial regulation; improved transparency was one objective of the Dodd-Frank bill. Moreover, the academic literature on financial regulation has suggested that the disclosure of financial data collected by regulators

to third parties may improve regulators' incentives (Landier and Thesmar [2011]). To some extent, NGOs also contribute to increased transparency—as, for example, Finance Watch in the financial industry—by conducting research on regulation. In turn, more transparency in regulation is likely to contribute to limiting special interests' influence over regulators and policy makers by improving the latter's accountability.

Last, the cost of NGO opposition γ could be lowered by involving NGOs more directly in the regulatory process. For example, in his measures to prevent regulatory capture, Sheng (2012) suggests the empowerment of stakeholders as a countervailing power. This raises other questions, such as the independence of NGOs, that go beyond the scope of our analysis.

VIII.E. The Legal Status of NGO Activism

Our theory rests on the assumption that the rise of NGOs occurred when activists perceived that their involvement would be an effective way to contribute to social progress. This is only possible when and where NGO activism is allowed by the legal environment.

Notably, the legal status of activism is ambiguous in most countries. Activism is generally tolerated by law in developed countries; sometimes, it is even guaranteed some financial independence. For instance, the Dutch government financially supports human-rights activist groups. Yet the right to protest only applies as long as protests do not break the law. When activist campaigns involve extreme behavior, activists often run the risk of legal repercussions. Even peaceful actions, such as calls for boycotts, may violate refusal-to-deal, anti-discrimination, and anti-defamation laws. It is on these grounds, for example, that several calls for boycotts by the French consumer association UFC have been declared unlawful. For its call to boycott Shell in response to the wreck of the Amoco-Cadiz oil tanker, the UFC was fined an enormous amount, which corresponded to Shell's estimated lost sales.

The legal protection of NGO activism is a more urgent issue for developing countries. In transitional economies and emerging markets, NGOs are often banned, especially in autocratic governments, on the ground that their opposition to the industry destroys business—see, e.g., *The Economist*, May 9, 2015. Our analysis calls for more protection of NGOs, and especially in these contexts, so that NGOs can effectively play their role of countervailing and disciplinary power.

Appendix A: The Empirical Relationship between Industry Lobbying and NGO Mobilization in the US

This appendix examines the empirical relationship between industry lobbying and NGO mobilization. We combine two data sources to assemble a panel dataset. This dataset contains, for each year between 2002 and 2014, and each industrial sector, ($\imath$) the number of negative reports by US-based NGOs about US-based companies and ($\imath\imath$) the lobbying expenditures of US-based companies. The next subsection describes our data sources in more details.

A. Data Description

Industry Lobbying. We use the lobbying expenditures data compiled by the Center for Responsive Politics.[24] The data comprise the entire federal lobbying activity undertaken in the US and disclosed to the Secretary of the Senate's Office of Public Records as required by the 1995 Lobbying Disclosure Act. We use the Center for Responsive Politics' calculation of annual lobbying expenditures from 2002 to 2014, expressed in current dollars, and aggregated by industrial sector: agribusiness; communication and electronics; construction; defense; energy and natural resources; finance, insurance, and real estate; health; miscellaneous business; transportation.

Between 2002 and 2014, the mean value of the above sectors' lobbying expenditures was \$268 million per sector per year. Their standard deviation was \$157 million.

The time series of industrial sectors' total expenditures in lobbying is represented in Figure VIII. Their annual average was \$2.4 billion. They were minimum in 2002 and 2004 with about \$1.5 billion and reached their maximum in 2010 with nearly \$3 billion.

Figure IX represents the absolute annual increase in total lobbying expenditures.

24. Available at `https://www.opensecrets.org/lobby`. Data on lobbying expenditures from the Senate's Office of Public Records has been previously employed in a few papers. See, for example, Bertrand et al. (2014), and the references therein.

