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Salience Games: Keeping Environmental Issues In (and Out) of the Public Eye

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Abstract

Businesses and green activists seek to influence public attention to the social impacts of a sector—they play *salience games*. An activist allocates funds between campaigning against a polluting industry and other environmental projects. When public attention is scarce, a greater campaign orientation induces industry to invest more heavily in symbolic action that cloaks damage and reduces the risk of salience. This makes fundraising more challenging for the activist, diminishing funds available for both campaign and non-campaign activities. The activist strategically biases its mission away from campaigns—and in favor of broad versus narrow campaigns— but not by as much as a welfare-motivated planner would wish. When salience is avoided by a mixture of symbolic and substantive action, a greater weight on the latter induces the NGO to become more campaign-oriented, with environmental damage lower and welfare higher. Concentrated industries prefer symbolic action, and un-concentrated industries prefer substantive action.

Keywords: Non-market strategy; NGOs; salience.

1   Introduction

Firms and industries vary not just in the amount of environmental damage that they do, but also in the propensity for this damage to catch the public eye (Hoffman and Ocasio, 2001). Polluters have obvious reasons for wanting to keep the damage that they do from becoming subject to public scrutiny (becoming 'salient'). In contrast, green activists recognize that they attract more donations when that damage is in the public eye—donations that can then be used to deliver a more potent campaign against the industry and/or to increase spending on other non-campaign activities. This makes issue salience a key battleground between polluting industries and the green non-governmental organizations (NGOs) with which they cohabit, something both sides can be expected to influence through strategic actions. It is the implications of such 'salience games' that we explore in this paper.

Public attention is a limited resource. Davenport and Beck (2001, p. 8) assert that managing scarce attention is the central task of modern business: "If you want to be successful in the current economy, you've got to be good at getting attention." Or—if you are behaving badly, as are the firms in the current paper—good at *not* getting attention. Researchers have sought to understand the process through which particular social issues come into and out of public consciousness. Among the most influential work in this area is Downs (1972), which develops the seminal notion of the issue-attention cycle in the context of environmental problems, while more recent contributions have sought to provide 'micro-foundations' for the cycle. In the opening to their classic sociological contribution, Hilgartner and Bosk (1988) pose the following question:

> Why does the plight of the indigenous people of South America... receive less public attention than the plight of laboratory rats used in scientific research? Why do toxic chemical wastes in landfills receive more public discussion than dangerous chemicals in America's workplaces? The extent of the harm in these cases cannot, in itself, explain these differences, and it is not enough to say that some of these situations become problems because they are more "important." All of these problems are important—or at least capable of being seen as such. (Hilgartner and Bosk, 1988, p. 54)

They develop a non-mathematical model of competition between issues under the plausible assumption that "...public attention is a scarce resource, allocated through competition in a system of public arenas" (page 55). In particular, they emphasize the objectives and roles of various players and institutional structures—activists, social

networks and the media—in directing societal attention given that public arenas are characterized by finite 'carrying capacities.'

Hoffman and Ocasio (2001) argue that abnormal events (such as accidents) can play an important role in attracting "the focus of public attention" (page 414). It is easy to think of examples in support of such a hypothesis, including the indelible image of Ohio's Cayuga River on fire in 1969, the terrible chemical accident at Union Carbide's facility in Bhopal, India, in 1984, or the collapse of the Rana Plaza clothing factory in Bangladesh in 2013 that killed 1,129 people. Vying for coverage in 2013, a train hauling oil derailed and ignited a fire that killed 47 and destroyed most of the main buildings in the small Quebec town of Lac Megantic, becoming the Canadian Press *News Story of the Year 2013*. Before the derailing, though, most Canadians were unaware of the fact that crude oil was transported by train, let alone of the detailed issues around wagon design, routing and scheduling practices that subsequently became subjects of popular discussion. As such "it was an event that launched public debates about the continent's boom in oil-by-rail. It caused everyone living in a small Canadian city, or town that had freight rumbling through it, to stop and ponder..." (The Toronto Star, Dec 25, 2013).

While disasters may play a role in creating it, salience does not require a single event as trigger. The flow of damage from things like deforestation, product testing on animals, and excess use of pesticides are more continuous in character. And different issues find the forefront of the public mind at different times and in different places. For example, the environmental footprint of Nespresso-style coffee capsules has emerged as a subject of public debate in Germany over the past two years, leading to significant push-back from consumers, and even the implementation of a ban on *kaffeekapselmaschines* (coffee capsule machines) from public buildings in the city of Hamburg, yet it remains far from the public consciousness in most other countries.

The analysis of Hilgartner and Bosk (1988) makes a compelling case that the foci of community attention at any given time are not exogenously determined but rather endogenous and manipulable. Competing social issues vary in their *visibility* to citizens via the filter of media outlets. Existing economic models of NGOs and private politics ignore this, starting analysis with a predetermined social issue over which opposing parties engage.

Consistent with this sociological line of research, the model that we develop has at its heart the idea that public attention is limited and can only focus on a small number of things at once. Other things equal, the likelihood that the environmental damage of a particular firm catches the public eye—becomes salient—depends on both the *quantity* of that damage and the *visibility* of that damage. These can both sensibly be regarded

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as strategic variables that the firm is able to influence, though making operations either cleaner and/or resulting damages less visible is likely to be costly. However this likelihood is not determined in a vacuum. Rather the activities of one firm compete for attention with the activities of many other firms, in the same industry and others, and with a diverse set of unrelated but attention-worthy happenings.[1],[2]

Regardless of how issue salience arises, however, it often affects the reputation of entire sectors, not just that of single firms. The Cayuga River incident helped ignite a social movement that led to passage of the Clean Water Act of 1972. The Bhopal disaster led to public outrage at the chemical industry in general, and an opinion poll in the U.S. in 1990 found that only 25% of the population found the chemical industry's behavior publicly acceptable, lower than any industry except tobacco (Gunningham, 1995). The Rana Plaza collapse generated anger at the entire business of outsourcing clothing production (Huq et al., 2016). In the wake of the Lac Megantic disaster, the public attention and NGO response to the event was not focused on MMA Freight in particular, but on the activity of oil-by-rail in general. To fit with this we build a model of collective reputation.

There are a number of reasons why an industry might want to avoid public scrutiny of its social impacts, and these have been investigated in various strands of literature (Friedman, 1999; Baron, 2001; Lyon and Maxwell, 2008). Here it is because salience increases funding to a green NGO, making it a more formidable opponent.

Our objective is to better understand the strategic interaction between activists and industries in a setting where public attention is scarce. The model that we develop includes a multi-issue activist or NGO. The NGO collects funds from donors and uses them to extract environmental 'clean-up' from the sector in question, but also to engage

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[1]Local elections, royal weddings, foreign wars, ministerial resignations, football match outcomes, movie launches, celebrity relationship breakdowns—the list of potential events to which the public may devote its limited attention budget is almost endless. Bordalo et al. (2013) develop a theoretical model of attention competition and uses it to analyze price competition in a market in which consumers have limited attention.