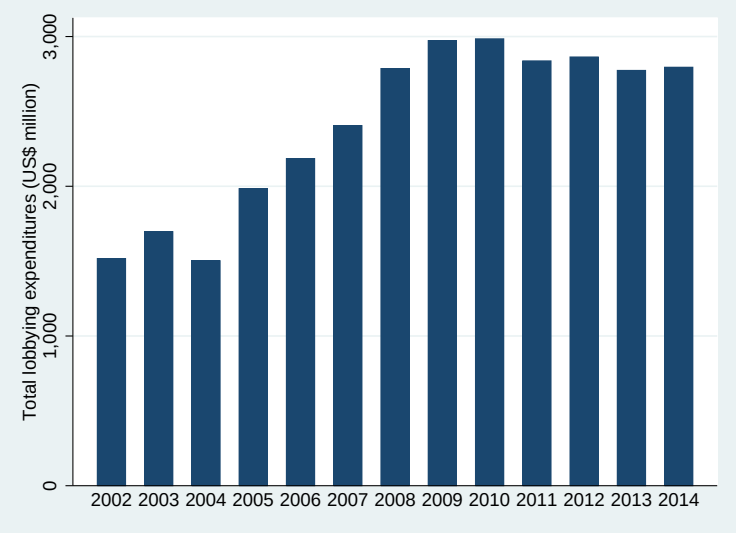


Figure VIII: Total lobbying expenditures per year

Over the period 2002-2014, they increased by an average of $106 million per year. While they increased most years, their annual change exhibited high variations; their standard deviation was $29 million.

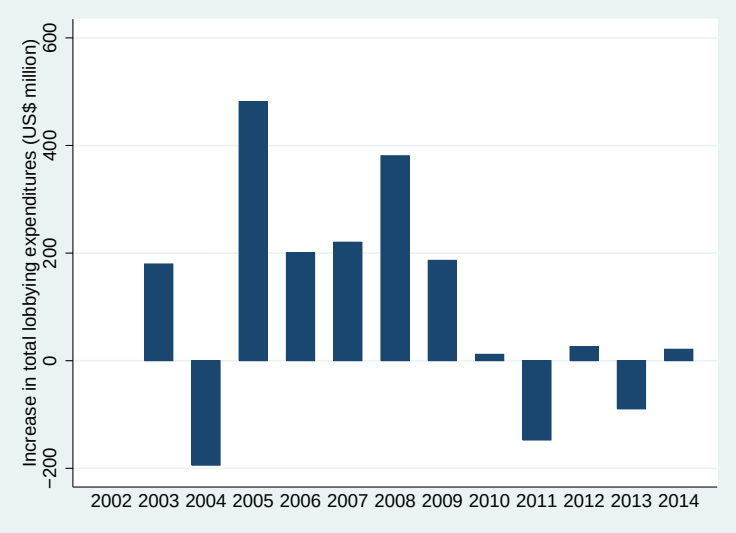


Figure IX: Annual increase in lobbying expenditures

Figure X shows total lobbying expenditures per sector over the period 2002-2014. The "health" and "finance, insurance and real estate" sectors made the highest expenditures

around $5.5 billion, followed by "communication and electronics." The "construction" sector made the lowest expenditures, with $600 million.

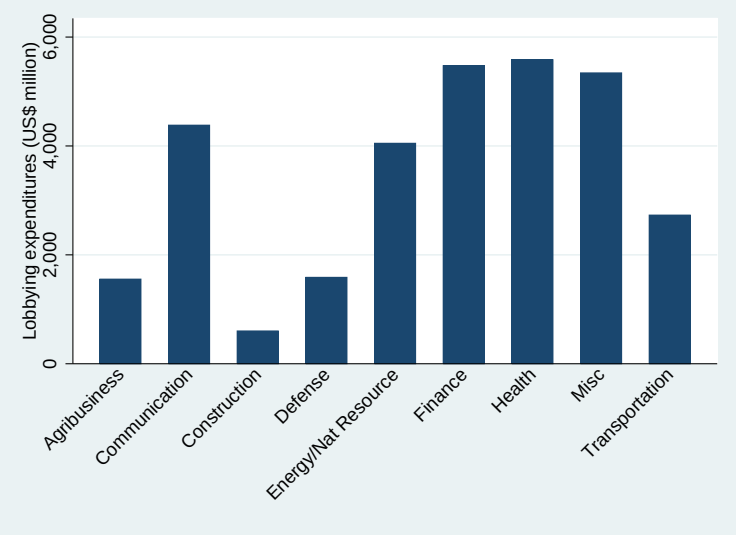


Figure X: Lobbying expenditures per sector

NGO Negative Reports. To capture NGOs' opposition, we use the number of negative reports that NGOs publish on their websites against firms' projects and practices, as recorded by *Covalence Ethical Quote*. We extract all 5004 negative reports published by US-based NGOs—i.e., 268 NGOs—against US-based companies—i.e., 738 companies.[25]

For example, the data include reports published by Rainforest Action Network in 2004 against Citigroup and by Alternet in 2013 against Starbucks—two conflicts mentioned earlier in the main text. Another entry, for example, shows the mobilization that took place in 2003 against the poor fuel efficiency of Ford cars. It reports a letter written by Rainforest Action Network and Global Exchange calling on Ford CEO to dramatically increase fuel efficiency: "Right now, a patriotic American seeking to embrace energy independence by purchasing a high efficiency hybrid must turn to Japanese automakers. Ford is years behind the curve." "If America is to have good jobs, a cleaner planet

25. Data on NGOs' reports recorded by *Covalence Ethical Quote* have been used in a very small number of papers. See, for example, Couttenier and Hatte (2015).

and a safer country, Bill Ford Jr. needs to take bold measures to kick the oil habit." This mobilization was successfully followed by Ford's decision in 2007 to develop hybrid vehicles.[26]

Finally, to assemble our panel dataset, we have matched each company targeted by an NGO report with its corresponding sector within the list of sectors used in the lobbying expenditures database: agribusiness; communication and electronics; construction; defense; energy and natural resources; finance, insurance, and real estate; health; miscellaneous business; transportation. Therefore, for each of the 5004 negative reports, the obtained data comprise its year of publication, and the sector of the targeted company.

Between 2002 and 2014, the average number of NGOs' negative reports was 43 per year and per sector. Their standard deviation was more than 38 reports.

The time series of NGOs' negative reports is represented in Figure XI. On average, 385 such reports were published per year. Their number was minimum in 2012 with 218 reports and reached a maximum in 2003 with 698 publications.

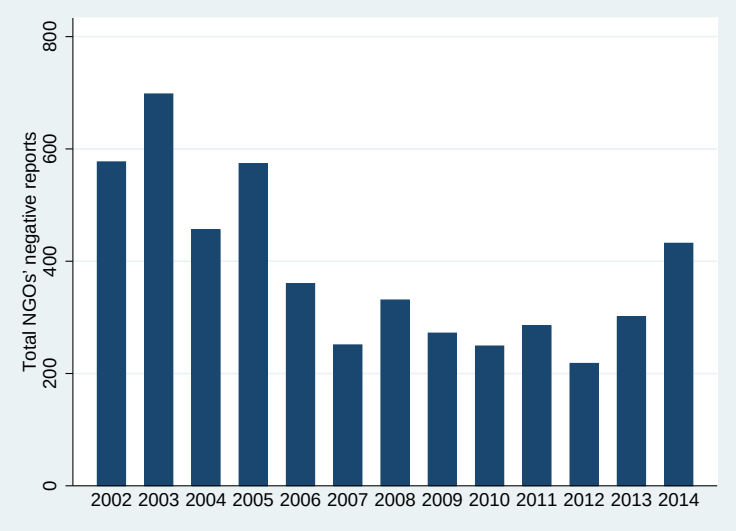


Figure XI: NGOs' negative reports per year

26. See *Reuters*, July 9, 2007, available at `http://www.reuters.com/article/us-ford-edisonintl-hybrid-idUSN0931005820070709.`

Figure XII shows the total number of reports by sector over the period 2002-2014. Put aside the "miscellaneous business" sector, the sectors most targeted by NGOs' negative reports were "agribusiness" and "energy and natural resources" with more than 900 reports, followed by "finance, insurance and real estate". The least targeted sectors were "defense" and "construction".