[2]The concept of salience is an important one in a number of fields. In psychology salience refers to any aspect of a stimulus that, for any of number reasons, stands out from the rest. Salience may be the result of emotional, motivational or cognitive factors and/or may be associated with physical factors such as intensity, clarity or size. In semiotics, salience refers to the prominence of a part of a sign. In neuroscience, salience is "... a state or quality by which something stands out relative to its neighbors, [and] [s]aliency detection is a key attentional mechanism that facilitates... survival by enabling organisms to focus their limited [attention] and cognitive resources on the most pertinent subset of the available sensory data" (Wikipedia entry for Salience (neuroscience), accessed February 2016). These all point towards the notion of outliers—a blue dot is visually salient if embedded in a scatter of red dots, but not in a scatter of blue—and this notion of *conspicuousness relative to others* will recur in the model here. Salience has been introduced in economics, though applied quite differently, by Chetty et al. (2009). In their model consumers under-react to a sales tax that is not factored into the ticket price.

in other projects. The process through which this happens is black-boxed but this is a common formulation (Baron, 2009, 2011) in stylized NGO/firm conflict settings. A key novelty in our analysis is the plausible assumption that the NGO associated with a particular issue or activity finds it easier to attract donations (of money or other forms of support) when that issue or activity is currently salient. In other words, donations to an NGO that opposes farmers using GMOs are higher, other things equal, if the *issue* of GMO foods is salient or currently 'in the public mind.' We operationalize this by assuming that an NGO has a group of core supporters who donate routinely, but also a periphery of "latent" donors who contribute only if the issue to which the NGO relates is salient. Other modeling approaches that lead to the same basic outcome—that salience of an issue makes fund-raising easier—would generate the same qualitative results.[3]

The set-up allows us to think in a more nuanced way about the incentives facing firms and NGOs. The collective character of industry reputation—that if one oil-by-rail firm is on the front page then the whole activity of oil-by-rail may find itself in the public gaze—creates a particular pattern of incentives *within* an industry.[4] This can affect both the level of environmental damage and the intensity of effort with which damage is cloaked. Of course, just as industry has incentives to manage reputation, so too the NGO will want to engage in what we term 'issue maintenance' and manage the likelihood that the issue in question gains and retains public salience. This allows it to raise greater funds that it can then direct both to forcing mitigative action from this industry, and to other environmental projects. There are a variety of ways in which the NGO might seek to maintain issue salience, such as expending resources criticizing a firm publicly (Abito et al., 2016). One intriguing possibility that we explore below is for the NGO to commit to a strategy that involves *not* targeting a campaign too narrowly on the particular *firm* whose activities bring the *industry* into the public eye.[5] Doing so

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[3]Indeed in an earlier version of the paper we adopted a reduced form approach in which salience simply entered the NGO funding function directly. NGOs and charities are well aware that having 'their' issue salient is a key driver of donations. To take a dramatic non-environmental example, consider the following headline: "Aid Groups See Dramatic Increase in Donations after Death of Syrian Toddler"(Los Angeles Times, 3 September 2015).

[4]To take another oil example: "We are an oil company, and we have to live with the sins of our brothers. We were doing fine until Exxon spilled all that oil. Then we were painted with the same brush as them" (Amoco executive, quoted in Hoffman (2001, p. 189)). In this spirit there is a well-established theoretical and empirical literature on collective reputation and "...the influence of the media and stakeholder activism...has made industry-level reputation management more important than ever" (Winn et al., 2008, p. 35).

[5]Traditional folk wisdom is that an NGO will always target a particular firm, especially if it is trying to mobilize a consumer boycott. It is clearly much easier to induce a consumer to abstain from the purchase of a particular brand of coffee, gasoline or sports apparel than from the product in general. Despite this we frequently observe campaigns launched against sectors more widely—the nuclear power

weakens the intra-industry incentives to invest in collective reputation and boosts the NGO's fund-raising efforts. We explore these and other possibilities below.

2 Model

2.1 Firms

There is a single industry made up of n symmetric firms. The activity of each firm generates net income r (revenues net of production costs) and creates damage to the environment d. The damage done by each firm is known by an NGO, but may or may not be noted by 'the public,' members of which are limited in their attention.

One way in which a firm might try to avoid public attention is to reduce the level of damage it does (i.e., abatement). For the purposes of this section we will ignore this option, fixing d to focus on other cloaking actions. Later in the paper we show that endogenizing d, while complicating the analysis, does not disturb the central results.

The *visibility* of damage may vary between firms in a way that a firm can influence. A firm chooses an amount of effort a to reduce the visibility of its damage. The larger an a a firm chooses, the less visible is its damage, and we will sometimes refer to it as *cloaking effort*.[6] This formulation implies that there is no social benefit to reducing visibility beyond the benefits to the firm.[7] The choice of a can be thought of as embedded in a choice of technology, with technology broadly construed to include processes and practices.[8] In fact, there is a large literature devoted to understanding how firms respond to stakeholder pressures to act as good corporate citizens, responses which can help divert public attention from their less savory activities (Oliver, 1991). They may "decouple" their organizational structure from their actual operations (Meyer and Rowan,

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sector, the oil-by rail industry, coal, whaling, etc.—consistent with the model here.

[6]Although our modeling approach is different, and we focus on public events rather than private consumption, our notion of cloaking is similar to the notion of shrouding of product attributes in Gabaix and Laibson (2006).

[7]That reducing d might also be a way to reduce probability of salience—and that such reductions imply additional benefits external to the firm—is what complicates the welfare analysis when we get to it later. The fixed d variant that we develop in the core of the paper allows for much cleaner elucidation of our main insights.

[8]We do not specify the exact means by which firms influence their visibility. Firms may engage in 'greenwashing' to make themselves appear environmentally responsible, possibly as a form of costly state falsification—see Lyon and Montgomery (2015) for a review. A firm's cloaking effort may be more technical in nature and relate to the 'inspectability' of its facilities (Heyes, 2000), or the precision of its disclosure documents (Sinclair-Desgagné and Gozlan, 2003). Marquis et al. (2016) note the use of 'symbolic compliance'—selectively disclosing relatively benign performance to obscure poor overall performance—to shift stakeholder attention away from areas of criticism. All we need analytically is some mechanism where by spending money a firm can make its footprint less visible to citizens.

1977). They may engage in "symbolic management" by issuing public statements that are not related to their actual behavior (Westpahl and Zajac, 1998). They may create an industry self-regulatory body to reduce the risk of future accidents (King and Lenox, 2000). They may greenwash by selectively disclosing positive information while withholding negative information (Lyon and Maxwell, 2011). Often, such seemingly socially responsible actions are direct responses to prior episodes of public attention to the firm's socially irresponsible actions (Kotchen and Moon, 2012). One of the benefits of such cloaking actions is that they can serve as insurance against the risk of future mishaps (Minor and Morgan, 2011).

2.2 Salience

Central to our model is the concept of salience: public attention is limited. For simplicity suppose that in any period the public can only be attentive to a single topic, and this topic is said to be the salient one (Hilgartner and Bosk, 1988). This could reflect constraints for the media—there can only be one lead story on the television news or on the front page—which necessitates the selection of stories by editors. Or it could represent something more primitive about how the public decides to which of a set of issues it will attend.

Let there be $n + 1$ topics—the environmental damage being done by firm 1, the environmental damage being done by firm 2, etc., and some non-environmental or representative 'outside' event. This outside event could be anything from a royal wedding to a sporting event or another social issue.[9] The degree to which this outside event draws attention away from the industry will give a measure of the public relations context within which the industry operates.

Assumption (Salience). *The activities of firm i become salient with probability $p(a_i, a_{-i})$ where $a_{-i} = \sum_{j \neq i} a_j$, $p_1(a_i, \cdot) < 0$, $p_{11}(a_i, \cdot) > 0$, $p_2(\cdot, a_{-i}) > 0$, $p_{22}(\cdot, a_{-i}) > 0$, and $p_{12}(a, (n-1)a) \geq 0$ (or $p_{12}(a, (n-1)a) < 0$ but small).*

In other words, the likelihood that a particular firm becomes the focus of public attention depends not only on its visibility, but also on the visibility of others. The more visible is a firm, the more likely it is to stand out.