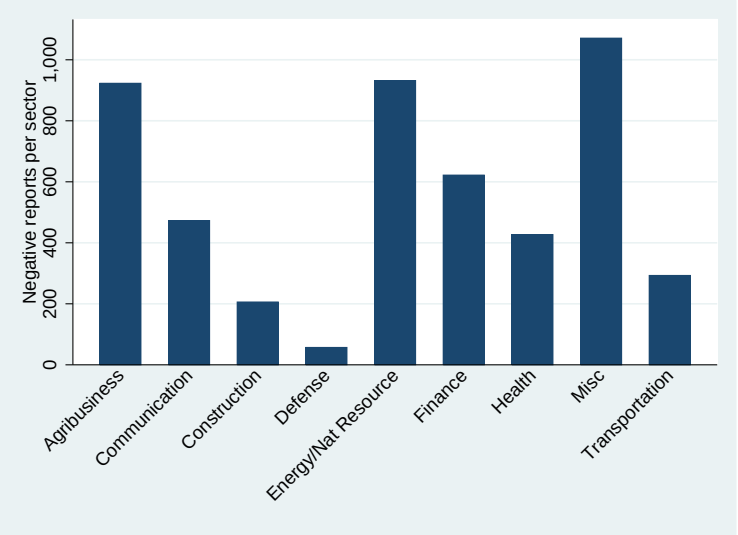


Figure XII: NGOs' negative reports per sector

B. Relationship between NGOs' Negative Reports and Prior Changes in Lobbying Expenditures

Our theory rests on the view that NGO opposition is a response to industry lobbying. Indeed, our model predicts that NGO opposition only takes place in contexts in which lobbying is observed. To support this view, we examine how prior increases in lobbying expenditures affected NGOs' negative reports. We estimate the following linear model:

$$NGOReports_{it} = \kappa + \rho \Delta Lobbying_{it} + FE_i + \epsilon_{it},$$

where the dependent variable $NGOReports_{it}$ and the independent variable $\Delta Lobbying_{it}$ are respectively the numbers of NGOs' negative reports targeting sector i in year t and the increase in lobbying expenditures made by sector i between years $t-1$ and t. FE_i is a time-invariant sector-specific fixed effect which filters out sectoral characteristics that can affect NGO opposition.[27] Indeed, for example, the relatively low number of reports targeting the "defense" and "health" sectors may be due to low transparency in those sectors. We estimate the scalar coefficients κ and ρ by the method of least squares with robust standard errors, which allow residuals ϵ_{it} to exhibit heteroscedasticity.

The result is presented in the following table.

Table I: Relationship between NGOs' Negative Reports and Prior Changes in Lobbying Expenditures

	Reports
$\Delta Lobbying$	0.149^{***}
Constant	39.23^{***}
Number of observations	108

Heteroscedasticity-robust standard errors are used.

*** $p < 0.01$

Table I shows that the coefficient ρ is significantly different from zero at the 1% level. Increased lobbying expenditures by $100 million are associated with 15 additional negative reports by NGOs.

27. The addition of year-specific fixed effects proves not to be significant.

C. Relationship between Lobbying Expenditures and Prior NGOs' Negative Reports

Our theory also suggests that NGOs deter industry lobbying. Indeed, our model predicts that in presence of NGOs industry lobbying is less likely. To test this prediction, we examine how prior NGOs' negative reports affected lobbying expenditures over the period 2002-2014. We estimate the following linear model:

$$Lobbying_{it} = \lambda + \varrho NGOReports_{it-1} + FE_i + \epsilon_{it},$$

where the dependent variable $Lobbying_{it}$ and the independent variable $NGOReports_{it-1}$ are respectively the lobbying expenditures made by sector i in year t and the number of NGOs' negative reports against sector i in year $t-1$. FE_i is a time-invariant sector-specific fixed effect.[28]

The result is presented in the following table.