Note that although in this case we have for analytic convenience fixed d across firms, this probabilistic formulation implies that the topic that comes to capture public attention is not necessarily the most damaging, consistent with the quotation from Hilgartner

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[9]In a fuller model we could envisage having more than one industry, each with multiple firms.

and Bosk (1988) with which we started the introduction. Figure 1 gives an example. The probability of firm i being salient is decreasing in its cloaking effort (although there are diminishing marginal returns to such effort) and increasing in the cloaking efforts of other firms.

While we do not need additional restrictions on p, the set-up lends itself naturally to an extended version of the Tullock-Buchanan contest model. Letting $v(a_i)$ be the degree of visibility of firm i given cloaking effort a_i, with v decreasing and convex in a_i, salience can be seen as the result of a contest where

$$p(a_i, a_{-i}) = \frac{v(a_i)}{\bar{v} + \sum_{j=1}^{n} v(a_j)}, \tag{1}$$

and $\bar{v} \geq 0$ is the visibility of some outside event.

The salient firm is the 'winner' of the contest and each firm is trying to 'lose.' Instead of firms competing for attention, firms are in competition for *lack* of attention so that their environmental damage is not salient. The outside option $\bar{v}$ also represents a 'bid' for attention and leaves open the possibility that *no* firm in the industry turns out to be salient.[10] The outside option is assumed to be non-strategic. To embed in the model the notion of collective industry reputation we make the following assumption.

Assumption (Collective Reputation). *If any firm i in the industry is salient then we say that the industry is salient. This is the case with probability $\sum_{j=1}^{n} p(a_j, a_{-j}) \leq 1$.*

This conforms with various examples presented earlier, and with a recent body of business research on collective reputation. It will allow us to explore intra-industry incentives when sector-wide reputation can be damaged by the behavior (salience) of any of its individual members. That salience of an industry emerges endogenously from the behavior of constituent firms has been ignored altogether in existing models (Baron, 2001, 2016).

2.3 The NGO and its Donors

There is a single NGO that is concerned with environmental improvement. It can pursue its objective in two ways. Since here d has been fixed, the NGO can put pressure on firms to clean up. More concretely the NGO can launch a *campaign*. If an NGO spends x on a campaign against a firm then it can 'force' that firm to clean-up an amount of

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[10]There can be many outside options competing for attention; if there are m outside events then $\bar{v} = \bar{v}_1 + \ldots + \bar{v}_m$. With many outside options it is reasonable to assume that $\bar{v}$ does not come about from the actions of a strategic player; the outside option in non-strategic.
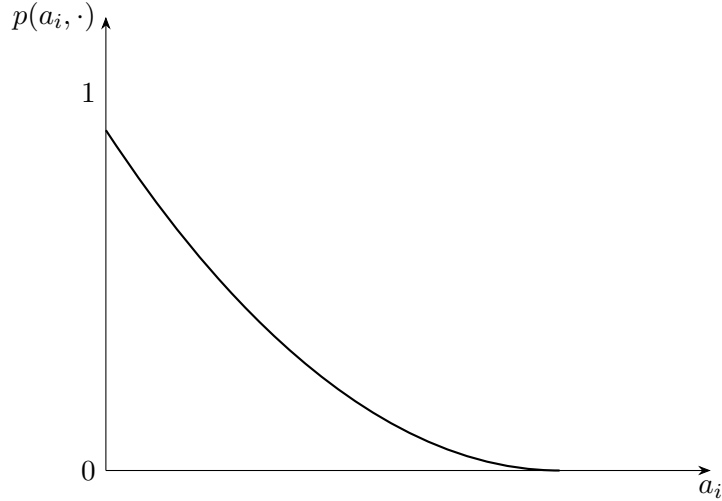
Figure 1: Probability of firm i being salient.

damage αx, where α is a parameter index that captures the campaigning effectiveness of the NGO. An NGO with a higher α is a more effective opponent and is able to force more clean-up-per-dollar (a similar reduced form approach to campaigns is taken by Baron (2009)).

In addition to campaigning against one or more firms in this industry, the NGO can also direct effort towards non-campaign activities that we will formalize as a single 'backstop' project. This is realistic—many of the bigger activist groups not only run campaigns against polluters but also conservation projects. The WWF-International website, for example, details their campaigning against various lines of business, but also the work done in fourteen of their largest conservation areas. For example, the six million square-kilometer Coral Triangle provides a 'global center of marine biodiversity' in the seas between the Philippines, Papua New Guinea and Malaysia. It provides a haven for over two thousand species of fish, seven of the eight threatened species of marine turtle, in addition to the many corals which inspire its name (see figure 2). As well as matching reality, analytically the backstop project has the effect of ensuring that in the mind of the NGO there is an opportunity cost to funds devoted to campaigns.

If industry does x units of clean-up, the NGO gets payoff $b(x)$, where $\partial b(x)/\partial x > 0$ and is multiplicative (e.g., $b = \log$) and $\partial^2 b(x)/\partial x^2 < 0$. If instead the NGO devotes x units of resource to the backstop, this produces payoff $\phi b(x)$, where $\phi > 0$. For a given budget the NGO's objective is the sum of these payoffs (Baron, 2009).

The NGO requires money in order to campaign and/or contribute to the backstop

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Figure 2: The left-hand panel is a picture of a WWF-sponsored demonstration against the production practices of those oil companies operating in the Alberta oil-sands, April 2009. The right-hand panel is a picture of part of the WWF-operated Coral Triangle Reserve in South-East Asia.

project. Support for it is stimulated when the industry that it watchdogs is in the public eye. Funding comes from donors, of which there are two types.

Assumption (Core and Latent Donors). *Core donors always donate an aggregate amount $\underline{m}$ to the NGO. Latent donors donate an amount m_e if and only if the industry is salient, and zero otherwise. Total funds available to the NGO equal $\overline{m} = m_e + \underline{m}$ if the industry is salient, and $\underline{m}$ otherwise.*

While the core donate come what may, the issue at stake must be *salient* to stimulate donations from the latent group—it must be 'on the radar.'[11] This formulation of donation with limited attention differs from standard treatments in which donors are solicited by NGO fund-raising activities (Aldashev and Verdier, 2009).[12] Here it is the activities of the firms themselves that may bring attention to the issue. It is the existence of the latent donors that provide the incentive for industry to worry about its collective

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[11]For instance, it is widely observed that charitable donations increase in the wake of a natural disaster, and that these donations are often quite out of proportion to need but rather to how the disaster is reported (Evangelidis and van den Bergh, 2013). This is similar to the 'identifiable victim effect,' where donors will donate more to help identifiable victims, such as those seen in pictures, rather than (an equal number of) statistical victims (Jenni and Loewenstein, 1997).

[12]The model of advertising of Grossman and Shapiro (1984) is similar in spirit. While we do not have a micro-founded model of donor behavior, our model captures the essential characteristic of salience: when a firm or industry is salient, an NGO attracts more funding from donors. Any model of donors that generates this outcome will do; the specifics of such a model are not important in our setting.

reputation, and for the NGO to 'issue manage.'

To define itself, the NGO must choose a *mission statement*—the statement of what it does—and *targeting strategy.*

Assumption (NGO Design). *The NGO (a) adopts a mission statement that specifies the fraction γ of funds to be devoted to campaigning against the industry, with the remainder $(1-\gamma)$ being directed to the backstop project; (b) decides whether it will target campaigning funds at the industry as a whole or at the salient firm.*

Ex ante there is uncertainty over the funds the NGO will obtain and this will depend upon the subsequent choices of firms and the outcome of the probabilistic salience process. The mission commits the NGO to how it will divide funds between the campaign against this industry and the backstop project.