Table II: Relationship between Lobbying Expenditures and Prior NGOs' Negative Reports

	Lobbying
Lagged *Reports*	-1.392^{***}
Constant	337.6^{***}
Number of observations	108

Heteroscedasticity-robust standard errors are used.

*** $p < 0.01$

28. The addition of year-specific fixed effects proves not to be significant.

Table II shows that the coefficient ϱ is significantly different from zero at the 1% level. 50 negative reports by NGOs in a given year are associated with $65 million less lobbying expenditures in the next year. This negative relationship can be illustrated by the following graph (Figure XIII) in which, for each year, the lagged number of total NGOs' negative reports is associated with total lobbying expenditures. The corresponding correlation coefficient is 0.92.

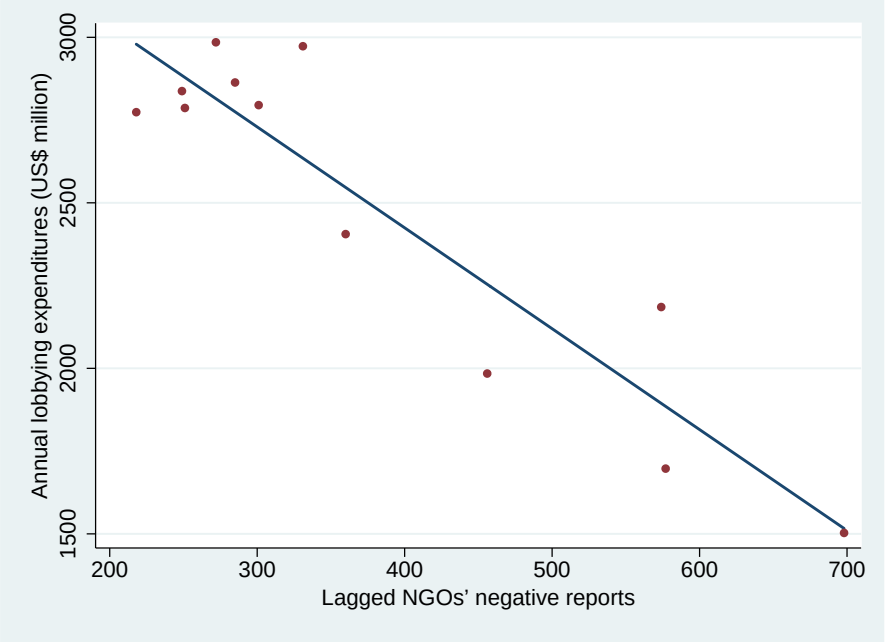


Figure XIII: Lagged NGOs' negative reports and lobbying expenditures

Appendix B: Proofs

Proof of Proposition 3

The first two points are shown in the main text that precedes the proposition. We now examine $\Phi_L(\sigma)$ and $\Phi_H(\sigma)$. Consider the latter first. Its definition in (21) implies that $\Phi'_H(\sigma) < 0$ if and only if

$$\hat{s}'(\sigma) + \frac{c_H - \hat{s}(\sigma)}{\sigma} > 0. \tag{33}$$

Thus, we analyze $\hat{s}'(\sigma)$. Rewriting (20) with (18) and (19), and rearranging, we easily obtain

$$\frac{f\left(\frac{c_L-\hat{s}}{\sigma}\right)}{f\left(\frac{c_H-\hat{s}}{\sigma}\right)} = \frac{p_H(c_H-\bar{s})}{p_L(\bar{s}-c_L)}, \tag{34}$$

which implicitly defines the function $\hat{s}(\sigma)$. In (34), the right-hand side does not depend on σ. Taking the logarithm and the total derivative of both sides with respect to $\hat{s}$ and σ jointly, and rearranging, we obtain

$$\hat{s}'(\sigma) \equiv \frac{d\hat{s}(\sigma)}{d\sigma} = -\frac{\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)\frac{f'\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)} - \left(\frac{c_H-\hat{s}(\sigma)}{\sigma}\right)\frac{f'\left(\frac{c_H-\hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_H-\hat{s}(\sigma)}{\sigma}\right)}}{\frac{f'\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)} - \frac{f'\left(\frac{c_H-\hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_H-\hat{s}(\sigma)}{\sigma}\right)}}. \tag{35}$$

Note that the function $\hat{s}(\sigma)$ is differentiable everywhere.