The NGO also has discretion over how targeted to make any campaign against the industry. We consider two types of targeting strategies. First, the NGO can choose a campaign that targets all firms in the industry equally (or, equivalently, a single randomly chosen firm).[13] Second, it can choose a campaign that targets only the salient firm. We will establish later that the NGO will always prefer the former, so the core of our analysis embodies that choice.

2.4 Timing

The timing of the game is as follows:

1. The NGO commits to γ (how funds are to be split between campaigning against the industry and the backstop activity—i.e., it designs its mission statement) and its targeting strategy.

2. Firms choose their cloaking efforts a.

3. Salience outcomes are realized.

4. Donors donate and the NGO may execute a campaign consistent with its mission.

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[13]An NGO may wish to target only a single firm instead of the entire industry for strategic reasons (Baron and Diermeier, 2007). Our setting can also arise from a model of an encounter with endogenous demands. Following Baron and Diermeier (2007), if an NGO makes a demand α to a firm, it will choose its demand so that the firm accepts. If firms have a type τ (say, reputation) that determines if they fight or concede to an NGO's demand, the largest α an NGO can select to ensure the firm concedes is a function of τ. The NGO targets the firm of type $\bar{\tau}$, the type that corresponds to the largest α. If both firms and the NGO do not know types *ex-ante* but types are learned before the NGO enacts its campaign, and types are drawn from an i.i.d. process, each firm is equally likely to be targeted with the campaign $\alpha(\bar{\tau})$.
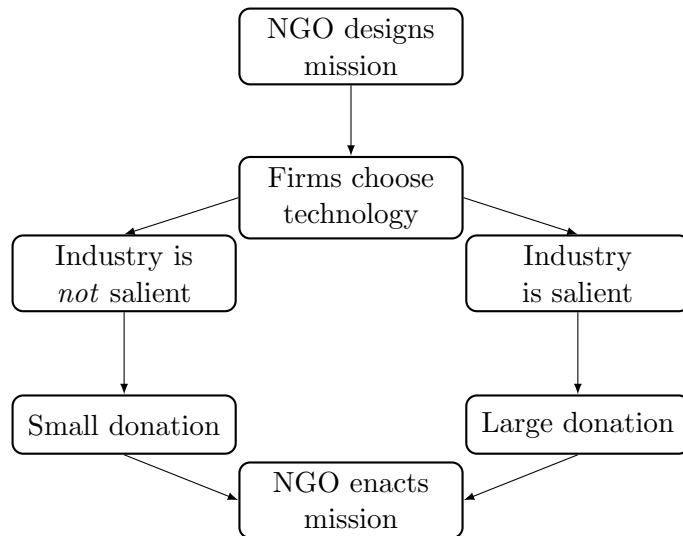
Figure 3: Structure of the game.

This is summarized in Figure 3. The equilibrium concept is sub-game perfect Nash and we only consider symmetric equilibria.

Before solving the game, it is worthwhile discussing the timing of the game. Design of the mission statement in the first stage follows Heyes and Martin (2015): the NGO credibly commits to the issues it will address, as well as the relative intensity with which it will address these issues (i.e., γ), to attract donors and produce social impact.[14] The presence of an NGO with a particular mission then induces firms to make choices regarding visibility for fear of facing a costly campaign; the NGO's mission statement sends a signal to firms about the type of opponent the NGO will be.

Stage 3 is where the main novelty of the model resides. A subset of potential donors to the NGO are not aware of the environmental impact of the industry or of the environmental issue at all—perhaps damage is not large enough for them to notice or an accident must occur in order to garner media attention—and will not donate unless the issue becomes salient. Given the actions by firms, the state of the world becomes known in stage 3—the industry is either salient or not. From this, in stage 4, the NGO attracts funds and engages in actions consistent with its mission.

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[14]Credibility is important here as *ex post* the NGO will always wish to choose γ to equalize marginal benefit across issues. There are several reasons to think that the mission set *ex ante* is credible. For example, there may be a reputational cost if the NGO deviates from its mission *ex post*. Heyes and Martin (2015) discuss credibility of mission in more detail. The choice of mission could also entail some sunk cost if γ is seen as a technology for using funds (e.g., by buying the Rainbow Warrior Greenpeace commits to a marine campaign of some intensity). It is standard in the literature to assume that the NGO can credibly commit to its campaign (Baron and Diermeier, 2007).

2.5 Solving the Model

We solve backwards and restrict attention to symmetric equilibria throughout. All proofs are relegated to the Appendix.

2.5.1 NGO funds and campaign (stages 3 and 4)

For any given level of funds m that the NGO has available, it spends an amount γm on a campaign against the targeted firm or firms in the industry, forcing cleanup $\alpha \gamma m$. Remaining funds $(1 - \gamma)m$ are spent on the backstop project. The overall payoff to the NGO is

$$B(\gamma, m) \equiv b(\alpha \gamma m) + \phi b((1 - \gamma)m).$$

If the industry becomes salient, then the NGO attracts the higher level of funds $\overline{m}$, and if it does not become salient then the NGO attracts the lower level of funds $\underline{m}$. As will be shown below, these actions and payoffs do not depend directly on the targeting strategy employed by the NGO, though the targeting *will* influence the decisions of firms.

For future reference, we define $\hat{\gamma}$ to be the mission statement the NGO would choose if salience were irrelevant.[15] In such a case, it would simply choose its mission statement to maximize its overall benefits by balancing the marginal benefit of funds allocated to the industry with the marginal benefit of funds allocated to the backstop issue. Thus, $\hat{\gamma}$ sets

$$B_1(\hat{\gamma}, m) = \alpha b'(\alpha \hat{\gamma} m) - \phi b'((1 - \hat{\gamma})m) = 0$$

or

$$\frac{b'(\alpha \hat{\gamma} m)}{b'((1 - \hat{\gamma})m)} = \frac{\phi}{\alpha}.$$

2.5.2 Firm choices (stage 2)

Firms anticipate the intensity and targeting of any NGO campaign contingent on salience outcomes. If the NGO targets equally all firms in the industry with its campaign (or picks at random a single firm from within the industry, which is analytically equivalent) the expected payoff for a firm i is

$$\mathbb{E}\pi(a_i) = r - \frac{1}{n} \sum_{j=1}^{n} p(a_j, a_{-j}) \alpha \gamma m_e - \frac{\alpha \gamma \underline{m}}{n} - a_i.$$

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[15]Note that multiplicativity of $\partial b(x)/\partial x$ implies that $\hat{\gamma}$ does not depend on m so that absent salience the choice of mission is time consistent.

This makes clear that strategic interdependence between firms here comes through salience outcomes (collective reputation).

Firm i chooses a_i to maximize its own expected profits. An interior solution a_i^* is then implicitly defined by the associated first-order condition

$$\left[-p_1(a_i^*, a_{-i}) - \sum_{k \neq i} p_2(a_k, a_i^* + a_{-k-i}) \right] \frac{\alpha \gamma m_e}{n} = 1.$$

By reducing the visibility of its damage, a firm can reduce the expected funds available to the NGO, conditional on the actions of other firms, and hence the expected cost of a campaign.

In a symmetric Nash equilibrium a^*,

$$\left[-p_1\left(a^*, (n-1)a^*\right) - (n-1)p_2\left(a^*, (n-1)a^*\right) \right] \frac{\alpha \gamma m_e}{n} = 1. \tag{2}$$

The equilibrium a^* can be seen as the industry's collective action to influence collective reputation. When all firms operate in a 'reputation commons'—i.e., exist in a setting where all members of the industry are 'tarred with the same brush'—there are incentives to engage in collective reputation management activities (Winn et al., 2008).

Proposition 1. *Equilibrium effort by firms to cloak environmental damage is increasing in the fraction of funds an NGO commits to campaigning and the effectiveness of the NGO, and decreasing in the visibility of the outside option. That is, $\partial a^*/\partial \gamma > 0$, $\partial a^*/\partial \alpha > 0$ and $\partial a^*/\partial \bar{v} < 0$.*

If an NGO commits to directing a greater portion of extra donations to campaigning, and/or is more effective per unit of campaign funds, then firms have the incentive to spend more heavily on trying to avoid industry salience. Similarly, the more eye-catching is the outside option for attention $\bar{v}$, the lower is the incentive for each industry member to invest in avoiding salience.

The first part of this proposition alerts us to a strategic consideration that the NGO will want to account for in designing its mission. Committing a greater fraction of funds to campaigning will encourage greater cloaking effort from the sector, reducing the equilibrium likelihood of industry salience, which in turn reduces funds available for both campaigning and the backstop project.

Industry structure naturally affects the incentives for firms to maintain a collective reputation. As each of the n firms in the industry are by assumption the same size, increasing the number of firms reduces concentration in the industry. The next propo-

sition characterizes how a reduction in concentration affects the likelihood of industry salience.

Proposition 2. *As the number of firms in the industry increases, each firm exerts less cloaking effort, and the likelihood of the industry becoming salient increases.*

There is a collective action problem associated with managing the visibility of the industry. In less concentrated industries each firm is less careful about cloaking its environmental damage—put another way, as concentration *falls* the willingness of any individual firm to invest in collective reputation is diminished. This issue became a serious concern for the chemical industry in the wake of Union Carbide's Bhopal disaster in 1984. Industry members feared a massive wave of regulation that would severely limit firms' strategic options, and mounted an industry self-regulation effort known as Responsible Care to attempt to preempt threatened regulations. However, with roughly 1,500 firms in the industry globally, there were grave concerns about free-riding amongst industry members. Indeed, these concerns proved prescient: by 1996 only 160 firms had joined Responsible Care (King and Lenox, 2000).

An interesting implication of the above results is the possibility that

Corollary 1. *Equilibrium profit for a firm in the industry may be increasing or decreasing in γ.*

The corollary may seem counterintuitive, since firms naturally prefer not to have to face campaigns from NGOs. However, we cannot rule out the possibility that a representative firm may be *better* off when facing an NGO committed to devoting a *larger* share of incremental donations to campaigning. This is because when faced by such an NGO *all* firms in the sector are induced to take greater care to prevent the damage that they do from becoming visible. The intensification of campaigning helps to reduce the free-riding problem that occurs in a less concentrated industry. This increase in industry discipline becomes increasingly valuable as the size of the industry grows, so for a large enough n the profits of an individual firm increase with the NGO's campaign orientation.

2.5.3   NGO mission design (stage 1)

Given the actions of firms, characterized above, the expected payoff for the NGO is

$$\mathbb{E}B(\gamma, m) = np(a^*, (n-1)a^*)B(\gamma, \overline{m}) + (1 - np(a^*, (n-1)a^*))B(\gamma, \underline{m}).$$

The NGO chooses γ—designs its mission—to maximize its expected payoff. If salience were uninfluenced by the actions of the NGO or the firms, and the NGO's budget were simply a randomization between $\overline{m}$ and $\underline{m}$, with the probability of $\overline{m}$ given by some exogenous p, then an interior solution to the NGO's mission design problem would be at $\hat{\gamma}$. We will refer to the mission chosen in this fashion as reflecting the *impact effect* of the NGO's design choice.

When salience is determined endogenously, however, the NGO knows that its choice will influence firms' cloaking efforts, the likelihood of industry salience, and therefore levels of donations. Thus, define the "endogenous salience effect" $S(\gamma, \overline{m}, \underline{m})$ as the marginal effect of a change in the NGO's mission on its expected payoffs, as mediated through the resulting change in firms' cloaking efforts, so that

$$S(\gamma, \overline{m}, \underline{m}) \equiv \underbrace{n \frac{dp(a^*, (n-1)a^*)}{da} \frac{\partial a^*(\gamma)}{\partial \gamma} [B(\gamma, \overline{m}) - B(\gamma, \underline{m})]}_{\text{Salience Effect}}, \qquad (3)$$

where we define $dp/da \equiv p_1 + (n-1)p_2$. With endogenous salience, an interior solution to the NGO's problem is at γ^* defined by

$$\frac{\partial \mathbb{E}B(\gamma^*, m)}{\partial \gamma} = \mathbb{E} \frac{\partial B(\gamma^*, m)}{\partial \gamma} + S(\gamma^*, \overline{m}, \underline{m}) = 0. \qquad (4)$$

Recall that, from (2), $dp/da < 0$ and Proposition 1 showed that $\partial a^*/\partial \gamma > 0$. It is easy to see that $B(\gamma, \overline{m}) > B(\gamma, \underline{m})$, so that $S(\gamma, \overline{m}, \underline{m}) < 0$. Thus, with endogenous salience the NGO does not simply choose γ to equalize expected marginal benefit across its policy domains (impact effect). Instead, the NGO designs its mission taking into account its endogenous effect on its expected flow of funds, given the expected visibility of the industry against which it campaigns (salience effect). Since $\mathbb{E}\partial^2 B(\gamma, m)/\partial \gamma^2 < 0$, (4) implies that $\gamma^* < \hat{\gamma}$. This is summarized as follows.

Proposition 3 (Salience bias in NGO mission design). *The NGO devotes a smaller fraction of funds to the campaign than would equalize expected marginal impact between campaign and backstop activity.*

In effect the NGO designs a mission that *softens* the penalty faced by a firm should the industry become salient. This reduces incentives for cloaking and increases the likelihood of industry salience. When the industry is salient the NGO receives additional donations that it can direct both to the campaign and to the other uses (the backstop project).

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Two important notions that emerge from the above proposition are that an NGO *needs an enemy* and engages in *issue management* to do so. By having a visible enemy—an industry salient in the public eye, seen to be producing environmental damage—the NGO is able to rally funding both for its campaign and for other uses. To this end it strategically chooses a mission that is not too penal on a firm that induces industry salience.[16]

As with firms, market structure is relevant for NGO choices. With more firms (each of pre-determined size) in the industry, each firm devotes less effort to cloaking (proposition 2) and hence the industry is salient more often, leading to more funds for an NGO.

Proposition 4. *The NGO's choice of mission, γ^*, may be increasing or decreasing in n, the number of firms in the industry. Expected impact (i.e., $\mathbb{E}B(\gamma, m)$) and expected funding for the NGO are increasing in n.*

An immediate implication of the proposition is that NGOs benefit more from targeting less concentrated industries than from targeting concentrated industries that can be expected to deploy extensive efforts to cloak their environmental impact.

2.6 Targeting salience: NGO preference for broad over narrow campaigns

So far we have assumed that any campaign launched by the NGO targets the whole industry. An alternative approach that the NGO might take would be to target only the salient firm should a firm become salient, and the whole industry otherwise.

In this case, expected payoff for firm i is

$$\mathbb{E}\pi(a_i) = r - p(a_i, a_{-i})\alpha\gamma\overline{m} - \left(1 - \sum_{j=1}^{n} p(a_j, a_{-j})\right)\frac{\alpha\gamma m}{n} - a_i.$$

It follows that in a symmetric Nash equilibrium a',

$$-p_1(a', (n-1)a')\alpha\gamma\overline{m} + (n-1)p_2(a', (n-1)a')\frac{\alpha\gamma m}{n} = 1.$$

Lemma 1. *Each firm exerts less cloaking effort if the NGO campaign targets all firms than if it targets only the salient firm.*

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[16]Of course, the literature has long recognized that firms engage in strategic issue management (Ansoff, 1980), but the notion of NGO issue management has not been previously identified.