Replacing $c_L - \hat{s}(\sigma)$ by $-(c_H - c_L) + c_H - \hat{s}(\sigma)$ in (35) and rearranging, the equality becomes

$$\hat{s}'(\sigma) + \frac{c_H - \hat{s}(\sigma)}{\sigma} = \left(\frac{c_H - c_L}{\sigma}\right)\frac{\frac{f'\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)}}{\frac{f'\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)} - \frac{f'\left(\frac{c_H-\hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_H-\hat{s}(\sigma)}{\sigma}\right)}}.$$

In this equality, $c_H > c_L$ implies that the first term on the right-hand side is strictly positive. It also implies, by the assumption that f is strictly log-concave, that the de-

nominator is strictly positive. Finally, we have noted in the main text preceding Figure III that, for all σ, $\hat{s}(\sigma) > (c_L + c_H)/2$, so that $\hat{s}(\sigma) > c_L$. This inequality, together with the single-peakedness property of f, implies that $f'\left((c_L - \hat{s}(\sigma))/\sigma\right) > 0$. It follows that (33) is verified for all σ, so that the function Φ_H is strictly decreasing.

Consider now $\Phi_L(\sigma)$. Its definition in (22) implies that $\Phi'_L(\sigma) > 0$ if and only if

$$\hat{s}'(\sigma) + \frac{c_L - \hat{s}(\sigma)}{\sigma} < 0. \tag{36}$$

Examine $\hat{s}'(\sigma)$ again. Replacing now $c_H - \hat{s}(\sigma)$ by $(c_H - c_L) + c_L - \hat{s}(\sigma)$ in (35) and rearranging, we obtain

$$\hat{s}'(\sigma) + \frac{c_L - \hat{s}(\sigma)}{\sigma} = \left(\frac{c_H - c_L}{\sigma}\right) \frac{\frac{f'\left(\frac{c_H - \hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_H - \hat{s}(\sigma)}{\sigma}\right)}}{\frac{f'\left(\frac{c_L - \hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_L - \hat{s}(\sigma)}{\sigma}\right)} - \frac{f'\left(\frac{c_H - \hat{s}(\sigma)}{\sigma}\right)}{f\left(\frac{c_H - \hat{s}(\sigma)}{\sigma}\right)}}.$$

In this equality, the first term and the denominator on the right-hand side are both strictly positive. Therefore, $\hat{s}'(\sigma) + (c_L - \hat{s}(\sigma))/\sigma$ has the same sign as $f'\left((c_H - \hat{s}(\sigma))/\sigma\right)$, which, by the single-peakedness property of f, has the same sign as $\hat{s}(\sigma) - c_H$.

Thus, we now compare $\hat{s}(\sigma)$ with c_H. Remember that $\mathbb{E}(c|s)$ is increasing in s in the definition (20) of $\hat{s}$. Therefore, $\hat{s}(\sigma) < c_H$ is equivalent to $\bar{s} < \mathbb{E}(c|s = c_H)$, which, using (18) and (19), rewrites

$$\frac{f\left(\frac{c_H - c_L}{\sigma}\right)}{f(0)} < \frac{p_H(c_H - \bar{s})}{p_L(\bar{s} - c_L)}. \tag{37}$$

On the one hand, the right-hand side of this inequality is independent of σ. Assumption 2 further implies that $0 < p_H(c_H - \bar{s})/\left(p_L(\bar{s} - c_L)\right) < 1$. On the other hand, the single-peakedness property of f implies that the left-hand side is continuously increasing in σ, with $\lim_{\sigma \mapsto 0} f\left((c_H - c_L)/\sigma\right)/f(0) = 0$ and $\lim_{\sigma \mapsto +\infty} f\left((c_H - c_L)/\sigma\right)/f(0) = 1$. It follows that there exists a unique $\tilde{\sigma} > 0$ such that (37) is satisfied if and only if $\sigma < \tilde{\sigma}$. In turn, for all

$\sigma < \tilde{\sigma}$, $\hat{s}(\sigma) < c_H$ is observed, (36) is satisfied, and $\Phi'_L(\sigma) > 0$. Similarly, for all $\sigma > \tilde{\sigma}$, one can show that $\Phi'_L(\sigma) < 0$. This concludes the proof of the third point.

Note, moreover, that the Φ_L and Φ_H functions are differentiable everywhere. ■

Proof of Proposition 5

Two parts of the result have been shown in the main text that precedes the proposition. First, the NGO does not enter when industry lobbying never takes place; according to Corollary 1, this is the case when $i/q > (i/q)^R$. Second, the NGO enters when industry lobbying takes place in the absence of the NGO and does not take place otherwise; according to Corollary 1, this is the case when $i/q \leq (i/q)^R$ and $\sigma < \sigma^{RN}(i/q)$.

It remains to be shown that the NGO enters when industry lobbying takes place irrespective of the presence of the NGO—i.e., when $i/q \leq (i/q)^R$ and $\sigma \geq \sigma^{RN}(i/q)$. In that case, expressions (30) and (31) yield

$$\mathbb{E}\mathcal{X}_{LH}^{RN} - \mathbb{E}\mathcal{X}_{LH}^{R} = p_L \Phi_L(\sigma) \left[c_L - \bar{s}\right] q + p_H \Phi_H(\sigma) \left[c_H - \bar{s}\right] q, \tag{38}$$

where Assumption 2 and Proposition 3 imply that the first term is negative and single peaked while the second term is positive and decreasing.

Using (21) and (22), we obtain the derivative of (38) with respect to σ:

$$\begin{aligned} \frac{d\left(\mathbb{E}\mathcal{X}_{LH}^{RN} - \mathbb{E}\mathcal{X}_{LH}^{R}\right)}{d\sigma} &= p_L \left(\frac{\bar{s} - c_L}{\sigma}\right) f\left(\frac{c_L - \hat{s}(\sigma)}{\sigma}\right) \left[\hat{s}'(\sigma) + \left(\frac{c_L - \hat{s}(\sigma)}{\sigma}\right)\right] \\ &- p_H \left(\frac{c_H - \bar{s}}{\sigma}\right) f\left(\frac{c_H - \hat{s}(\sigma)}{\sigma}\right) \left[\hat{s}'(\sigma) + \left(\frac{c_H - \hat{s}(\sigma)}{\sigma}\right)\right]. \end{aligned} \tag{39}$$

Now, rewriting (20) with (18) and (19), and rearranging, we obtain the equality $p_L \left((\bar{s} - c_L)/\sigma\right) f\left((c_L - \hat{s}(\sigma))/\sigma\right) = p_H \left((c_H - \bar{s})/\sigma\right) f\left((c_H - \hat{s}(\sigma))/\sigma\right)$. With this equal-

ity, one can factorize (39), and simplify it to

$$\frac{d\left(\mathbb{E}\mathcal{X}_{LH}^{RN}-\mathbb{E}\mathcal{X}_{LH}^{R}\right)}{d\sigma}=-p_L\left(\frac{\bar{s}-c_L}{\sigma}\right)f\left(\frac{c_L-\hat{s}(\sigma)}{\sigma}\right)\left(\frac{c_H-c_L}{\sigma}\right), \tag{40}$$

which is strictly negative because $c_H > c_L$ and because $\bar{s} > c_L$ by Assumption 2.