Intuitively, if the NGO randomizes its campaign then firms have a greater incentive to free ride on the cloaking efforts of other firms, leading to lower equilibrium cloaking for each firm. As before, the NGO can induce firms to invest less in collective industry reputation if it launches a broader campaign.

Proposition 5 (NGO preference for broad campaigns). *Expected impact is greater for the NGO if it targets the whole industry (or randomizes over firms within the industry) rather than targeting only the salient firm.*

In colloquial terms, the NGO will prefer to "tar all firms with the same brush." By softening the implications for any *particular* firm from being the one that brings attention to the activities of the industry *as a whole*, the NGO increases the chance that this indeed happens.

2.7 Welfare

There are two elements to thinking about welfare in the current model. First, does the NGO make socially desirable choices *given* the need to account for salience considerations? In other words, how does the mission γ^* chosen by the NGO compare to that which the planner would wish it to choose? Second, how does the *presence* of salience considerations—which we introduce into the literature on private politics in this paper—exacerbate or mitigate any social inefficiency in NGO campaign decisions? We deal with these in turn.

Expected social welfare is

$$\mathbb{E}W(\gamma) = \mathbb{E}B(\gamma, m) + n\mathbb{E}\pi(a^*(\gamma)).$$

At γ^*, the NGO's chosen mission,

$$\frac{d\mathbb{E}W(\gamma^*)}{d\gamma} = -np(a^*, (n-1)a^*)\alpha m_e - \alpha\underline{m} < 0,$$

so the NGO does not maximize social welfare. In particular, given concavity of $\mathbb{E}W$, γ^* is *greater* than the level that maximizes social welfare.

Proposition 6 (Socially excessive campaign orientation). *The NGO devotes a greater fraction of funds to campaigning against the industry than is socially desirable.*

The NGO will design its mission to devote a greater share of funds to campaigning (smaller share to backstop projects) than a social planner would wish it to. The source
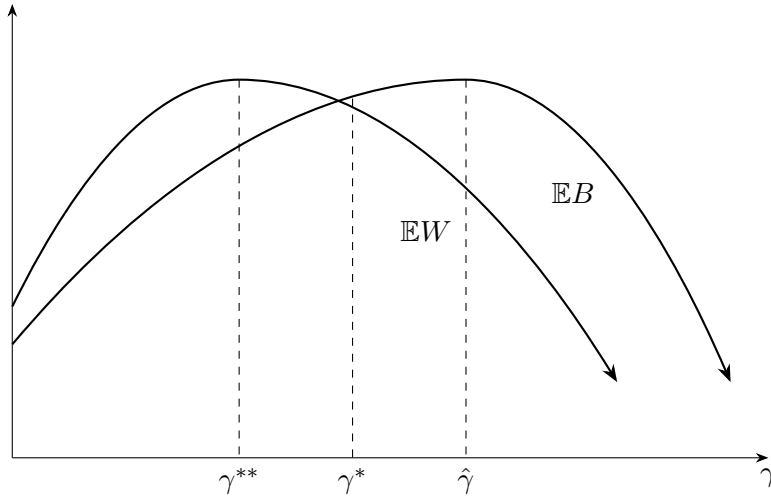
Figure 4: The NGO's mission γ^* is smaller than that which maximizes impact across issues, $\hat{\gamma}$, but greater than that which maximizes welfare γ^{**}. Welfare is greater with salience.

of inefficiency here is important to understand. In its calculations, the NGO does not weight the impact of its choices on expected producer surplus, whereas the social planner does. Thus, the NGO places too much weight on its profit-reducing campaign against the industry. Nevertheless, comparing this result with proposition 3, we see that the strategic manipulation of mission design, which the NGO conducts to increase salience ('issue management'), reduces its campaign orientation. As a result, the NGO's salience gaming produces a better welfare outcome than if the NGO simply equated expected marginal impact across campaign and backstop spending, which would have produced an *even more excessive* campaign orientation. This is summarized in the following:

Corollary 2 (Salience concerns imply NGO and social incentives more closely aligned)**.** *The desire to influence salience induces the NGO to choose a more socially desirable mission.*

Recall that if strategic manipulation of salience were impossible, then the NGO would choose its mission to equate expected marginal impact across issues. This would exacerbate its socially-excessive emphasis on campaigning against the industry, as proposition 3 implies. Thus, somewhat counter intuitively, the NGO's strategic manipulation of salience reduces its campaign orientation, moving it closer to the social planner's preferred outcome.

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3 Avoiding salience by being good: Combining symbolism with substance

So far we have assumed that the only thing a firm does to reduce the probability of becoming the focus of public attention is spending on 'cloaking.' Such cloaking is costly, and hence a concern to the firm (and the social planner), but it is a cosmetic device and delivers no environmental benefits. This modeling approach is plausible—there is much evidence that firms in many settings do engage in greenwash, public relations on social impact, 'uninspectability', obfuscation, corporate opacity etc.—and has streamlined the model substantially.

However it should be clear that another important way in which a firm might seek to stay out of the public eye is by actually *reducing* its environmental footprint (abating). In this section we investigate how the insights developed earlier need to be adjusted in a setting in which a representative firm engages in both *substantive* and *symbolic* action to reduce the probability of salience. There is a sizable literature in management on the strategic use of symbolic management, as opposed to making substantive changes in corporate operations. For example, Delmas and Montes-Sancho (2010) find that early participants in the U.S. Department of Energy's Climate Challenge program made substantive reductions to their greenhouse gas emissions, but late joiners were simply free-riders on the program's reputation, and made no substantive improvements. Similarly, Kim and Lyon (2011) find that firms participating the Department of Energy's Voluntary Greenhouse Gas Registry increased their greenhouse gas emissions over time while reporting reductions, whereas non-participants actually reduced their emissions over time. Both studies demonstrate that there can be a sharp disconnect between the symbolism and the substance of corporate actions.

In the extended model of the present section, a now refers to abatement and h refers to hiding, or cloaking effort; the function ν maps (a, h) into the probability space such that $p(\nu(a_i, h_i), \nu_{-i}(a_{-i}, h_{-i}))$ gives the probability that firm i is salient—ν is the 'production function' that takes abatement and cloaking as inputs to reduce visibility. As abatement is something to which the NGO attaches value, there is now another margin that the NGO will wish to take into account when designing its mission. This will make the results of the model less precise. To ease the analysis and make the main points clear, let $\nu = a + h$; abatement and hiding are perfect substitutes in the reduction of visibility. Suppose both abatement and cloaking effort entail a marginal cost of unity. These assumptions allow for firms to employ both substantive and symbolic action to influence salience, but remove any scale effect associated with changes in the share of

abatement and cloaking to produce visibility.

A firm's decision regarding how much to reduce its visibility is the same as in section 2.5.2, and the equilibrium ν^* is identical to the equilibrium a^* given by (2). The only difference introduced by having both cloaking and abatement is the relative intensity with which these actions combine to produce visibility. Letting ω be the share of abatement, in a Nash equilibrium firms choose a^* and h^* such that $a^* = \omega\nu^*$ and $h^* = (1 - \omega)\nu^*$. Since ν embodies abatement and cloaking as perfect substitutes, any ω is a possible solution. In order to conduct comparative statics we will treat the share ω as exogenous and this can be interpreted as the degree to which a firm can substitute substantive for symbolic action (or vice versa).