It follows that the difference $\mathbb{E}\mathcal{X}_{LH}^{RN}-\mathbb{E}\mathcal{X}_{LH}^{R}$ is strictly decreasing with σ. Moreover, its limit is zero when σ tends to the infinity because $\lim_{\sigma\mapsto+\infty}\Phi_L(\sigma)=\lim_{\sigma\mapsto+\infty}\Phi_H(\sigma)=0$ by Assumption 2. It follows that $\mathbb{E}\mathcal{X}_{LH}^{RN}-\mathbb{E}\mathcal{X}_{LH}^{R}>0$ for all $\sigma>0$, which concludes the proof. ■

Proof of Proposition 6

The first point is shown in the main text that precedes the proposition. The second point remains to be shown. It concerns the situation in which industry lobbying takes place regardless of whether there is an NGO or not. In that case, the comparison of (6) with (27) yields

$$\mathbb{E}\mathcal{W}_{LH}^{RN}-\mathbb{E}\mathcal{W}_{LH}^{R}=p_L\Phi_L(\sigma)\left[c_L-(1+2\gamma)v\right]q+p_H\Phi_H(\sigma)\left[c_H-(1+2\gamma)v\right]q. \tag{41}$$

Since lobbying expenditures are identical in $\mathbb{E}\mathcal{W}_{LH}^{RN}$ and $\mathbb{E}\mathcal{W}_{LH}^{R}$, they cancel out in (41). Therefore, $\mathbb{E}\mathcal{W}_{LH}^{RN}-\mathbb{E}\mathcal{W}_{LH}^{R}$ differs from the change in activists' valuation $\mathbb{E}\mathcal{X}_{LH}^{RN}-\mathbb{E}\mathcal{X}_{LH}^{R}$ only by the intervention of the bias $\beta\geq 0$. If $\beta=0$, $\mathbb{E}\mathcal{W}_{LH}^{RN}-\mathbb{E}\mathcal{W}_{LH}^{R}=\mathbb{E}\mathcal{X}_{LH}^{RN}-\mathbb{E}\mathcal{X}_{LH}^{R}$ and it follows that the NGO's entry, as per Proposition 5, improves social welfare. If $\beta>0$, $\mathbb{E}\mathcal{W}_{LH}^{RN}-\mathbb{E}\mathcal{W}_{LH}^{R}<\mathbb{E}\mathcal{X}_{LH}^{RN}-\mathbb{E}\mathcal{X}_{LH}^{R}$, and the NGO's entry is not necessarily optimal. However, since the Φ_L and Φ_H functions do not depend on γ, as per (21) and (22)—and in the light of (18), (19) and (20)—$\mathbb{E}\mathcal{W}_{LH}^{RN}-\mathbb{E}\mathcal{W}_{LH}^{R}$ is strictly decreasing in γ.

In (41), the first term is negative as a consequence of Assumption 2. As far as the second term is concerned, there are two possibilities. Assume first that $\gamma\geq\frac{c_H-v}{2v}$, which

implies that the second term in (41) is nonpositive. In that case, $\mathbb{E}\mathcal{W}_{LH}^{RN} - \mathbb{E}\mathcal{W}_{LH}^{R} < 0$ for all values of σ. The NGO's entry cannot be optimal in that case.

Assume now that $\gamma < \frac{c_H - v}{2v}$, implying that the second term in (41) is strictly positive. The NGO's entry may be optimal in that case. Assumption 2 implies that when σ tends to zero, $\Phi_L(\sigma)$ tends to zero and $\Phi_H(\sigma)$ tends to one, so that the first negative term in (41) vanishes. By continuity of the Φ_L and Φ_H functions, therefore, $\mathbb{E}\mathcal{W}_{LH}^{RN} - \mathbb{E}\mathcal{W}_{LH}^{R}$ is strictly positive if σ is sufficiently small. Formally, there exists $\sigma^* > 0$ such $\mathbb{E}\mathcal{W}_{LH}^{RN} - \mathbb{E}\mathcal{W}_{LH}^{R} > 0$ for all $\sigma < \sigma^*$. Since, furthermore, $\mathbb{E}\mathcal{W}_{LH}^{RN} - \mathbb{E}\mathcal{W}_{LH}^{R}$ is strictly decreasing in γ, the threshold σ^* is a decreasing function of γ: $\sigma^* = \sigma^*(\gamma)$. ■

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