Defining B as before, if the industry is salient then the payoff to the NGO can now be written $B(\gamma, \overline{m}) + \beta n a^*(\gamma)$ and if the industry is not salient the NGO's payoff is $B(\gamma, \underline{m}) + \beta n a^*(\gamma)$, where β captures the environmental benefit associated with abatement. Although the analysis for stage 2 of the game remains the same, the first-order condition associated with the NGO's choice of mission now contains an extra term. In particular, the first derivate of the NGO's objective function becomes

$$\frac{\partial \mathbb{E}B(\gamma^*, m)}{\partial \gamma} = \underbrace{\mathbb{E}\frac{\partial B(\gamma^*, m)}{\partial \gamma}}_{\text{Literature Benchmark (no salience)}} + \underbrace{S(\gamma^*, \overline{m}, \underline{m})}_{\text{Salience effect}} + \underbrace{\beta n \omega \frac{\partial \nu^*(\gamma^*)}{\partial \gamma}}_{\text{Abatement effect}}, \quad (5)$$

where $S(\gamma^*, \overline{m}, \underline{m})$ is the salience effect exactly as in (3) (replacing a^* with ν^* of course). In comparison to the earlier analysis, when firms avoid being salient through abatement rather than cloaking there is a new effect (captured by the last term in equation (5)) that encourages the NGO to increase the intensity of its campaign against the industry. Because the NGO values abatement, it increases the intensity of its campaigning, which in turn encourages firms to spend more resources on abatement in order to limit the NGO's ability to raise funds and reduce the equilibrium size of an NGO's campaign.[17]

Proposition 7 (Salience avoidance through abatement increases campaign-orientation of NGO). *If firms reduce visibility partly by abatement, the NGO chooses a mission that directs a greater share of funds to campaigning (lower share of funds to backstop project).*

In fact, equation (5) shows that in addition to the benchmark effect there are now two additional effects pulling in opposite directions, the "salience effect" (which is negative)

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[17]If h is interpreted as greenwashing, then the model predicts a negative relationship between the strength of an activist's campaign (here γ) and greenwashing, as in Marquis et al. (2016). However, it is the NGO's anticipation of corporate greenwash that influences its campaign, not the influence of the campaign on the decision to greenwash.

and the "abatement effect" (which is positive). Compared to the 'literature' benchmark in which salience considerations are ignored, the NGO may bias its mission either against the campaign *or* against the backstop, depending on which effect dominates. Since firms now abate in order to avoid salience, in addition to whatever cleanup is induced by the NGO's campaign, it is intuitive that there is an improvement in social welfare. Assuming γ^* is approximately linear in ω, we have the following:

Proposition 8. *Expected environmental damage is lower and welfare higher if firms avoid public attention partly through abatement rather than cloaking activity.*

Since the choice of abatement (substantive action) versus cloaking (symbolic action) influences the mission design decision of the NGO, there is strategic value for firms to be able to commit to one or the other type of strategy to avoid salience, since this serves to influence the vigor of any NGO campaign. If firms cloak emissions to evade public attention, this leads the NGO to bias its mission *against* campaigning; instead, if firms abate to evade public attention, the NGO commits to a greater campaign-orientation.

If firms as a group could credibly commit to a type of action—symbolic or substantive—the type of action that generates the greatest equilibrium profit would be selected. Intuitively, it seems firms would like to commit to hide emissions as this induces the NGO to pursue a *softer* campaign. This intuition, however, fails to take account of *why* the NGO enacts a softer campaign: it wants to discourage firms from hiding emissions, thus rendering the industry more salient in the public eye and generating more revenue for itself. Following corollary 1, there is qualitative ambiguity in the strategy that firms would wish to follow. Although symbolic action induces the NGO to enact a softer campaign, this leads firms to become salient more often and so expected funding for the NGO increases. Thus, substantive action may be a better strategy, since it limits the NGO's ability to garner support. The size of the industry—and hence the size of its collective action problem—determines whether symbolic or substantive action is more profitable, as recorded in the following proposition.

Proposition 9. *If the number of firms in the industry is sufficiently small, then firms prefer to commit to cloak emissions. If the number of firms is sufficiently large, firms prefer to commit to abate emissions.*

Proposition 9 seems counterintuitive at first glance. The theoretical literature on self-regulation suggests that larger firms in concentrated industries will be better able to coordinate and take meaningful action to preempt NGO pressure (Maxwell et al., 2000). Moreover, the empirical literature finds that larger firms are indeed more likely to engage

in substantive action (King and Lenox, 2000; Delmas and Montes-Sancho, 2010). In addition, casual empiricism suggests that one of the reasons the Montreal Protocol on ozone-depleting substances was successful was that there were only a small number of firms producing the substances, and hence it was relatively easy to elicit substantive action. In contrast, the Kyoto Protocol on greenhouse gas emissions has been relatively unsuccessful, in part because there are so many firms that emit greenhouse gases. Thus, it seems strange to think that more fragmented industries have stronger incentives to commit to substantive action.

Although it may initially seem puzzling, Proposition 9 has a simple intuition: since there is a free-rider problem among firms, a larger industry leads to greater free-riding and the industry becomes salient more often, leading to the expectation of a costly campaign. Even though abating emissions leads to a tougher campaign and extra effort on the part of firms to reduce visibility, a commitment to abatement can reduce the expected funds available to the NGO enough to make such pre-commitment worthwhile when there is a large collective action problem for the NGO to exploit. Returning again to the greenwashing example, when industries face the threat of an NGO campaign, our analysis shows that a more competitive industry is less likely to greenwash, counter to the managerial analysis of (Delmas and Burbano, 2011) but consistent with the findings of Fernández-Kranz and Santaló (2010). The reason this comes about is from the more pronounced collective action problem created by salience in a competitive setting, and hence the greater value to solving it through pre-commitment.

4   Conclusions

Many disciplines recognize the importance of salience as a phenomenon (including psychology, neuroscience and political science) but work in strategy and private politics has treated salience as an exogenous phenomenon, rather than something that can be influenced through the strategic interaction of firms and NGOs. In this paper, we have contributed the first model of private politics that incorporates the strategic creation of salience. We considered an industry whose reputation can be sullied if any member's social damages become the focus of public attention, and we allowed individual firms to invest in "cloaking" actions that reduce the risk that their damages will become salient. Firms face a tension between taking action to minimize their risk of becoming salient and free-riding on the efforts of other firms. The industry confronts an NGO that can design its mission to incorporate a desired level of anti-corporate campaigning, which in turn affects its financial support from donors. The NGO faces a tension between wanting to

minimize environmental damage and wanting to maximize the salience of environmental damage so as to ensure vigorous fundraising. From the strategic interactions of these players, we obtained a number of new insights, some of which are counterintuitive.

The contributions of our approach are three-fold. First, we showed how an activist NGO can optimally use salience games to exploit industry free-riding behavior when the industry faces a reputational commons. The reputational externalities within the industry are not reflected in the profit-maximizing decisions of individual firms, so they lead to free-riding by firms who undertake less cloaking effort than would be optimal for the industry as a whole. The NGO strategically exploits this free riding through the design of its mission and its targeting strategy. An important implication of our analysis is that the NGO optimally targets the entire industry instead of a single firm. In this way, the NGO enhances the reputational externalities between firms, and induces firms to reduce their spending on cloaking effort. This in turn raises the likelihood that the industry will become salient, which increases the NGO's fundraising prospects. In addition, because a strong threat of an anti-corporate campaign imposes discipline on the industry and reduces free-riding, the NGO strategically under-invests in campaigning in order to promote free-riding and increase the likelihood of an incident that creates salience and increases donations. In an important sense, the NGO "needs enemies" in order to fund its activities, and it chooses a mission that helps to keep its enemies in the public eye.

A second contribution is that we characterized the welfare impacts of salience games. Perhaps surprisingly, these games are not necessarily socially undesirable. Instead, they help to mitigate a misalignment between the objectives of the NGO and overall social welfare. Because the NGO is not concerned about producer surplus, it has incentives to over-invest in profit-reducing anti-corporate campaigns. Thus, the strategic reduction in campaigning that the NGO uses to boost industry salience turns out to raise welfare by blunting the NGO's otherwise excessive incentives for campaigning.

Thirdly, we provided new insights into when industries will take symbolic vs substantive actions in response to social movement pressures. We allowed firms to reduce the risk of becoming salient by undertaking pollution abatement rather than simply by cloaking their actions. We showed that the more firms rely on substantive actions to shield themselves from salience, the harder the NGO campaigns. This occurs because abatement, unlike cloaking, directly benefits the NGO, so the NGO intensifies its campaign in order to induce more abatement. Not surprisingly, welfare is greater when firms take substantive action because it directly reduces damages, although this must be weighed against tougher NGO campaigns. Intriguingly, we found that industry struc-

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ture has important implications for the choice between symbolic and substantive action. If the industry can commit to a coordinated strategy, e.g. through its trade association, then a concentrated industry engages in cloaking effort but a fragmented industry takes substantive action. The reason is that a fragmented industry has greater incentives for free-riding behavior, which exposes it to a greater risk of becoming salient. By taking substantive actions, the industry can encourage the NGO to pursue a tough campaign, thereby providing needed discipline against free-riding. This is a striking result, and is consistent with the empirical results of Fernández-Kranz and Santaló (2010), who find that firms in more competitive industries have lower pollution levels, and Flammer (2015), who finds that firms increased their socially responsible performance after an exogenous reduction in import tariffs increased competition.

Although our analysis has generated a set of new insights, there remain a number of ways in which our model can be extended. One of the most important is to relax the assumption of symmetric firms. This is not an easy task, however, because models of collective action often admit of multiple asymmetric Nash equilibria and it can be difficult to pin down a clear set of predictions in an asymmetric setting. Nevertheless, doing so is important because it would help to link economic models of private politics with the growing empirical literature in management and strategy that studies how firms respond to social movement pressure. A second important extension is to flesh out the details of market structure and competition, exploring differences between price and quantity competition, and incorporating horizontal and vertical product differentiation. A third area with rich opportunities for further research is more detailed modeling of symbolic and substantive action, which may generate new insights into when they are complements and when they act as substitutes. Finally, empirical work that explores the links between NGO strategy and industry choices of symbolic and substantive action would be highly worthwhile.

Appendix

Proof of proposition 1. From (2) and the implicit function theorem $\partial a^*(\gamma)/\partial \gamma > 0$. The case for α and $\bar{v}$ is similar. $\qquad \square$

Proof of corollary 1. To begin, $\partial \pi(\gamma)/\partial \gamma = (n-1)\partial a^*(\gamma)/\partial \gamma - \alpha \underline{m}/n - p(a^*, (n-1)a^*)\alpha m_e$. If n is sufficiently close to 1 then $\partial \pi(\gamma)/\partial \gamma < 0$. Provided $\partial a^*(\gamma)/\partial \gamma$ is bounded below by a strictly positive constant, for n sufficiently large $\partial \pi(\gamma)/\partial \gamma > 0$. $\qquad \square$

Proof of proposition 2. From (2) and the implicit function theorem $\partial a^*(n)/\partial n < 0$ and

$$\partial p(a^*, (n-1)a^*)/\partial n = -n\partial a^*(n)/\partial n + p_2(a^*, (n-1)a^*)a^* > 0.$$

$\square$

Proof of proposition 3. Let $\hat{\gamma} = b'^{-1}(\phi)/[b'^{-1}(\phi) + \alpha b'^{-1}(\alpha)]$. Then $\hat{\gamma}$ is the unique point such that marginal impact is equated across issues. For any $\gamma < \hat{\gamma}$, $\mathbb{E}\partial B(\gamma)/\partial\gamma < 0$ and for any $\gamma > \hat{\gamma}$, $\mathbb{E}\partial B(\gamma)/\partial\gamma > 0$. Therefore $\mathbb{E}\partial B(\gamma)/\partial\gamma > 0$ implies that $\alpha b'(\alpha\gamma\overline{m}) > \phi b'((1-\gamma)\overline{m})$ and $\alpha b'(\alpha\gamma\underline{m}) > \phi b'((1-\gamma)\underline{m})$. $\square$

Proof of proposition 4. From the envelope theorem,

$$\partial\mathbb{E}B(n)/\partial n = [p(a^*, (n-1)a^*) + np_2(a^*, (n-1)a^*)a^*$$
$$+ n(p_1(a^*, (n-1)a^*) - (n-1)p_2(a^*, (n-1)a^*))\partial a^*(n)/\partial n]\left[\overline{B} - \underline{B}\right] > 0,$$

where $\overline{B} = B(\gamma^*, \overline{m})$ and $\underline{B} = B(\gamma^*, \underline{m})$. $\square$

Proof of lemma 1. Suppose this were not the case so that $a^* \geq a'$. It follows that

$$-p_1(a', (n-1)a')\alpha\gamma\overline{m} + (n-1)p_2(a', (n-1)a')\frac{\alpha\gamma m}{n} \leq$$
$$[-p_1(a^*, (n-1)a^*) - (n-1)p_2(a^*, (n-1)a^*)]\frac{\alpha\gamma m_e}{n}. \tag{6}$$

Since $-p_1$ is strictly decreasing in a,

$$-p_1(a', (n-1)a')\alpha\gamma\overline{m} > -p_1(a^*, (n-1)a^*)\frac{\alpha\gamma m_e}{n}$$

and hence (6) is false; therefore $a' > a^*$. $\square$

Proof of proposition 5. If the NGO only targets the salient firm, each firm picks a larger a^* from lemma 1. Now

$$\partial\mathbb{E}B(\gamma)/\partial a = n[p_1(a, (n-1)a) + (n-1)p_2(a, (n-1)a)]\left[\overline{B} - \underline{B}\right] < 0.$$

For any γ, expected impact is greater if the NGO targets all firms; hence the NGO can produce a strictly greater payoff by targeting all firms. $\square$

Proof of corollary 2. The γ that maximizes social welfare is less than γ^*, since $\partial\mathbb{E}W(\gamma^*)/\partial\gamma < 0$ and $\mathbb{E}W$ is concave. From proposition 3, $\gamma^* < \hat{\gamma}$. $\square$

Proof of proposition 7. From the implicit function theorem and (5), $\partial\gamma^*/\partial\omega > 0$. $\qquad\square$

Proof of proposition 8. From the envelope theorem, $\partial\mathbb{E}B(\gamma^*)/\partial\omega = \beta n\nu^*$ and $\partial n\pi(\gamma^*)/\partial\omega = [-np(\nu^*,(n-1)\nu^*)\alpha m_e - \alpha\underline{m}]\partial\gamma^*/\partial\omega$. If $\partial\gamma^*/\partial\omega$ is approximately constant then $\partial\gamma^*/\partial\omega < 1$. If $\beta n\nu^* > \alpha\overline{m}$ (which must be true for abatement to be socially valuable) then $\mathbb{E}W$ is increasing with ω. $\qquad\square$

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